1889.

NEW ZEALAND.

THE MINING INDUSTRY.

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

The Secretary of Mines to the Hon. the Minister of Mines.

Sir,— Mines Department, Wellington, 27th June, 1889.

I have the honour to forward herewith the general report on the mining industry in the colony for the year ending the 31st March last, together with the reports of the Inspecting Engineer, Inspectors of Mines, Wardens, and Water-race Managers for the same period.

I have, &c.,

S. Percy Smith,

The Hon. G. F. Richardson, Minister of Mines. Secretary of Mines.

MINES REPORT.

The mining industry is slowly but gradually progressing, and looks now in a more hopeful condition than it has done for some years past. The gold- and coal-mines are beginning to attract the attention of people residing outside the colony as being ventures in which they can profitably invest their money, and recently a considerable amount of foreign capital has been attracted to our mines. If these mining ventures prove successful, it will be a great inducement for others to invest their money in similar enterprises. In all mining matters there is an uncertainty in regard to wealth lying buried beneath the surface, and mine-owners requiring capital to prospect and open up their mines should not place too high a value on their properties, nor submit to the outside public any which are not likely to pay fair interest on the capital proposed to be expended. It is only by following this course that abundance of capital will be forthcoming to open up and develop the mineral resources of the colony.

The total value of gold and minerals produced in 1888, including kauri-gum, was £1,531,614, as against £1,487,888 for 1887, showing an increase last year of £43,726. The total value of gold and minerals, including kauri-gum, produced since 1853 was £52,512,642, as will be seen from the following table:—

Name of Metal or Mineral.	For Year ending the 31st December, 1888.		For Year ending the 31st December, 1887.		Total from the 1st January, 1853, to the 31st December, 1888.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Precious metals—	Oz.	£	Oz.	£	Oz.	£
Gold	201,219	801,066	203,869	811,100	11,421,817	44,843,642
Silver	403	71	20,809	3,453	497,868	124,792
Total gold and silver	201,622	801,137	224,678	814,553	11,919,685	44,968,434
Mineral produce, including kauri-gum—	Tons.	£	Tons.	£	Tons.	£
Copper-ore	2	75	..	..	1,394	17,862
Chrome-ore	..	..	..	..	5,666	37,367
Antimony-ore	376	6,246	134	3,989	1,365	19,750
Manganese-ore	1,085	2,404	305	895	13,741½	47,718
Hæmatite-ore	..	..	..	..	51	220
Mixed minerals	162	2,955	144	4,142	13,848	58,777
Coal exported	64,192	61,367	43,719	44,143	258,376	260,324
Coke exported	953	1,646	183½	266	4,592	7,500
Coal consumed in the colony	549,703	274,851	514,901	257,451	4,816,313	2,408,156
Kauri-gum	8,482	380,933	6,791	362,449	119,673½	4,686,534
Total quantity and value of minerals	624,955	730,477	566,177½	673,335	5,235,020	7,544,208
Value of gold and silver, as above	..	801,137	..	814,553	..	44,968,434
Total value of minerals produced, including gold and silver	..	1,531,614	..	1,487,888	..	52,512,642

Gold.

This branch of mining is gradually improving. Large works are in course of construction in the North Island Mining District for the reduction and treatment of auriferous and argentiferous ores, consisting of concentrating and roasting machinery; also works for the chlorination and

smelting of ores. These operations are likely to solve the baffling problem which proprietors have been working at for years—*i.e.*, how to get a fair percentage of the metals from the complex ores found on some of the fields. In the Middle Island, gold is found in a comparatively free state but in lodes, it is generally associated to some extent with iron, sulphur, and arsenic, and sometimes with antimony. Some of the mining companies in the Reefton district are erecting concentrating machinery to collect the auriferous pyrites hitherto thrown away as a waste product.

In alluvial mining, considerable attention is now being directed towards getting suitable machinery and plant to work the auriferous ocean-beaches, and from trials of the appliances already constructed the results are said to be satisfactory. In hydraulic mining there are considerable improvements in the plant now used, whereby low-lying ground, formerly considered valueless, is now worked on the hydraulic elevating system at a profit. Miners are now beginning to see the advantage of using wrought-iron and steel pipes to convey the water to their claims, as by this means they are able to utilise the whole of the available head.

To carry on mining successfully, capital and labour must go hand in hand in the future. Expensive plant is required in every branch of mining, which many working miners have not the means of procuring. Most of the easy and shallow ground, where the only appliances necessary were the tub and cradle, or a long-tom or short sluice-box, is worked out. Large quantities of materials have to be operated on, requiring labour-saving appliances to make the ground pay for working, thus entailing in most instances the employment of a considerable amount of capital to commence a new undertaking.

The table showing the production of minerals is for the year ending the 31st December, 1888, and shows a decrease in the yield of gold of 13,416oz.; but when the yield is taken for the year ending the 31st March last, there is an increase of 16,941oz., as will be seen by referring to Table No. 1 annexed. The increase in yield has been from the following districts:—

	Oz.
Marlborough	1,356
Nelson	1,546
West Coast	8,435
Canterbury	24
Otago	6,883
Total increased yield	18,244
Thames shows a decrease of	1,303
Total increase for the year	16,941

The yield of gold from the two principal quartz-mining districts—namely, Hauraki and Reefton—varies very little from year to year, as shown in the following statement, which embraces the last five years:—

District.	1884-85.		1885-86.		1886-87.		1887-88.		1888-89.	
	Quartz.	Gold.	Quartz.	Gold.	Quartz.	Gold.	Quartz.	Gold.	Quartz.	Gold.
Auckland—	Tons.	Oz.	Tons.	Oz.	Tons.	Oz.	Tons.	Oz.	Tons.	Oz.
Coromandel	456	3,201	550	3,382	305	4,170	1,923	6,774	2,149	8,090
Thames and Ohinemuri	31,496	37,705	35,998	61,540	34,827	38,142	35,207	39,354	51,158	39,475
Te Aroha	11,042	9,506	6,552	4,489	4,743	3,658	7,166	2,918	1,381	1,113
	42,994	50,412	43,100	69,411	39,875	45,970	44,296	49,046	54,688	48,676
Reefton	34,349	23,997	27,198	14,591	23,930	21,143	24,403	16,775	28,565	18,663
Totals	77,343	74,409	70,298	84,002	63,805	67,113	68,699	65,821	83,253	67,339

In the Coromandel district there has been a large increase in the yield last year, due entirely to the introduction and application of English capital to the opening-up and developing of the Kapanga Mine. About 40lb. of auriferous-quartz specimens from this mine were exhibited at the Melbourne Exhibition, which was valued by the manager at £600, or about 5oz. of gold to every pound of quartz. New discoveries of auriferous lodes have been made at Matarangi, between Whangapoua and Mercury Bay, which give encouraging returns from the parcels of stone already crushed. A lode has also been found in the Manaia district which is highly spoken of, but nothing definitely is yet known as to its value. In the Thames, Ohinemuri, and Te Aroha districts the yield has been less than in the previous year, but when the new plant in course of construction and erection at Karangahake, Waihi, and Te Aroha for the treatment of complex ores is in full operation the yield is likely to be largely increased.

The Reefton district shows a slight increased yield for last year, due in a great measure to the produce of the Keep It Dark and Globe Mines. Another mine, the Progress, is now opened up on the lower level, and is likely to be a steady gold-producing mine for some years, which will tend to augment the yield for the present year. The Welcome Mine, at Boatman's, which has been for many years worked profitably, requires a large amount of prospecting before it is likely to become a steady gold-producer for the future. The Fiery Cross Mine continues to be energetically worked, producing a fair amount of gold; but very little work is being carried on in the other mines in this locality with the exception of dead work.

In the Otago District the returns from the quartz-workings have not been so good as in previous years. At Skipper's and Macetown comparatively little work has been done. At the latter place

the Sunrise Company is working a lode on Advance Peak which is over 5,000ft. above the sea-level, and covered with snow for six months in the year. To enable the mine to be worked without intermission this company has erected sheds so that the workings can be carried on in the winter months. At the head of Lake Wakatipu mining operations were again commenced by tributers in the Invincible Mine, but it is not yet known whether they will make it pay or not. At White Reef, on the Old Man Range, the workings are still carried on at a profit, and at the Rough Ridge some good stone was crushed last year. The claims at the latter place have recently been formed into a large company with English capital. In the Nenthorn district new discoveries of auriferous lodes have been made, which are attracting the attention of those interested in mining as being a field for the investment of capital. Some trial-crushings have been made from some of the claims, which gave satisfactory results.

Although the returns from the quartz-workings generally have not come up to the expectations for the past year, there are reasonable grounds to believe that this branch of mining, which is the only permanent gold-mining in the colony, will, with improved machinery and appliances for treating the ore, and also by the employment of capital, yet develop into an industry giving profitable employment to a large population.

The yield of gold from the alluvial workings shows an increase in all districts, which is principally due to the improved appliances for working the ground, and also in some measure to the fact of a new field, the Mahakipawa, having been opened in May last year. In this place rich deposits of auriferous wash-drift have been found on some of the terraces, also in several of the claims in the creek-bed, and gold is now being traced down the creek into a large flat known as Cullen's Freehold. The extent of payable ground in this flat has not yet been determined. Extensive enterprises in alluvial mining, involving in each case a large expenditure, are in hand in the Otago District, amongst which may be mentioned the Gabriel's Gully and Blue Spur Consolidated Gold-mining Company, at Tuapeka; the Island Block Gold-mining Company, in the valley of the Molyneux; J. R. Perry's company (Hercules), near Roxburgh; and John Ewing's, at Tinker's. All of these are making arrangements to carry on very extensive hydraulic sluicing operations, the top material being sluiced off to such a depth as to allow of sufficient fall for the tailings, whilst the bottom material is lifted on the hydraulic elevating system. Messrs. Perry and Ewing are going to use steel pipes: the former is manufacturing them on the ground, and Mr. Ewing intends to follow the same course as soon as the plates which have been ordered from England come to hand.

Dredging-plant.

A number of dredges have been at work on the Molyneux River for years, some of which have been very successful. The Wellman dredger referred to in last annual report was refitted with a 12in. dredging-pipe and placed in the Manuherikia River, near its junction with the Molyneux. After working satisfactorily for a few weeks a flood occurred and sank it in deep water; it has not been recovered since. The pontoon, or barge, on which the machinery was placed was too small to resist the current of water in the river. A new bucket-dredge has been placed on the Big Beach, Shotover River, but it is not yet known whether this one will be successful or not.

A Wellman dredger has been in operation for some time at Waipapa, Otago, on the ocean-beach, and is said to be working satisfactorily. Another of these dredgers is in course of erection at the Saltwater Beach, south of Hokitika, and considerable interest is taken by those having beach claims in this locality in watching whether it will come up to expectations. The Ball dredger brought out from England by Mr. Brooke-Smith, which is somewhat on the same principle as the Wellman, was erected at the Five-mile Beach, below Okarito; but the pontoon for carrying the machinery was far too small to be of any utility for dredging. The dredging-pipes—7in. in diameter—were also found too small to work the ground at a profit. It, however, proved that the beach contained sufficient gold to pay for working if suitable machinery were employed.

At the Saltwater Lagoon, between the Grey and Teremakau Rivers, Mr. S. Brown, of Wellington, is constructing a large dredge with washing appliances different from any other in the colony. The dredging is to be done with a Cataract pump similar to that used in dredging the harbour at New York, and also during former times in dredging the Sacramento River, California, for gold. The washing appliances separate the large stones and fine shingle from the sand by using gratings, the material being again assorted by a travelling rake-belt, whilst the sand is discharged on to washing-tables, the latter being constructed in a similar manner to those now used for working the black-sand leads. On the Back Beach lead, three miles north of Greymouth, Mr. Joseph Taylor has constructed a dredge somewhat like the Wellman; but, instead of having the machinery on a pontoon, it is erected on a travelling frame set on wheels resting on iron rails, which enables the machinery to be moved back as each paddock is taken out. It has now been working for some time, and is said to answer satisfactorily. A large bucket-dredge has recently been constructed and erected in a small lagoon between the Waimangaroa and Ngakawau Rivers; but all the alterations found necessary are not yet completed. The washing appliances are of a new design, by Messrs. Kincaid and McQueen, of Dunedin; they consist of small circular convex tables covered with copper plate, with a semicircular gutter round the periphery, discharging on the outside.

A large area of ground is held in special claims on the ocean-beaches along the West Coast, from the Kowhai Bluff, north of Karamea, to Jackson's Bay, comprising in the aggregate 4,688 acres. The owners of these claims are merely holding them at the present time, waiting to see the different dredges now in course of erection in full operation, in order to satisfy themselves as to the best plant to use. There is sufficient known about the auriferous beaches on the West Coast to infer that they will pay for working with suitable appliances. The commencement of a new system of mining and introduction of a new class of machinery will have the effect of untrammelling the mind of those who have hitherto followed the pursuits of a digger's life, from old ideas and preconceived notions regarding the method of working the ground, and are likely to be the means of other

labour-saving appliances being devised. In order to make poor ground pay, some more economical method of working is necessary. When all these dredges now in course of erection are in full operation, and practically demonstrating that these beaches can be successfully worked, it will open up a new field entirely for the employment of capital and labour, which must in the future go hand in hand to make mining a commercial success.

Antimony.

The workings at Endeavour Inlet are still being carried on with a fair amount of success. Since the new company have taken possession of the works they have been forwarding the ore to England for treatment. Last year about 346 tons was exported, valued at £6,246, as against 134 tons, valued at £3,989, for the previous year. The company has been erecting a furnace to produce crude antimony, but so far has not been successful, the great difficulty being contained in the fact that the antimony and sulphur destroy the iron of which the furnace is made; but if a suitable material be got for lining the furnace so as to resist the action of these two metals it will enhance the value of the property considerably, as it will enable the antimony to be produced at a much less cost than heretofore.

Manganese.

This mineral is found in the northern districts of the colony. The quantity exported last year was 1,085 tons, valued at £2,404; as against 305 tons, valued at £895, for the previous year; which is an increase of 780 tons, of a value of £1,509. It is only when large deposits are found, with a cheap mode of transport, that manganese-mining can be made to pay.

Tin.

During the latter portion of last year discoveries of tin-ore were made in Stewart's Island, both in alluvium and in lodes. There is not sufficient known with regard to the value of this discovery yet; but it is evident that tin-ore is widely distributed over a large area. There have been 138 applications for mineral leases received by the Commissioner of Crown Lands for the district, for 60 acres each, or 8,280 acres in all. No doubt a large proportion of this area will prove valueless for working; but the probabilities are that some rich finds of tin-ore may be made. From the fact of the ore being distributed over a large area in the alluvial drift it is not unreasonable to expect that a rich lode will yet be found. If the tin-ore prove payable for working it will enhance the value of the land in this part of the colony, which at present is almost valueless for either agricultural or pastoral pursuits, and will also give employment to a considerable mining population.

Coal.

This industry is gradually increasing. The output from the mines in the colony last year was 55,275 tons more than for 1887: of this increased output there were 42,282 tons of bituminous coal, 14,023 tons of brown coal, and 261 tons of pitch-coal. At the same time there was a decrease in the output from the lignite-pits of 1,291 tons. This shows that the bituminous-coal mines are in a fairly progressive state of development. The other classes of coal are only suitable for local purposes, or, at most, for consumption within the colony. It is in the bituminous-coal mines that a largely-increased output is desirable, for that is the only class of coal which will find a ready market in foreign countries—and the time has now arrived when the coal industry will only progress to a large extent by finding markets outside the colony. There will always be a certain quantity of coal imported from Australia, as vessels going from here to New South Wales with produce will carry coals from that colony as return freights at very low rates, and so long as New Zealand can find a market for her produce in Australia, coals from New South Wales and Queensland will be brought back as return-freight in lieu of ballast.

The total output of coal from the mines in the colony last year was 613,895 tons, as against 558,620 tons for 1887; while the quantity imported from other countries was 101,341 tons, being a decrease of 5,889 tons from the previous year's imports. This makes the total quantity of coal raised within the colony and that imported to be 715,236 tons. Of this amount there was 68,087 tons exported to other countries, including 40,409 tons which were used in coaling the Direct mail-steamers, and which might be fairly considered as coal consumed in the colony. Of the quantity exported 64,192 tons was from New Zealand mines, and 3,895 tons from foreign sources. This makes the total consumption of coal within the colony last year to be 687,558 tons, as against 652,899 tons for 1887, thus showing that the increased demand last year was 34,659 tons more than for the previous one. The increased consumption shows that other industries in the colony are progressing and becoming more numerous, and that steam is now more largely used as a motive-power, that being the great factor in the consumption of coal.

The total quantity of coal raised in the colony since records have been kept by the department is 5,232,832 tons, of which 2,484,687 tons was bituminous and 1,797,725 tons brown coal, the balance being pitch-coal and lignite. The principal fields where bituminous coal is found are on the west coast of the Middle Island.

Number of Coal-mines and Men employed.

The number of coal-mines on the list last year was 128, being two more than for the previous year; but a large number ought not to be classed as mines, as they are only excavations and open pits, where the lignite is taken out in a face. The number of mines will vary to a considerable extent every year in proportion to the demand for local consumption: for instance, every mining company in the Reefton district using steam as a motive-power has a small pit or mine of their own, and only work it when they require a supply of coal, and sometimes the operations are suspended for a considerable time, extending over two and three years, as in the case of

the Golden Fleece Mine, at Murray Creek, in that district. There are only eight mines in the colony yet opened for supplying bituminous coal—namely, Kawakawa, at the Bay of Islands; Wallsend, Collingwood, Mokihinui, and Coalbrookdale, in the Westport district; and Brunner, Coal-pit Heath, Wallsend, and Tyneside, in the Greymouth district.

The total number of men employed in coal-mining is 1,689, as against 1,499 for 1887, being an increase last year of 190; but some of the mines are only yet doing preliminary work, and not sending much coal to market.

The average output per man last year was 363 tons, as against 372 tons for the previous year; but it will be seen by referring to table No. 5, attached, that the average is reduced by the lignite-pits and small mines at Reefton being included, where the average per man was only 225 tons. Were these deducted from the output of the other mines the average per man employed is about 380 tons for the year; while the average output from the mines in Great Britain and Ireland for 1887 was 329 tons for every person employed. The average output in the colony compares very favourably with that in older countries, and more especially so when the amount of dead work done last year is taken into consideration. In making this comparison it may be stated that out of 526,277 persons employed in the mines of Great Britain and Ireland last year there were 43,946 youths between the ages of ten years and sixteen years, and 4,183 females, which would in some measure account for the low average. The value of the coal at the mines in Great Britain varies in different districts, the highest being 7s. per ton, in Somersetshire and Westmoreland, in England, and the lowest, 3s. 8d. per ton, at Kinross, Scotland, the average being about 4s. 10d. per ton. This is less than the cost of coal at the mines in this colony, and has to be taken into consideration by our coal-mine owners when it is necessary to find markets for coal in foreign countries.

Future Prospects of the Coal-mines.

In regard to the further development of the coal industry, it will in a great measure depend on the trade that can be opened up in other countries. This will be regulated, so far as New Zealand is concerned, by the depth of water in the harbours of Greymouth and Westport, as it is only in those districts where coal suitable for foreign markets can be procured in large quantities.

In exporting coal the question of freight is a large factor in the price at which it can be delivered in foreign markets. This necessitates the employment of large vessels, carrying at least 2,000 tons on one bottom, in order to successfully compete with coal sent from other countries. The development of the industry is not likely to be rapid, but more of a slow, gradual increase year by year. From what is known of the bituminous coalfields in the colony, Mr. Park, of the Geological Survey staff, in a paper read before the Philosophical Institute, estimated that there were 187,000,000 tons, of which 177,000,000 tons were in the Greymouth and Westport districts.

Accidents in Coal-mines.

There were eighteen accidents last year in the coal-mines—four of which proved fatal—as against thirty-one for the year previous. It is impossible, with all the precautions taken, to secure an entire immunity from accidents. The workmen themselves are in most cases to blame for not using sufficient care, and the Inspectors have in some instances prosecuted them for their carelessness. The most efficient precaution against accidents would be for the workmen to co-operate amongst themselves to see that the spirit of the Act is strictly enforced in the mines where they are employed, and for each of them to strictly conform thereto, and, when they find any of their fellow-workmen neglecting anything that should be done, to at once inform the manager, and insist upon proceedings being instituted against them. It is only by a cordial co-operation of the managers and workmen that the Inspectors can hope to secure an immunity from serious accidents.

Earnings of the Miners.

Gold-mining.—The actual number of persons engaged in gold-mining on the 31st March last was 13,497, and at the end of last year 11,720, making an average for the year of 12,609; while the average for the year previous was 11,751: thus showing an increase in the number last year of 858. The value of the gold obtained was £831,907, which makes the average earnings of the miners £65 19s. 6d. per man. For the previous year it was £65 4s. 3d.

Coal-mining.—The number actually engaged in coal-mining at the end of 1887 was 1,499, and the number at the end of 1888 was 1,689; making the average for last year 1,594, as against 1,552 for the year previous. Taking the output of coal last year at 613,895 tons, and allowing 6s. per ton as the cost of getting and loading at the mine ready for the market, the average earnings of the miners would be about £109 per man. Making a comparison between the average earnings of the coal-miners in Great Britain and the colony, the earnings in the colony are double those at Home.

Kauri-gum.

Although this industry has been carried on for the last thirty-six years, the quantity exported every year, with few exceptions, has been increasing; and when it is taken into consideration that no expensive outfit is required—simply a spade and a spear—it will be seen that it is an enterprise suitable to the working-man. The value of the gum exported last year was £380,933, as against £362,449 for the previous year; thus showing an increase of £18,494. A field of this description in the vicinity of a large populous city like Auckland must have a beneficial effect in finding profitable work for the unemployed. It is also the means of livelihood of a considerable number of the Native population, and affords employment to many of the small settlers in the vicinity of the gum-fields. It is, however, an industry in which considerable care must be exercised by the gum-digger when working in the kauri forests during the dry season, in order to prevent bush-fires taking place, which prove very disastrous to the forests themselves. A sum of £254 10s. was realised from licenses to dig gum within the State forests during last year, that being the first in which any such charge was made.

Machinery, Plant, and other Works in connection with Mining.

The estimated value of machinery and works necessary to carry on gold-mining operations at the end of last year was as follows:—

	£
Machinery and plant used in alluvial and quartz mining ...	478,465
Water-races, exclusive of those controlled by the department ...	815,896
Tail-races and sludge-channels	168,703
Dams and reservoirs	126,429
Sluices	10,565
	1,600,058
Water-races constructed by Government and under its control ...	370,206
Total	1,970,264

There are 59 steam-engines employed in connection with mining, having an aggregate of 1,612 horse-power, and also 196 water-wheels. The crushing machinery used. consists, with very few exceptions, of stamping-batteries, berdans, and Mackay pans. The stamping-batteries have, in the aggregate, about 1,086 head of stamps, which vary in weight from 6cwt. to 8cwt. each. There are 5,130 water-races constructed, having a total length of about 7,108 miles, and these races are estimated to be capable of conveying about 13,638 sluice-heads, or 545,520 miners' inches of water.

Mining and Agricultural Leases.

There were at the end of last year 626 holdings in connection with gold-mining, including licensed holdings, mining leases, and special claims, comprising an area of 13,256 acres, the annual rental of which is £7,000; and also 414 agricultural leases in mining districts, the total area of which is 32,801 acres, producing an annual rental of £4,698. The rent of the former is paid to the local bodies in the district where they are held.

Goldfields Revenue.

The amount of revenue collected during last year was: Gold duty £20,633, and for miners' rights, business licenses, rents, fees, and other charges, £23,737; making a total of £44,370, as against £37,298 for the previous year: thus showing an increase in revenue last year of £7,082. The whole of the revenue under this head is paid to the local bodies in the districts in which the revenue arises. The total of goldfields revenue collected since 1857, when gold-mining was commenced in the Collingwood district, amounts to £2,341,219 14s. 7d. The amount of revenue last year was more than in any of the four previous years.

Water-races.

The water-races managed and maintained under the direction of the department leave a surplus over the expenditure last year of £2,771 18s. 11d., as against £4,125 17s. 4d. for the previous year, as will be seen from the following statement:—

Name of Water-race or Channel.	Value of Sales of Water, Channel-fees, and Gold obtained from Channel.	Expenditure on Maintenance.	Profits, marked thus +. Losses, marked thus −.	Cost of Construction.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Waimea	1,416 6 8	860 2 5	+556 4 3	118,762 11 8
Kumara	6,716 6 10	1,024 1 9	+5,692 5 1	37,400 2 11
Kumara Sludge-channel ...	1,095 3 3	4,285 6 2	−2,619 8 2	17,200 12 6
Gold obtained from channel ...	570 14 9			
Nelson Creek	427 1 8	1,384 9 3	−957 7 7	90,701 10 8
Argyle	497 5 2	396 19 10	+100 5 4	14,701 15 3
Total	10,722 18 4	7,950 19 5	+2,771 18 11	278,787 13 0

This shows a decrease in the profits last year of £1,353 18s. 5d., due in some measure to a breakage in the Nelson Creek Water-race, which took about ten weeks to repair, during which time no water could be supplied to the miners; and also to the fact that several claims are worked out. The greatest loss is in working the Kumara Sludge-channel. The value of channel-fees and gold obtained from this source amounted to £1,665 18s., while the expenditure on maintenance was £4,285 6s. 2d., thus showing a direct loss of £2,619 8s. 2d. The working of this channel is fully referred to in the Inspecting Engineer's report, and deserves consideration as to the best means of averting so heavy an annual loss. The profit on the working of these water-races last year gives about 1 per cent. on the cost of their construction,

The Mount Ida Water-race is managed by a Trust; but it may also be termed a work under the control of the department, for any deficiency in the working of the race has to be made good by Government. The value of the sales of water last year amounted to £1,099 18s. 3d., and the expenditure on maintenance to £1,687 15s. 6d., leaving a deficit on the actual working of £587 17s. 3d.; but against this deficit, gold was obtained from the sludge-channel during the dry season, when the miners could not work, to the value of £300. This leaves a deficit last year of £287 17s. 3d.

The portion of the Mikonui Water-race that was constructed about eighteen years ago is now

leased to the Mont d'Or Company of Ross at a yearly rental of £50. Recently this company has retimbered the tunnels and put the race in good repair. This portion of the water-race cannot be utilised by any one excepting those who have water-rights from Donnelly's and Scandinavian Creeks, as no additional supply can be obtained until the long tunnel between Donnelly's Creek and the Totara River is completed. The cost of construction up to the present time is £25,644 9s. 6d., and the estimated additional cost to complete the race is £60,000.

Schools of Mines.

There are three principal schools of mines in the colony—one at the Thames, in the North Island; one at Reefton, on the west coast of the Middle Island; and one connected with the University at Dunedin—as well as several subsidiary schools which are carried on by the miners in the districts where they are situate. In these outside schools ores are analysed, and the miners are shown how to do this and ascertain for themselves the means of distinguishing the different metals and minerals that are met with. At the Thames school, which has so far been the most successful, a considerable number of pupils attended during last year and have been taught by Mr. A. Montgomery, who has charge of this school, in the following subjects:—

	Students.
Laboratory and practical chemistry class	16
Architectural drawing class	4
Mining class	14
Assaying class	38
Chemistry class	6
Mathematical class	6
Mineralogy and geology class	10

Mr. T. Fenton, who is in charge of the Reefton school, has held classes and given lectures on chemistry, assaying, the use of the blowpipe, mining, and metallurgy at Nelson, Westport, Denniston, and Boatman's, as well as at the principal school at Reefton. He has also made a considerable number of assays of tailings from different companies' mines in the district, which show that they are losing a large percentage of the gold in the quartz crushed by the present process of treatment. Mr. Montgomery has also shown, by tests made of parcels of ore at the testing-plant in connection with the school at the Thames, the great loss of gold and silver in the North Island ores by the present methods of extraction. This, together with the knowledge of the different metals and minerals which these schools are the means of disseminating, cannot fail to produce good results in the future.

There is no industry where a person requires a more scientific training than in mining, in order to carry it on successfully and on an intelligent basis, and in former years it has not received the attention in this respect that it deserves. It has been heretofore looked on in a great measure as a speculative transaction more than as a legitimate enterprise, and thousands of pounds have been thrown away in mining ventures by those who had little or no knowledge of the industry they were embarking in. These remarks are not confined to mining, but apply to every other industry. The schools of mines at Thames, and Reefton, which are the only two large quartz-mining centres in the colony, and also the school at Dunedin, in connection with the University, will have the effect of training men in the theoretical principles of mining, and in ascertaining the composition of gases and of the different ores they meet with, and will also cause men to observe more closely the effect that faults and slides have in lodes, as well as the character of the rocks in which different minerals may be expected to be found. This, together with a few years' experience in working in mines, will enable the student to carry on mining in the future in a more sound and intelligent manner.

The expenditure last year on schools of mines, exclusive of the contribution of £500 in connection with the University of Otago, is as follows:—

	£	s.	d.
Subsidies towards the erection of buildings...	42	10	0
Chemicals	6	12	9
Salaries of teachers and travelling-expenses	1,139	4	1
Total	1,188	6	10

The total expenditure for the last four years has been £8,054 2s. 10d.

Minerals sent to the Melbourne Exhibition.

A collection of minerals was forwarded last year to the Melbourne Exhibition, consisting of ores containing gold, silver, copper, antimony, chrome, iron, scheelite, lead, zinc, &c., as well as samples of coal from different mines in the colony, and coke from the Brunner Mine; also, some valuable auriferous specimens from the Kapanga Mine, Coromandel; the Saxon and Reuben Parr Mines, at the Thames, and a collection from the Reefton mines. The whole of these specimens have been forwarded to the Paris Exhibition. There was also a collection of valuable specimens exhibited by J. Witheford, of Auckland, from the gold-mines in the Coromandel district, which were returned to that place. The greater portion of the other minerals was also forwarded to the Paris Exhibition. These exhibits may have the effect of bringing the mines in the colony prominently before the public, and may also tend to assist those requiring capital to develop them, and thereby be the means of enhancing the value of mining properties. A report by the Inspecting Engineer of the department will be furnished on the mining machinery exhibited at Melbourne, and also on machinery and appliances for the reduction and treatment of ores in Australia and Tasmania.

Works on Goldfields.

The expenditure on roads and works undertaken either wholly by the department or by subsidies to local bodies during the past year has been £8,555 5s. 6d., including £1,188 6s. 10d.

paid on account of schools of mines; while the value of the works undertaken amounts to £19,531 2s. 6d. The liabilities on works authorised and in progress, including those on works authorised previous to last year, amounts to £19,489 13s. 3d. The total value of works undertaken on goldfields and for the development of the mining industry since the votes were placed under the control of the department amounts to £324,081 11s., 8d. of which amount £219,152 5s. 3d. has been paid by Government. This shows that of the total value of works undertaken, the local bodies have contributed to the extent of £85,539 13s. 2d. The details of the whole of this expenditure are shown in the tables attached to the report of the Inspecting Engineer. Although a large amount of work has been done in opening up the country for mining, a great deal yet requires to be done to give facilities towards carrying on mining operations. The hilly, broken nature of the country, especially in mining districts, which in many places is densely timbered, necessitates a network of roads and tracks to enable machinery and supplies to be brought to different places as the mines get opened out.

Departmental.

During last year there have been thirteen applications for mining managers' certificates, of which ten are under the Mining Act and three under the Coal-mines Act. One of the applicants came up for examination and passed, and the Board of Examiners have fixed the third week in July for the examination of the other applicants.

The changes that have taken place in the departmental officers are as follow: Mr. J. McKerrow, who has for a number of years ably filled the position of Secretary of Mines in conjunction with that of Surveyor-General, has now been promoted to be Chief Commissioner of Railways; Mr. J. Gow has been removed from the Nelson Creek Water-race and appointed manager of the Waimea-Kumara Water-races in lieu of Mr. J. Dand, who had to give up the management on account of ill health; and Mr. J. McNaughton, who had been employed on the Nelson Creek Water-race since its construction, has recently been appointed manager, owing to the removal of Mr. Gow. The reports of the Inspecting Engineer, Inspectors of Mines, Wardens, and Managers of Water-races accompany this report, and will show in detail what has been done in the several mining districts and in connection with mining generally during the past year.

S. Percy Smith.

No. 1.

Table showing the Quantity and Value of Gold entered for Duty for Exportation from New Zealand for the Years ending the 31st March, 1888, and 1889, and the Total Quantity and Value from 1857 to 31st March, 1889.

Name of Goldfield.	Port of Entry.	Year ending 31st March, 1889.		Year ending 31st March, 1888.		Increase or Decrease for Year ending 31st March, 1889.		Total Quantity and Value from January, 1857, to 31st March, 1889.	
		Quantity.	Value.	Quantity.	Value.	Increase.	Decrease.		
		Oz.	£	Oz.	£	Oz.	Oz.	Oz.	£
Auckland ..	Auckland ..	30,683	121,505	31,986	126,723	..	1,303	1,585,370	5,908,920
Wellington ..	Wellington	..	..	..	..	..	..	188	706
Marlborough	Picton ..	718	2,645	..	..	..	..		
	Nelson ..	97	356	176	656	..	..		
	Blenheim ..	1,621	6,227	944	3,400	..	..		
	Dunedin ..	6	21	..	..	..	..		
	Auckland ..	1	4	..	..	..	..		
	Greymouth	33	132	..	..	..	..		
		2,476	9,385	1,120	4,056	1,356	..	57,450	221,472
Nelson	Nelson ..	3,645	13,635	1,987	7,378	..	..		
	Dunedin ..	..	..	112	448	..	..		
		3,645	13,635	2,099	7,826	1,546	..	229,356	910,025
West Coast	Nelson ..	954	3,684	1,593	6,334	..	..		
	Westport ..	9,235	36,912	8,783	35,131	..	..		
	Greymouth	63,205	252,835	55,581	222,304	..	..		
	Hokitika ..	30,056	120,222	29,121	116,482	..	..		
	Auckland ..	63	252	..	..	..	..		
		103,513	413,905	95,078	380,251	8,435	..	4,932,480	19,583,786
Canterbury ..	Christchurch	24	96	..	..	..	..		
		24	96	..	..	24	..	48	192
Otago ..	Dunedin ..	56,775	226,332	55,451	219,539	..	..		
	Invercargill	11,786	47,049	6,227	24,482	..	..		
		68,561	273,381	61,678	244,021	6,883	..	4,677,316	18,458,418
	Totals ..	208,902	831,907	191,961	762,877	16,941	..	11,482,208	45,083,519

No. 2.

TOTAL QUANTITY and VALUE of GOLD ENTERED for DUTY for EXPORTATION from the 1st January, 1857, to the 31st December, 1888. (This return shows the produce of the various goldfields. Gold entered at Nelson from Hokitika, Greymouth, and Westport is put under the head of "West Coast," and from Invercargill and Riverton under the head of "Otago.")

Year.	Auckland.		Nelson.		Marlborough.		West Coast.		Otago.		Wellington.		Canterbury.		Total.	
	Oz.	Value.	Oz.	Value.	Oz.	Value.	Oz.	Value.	Oz.	Value.	Oz.	Value.	Oz.	Value.	Oz.	Value.
		£		£		£		£		£		£		£		£
1857 ..	..	..	10,437	40,422	..	..	..	..	..	..	..	..	..	..	10,437	40,422
1858 ..	308	1,192	13,226	51,272	..	..	..	..	..	..	..	..	..	..	13,534	52,464
1859 ..	..	..	7,336	28,427	..	..	..	..	..	..	..	..	..	..	7,336	28,427
1860 ..	..	..	4,538	17,585	..	..	..	..	..	..	..	..	..	..	4,538	17,585
1861 ..	..	..	6,335	24,552	..	..	..	..	187,696	727,321	..	..	..	..	194,031	751,873
1862 ..	1,239	4,098	10,422	40,386	..	..	..	..	399,201	1,546,905	..	..	..	..	410,862	1,591,389
1863 ..	4,483	13,853	9,580	37,120	..	..	..	..	614,387	2,380,750	..	..	..	..	628,450	2,431,723
1864 ..	3,448	10,552	14,410	55,841	24,838	95,231	1,463	5,560	436,012	1,689,653	..	..	..	..	480,171	1,856,837
1865 ..	5,449	17,096	12,137	47,030	7,952	30,814	289,897	1,127,370	259,139	1,004,163	..	..	..	..	574,574	2,226,474
1866 ..	5,814	17,463	7,650	29,643	469	1,818	552,572	2,140,946	168,871	654,647	..	..	..	..	735,376	2,844,517
1867 ..	6,637	18,277	9,123	35,918	501	1,978	511,974	2,018,874	158,670	623,815	..	..	..	..	686,905	2,698,862
1868 ..	53,660	168,874	5,999	38,396	404	1,616	405,762	1,608,844	171,649	686,596	..	..	..	..	637,474	2,504,326
1869 ..	132,451	434,687	10,631	42,524	666	2,664	317,169	1,269,664	153,364	613,456	..	..	..	..	614,281	2,362,995
1870 ..	85,534	319,146	12,244	48,692	1,852	7,408	280,068	1,121,525	165,152	660,694	30	120	..	..	544,880	2,157,585
1871 ..	330,326	1,188,708	10,014	40,056	1,867	7,468	232,882	931,528	154,940	619,760	..	..	..	..	730,029	2,787,520
1872 ..	104,890	369,341	8,175	32,700	2,057	8,228	172,574	690,296	157,674	630,696	..	..	..	..	445,370	1,731,261
1873 ..	119,449	437,123	13,697	54,786	1,274	5,050	188,501	756,442	182,416	734,024	..	..	..	..	505,337	1,987,425
1874 ..	76,910	305,068	5,642	22,158	1,198	4,748	157,531	631,203	135,107	542,154	..	..	..	..	376,388	1,505,331
1875 ..	69,485	262,156	4,577	17,866	1,159	4,636	158,678	635,480	121,423	487,632	..	..	..	..	355,322	1,407,770
1876 ..	56,057	221,905	14,018	55,862	450	1,796	133,014	531,274	118,477	473,491	..	..	..	..	322,016	1,284,328
1877 ..	99,081	403,627	5,367	21,092	870	3,197	153,198	612,823	113,169	455,341	..	..	..	..	371,685	1,496,080
1878 ..	55,982	220,454	4,463	17,223	404	1,617	144,634	578,508	105,003	422,277	..	..	..	..	310,486	1,240,079
1879 ..	37,901	154,295	2,993	11,424	879	3,460	142,822	571,061	102,869	407,868	..	..	..	..	287,464	1,148,108
1880 ..	42,720	176,416	3,222	12,223	1,550	5,650	144,090	575,258	113,666	457,705	..	..	..	..	305,248	1,227,252
1881 ..	35,516	141,326	3,453	13,039	1,378	4,531	127,544	509,971	102,670	411,923	..	..	..	..	270,561	1,080,790
1882 ..	33,059	131,007	3,289	12,494	1,352	5,400	130,048	519,978	83,446	333,804	10	37	..	..	251,204	1,002,720
1883 ..	41,291	163,618	2,064	7,724	636	2,524	116,905	467,152	87,478	352,334	..	..	..	..	248,374	993,352
1884 ..	36,087	143,564	2,159	8,002	1,079	4,306	111,686	446,517	78,810	318,932	101	380	24	96	229,946	921,797
1885 ..	42,989	170,416	2,798	10,337	540	2,160	117,861	471,325	73,183	294,378	..	..	..	..	237,371	948,615
1886 ..	32,271	128,140	2,582	9,979	404	1,451	112,671	446,287	79,104	317,543	47	169	..	..	227,079	903,569
1887 ..	30,697	121,564	2,914	10,829	1,041	3,759	98,774	395,430	70,443	279,518	..	..	..	..	203,869	811,100
1888 ..	35,223	139,556	3,027	11,320	699	2,547	100,139	400,405	62,107	247,142	..	..	24	96	201,219	801,066
Totals ..	1,578,957	5,883,522	228,522	907,922	55,519	214,057	4,902,457	19,463,721	4,656,126	18,374,522	188	706	48	192	11,421,817	44,843,642

No. 3.

TABLE showing the TOTAL QUANTITY of MINERAL ORES (the Product of Mines other than Gold), COAL, COKE, and KAURI GUM, EXPORTED from the Colony up to 31st December, 1888.

Year.	Silver.		Copper Ore.		Chrome Ore.		Antimony Ore.		Manganese Ore.		Hæmatite Ore.		Mixed Mineral Ore.		Coal.		Coke.		Kauri Gum.		Totals.		
	Oz.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	Ounces.	Tons.	Value.
		£		£		£		£		£		£		£		£		£		£			£
1853	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	830	15,972	..	830	15,972
1854	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,661	28,864	..	1,661	28,864
1855	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	355	4,514	..	355	4,514
1856	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,440	18,591	..	1,440	18,591
1857	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2,522	35,251	..	2,522	35,251
1858	..	..	351	5,000	3	25	..	..	..	..	..	..	..	..	2	4	..	..	1,811	20,037	..	2,167	25,066
1859	..	..	245	2,605	8	120	..	..	..	..	..	..	..	..	..	..	..	..	2,010	20,776	..	2,263	23,501
1860	..	..	137	1,590	116	1,440	..	..	..	..	..	..	..	..	1	2	..	..	1,046	9,851	..	1,300	12,883
1861	..	..	110	1,300	52	520	..	..	..	..	..	..	..	..	..	..	..	..	856	9,888	..	1,018	11,708
1862	..	..	51	1,024	3,843	24,719	..	..	..	..	..	..	..	..	..	..	..	..	1,103	11,107	..	4,997	36,850
1863	..	..	..	..	595	4,318	..	..	..	..	..	..	..	..	..	..	..	..	1,400	27,026	..	1,995	31,344
1864	..	..	..	..	768	4,910	..	..	..	..	..	..	..	..	..	..	..	..	2,228	60,590	..	2,996	65,500
1865	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,867	46,060	..	1,867	46,060
1866	..	..	..	..	281	1,315	..	..	..	..	..	..	..	..	261	400	..	..	2,535	70,572	..	3,077	72,287
1867	..	..	246	2,700	..	..	..	..	..	..	..	..	..	..	973	1,228	..	..	2,685	77,491	..	3,904	81,419
1868	..	..	84	977	..	..	..	..	..	..	..	..	..	..	1,027	1,210	..	..	2,690	72,493	..	3,801	74,680
1869	11,063	2,993	..	..	..	..	..	..	..	..	..	..	..	..	750	800	..	..	2,850	111,307	11,063	3,600	115,100
1870	37,123	11,380	7	120	..	..	..	..	..	..	..	..	..	..	1,672	1,508	..	..	4,391	175,074	37,123	6,070	188,082
1871	80,272	23,145	..	..	..	..	..	..	..	..	..	..	..	..	1,696	1,612	..	..	5,054	167,958	80,272	6,750	192,715
1872	37,064	9,910	..	..	..	..	..	..	..	..	..	..	..	..	990	855	21	50	4,811	154,167	37,064	5,822	164,982
1873	36,187	9,850	..	..	..	..	..	..	..	..	..	..	..	..	724	655	..	..	2,834	85,816	36,187	3,558	96,321
1874	40,566	10,380	..	..	..	..	..	..	..	..	..	..	..	..	1,463	1,363	87	228	2,569	79,986	40,566	4,119	91,957
1875	29,085	7,569	..	..	..	..	..	..	..	..	..	..	..	..	3,385	3,129	15	51	2,231	138,523	29,085	5,631	149,272
1876	12,683	3,171	..	..	..	..	..	..	..	..	..	..	3,180	14,824	1,854	1,954	53	189	2,888	109,234	12,683	7,975	129,372
1877	33,893	7,556	..	..	..	..	..	..	..	..	..	..	2,366	9,664	2,658	2,071	25½	72	3,633	118,348	33,893	8,682½	137,711
1878	23,019	5,755	6	115	..	..	4	102	2,516	10,416	..	..	2	8	6,362	5,139	85	177	3,445	132,975	23,019	12,420	154,687
1879	20,645	4,512	55	1,105	..	..	..	..	2,140	8,338	..	..	..	..	7,144	6,187	154	324	3,229	147,535	20,645	12,722	168,001
1880	20,005	4,500	..	..	..	..	60	612	2,611	10,423	..	..	2,674	11,335	7,020	5,977	87	135	4,725	242,817	20,005	17,177	275,799
1881	18,885	4,236	5	36	..	..	2	24	1,271	3,283	..	..	1,955	4,303	6,621	5,610	223	353	5,461	253,788	18,885	15,438	271,633
1882	5,694	1,286	9	41	..	..	30	900	2,181	6,963	..	..	2,784	8,597	3,207	2,380	275	480	5,533	260,369	5,694	14,019	281,016
1883	16,826	3,785	46	678	..	..	31	804	384	1,155	½	12	22	110	6,522	4,879	1,430	2,057	6,518	336,606	16,826	14,953½	350,086
1884	24,914	5,125	20	106	..	..	..	..	318	809	..	..	..	..	6,104	4,461	236	372	6,393	342,151	24,914	13,071	353,024
1885	16,624	3,169	..	..	..	..	666	5,289	602	1,716	50½	208	114	993	43,893	51,257	267	385	5,875$\frac{3}{4}$	299,762	16,624	51,468¼	362,779
1886	12,108	2,946	20	390	..	..	62	1,784	328½	1,316	..	..	445	1,846	46,136	52,133	497	715	4,920$\frac{3}{4}$	257,653	12,108	52,411¼	318,783
1887	20,809	3,453	..	..	..	..	134	3,989	305	895	..	..	144	4,142	44,129	44,650	183½	266	6,791	362,449	20,809	51,666½	419,844
1888	403	71	2	75	..	..	376	6,246	1,085	2,404	..	..	162	2,955	68,087	64,971	953	1,646	8,482	380,933	403	79,145	459,261
Totals	497,868	124,792	1,394	17,862	5,666	37,367	1,365	19,750	13,741½	47,718	51	220	13,848	58,777	262,681	264,435	4,592	7,500	119,673½	4,686,534	497,868	423,112	5,264,955

No. 4.

TABLE showing the INCREASED PRODUCTION of COAL, Year by Year, during the last Ten Years, and the DECREASE of COAL IMPORTED for the same Period.

Year.	Coal raised in the Colony.		Coal imported.		
	Tons.	Yearly Increase.	Tons.	Plus or Minus.	Increase and Decrease.
1878	162,218	..	174,148	..	..
1879	231,218	69,000	158,076	–	16,072
1880	299,923	68,705	123,298	–	34,778
1881	337,262	37,339	129,962	+	6,664
1882	378,272	41,010	129,582	–	380
1883	421,764	43,492	123,540	–	6,042
1884	480,831	59,069	148,444	+	24,904
1885	511,063	30,232	130,202	–	18,242
1886	534,353	23,290	119,873	–	10,329
1887	558,620	24,267	107,230	–	12,643
1888	613,895	55,275	101,341	–	5,889

No. 5.

TABLE showing the OUTPUT of COAL from the various Mining Districts, and the Comparative INCREASE and DECREASE, for the Years 1887 and 1888, together with the TOTAL APPROXIMATE QUANTITY of COAL produced since the Mines were opened.

Name of District.	Output of Coal.		Plus or Minus.	Increase or Decrease.	Approximate Total Output of Coal up to 31st December, 1888.
	1887.	1888.			
	Tons.	Tons.		Tons.	Tons.
Kawakawa	35,078	33,145	–	1,933	683,625
Whangarei, Kamo, and Whauwhau ..	15,265	19,091	+	3,826	214,685
Waikato	48,367	56,302	+	7,935	423,990
Pelorus	..	..	..	..	711
West Wanganui	3,783	4,181	+	398	29,120
Westport	116,242	130,486	+	14,244	648,244
Reefton	1,786	3,255	+	1,469	33,703
Greymouth	162,170	188,448	+	26,278	1,119,928
Malvern	11,681	12,631	+	950	232,276
Timaru	172	300	+	128	2,048
Otago	144,741	148,984	+	4,243	1,727,223
Southland	19,335	17,072	–	2,263	117,279
Totals	558,620	613,895	+	55,275	5,232,832

No. 6.

TABLE showing the DIFFERENT CLASSES of COAL from the MINES in the COLONY.

Name of Coal.	Output of Coal.		Plus or Minus.	Increase or Decrease.	Approximate Total Output of Coal up to the 31st December, 1888.
	1887.	1888.			
	Tons.	Tons.		Tons.	Tons.
Bituminous	317,273	359,555	+	42,282	2,484,687
Pitch	81,048	81,309	+	261	803,948
Brown	142,113	156,136	+	14,023	1,797,725
Lignite	18,186	16,895	–	1,291	146,472
Totals	558,620	613,895	+	55,275	5,232,832

No. 7.

TABLE showing the NUMBER of COAL-MINES in OPERATION, the NUMBER of MEN EMPLOYED, and the OUTPUT of COAL per MAN.

Number of Mines working.	Number of Miners employed in each Mine.	Total Number of Men employed.	Output of Coal during 1888.	Average Output per Man.
			Tons.	Tons.
92	1 to 4 men in each	156	35,250	225
16	5 to 10 "	102	39,926	390
4	11 to 20 "	86	27,248	316
16	21 men and upwards	1,345	511,471	380
128		1,689	613,895	363

No. 8.

RETURN showing the QUANTITY and VALUE of COALS IMPORTED INTO and EXPORTED FROM NEW ZEALAND during the Year ended the 31st December, 1888.

Imported.			Exported.		
Countries whence imported.	Quantity.	Value.	Countries to which exported.	Quantity.	Value.
	Tons.	£		Tons.	£
United Kingdom	102	153	United Kingdom	40,409	44,498
Victoria	241	176	Victoria	1,357	908
New South Wales	98,241	95,814	New South Wales	11,666	8,402
Queensland	2,757	2,288	Western Australia	550	275
			Tasmania	7	8
			Fiji	6,515	4,054
			Hongkong	1,495	1,495
			Bengal	900	900
			Mauritius	400	220
			Portugal	1	1
			United States of America on the West Coast	782	742
			New Caledonia	225	146
			South Sea Islands	3,780	3,322
Totals	101,341	98,431	Totals	68,087	64,971

NOTE.—Foreign Coal: Included in exportation to—United Kingdom, 60 tons, value £69; New South Wales, 2,055 tons, value £1,889; United States of America on the West Coast, 422 tons, value £382; South Sea Islands, 1,358 tons, value £1,264. The remainder is New Zealand produce.

Department of Trade and Customs,
Wellington, 7th June, 1889.

W. T. GLASGOW,
For Secretary.

No. 9.

NUMBER of MINERS EMPLOYED during the Years ending 31st March, 1889, and 1888.

Mining District.	Alluvial Miners.		Quartz-miners.		Totals.		Grand Totals.	
	European.	Chinese.	European.	Chinese.	European.	Chinese.	1888.	1889.
AUCKLAND—								
North Hauraki	..	..	300	..	300	..	300	300
South Hauraki	..	..	847	..	847	..	871	847
Te Aroha	..	..	105	..	105	..	76	105
	..	..	1,252	..	1,252	..	1,247	1,252
MARLBOROUGH—								
Pelorus	621	..	25	..	646	..	90	646
Wairau							50	
	621	..	25	..	646	..	140	646
NELSON—								
Bâton	45	..	..	..	45	..	..	45
Wangapeka	9	..	..	..	9	..	47	9
Sherry and Tadmor	11	..	..	..	11	..	..	11
Collingwood, Takaka, and West Wanganui	230	5	25	..	255	5	300	260
Motueka	17	..	..	..	17	..	..	17
Inangahua	140	270	400	..	540	270	789	810
Ahaura	500	289	..	..	500	289	700	789
Charleston	250	..	..	..	250	..	250	250
Westport, including Addison's, Northern Terraces, Waimangaroa, North Beach, Mokihinui, Karamea, and Lower Buller Valley	320	7	32	..	352	7	358	359
Lyell	62	18	16	..	78	18	190	96
Murchison	137	60	..	..	137	60	220	197
Owen	..	..	25	..	25	..	50	25
	1,721	649	498	..	2,219	649	2,904	2,868
WESTLAND—								
Ross	250	40	30	..	280	40	270	320
Waimea and Stafford	200	120	..	..	200	120	..	320
Goldsborough	250	100	..	..	250	100	..	350
Hokitika and Kanieri	400	250	..	..	400	250	395	650
Kumara	520	90	..	..	520	90	430	610
Greymouth	851	400	..	..	851	400	600	1,251
Arnold	..	..	..	..	..	..	420	..
Greenstone	..	..	..	..	..	..	180	..
Okarito	90	1	..	..	90	1	90	91
Jackson's Bay	19	..	..	..	19	..	30	19
	2,580	1,001	30	..	2,610	1,001	2,415	3,611
OTAGO—								
Hindon	40	6	20	..	60	6	57	66
Tuapeka	450	440	30	..	480	440	940	920
Clyde	30	10	..	..	30	10	53	40
Cromwell	340	180	50	..	390	180	500	570
Alexandra	95	80	20	..	115	80	250	195
Roxburgh	170	75	..	..	170	75	276	245
Black's	140	42	12	..	152	42	178	194
Tapanui	30	30	..	..	30	30	90	60
Waikaia, Upper Waikaia, Nokomai, Waikaka, and Waikawa	198	131	..	..	198	131	308	329
Longwood and Merrivale	200	300	12	..	212	300	40	512
Orepuki							120	
Roundhill							430	
Wakatipu Goldfields—Arrow, Macetown, Cardrona, Kawarau, Bracken's, and Motatapu	350	80	50	..	400	80	350	480
Naseby	170	140	..	..	170	140	310	310
Queenstown	350	100	200	..	550	100	600	650
Kyeburn and Clarke's	45	15	..	..	45	15	..	60
Hamilton, Sowburn, &c.							60	
Hyde and Fullerton's	40	7	15	..	55	7	101	62
Serpentine	12	10	9	..	21	10	31	31
Macrae's, Strath-Taieri, and Shag Valley	50	65	..	..	50	65	115	115
Maerewhenua	70	2	..	..	70	2	40	72
St. Bathan's and Ida Valley	135	20	10	..	145	20	165	165
Nenthorn	4	..	40	..	44	..	..	44
	2,919	1,733	468	..	3,387	1,733	5,014	5,120
SUMMARY.								
AUCKLAND	..	..	1,252	..	1,252	..	1,247	1,252
MARLBOROUGH	621	..	25	..	646	..	140	646
NELSON	1,721	649	498	..	2,219	649	2,904	2,868
WESTLAND	2,580	1,001	30	..	2,610	1,001	2,415	3,611
OTAGO	2,919	1,733	468	..	3,387	1,733	5,014	5,120
Totals	7,841	3,383	2,273	..	10,114	3,383	11,720	13,497

GOLDFIELDS WATER-RACES AND OTHER WORKS IN CONNECTION WITH MINING.

Mr. H. A. GORDON, F.G.S., Inspecting Engineer, to the UNDER-SECRETARY of MINES.

SIR,— Mines Department, Wellington, 8th June, 1889.

I have the honour to submit my annual report for the year ending the 31st March, 1889, on the mining industry in the colony and on works which have been undertaken and executed for the development of that industry by the Mines Department.

The different subjects are classified under the heads of "Subsidised Roads and Tracks;" "Aids to Deep-level Tunnels;" "Grants for the Construction of Roads;" "Schools of Mines;" "Water-races;" "Mining generally, Quartz and Alluvial;" "Tin-mining;" "Chlorination of Gold-bearing Sulphides;" "Evenden's Gold-gleaner;" and "Statistical Tables showing the expenditure on Works, &c."

SUBSIDISED ROADS AND TRACKS (NORTH ISLAND).

COROMANDEL COUNTY.

Track, Tiki Bridge to Mercury Bay.—This horse-track has been under construction for the last four years. When completed it will be about twenty miles in length, and will afford easy communication between Coromandel and Mercury Bay. It is estimated to cost about £2,700. Of this amount subsidies have been from time to time authorised to the extent of £1,566 13s. 4d., of which £1,126 13s. 4d. has been paid.

Dray-road, Old Saw-mill towards Matawai.—This road is for getting down quartz from the claims in the Matawai district, and also to get machinery up to Matawai Creek. It was formerly a horse-track, and is now being widened into a dray-road. It is estimated to cost £300. Of this amount a subsidy was given to the extent of £166 13s. 4d., of which £100 is paid.

Extension, Paul's Creek Track.—This is an extension of the track going from Coromandel to Cabbage Bay. It is constructed for a certain distance at each end, with about five miles between the constructed portions. It is now proposed to extend the Coromandel end for some distance to give the miners facilities to get their supplies, and £150 has been authorised as a subsidy.

Track, Tiki to Sea-beach at Wilson.—This is a portion of the main road from Coromandel to the Thames. The track requires improving and altering the grade in places, and also metal. It is proposed to expend £300 on this work, and a subsidy of £150 has been authorised.

Road, Harbour View Extension.—The extension of the dray-road is required to enable the quartz from the workings on this side of the range to be conveyed to the crushing-battery. It is estimated to cost £300. Of this amount a subsidy has been authorised to the extent of £150.

Track, Mopoke Gully.—Some claims have recently been taken up in Mopoke Gully, and a track is required to connect them with the road going from Coromandel to Tokatea Saddle. Its estimated cost is £100. Of this amount a subsidy has been authorised to the extent of £50.

Track, Matarangi Goldfield.—Gold has been found between Whangapoua and Mercury Bay. At Matarangi a parcel of quartz recently crushed from this field, of 26 tons, yielded 37½oz. of gold. There is no road into this field, and the proposed track is estimated to cost £400. Of this amount a subsidy has been authorised to the extent of £200.

Widening and Extending Manaia Track.—About three years ago a track was constructed from the Native settlement on the main road, Coromandel to Thames, to the gold discovery in the Manaia Block. It is now proposed to widen portions of this road and extend it, which is estimated to cost £200. Of this amount a subsidy has been authorised to the extent of £100.

Track, Kapanga to Paul's Creek.—Several miners have been working between Kapanga and Paul's Creek, and a little gold has been found; but there is no way of getting the stone to a crushing-battery. It is proposed to expend £200 on making a horse-track, and a subsidy has been authorised to the extent of £100.

Road, Marabel to Tiki.—This is to improve the present road, and cut off some very steep gradients. Its estimated cost is £200. Of this a subsidy to the extent of £100 has been authorised.

Track, Waikawau Creek.—This is a track up the north side of Waikawau Creek, to give facilities to the miners and settlers to get up supplies. It was completed at a cost of £100. Of this amount a subsidy of £50 has been paid.

Road to McLaughlin's.—This is a continuation of a track up the Waikawau River to open up the country and afford the miners facilities for prospecting. The estimated cost of the track is £100. Of this amount £50 has been authorised as a subsidy.

THAMES COUNTY.

Road, Karaka Creek to Lucky Hit.—This is improving and widening the road to enable quartz to be conveyed from the mines to crushing-batteries at Grahamstown. The estimated cost of the work is £600. Of this amount a subsidy to the extent of £300 has been authorisd, of which the sum of £167 5s. 3d. has been paid.

Track, Waiotahi towards Mercury Bay.—This is the continuation of the horse-track already constructed from Waiotahi to Punga Flat. It is now being extended towards Gum Town. The estimated cost of the work is £616 3s. Of this amount a subsidy was authorised to the extent of £360 15s. 4d., of which the sum of £261 5s. 6d. has been paid. There has been no work done on this track last year.

Road, Waiomo Creek to Tapu.—This is a portion of the main road from Thames to Coromandel. It was widened to admit of dray-traffic. Its estimated cost was £1,500. Of this amount a subsidy was authorised to the extent of £750, of which the sum of £659 1s. 10d. has been paid.

Track, New Find to Waiomo Battery.—This is a horse-track on the south side of the Waiomo Creek, to give facilities to get quartz taken from some claims in this locality; but the quartz proved of too low a grade to pay. This track was completed at a cost of £110. Of this amount a sum of £55 was paid as subsidy.

Road, Puriri to New Discovery.—There are several mining-claims taken up near Puriri, and gold is being got. It is proposed to construct a dray-road to enable the quartz from these claims to be conveyed to the crushing-battery. Its estimated cost is £200. Of this amount a subsidy has been authorised to the extent of £100.

Track, Te Mata Creek.—This is a horse-track up Te Mata Creek, to enable supplies to be brought up to the claims and machinery to be conveyed to the mines. The estimated cost of the work is £200. Of this amount a subsidy was authorised to the extent of £100.

Road, Hikutaia towards Marototo.—This is a dray-road from the Thames–Te Aroha main road up the valley of the Hikutaia going towards Marototo. The road is formed for some distance up the valley, but it requires to be continued up to the county boundary. The estimated cost of the work is £400. Of this amount a subsidy was authorised to the extent of £200, of which £73 7s 7d. has been paid.

Track, Alabama Creek.—This is a horse-track to open up the country and enable supplies to be brought to the miners who are prospecting in this creek, where auriferous lodes are known to exist. The cost of the track is estimated at £60, and a subsidy has been authorised to the extent of £30.

Road, Paroquet Mine to Waiomo Battery.—A dray-road was formed here about eighteen months ago, but the ground is of a very soft nature, and the road requires to be metalled. The estimated cost of the work is £250. Of this amount a subsidy has been authorised to the extent of £125.

Road, Rocky Point.—This is portion of the Thames–Coromandel Road, in the Borough of Thames, which is constructed alongside the sea-shore. The waves are cutting away the road, and it requires a strong wall built facing the sea to protect it. The estimated cost of the works is £280. Of this amount a subsidy has been authorised to the extent of £140.

Ohinemuri County.

Road to Waihi Gold- and Silver-mines.—This is a dray-road from the end of the constructed road to the Martha Mine up to the Waihi Gold and Silver Company's mine, to enable machinery to be conveyed on to the ground. The estimated cost of this work is £300. Of this a subsidy has been authorised to the extent of £150.

Strengthening Bridges, Waihi Road.—This work was required to be done before the Waihi Company could convey their machinery to their claim. The cost of the work was £200. Of this amount a subsidy of £133 6s. 8d. has been paid.

Track, Marototo.—This is a track from Waitekauri to Marototo, to give the miners an opportunity of getting through the country to prospect. The estimated cost is £100, of which amount a subsidy has been authorised to the extent of £50.

Track, Jubilee Claim, Waitekauri.—This was a track to enable machinery to be taken up to a special claim that was granted in the beginning of the year. It was completed at a cost of £118, and a subsidy has been paid to the extent of £59.

MIDDLE ISLAND.

Marlborough County.

Track, Mahakipawa.—This is a horse-track from Cullen's Flat to the forks of the Mahakipawa Creek, about two miles in length. The cost of construction was £450. Of this amount a subsidy was authorised to the extent of £225, and up to the 31st March last £46 10s. of this subsidy had been paid.

Waimea County.

Track, Baton to Karamea.—This is for improving and repairing the track from the Baton to Karamea, which is getting in some places almost impassable. The estimated cost of the work is £100. Of this amount a subsidy has been authorised to the extent of £50.

Punt over Motueka River.—This is for the erection of a punt for crossing the Motueka River, near the junction of the Baton. It is estimated to cost £100. Of this amount a subsidy has been authorised to the extent of £50.

Buller County.

Extension of Track to Fenian Creek.—This is the continuation of the track that was constructed about two years ago to enable supplies to be taken up to the Fenian Creek Diggings. It is estimated that an expenditure of £100 will be sufficient to do the work. Of this amount a subsidy has been authorised to the extent of £50.

INANGAHUA COUNTY.

Track, Larry's Creek to Lyell.—This track has now been constructed for about six miles, and has been the means of auriferous lodes being discovered northwards from Larry's Creek. The estimated cost of the track to Coal Creek is £1,980. Of this amount a subsidy has been authorised to the extent of £990, of which the sum of £423 10s. has been paid.

Road, Devil's Creek to Globe Mine.—This is a dray-road to enable machinery and supplies to be conveyed from the road Reefton to Big River up Devil's Creek to the Globe Mine. The estimated cost of the work is £750. Of this amount £375 was authorised as a subsidy.

Track, Globe Hill to Merrijigs.—This is a track along the line of a new reef on which claims are taken up and being worked with success. It will open up about six miles of new country. The estimated cost is £1,560. Of this amount a subsidy has been authorised to the extent of £780.

GREY COUNTY.

Track, Deep Creek to Bell Hill.—This is a horse-track to open up the country between Deep Creek and Bell Hill, and complete the line of communication between Notown and Bell Hill. The work is estimated to cost £800. Of this amount a subsidy was authorised to the extent of £400, of which £365 10s. has been paid.

Road, Hatter's Terrace.—This is a dray-road from the junction of the main Grey Valley Road at the bridge over Nelson Creek (on the west side of Nelson Creek) to Hatter's Terrace Township, which has cost £800 to construct; of this amount a subsidy of £400 has been paid.

Track to Black Ball Diggings.—This is the continuation of the horse-track up the north side of the Grey River from Brunnerton to the Black Ball Diggings, where there are a number of men at work. It is estimated to cost £800. Of this amount a subsidy was authorised to the extent of £400, of which £40 has been paid.

Track, Irishman's to Lake Brunner.—This is a horse-track to open up the country for prospecting between Marsden and Lake Brunner, a distance of about fourteen miles. The cost of the work, from the end of the constructed track at Irishman's, has been £2,400. Of this amount £1,200 has been paid as subsidy.

DEEP-LEVEL TUNNELS.

Deep-level Tunnel, Inangahua.—This tunnel has now been constructed for a distance of 2,880ft., at a cost of £6,956. Of this amount £3,218 has been paid as a subsidy, which was the total amount authorised. It has not, so far, been the means of finding any payable lodes at the deep levels.

Deep-level Tunnel, Manaia.—There has been no work done in this tunnel during last year. It cost £480 to construct, and a subsidy was authorised to the extent of £250, of which £240 has been paid. The balance of £10 can be cancelled.

Prospecting Deep Levels, Kapanga Company, Coromandel.—A subsidy of £1,000 was authorised to prospect the deep levels in this company's mine, and payments amounting to 5 per cent. of the actual expenditure of the company were to be made. Of the subsidy, £337 has been paid on an expenditure of £6,740 by the company. Sinking is again resumed, and a further payment will soon be due.

ROADS AND WORKS CONSTRUCTED FROM DIRECT GRANTS BY THE DEPARTMENT FOR THE DEVELOPMENT OF MINES AND OPENING-UP OF LANDS.

Road, Wakawau to Manaia.—This is a portion of the main Coromandel–Thames Road, in the Coromandel County. A survey has been completed, and contracts for the work accepted. It is estimated to cost £1,000. Of this amount only £1 18s. has yet been paid.

Road, Whangamata Mines to Harbour.—This is a dray-road to enable quartz to be conveyed from the mining-claims at Whangamata to the harbour, in order to forward it to some of the crushing-batteries at Auckland or Thames. The reefs have not been far enough developed yet to justify the erection of machinery in this district. The estimated cost of the work was £150. Of this amount £141 10s. 6d. has been paid.

Track, Aorere Valley to Karamea and Mokihinui.—There is about twenty-six and a half miles of this track constructed at the Mokihinui end, and ten miles at the Aorere Valley end, which has cost £18,623 12s. Of this amount £18,451 0s. 8d. has been paid. The work done last year consisted in surveying a line of road from the Gouling Downs to the mouth of the Heaphy River, a distance of twenty-five miles; and also about forty chains of the track was constructed near Little Wanganui, and a track formed from this to the sea-beach. Tenders have been accepted for a bridge over the Mokihinui River, the contract price of which is £4,835. When this is completed the road on the north side of the Mokihinui River can be utilised to get to Karamea. At present horses cannot cross the Mokihinui River and get on to the road on the north side. Before the track is available for horse-traffic from the Aorere Valley to Karamea at least thirty-seven miles more of the road will have to be constructed. The estimated cost of constructing the surveyed portion—namely, from the Gouling Downs to the mouth of the Heaphy River—is £6,750. From the mouth of the Heaphy to the Kowhai River, where the road would have to be constructed, is about thirteen miles. This portion is not yet surveyed, but the probable cost of construction would be, taking the cost of survey, about £3,600, making a total of £10,350 to complete this end of the road for horse-traffic.

Road, Cobden to Seventeen-mile Beach.—A dray-road has been constructed from Cobden Flat to the Seven-mile Creek, and also portions of a horse-track over the Ten-mile Bluff. Between Cobden and the Seven-mile Creek a horse-track was at first constructed, but no gravel could be obtained for metal. This portion of the road was widened into a dray-road, so that metal might be taken from the Seven-mile and the Cobden end. The work has been carried out under the county, but the metal used is full of large boulders on portions of the road. The estimate for the cost of the work was £2,886 1s. 4d. Of this amount £2,652 1s. 4d. has been paid.

Bridle-track, Upper Anatoki.—This track remains in the same state as last year. £833 8s. 6d. has been expended on the work, leaving the balance of authority £16 12s.

Track, Jackson's Bay to Cascade and Gorge River.—This track is completed from the Cascade to the Duncan River, a distance of thirteen miles. There is still a connection to make from the Jackson to the Cascade Rivers, but a new survey will have to be made of this portion before any further expenditure is made. The county made a survey of a line of road up the Jackson River some years ago; but the line was laid off too near the river, and portions of it are now in the river-bed. It would be useless to spend any money here until a fresh survey is made and the road laid off clear of the river-flats altogether. Authorities to the extent of £5,350 7s. 7d. have been given, out of which £4,574 16s. 9d. has been expended, leaving £775 10s. for the construction of the intervening portion.

Road, Arthur's Point to Skipper's.—There is about four miles of this road under construction, which when completed will enable drays to be taken up to the bridge over the Shotover, a little below Skipper's Point. The contract for the completion was let in November last, and the time expires in July next. There is so much rock-cutting in the portion under contract that probably the work will not be done within the contract time. The contractor was, however, making fair progress with the work at the time of my visit of inspection in March last, and shows his intention of carrying out his contract satisfactorily. The work is carried out under the supervision of the County Engineer, who will see that the work is properly carried out. This road has cost up to the present time £8,306 19s. 1d., and the liabilities on present contract amount to £3,733 6s. 7d., of which £679 has been paid.

Road, Grey Valley to Teremakau.—This is the construction of the intervening portion of the horse-track between Bell Hill and the Teremakau, and, when completed, will allow horse-traffic and stock to be taken from the Christchurch–Hokitika Road, near Mr. Jackson's accommodation-house, to the Grey Valley, at Nelson Creek. The estimated cost of the portion to complete this road is £900.

Road, Cedar Creek.—This is the continuation of the road that was constructed from the Woolhouse Road up the west side of the Totara River, which cost £3,000. There is now two and a half miles under contract, which will complete the road to near Cedar Creek. An authority for £1,500 has been given for the completion of this road, and the county is to find the balance, which will be something like £250. The work is under the supervision of the County Engineer. At the time of my visit of inspection in April the contractors were making good progress with the work. The whole of the road is constructed with good grades, and will make a good dray-road when completed.

WHARVES.

Coromandel.—This is for repairing the wharf to allow vessels laden with coal for the mining companies to discharge. The estimated cost of the work is £300. Of this amount £150 has been authorised as a contribution.

Queen Charlotte Sound.—A wharf was required at Anakiwa to land goods at the head of Queen Charlotte Sound for supplying the mining population on the Mahakipawa Diggings. The cost of this work has been £289 9s. 5d., of which £96 6s. has been paid.

SCHOOLS OF MINES.

It is satisfactory to note the progress made by the students who attend these schools, and also the good effect the schools have amongst a mining community. The dissemination of scientific knowledge in regard to the character and composition of ores, and the class of rocks in which certain metalliferous substances are likely to be found, and the instructions which miners are able to obtain in order to qualify themselves for managers of mining works, are bound to produce good fruits and insure the mining industry being carried on in future years on a more intelligent basis. These schools are drawing attention by practical demonstration to the great waste and loss of gold and silver there is now and has been in former years, and are causing mine-proprietors and crushing-mill owners to turn their attention to different processes for saving the precious metals. This will have the effect of causing low-grade ores which have hitherto been passed over as worthless to be worked, and will open up a new field for the employment of labour.

There are now two schools receiving Government aid—namely, one at the Thames, in the North Island, and one at Reefton, in the Middle Island, both in large centres of quartz-mining districts; and every credit is due to the teachers who are employed in those schools for the progress they made last year with the limited appliances at their command. In addition to those two schools, the Government has been contributing £500 per annum for a School of Mines at the Dunedin University, which affords an opportunity to those residing in the south portion of the Middle Island of receiving a good sound technical education in mining in all its branches. Hitherto this has not been taken so much advantage of as it deserves, for the obvious reason that, although Dunedin may be termed a large centre of a mining country, it is not near any of the mining centres where actual operations are carried on, and there are many, especially those who are engaged in mining, who cannot afford to go to the University to receive instruction, nor send their children. For this reason alone the schools of mines in large quartz-reefing districts will always be better attended; besides, the students can go in and about the mines, and learn the practical working, and see the different classes of machinery employed in the reduction and treatment of ores, and by this means, together with a technical training at the school of mines, will be far better qualified to act as battery-managers and mine-managers than those who have been merely taught the theory at the University.

Mr. Alexander Montgomery, M.A., who has been conducting the School of Mines at the Thames, has made a great many interesting experiments with the testing-plant erected at the school, and has shown conclusively that there are ores in the North Island district from which with the most careful treatment by the ordinary battery-process only 27·3 per cent. of the gold is saved, and 6 per cent. of the silver. This was shown by his experiments Nos. 1, 2, and 3 from ore in the Karangahake district. He also shows that the loss of gold and silver in fine slimes, that are carried away with the water and do not settle for a long time, is something very considerable. From ore that assayed 2oz. 0dwt. 8gr. of gold and 2oz. 6dwt. 4gr. of silver to the ton the fine slimes suspended in the water contained on assay 1oz. 15dwt. 7gr. of gold and the same amount of silver to the ton.

The following is an extract from Mr. Montgomery's report on the progress made by the school last year, and the experiments he conducted with the testing-plant, which is exceedingly interesting:—

"The school has made better progress during the last year than in any former year, the classes being more regularly attended and the work done of a higher character than previously. The school has firmly established itself in the public estimation, and is proving a great boon to the district.

"During 1888 classes were conducted in chemistry, practical chemistry, assaying, mathematics, mining, and drawing, and this year a strong class has also been formed to study mineralogy and geology. Lectures are also delivered every Saturday morning to such pupils of the public schools as like to attend, the subject being elementary chemistry, illustrated by numerous experiments.

"The work of the chemistry class comprises the study of the properties of the elements and their compounds, their mutual relations and modes of formation, the principal chemical industries, and, more particularly, metallurgical processes. The chemistry and metallurgy of gold and silver receive special attention. The standard of work in this class is only a little lower than in the university colleges.

"In the class in practical chemistry the students have to learn and practise the methods of qualitative and quantitative analysis, particularly of ores of the metals. The laboratory, though still very deficient in many essential requisites, is complete enough to give a very fair course of instruction in analysis of the most important metallic ores.

"The assaying class is occupied with the practical study of both wet and dry methods of assaying gold and silver bullion, gold- and silver-ores of all sorts, lead, zinc, copper, mercury, antimony, iron, tin, and other ores. Two banks have been furnished with assayers from the students of this class. Other students have been employed in the reduction-works at Waiorongomai and Waihi, and at the Newbery-Vautin works at the Thames, and have given satisfaction to their employers, although none of them had been long enough at the class to go through anything like the whole course of study. This class is very popular, and is joined by numerous miners, who find it of immediate practical benefit to them.

"The class in mathematics is for the study of algebra, geometry, and trigonometry to the extent to which these subjects are usually pursued in the high schools and junior classes in the university colleges.

"The mining class was formed to study the subjects prescribed in the regulations attached to the Mining Act for the examination for certificate of underground manager. I have found it necessary up till now to confine it to higher arithmetic, mensuration of surfaces and of solids, use of logarithms, solution of triangles, calculation of areas and of co-ordinates of traverses, and plotting to scale of plans and sections. This year one afternoon a week is devoted to practical field and underground surveying, and levelling work. Permission has been obtained from several of the managers of the largest mines here for the class to go underground and practise surveying. A great deal of time has been devoted to plotting, actual surveyors' field- and level-books having been borrowed for the purpose.

"In mineralogy the course includes the determination by blowpipe-tests and physical characters of all the most important minerals, detailed descriptions of these, and the elements of crystallography. Specimens of minerals are handed round the class in illustration of the teaching. Practical determination of minerals by means of the blowpipe is made a prominent part of the work of the class.

"The geology class studies the general subject of geology, and more particularly mining geology, modes of occurrence of mineral deposits, phenomena of lodes, faults, heaves, &c.

"The Council of the Geological Society of Australasia have, at the instance of Professor Hutton, of Canterbury College, who takes much interest in our school, presented a silver medal to be competed for by our students in mineralogy and geology at the end of this year.

"I am sorry to have to report that this year there has been no class in drawing, the gentleman who so kindly gave his services gratuitously as drawing-master for the last three years having gone to live at too great a distance to permit of his continuing to attend. The Committee are trying to arrange for the continuance of this class, but have not yet been able to find any one to take Mr. Smith's place.

"The following table shows the numbers of students attending the classes during 1888 and the first quarter of 1889:—

Class.	First Quarter, 1888.	Second Quarter, 1888.	Third Quarter, 1888.	Fourth Quarter, 1888.	First Quarter, 1889.	Total Number of Individuals attending during these Five Quarters.
Laboratory and practical chemistry ...	13	15	15	18	17	32
Architectural drawing	5	5	5	5	...	7
Mining	15	14	16	12	13	28
Assaying	33	37	44	39	31	74
Chemistry	...	4	8	6	5	13
Mathematics...	...	5	8	6	6	13
Mineralogy and geology	...	...	...	...	10	10
Public schools' pupils' class ...	125	75	74	52	40	152
Total (exclusive of school-pupils) ...	66	70	96	86	82	81

"The total number of separate individuals attending the classes for the period shown in the above table (exclusive of the school-children's class) was eighty-one. For the first quarter of the present year there are thirty-one individuals attending.

"These figures show clearly the demand that exists for the sort of instruction that is given at this school. I do not think that any of the Australian schools of mines, though well endowed, and much more liberally supplied with teachers and apparatus, can show such numbers of students in their earlier years. As the institution is becoming better known and more appreciated by the public, we are getting students from Auckland, Coromandel, and other places, and more would doubtless come if the curriculum of study and advantages of the school were liberally advertised throughout the North Island. The Committee of Management of the school have, however, no funds wherewith to advertise, all their efforts being barely able to raise enough money to pay for chemicals, coke, crucibles, and gas. Even necessary repairs have to stand over often until a little more money comes in. Surely something could be done to put the school on a more satisfactory financial basis, and get rid of this hand-to-mouth way of carrying on. The Committee have often considered the matter, and can see no way of raising more money without aid from the Government. The gentlemen composing the Committee number among them several of the most influential and respected men in the district, and if their efforts to persuade the public to subscribe more liberally are comparatively futile, then it may be looked upon as certain that no one else could raise the necessary funds by public subscription. The members of the Committee have had a hard task to keep the school out of debt, and frequently have been themselves personally liable on its account to the Bank of New Zealand for considerable sums. It is hardly to be wondered at that they sometimes feel inclined to withdraw from the task, and I am sure that it is only their conviction that they are doing a good and most useful work that nerves them to continue to give their services. If any men are entitled to have assistance given to them because they have themselves done their best they are the gentlemen of the Committee of the Thames School of Mines. I hope that the Hon. the Minister of Mines will see fit to give some annual assistance to them, to make their task of maintaining the school an easier one.

"The school has passed the experimental stage and has firmly established itself in public favour; but if it is to expand, and extend its usefulness, and take rank among other schools of mines, it must have a charter to give certificates to its students which will be recognised throughout this colony and the world. This would probably require that a constitution should be granted to it by Act of Parliament. It is time that it should have some fixed constitution.

"As the question of extending and perfecting the school by the appointment of more teachers involves considerations of expense upon which it is not my province to enter, I can only say in regard to it that it is impossible for one man satisfactorily to carry on a complete school of mines by himself. My time is so much taken up with the six classes now carried on that I have no time for analysing the ores and experimenting on the metallurgical problems that are so abundant. This should be a most important part of my work, and it is a matter of extreme regret to me to see so much work to be done on every side and to have no time to do anything to it.

"*Experimental Battery.*—Since my last report the experimental battery has been completed as far as was possible with the money in hand. It now comprises a two-stamp battery with copper tables and blanket-strakes, one roasting-furnace with condensing-chambers and drying-floor, one Railey pan, one settler, one berdan, one Pelton water-wheel, and a set of four tailings-pits. The floor is of concrete, and the building of wood and galvanised iron. Everything works satisfactorily. Fourteen tests have been made of ores from different parts of the goldfield. The results of these are as follows:—

"*Nos. 1, 2, and 3.*—Three parcels of stone each a little over 100lb. in weight, from the Truro Mine, Karangahake. These were roasted and then amalgamated separately in the berdan. This treatment, which, with the exception of the roasting, is that usually adopted, was very ineffective in extracting the metallic contents, the average extraction of the three parcels being only 27·3 per cent. of the gold shown by assay and 6 per cent. of the silver. This shows strikingly the unfitness of the ordinary process for such ore as that from the Truro Mine, where the gold is very fine.

"*No. 4.*—All the tailings from the above three tests were then ground and amalgamated again in the Railey pan without the use of heat, sulphate of copper, or salt. This extracted 3·1 per cent. more gold and 3 per cent. more silver from the tailings; but the amalgamation was conducted rather under difficulties, as it was the first charge worked in the pan. However, the result plainly showed the necessity of further treatment. The owner of the mine, Mr. C. P. Cox, then sent some larger parcels for treatment, the result of which will be seen below—tests Nos. 8 and 9.

"An experiment was made during the progress of this test to determine the amount of loss of gold in fine slime that does not settle but remains suspended in the water for a long time. Only 59 per cent. of the ore could be caught in the first tailings-pit. An assay of the fine slime yielded gold at the rate of 1oz. 15dwt. 7gr., and silver 1oz. 15dwt. 7gr. per ton, the original assay being 2oz. 8gr. of gold and 2oz. 6dwt. 4gr. of silver per ton. This shows that the slime escaping was nearly as rich as the original stone.

"*No. 5.*—This was a test by raw amalgamation in the Railey pan of 1,970lb. of quartz from the Werahiko Mine, Waiorongomai, containing fine free gold and sulphide of silver. The ore contained by assay 3oz. 19dwt. 16gr. of gold per ton and 7oz. 11dwt. of silver. It was crushed wet in a stamp-battery, passed over amalgamated copper plates, and then into the tailings-pits, whence, after settling, it was shovelled and baled into the Railey pan. In the battery we saved 55·7 per cent. of the gold and 28·3 per cent. of the silver shown to be present by assay. This would represent the saving by the ordinary battery-process. By further amalgamation in the pan the total saving of gold was brought up to 90·5 per cent. and of silver to 78·3 per cent., making a total saving of 89·6 per cent. of the assay-value. The tailings from the pan still, however, contained 12dwt. 14gr. of gold and 2oz. 10dwt. 10gr. of silver per ton, so that the extraction was by no means perfect. Still, the pan-treatment showed a great saving above the mere battery-process. An assay

of the fine slime in the last settling-pit before pan-treatment gave—gold, 1oz. 4gr. per ton; and silver, 8oz. 3dwt. 20gr. The assay of all the tailings, mixed, before pan-treatment gave 1oz. 15dwt. 7gr. of gold and 5oz. 8dwt. 9gr. of silver per ton. This shows that the very finest slime from the battery is nearly as rich as the general bulk. As the fine slime often amounts to 30 or 40 per cent. of the whole, the need of saving it carefully is therefore evident. It is often quite disregarded.

"*No. 6.*—The next test was of 2,695lb. of ore from the Hikutaia Gold-mining Company's mine at Marototo. The ore appeared to be of the same character as that from the Werahiko, above, but was richer in silver while poor in gold, containing 74oz. 13dwt. of silver and 1oz. 17dwt. 10gr. of gold per ton. This ore proved quite unsuitable for raw amalgamation without heat or chemicals, and we only succeeded in saving 64·6 per cent. of the gold and 39·5 per cent. of the silver, or 49·6 per cent. of the assay-value. A cause of heavy loss of silver was detected in this test in the formation of a black metallic-looking scum floating on the surface of the water in the settler, and also on the water from the stampers. When this settled under the water it appeared to be very heavy, but as a rule it floated in films on the surface, and would not sink. I found that it contained silver, mercury, sulphur, and selenium. I believe this is the first time the existence of selenium in these ores has been recorded. I have detected it in several other ores from the Ohinemuri district, particularly in the black ore from the old Rosemont Mine. When cleaning the amalgam from the pan it was found to contain much of this same black compound. Grinding it for some time with salt in the berdan had a beneficial effect in cleaning the amalgam; but the black slime expelled was very rich. Indeed, I have invariably found that when amalgam is cleaned by grinding in berdans, as is the usual custom, the refuse is very rich, though small in quantity. It contains a good deal of quicksilver, and on standing for a time, and especially if allowed to become dry, the quicksilver often segregates out into large drops, which can easily be recovered; this, too, when the slime contained no mercury visible even with a magnifying-glass.

"*No. 7.*—The result of the No. 6 test being so unsatisfactory, at the first opportunity I had the tailings from the pan again amalgamated, this time using sulphate of copper and salt in the pan, and heating its contents up nearly to boiling-point while amalgamating. Owing to a misunderstanding, my amalgamator had ejected a large quantity of sludge from the tailings-pits before I noticed what he was doing, and consequently on drying the remainder of the tailings we found there were only 1,397lb. out of the original 2,695lb. The treatment with heat and chemicals gave a saving of 40·4 per cent. of the gold and 69·5 per cent. of the silver in these tailings—equal to 61·3 per cent. of their assay-value. This brought the total amount saved up to 64·6 per cent. The tailings from this second treatment contained 7dwt. 12gr. of gold and 12oz. 18dwt. of silver per ton. The ore was ground to impalpable powder, and formed mere sludge when done with, being too light to settle properly in the tailings-pits. I do not think that much more could have been extracted by further amalgamation unless the ore were roasted, and it was so finely ground that this would have been a very troublesome process. Another test was pressing, and so the tailings had to be thrown out and lost. I should like to try another parcel of this ore by amalgamation after a chloridising roasting. There was much less of the seleniferous black slime in this test than in No. 6, and one charge that was longer hot than the others and had more sulphate of copper and salt was free from it or nearly so. What was formed contained a great deal of copper and little silver, showing that copper had acted beneficially in freeing the silver from its combination with selenium.

"*No. 8.*—This test was on 1,085lb. of ore from the Truro Mine, Karangahake. As the ore appeared to be very free from sulphides I did not think it advisable to roast it, thinking it of more consequence first to determine the percentage that could be saved by raw amalgamation. The ore was put through the stamps first—35½ per cent. of the gold- and 21 per cent. of the silver-contents being here saved—and then amalgamated hot, but without chemicals, for six hours in the pan. The bulk assay of the ore was 1oz. 5dwt. 10gr. of gold and 2oz. 12dwt. 15gr. of silver per ton, and of this we saved 68·36 per cent. of the gold, and 78·54 per cent. of the silver, or 69 per cent. of the total value. The tailings from the pan contained 7½dwt. of gold and 1oz. of silver per ton.

"*No. 9.*—This test was on 1,120lb. of ore from the Ivanhoe Mine, Karangahake, and was treated in the same way as No. 8. Eighty per cent. of the gold and 83·7 per cent. of the silver, or 80·5 per cent. of the total value, was saved. The tailings contained 7½dwt. of gold and 10dwt. of silver per ton. It is doubtful if these ores are rich enough to bear the expense of roasting at Karangahake, and the gain would probably not make up for the extra cost of doing so. The owner is now steadily trying these ores with a small pan-battery, and finds the treatment satisfactory.

"*No. 10.*—This ore contained 7dwt. 8gr. of gold and 34oz. 3dwt. of silver per ton. It contained some chloride of silver, and also sulphide of silver; but was troublesome from containing a great deal of black oxide of manganese, which seriously interferes with amalgamation. Of this ore, 1,078lb. which came from the Goldwater Mine, at Whangamatā, was treated by stamping and pan-treatment, sulphate of copper, salt, and heat being employed. The result was exceedingly bad, only 4dwt. 20gr. of gold and 7oz. 17dwt. of silver per ton being saved.

"*No. 11.*—This parcel was also from the Goldwater Mine, and of much the same character as No. 10. It weighed 5,308lb., and contained 5dwt. 21gr. of gold and 30oz. 4½dwt. of silver per ton. It was treated in the same way as No. 11, and yielded 77·3 per cent. of its gold and 44·3 per cent. of its silver, or 51·1 per cent. only of its assay-value. The tailings contained 2dwt. 12gr. gold and 15oz. 17½dwt. silver per ton. I think this ore would be rendered easier to treat by calcining it to destroy the black oxide of manganese. The tailings from tests Nos. 10 and 11 have been saved for roasting-treatment at first opportunity.

"*No. 12.*—A parcel of 3,455lb. of very mullocky quartz was brought for treatment, the owner believing that the ordinary battery-treatment was unsuitable for it. The stuff was put through the battery and treated in the manner usual in the batteries here, with a view to test this point. Samples of the tailings were regularly taken throughout the test, and, as these gave by assay only 3dwt. 18gr. of gold and 3dwt. 18gr. of silver per ton, it was not worth while giving them the pan-

treatment, more especially as the owners could not afford the expense of such a test. The parcel yielded 15dwt. of melted gold, or about 10dwt. per ton. A concentration-test of this ore would have been useful, but we have no concentrator—not even a straight buddle.

"*No. 13.*—As far as value of ore is concerned, this was the most important test made at the experimental battery. It was also of great interest on account of the complex nature of the ore, which contains chloride, bromide, iodide, selenide, and sulphide of silver, native silver, and free gold. The ore was very rich, containing 32oz. 10dwt. 17gr. of gold and 822oz. 5dwt. of silver per ton. The weight of ore treated was 1,938lb. I was very doubtful as to what was the best treatment for this ore. No doubt such stuff ought to be smelted; but we have no appliances for trying this process. As lixiviation with hyposulphite of soda extracts 75 to 80 per cent. of the silver from this ore when treated on a laboratory scale, it might be desirable to lixiviate it, and then treat by roasting and amalgamation. As the ore is very soft and friable it could be lixiviated without much crushing. However, I finally decided to give a thorough amalgamation-test. The ore was very carefully crushed wet, the escape from the tailings-pits being almost imperceptible, and then amalgamated hot for from six to seven hours, sulphate of copper and salt being liberally used, though, as it turned out afterwards, even more ought to have been used. Owing to the richness of the ore it was necessary from time to time to draw off the quicksilver from the pan and squeeze it through canvas to separate amalgam, and then put it back into the pan. After the whole of the ore had been treated, all the heavy tailings from the settler were again put through, and finally the whole of the tailings were again subjected to a second amalgamation in the pan. This, however, yielded very little more amalgam—hardly enough to pay for the extra expense. So it may be assumed that all that raw amalgamation would extract had been extracted. Still, the tailings contain 4oz. 12dwt. of gold and 189oz. silver per ton. The saving of gold amounted to 85·8 per cent., and of silver to 77 per cent., or 81·5 per cent. of the total assay-value. All the tailings have been carefully saved, and at the first opportunity I intend to have them subjected to a chloridising roasting, and again amalgamate them. In this test there was a very heavy loss of quicksilver, due to the formation of chloride of mercury. The bullion was almost free from copper, and this, taken with the formation of mercury-chloride, shows that more sulphate of copper was required. In melting the retorted bullion a rather peculiar fact was noted—viz., the formation of chloride of silver. This, too, notwithstanding that the amalgam was very thoroughly cleaned, and appeared quite free from any impurities. It came from the retort quite black, and on melting a scum of chloride of silver rose to the top. I ascribe this to chloride of mercury (calomel) being enclosed in the amalgam, and on heating giving off chlorine to the silver. The formation of chlorine in this way tends to refine the bullion, as in the Miller process. Some gold from the Woodstock Mine, Karangahake, gave, when melted at the Bank of New Zealand, Paeroa, quite a thick scum of a mixture of chloride, bromide, and iodide of silver, formed in exactly the same way.

"*No. 14.*—After finishing the main large parcel of Marototo ore (No. 13) the mine-manager wished me to test another small parcel of 86lb., representing samples taken by him from some thirty or forty tons from time to time. The ore assayed 5oz. 14dwt. 14gr. of gold and 164oz. 15½dwt. of silver per ton. The same treatment as No. 13 yielded 90·3 per cent. of the gold, and 76·6 per cent. of the silver, or 82·9 per cent. of the total assay-value. The percentage of extraction was almost the same as in the former test, though the value of the parcel was much lower. The test shows that raw amalgamation is not capable of completely extracting the gold and silver. What can be done with the aid of a chloridising roasting remains to be seen. I do not think that with very rich ore such as that treated in test No. 13 chloridising roasting should be resorted to until as much gold as possible has been extracted, as recent researches show that very heavy losses of gold by volatilisation frequently occur when roasting in this way. Muffle-tests show 50 or 60 per cent. loss of gold by roasting this Marototo ore with salt. The silver is less liable to loss. Professor Christy has recently shown, in a paper read before the American Institute of Mining Engineers, that the cause of loss is chlorine, and not tellurium, antimony, and arsenic, as has been often imagined. Some experiments of my own, made and published before the publication of Professor Christy's paper, quite bear out his conclusions.

"Since the beginning of this year we have not been able to do anything with the experimental plant. My classes take all my time in the mornings and give me a great deal of preparatory work in the afternoons, while the evenings again are taken up with classes. A certain amount of expense must always be provided for in making these tests, more particularly the wages of a reliable amalgamator. Roasting-tests require money for fuel and salt as well. The Committee have no funds for carrying on experiments unless the owners of mines will pay for having them made, and lately no one has come forward to do so. All the above tests were paid for by the owners. The Committee have made £5 per ton the minimum charge for having tests made, and if the cost of the test comes to more the amount must be made good by the owner. When the value of the information gained by a few tests is taken into account, the fees seem to me to be very low, but many persons here appear to think them far too high. I have given the above detailed account of the tests in the hope of showing how much can be learned by a series of experiments on a working scale, and I have not the least hesitation in saying that the expenditure of £1,000 in experimenting on the ores would give results which would lead to the saving of over twice that amount in a year or two. As I have frequently said before on this subject, the miners here are quite ignorant of how to treat silver-ores, and do not know any other process than the ordinary battery one, and until they see something better actually in operation will never take any steps towards introducing anything new. I must also say that the men who will come forward and have experiments made to benefit others as well as themselves are unfortunately very rare, every one rather waiting to let his neighbour buy his experience, and then himself profit by it. This being the state of things, I think it would be money well spent if the Government would take the lead in this matter, and give a small sum annually for the purpose of carrying on experiments. A sum of £200 a year, which would enable us to employ an amalgamator constantly, would, I believe, be sufficient to do a great deal of good; but we should

then have to depend very much on the goodwill of mine-owners for donations of ore. I do not think we should have much difficulty in getting given to us enough ore of sufficient value to cover wear-and-tear of plant and expenses of experiments. The expenses are necessarily much higher than in working on a larger scale. A much more satisfactory plan, however, would be to buy parcels of ore at a price sufficiently below the assay-value to allow a small profit on the treatment. If money for this could be provided there would be no difficulty in getting a constant supply of ore of all sorts. I am of opinion that if a sum of £100 were advanced to us for the purchase of ores for treatment, we could get enough from parcels of ore to cover all expenses, and hand back the principal, provided that the wages of our amalgamator were paid by the Government. A mass of information could thus be accumulated as to the treatment of our ores that would be, being periodically published, of the greatest service to the goldfield. While admitting that such things are far better done by private enterprise, I hope that the Government will look upon this matter in a liberal light, and show an example that will cause private enterprise to follow their footsteps, and in all probability soon relieve them of any necessity for further continuing their help.

"If the Government will provide a good amalgamator to be constantly at the experimental battery, any other assistance required could be furnished by the students. There are several now attending the school who would be glad of the opportunity of working in the battery, but who are not capable of being left there without the supervision of an experienced man. I have no time, with my other duties, to do more than direct operations, and have certainly no time to continually supervise the actual working. In a short time, however, some of the students would be able to do with very little help. In the tests that have been made an amalgamator was employed at the expense of the owners of the ore, and the students had nothing to do with these tests. This was necessary when doing work directly for the public, it being essential that a trained man should be responsible for every step in the operations; but in carrying on series of experiments as I propose to do, treating the ore at our own time and in our own way, it would be quite proper to make use of the students."

It will be seen from Mr. Montgomery's report that the average number of pupils attending the School of Mines from public schools for the twelve months ending the 31st March last was sixty, and that exclusive of public-school pupils the average for the twelve months was as follows: In the laboratory and practical-chemistry class, 16; in the architectural-drawing class, 4; in the mining class, 14; in the assaying class, 38; in the chemistry class, 6; in the mathematics class, 6; in the class for mineralogy and geology (last quarter only) 10.

In Reefton Mr. Thomas Fenton is in charge of the School of Mines; but there are not the same appliances here as there are at the Thames School; neither is the teaching carried on constant at Reefton, as at the Thames. Mr. Fenton has held classes at Nelson, Boatman's, Westport, and Denniston, which took him away for a considerable time from Reefton. The average attendance at those places was as follows: Nelson, 35; Westport, 6; Denniston, 20; Boatman's, 9; Reefton, from eight to ten regular pupils, and also several miners who wish to qualify themselves for mine-managers, and pass their examination.

Mr. Fenton has also drawn the attention of the mine-proprietors and mill-owners to the large amount of gold that is left in the tailings; and the result is that some of the companies are erecting Triumph ore-concentrators to save the pyrites. These or similar machines should have been erected long before this time to save the pyrites, but it is a very difficult matter to get those who have been for years engaged in mining and in crushing-mills to leave the groove they have been accustomed to go in. It will be interesting to tabulate the assays and value of the different companies' tailings and pyrites, from several assays made from each by Mr. Fenton.

Name of Company.	Assay of Tailings per Ton.	Assay of Pyrites per Ton.
Globe	From 3dwt. to 1oz ...	2oz. 10dwt.
Keep It Dark	From 10dwt. to 15dwt....	3oz.
Welcome	From 8dwt. to 14dwt. (These were first treated in berdans)	No assay.
Progress	No assay	4oz. to 5oz.
Sir Francis Drake...	"	3oz.

It will be observed from this that, although the Welcome Company are stacking all the tailings and treating them in a plant of berdans, the tailings leaving the berdans still assay from 8dwt. to 14dwt. per ton. There is nothing more certain than that the loss of gold on this field by the ordinary crushing-battery process amounts on an average to about 50 per cent., and on the North Island goldfields, where the gold is combined with silver, and extremely finely disseminated through the quartz, very little more than 33 per cent. is obtained on an average of the precious metals where the yield does not exceed more than 1½oz. to the ton. With very rich stone, and by taking extreme care, a higher percentage may be obtained. One thing, however, is certain, that a different process of treatment will have to be adopted before anything like a fair percentage of the precious metals is saved.

The following is an extract from Mr. Fenton's report on the School of Mines on the West Coast:—

"By the direction of the Hon. the Minister of Mines I proceeded last April to Nelson, where a school had been formed. On my arrival I found the Committee had rented a good building, containing two large rooms, one for class and assay purposes and the other for a lecture-room. The class-room was fitted up with furnace, tables, had gas laid on, &c., and all complete. They had also a

good stock of chemicals and assay-plant, which the Committee had imported from Home. I held classes and delivered lectures in this place during April and May in chemistry, assaying, blowpipe, general mining, and metallurgy. There are a large number of subscribers to the school, and the average attendance is between thirty and forty, all of whom are most anxious to learn. I never had anything to do with a class that advanced so satisfactorily in the time as the students of the Nelson School of Mines. For this I must thank Mr. Littlejohn, of the Nelson College, Dr. Coleman, Mr. Holloway, and others, who assisted me in every way. I think one good result of my visit to this place is that most of my students are able to tell the practical value of any mineral, and the Nelson people will not throw away their money again in useless mining ventures.

"*Boatman's.*—On my return from Nelson I held classes at Boatman's for a month; the average attendance about eight or ten. Several battery-managers and miners who wish to pass the examination and get certificate for mine-manager also attended, and I think some of them will shortly be able to pass their examination. I also held classes here once a week during September, October, November, and December, and for a month in January and February. They have a good building here, and a large number of members. The attendance was not as large as I should like, but this is easily accounted for, as a good many of the mines have lately stopped work, and the miners have left for other places. After leaving Boatman's I proceeded to

"*Westport and Denniston*—at which places I held classes during July and August. The attendance at the former place was, I am sorry to say, small. The Committee have lately removed their building on to an allotment of their own. The building is rather small, but we hope soon to have it enlarged, and have a better attendance of members.

"*Denniston.*—The Denniston Committee have erected a fine building, consisting of two large rooms, one of which they use as a museum and lecture-room, and the other for class purposes. They have also built melting- and assay-furnaces, and have a fair stock of chemicals on hand. The attendance here of the coal-miners and others averaged about twenty, and I feel satisfied with the progress made in this school.

"*Reefton.*—On my return from Westport I held classes in Reefton during the remainder of the year—on Mondays, practical chemistry; Tuesday, at Boatman's Institute; Wednesday, assaying; Thursday, mining; Friday, chemistry. I also held classes for boys during the week, and on Saturdays; the average attendance, about eight to ten. Several miners and others wishing to obtain mine-managers' certificates also attend a class, and one has already passed the examination and got his certificate, and I expect three or four more to pass the next examination. This school is badly in need of a little Government assistance, as we find it takes all our revenue to supply chemicals, coke, lights, &c. We are also going to make an addition to our building to place our furnace in, and we are getting water laid on for a Pelton wheel to drive our berdan for test purposes.

"*Tailings.*—In conclusion I may say I have made numerous assays of tailings from the different claims crushing in this place, and find that we lose a large percentage of our gold. We have no tailings or chlorine plant, or any way of treating the tailings after they leave the batteries. The following tests will show the value of the tailings from the different companies:—

"Globe: This company has saved several thousand tons of tailings, which assay from 3dwt. to a little over an ounce per ton. The pyrites in tailings out of a good many tests averaged over 2½oz. gold per ton. They are now erecting several Triumph vanners to concentrate them, but have not determined in which manner to treat them afterwards, as they think chlorine too expensive, and by other processes they would still lose a large percentage of gold.

"Keep It Dark: This company is also saving some of its tailings lately. For years they have been allowed to run away into the river. The tailings assay 10dwt. to 15dwt., and pyrites over 3oz., gold per ton.

"Welcome: This company has also several thousand tons of tailings saved, most of which have already been through berdans, out of which, I am informed, the company has made a profit of £200 to £400 per month. They assay from 8dwt. to 14dwt. gold per ton.

"Progress: This company has only crushed for a few months out of a surface-level. They have a very large reef, 30ft. thick, which yielded 16dwt. per ton. They have now cut it 200ft. deeper, where it looks well, and contains a large percentage of pyrites, which on testing I found to contain 4oz. to 5oz. gold per ton.

"Sir Francis Drake: This company's pyrites also assay well—viz., over 3oz. per ton. In fact, all the pyrites in this field contains from 2½oz. upwards of gold per ton, and the gold is very pure—97 to 98 per cent.

"I want to lay particular stress on the subject of tailings in this district, both for the information of the Mines Department and, further, with a view of drawing attention from outside capitalists as to their great value. It is really astonishing that, with mineral wealth of such magnitude going to waste for many years, no plant of any kind has been erected in the field for its treatment; and can only be accounted for by our isolated geographical situation. We hear and read every day of some wonderful new patent for the treatment of tailings and pyrites, with more or less claims of success according to the nature of the *débris* operated on: one naturally asks, how is it none of them have come this way, where such a splendid opening for enterprise and capital in this department exists—not to be surpassed, I will venture to affirm, in New Zealand. The mining companies in this field, who up to the present have rested satisfied with the gold obtained from the ordinary battery-treatment, would one and all be only too glad to either sell their tailings or purchase the right to use a cheap method for their treatment that could be guaranteed a success. By success, I mean they do not care if one method costs £3 per ton and saves 90 per cent. of gold, or another costs 10s. per ton and only saves 70 per cent. of gold. The question is, which will give most profit? One thing I am sure of, we have the best quartz-field in New Zealand at present in Reefton, and we are losing large quantities of our gold, and if any enterprising, competent, and practical man comes to this district, and can treat our tailings cheaply and successfully, he will soon make a fortune for himself and save thousands of pounds for companies"

In addition to these schools, Professor Black went round the different mining centres in the Middle Island, and completed the engagements he had previously entered into with the several School Committees, which are established in all the principal places, and which are now carrying on the schools themselves.

The following statement will show the expenditure by the department on the schools of mines since their inauguration :—

Financial Years.	Subsidies towards the Erection of Schools of Mines.	Chemicals and Apparatus, also Mineralogical Specimens, supplied to Schools of Mines.	Salaries of Teachers, with Travelling-expenses, &c.	Total Sums paid to Schools of Mines by the Department.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1885–86	Nil	36 19 9	1,223 9 10	1,260 9 7
1886–87	257 16 6	409 1 4	2,716 9 3	3,383 7 1
1887–88	253 15 9	253 14 1	1,714 9 6	2,221 19 4
1888–89	42 10 0	6 12 9	1,139 4 1	1,188 6 10
Total	554 2 3	706 7 11	6,793 12 8	8,054 2 10

It will be seen from this that the total expenditure on schools of mines, exclusive of the annual contribution of £500 to the school at the Dunedin University, has been £8,054 2s. 10d.; and that the expenditure last year only amounts to £1,188 6s. 8d., which includes £250 paid to Professor Black to enable him to fulfil the engagements entered into. The total amount paid to the School of Mines at Dunedin University has been £2,000. The two schools that are now carried on require to have better appliances to make them more useful; but this would not amount to a great deal. The great object to be attained is to make the two schools in the main quartz-mining districts in the colony as useful as possible, without allowing them to become large institutions requiring a heavy expenditure to keep them up. So long as this is done at an expenditure of about £1,400 per annum, it will be money well spent, and will tend greatly to develop the mining industry by enabling lower grades of ore to be worked than at present.

WATER-RACES.

Waimea Water-race.

The flumes on this water-race are in very fair condition. All the decayed legs in the understructure have been renewed. The original totara and rata legs are still in good condition, but the kawhaka legs which were used in the first instance are getting decayed and very brittle, and will in the course of the next two years have to be renewed. Since the construction of the flumes in 1874–75 a great many of the original legs have been replaced by red-pine and miro legs; but miro proves to be worthless timber, and should not be used in future. The red-pine legs are all in good condition. Indeed, the heart of red-pine is the next best timber to totara and rata.

The stringers in the superstructure are getting a little decayed. Some of these will have to be replaced shortly, but the greater portion of them will last for a considerable time yet. The upper side planking of the box is very much decayed in places—that is, the portion above the water-line—but, generally, below the water-line the planking is fairly good yet. Occasionally a plank has to be replaced here and there below water-level, but the timber is in a much better state of preservation below water-line than above it.

The tunnels and ditching are all in good repair. The only tunnel where the timber is getting bad is the long tunnel at the Kawhaka Creek, forming portion of the supply-race. There is nothing to prevent this water-race being kept in a good state of repair by the ordinary maintenance-men for a number of years yet.

The ground that the race commands is getting greatly worked in the vicinity of Goldsborough and Stafford. Still, there is a large extent of country having deep alluvial drift-terraces, which will no doubt be all worked yet. The miners state that the ground is getting very poor; that they are not able to make more than from £1 10s. to £2 10s. per week, after paying for water: but ground of this description will be all worked yet, and with a better system of working could be made far more remunerative than it is at present. Most of the mining claims in this locality are worked in a very primitive manner: no advantage is taken of the head of water that can be obtained from the water-race; small ditches are cut down the side of the terrace from the dams the miners have constructed to store their water, and from these the water is brought on the surface to the face of the workings, and in many instances a canvas hose is still used to take the water to the nozzle. Formerly most of the miners had dams to store the water; but the ground in some instances is worked up to these dams, so that they cannot now be utilised. In consequence of the primitive method of working, and of the ground not being particularly rich in the precious metal, and of the miners in general having large families, it takes all they can earn to provide sufficient for their actual wants, and leaves nothing to enable them to construct new dams and get a proper plant to work the ground systematically.

The following table shows the sales of water, cash received for sales of water, expenditure, outstanding moneys at end of each month, number of men employed, approximate amount of gold obtained, and value of gold, for the year ending the 31st March, 1889:—

Month.	Sales of Water.	Amount of Cash received for Sales of Water.	Expenditure.	Amount of Outstanding Moneys at the End of each Month.	Number of Men employed.	Approximate Amount of Gold obtained.	Value of Gold.
1888.	£ s. d.	£ s. d.	£ s. d.	£ s. d.		Oz.	£ s. d.
April	134 15 10	45 11 3	51 3 0	159 14 3	91	255	969 0 0
May	140 9 2	155 13 5	65 10 0	144 10 6	97	260	988 0 0
June	148 4 7	176 2 11	51 14 0	116 12 2	100	283	1,075 8 0
July	159 7 1	109 15 4	55 4 6	166 3 5	102	276	1,048 16 0
August	133 17 6	152 2 11	52 9 6	147 18 0	91	255	969 0 0
September	131 15 0	160 9 2	55 19 0	119 3 10	94	237	900 12 0
October	131 11 8	133 12 11	77 4 0	117 2 7	103	268	1,018 8 0
November	153 6 3	108 0 5	83 10 3	162 8 5	97	264	1,003 4 0
December	105 5 0	197 3 3	99 5 3	70 10 2	92	181	687 16 0
1889.							
January	73 16 3	46 11 8	101 4 11	97 14 9	81	156	592 16 0
February	103 18 4	102 14 7	85 6 0	98 18 6	85	195	741 0 0
March	..	40 9 2	71 12 0	62 16 10	88	239	908 4 0
Totals	1,416 6 8	1,428 7 0	860 2 5	..	1,121	2,869	10,902 4 0

It will be seen from the foregoing table that the sales of water for the year amounted to £1,416 6s. 8d., as against £1,612 11s. 3d. for the year previous, thus showing a decrease in the sales of water last year of £196 4s. 7d.,; while the expenditure on maintenance last year was £860 2s. 5d, as against £1,027 17s. 11d. for the previous year, thus showing a decrease in the expenditure last year of £167 15s. 6d. The actual profits on the working of this water-race last year amounted to £556 4s. 3s., while the profits the year previous were £584 3s. 4d., or £28 9s. 1d. more than last year. Although the sales of water last year decreased to a considerable extent, the expenditure on maintenance was reduced to such an extent that the profits are nearly the same as for the last three years.

The value of free water given to the miners in the Waimea district, to open out their claims, last year amounted to £183 10s. The number of miners employed in claims worked with water from the race was ninety-three; and the approximate amount of gold obtained by them was 2,869oz., representing a value of £10,902 4s. This will make their average earnings, after deducting the value of the sales of water, about £2 5s. 1d. a man per week, or 8s. 10d. a week more than the previous year. Taking the cost of constructing the race, which has been £118,762 11s. 8d., the profit on the working last year is about ½ per cent. on the capital expended.

Kumara Water-race.

This branch of the Waimea–Kumara water-supply is the most profitable of the whole of the water-races constructed by the Government. It is the means of keeping a large population in the Kumara district, who are all earning fair wages, and some of whom are doing remarkably well. There is still a large extent of country in this locality, that the water commands, which will pay for hydraulic sluicing, and at the present rate of working will give a number of years' work to a large population.

The reservoirs, tunnels, and ditching in connection with this portion of the water-supply are all in good order. The waste water from the loopline-dam, coming through the by-wash, has cut away the ground at the bottom of the apron a little, but this can easily be protected, the manager having already put in some scrub and stones to prevent the water cutting away the ground any further. The water-race at the Kumara end goes through the heart of the workings, and was originally constructed on ground that had been partially worked by shafts, the wash-drifts near the bottom having been driven out and the ground kept up by sets of timber. There are now five of the mining claims worked up close to the ground, through which a portion of the ditching is cut, and a deviation of the race is now required to enable the ground on which it stands to be worked. The depth of the auriferous drift at this place is from 60ft. to 100ft., and, the ground being originally worked and broken, a wide reserve has to be left on each side of the race to insure its safety. The miners have arranged to make a deviation which will allow of about twenty-five chains of the present race-line to be worked, which will take about seven years, the Government giving a subsidy in free water towards the deviation, to the value of £900. The end of this race is such a network of siphons and flumes, with numerous deviations, that one can scarcely recognise the place where the race originally was after an absence of twelve months from the field. The water-supply has been extended to Nardoo Flat by a siphon. There are six claims working here, two of which are supplied with water from the Kumara Race, and the others from Holmes's race. The claims here are said to be paying fairly well, and there is a large extent of deep ground in this locality to work if proved to contain sufficient gold for working.

The following table shows the sales of water, cash received for sales of water, expenditure, outstanding moneys at end of each month, number of men employed, approximate amount of gold obtained, and value of gold for the year ending 31st March, 1889:—

Month.	Sales of Water.	Cash received for Sales of Water.	Expenditure.	Outstanding Moneys due at End of each Month.	Number of Men employed.	Approximate Amount of Gold obtained.	Value of Gold.
1888.	£ s. d.	£ s. d.	£ s. d.	£ s. d.		Oz.	£ s. d.
April	490 6 8	419 14 10	84 19 6	62 3 3	180	876	3,328 16 0
May	338 7 7	252 17 0	59 1 1	66 8 1	180	331	1,257 16 0
June	532 1 1	598 15 3	129 1 10	55 13 3	177	921	3,499 16 0
July	626 19 10	550 9 10	70 0 5	58 14 10	174	1,021	3,879 16 0
August	667 8 3	718 11 3	92 7 6	66 7 10	170	1,002	3,807 12 0
September	542 8 4	656 2 0	65 6 5	54 1 1	170	851	3,233 16 0
October..	702 12 6	510 14 8	78 6 1	68 16 9	175	958	3,640 8 0
November	664 1 7	631 14 10	86 5 8	61 14 2	171	879	3,340 4 0
December	395 12 3	504 9 11	94 13 0	74 18 9	169	551	2,093 16 0
1889.							
January	465 2 1	440 6 7	86 4 7	58 6 11	169	615	2,337 0 0
February	623 18 4	555 16 7	81 2 9	66 6 2	174	859	3,264 4 0
March	667 8 4	665 19 11	96 12 11	63 17 3	178	961	3,651 16 0
Totals	6,716 6 10	6,505 12 8	1,024 1 9	..	2,087	9,825	37,335 0 0

This table shows the sales of water last year amounted to £6,716 6s. 10d., while the year previous they were £7,169 10s. 2d. This shows a decrease in the sales of £453 3s. 5d. This decrease can be accounted for to the extent of £427, which is the value of water given to some of the claimholders for substituting iron piping in lieu of flumes and for the purchase of a tailings-site; so that this £427 ought in reality to be added to the sales. This would reduce the decrease in sales of water last year to £26 3s. 5d. The expenditure on maintenance for the year amounts to £1,024 1s. 9d., as against £982 12s. for the year previous, or an increase of £41 9s. 9d. This extra expenditure was caused by having to construct a new tunnel across the Dillman's Town Road for the lower water-supply, which cost £53 15s.; so that, deducting this amount from the cost of maintenance, it shows a reduction for the last year of £12 5s. 3d. Taking the sales of water and the expenditure, as shown in the table, it leaves a profit on the year's working of £5,692 5s. 1d., as against £6,183 18s. 3d. The net profits, therefore, for the last year are £491 13s. 2d. less than for the year previous.

The value of free water given to the miners to open out their claims last year was £292. The average number of miners employed in claims worked with water from the race is 174, and the approximate amount of gold obtained by them last year was about 9,825oz., representing a value of £37,335, which will make their average earnings, after deducting the value of sales of water and channel-fees, £3 6s. 4d., or 2s. less than the earnings last year. Taking the net profit on the working of the race last year—namely, £5,692 5s. 1d.—and the cost of construction, which was £37,400 2s. 11d., it is 15$\frac{1}{5}$ per cent. on the capital expended.

Kumara Sludge-channel.

The tailings reserve is now getting filled up to such an extent that it depends on floods in the river to carry a portion of the deposit away in order to be able to work with this channel; and the bed of the river is filled up to such an extent now that very soon it will be impossible to use the channel with any advantage to the miners. The tailings coming from the channel have forced the river against the northern bank, and the result is that a large portion of it on this side is washed away, and now forms the river-bed. Judging from where the river was four or five years ago, the bed has now shifted fully twelve chains further northwards, and the river-bed down at the Teremakau bridge seems to be about 7ft. higher than it originally was. The grass-paddocks belonging to Messrs. Keech and Malloy are cut away to a great extent on the southern side below the bridge, and the one on the northern side is now nearly all a bed of shingle. Indeed, it is only a question of time when the bed of the Teremakau will be raised to such an extent that the bridge will be liable to be carried away in flood-time.

Representations have been made from time to time to the department that a wing-dam constructed on the north bank of the river would allow the channel to be worked for several years yet; but a wing-dam would not get over this difficulty: besides, it would cost from £3,000 to £4,000 to construct, and portions of it would always be liable to be washed away in flood-time. This is a work that would be useless to undertake, and it would not prevent the bed of the river from being raised by the continual discharge of tailings.

The whole of the miners that use the sludge-channel are now unanimous in their opinion that a wing-dam would be of permanent benefit to them, and now want a new channel constructed, with less fall, at a higher level. The fall of the present channel is 2ft. 6in. to the chain—or about 3ft. 9$\frac{1}{2}$in. to 100ft.—in the tunnel, and about 2ft. 0$\frac{3}{4}$in. to the chain from the mouth of tunnel to the end of the boxes at the river. The miners now propose to construct a new channel for 34 chains from the mouth, and join on to the upper end of the present channel, with a fall of 4in. to every 12ft., and increase the grade some distance before it joins the upper end of the present channel. This fall equals 1ft. 10in. to the chain, or 8in. less fall than the present channel has, which would give a drop of about 22ft. 8in. at the mouth of the present tunnel.

With reference to the channel working with the proposed grade, the miners would have to be careful not to put so large stones in their boxes as they do at present; but if the width of the new portion of the channel were increased to 4ft. it would work perfectly well. This seems to be the

only solution of the difficulty. If a new channel has to be constructed it should be handed over to the miners, and constructed on the same basis as No. 2 channel, which is working very satisfactorily, being managed and maintained by trustees appointed by those who are using it.

The following table shows the channel-fees, value of gold-dust obtained from the channel, amount of cash received for channel-fees, expenditure, outstanding moneys due at the end of each month, and number of men employed using the channel, for the year ending 31st March, 1889:—

Month.	Channel-fees.	Value of Gold-dust obtained from the Channel.	Cash received for Channel-fees.	Expenditure.	Outstanding Moneys due at End of each Month.	Number of Men using the Channel.
1888.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	
April	79 7 11	47 13 0	52 14 2	306 5 11	..	88
May	49 6 9	25 6 3	24 0 0	437 13 4	0 4 7	88
June	94 17 6	39 19 0	97 12 0	359 0 8	0 13 2	88
July	104 19 8	39 1 0	98 0 8	448 16 11	4 4 2	88
August	110 8 2	45 17 6	127 11 3	415 19 8	0 9 2	84
September	73 17 6	41 6 0	95 1 0	371 0 10	..	84
October	115 1 3	75 14 0	87 6 6	291 9 7	3 9 2	84
November	114 5 10	66 17 6	102 16 8	368 5 5	1 14 2	80
December	57 1 11	35 13 0	42 9 7	280 11 8	3 18 1	76
1889.						
January	71 15 0	44 0 0	103 9 5	299 5 3	..	80
February	107 0 6	41 3 6	94 18 5	374 15 2	3 12 4	80
March	117 1 3	68 4 0	114 15 1	332 1 9	2 1 3	80
	1,095 3 3	570 14 9	1,040 14 9	4,285 6 2	..	..

This shows the channel-fees amount to £1,095 3s. 3d., while for the year previous the fees were £1,075 6s. 7d. This shows an increase last year of £19 16s. 8d. The value of gold-dust obtained from the channel last year was £570 14s. 9d., making the total receipts £1,665 18s.; while the expenditure was £4,285 6s. 2d., as against £4,260 12s. 4d. for the previous year. The actual loss on the working of the channel last year was £2,619 8s. 2d., or £158 15s. 11d. more than the preceding year.

The annual loss on the working of this channel has always been great. The following statement shows the results of working this channel during the last six years:—

Year ended 31st March.	Value of Channel-fees and Gold-dust obtained from Channel.	Expenditure in Maintenance.	Loss on Working the Channel.
	£ s. d.	£ s. d.	£ s. d.
1883–84	2,128 18 3	6,405 10 8	4,276 12 5
1884–85	2,163 16 4	6,161 14 7	3,997 18 3
1885–86	2,219 18 7	6,215 13 0	3,995 14 5
1886–87	2,262 2 8	5,957 11 5	3,695 8 9
1887–88	1,800 0 1	4,260 12 4	2,460 12 3
1888–89	1,665 18 0	4,285 6 2	2,619 8 2
Total	12,240 13 11	33,286 8 2	21,045 14 3

This shows the actual loss on working the channel during the last six years to be £21,045 14s. 3d.; but this does not show the whole of the loss, as a large number of sluice-heads of water are required for flushing-water to keep the channel clear, and if the value of this water be taken into consideration the loss is augmented by at least £1,964 per annum, which would be £11,784, making the loss at least £32,829. It may be said, were it not for this channel the water could not have been sold; but when it is borne in mind that time after time complaints have been made that the supply of water was insufficient, and that large sums of money have been at various times spent in enlarging the channel, and in constructing a reservoir at the loop-line road, it will be evident that the existence of the channel has been a cause rather of expenditure than of revenue. Therefore, in dealing with the question the value of flushing-water must be taken into account. This flushing-water is given away for the benefit of those who are using the channel, and whatever profit has been derived from the Kumara water-race has been obtained from those who have private tail-races of their own. It is therefore only fair that those parties who are using the channel should bear the whole expense of maintenance.

The following table shows the sales of water to parties using the channel, channel-fees, gold-dust obtained from channel, number of men using channel, approximate amount of gold obtained, value of gold, expenditure, number of weeks per month flush-water is used, number of heads, and value of flush-water, for the year ending 31st March, 1889:—

Month.	Sales of Water.	Channel-fees.	Gold-dust obtained from the Channel.	Number of Men using Channel.	Approximate Amount of Gold obtained.	Value of Gold.	Expenditure.	Number of Weeks per Month of 8 Hours per Day Flush-water used.	Number of Heads.	Value of Flush-water, at £2 per Head per Week.
1888.	£ s. d.	£ s. d.	£ s. d.		Oz.	£ s. d.	£ s. d.			£ s. d.
April	238 2 6	79 7 11	47 13 0	88	347	1,318 12 0	306 5 11	3⅜	20	135 0 0
May	143 16 2	49 6 9	25 6 3	88	141	535 16 0	437 13 4	1¼	20	75 0 0
June	271 6 4	94 17 6	39 19 0	88	503	1,911 8 0	359 0 8	4⅛	20	165 0 0
July	303 16 0	104 19 8	39 1 0	88	536	2,036 16 0	448 16 11	4⅝	20	195 0 0
August.. ..	324 7 7	110 8 2	45 17 6	84	518	1,968 8 0	415 19 8	5 1/16	20	202 10 0
September ..	212 15 10	73 17 6	41 6 0	84	473	1,797 8 0	371 0 10	3½	20	140 0 0
October ..	335 16 8	115 1 3	75 14 0	84	532	2,021 12 0	291 9 7	5	20	200 0 0
November ..	332 17 6	114 5 10	66 17 6	80	479	1,820 4 0	368 5 5	4⅝	20	193 6 8
December ..	166 9 7	57 1 11	35 13 0	76	269	1,022 4 0	280 11 8	3	20	120 0 0
1889.										
January ..	215 1 8	71 15 0	44 0 6	80	318	1,208 8 0	299 5 3	4⅛	20	165 0 0
February ..	308 18 4	107 0 6	41 3 0	80	437	1,660 12 0	374 15 2	4⅜	20	180 0 0
March	347 5 0	117 1 3	68 4 0	80	499	1,896 4 0	332 1 9	4⅝	20	193 6 8
Total ..	3,200 13 2	1,095 3 3	570 14 9	1,000*	5,052	19,197 12 0	4,285 6 2	49 5/48		1,964 3 4

* Average, 83⅓.

This statement shows that last year the value of the channel-fees was £1,095 3s. 3d.; the value of the gold-dust obtained from the channel, £570 14s. 9d.; and the value of the sales of water to those parties who are using the channel, £3,200 13s. 2d.; making the total receipts from all sources £4,866 11s. 2d.: and the expenditure on the maintenance of the channel was £4,285 6s. 2d., and the value of the flushing-water £1,964 3s. 4d.; making a total of £6,249 9s. 6d., which shows that the Government is paying annually £1,383 for the sake of keeping 83⅓ miners at work on this gold-field, which was the average number working claims into this channel last year. This really means that the Government is making a present of £16 12s. per man per annum, and giving them in addition free water to work the ground; or, if the total value of the water sold, channel-fees, and value of gold-dust obtained from the channel, namely, £4,866 11s. 2d., and the actual cost of maintenance, £4,285 6s. 2d., be taken as a basis, the profit accruing from sales of water to parties using the channel last year was £581 5s., which is equal to 6s. 7d. per sluice-head; whereas the profit on the working of the Kumara race, without including the cost of channel maintenance, was £5,692 5s. 1d., or £1 13s. 5d. for every sluice-head of water sold. Although the channel has cost a large amount of money to construct—namely, £17,200 12s. 6d.—it would be far better to hand over the channel to the parties that are using it, and have nothing further to do with it, in order to get clear of the annual loss on maintenance. The gold-mining industry requires to be fostered to a certain extent, but this large annual expenditure is not compensated by all the collateral advantages derived from those who are using the channel.

Waimea-Kumara Water-race and Sludge-channel.

Although each of the several branches of the water-supply to the Waimea and Kumara districts have to be taken separately, both of these water-supplies and sludge-channels have to be taken as one work to show the actual profits on the working for the last year.

The following table shows the sales of water, channel-fees, and gold-dust obtained from channel, cash received for sales of water and channel-fees, expenditure, outstanding moneys at end of each month, number of men employed, approximate amount of gold obtained, and value of gold, for the year ending the 31st March, 1889:—

Month.	Sales of Water, Channel-fees, and Value of Gold-dust obtained from Channel.	Amount of Cash received for Sales of Water and Channel-fees.	Expenditure.	Amount of Outstanding Moneys at the End of each Month.	Number of Men employed.	Approximate Amount of Gold obtained.	Value of Gold.
1888.	£ s. d.	£ s. d.	£ s. d.	£ s. d.		Oz.	£ s. d.
April	752 3 5	565 13 3	442 8 5	221 17 6	271	1,131	4,297 16 0
May	553 9 9	457 16 8	562 4 5	211 3 2	277	591	2,245 16 0
June	815 2 2	912 9 2	539 16 6	172 18 7	277	1,204	4,575 4 0
July	930 7 7	797 6 10	574 1 10	229 2 5	276	1,297	4,928 12 0
August	957 11 5	1,044 2 11	570 16 8	214 15 0	261	1,257	4,776 12 0
September..	789 6 10	952 18 2	492 6 3	173 4 11	264	1,088	4,134 8 0
October	1,024 19 5	807 8 1	446 19 8	189 8 6	278	1,226	4,658 16 0
November	998 11 2	909 9 5	538 1 4	225 16 9	268	1,143	4,343 8 0
December	593 12 2	779 15 9	474 9 11	149 7 0	261	731	2,777 16 0
1889.							
January	654 13 10	634 8 2	486 14 9	156 1 8	250	771	2,929 16 0
February	876 0 2	794 12 7	541 3 11	168 17 0	259	1,054	4,005 4 0
March	852 13 7	889 8 2	500 6 8	128 15 4	266	1,200	4,560 0 0
Totals	9,798 11 6	9,545 19 2	6,169 10 4	..	3,208	12,693	48,233 8 0

This shows that the receipts from sales of water, channel-fees, and value of gold-dust obtained from the channel amounted to £9,798 11s. 6d., as against £10,582 1s. 7d. for the previous year; which shows a falling-off in the receipts last year of £783 10s. 1d. The total expenditure on maintenance was £6,169 10s. 4d., while the previous year it amounted to £6,271 2s. 3d. The decrease

in the expenditure last year was therefore £101 11s. 11d. The net profit on working this water-race last year amounted to £3,629 1s. 2d., whereas the profit the year previous was £4,310 19s. 4d. This shows a decrease in the profits last year of £681 18s. 2d.

It is gratifying to find that the outstanding moneys at the end of each month are gradually decreasing. At the end of the previous year they amounted to £146 11s. 9d., and at the end of last year they were £128 15s. 4d. The average number of men employed in mining-claims worked with water from the water-race last year was 267, as against 281 for the year previous. The approximate amount of gold obtained last year from claims worked with water from this race was 12,693oz., representing a value of £48,233 8s., or £3,104 12s. less than the year previous. Taking the average number of men—namely, 267—and the value of gold obtained by them, after deducting the money paid for water and use of the sludge-channel, it makes their average earnings £2 15s. 4d. a man per week, or 1s. 5d. per week less than the year previous. Taking the total cost of construction of the whole of the works, which was £173,363 7s. 1d., and the net profit on the working last year, it is equal to nearly $2\frac{1}{10}$ per cent. on the outlay.

Nelson Creek Water-race.

The water-race is in fair repair. The flumes and bridges, which are the principal expense in maintenance, are getting decayed, but portions of these are from time to time renewed, so that there is no immediate danger of any large expenditure being required for a considerable time. The present maintenance-men are sufficient to effect any necessary repairs. Some sawn timber will have to be got on hand, so that no delay be made in doing repairs when these are necessary. The ground that the race commands is getting pretty well worked out on the terrace, but very rich ground has lately been opened in the valley of Nelson Creek, and this is likely to prove of considerable extent. If arrangements could be made with the claimholders in this locality to take water by pipes from the level of the race it would increase the revenue greatly.

The revenue last year shows a considerable decrease owing to a breakage which took place in the tunnel leading from the dam—some twenty-eight chains in length; and the manager considered at the time that it was cheaper to make a deviation in the race, and take the water from the bed of Nelson Creek, than to repair the tunnel. This deviation took two months and a half to construct, during which time there was no water in the race, so that the sales of water were only for nine months and a half last year. The total cost of this deviation was £389 14s.

The following table will show the results of working this water-race last year:—

Month.	Sales of Water.	Expenditure.	Number of Men employed.	Approximate Amount of Gold obtained.	Value of Gold.
1888.	£ s. d.	£ s. d.		Oz.	£ s. d.
April	12 0 10	90 0 0	26	40	153 0 0
May	Nil.	202 19 0	Nil.	Nil.	Nil.
June	5 17 6	195 19 0	"	"	"
July	71 6 8	93 12 0	24	72	275 8 0
August	43 13 4	99 4 0	25	73	279 4 6
September	44 10 0	96 13 0	34	97	371 0 6
October	36 3 4	93 12 0	35	95	363 7 6
November	38 10 0	113 9 8	34	96	367 4 0
December	48 12 6	100 13 0	29	69	263 18 6
1889.					
January	50 6 8	97 4 0	23	64	244 16 0
February	45 8 4	98 4 9	25	77	294 10 6
March	31 2 6	102 18 10	25	61	233 6 6
Totals	427 11 8	1,384 9 3	280	744	2,845 16 0

It will be seen from the above table that the receipts from sales of water were £427 1s. 8d.; whereas the receipts the previous year were £1,045 1s. 8d.: which shows a decrease of £618. The expenditure on maintenance and cost of deviation last year was £1,384 9s. 3d.; but, deducting the cost of deviation (£389 14s.), it leaves the actual cost of maintenance £994 15s. 3d. This would still leave a loss on the working of the race last year of £567 13s. 7d.; while the loss the year previous was £128 13s. 8d. It is evident that unless new ground is opened up the loss on working this water will increase every year; but, with the present prospect of a large extent of good ground being opened up in the Nelson Creek Valley, the whole of the water may yet be utilised and the revenue increased.

The value of free water given last year to open up claims was £172 19s. 2d., as against £353 6s. 8d. given for the previous year. The average number of miners employed in claims that are worked with water from the race for last year has been twenty-three, and the approximate amount of gold obtained by them was 744oz., representing a value of £2,845 16s., which makes their average earnings for the year, after deducting sales of water, £2 0s. 5d. a man per week, as against £2 5s. 8d. for the previous year. This shows that the ground is gradually getting less remunerative for working.

Argyle Water-race.

The main water-race is in good repair, and will require very little to maintain it for many years yet, as all the flumes and timber-work were renewed about three years ago. The branch supply-races that were constructed about eight years ago are getting in a bad state of repair owing to the timber-work getting decayed. This timber-work is now giving a good deal of trouble to keep it properly maintained. The only work therefore requiring to be done, unless a breakage takes place, is renewing a portion of the timber in these supply-races; but this can be done by the ordinary main-

tenance-man without incurring any extra expenditure beyond the purchase of timber for this purpose, which will cost about £20. The siphon across Ballarat Gully on the main race is liable at any time to burst in places; still, it might stand for many years. This siphon was constructed during the time the county had charge of the work, and is of a very defective character, the pipes being rolled with the grain of iron instead of across it, and the result is that when a burst takes place it rips up along the line of rivet-holes from one end to another of each length of plate that the pipes are made of.

In regard to the future prospects of this water-race, the principal ground that the race commands about Candlelight and on the south-western side of Ballarat Gully is getting pretty well worked out—that is, as far as the principal leads of gold have been found; still, there is plenty of ground in the flat outside of those leads that could be worked with water from this race, if there is sufficient gold to pay for working.

The principal ground that is now worked by the aid of this water-race is in Ballarat Gully, Sardine Terrace, and the Back Lead; but some of the ground in this locality is reputed to be very poor, while in some of the claims the owners make very good wages. One of the best customers for water—namely, the Dublin City Company—had at the time of my visit suspended their operations pending the erection of a crushing-battery to crush the cemented sand, which contains the most of the gold. They expect, however, to be able to commence work again in six weeks or two months. Unless a different system of working be adopted on this field, and the creek-beds be worked, there is no prospect of the receipts from sales of water being larger than at present.

The following table shows the receipts and expenditure for the year, as well as the approximate amount of gold obtained, and number of men employed:—

Month.	Sales of Water.	Expenditure.	Number of Men employed.	Approximate Amount of Gold obtained.	Value of Gold.
1888.	£ s. d.	£ s. d.		Oz.	£ s. d.
April	53 13 5	39 8 9	21	56	214 4 0
May	54 10 2	33 11 0	21	55	210 7 6
June	44 15 2	33 17 10	20	45	172 2 6
July	42 10 4	29 18 0	19	48	183 12 0
August	37 8 11	38 2 7	20	52	198 18 0
September	36 15 8	28 15 0	23	60	229 10 0
October	46 10 4	32 1 3	24	61	233 6 6
November	45 13 0	31 5 8	21	59	225 13 6
December	37 8 11	30 15 6	19	80	306 0 0
1889.					
January..	26 15 3	31 1 0	18	35	133 17 6
February	38 17 2	35 5 3	18	45	172 2 6
March	32 6 10	32 18 0	18	32	122 8 0
Totals	497 5 2	396 19 10	242	628	2,402 2 0

The sales of water last year amounted to £497 5s. 2d., as against £455 12s. 9d. for the previous year, which shows an increase last year of £41 12s. 5d. The expenditure on maintenance last year was £396 19s. 10d., while for the year previous it amounted to £398 3s. 10d. This shows a decrease last year of £1 4s. 6d. The net profit on the working of the race last year was £100 5s. 4d., which is the largest profit made for the last five years. The average number of men employed in claims worked with water from the race last year was twenty, being the same number as the year previous; and the average number of days that the claims were worked with water was eighty-five; while the approximate amount of gold obtained by those using the water was 628oz., representing a value of £2,402 2s. Deducting from this amount the value of the sales of water, it leaves the average earnings of the miners to be £1 16s. 7d. per week, as against £1 17s. 3d. per week for the previous year. Taking the net profits on the working last year and the total cost of construction, which was £14,701 15s. 3d., it amounts to $\frac{7}{10}$ per cent. on the capital expended.

Mikonui Water-race.

This water-race is leased to the Mont d'Or Company at an annual rental of £50. The tunnels have been retimbered, and the race is now in good repair. The expenditure on this work has been £25,644 9s. 6d.

Mount Ida Water-race.

This water-race is managed by the Mount Ida Trust. The working of this race last year shows a considerable loss, owing to heavy floods which occurred in the spring, and an unusually dry summer. A large slip took place last August at the Wedderburn, which carried away a portion of the ditching, and iron piping was substituted at an expense of £70. Not only does the mere cost of this affect the expenditure, but the loss of the sales of water is a great item, especially in the season when plenty of water was available. The Trust had also to construct a channel in Home Gully, to prevent the tailings from getting on to freehold property. This cost £175: of this amount £25 had to be paid as compensation for damage done to freehold property.

The supply of water during the summer months, and also in midwinter is not equal to the demand, and the Trust strongly advocates the construction of a large reservoir at the Wedderburn, which would cost from £8,000 to £10,000. This reservoir is estimated to hold thirty sluice-heads

of water for sixty days. There is a good deal of ground in this district that will yet be worked. The question whether the extra cost of this reservoir would be compensated by the extra supply of water is a subject worthy of consideration. From observations and information on this subject during my visit to this district, there is little hope of this work, with the present supply of water, ever paying for working-expenses. The Trust is strongly of opinion that labour could be obtained very cheaply at the present time, and that the cost of the reservoir is greatly overestimated, and that a cheaper design could be adopted. This could be easily settled by getting them to submit plans of a reservoir for approval, with estimate of cost; and, if approved, tenders could be called for its construction. Even should the goldfield get worked out, this water-supply would always be useful for irrigation in the summer months—and it commands a large extent of auriferous-country, and also country suitable for cultivation. However, this is purely a subject for consideration, as it will involve a large outlay in the first instance, and the prospects of that outlay being reimbursed are not of the brightest description.

The following is a statement showing the results of working this water-race for the year ending the 31st December last:—

Months.	Sales of Water.	Cash received for Sales of Water.	Expenditure.	Amount of Outstanding Moneys at End of each Month.*	Number of Men employed.†	Approximate Amount of Gold obtained.	Value of Gold.
1888.	£ s. d.	£ s. d.	£ s. d.	£ s. d.		Oz.	£ s. d.
January	51 1 3	132 2 0	254 11 1	..	..	300	1,125 0 0
February	49 11 1	209 11 3	187 4 8	..	..	250	937 10 0
March	87 4 1	101 16 0	87 2 8	..	..	230	862 10 0
April	131 6 1	61 5 0	79 18 8	..	..	250	937 10 0
May	151 13 10	70 4 2	94 4 0	..	..	200	750 0 0
June	140 1 6	152 5 2	101 8 8	..	..	150	562 10 0
July	20 12 6	12 8 8	78 18 8	..	..	100	375 0 0
August..	31 8 6	..	268 19 2	..	..	..	..
September	48 7 5	119 17 5	276 0 4	..	..	400	1,500 0 0
October	143 8 6	50 5 4	99 0 8	..	..	350	1,312 10 0
November	150 4 1	124 16 4	71 19 8	..	..	320	1,200 0 0
December	94 19 5	50 10 0	88 7 3	..	..	450	1,687 10 0
Totals	1,099 18 3	1,085 1 4	1,687 15 6	..	..	3,000	11,250 0 0
Value of gold obtained from cleaning up sludge-channel	300 0 0	..	..	..	..	..	..

* No monthly record kept. The outstanding accounts on the 31st December, 1887, amounted to £1,315 15s. 11d., and on the 31st December, 1888, to £1,330 12s. 10d.; £1,000 of this sum is reckoned bad, having accumulated during the last twelve years.

† A full supply of water gives employment to about a hundred and thirty men. The number of men employed is regulated by the quantity of water supplied. When water is scarce they are engaged in "falling," and other dry work.

It will be seen from the above statement that the sales of water last year amounted to £1,099 18s. 3d., while those of the preceding year were £1,394 17s. 4d.; thus showing a decrease last year of £294 19s. 1d. The expenditure last year was £1,687 15s. 6d., as against £1,255 18s. 4d. for the year previous, thus showing an increase in the expenditure of £431 17s. 2d. However, the receipts were augmented last year by the cleaning-up of the sludge-channel during the dry weather in summer, from which gold was obtained to the value of £300. This, added to the value of the sales of water, still leaves a loss on the working of the race of £287 17s. 3d.; but this amount of gold cannot be obtained every year, so that the actual expenditure above the value of the sales of water must be considered as loss, which amounts to £587 17s. 3d.

The Trust has been unable to forward a balance-sheet this year on account of it not being audited, but have supplied the above statement. The outstanding accounts at the end of December, 1887, were £1,315 15s. 11d., and at the end of last year they amounted to £1,330 12s. 10d. The average number of men that this water-supply is the means of giving employment to when water is available is 130, and the approximate amount of gold obtained by them last year was 3,000oz., representing a value of £11,250, which, after deducting the value of the sales of water, leaves their average earnings to be a little over £1 10s. a man per week, or about 3d. a man per week less than the previous year. The total cost of this work amounts to £65,766 3s. 8d.

Summary of Water-races.

In dealing with each of the water-races they have only to be considered on purely commercial principles—that is, the same as though they were the property of a private company; but in treating them as Government properties the collateral advantages have to be taken into consideration—namely, the amount of gold duty that they cause to be received, the rents paid for licensed holdings, the amount received from miners' rights, and the Customs revenue that is paid by those that they are the means of supporting. In dealing with them under these heads the immediately following table will give a clear idea of the population they are the means of supporting, and the succeeding table will show the profits and losses by merely comparing the value of the sales of water and the gold duty on the water-races worked under Government control, with the total expenditure for working and maintenance. In taking the population supported by means of these water-races, we may assume that every man actually employed supports five—that is, including families and those engaged in business which the miners support. The following is the statement for last year:—

Name of Water-race.	Actual Profit on Working, including Value of Gold Duty.	Percentage on Cost of Construction.	Population that these Water-races are the Means of supporting, which pays Customs Duties.
	£ s. d.		
Waimea–Kumara	4,898 7 2	2·83	1,335
Nelson Creek	*882 19 7* (Loss)	...	115
Argyle	163 1 4	1·11	100
Mount Ida	12 2 9	0·02	650
Total	4,190 11 8	1·21	2,200

This shows a profit on the working of all the water-races, including the value of the gold duty of £4,190 11s. 8d., of about $1\frac{2}{10}$ per cent. on the cost of their construction; and the population that they are the means of supporting amounts to 2,200, which pays Customs duties, which are not included in the profits derived.

STATEMENT showing the PROFITS and LOSSES on the Working of the WATER-RACES for Eleven Years.

Name of Water-race.	Value of Sale of Water, including Value of any Gold obtained.	Expenditure.	Profit or Loss on Working.	Average Number employed.	Approximate Amount of Gold.	Value of Gold obtained.	Duty received on Gold obtained.	Total Profits or Losses, with Value of Gold-duty added.	Total Cost of Construction.
	£ s. d.	£ s. d.	£ s. d.		Oz.	£ s. d.	£ s.	£ s. d.	£ s. d.
Waimea-Kumara Water-race and Sludge-channel.									
Ten years ending 31st March, 1888	83,737 14 1	57,287 19 3	26,449 14 10	419	171,283	636,967 0 6	.. ..	48,491 10 0	173,363 7 1
Year ending 31st March, 1889	9,798 11 6	5,169 10 4	3,629 1 2	267	12,844	48,807 18 9	.. ..	.. ..	.. ..
Total	93,536 5 7	63,457 9 7	30,078 16 0	405	184,127	685,774 19 3	18,412 14	48,491 10 0	173,363 7 1
Nelson Creek.									
Ten years ending 31st March, 1888	15,836 15 7	11,881 1 4	3,955 14 3	59	30,143	115,296 19 6	.. ..	6,087 0 8	90,722 10 8
Year ending 31st March, 1889	427 1 8	1,384 9 3	*957 7 7	23	744	2,845 16 0	.. ..	.. ..	.. ..
Total	16,263 17 3	13,265 10 7	2,998 6 8	56	30,887	118,142 15 6	3,088 14	6,087 0 8	90,722 10 8
Argyle.									
Ten years ending 31st March, 1888	4,465 0 0	3,999 1 2	465 18 10	17	6,708	25,627 7 0	.. ..	1,299 16 2	14,701 15 3
Year ending 31st March, 1889	497 5 2	*396 19 10	100 5 4	20	628	2,402 2 0	.. ..	.. ..	.. ..
Total	4,962 5 2	4,396 1 0	566 4 2	17	7,336	28,029 9 0	733 12	1,299 16 2	14,701 15 3
Mount Ida.									
Ten years ending 31st December, 1887	14,515 8 11	17,424 13 6	*2,909 4 7	96	24,011	91,118 0 0	.. ..	*495 19 10	65,776 3 8
Year ending 31st Dec., 1888	1,399 18 3	1,687 15 6	*287 17 3	130	3,000	11,250 0 0	.. ..	.. ..	.. ..
Total	15,915 7 2	19,112 9 0	*3,197 1 10	99	27,011	102,368 0 0	2,701 2	*495 19 10	65,776 3 8
Grand Totals ..	130,677 15 2	100,231 10 2	30,446 5 0	577	249,361	934,315 3 9	24,936 2	55,382 7 0	344,563 16 8

* Shows actual loss on working.

The foregoing statement shows that the cost of constructing the whole of these water-races amounts to £344,563 16s. 8d., and also that during the eleven years they have been in operation the total of the sales of water and gold duty amounts to £155,598 15s. 2d., while the total expenditure has been £100,231 10s. 2d.; thus showing a profit on the working of £55,367 5s. The Waimea–Kumara Water-race shows by far the highest percentage of profit, which is due entirely to the Kumara branch. The Mount Ida Race still shows a direct loss of £495 19s. 10d.

MINING GENERALLY.—QUARTZ WORKINGS.

COROMANDEL DISTRICT.

This field is looking better than it has done for some years. A large amount of English capital has been expended in working and opening out the mines belonging to the Kapanga and Coromandel companies, and a fair amount of success has attended their labour. It will be remembered, the Kapanga Mine has been worked by English companies for over sixteen years, and, although rich patches of gold were found in the lodes, it could never be made to pay working-expenses until the present company took possession and effected alterations and improvements in the mining machinery, and also opened out the mine more fully. At the time the present company purchased the mine, about three years ago, the shaft was 420ft. deep, and the Kapanga and Scotty's Lodes were supposed to be worked out to that depth.

Since the present company have commenced operations the shaft has been sunk to a depth of 500ft., and a level opened out at this depth, cutting the Kapanga Lode, which has been driven on for some distance; but, so far, the company have not been successful in finding the lode payable for working at this level. The reef is greatly broken up, but the character of the stone gives indication that a payable shot of gold-bearing quartz is not far distant. Levels were also opened out at 420ft. and 340ft., and from these levels working has been carried on both on the Kapanga and Scotty's Lodes.

After the company commenced operations they prospected the 300ft. level on Scotty's Lode, and discovered a rich shot of gold, which the manager at one time thought would run up to the surface; but after carrying up five stopes they broke into old workings. The length of this shot of gold was 80ft. At the 340ft. and 420ft. levels, where workings are now carried on, the Kapanga Lode averages about 18in. in width, and Scotty's Lode 2ft. in width. Arrangements are now being made to continue the sinking of the shaft to test the lode at a greater depth. There is a good opportunity for doing this here, as the quantity of water to contend with is very light when compared with the deep levels of the Thames. There are two 12in. plungers and a 9in. draw-lift fixed in the shaft, one below the other, the draw-lift being at the bottom: these, working with a 6ft. stroke, making three strokes and three-quarters per minute, easily keep the water down at the present time.

While on the subject of sinking to test the deep levels it may be of interest to state that the whole of the quartz workings in the colony are merely on the surface when compared with the workings in the mines in Sandhurst, Victoria. The deepest shaft there is 2,400ft., or about 1,400ft. below sea-level. This refers to Mr. Landsell's No. 180. Auriferous quartz, in saddle-lodes, was traced from near the surface to a depth of 750ft.—not in one continuous lode, but in a succession of saddle-lodes one below the other; but at this depth the quartz pinched out, and in sinking down the shaft to a depth of 1,500ft. no further trace of a lode could be discovered until this depth was reached, when another saddle-lode was found, which continued to go down to a depth of 1,875ft. Recently the shaft has been sunk down to a depth of 2,400ft., and another gold-bearing lode has been struck. In October last a commencement was made to open out on this lode to prove it. This is merely quoted to show that auriferous lodes have been found payable at great depths in Victoria, which holds out an inducement to mining companies to test the deep levels in this colony.

Since the Kapanga Company commenced operations they have crushed 3,000 tons of quartz, which has yielded 7,223oz. of gold, representing a value of £21,239, thus averaging 2oz. 8dwt. of gold per ton. During the twelve months ending on the 24th November last 2,291 tons of quartz was crushed, which yielded 5,422oz. of gold. This return is exclusive of about 40lb. of specimen-stone sent to the Melbourne Exhibition, and now being exhibited at Paris, which was valued by the Bank of New Zealand at Auckland at £400, but on which the manager places a value of £600. If the latter value can be realised it would show that there is about 5oz. 9dwt. of gold in every pound of stone. The specimens were by far the richest exhibited at the Exhibition. The balance-sheet published by this company for the year ending the 7th July, 1888, shows that up to that date 2,163 tons of quartz had been crushed, yielding 4,381oz. of gold, which represented a value of £12,733. The expenditure on the mine and plant during this period was £9,137; thus leaving a net profit on the working of the mine of £3,596. This result must be very encouraging to the share-holders, and reflects credit on the management of the company, inasmuch as the stone is not so rich as it was in former years, when the late company could not make it pay working-expenses; but the recent result is entirely due to a better and more systematic mode of conducting the operations. Any one who, having visited the mine in former years, now revisits it can see the marked improvement. Instead of the machinery working like a rattletrap, as formerly, it now works very smoothly; and the underground workings are more systematically opened out.

Coromandel Company.—This company purchased the Union Beach Company's mine and plant for £40,000, of which amount they paid £7,500 in cash and the balance in paid-up shares. They commenced operations in February, 1887, to get the water pumped out of the mine so as to see its condition. Since then they have sunk a new shaft on the side of the hill facing the sea, which is now down to a depth of 276ft. below sea-level. This new shaft is intended for a working-shaft, while the old Union Beach shaft is to be used as a main pump-shaft. The latter shaft is 180ft. in depth, in which is fixed a 12in.-plunger lift; and the water from the Palmerston shaft, which is about 360ft. distant, is conveyed in boxes placed in the adit connecting the two shafts at the 180ft. level.

A 40in.-cylinder Cornish beam-engine, having 10ft. stroke, has recently been erected as a pumping-engine. It was purchased second-hand in England; but the cylinder has been newly bored out and new piston fitted, with all the joints and wearing-parts so thoroughly overhauled that it is now equal to a new engine. This class of pumping-engine requires very solid foundations as well as strong framing. The latter in most cases is built of solid masonry, but in this instance the engine-

framing and house is built of heavy sawn square balks of kauri, all closely fitted and bolted, so that there is not the slightest movement in the building or framing occasioned by the working of the engine. The pump in the main shaft is worked direct from the beam of the engine; and the pump in the Palmerston shaft, which is about 360ft. distant from the main pump-shaft, is worked with balance and T-bobs, having solid connecting-rods made of kauri timber, supported every 30ft. on a roller or pullies. The mouth of the Palmerston shaft being at a considerable elevation above the main pump-shaft, the connecting-rods work on an incline up the face of the hill, and are about 400ft. in length. The water from the pump in the Palmerston shaft is discharged at the 180ft. level, and led to the main pump-shaft.

The operations in the mine are confined to prospecting, and sinking the Palmerston shaft, which was down at the time of my visit 96ft. below the 180ft. level, the intention being to open out from this shaft at 100ft. below the present level, and work three lines of reef—namely, the Black, Cross, and Green Harp Reefs. The two latter reefs run in a generally northerly-and-southerly direction, and the Black Reef in an easterly-and-westerly course. Until such time as these reefs are cut there will be no returns from the mine, unless some fresh lode is struck at the 180ft. level.

The whole of the workings and the manner in which the machinery is erected indicate that no legitimate expense will be spared in thoroughly prospecting and opening out the mine in a proper manner. Up to the time of my visit the company had spent £13,000 on plant and mining operations.

The Kapanga and Coromandel Companies are both under the management of Francis Hodge, a gentleman sent out from England to represent these companies, who, while exercising the strictest economy in carrying on the works, has spared no legitimate expenditure in making arrangements to work these mines on a purely commercial basis. And it would not only be gratifying to these companies to be well recompensed for their large expenditure, but it would be of great advantage to the colony for enterprises of this nature to be brought to a successful issue, as other capitalists would be induced to embark money for similar ventures.

Tokatea Range.—The mines on this range have afforded profitable employment to a number of men since 1864. Claims have time after time been occupied and given up as worked out, and no sooner were they given up than they were taken up again by other parties, and found to give good returns for working. There is no quartz-field in the colony that is better adapted for working by individual miners than this range. There is no expensive mining plant required, no large crushing machinery to be erected. A small outfit of picks, drills, gads, and shovels is all that is required. The whole hill is burrowed in every direction, following small thread-like veins and leaders of quartz, which widen out occasionally to 2in. and 4in.; and when this takes place there is generally a good patch of gold found. Men sometimes may work for four or five months and scarcely get anything, and afterwards come on a patch which remunerates them for all their labour. The quartz is considered by the miners here of poor quality if it does not average 10oz. of gold to the ton. This may appear a high average, but it requires a high yield to pay for working the thin veins in which the gold is found. It is a range in which the present generation will not exhaust the supply of gold. Indeed, after it has been entirely given up as worked out it will then become a question if the whole hill will not pay for working in a face if a large and efficient crushing-plant were erected on the flat, and the whole of the material sent down by tramways and put through. This plan is being adopted for working the Kuranui Hill, at the Thames, at the present time, and very low-grade material made to pay for working.

The yield from some of the principal claims on this range last year gave a very high average for the quantity of quartz crushed, as will be seen from the following statement:—

Name of Claim.	Number of Tons of Quartz crushed.	Yield of Gold. (Ounces.)	Number of Men employed.
Tokatea	14	459	20
Queen of the North	7	166	7
Bachelor's	2½	52	2
Rob Roy	3	25	2
Royal Oak	9	789	10
Bismarck	2½	160	6
West Tokatea	4	45	2
Total	42	1,696	49

It will be seen from the foregoing returns that 42 tons of stone were crushed during the past year, which averaged the high yield of 40oz. 8dwt. of gold per ton. This amounts to 34oz. 12dwt. 6gr. per man for the number of men employed. There are twelve other claims at work on this range, from which no returns could be got—namely, the Young American, Regan's, Scanlon's, Ogilvie's, Mayflower, Simms's, Mason's, Waverley, Rathbone's, Pilot, Stirling Castle, and the veapai. Some of these may not have got a great deal of gold, but no doubt some of them have paid Kry well for working.

The West Tokatea, one of the claims mentioned in the foregoing statement, is held by an English syndicate, and comprises an area of thirty acres, through which the main Tokatea reef runs. This reef is of a great width in places, and contains a little gold; but it has heretofore been termed a buck reef, that will not pay for working. The syndicate, however, intends to construct several adits to cut this reef at low levels, to prospect it, and, if they find anything payable for working, to erect a large crushing-plant to deal with low-grade material.

Tiki, Matawai, and Manaia.

These were at one time busy places, but they have fallen off greatly of late years. The Calliope Mine, which is partially on freehold property, was worked last year with fair results: 94 tons of quartz were crushed, which yielded 195oz. of gold, and nine men were employed.

Castle Rock Mine.—This was formerly known as Vizard Claim, when a fair shot of gold-bearing stone was worked on the upper levels, containing a good deal of antimony, which made the ore difficult to treat by the ordinary crushing-battery process. The upper levels are stoped out, and a low adit is now constructed for a distance of over 600ft., but the lode has not yet been reached at this level.

Blackmore's Claim, Manaia.—The upper levels in this claim are stoped out. The proprietors are now constructing a low-level adit from the south side of the range, to prospect the lode. Six tons of quartz have been crushed during the year, which yielded 49oz. of gold. There have been four men employed.

In several other claims at Manaia prospecting has been carried on; but the owners have not yet been successful in finding anything that would pay for working.

Coromandel is a field at the present time that is attracting a good deal of attention from English capitalists. A new company has been formed, termed the Colville Company, London. They are to work the ground formerly held by the Just in Time Company, and what is known as Blagrove's Freehold. No mining operations are yet commenced, but this ground can only be prospected by sinking shafts, which will entail a considerable outlay, as pumping appliances will have to be erected.

The yield of gold from this district last year has been more than for any year during the previous eight years. There were 2,149 tons of quartz crushed, which yielded 8,090oz. of gold, or an average of 3oz. 15dwt. 7gr. per ton. The quantity crushed the previous year was 1,923 tons, which yielded 6,774oz. of gold, or an average of 3oz. 10dwt. 5gr. per ton. The highest yield for any of the previous years was in 1882–83, when 2,907 tons of quartz were crushed, which yielded 7,577oz., or an average of 2oz. 12dwt. per ton. Therefore the yield last year was 513oz. more than it has been for any year since 1880–81.

Mata, Tapu, and Waiomo Districts.

The quartz reefs at Te Mata have not turned out according to the expectations formed by many of the miners in this district. The owners of the Gentle Annie Claim—of which much was expected—crushed 37 tons of stone, which yielded 31oz. of bullion, worth £1 4s. 3d. per ounce; and 24 tons have been crushed from the Mata Claim, which yielded 31oz. of gold. Messrs. Fraser and Sons, of Auckland, erected a crushing-battery on the field; but unless some better class of stone be obtained there is no prospect of it being employed unless as a prospecting-plant.

At *Tapu* very little work has been done. There are a few men employed working in the reefs, but it is more of a prospecting character than anything else. The total quantity of quartz crushed here during last year has been 64 tons, which yielded 44oz. gold.

Waiomo.—The Paroquet Claim, from which rich stone was got on the outcrop of the reef by the prospectors, Laurie Brothers, is still being worked, but the stone appears to get poorer as it goes down. Some small patches of good stone have been obtained, but they have not been of sufficient extent to make the mine a payable venture up to the present time. Still, there is a good prospect of payable stone being discovered in this mine. The formation of the lode is such that one would expect to find gold. There is a strong body of quartz with a little gold through it. Work in this mine was suspended for a time, but operations have again been commenced to repair the adits and stope out the lode. The company have constructed a wire tramway between the mine and the crushing-battery, which is 81 chains in length, and also have erected two of the Watson-Denny pans in conjunction with the crushing-battery. As soon as all the new arrangements are completed crushing will be again resumed.

The Golden Gem Mine.—This mine has been constantly worked during the year, with a fair amount of success. The lode or leader that is being stoped out is from 6in. to nearly 2ft. in places in width. During the year 309 tons of quartz have been crushed, which yielded 295oz. of gold. This company gets the quartz crushed at the Paroquet battery, which is connected with the mine by a tramway.

Thames District.

There have not been any new finds of any note in this district during the year, but the gold-returns correspond very closely with the quantity obtained for the previous year. Last year 25,651½ tons of quartz, 15,021 tons of mullock, and 6,690 tons of tailings were crushed and treated, which yielded 35,796oz. of gold. The number of tons crushed and treated the previous year was 25,798 of quartz and 7,022 of tailings, which yielded 35,949oz. of gold, or 163oz. more than last year. The total quantity of material treated last year is greatly in excess of the previous one when the mullock is included. It is satisfactory to find that the old waste mullock-heaps that have been lying on the surface as worthless material can now be made to pay for crushing. The quantity of mullock crushed last year, amounting to 15,021 tons, yielded 1,127oz. of gold, which is an average yield of 1dwt. 12gr. per ton; and this low yield is said to pay all expenses connected with collecting, bringing to the battery, and crushing, and to leave a fair profit on the outlay of erecting machinery.

Before referring to the different mines in this district it will be interesting to give a statement, compiled from the returns of the principal gold-producing mines on the field, showing the number of tons of quartz, &c., crushed, the yield of gold, and number of men employed.

Name of Mine.	Number of Tons of Quartz crushed.	Number of Tons of Mullock crushed.	Yield of Gold.	Average Yield of Gold per Ton.	Number of Men employed.
			Oz.	Oz. dwt. gr.	
Saxon	8,200	...	7,683	0 18 17	69
New Prince Imperial	867	...	950	1 1 21	30
Waiotahi	2,365	...	2,900	1 4 12	40
New Manuka	582	...	1,054	1 9 8	13
Old Caledonian	945	...	1,352	1 8 14	38
Moanataiari	1,857	...	2,806	1 10 4	70
Kuranui No. 2	1,585	...	2,093	1 6 9	55
Kuranui No. 3	...	12,610	700	0 1 2·6	16
Kuranui No. 3	245	...	399	1 12 13	12
Reuben Parr	172	...	460	2 13 11	8
Coliban	250	...	87	0 6 23	5
Dixon's No. 1	723	...	401	0 5 13	9
New Alburnia	916	...	1,508	1 12 22	37
Cambria	1,680	...	2,135	1 5 10	29
Pinafore	73	...	198	2 14 5	6
Fame of Fortune	20	...	45	2 5 0	18
Blanche	135	...	97	0 14 8	8
Adelaide	391	...	470	1 4 0	8
City of Manchester	31	...	64	2 1 6	2
Lone Hand	13	...	126	9 13 20	4
Hokianga	27	...	71	2 12 14	3
Lucky Hit	91	...	236	2 11 20	7
North Star	246	...	594	2 8 7	15
Magnolia	150	...	205	1 7 8	20
Norfolk	36	...	70	1 18 21	4
Eureka	479	...	115	0 4 19	8
Mullock from other mines	...	2,411	527	0 4 4	...
Totals	22,079	15,021	27,346	...	534

It will be seen from this statement that 22,079 tons of quartz has been crushed from the principal claims on the field, for a yield of 26,119oz. of gold, which is an average of about 1oz. 3dwt. 15gr. to the ton; and 15,021 tons of mullock, which averaged about 1dwt. 12grs. per ton. To take the total number of men employed, and the quantity of gold obtained by their labour, it amounts to about 50oz. 4dwt. 6gr. per man.

Saxon Company.—This company was the most successful one in the Thames District last year. The yield of gold was 7,683oz., out of which £6,250 was paid in dividends to the shareholders. Their claim comprises an area of 17 acres, and is situate within the limits of the Borough of the Thames, adjoining the New Prince Imperial Company's mine, from which large returns of gold were obtained a few years ago. Their workings are carried on from a shaft which is 461ft. in depth; but they are not able to work at the present time down to this level on account of the drainage being only effected down to the 400ft. level. There are several quartz lodes running through their ground carrying gold; but last year their workings were principally confined to the No. 4 Level, which is 300ft. below sea-level, on a lode about 2ft. 6in. in thickness, carrying very good gold. Another level has been constructed about 70ft. below No. 4 Level, and the lode here is from 4ft. to 5ft. in thickness, carrying good stone; but this is the lowest level that can be worked until the drainage is lowered to a greater depth. The reef, as far as it has been tested, continues to carry a fair amount of gold; but possibly it will cut out at the deep levels, the same as it did in the New Prince Imperial Mine, adjoining it. However, this will only be determined as the workings go down. The average number of men employed in this mine is about sixty-nine. It is a mine that is likely to be very good property for some time to come.

New Prince Imperial Company.—A few years ago a large body of rich stone was obtained, which enabled dividends to be paid to the shareholders to the extent of £60,750; but during the last three years this company has only been able to carry on their operations without making an actual loss. Their shaft is down to a depth of 562ft. below sea-level; but last year the workings were confined to the lodes and leaders on the upper levels, principally by tributers. The company purchased this mine in October, 1881, for £250, and from that date to the commencement of September last they crushed 34,123 tons of ordinary lode-material and 12½ tons of specimen-stone, which yielded 45,107oz. of gold, representing a value of £125,715.

Trenton Company.—The situation of this company's mine is such that it is almost certain to become valuable property. A large amount has been expended in constructing preparatory works and prospecting the ground; but there is every probability of the company being well paid for the expenditure. Their shaft is down to 557ft., and a level is being constructed at this depth; and no doubt they will get the same lode that the Saxon Company have been working on, as that company stoped out the lode up to the boundary of this mine with a good profit.

Waiotahi Company.—This mine is situated on the Waiotahi Creek, and has produced since the present company commenced operations about 35,000oz. of gold. It has never been what can be termed a rich mine, but has always been gold-producing. Indeed, were it not for the careful and

systematic manner in which this mine is worked operations would have been suspended years ago. It is really a pleasure to visit and inspect this mine—to see the order, regularity, and workmanlike manner in which all the mining operations are carried out. The mine is worked on a system to make a regular dividend-paying mine without giving at any time large returns. There are numerous small leaders and veins, almost like network, traversing the country rock on each side of the main reef running through this company's ground, and it is from these that a great deal of the gold is obtained. The mine has been worked for the last sixteen years, always employing men on wages, and during that period dividends have been paid to the extent of £20,250.

New Manuka Company.—This company's claim adjoins the Waiotahi Mine, and is worked from the same shaft, which is down to a depth of 320ft., and is under the same management as the Waiotahi Company. The ground is similar to that in the adjoining mine, full of small leaders and thread-like veins of gold-bearing quartz, which produce a good deal of the gold obtained from this mine. It is worked partially on wages and partially on tribute. Previous to the present company taking up this ground about 30,000oz. of gold was taken out of it.

Kuranui Hill.—There are three claims on this hill which were worked last year with payable results. These belong to S. Turtle, R. Comer, and P. C. Hansen and Co. A great deal of gold was obtained from this hill in the early days of the field, and a number of old rubbish-heaps are lying on the surface, which are now being brought to the crushing-battery, and the whole of the material put through. It will be seen on reference to the foregoing statement, showing the yield of gold from the Thames District, that 15,021 tons of mullock has been treated, which yielded 1,127oz. of gold, being an average of 1dwt. 12gr. per ton. Hansen and Co. crushed 12,610 tons of mullock from this hill, which yielded 700oz. of gold, being an average of 1dwt. 2·6gr. per ton; and yet with this low average it leaves a fair margin of profit. About 70 tons of material are operated on daily for a yield of about 3oz. 17dwt. 9gr. of gold. When these mullock-heaps are exhausted it is the intention to take portions of the hill in a face and put it all through the battery. By adopting this system it is expected to find numerous gold-bearing leaders and veins, which will make up for the large amount of worthless material operated on. If this prove successful there are many places on the Hauraki Peninsula that can be worked at a profit on this system.

Moanataiari Company.—This company has been re-formed during the year, and a considerable amount of English capital has been obtained to prospect and further develop the mine. It is a mine from which a large amount of gold has been obtained, and its position, and the low-level adit which is carried into the hill at about 30ft. above sea-level for a distance of 3,000ft., carrying a double line of iron rails, where the material is hauled out and in with horses, enable a company to employ a large number of men, and carry on the workings on the different reefs that run through the ground on a large scale, and this will tend to make low-grade ore pay for working. About the centre of the mine a shaft has been sunk below the adit-level for 215ft., and a winding-engine erected to haul the material up to the adit-level. The ground below the adit to the depth of the shaft has been partially worked, and some very good stone was obtained, which enabled dividends to be paid from this portion of the mine to the extent of £78,000. The total yield of gold from this mine up to the beginning of September last year was 141,569oz., representing a value of £389,193, of which £121,365 was paid in dividends.

There is a large crushing-battery of forty heads of stamps, and a number of berdans, and all appliances for carrying on the workings on a large scale if anything is discovered. This, together with the underground roadway into the back country, which can be prospected at low levels from this roadway, are likely to make this company's property a valuable one in years to come. The mine is, and has been for a number of years past, worked principally on the tribute system, sixty tributers being employed during last year, who obtained 1,782 tons of stone, yielding 2,765oz. of gold. The only wages-men employed are those keeping the adit-level in repair, and doing the haulage of material from the mine.

Cambria Company.—This is one of the successful mining companies in the Thames district. It was formed in 1884 with a capital of £44,700, of which £12,851 was declared paid up, and since its formation only £1,181 has been paid in calls, while dividends were paid to the shareholders up to the end of December last to the extent of £79,357. There are several lodes and gold-bearing leaders and veins running through this company's ground, but the rich stone that was discovered a few years ago is worked out. The workings last year were chiefly above No. 4 Level, where no rich stone has been obtained, but the ordinary crushing-material has averaged 1oz. 5dwt. 10gr. to the ton.

Old Caledonian Company.—This company in 1869 paid dividends to the shareholders to the extent of about £600,000, and the mine has been constantly worked ever since; but of late years the returns have not been very encouraging: still, it continues to produce a fair amount of gold, and gave employment last year to about thirty-eight men, the operations being chiefly confined to the upper levels. There is always a prospect of again picking up the lode where the rich stone was got in former years, and if such should be the case it would cause a great sensation in mining circles, as a far larger amount of dividends has been paid from this mine than from any other in the colony.

New Alburnia Company.—The chief operations in this company's mine were carried on last year near the surface, and down to a depth of about 160ft. There is a large body of stone in the low adit-level, which is constructed for 2,600ft.; but the lode-stuff is of too low a grade to pay for working—at least, with the present appliances for crushing and extracting the gold. The mine is principally worked on tribute, and the quartz obtained last year gave an average of nearly 1oz. 13dwt. of gold to the ton. It is about 1,000ft. above sea-level, and has been worked continuously since 1868, giving since that period a steady produce of gold, which has enabled £72,500 to be paid in dividends to the shareholders.

Several other claims in this locality have been successfully worked during the past year, and have given employment to a number of men—namely, the Reuben Parr, Coliban, Dixon's No. 1, New Whau, Lincoln Castle, West Coast, and Perseverance.

Smile of Fortune.—This claim has been either taken up or purchased by an English syndicate, and mining operations resumed. A great deal of work was formerly done in this mine, and a large quantity of gold obtained. The old levels have been repaired, and the reefs are being prospected. There is reason to believe that this mine will again become a gold-producer. Some 20 tons of stone obtained from a leader last year yielded 45oz. of gold.

Adelaide Company.—This company's mine is situated on the Karaka Creek. During the last eight years six men have been constantly employed, and up to the beginning of September last 5,855 tons of quartz had been crushed, which yielded 6,333oz. of gold, representing a value of £18,569. The reef is about 2ft. in thickness, and had been stoped out to a depth of 300ft. below the surface. Another level will have to be constructed before the lode can be worked to a greater depth.

City of Manchester Mine.—This mine adjoins the Adelaide, and the lode is of the same character. It has been worked by two men, who have obtained gold to the value of £10,000 from the mine; but the upper levels are getting worked out, so that a new low adit will have to be constructed before the lode can be further worked.

Lone Hand Mine.—This mine adjoins the City of Manchester, and these two mines have recently been amalgamated, so that they can be worked from one adit-level. The Lone Hand has been worked down to a depth of 250ft. from the surface, and gold obtained from small flinty leaders to the value of £9,500. It is now intended to construct a new adit-level, which will give about 90ft. of backs in both of these claims. From 1 ton of quartz taken from small leaders last year in the Lone Hand 58½oz. of gold was obtained.

There are a number of small claims in this locality which were worked last year with a fair amount of success.

Una Hill and Te Papa.—There were two gold-producing claims last year in this locality—namely, the North Star and the Magnolia. They are chiefly worked on the tribute system, and employ about thirty-five men. They obtained 799oz. of gold last year, from numerous leaders and veins.

Otanui.—The Eureka Mine is the only one that was worked here last year. A few years ago great expectations were formed respecting the mines here, and a dray-road was constructed to enable the quartz to be conveyed to the crushing-battery at the junction of the Otanui and Maungawherawhera Creeks, which cost £710, out of which a subsidy was given to the extent of £473; but since the road has been completed and the quartz tested none of the mines have proved payable for working with the exception of the Eureka, and the quartz from this mine is of very low grade, only averaging 4dwt. 19gr. to the ton. This mine is entirely worked by tributers.

Puriri District.

Several claims have been taken up here, and prospecting-work done, but very few of them have produced gold to any extent. The Surprise, or what is now known as the Puriri, Mine is the only one in which a payable lode has been found, and it is questionable if this can be termed a payable mine. Six men were employed last year, who obtained 140 tons of quartz, which yielded 139oz. gold, or an average of about 25oz. per man.

Whangamata District.

There is only one claim being worked here—namely, the Goldwater: all the others taken up when the discovery of silver and gold in the reefs here was made are now given up. The Goldwater still continues to be worked, but the large percentage of silver in proportion to the gold in the lode make the lode-material difficult to treat successfully. Thirty-one tons of stone was crushed last year, which yielded 1,257oz. bullion, or an average of over 41oz. to the ton. Even if this were all silver it ought to pay for working if there was a plant capable of properly treating the ore—that is, if there is a good thickness of a lode. The average yield from the Broken Hill Proprietary Mine, New South Wales, is only about 43oz. silver to the ton; but the lode is 160ft. in width in places. No small private company can afford to erect a plant capable of dealing with silver-ore. It is only by having a central reduction-plant, and the whole of the ore brought to it, that small lodes can be worked to a profit, and then the cost of transit of the ore will be a considerable element in the expense of treatment.

Marototo District.

A large amount of prospecting has been done in this district since the discovery of rich silver-ore in the Marototo Mine; but, with the exception of this mine, all the other claims and licensed holdings in the district are either abandoned or, at least, mining operations are suspended. When the discovery was first made by Mr. R. McBrin some extremely rich ore was found near the outcrop, assays of which gave at the rate of 2,226oz. of bullion to the ton—80oz. gold and the rest silver; but the vein which contained this rich ore very soon cut out. However, there has been a considerable quantity of good ore got from this mine. Two small cases of ore were forwarded to the Melbourne Exhibition, one of which contained ore which assayed at the rate of 944oz. silver and 42½oz. gold per ton, which represented a value of £312 per ton. The other case contained ore of the value of £40 per ton. Both of these cases have been forwarded to the Paris Exhibition. This class of ore occurs in irregular patches in the reef, from 2in. to nearly 2ft. in thickness, and is chiefly found on the hanging-wall of a large reef of low-grade quartz.

The silver and gold seem to diminish in the reef as the adits go into the hill, and also as the lode goes down. The mine at the present time is not what can be termed a valuable property, but it is one worthy of money being expended in thoroughly prospecting it. The difficulty here is that

all the ore has to be packed on horses from the mine to Hikutaia to send away for treatment. The greater portion of the ore from this mine has hitherto been forwarded to Freiberg, Germany; but when the Te Aroha Gold- and Silver-mining Company's plant is erected the ore can be sent to it for treatment. There have been 5 tons of the lode-material crushed and 20 tons of ore sold, realising in all £1,000. About 100 tons of rich ore is now on hand. The company intend erecting a small plant to treat the ore; but a plant to treat this class of ore cannot be erected at a small cost to extract anything like a fair percentage of the metals the ore contains; and, besides this, unless there is a large body of ore in the lodes the erection of a plant for one small mine is scarcely justifiable. It would prove more advantageous to forward it to central reduction-works, such as are now established at Waiorongomai.

Ohinemuri District.

This includes Karangahake, Owharoa, Waitekauri, and Waihi districts. The total quantity of quartz crushed last year was 3,488 tons stone and 308 tons tailings, which yielded 3,679oz. of gold, which is a yield of 273oz. more than for the previous year. During last year, also, large mining operations have been commenced at Karangahake, Waitekauri, and Waihi, which are likely to produce a large increase in the yield for the present year.

Karangahake.

Very few of the mines in this district have as yet been worked with success. There is a large percentage of silver and other metals in the ore along with gold, that has as yet baffled all those who have attempted to treat the ore. The ordinary crushing-batteries have been tried and found wanting. The La Monte furnace also has been tried, and proved a failure; and after this a battery and amalgamating-pans were erected by Mr. Railey to treat the ores—the same as adopted in Mexico some fourteen years ago; but this process also proved a failure. And, lastly, Mr. Chambers, of Auckland, made arrangements with the Parkes' Gold and Silver Ores Smelting Company, London, to secure the patent of their process for New Zealand if it proved a success for treating the ores in this district. He also guaranteed the expenses of Mr. Parkes coming to New Zealand to superintend the erection of a plant, and to prove his process capable of dealing with such ores as are found in this district.

Any one reading a description of the successful manner in which Parkes's process treated refractory ores sent from the colonies to London would naturally come to the same conclusion as Mr. Chambers—namely, that the erection of a plant in the North Island goldfields would tend to make the mining properties in the Karangahake, Te Aroha, Waihi, and Whangamata districts valuable. Mr. Chambers therefore erected a plant at Karangahake.

The following is a statement published by the Parkes' Company with reference to their process:—

At the invitation of the directors of this company a number of gentlemen met at their experimental works, East Greenwich, to see the patent process in full operation. The inventor, Mr. Parkes, showed the visitors the charge of ore, which consisted of 2cwt. "Alexandra" refractory ore and the fluxes of lime, iron-ore, salt-cake, fluor-spar, and coal—in all 92lb. These were all mixed, and the furnace charged. Thereafter Mr. Parkes conducted the party over the works, which consist of a laboratory, smelting-furnace, calcining-furnace, and a cupelling-furnace, and explained the various "processes," which were being conducted in full operation at the time. The chairman of the company, in the course of his remarks, said, "You have seen and have had explained to you the various operations connected with the process, which I may be allowed to repeat and enlarge upon. The raw ore is first crushed roughly, then intimately mixed with the fluxes, and put into the reverberatory smelting-furnace. It is then allowed to smelt for three to four hours, when the ore and fluxes become one liquid mass of molten material. The slag, which swims on the top in a fine fluid state, is now skimmed off, and the regulus tapped, which flows out into iron or sand moulds. This regulus contains all the gold and silver and other metals. The regulus is allowed to cool and disintegrate. It is then placed in a calcining-furnace, and about half the sulphur burned out of it. It is then mixed with oxide of lead and smelted, and the gold, silver, and copper combine with the lead and form an alloy. When this is considered complete the lead is tapped and run into moulds. This lead is then smelted in the cupelling-furnace, and the lead oxidized in the usual way, leaving behind it the precious metals. The fluxes vary in their kind and proportions according to the particular nature of ore to be operated upon. The operations are also varied to a considerable extent. The regulus of some ores does not require calcination, and the lead is mixed with the ore before being put into the furnace, and in cases may be even mixed with the regulus in the furnace after the slag has been skimmed off. The ore we have been smelting to-day is the 'Alexandra,' from Queensland, which is a very refractory ore, and contains iron, sulphur, lead, zinc, copper, and over 50 per cent. of siliceous insoluble matter. In dealing with this ore the operations are conducted without the slightest difficulty, as you have seen to-day, and on a former occasion, when trial-smeltings were made and samples taken of the slag, and assayed by Messrs. Johnson, Matthey, and Co., there were only 2dwt. 10gr. of gold found in the ton of slag, out of 2oz. 12dwt. in the ton of the ore; and 2dwt. 10gr. of silver in the ton of slag, out of 10oz. 5dwt. contained in the ton of raw ore. The fluxes used for this particular ore are lime, salt-cake, iron-ore, fluor-spar, and coal—in all, 920lb. to the ton of ore, and costing only 4s. 9½d."

The following ores have been experimented upon, and have been assayed by Messrs. Johnson, Matthey, and Co. for the company: "We have carefully analysed the samples of ore marked as under, and find the following proportions in every 100 parts:—

	No. 1. Queensland.	No. 2. General Exhibition.	No. 3. Never Never.	No. 4. New England.	No. 5. Conrad Richardson.	No. 6. North Star.	No. 7. Alexandra.
Iron	27·00	14·30	13·40	18·60	22·60	5·40	17·20
Lead	0·70	3·60	3·00	0·50	2·00	Nil	2·10
Copper	0·80	0·20	0·30	0·80	0·90	Nil	0·20
Antimony	0·70	0·20	0·30	Traces	·50	0·10	Nil
Zinc	4·90	4·10	4·50	6·00	6·20	0·30	3·20
Arsenic	7·50	1·40	1·50	16·30	4·50	0·10	Nil
Manganese	Nil	Traces	Traces	Traces	Traces	Traces	Nil
Lime	Nil	3·10	15·70	Nil	0·80	0·70	Nil
Sulphur	29·40	14·80	13·70	15·50	25·10	2·90	20·00
Phosphorus	Nil	Traces	Traces	Nil	Nil	Traces	Nil
Carbonic acid	Nil	2·50	13·00	Nil	0·40	Traces	
Siliceous insoluble matter ...	27·30	54·60	33·20	40·40	36·20	89·60	57·30
Gold, silver, water, oxygen, and loss	1·70	1·20	1·40	1·90	0·80	0·90	
	100·00	100·00	100·00	100·00	100·00	100·00	100·00
	Oz. dwt.	Oz. dwt.	Oz. dwt.	Oz. dwt.	Oz. dwt.	Oz. dwt.	Oz. dwt.
Gold (per ton of 20cwt. of ore)...	4 12	0 18	2 12	1 18	3 2	0 8	2 12
Silver " " " ...	7 6	4 3	2 10	2 16	8 18	0 15	1 5

It will be seen that these ores are mostly of a very refractory character, and the result of trials on the same scale as you have seen to-day is as follows, as per assay by Messrs. Johnson, Matthey, and Co.: "We have examined the samples of slags marked as under, and find the following to be the result (per ton of 20cwt. of slag) :—

	Gold. Oz. dwt. gr.		Silver. Oz. dwt. gr.
No. 1. Queensland	0 7 0	...	0 4 0
No. 2. "	0 6 12	...	0 3 0
No. 3. General Exhibition	0 3 6	...	0 3 0
No. 4. " " and Never Never	0 5 0	...	0 4 0
No. 5. Never Never	0 6 12	...	0 5 0
No. 6. New England	Traces	...	Traces
No. 7. " and General Exhibition	0 1 12	...	Traces
No. 8. Conrad Richardson	0 3 6	...	0 3 0
No. 9. " " and North Star ...	0 3 6	...	0 2 0"

From these figures it will be seen that there is left in the slags only a very small percentage (a few pennyweights) of the gold and silver, and in one case only traces of gold and silver were found. In order to prove the utility and commercial adaptability of the "process," the company asked Sir Henry Roscoe, President of the British Association for this year, to report upon it. The trial in his presence was on 1cwt. of a refractory ore called "New England" from the District of Ravenswood, in Queensland, and the fluxes employed weighed 34½lb., and his report is as follows: "The cost of this mixture of fluxes amounts to about 4s. per ton of ore. Before smelting a sample of the ore was carefully collected for assay. The time occupied in smelting the ore was exactly four hours, the mixture being placed in the furnace at 12.40, and the skimming finished and regulus tapped at 4.40. The slag was a good skimming one, and the weight of the regulus was 29¼lb. The cost of the operation, exclusive of fluxes, can be taken to be that of the easily-ascertained cost of working a similar furnace in smelting copper ore, which is about 4s. 6d. per ton of ore. Samples (1) of the ore, (2) of the regulus, (3) of the slag, collected by me, were forwarded by me to Messrs. Johnson, Matthey, and Co. for assay. I enclose the report of these gentlemen, which is highly satisfactory. The ton of ore contains 2oz. of gold and 2oz. of silver. The ton of regulus contains 8oz. 2dwt. of gold and 7oz. 5dwt. of silver. The ton of slag contains 7dwt. of gold and 5dwt. of silver. It thus appears that in the above operation, which I understand was the first trial of this particularly refractory ore, practically the whole of the precious metals have been withdrawn easily, and at a low cost."

The following is copy of assays referred to in above report:—

"Certificate of Assay for Sir Henry E. Roscoe.—We have examined the samples of mineral marked as under, and find the following to be the result per ton of 20cwt. of ore, regulus, and slag:—

	No. 1. Ore. Oz. dwt.		No. 2. Regulus. Oz. dwt.		No. 3. Slag. Oz. dwt.
Produce of gold	2 9	...	8 2	...	0 7
Produce of silver	2 0	...	7 5	...	0 5"

Further, a sample of 14lb. weight of the very refractory Australian gold-ore, called "Never Never," with the necessary fluxes, weighing 6lb., consisting of lime, soda-cake, and fluor-spar, was sent to Dr. Wallace, of the City of Glasgow Analysts' Laboratory, in order that it might be tested on the small scale by this process, and he reported as follows: "I made two experiments, and obtained a good regulus, which separated from the slag readily. I obtained the following quantities

of regulus from 100 parts of ore: Regulus, per cent., (1), 22·91; (2), 22·89. The regulus was in each case fused with oxide of lead (6 parts) and a small quantity of lamp-black after having been ground and partially calcined, and the button of metal was cupelled in the usual manner. Beads of the precious metals were obtained amounting to—gold and silver, per ton of ore, (1), 3oz. 5dwt. 16gr.; (2), 3oz. 3dwt. 1gr. The metals were separated in one case, and gave the following results: Gold, per ton of ore, 1oz. 2dwt.; silver, ditto, 2oz. 3dwt.: total metals, 3oz. 5dwt. The whole operations are performed without difficulty, the fluxes used are very inexpensive, and I think considerably less oxide of lead might be used. For comparison, I made two experiments by the ordinary process of assaying refractory gold-ores. The ore was first calcined to oxidize the sulphides, then fluxed with an equal weight of carbonate of potash, 60 per cent. of carbonate of soda (refined soda-ash), 40 per cent. of acetate of lead, and 10 per cent. of lamp-black. A button of lead was obtained in each case, which was cupelled in the usual manner, and the gold and silver were afterwards separated by the well-known process of quartation. The result obtained was: Gold, per ton of ore, 1oz. 3dwt.; silver, ditto, 2oz. 2dwt.: total metals, 3oz. 5dwt. I need scarcely say that this process of assaying could not be carried on on the large scale on account of the expense of the fluxes and crucibles, the latter being of large size in proportion to the result obtained."

It will be noticed that the result of this test shows that all the gold and silver was taken out of the ore, and was quite equal (although only costing a few shillings for fluxes per ton of ore) to the most expensive process of assaying, which would cost for fluxes about £23 per ton of ore.

With such a flourish of trumpets did Mr. Parkes arrive in this colony that many believed a new era had dawned on mining, and that the industry that has been languishing in the Karangahake district for years would soon become a prosperous one. Mr. Chambers had perfect confidence that Mr. Parkes would treat the ores successfully, and purchased ores in the district by assay to operate on. The plant was completed, and the process carried on for nearly a month; but, instead of being able to obtain fluxes for smelting the ore for 12s. 6d. per ton, which was Mr. Parkes's estimate, it cost from £18 to £20 per ton, and even with all the costly fluxes the ore could not be successfully smelted. When examining the slag from the furnace it was full of knots and lumps of silica, like lumps of dry oatmeal amongst pottage.

This plant is referred to merely to show that the ore in this district is not suitable for smelting in its raw state as it comes from the mine, on account of the very large percentage of silica it contains. If smelting is resorted to the ore will have first to be crushed and concentrated, and then it is possible to smelt the concentrates and extract the metals. There are large lodes of ore in this district that will pay for working as soon as an efficient and economical process is found to extract a fair percentage of the metals it contains.

Woodstock Mine.—The workings in this mine were carried on last year by tributers. Six men obtained 101 tons of quartz, which yielded by the ordinary crushing-battery process 449oz. of gold. There is a large body of quartz in some of the lodes in this mine, some of it of low grade, and all of the lode-stuff contains a certain percentage of silver.

Kenilworth Mine.—This mine adjoins the Woodstock, and was worked last year by tributers. Eight men have obtained about 150 tons of stone, which contains a large percentage of silver. Thirty-six tons of this ore has been sold to export to Europe for treatment, the assay-value being £3,400, or over £94 per ton. Some of the remaining ore on hand will be sent to the reduction-works at Waiorongomai for treatment.

Crown Mine.—This property has recently changed hands, and now belongs to the New Zealand Crown Mines Company, which is formed partially with foreign capital. The mining operations were suspended in this mine for a long time, but now they have resumed work again. There are numerous gold- and silver-bearing lodes running through this mine, some of which are 10ft. in thickness in places. The ore in general has been of low grade, or, at least, there have never been any high returns from large parcels of stone crushed.

An incline tramway was constructed from Railey's battery up the face of the range by subsidy from the Mines vote, but since its completion it has never been used. This company now propose to utilise this tramway in conveying the ore from their mine to their reduction-plant, which is to be erected on the site where Railey's crushing-battery stood. Their plant is to consist of a stone-breaker or pulveriser and Lamberton mills, which have been sent from Glasgow, in Scotland. These mills are entirely new in the colonies, and, not having seen any of them, their construction cannot be described. They are spoken highly of by those who have seen them at work. After the ore is finely pulverised it is to be handed over to the Cassells Company, who are also erecting chlorination-works near the reduction-machinery. This company have entered into an agreement with the Crown Mines Company to treat the whole of their ore at a certain percentage of the yield, and have also agreed to save a high percentage of the bullion in the ore.

Several other mines have been worked to some extent. Ten men have been employed in the Ivanhoe and Truro Mines, and a considerable amount of prospecting-work has been done. About 77 tons of quartz have been taken out during last year; but the yield has not been very high, 43oz. of gold being obtained from 37 tons of stone. A crushing-battery consisting of four heads of stamps has been erected on these mines, and also two pulverising-pans and settler. The muddy water coming from the table attached to the battery is conducted into settling-tanks or reservoirs, and there allowed to stand until it is clear, when the water is drawn off and used again, and the slimes from the muddy water are treated and found to contain a considerable percentage of bullion.

Many of the mines are merely held waiting to see if any process can be got to satisfactorily deal with the ore. Prospecting is carried on now and again, and sufficient work done to prevent cancellation of the holdings being made.

Owharoa and Waihi.

There is only one claim at Owharoa where there has been any extent of work done—namely, the Smile of Fortune. This claim is worked entirely by tributers—eight men. The lode on which

the principal operations were carried on last year is a conglomerate mass of quartz stringers and sandstone, 10ft. thick in places; but there are no regular well-defined walls. There were 1,138 tons of lode-material crushed last year, which yielded 780oz. gold. A large amount of gold has been obtained from this claim since it was opened, but the gold-bearing reefs do not appear to extend far in this neighbourhood.

Waihi Mine.—This is the property of an English company termed the Waihi Gold- and Silver-mining Company, who have been employing about sixty-five men, and have erected a very extensive plant for the reduction and treatment of the ore. The plant consists of four drying-kilns, one of Howell's revolving furnaces, two sets of rock-breakers, one set of smooth-faced rolls, with revolving screen with steel tires, two Globe ore-crushers, four McKay pans, eight combination-pans, four settlers, and one clean-up pan, and two sets of elevators.

The ore, as it comes from the mine, is dumped into the drying-kilns, and while it undergoes the process of drying it is partially calcined. These kilns are of a circular form, resembling a lime-kiln. The ore is taken from these kilns to the stone-breakers, and there reduced to about $\frac{3}{4}$in. diameter. From there it goes into a hopper which feeds the rolls. The rolls are made on the Krom principle, of 26in. diameter and 15in. face, having steel tires 3in. in thickness. They are driven at a speed of eighty revolutions per minute. Underneath the rolls there is a chute into which all the crushed materials fall, and this chute conveys it into a revolving screen of thirty-six meshes—which is equal to nearly 1,200 meshes—to the square inch. What will not pass through the meshes in the screen falls into a chamber and is lifted with a set of elevators into the hopper feeding the rolls, and is again put through.

The crushed material from the rolls is taken to the Globe crushers, and there pulverised to such a fineness that it will pass through a screen having about 2,500 meshes to the square inch. The Globe crushers are 3ft. in diameter, with a steel ball of 8in. in diameter. The revolving disc of the mill makes 250 revolutions per minute, carrying round the ball with it, the ball being held in its path by a half-round groove in the cast-iron casing. On each side of the revolving disc screens are bolted on to the casing, and from the discharge-openings the finely-pulverised material is drawn by an exhaust fan through a square box or tube into a system of pyramidal chambers having numerous divisions. The object of this pyramidal or V-shaped chamber is to cause the fine dust to take a serpentine course, to allow it time to settle in the chambers, on the same principle as chambers for condensing fumes.

The next process is to take the finely-pulverised material from the pyramidal chambers to the Howell revolving roasting-furnace, where it is operated on. After being roasted, the ore is taken to the combination-pans and treated in them. These pans are 5ft. in diameter and 3ft. deep, having a revolving muller fitted with chilled hæmatite-iron shoes, and dies of same material in the bottom of the pans. Each of the pans is charged with 300lb. of quicksilver and $1\frac{1}{2}$ tons of ore, with sufficient water in the pan to convert the material into a thin pulp. A cover is bolted on to the top of the pan and the muller set in motion, the ordinary speed of which is from seventy to eighty revolutions per minute. The water is heated in the pans by a steam-jet to a temperature of about 180°. A little salt and sulphate of copper is used in each charge according to the character of the ore. The mullers are kept working for about seven hours, when the whole of the bullion is supposed to be amalgamated. A tap is opened at the bottom of the pan, and the pulp and quicksilver runs into the settler. There is a settler for every two combination-pans, and things are so worked that the two pans are discharged into the settler at the same time.

The settlers are 9ft. in diameter and 3ft. deep, having a revolving arm, with shoes, to keep the pulp in a state of agitation. The shoes do not touch the bottom of the settler, but stand a short distance above it. This arm is made to revolve at the rate of seventeen revolutions per minute, and the settler is kept working until it is required for the next charge from the combination-pans. Each settler is fitted with a siphon for drawing off the quicksilver. When the settlers are cleaned out ready for another charge the quicksilver and amalgam is run into a straining-cloth made of canvas, which is held in position by a wooden frame directly over a cast-iron tank, into which the quicksilver filters, and from which it is again lifted to charge the combination-pans. The whole of the machinery is to be worked by a semi-portable compound steam-engine of the under-type make, with multitubular boiler, the cylinders of the engine being 15in. and 24in. in diameter respectively.

The revolving furnace was not erected at the time of my visit; neither had the mill done any work. The whole of the machinery is fitted up in a good workmanlike manner, but the arrangement of the plant does not do credit to the superintendent: there is by far too much power lost in lifting and elevating the material from one process to the other, and that power will be expensive, especially where steam is used, on account of the cost of fuel. The plant, no doubt, should have been placed in such a position that the ore could be run directly to the rock-breaker, and from thence by gravitation to every other process that it has to go through, so as to economize labour and motive-power. The Globe mills erected here are new machines in the colonies; but it is very questionable if they will prove economical crushers, judging from the one working at the Melbourne Exhibition. They require a large amount of power to drive them, and the wear-and-tear on the balls and casing must be very great. The Waihi Company's plant has, however, many good points about it, and will certainly save a larger percentage of the bullion than was formerly done. It has cost about £12,000.

A shaft has been sunk to a depth of 130ft., and a pumping-and-winding engine erected. About 2,400 tons of ore has been stoped out of the upper adit-levels, and stacked on the surface ready to be operated on when the mill is in full working-order. This ore has been all assayed by the company's metallurgist, Mr. G. W. Small, and its value is estimated at about £10 per ton. As soon as the machinery is in full working-order a new level will be constructed from the shaft, to give about 100ft. of backs on the Union Reef, which is from 4ft. to 5ft. in thickness. Parcels of stone

from this lode have been forwarded to England and America for treatment, with the following result: Ore treated in California, value £43 per ton; ore treated at Swansea, England, value £44 per ton.

Upwards of 17 tons of ore was sent to Messrs. Johnson, Matthey, and Co., assayers to the Bank of England, in February last year, which contained 9½oz. gold and 54oz. silver to the ton of ore, which represents a value of about £50 per ton. A further parcel of 36 tons of ore was sent to the same firm, which was divided into three classes, giving the following result: First class—gold, 9oz. 1dwt.; silver, 49oz. 10dwt.: or a value of £45 per ton of ore. Second class—gold, 5oz. 7dwt.; silver, 9oz.: or a value of £23 per ton of ore. The third class was divided into two portions: one portion gave a value of £16 per ton of ore, and the other portion a value of £17 11s. per ton.

This company has a special claim of about 160 acres, with numerous lodes going through the ground; but as yet the surface-ore only has been tested—nothing is known whether the lodes will continue to carry down rich ore to a great depth or not.

Silverton Mine.—This mine adjoins the Waihi, but the lode going through the ground is of a different character. Some very rich stone is obtained from this mine. The lode is 12ft. wide in places, but a good portion of it is composed of low-grade ore. The operations in the mine were suspended for a long time, but were resumed previous to my visit. No stone was crushed last year.

Martha Extended Mine.—This mine has been steadily worked for the last six years. The lode near the surface was 30ft. wide in places, and was worked in a face for a certain distance down. An adit-level was constructed at the lowest point that could be got; but the reef got narrower as it went down, and the gold did not seem to improve. The stone has always been of low grade, yielding from 4dwt. to 4½dwt. of gold per ton. Last year 2,000 tons of stone was crushed, which yielded 500oz. gold. The mine is worked entirely by tributers, sixteen being employed. One thing has to be said about the low yield from this mine—the crushing-battery where the stone is treated is one of the old type, and not likely to save a high percentage of the gold in the stone, and certainly very little of the silver. It is possible that when the Waihi Company's reduction-works are in full swing it will be found more economical to send the ore to them for treatment.

Britannia Mine.—This mine is on the same line of reef as the Martha. A winze has been sunk for a distance of 56ft., and good prospects obtained from the lode, which is about 14ft. in width. Recently this mine has been purchased by the Waihi Company, and will be worked by them in conjunction with the other claim.

Waitekauri.

There was not a great deal of mining carried on in this district last year, but a considerable amount of preparatory work has been done in the Jubilee Company's ground, where twenty men have been employed. This company are erecting a crushing-battery of ten heads of stamps, five berdans, two grinding-pans, a settler, and shaking concentrating-tables. It is the intention of the company to treat all the large heaps of quartz and mullock in the gully where the battery is erected, and also to work large blocks of quartz, known to be of low grade, near the surface.

About six men in all have been employed in the Waitekauri, Welcome, and Eclipse Mines, with the following results:—

Name of Mine.	Quartz crushed.	Yield of Gold.	Number of Men employed.	Average Yield of Gold per Ton.
	Tons.	Oz.		Oz. dwt. gr.
Waitekauri	276	85	3	0 5 10
Welcome	65	75	2	1 4 0
Eclipse	Specimens	5	1	...
Total	341	165	6	...

There are 30 tons of stone at the Eclipse Mine awaiting treatment. 1 ton 12cwt. of ore from the Welcome was sold to Mr. Chambers, to be treated at the reduction-works at Karangahake by the Parkes process, for £30; but, unfortunately, this process could not extract the bullion from the ore.

Te Aroha District.

The most complete reduction-works in the whole of the Australasian Colonies are now erected in this district—namely, that of the Te Aroha Gold- and Silver-mining Company at Waiorongomai, which is likely to be able to deal with all descriptions and characters of ore found on this field. Before proceeding to give a description of these works a short *résumé* of the history of this field will not be out of place, to show the difficulties that have had to be encountered from time to time since it was first opened.

The Te Aroha Goldfield has passed through many phases since it was first opened about seven years ago. It looked at one time the most promising field in the North Island, and everything was done at the outset to get it properly opened up. Messrs. Firth and Clarke erected a large custom reduction-works, and the Piako County constructed a tramway from the leading mines then opened up to connect them with these works, at a cost of £18,000, of which amount the Government contributed to the extent of £9,000. A fixed tariff of 10s. per ton was charged for treatment. No expense was spared in the erection of this crushing-plant to make it as complete as possible; indeed, it was the most complete plant erected in the colony at that time, costing about £20,000. The field was therefore opened under the most favourable auspices.

After the whole of the works were completed and the mines opened up, it was found that this crushing-plant was not capable of properly treating the character of the ore found on the field, which contained gold, silver, copper, zinc-blende, and galena. It was only suitable for free-gold ores; indeed, gold was the only metal that was looked for: up to the time the La Monte furnace was erected at the Thames the miners had no idea of silver being in the lodes in payable quantities. The combination of sulphur, arsenic, galena, and zinc-blende with the gold sickened the mercury used in the battery treatment to such an extent that even a fair percentage of the gold could not be obtained.

After struggling for about three years in trying experiments with this class of ore, the battery-proprietors sent their manager, Mr. H. Adams, to America, to see the processes in use there for extracting the metals from the ore, and on his return they erected a small testing reverberatory furnace, and also a White-Howell revolving furnace, to roast and chloridise the ore, which was an improvement on the former process, but, still, did not prove entirely satisfactory in treating the different ores.

Another plant was erected by Messrs. P. Ferguson and Co. higher up the Waiorongomai, consisting of a stone-breaker, one set of edge-runners, and six McKay grinding-pans with settlers; but this also proved a failure. Mr. Ferguson went Home to try and form another company to work the claims his company had taken up, and has so far been successful, and has returned, bringing out a new class of machinery to treat the ore; but whether this machinery will be successful or not in dealing with the ore will only be ascertained when it is erected and in full work.

Messrs. Firth and Clarke, after continuing for a number of years to work the claims which eventually fell into their hands as they were given up by the original owners, sold their plant and properties to Mr. W. R. Wilson, who is well known as one of the pioneers of Silverton, in New South Wales, and who was the manager of the Barrier Ranges silver-mining properties, including the Broken Hill Proprietary, at the time of my first visit to this district. Mr. Wilson formed the present Te Aroha Gold- and Silver-mining Company, and placed Mr. John Howell in charge as general superintendent. Mr. Howell has had large experience in gold- and silver-mining on the Pacific Slope of America, and has erected this company's plant at Waiorongomai.

The plant consists of three rock-breakers, twelve ore-feeders, sixty heads of stamps, twenty-five concentrators, one Howell revolving furnace, one large reverberatory furnace, six Boss combination-pans, three settlers, and one water-jacket smelting-furnace, and includes the following methods of treatment: namely, dry and wet crushing, concentrating, desulphurising, chloridising, amalgamating, and smelting.

The ore is brought from the mines and dumped on a grizzly, and what will not go through the bars of the grizzly goes to the rock-breakers, which are on the Blake-Marsden principle. After passing through the rock-breakers it falls into a bin, which supplies the ore-feeders by gravitation. Each five heads of stamps is fed by a Challenge ore-feeder, and these feeders can be regulated to such a nicety that there is always a uniform quantity of ore in the stamp-mortars. After the crushed material passes through the screens it goes over a short length of electro-plated and silvered copper plates, 4ft. long, and then passes on to the concentrators.

There are two Frue vanners, for concentrating the tailings, to every five heads of stamps. The tailings passing from the Frue vanners are amalgamated in the Boss combination-pans and settlers; whilst the concentrates, which are collected in the tanks underneath, are first desulphurised in the Howell revolving furnace, and afterwards subjected to a strong heat in the reverberatory furnace, thereby reducing the finely-pulverised sulphides to a semi-fused condition necessary for final treatment in the smelting-furnace. A full description of the working of the Frue vanners is given in my report on the mining machinery exhibited at Melbourne.

The Howell furnace is a cylindrical tube, 24ft. long, 5ft. in diameter at the discharging end, and 4ft. 2in. at the receiving end. The furnace is set at an inclination downwards to the discharging end of 5in. to the 24ft. In the inside of this furnace or iron tube there are eight longitudinal ribs, projecting about 3in., for holding in the fire-bricks with which it is lined. The fire-bricks are specially made, having a projection on each face about 2½in. high and about the same width. It may be well to state that there is not a regular taper on the furnace, but it is 5ft. in diameter at the lower end for 9ft. in length and 4ft. 2in. at the upper end for 15ft. in length. The flame from the fire enters the lower end of the furnace, and the fumes and dust, as they emerge from the upper end, drop for 5ft. into a condensing-chamber, which is 6ft. wide and 9ft. high. From this the flue is the same size for 40ft. in length, turning at one place at right angles, and then there is a drop of 3ft. into the bottom of the chimney-stack, the latter being 65ft. in height. The furnace revolves at from three to four revolutions per minute, according to the character of the concentrates or ore to be operated on.

After the ore or concentrates is roasted in the Howell furnace there is still about 12 per cent. of the sulphur left in the form of sulphates. The ore is then put into the reverberatory furnace, which is 44ft. long and 10ft. wide, having a depth of 20in. from the crown of the arch to the hearth. The furnace-hearth is truly horizontal, and the material is worked from the back end towards the furnace with long iron slices or rakes, through the small doors in the side, by manual labour, and by the time it gets to the furnace-end it is in a claggy matte or slag without being smelted.

The matte coming from this furnace is now taken to the blast water-jacket smelting-furnace and mixed with a certain proportion of lime, iron, and lead as fluxes—that is, if there is not sufficient iron and lead in the ore. When smelted the lead goes, along with the silver and gold, to the bottom, and the copper floats on the top. The amount of sulphur in the copper causes it to separate easily from the lead. This regulus is to be shipped to England for treatment. The lead-bullion will be treated and the precious metals obtained by the zinc-desilverisation process, which is fully described in my report on the Dry Creek Smelting-works, near Adelaide.

The tailings from the Frue vanners are collected and ground in three Boss pans, 3ft. in diameter and 20in. deep, revolving at the rate of about sixty-five revolutions per minute. From these the pulp

goes into the Boss combination amalgamating-pans, which are 5ft. in diameter and 30in. in depth, revolving at the rate of seventy revolutions per minute. Each of these pans is charged with 300lb. of quicksilver, and after the amalgamation is considered complete the material is run out into settlers—there being one settler to every two amalgamating-pans—and the quicksilver and amalgam collected.

There were only forty heads of stamps erected at the time of my visit, but arrangements were being made and foundations laid down for the erection of twenty additional heads of stamps of American pattern, which, Mr. Howell assured me, would crush nearly as much as the forty heads previously erected of the old type; and there is no gainsaying the fact that these American stamps, although the same weight, will not require nearly the same power to work them as an equal number of those that have been previously used, which will be seen from the reasons adduced in my report on crushing-and-pulverising machinery exhibited at Melbourne.

As previously stated, there is no other plant erected, as yet, either in this or any of the Australian Colonies, that is capable of treating the refractory ores, such as are found in this district, with the same probability of success. The large quantity of silica the ore contains renders it unsuitable for the smelting process, and this plant copes with this difficulty by getting clear of most of the silica on the concentrating-tables, and only dealing with a small percentage of it in the material that goes into the smelting-furnace.

Mining operations have been steadily carried on in the Te Aroha Company's claims during the year, and 1,381 tons of stone have been crushed, which yielded 1,113oz. of gold. They have in all their claims an area of 225 acres. A considerable amount of work has been done in constructing adits and opening up the various claims, so that a larger quantity of ore can be got as soon as the reduction-works are completed. Since January last a little over 30 tons of concentrates have been obtained from the Frue vanners, which will be treated as soon as the whole of the roasting- and smelting-works are completed, and the necessary fluxes are on the ground.

This company has been employing about 216 men, and will always have to employ a great deal of labour in order to keep this extensive plant in full work. There are a large number of lodes running through this company's properties, some of which contain low-grade ore; but by having a large plant the whole of the lodes may be profitably worked. The principal lodes going through their claims are as follow: The Buck Reef, which runs through the whole of the special claims, from 12ft. to 20ft. in thickness; New Find, from 5ft. to 14ft.; Galena, about 3ft.; New Reef, about 4ft.; Silver King, from 3ft. to 6ft.; Canadian, about 20ft.; May Queen, about 3ft.; Hero, from 2ft. to 4ft.; Goldsworthy, about 2ft.; Virginia City, about 2ft.

The greater number of these lodes are known to be payable for working if the ore is properly treated. There is scarcely another mining company in the colony which has a greater number of lodes in its ground—namely, ten, with an aggregate thickness of 56ft.

New Era Company.—This company's property comprises a special claim of 164 acres, and has five distinct lodes running through it—namely, the Premier, Inverness, Phœnix, Silver King, and Vermont. This property has been purchased by a Glasgow syndicate, represented by Mr. P. Ferguson, who is going to expend a considerable amount of capital in opening up the mines and erecting reduction-works to treat the ore. The works will contain a rock-breaker and a Lamberton grinding-mill, and the gold and silver will be extracted by the Cassell process, in which a solution of cyanide of potassium is said to be used. From what is known of the Cassell process, the metalliferous ores, and especially auriferous compounds, are treated by electrolysis in a machine where chlorine and oxygen are generated. The metals are dissolved at the positive pole and deposited at the negative pole, and it is possibly in conjunction with this that the solution of cyanide of potassium is used. Cyanide of potassium will readily dissolve chloride of silver, but Fresenius states it fails to dissolve sulphide of silver. However, ore from these mines has been forwarded to Glasgow for treatment, and from what Mr. Ferguson saw of the process he is satisfied that it will be successful in dealing with the ores here, and that a high percentage of the precious metals will be obtained. An expert is to be sent out from Glasgow to conduct the operations of extracting the metals from the ore by Cassell's process.

There are a few men employed in the Colonist Mine stoping out the lode, which is about 8ft. in thickness, and stacking the ore ready for treatment at the Te Aroha Company's works.

Tui Creek.—The Champion Lode at Tui Creek is now the property of a London syndicate and a few people in the colony. A considerable amount of work has been done in constructing adit-levels and opening up the mine. Three different levels have been constructed, and a communication made between them on the main lode, which is from 7ft. to 8ft. in thickness. An aerial wire-tramway is in course of construction from the mine to the flat, a distance of 120 chains. When this is completed it is intended to send some of the ore, which contains a large percentage of galena and zinc-blende, along with silver, gold, and other metals, to the Te Aroha Company's reduction-works at Waiorongomai, and also to export 200 tons of the ore to England to be treated there. The last parcel of 11 tons sent Home realised £6 10s. per ton.

The Ruakaka Mine, on the opposite side of the range from Tui Creek, is still being steadily worked, and ore is being stacked on the ground ready for treatment.

In concluding my remarks on the North Island goldfields, it may be stated that there appears to be a more hopeful future for them than in former years. There are numerous lodes in different parts lying untouched, and many of them not prospected. The solution of the difficulty of being able to satisfactorily treat the complex ores in these fields is near at hand; but the next question that will have to be faced is the erection of central reductions-works, to which ores can be easily taken and treated. The time is drawing nigh when mining companies must see that the expense of erecting a large plant for a single mine to successfully deal with the ores is not the most economical method of getting returns from their mining properties. If large central reduction-works were established where fuel and fluxes could be brought to them by water-carriage, and the ores from

the several mining companies purchased by assay, a large number of mines would be profitably worked that are now standing idle, and the mining industry would be conducted on a better commercial basis.

The total quantity of material treated for gold last year was 32,664 tons of quartz, 3¾ tons of specimen-stone, 15,024 tons of quartz mullock, and 6,997 tons of tailings, which yielded 48,677oz. of gold, or 868oz. less than the year previous. This decrease last year was due to the falling-off in the returns from Te Aroha, which might be expected pending the erection of the large plant belonging to the Te Aroha Company. The decrease from this field was 1,805oz. There was also a slight decrease in the Thames district, of 153oz.; but in Coromandel there was an increase of 1,317oz., and in the Ohinemuri district of 273oz.

The following table shows the number of tons of stone crushed and the yield of gold from the northern goldfields since the returns have been supplied to the Mines Department. The Thames returns include the Ohinemuri district up to 1886–87 :—

District.	Number of Tons of Quartz and Mullock crushed.	Yield of Gold.	Average Yield of Gold per Ton.
Coromandel—		Oz.	Oz. dwt. gr.
1st April, 1880, to 31st March, 1881 ...	720	4,960	6 18 0
" 1881, " 1882 ...	3,358	7,351	2 4 0
" 1882, " 1883 ...	2,907	7,577	2 12 0
" 1883, " 1884 ...	1,043	4,018	3 17 0
" 1884, " 1885 ...	456	3,201	7 0 0
" 1885, " 1886 ...	550	3,382	6 3 0
" 1886, " 1887 ...	305	4,170	13 13 0
" 1887, " 1888 ...	1,923	6,774	3 10 5
" 1888, " 1889 ...	2,149	8,090	3 15 7
Totals	13,411	49,523	3 13 20
Thames—			
1st April, 1878, to 31st March, 1879 ...	41,917	57,207	1 7 7
" 1879, " 1880 ...	33,017	59,576	1 16 2
" 1880, " 1881 ...	32,405	53,154	1 12 19
" 1881, " 1882 ...	30,698	45,803	1 9 20
" 1882, " 1883 ...	25,867	43,311	1 13 12
" 1883, " 1884 ...	34,228	54,878	1 12 2
" 1884, " 1885 ...	31,496	37,705	1 4 4
" 1885, " 1886 ...	35,998	61,540	1 14 4
" 1886, " 1887 ...	34,827	38,142	1 1 22
" 1887, " 1888 ...	32,819	35,949	1 1 11
" *1888, " 1889 ...	47,363	35,796	0 15 3
Totals	380,635	523,061	1 7 11
Ohinemuri—			
†1st April, 1887, to 31st March, 1888 ...	2,388	3,406	1 8 13
" 1888, " 1889 ...	3,795	3,679	0 19 9
Totals	6,183	7,085	1 2 22
Te Aroha—			
‡1st April, 1883, to 31st March, 1884 ...	4,262	4,629	1 1 17
" 1884, " 1885 ...	11,042	9,506	0 17 5
" 1885, " 1886 ...	6,552	4,489	0 13 17
" 1886, " 1887 ...	4,743	3,658	0 15 10
" 1887, " 1888 ...	7,166	2,918	0 8 3
" 1888, " 1889 ...	1,381	1,113	0 16 3
Totals	35,146	26,313	0 14 23
Grand totals from North Island	435,375	605,982	1 7 20

* This includes 15,021 tons of mullock, which yielded 1,127oz. gold, or an average of 1dwt. 12gr. per ton.
† No separate returns kept before this. ‡ Since the field was opened.

MIDDLE ISLAND.

Pelorus District.

Mahakipawa.—Several quartz reefs have been discovered on the range between Mahakipawa and Waikakaho, containing a little gold, but none of those yet discovered can be said to be rich. Indeed, it is very questionable if many of them will prove payable for working. There is no doubt that there is a rich lode in this range, if it could be discovered. Prospecting is being carried on in several

of the licensed holdings, and a good deal of work has been done; but a great deal more prospecting has yet to be done, and the reefs already found cut at deeper levels, in order to ascertain their value, before any machinery need be brought on the ground.

Mahakipawa Licensed Holding.—This is a holding at the head of the right branch of the Mahakipawa Creek. The workings are about 2,800ft. above sea-level. A considerable amount of trenching has been done, and the cap of the reef sunk on for about 25ft. in length, and to a depth of about 10ft. A winze has been sunk on the reef to a depth of 76ft. The lode averages about 3ft. in width, and continues nearly at a uniform thickness all the way down the winze. A few tons of stone is stacked on the surface, which the manager, Mr. A. Hill, estimates will average from 4oz. to 5oz. of gold to the ton; but, judging from the prospects obtained at the time of my visit, it will not average more than from 12dwt. to 15dwt. per ton. Very little gold can be seen in the stone; the most of it is got in the fine stuff on breaking out the lode. The cap of the reef contains a large quantity of oxide of iron, which is decomposed iron-pyrites, and it resembles to some extent the cap of the Enterprise Company's reef at the Owen. It is a lode cutting anglewise across the strata of the country-rock, and therefore a lode more likely to go down than a segregated vein-lode; but it is one from which, should it be found payable for working when properly prospected, a fair percentage of the gold will not be obtained unless concentrating machinery be used after crushing, as it will contain a large percentage of iron-pyrites. An adit-level is being constructed to cut the reef at about 120ft. below the surface, at the outcrop, and at the time of my visit it was in about 30ft., two men being employed. Since my visit to this mine Mr. Logan has informed me that he got a small parcel of stone tested by crushing and amalgamating it in a Chilian mill, which gave at the rate of over 3oz. of gold per ton.

Lucky Hit Licensed Holding.—A considerable amount of trenching has been done here, and a small lode about 10in. wide cut, out of which fair specimen-stone has been got; but very little work has yet been done in prospecting this lode. There are two men employed.

Kapai Licensed Holding.—This is on the saddle of the range between the right branch of Mahakipawa Creek and Waikakaho, which is about 2,600ft. above sea-level. Trenching has been done on the lode on the top of the saddle, and an adit-level is commenced on the Waikakaho side of the range 140ft. below the cap of the lode, to test it at a greater depth. This adit was in at the time of my visit about 30ft. There is about 2ft. of solid quartz, and 2ft. more of lode-stuff in which there is a little gold. The quartz in this lode is far more solid than in the Mahakipawa licensed holding, and of a bluish colour, containing a good deal of iron-pyrites. There were two men employed in driving the adit.

Waikakaho Licensed Holding.—This holding is lower down the range on the Waikakaho side than the Kapai, but it is the same lode, and the two holdings adjoin. The lode at the mouth of the adit that is being constructed and is in for a distance of 110ft. is about 6ft. in width, and shows a little gold in the stone. At the end of the adit the quartz nearly pinched out, but probably it will widen out again as it gets into the hill. This adit-level is about 2,240ft. above sea-level, which is about 360ft. below the cap of the lode at the saddle. There are five men employed on this holding.

Southern Cross Licensed Holding.—A large amount of trenching has been done, and a lode cut in which there are fair prospects of gold; but nothing has yet been found to warrant the erection of crushing machinery, for more prospecting will have to be done before anything is known respecting the permanency of the lode.

The whole of the lodes here run in a north-westerly and south-easterly direction, and dip to the north-east, and they all cut across the strata of the country-rock anglewise, which shows them to be fissure-lodes, and, if payable for working, they are likely to go down to a good depth.

Reefton District.

Mining operations in this district are steadily being carried on, but not with so much vigour as they might be. It is a district where the rise and fall of mining-stock has a great effect on the working of the mines. A large portion of the mining properties on this as well as other fields in the colonies are held by men who do not look so much to the working and proper development of the mine as to being able to create a rise in the price of shares, so that they can make money by trafficking in them. It really means this: that very few mines are worked on a solid and commercial basis. The moment a patch of good-looking stone is found the mining-manager hastens to communicate the information to the legal manager, who is in many instances a share-broker, and he naturally will buy and make as much as possible before the information is made public. It is one of the worst features in connection with mining companies to have sharebrokers as managers.

There were many drawbacks last year in the Reefton district, owing to the yield of gold decreasing in some of the principal gold-producing claims, such as the Welcome, at Boatman's; and the Big River Company's mine, from which a great deal of gold was expected, has not realised expectations. In the Globe Mine, also, although it is still good property, the stone is not nearly so rich as formerly; still, the yield of gold from the district for last year shows an increase on that of the previous year.

Keep It Dark Company's Mine.—This is one of the steadiest gold-producing mines in the Reefton district. The company was formed in 1874, and since the mine was opened up they have been steadily paying dividends. The capital of the company is £20,000, of which one-half is declared paid up, and £2,625 is all the actual capital that has been called up. Since this company commenced operations they have crushed, up to the end of December last, 97,129 tons of stone, which yielded 53,112oz. of gold, representing a value of £205,801 1s., out of which they have paid £95,167 in dividends, which is equal to £4 15s. 2d. per share, while the calls paid on same only amount to 2s. 7½d.

There is no provision yet made by the company to concentrate and treat the tailings from the crushing-battery, and until this is done they will lose a considerable amount of gold. The directors, however, are beginning to be aware of this fact. They have forwarded 7 tons of tailings to the Thames to be operated on by the New Zealand Gold-extraction Company (Newbery-Vautin process), and if the results are encouraging they intend to adopt some means of saving the pyrites which now run to waste. There has been 8,345 tons of quartz crushed during the past year, which yielded 5,059oz. of gold, representing a value of £19,731, out of which £10,000 has been paid in dividends. The average yield of the stone for the year was 10dwt. of gold per ton.

They are at present engaged in stoping on the east and west lodes, and also on the north lode. The stopes are up for 120ft. on the former and 110ft. on the latter, leaving about 30ft. still to work of the former lode and 40ft. of the latter. The reef averages from 12ft. to 15ft. wide in both lodes, and the average output of quartz per week was at the time of my visit 190 tons. An auxiliary shaft has been sunk to a depth of 130ft. near the foot-wall of the lode, at a distance of 522ft. in from the main shaft on the 500ft. level, and a commencement made to open up a new level from this shaft to stope out the quartz. A chamber is made in the 500ft. level over the new shaft, and poppet-heads erected 30ft. high. On one side of the poppet-heads there is a paddock constructed which is capable of holding from 70 to 80 tons of quarts. The new shaft has one compartment for winding and one for ladder-way. When winding has to be done from the new shaft the rope is uncoupled from one of the cages in the main shaft and taken under a pulley at the main shaft and extended on rollers at intervals to the auxiliary shaft, where there is another pulley, and from this it goes over a pulley on the top of the poppet-heads and is coupled on to a cage and winding commenced. All winding operations are suspended in the main shaft during the time that quartz is being lifted from the auxiliary shaft to the paddock just referred to. Before sinking this new shaft a winze was put down from the 500ft. level of the lode for 90ft. At the bottom of this winze the lode was over 20ft. in width, and the quartz taken from this winze averaged about 14dwt. of gold per ton. There are thirty men employed about the mine and six at the battery.

Nil Desperandum Company.—This company's ground adjoins the Keep It Dark Company's lease. They are prospecting on the No. 3 Level. Sometimes a block of payable stone is discovered; but there has been a large amount of money expended on this mine—some £10,830—without getting any adequate return. The company was formed in 1877, and the total amount of dividends paid has been only £431. During last year they crushed 1,408 tons of stone, which yielded 624oz. of gold.

South Keep It Dark, Pandora, and South Wealth of Nations Companies.—These companies' mining-claims adjoin, and a shaft has been sunk conjointly on the boundary between the Pandora and South Keep It Dark. The shaft is down to a depth of 280ft., at which depth a level is constructed, and stoping on the reef has been done to some extent by the South Keep It Dark Company, the other two companies having suspended operations, as they could not find a payable lode for working. The lode in the South Keep It Dark Company's ground pinched out. They are now employed in sinking a winze on the lode, and are down 103ft., but nothing payable for working has been discovered. During last year the South Keep It Dark crushed 515 tons of quartz, which yielded 412oz. of gold, and they paid £400 in dividends. The Pandora crushed 329 tons of quartz, which yielded 292oz. gold. The Pandora and South Wealth of Nations Companies have expended £11,982 without getting any returns.

Inkerman Company.—This company's mine is situated at Rainy Creek, about seven miles from Reefton. In former years they were working on a large block of quartz of very low grade; but, this becoming too poor to work, they took up another claim, which they term the Western Lease, and found a lode containing payable stone. This lode has been traced on the surface for 350ft., and at any place where the cap was cut payable stone was obtained. They have sunk a shaft on the lode to a depth of 103ft., and opened up a level at 80ft. This new find is about 20 chains distant from the old workings. The company are now constructing an aerial tramway from the mine to the battery for a distance of 73 chains, which is estimated to cost £1,000. This company was formed in 1876, and since that date they have expended £15,399 without receiving any dividends; but they are in hopes that the new lode they are opening, which shows gold freely, and is apparently the same line of reef as that found in the Scotia, Sir Francis Drake, and Happy Valley Companies, will yet recoup them for all their outlay.

Globe Company.—This company's mine continues to be good property. The lode is smaller than when it was first discovered, but it still gives good returns for working. During the year ending the end of March last 7,005 tons of quartz was crushed, which yielded 3,625oz. of gold. This enabled them to pay £1,800 in dividends. This company was formed in 1882, and after expending some £14,775 the shareholders had agreed to put the company in liquidation. Every one wished to dispose of his shares, and many gave them away to save themselves from any future calls towards paying the liabilities of the company or contributions for winding up the company. While this state of affairs existed a new lode was discovered, in September, 1886, and from that date to the 22nd May, 1888, the company declared dividends to the amount of £11,250. They are stacking the tailings from the crushing-battery, which now amount to over 7,000 tons, and are erecting a plant of Triumph's ore-concentrators to treat them. Three samples of tailings from the stone coming from the low level were assayed by Mr. Fenton, of the Reefton School of Mines, and gave the following results:—

	Oz.	dwt.	gr.	
No. 1.—Clean tailings	1	2	20	to the ton.
No. 2.—Pyrites and tailings	1	15	22	" "
No. 3.—Pyrites	2	9	0	" "

Taking the first sample, of clean tailings, and the highest return from the low level, which was obtained from 200 tons of stone crushed, which yielded 306oz. of gold, or an average of 1oz. 5dwt. 12gr. per ton, this shows that they have been losing about 46 per cent. of the gold. The gold in the

stone in this mine is comparatively of a free character, and if so large a percentage is lost here the loss from some of the mines in the colony must be very great. They have been winding from the low levels by a water-wheel erected alongside their crushing-battery, about one mile and a half distant from the shaft, conveying the power by a wire-rope over a range 1,100ft. high; but they have recently ordered a new winding-plant from England, which is to consist of a twenty-horse semi-portable engine, with reversing-gear.

Progress Company.—This company's mine is situated at Devil's Creek, adjoining the Globe Company's ground. The upper levels are all worked out, but a low-level adit is now constructed for a distance of about 1,450ft., and the lode intercepted where it will give over 200ft. of backs. This is likely to be one of the best gold-producing mines in the Reefton district for the next four years. There is a great thickness of lode: in some places it is 25ft. in width. They have enlarged their crushing-battery to twenty-five heads of stamps, which are to be worked by a fifty-horse-power compound steam-engine. There are no concentrators attached to the crushing-plant, although the quartz from this mine contains a large percentage of pyrites, which, from several assays made by Mr. Fenton, of the Reefton School of Mines, contained from 4oz. to 5oz. of gold to the ton. During last year 1,915 tons of quartz was crushed, which yielded 987oz. gold. There are 24,000 shares in the company, of £1 each, but half the value is declared paid up. Their last statement of affairs shows the actual capital paid up to be £2,081; thus leaving £9,919 available capital for undertaking future works.

Sir Francis Drake Company.—This company's mine is situated on the new line of reef discovered about two years ago, and supposed to be the same as the Inkerman Reef. The lode is from 2ft. 6in. to 3ft. 6in. wide, and considered payable for working. The company have completed a new adit-level which will give them about 150ft. of backs to the surface. A crushing-battery of fifteen heads of stamps has been erected, and a tramway from the mine to the battery 29 chains in length has been constructed. During last year 1,475 tons of quartz was crushed, which yielded 295oz. gold, or an average of 4dwt. to the ton.

On the same line of reef as the last-mentioned company there are three other claims taken up and being worked—namely, the Happy Valley, on the south side of the Sir Francis Drake, and the Gallant and Scotia, on the north side. The Happy Valley Company did very little work last year. The Gallant Company have sunk a winze on the lode—which is about 3ft. in thickness, carrying gold—to a depth of 120ft., and an adit-level is being constructed to cut the lode about 28ft. below the bottom of the winze. As soon as this adit is constructed a connection will be made between the mine and the Sir Francis Drake Company's battery by tramway, where the stone will be crushed.

The Scotia Company have sunk two winzes on the lode some distance apart, and proved it to contain gold to pay for working. An adit has been constructed for 320ft., which cuts the lode 72ft. below the surface, and they are connecting the mine, by tramway 29 chains in length, with the Sir Francis Drake crushing-battery. One ton of stone was crushed from this mine, which yielded 12oz. gold. The great drawback to the whole of the mines in this locality was the want of a crushing-plant to test the value of the stone; but now this want is supplied this portion of the district will no doubt get properly prospected.

Big River Extended Company.—This company was formed in 1882, and they have been prospecting and working their claim near the Big River ever since. Some good gold-bearing stone was got near the cap of the reef, and a large amount of prospecting has been done. There has been £7,077 expended on the mine and plant. Several reefs have been found in their ground, which were considered payable for working. Owing to the great distance of this claim from any crushing-battery, the only way of testing the stone was by pestle-and-mortar, and by this means the stone was estimated to yield about 2oz. of gold to the ton. A crushing-battery was erected, and high expectations were formed of the result of the first crushing, which only yielded a few pennyweights per ton. Prospecting was continued, and recently a new lode has been discovered, about 3ft. in thickness, 300ft. west of the old lode. An adit has been constructed for a distance of 350ft. on this lode, which gives about 100ft. of backs, and the lode is being stoped out. For the year ending March last 335 tons of stone were crushed, which yielded 443oz. of gold, being an average of a little over 1⅓oz. to the ton. The country is very broken in this district, and the lodes run very bunchy and irregular. A fair thickness of lode may be found one week, and the next week it may have nearly pinched out. Several claims have been taken up in the Big River district, and prospecting is being carried on. This may probably lead to some good reefs yet being discovered.

Inangahua Low-level Tunnel.—This tunnel is now constructed for a distance of 2,880ft., but no lodes have been cut through—that is, payable for working. Operations are now suspended, but probably they will soon be resumed. Another 600ft. would require to be constructed to take it into the country where the Venus Company are getting gold on the upper levels. The company have spent £8,073 on this tunnel, including the sum of £3,246 which the Government has paid in subsidies.

Wealth of Nations Extended Company.—The company was re-formed in 1882. They have expended altogether £32,256 out of capital on the plant and mine. A large quantity of gold was obtained from this mine previous to the present company taking possession, and a considerable amount of money paid in dividends; but of late years nothing has been found payable for working. A large amount of work has been done in constructing adit-levels, sinking winzes and shafts, and erecting winding machinery to work the deep levels; but, so far, success has not attended their efforts. They struck a small body of stone in the bottom level quite recently, carrying gold, but nothing is yet known respecting it. During last year they have been treating some of the tailings that were stacked from the crushing-battery, and have obtained 209oz. of gold.

Energy Company.—This company has taken up the ground formerly held by the Energetic Company, from which a large quantity of gold has been obtained; but the stone was always of low grade. Nevertheless, it paid for working, and gave a number of men employment. There

has been no work of any consequence done in this mine for several years. Last year the mine was let on tribute. The low adit-level is being repaired, and they are working on a lode about 3ft. in thickness, and getting out stone and crushing it at the Venus battery. There was 1,917 tons of quartz crushed last year, which yielded 775oz. of gold.

Golden Treasure Company.—This company's property in Murray Creek is said to have been purchased by Mr. J. B. Beeche in August last year. The mine was idle for several years. In the beginning of this year all necessary repairs were made to the poppet-heads, and since then the Band of Hope adit-level has been cleaned out and retimbered for about 650ft., and stoping is being carried on 160ft. above this adit on a lode about 2ft. 6in. in thickness, showing a fair amount of gold. There is about 60 tons of stone broken out ready to forward to the crushing-battery as soon as the necessary repairs are effected. In former years there was a good deal of antimony in the stone in conjunction with gold, and that made the ore unsuitable for crushing with quicksilver. It is ore which requires to be concentrated in order to get a fair percentage of the gold in the stone. During last year 78 tons of stone was crushed from this mine, which yielded 38oz. of gold.

Venus Extended Company.—The principal work done at this company's mine during the year was stoping out the lode between No. 2 and No. 3 Levels, and also in extending No. 3 Level, and in prospecting. There was 2,078 tons of stone crushed during last year, which yielded 1,680oz. gold, out of which dividends have been paid the shareholders to the extent of £600. The reef varies greatly in thickness, being only a few inches in places, and then it widens out in other places to over 3ft. If a body of stone is discovered, even of low grade, with the appliances this company have it ought to be made to pay for working. The mine is connected with a crushing-battery by an aerial tramway. There are altogether twenty-two men employed by this company.

Inglewood Extended and Phœnix Extended Companies.—These companies' mines adjoin each other, and are worked from a main adit-level, which is over 1,400ft. in length. The lode is being worked between this level and the old workings, and will yet take over twelve months to stope out. It is about 2ft. in thickness, generally containing low-grade quartz. During last year the Inglewood Extended Company crushed 620 tons of quartz, which yielded 266oz. of gold, being an average of nearly 8dwt. 14gr. per ton. The Phœnix Company have done very little work last year, the quartz being of very low grade.

Boatman's District.

There was a falling-off in the yield of gold from this district last year to the extent of 834oz., owing chiefly to the Welcome and Just in Time Mines not turning out so well as formerly. There is, however, a prospect of better returns being got from this district next year. The Homeward Bound Company will likely be in full work on the Welcome line of reef, which was found to contain payable gold up to the boundary of their claim.

Welcome Company.—This company have worked out two levels below the main or No. 6 Level, which is constructed into the hill for a distance of 2,600ft. The shaft at the end of this main adit has been sunk to a depth of 450ft., and a level constructed at the bottom of the shaft for a distance of 80ft. on the line of reef, but no stone was met with. They then constructed an uprise for 45ft., and put in an intermediate level from which some stone was obtained; but the lode was greatly broken up. A good deal of work has been done in cross-cutting to prospect the ground, but up to the time of my visit they had not been successful in finding a lode at the lower level. There were only five men employed in the mine. The manager informed me that all work was suspended, pending amalgamation with the Homeward Bound Company, which adjoins this on the north side. The lode the Welcome Company has been working runs into the Homeward Bound Company's claim. This company is sinking a shaft from the low-level adit-tunnel that was constructed by some six different companies in this district about four years ago, and they have now got the shaft down for a considerable distance, and expect in a few months to strike the lode. If an amalgamation was effected between the two companies the stone could be taken out from the Welcome levels. At the time of my visit there was a proposition to amalgamate the two companies and form a new company with a capital of £48,000 in £1 shares, each of the present companies to get 24,000, with 10s. per share paid up, and be liable for the balance of the capital if required to be called up. During last year the Welcome Company crushed 937 tons of quartz, which yielded 1,707oz. of gold.

Fiery Cross Company.—This company's mine produced more gold last year than for the previous one. The workings are carried on from a shaft which is 450ft. in depth, and a level is constructed at this depth in a southerly direction to the Just in Time Company's boundary. They are sinking a winding-shaft in a cross-cut from the main 450ft. level about 200ft. distant from the main shaft, and propose working the lode below the 450ft. level by means of this new shaft, on the same principle as that adopted by the Keep It Dark Company. The lode is from 1ft. 6in. to 2ft. 6in. in thickness, and averages about 17dwt. of gold per ton. During last year 2,983 tons of stone was crushed, which yielded 2,495oz. of gold, which enabled the sum of £3,600 to be paid to the shareholders in dividends.

Lone Star Company.—This company's mine is situated on the range on the south side of Boatman's Creek. The lode has so far been variable in thickness and broken; but the company expect it will be payable for working, and are connecting their mine by an aerial tramway to the Just in Time crushing-battery, where they have made arrangements to have the whole of their quartz crushed at the rate of 10s. per ton. A good deal of prospecting has been done in this mine, and the company estimates that they have about 800 tons of stone in sight, including that already on the surfaces, to operate on as soon as the tramway is completed.

Just in Time and Reform Companies.—These companies' claims adjoin each other, and are both worked from one shaft, which is 200ft. in depth. Most of the stone on the upper levels is stoped out, and very little work is being done in either of the companies' mines at present. Before the lode can be worked to a greater depth the shaft will have to be sunk deeper, which will very probably soon be undertaken.

Lyell District.

There has been a considerable falling-off in the yield of gold from this district on account of comparatively very little gold being obtained from the United Alpine Mine, which has for many years been a steady gold-producer. The gold got very poor in the stone on No. 6 Level, and operations were almost suspended on this level, with the exception of a few tributers who were at work. The No. 7 or lower adit had been constructed for a distance of 2,095ft., when the reef was met with; but the lode here is very broken and mullocky, and so far no gold has been seen in the stone that would prove payable for working; but the adit-level is being extended along the lode, and probably a shot of gold will yet be found. During last year the tributers got 1,579 tons of quartz crushed, which yielded 630oz. of gold. Unless gold be got in the present low level there is little prospect of this mine being a gold-producer for some time. A large amount of money will have to be expended in prospecting before anything further is found.

Lyell Creek Extended Company.—This company is constructing a low-level adit to cut the Alpine reef at a low level; but the present prospects of the Alpine Company are rather disheartening. The adit-level is now in about 2,800ft., and the country through which the adit is being constructed is very hard. Operations at the present time are suspended owing to the contractors throwing up their contract.

Tyrconnell and United Italy Companies.—These companies' mines have been let on tribute. Two parcels of stone have been crushed from the United Italy Mine, which proved to be payable.

Westport District.

There is nothing doing in this district in quartz-mining, with the exception of preparatory work and prospecting. The Beaconsfield Company at Waimangaroa is sinking a shaft on the north side of the Waimangaroa River, which was down to a depth of 48ft. at the time of my visit. The reef, which is from 2ft. 6in. to 4ft. thick, is opened out on the south side of the river, and prospected to a small extent. A winze has been sunk on the lode below the adit-level for 36ft. The lode here showed more gold than at the place where the adit cut it. The reef is running anglewise across the strata, and keeps very regular, with good defined walls. The lode has every appearance of being gold-bearing. It is a reef that is well worthy of being prospected, and where there is a likelihood of payable stone being found. The company sank their shaft on the north side of the river, as that is the only place where there is any level ground to erect a crushing-plant. When the shaft is down a depth of 130ft. they intend to open out a level, and drive in the direction of the bottom of the winze sunk in the adit-level, on the south side of the river, and stope out the stone. During the last six months the company have spent over £1,300 in prospecting and preparatory work.

Mokihinui Reefs.—The whole of the mining operations here have been suspended for nearly twelve months, pending the floating of the whole of the mines in London in one company. Nothing definite is yet known as to whether Mr. Hay Dickson, who undertook the formation of this company, has been successful or not. It is to be hoped that English capitalists will satisfy themselves as to the value of these properties before embarking their capital. We want foreign capital in the colony to develop the mining industry, but do not wish to see any one embark their capital in mining ventures where there is not a prospect of it being returned with fair interest.

Cedar Creek, Totara.

It is about four years since auriferous-quartz lodes were discovered at Cedar Creek. At the time the first lode was found several people thought that by the appearance of the outcrop the reefs would excel in richness anything that had hitherto been discovered in the Middle Island, but on constructing an adit-level a few feet below the surface all the high expectations vanished, and several claims that had been taken up during the time of the excitement were abandoned, or, at least, all operations were suspended. A low-level adit was constructed to try and cut the reef, which was subsidised from the Mines vote to the extent of £603 15s. This adit was driven for about 1,000ft. without cutting any lode that would pay for working, although gold was found in some narrow leaders. The field was deserted for a time until about eighteen months ago, when a payable lode was discovered in the William Tell's Company's ground, and this led to prospecting being carried on in some of the other claims.

William Tell Company.—It was in this company's ground where gold was first discovered in a quartz lode crossing the bed of the creek, in which very rich specimens were got on the outcrop of the lode; but the gold could not be traced. A deal of prospecting was carried on without meeting any success, until, about eighteen months ago, a body of stone was struck about 3ft. in width, in which gold could be plainly seen. After driving along the lode for a considerable distance a winze was sunk some 60ft., and it was said at the time of my visit to this mine, about fifteen months ago, that the reef was larger and carrying better gold at the bottom of the winze than it did at the top. A considerable agitation was got up at that time to get the Government to complete the dray-road to the reefs up the side of the Totara River. The mine was inspected with the view of seeing whether this discovery warranted a large expenditure in the construction of the road, and the company was requested to bale the water out of the winze so that it could be examined. They baled out the water for about 20ft., and for that distance gold could be plainly seen in the stone. The company had at that time commenced to construct another adit-level at a depth of about 84ft. below the adit in which the good stone was struck.

On my last visit the lower adit was constructed for about 567ft., and an uprise made to the bottom of the winze that had been previously sunk; but, instead of finding a lode at the bottom of the winze, the quartz cut out at about 20ft. from the top, or about the place where the water had been baled down to on my former visit. Below this there is nothing but a trace of a lode to be found. There is, however, a good block of stone in the upper level that will pay for working. They were at the time of my last visit constructing an adit from the winze at about 25ft. below

the upper adit-level, so as to work the block of gold-bearing stone that has been discovered. In the lower adit a quartz lode 3ft. in thickness was cut through at about 450ft. in from the mouth, but no gold was found in the stone of any consequence. Indeed, a great deal of prospecting will have to be done yet in this mine before much is known respecting it. It is a likely-looking country for gold-bearing lodes to exist in; but unless a permanent gold-bearing lode be discovered the value of the property is very little. There were ten men employed at the time of my visit in and about the mine.

The company have erected a crushing-battery of ten heads of stamps and four berdans, which is to be driven by a Pelton hurdy-gurdy wheel 6ft. in diameter. They have constructed a water-race from Cedar Creek which will give 116ft. of head on the wheel. There are no new appliances for saving the gold, the ordinary riffle- and blanket-tables are to be used, and the stamping-battery is one of the old-fashioned type, which absorbs a considerable amount of power to work it without giving good effects. The battery is placed on the flat, near the junction of Cedar Creek and a branch of the Totara River, about one and a quarter miles in a straight line from the mine, and at the time of my visit an aerial tramway was in course of construction to connect the mine with the battery. They expected to be ready for crushing in July.

All Nations Company.—This company's ground adjoins the William Tell licensed holding on the north-east side. They have constructed an adit for about 400ft., but have not struck anything but small leaders of quartz which contain a little gold. At the time of my visit all operations were suspended.

Larnach Company.—The low-level adit constructed by subsidy from the Mines vote is in this company's ground. They have driven from the adit on some of the small leaders that were crossed, but have not yet found a payable lode, although a small leader about 4in. thick was found near the surface, in which rich specimens were found. All operations at the time of my visit were suspended.

Swiss Republic Company.—This company has done a good deal of work in prospecting the ground. An adit-level was constructed from the level of the creek following the lode for about 60ft., when it took a heave to the south for about 12ft.: after following it for another 50ft. it cut out in the adit, and went underfoot. A cross-cut was made from this adit, at 60ft. from the mouth, for about 240ft. in a southerly direction, and two small leaders and a reef or lode 4ft. in thickness, carrying gold, have been cut. They were at the time of my visit sinking a winze on the hanging-wall side of the Swiss Reef, near the mouth of the adit. The manager expects the lode at this place, where it is about 2ft. 6in. in thickness, to average about 1oz. of gold to the ton. There were only two men employed at the time of my visit, but there had been six men at work in the mine for a considerable time.

The erection of the crushing-battery belonging to the William Tell Company will afford the other claimholders an opportunity of testing any stone they discover, and will no doubt be the means of this field being prospected, which otherwise could not be satisfactorily done on account of not being able to get the quartz crushed to see the amount of gold it contains.

Taipo.

Teremakau Company.—This company's ground is on the range between the Taipo and Otira Rivers, about a mile and a half from Jackson's accommodation-house, on the Christchurch Road. The company is principally composed of Christchurch people, who have been prospecting here for some considerable time, and have found a quartz lode which they consider payable for working, and they are making arrangements for the erection of a crushing-battery as soon as the dray-road now in course of construction, with subsidy from the Mines vote, is completed. Very little can yet be said respecting this discovery, but with a crushing-battery on the ground the reefs in this district will be properly prospected, and may lead to payable lodes being found.

Nenthorn.

This is a district where auriferous quartz reefs were discovered by McMillan and party in November last. The first discovery was made on the terrace of the southerly side of Deighton Creek, which is the principal branch of the Nenthorn Creek, about three miles in a northerly direction from A. McRae's farm in Moonlight Valley. A trial-crushing of 3 tons was sent to Kincaid and McQueen, Dunedin, where it was crushed, and yielded about 3oz. of gold to the ton; and the adjoining claimholders on the north-easterly side sent 2 tons to Melbourne, which was crushed at Parker's Works at Footscray, and yielded 1oz. 13dwt. per ton.

There are six lines of quartz reefs where gold has been got, running almost parallel with each other, the general direction being north-west and south-east. Some of the lines vary as much as 10° in a more easterly-and-westerly direction. The most northerly line is that discovered by McMillan and party, on which six licensed holdings have been taken up; the second line is known as Crossan's line of reef, on which there is one holding; the third is the Crœsus line, on which there are nine holdings; the fourth, the Victoria and Break of Day, on which there are four holdings; the fifth is Sinclair's line, on which there are four holdings; and the sixth is the Reliance line, on which there are three licensed holdings; and there are three other licensed holdings outside those mentioned In all there are thirty licensed holdings applied for, and being surveyed at the time of my visit. Twenty-seven of these holdings are of 30 acres, and the other three are of smaller areas.

With regard to these quartz lodes, the whole of them are segregated veins from 2in. to 2ft. 6in. in thickness. McMillan's reef varies from 4in. to 18in. in thickness. Crossan's reef is only a narrow vein, but appears to increase in width as it goes down: Crossan's party were engaged at the time of my visit in sinking a shaft in which they expect to cut the reef at 45ft. or 50ft. from the surface. On the Crœsus line a number of holes have been sunk and cuttings have been made, and these have in almost every instance cut the reef. The greatest width of the lode on this line that was

proved at the time of my visit was in the Crœsus Company's claim, where it showed about 2ft. 6in. in thickness. A shaft on this company's claim was down for 14ft., and the stone taken from it was lying on the surface, showing gold in several pieces. On the Victoria and Break of Day line the lode is in some places 18in. in thickness, and has the foot- and hanging-walls very well defined; and on Sinclair's and the Reliance lines the lodes are merely quartz leaders. The distance between McMillan's line and the Reliance line is about 100 chains

The stratification of the schist rocks on the surface is nearly horizontal, but from what could be learned from those who are sinking shafts the strata change, and the bedding has the same dip as the underlie of the lodes, which goes down at a high angle. The quartz in some places is of a soft loose character, greatly coloured with red oxide of iron; in other places the quartz is solid and hard and very crystalline. In some of the crystalline quartz traces of copper can be seen, and a little antimony, and there are small specks of sulphate of iron disseminated through a great deal of the stone. In some of the claims shares are changing hands at high prices: according to the prices paid for the shares the value of some of the claims would be £3,750, and others are valued as highly as £4,000.

With regard to this field, there are a number of licensed holdings now applied for that will never be worked, and it is very probable that some of these are merely taken up with the view of selling shares during the time of the excitement. Indeed, there are many people who believe that it is the richest quartz-reefing district that has been discovered, and who are purchasing shares although they have never seen the field, but are merely guided in their opinions concerning its value by seeing specimens that come from the district. There may be portions of some of these lodes that will pay well for working near the surface, but there is nothing to justify high prices being paid at the present time for shares in the best of the claims, as it is very questionable if these lodes will carry gold that will pay for extracting to any great depth. However, there is near the surface sufficient quartz that contains gold to pay for working if a small battery were erected in the district; but none of the claims are as yet sufficiently prospected to warrant the owners of any individual claim in putting up machinery. The whole of the claimholders on the field ought to combine and put up a small crushing-plant, with good concentrating appliances, in order to test their claims properly before erecting expensive machinery. Unless concentrating machinery is erected a great deal of the gold will be lost, as some of the quartz contains a deal of iron and arsenical pyrites. Some of the stone appears as though there was a little silver in it, but unless it were analysed this could not be definitely determined.

There were, at the time of my visit from sixty to seventy men on the field, and no doubt the country in this direction will be well prospected for quartz reefs. Indeed, a piece of rich stone was shown me by A. Mackay, a miner well known in the Hyde district, who had on the day of my visit brought the specimen from a reef he had found about six miles distant from the Nenthorn reefs; but, as he had not got the ground properly secured, he would not tell exactly where the new discovery was situate.

There is a large reef crossing Deepdell Creek about three miles down from where the road from Macrae's to Hyde crosses it, which has recently been taken up, and gold has been found in it. The place where it crops out on the terrace shows a width of about 9ft. Two shafts were sunk some years ago on each side of the reef to a depth of from 10ft. to 14ft., and gold was then found, but at that time the stone was not deemed payable for working.

Old Man Range.

White's Reef.—The company working this reef has during the last year extended the main level for about 50ft., and stoped out about 50ft. of the reef near the main shaft, which is about 150ft. from the end of the adit. The total length of the adit-level is now 750ft., and the main shaft, which was sunk to a greater depth last year, is now 175ft. deep. A winze has also been sunk below the adit-level, at a distance of about 100ft. from the far end, to a depth of 35ft., and stoping has been carried on from this winze, which really means the workings have been carried on to some extent backside foremost.

The reef, which is 18in. in thickness, is of a very soft and friable nature, and mixed to a great extent with mullock. Indeed, to see the quartz when lying in the paddock, it looks more like wash-dirt for sluicing than quartz for crushing, and it is very questionable if a double process of treatment would not result in far more gold being obtained. The amount of sludge in the stamp-mortar from this class of material makes the water very muddy, and consequently this thick water must carry away a considerable amount of fine gold which would never be deposited on the copper plates. In addition to this there is a considerable quantity of pyrites in the quartz, which is said to be rich in gold; but no attempt is made to save this beyond what can be saved on the blanket-tables. It is well known that there are many mining companies in Victoria that would not pay at all were it not for the pyrites they save and treat; and even some of the concentrated material only yields about 1oz. of gold per ton, whilst other samples average as high as 6oz. to the ton. It is to be regretted that many mining companies adopt a makeshift method of working their ground and treating the lode-stuff imperfectly, rather than lay out a little money in the first instance to open up their mine properly and erect appliances for saving the gold.

During last year about 800oz. of gold was obtained from about the same number of tons of stone, and dividends to the extent of £1,250 were paid. There has been an average of nineteen men employed in connection with this mine.

Bell and Bow Claim.—This is a new reef which was discovered by Messrs. Kemp and Symes about December last. It is situated on the face of the ridge that divides Butcher's Creek from Conroy's Gully, and about two miles up Butcher's Creek from the main road. The reef on the surface was found cropping up about 18in. in width, and it is of the same character of loose, rubbly mullock as that found in White's Reef. A winze has been sunk for 15ft., and the stone at the bot-

tom is said to be of better quality than that found a little below the surface; but near the bottom the lode splits, being about 12in. wide on the hanging-wall and 6in. on the foot-wall, with a narrow horse of mullock in between. The lode-stuff, which is quartz-drift mixed with blue mullock, is greatly charged with iron-pyrites, and when it comes to be treated concentrators will have to be used to save the pyrites. The owners estimate the lode-stuff will yield nearly 2oz. to the ton; but they will be fortunate if half this amount of gold be obtained. Nothing can be said with respect to this discovery until further work is done.

Cromwell District.

Cromwell Gold-mining Company.—This company is at present engaged in sinking a main shaft, which was at the time of my visit in March last down to a depth of 330ft. The old workings were down to 420ft., and before an adit-level can be commenced the shaft will have to be at least 500ft. deep. It will take at the present rate of sinking, which is 4ft. per week, about ten months before the shaft is down to the required level—that is, allowing that no stoppages or breakages take place; but possibly before the shaft is down to the required depth and the level constructed from fifteen to eighteen months will elapse.

Since the new company have commenced operations they have erected new pumping machinery, which is worked by a hurdy-gurdy Pelton water-wheel, also winding machinery, which is driven by a Whitlaw turbine-wheel. The latter wheel also works one of Ford's compressors to supply air for the rock-drills when they are used. The pumps consist of a 9in. plunger fixed at a depth of 250ft. below the surface, with a column of wrought-iron pipes 8in. in diameter; and a draw-lift pump 10in. in diameter is fixed below the plunger to lift the water from the bottom of the shaft. At the time of my visit the pumps were working with a 4ft. stroke, making between four and five strokes per minute; but a much less stroke would have been sufficient to keep the water down. The pumping machinery is well constructed and erected, but the winding machinery is a piece of patchwork, and apparently has been constructed from odds and ends that the old company had on hand at the time the present company took the mine over. At the same time it is safe enough to work with.

The present manager, C. Todd, had charge of the mine when the old company carried on operations, and is therefore well acquainted with the nature of the lode. He stated that previous to the old company suspending the works they sunk a winze below the 420ft. level for 27ft., and at 20ft. down the winze stone was struck which showed gold pretty freely, the reef being from 2ft. to 2ft. 6in. in width, following an easterly-and-westerly course, with an underlie to the north of 1 in 6.

An electric battery is used to fire all the shots in the shaft; but the manager complains greatly of the quality of the copper insulated wire and the detonators which are supplied by Nobel's company to fire the dynamite. He also states that the wires and detonators that the company gets from Melbourne manufacturers are far superior to the others, and scarcely ever fail to explode the charge.

If a payable lode be found at the depth anticipated the whole machinery in connection with the working of the mine and treatment of quartz can be run at a minimum cost, as they have a good supply of water from two head-races, one from Devil's Creek and the other from Bendigo Creek. Both these supplies amount to about fourteen sluice-heads, and are brought on to the ground close to the place where the machinery is erected, having 160ft. head.

Carrick Range.—There is very little doing here with the exception of prospecting. A special claim has been granted, which includes the ground formerly held by the Star of the East, Elizabeth, and other companies, but nothing has been discovered yet of any note. In the early days the reefs on this range were worked with success: rich patches of stone were obtained near the surface, but on following the lode down for about 70ft. it cut out. It was on this range that the Royal Oak Company obtained a large amount of gold from a reef, that enabled them to pay £14,000 in dividends to the shareholders. The same ground has been prospected at deep levels, but no more stone has as yet been found to pay for working.

Ophir.

Green's Reef Company.—The manner in which this company has been carrying on their operations is deserving of comment. The nature of the material where the gold was found by Mr. Green was decomposed finely-laminated schist lying in almost horizontal beds, having veins of quartz-gravel through it. In some of these veins very good prospects of gold were obtained; but now that a gut has been taken out the bottom of this decomposed schist can be plainly seen some distance above the bottom of the cutting, and it appears to one visiting the place now that Mr. Green had most of the decomposed schist worked out previous to selling his property to the present company; but, be that as it may, there has been scarcely any gold got since the present company commenced working.

As soon as the present company was formed they ordered a set of Wall rolls to crush the whole of the material; but it was found after operating about 100 tons of material that this machine was not suitable—that it clogged up, as was predicted would happen in my last annual report. The 100 tons mentioned yielded at the rate of about 1dwt. 12gr. of gold per ton. A wrought-iron puddling-machine was next erected, and a tramway constructed between the mine and the machine, and after treating some 200 tons it yielded at the rate of about 3gr. per ton. Eighteen tons of picked stuff was tested by the puddling process, which yielded about 2½dwt. The puddling and crushing processes having both failed, a line of sluice-boxes with a number of drops was then constructed, and the stuff was operated on with the following results:—

127	tons yielded	17dwt.	of gold.
250	"	11	"
220	"	13	"
597	"	41	"

This shows that 597 tons was treated in the sluice-boxes, and yielded 2oz. 1dwt. of gold. These figures were given me by the mine-manager, who is still carrying on prospecting operations with the view of cutting a quartz lode, which shows going down alongside the foot-wall of the material worked. The amount of money expended is stated to have been about £3,400.

The manner in which the workings of this company's property have been carried on, employing labour to get out and treat what both the manager and directors must have known to be worthless material, is almost sufficient to damn any legitimate mining enterprise, as the shareholders could be made to pay to the uttermost farthing of the value of their shares without any prospect of the venture ever being made successful. If gold did exist in the material they are now working in, it would never be got out by the present appliances. The Wall rolls, although having a great crushing-capacity, are not suitable to operate on this class of material unless the quartz were first separated from the schist. And then, merely a set of rolls is not sufficient. They require revolving screens to each set of rolls, and an elevator to return any coarse stuff back into the hopper above the rolls; and also, before rolls of this description can be utilised the quartz must be first put through a stone-breaker to reduce it well before allowing any piece to pass into the rolls. Even had the company had a solid-quartz lode instead of decomposed schist and quartz, they had only one part of a crushing-machine, which in itself was perfectly useless unless connected with the other parts. The sluicing process adopted could not possibly save the gold, as it is known only to exist in cemented seams, and this cement does not get broken up, but merely rolls down the boxes and gets away among the tailings. If there was gold in this material a good method of treatment would be to sluice the stuff into a paddock, and then puddle it clean in the paddock with hydraulic nozzles, and afterwards crush the quartz-gravel. By this means all the gold could be obtained.

Green's Claim.—Mr. Green, the prospector of Green's Reef, has discovered a new reef to the northwards of Corrigall's Reef, and was at the time of my visit prospecting on the outcrop. He has also taken up Corrigall's Reef, and erected a battery of eight heads of stamps to crush the quartz. The new discovery cannot be termed a quartz lode, but it is more of a quartz conglomerate without having any clearly-defined walls. This conglomerate is full of oxide of iron, and on washing a dishful of the lode-stuff a fair prospect of very fine gold was obtained, resembling to a great extent the prospects obtained from the caps of the reefs in the Owen district. Although the prospects appear encouraging, the character of the gold is such that not more than from 6dwt. to 8dwt. to the ton can be expected. There is, however, a good width of this quartz conglomerate carrying gold, which may be made to pay for working with a good reduction-plant.

The crushing-plant erected by Mr. Green is one of the very old type, requiring a large amount of power to work for the quantity of material operated on. The stamps are to be driven by a new design of water-motor, which is a combination of the Pelton and Ponclet wheels. It had not been tried at the time of my visit; but, from the principle on which it is constructed, it cannot give a high percentage of the power of the water.

Burren's Reef.—This is a new discovery of quartz conglomerate similar to that in Green's Claim. Mr. Burren is sluicing away the soft mullocky material and saving the quartz. There is a little gold through the whole of the material. A quartz specimen was shown to me with gold fairly distributed through it. Still, on the whole, the prospects are not very encouraging.

Rough Ridge.

The only company that has been doing any work here for a considerable time is the Great Eastern. This company has been working from a shaft which is about 240ft. in depth, and hauling the lode-stuff up by means of a horse-whim. At the bottom of this shaft there is a level constructed at both sides, which altogether is from 400ft. to 500ft. in length, and they have been stoping out the lode at about 260ft. from the shaft. The workings were suspended at the time of my visit to this portion of the district, and there was a considerable amount of water in the shaft, so that there was no opportunity of examining the workings. From information received, the lode is said to average about 2ft. in thickness; and Mr. Norman, the legal manager, informed me that during the last eighteen months 615 tons of quartz had been crushed, which yielded 1,180oz. of gold, which represents £4,435.

This company's property, together with that of the Progress, Old Prince Alfred, and Queen of the Isles, also Mr. Withers's freehold of fifty acres, has been combined, and a large company has been floated in the London market with a capital of £100,000; but the new company, like all the other English companies that have been formed for working New Zealand mines, is greatly loaded. Out of this large capital there is only £25,000 left to work the mine. Most of the capital is gone in promoters' shares. The exact price paid to the shareholders of the several companies has not yet transpired, but from information given me it is something like £22,000. Of this amount £15,000 is in paid-up shares, and the balance in cash. If these be the terms on which the new company acquired the property, £55,000 has gone to the promoters in either cash or paid-up shares. Mining companies formed on a basis of this description can hardly expect mines to pay a fair interest on the capital unless the lodes were exceptionally large and also rich in gold. We want foreign capital to develop the mines in the colony, but unless the ventures pay fair interest on the capital invested it will ultimately be ruinous to the mining industry, as it will prevent those who would actually put capital into mining companies from investing it in this channel.

The area of ground transferred to the new company is, two licensed holdings of twenty-five acres each, two special claims of twenty-five acres each, and fifty acres of freehold—in all, 150 acres. There are some water-rights connected with the property, and also a crushing-battery of five heads of stamps. The latter is valueless to the new company, as it is one of the old type, as well as all the appliances connected with it, and is not likely to save more than 50 per cent. of the gold in the quartz that is reduced and treated at it.

SERPENTINE.

The Golden Gully United Company have done considerable work on the reefs at Serpentine. They have constructed an adit-level for a distance of 1,200ft., and have sunk the old shaft used by Turnbull to a further depth of 60ft., making the total depth of the shaft 100ft. In constructing the adit a quartz lode or leader, from 1in. to 2ft. in thickness, was followed, which contained gold, but not sufficient to pay for working. At one time it was thought that the lode in the adit-level was the same that Turnbull was working on near the surface, from which he got out a crushing which yielded 4oz. of gold per ton of quartz. This induced the present company to go into his shaft and sink it deeper; and the trial-crushing of the stone from this shaft averaged about 1oz. of gold to the ton. They now find, according to the underlie of the lode, that the adit-level is from 80ft. to 100ft. to one side, and they are now engaged in constructing a cross-cut to try and cut the lode if it continues to go down to the depth of the adit-level, which is 250ft. below the surface of the ground at Turnbull's shaft.

This company has a nominal capital of £18,000, in 72,000 shares of 5s. each, of which 50,000 are taken up. Two shillings per share has been paid on 30,000 shares, and 6d. per share on 20,000, which is £3,500 that has been spent on the mine. The company have no crushing machinery of their own, but have to take their quartz a distance of four miles to a crushing-battery belonging to the Colonial Bank. The area of ground held by them is ninety-nine acres.

MACETOWN.

Tipperary Company.—This company has done very little work in their mine for several months—merely prospecting. They have sunk a winze from No. 4 Level for 110ft., and went through a body of stone from 9ft. to 12ft. in thickness, which the manager informed me yielded 11dwt. of gold per ton. They also continued the No. 7 Level northwards, and went through a block of stone 74ft. in length and from 6ft. to 8ft. in thickness, which was said to yield 8dwt. of gold per ton; but the present way of working, which is merely a makeshift, would not enable the company to make a lode of this description pay.

Recently this company has taken up the ground formerly held on mining leases by the Canton, Caledonian, Macetown, Otago, and No Tipperary Companies, and now hold it, including their own mining lease, in a special claim of about eighty acres. The manager informed me that it is the intention of re-forming the company, with a capital of £100,000, to work the ground on a large scale and open the mine systematically, so as to reduce the cost of taking out and crushing the stone to a minimum amount.

The manager informed me that as soon as the re-formation of the company is effected the intention is to construct a low-level tunnel from the battery-level to work the ground. This tunnel, or adit, will be about 3,000ft. in length and will take about two years to construct, and he estimates its cost at £5,000, which appears to be, judging from the character of the rock, a very low estimate. Indeed, it is questionable whether it could be constructed under the most favourable circumstances for this amount: probably £7,500 will be nearer the mark.

There is no doubt that the construction of a low-level tunnel will enable the ground to be worked economically, but there is a question which ought to be well thought of before incurring so large an expenditure—namely, are the auriferous lodes in the ground of sufficient dimensions and richness to warrant the expenditure? These ought to be well prospected, so that some definite basis can be got to calculate their value, in order to carry on the future operations in the mine on purely commercial principles. This low-level adit will, however, be the means of low-grade quartz being worked which under the present system of working would not pay the expense of taking out of the mine, and therefore it will be the means of the low-grade stone being worked, which otherwise could not be done. There are four men employed in keeping down the water in the lower levels, and in effecting repairs to the crushing-battery.

Premier Company.—This company have now only four men employed. They suspended their principal operations at the end of last year with the view of re-forming the company with larger capital, to open up the mine in a proper and systematic manner, which hitherto has not been the case, for a more expensive method of working a quartz-mine than has been adopted here could scarcely be devised, and had it not been for the richness of the lode the manager could not have been able to make it pay the expenses of working. Everything appears to be constructed, if the term may be used, "backside foremost."

The manager informed me that Mr. Farrell, one of the directors, had gone to London with the view of placing the company's property in the English market, in order to get sufficient capital to construct a low adit and open out the mine properly. The lode in this mine averages about 3ft. in thickness, and the last crushing of 370 tons of quartz yielded at the rate of 17dwt. of gold per ton. In the event of the new company being formed, two other mining leases—namely, the Orient and Amenta—will be amalgamated, with their present ground.

The construction of a low adit, if done five years ago, would have made this mine a payable venture for the shareholders, and the cost of its construction would have been paid long ago in the saving effected in taking out the quartz. It is this hand-to-mouth business that is crippling the mining industry and causing many mines to be worked only paying bare expenses, whereas if they were properly opened out in the first instance they would have produced good returns for the capital invested; and the Premier Company's mine is an instance of this. Instead of working for almost bare expenses, the richness of the lode and the body of auriferous stone should, under a favourable system of working, have given the shareholders good interest for their capital.

Sunrise Company.—This company's mine is situate on Advance Peak, and is the same ground which was said to be held in former years by the Keep It Dark Company. The lode is worked from an adit-level; but the stone overhead is getting stoped out, and before any large workings can be opened out a lower level will have to be constructed. The lode is very much in bunches,

widening out and pinching in intermittently; but the stone gives a good average yield of gold. But, with regard to the permanency of the mine, little can be said about it until there is prospecting done on the deeper levels.

This is a district where there is an abundance of auriferous-quartz lodes; but they are as yet merely scratched on the surface, owing to the rough broken nature of the country, and the expense of timber for the mines, which all comes from the side of Lake Wakatipu, together with the defective crushing-plants, which can only get but a certain percentage of the gold out of the stone. No attempt is made to save any pyrites, this product being considered as valueless.

Lake District.

Invincible Company.—This company's mine is situated about fourteen miles up the Rees Valley the head of Lake Wakatipu. At the time of my former visit to the district the workings in this mine were suspended. No auriferous stone could be obtained that would pay for working. Indeed, the state of the workings at the time of my visit two years ago, and the manner in which the lower level was being constructed, showed that the person in charge of the mine did not possess the highest qualifications necessary for a mine-manager, but carried on the workings in a haphazard manner, trusting to chance more than anything else to strike the lode at a lower level. He pronounced the mine a failure, and advised the company to abandon it and wind up its affairs. However, some of the shareholders were not inclined to do this, and finally it was agreed to let the mine on tribute, the tributers paying 16 per cent. of the gross yield of gold and to have the mine for three years. The result was that the tributers found the lode sufficiently rich to pay them to work it. During last year the total amount of gold obtained from this mine was 500oz., representing a value of £1,925. The body of stone this amount of gold was taken from is under the lowest or machine level. A winze was sunk in the bottom of this level for 55ft. in depth. At the bottom of this winze the lode proved to be 55ft. in length and 10ft. in width; but, although it maintains the same width on the machine-level, it is only 32ft. in length, thereby showing that it increases in length as it goes down. The way in which the stone has to be hauled up the winze, and also the amount of water that has to be lifted out of the winze, makes the cost of getting the quartz much more than it otherwise should be if the mine were worked to the best advantage. The last crushing of 510 tons yielded 165oz. of gold, or nearly 7dwt. per ton. The number of tons of quartz crushed during the year was 1,361, which yielded on an average a little over 7dwt. per ton. The character of the lode that the tributers are now working is exactly similar to that found on the upper levels, only that the lode is more solid. It cannot be traced up to join the upper lode, which cut out; but it is apparently the same lode thrown out of its original position.

Skipper's.

Phœnix Company.—This company is at the present time almost at a standstill. All the men are discharged with the exception of four, who are prospecting the ground. On my last visit to this mine the upper levels were being opened out with the expectation that some payable auriferous quartz would be found; but this has been proved to be a failure, and all the workings in this direction has been suspended. Recently Mr. Bullin, the owner of the Phœnix Mine, has purchased the ground belonging to the Phœnix Extended Company, and has four men employed in prospecting that ground to try and find the north and middle lode. The latter was formerly known by the name of the Promised Land. These two lodes are the ones where gold is expected to be found. The south and main lodes proved at the deepest level the company worked at that they would not pay to stope out, and the north and middle lodes at this level contained very low-grade stone.

The winding-engine which was erected underground to haul the quartz from the main tunnel is being taken out with the view of erecting it near the shaft on the Phœnix Extended Company's lease, to pump out the water in the shaft, so that the present cross-cut adits may be extended. This engine will be driven by compressed air, as formerly. On the whole the mine presents a dilapidated appearance at the present time, especially in the crushing-battery, where ten heads of stamps are being removed to Butcher's Gully to test the reefs in that locality; but the underground manager stated he had great hopes of something being struck before long to warrant the mine being worked with the full complement of hands. The total amount of gold obtained by the company during last year was only 150oz.

The suspension of this mine must be severely felt in this district, as during the last three years Mr. Evans, jun., stated that over £60,000 has been expended in wages, timber, plant, &c., in connection with the working of the mine.

Phœnix Extended.—This company held the ground adjoining the Phœnix Mine, and sunk a shaft to a depth of 150ft., and constructed an adit from the bottom of this shaft for about 100ft., to try and cut the south lode that was found in the Phœnix Mine; but were unsuccessful. Latterly they have sold the crushing-battery they purchased from Mr. Southberg's company, to be removed from the ground, and their lease has been sold to Mr. Bullin, so that practically the company may be said to have been wound up. The expenditure by this company is said to be about £4,500.

Butcher's Reef.—This reef was discovered over twelve months ago by Messrs. Richards and Dunlop, about two miles up Butcher's Creek, above its junction with Skipper's Creek. There are two lodes running parallel with one another about 100ft. apart; these lodes are on the face of the terrace, about 150ft. and 250ft. above the level of the creek respectively. From information received respecting these lodes the upper one is about 3ft. in thickness, and the lower one about 18in.,

the lodes following the strata of the adjoining rocks. Eighteen tons from the upper lode has been crushed, which yielded 12dwt. of gold per ton, and a few tons have been crushed from the lower lode, which gave remarkably good returns, being over 1oz. per ton. However, there is scarcely any work yet done on either of the lodes to prove whether they will continue to go down. The lower lode only appears to be a short block of quartz—say, 16ft. in length—and pinches out at each end; but Mr. Evans informed me that it is getting longer and thicker as it goes down. The claim has recently been purchased by Mr. F. Evans and Sons, and they were engaged at the time of my visit in removing ten heads of stamps from the Phœnix Company's battery at Skipper's, to erect at the reef at Butcher's Gully, in order to test the ground. This battery is to be driven by a Little Giant turbine water-wheel, which was formerly used by the Pyrites Company in the valley of the Rees River to work their machinery.

Gallant Tipperary Company.—This company's mine is situated about a mile up the Shotover River, above its junction with Skipper's Creek. There has been a deal of work done since my last visit, and the mine is now in good working-order. The block of auriferous quartz that has been worked is about 90ft. in length, and is stoped out for about 170ft. above the main level. At the time of my visit they were constructing an intermediate level at 150ft., which was necessitated owing to a new body of quartz being found in the same line as the lode they had been working. The lode wedged out into mullock, and the walls closed considerably; but after driving some distance, following a thin vein which divided the hanging- from the foot-wall, they came upon a large body of quartz again, which promises to be equally as rich in gold as that which has been stoped out.

The lode in this mine has every appearance of being a permanent one, inasmuch as it not a segregated vein following the strata of the country, but it is a true fissure-lode cutting across the strata at a good angle; but, although the quartz lode may be a permanent one, it has to be prospected at greater depths in order to ascertain whether the gold continues to go down with the stone in sufficient quantities to pay for working. This company, like many others, have been working at great disadvantage in being encumbered with debt when they commenced to work the lode. They would not make calls to open out the mine properly, but trusted to finding funds from the proceeds of the mine to pay off their liabilities and undertake new works; and the result has been that all manner of makeshifts have been resorted to in order to keep the expenditure down to the lowest point, and the effect of this has been that the cost of getting and crushing the stone has been so great that the profits on the working of the mine have been extremely small considering the average yield of gold in the quartz.

When it is stated that the lode that this company has been working on has averaged 6ft. in thickness, and yielded from 11dwt. to 18dwt. of gold per ton of stone, and that the profits on last year's work have only amounted to about £1,500, which the manager informed me had enabled them to clear off their liabilities, the natural impression is that with a lode of this description the net profits on the working ought to have been considerably more.

In addition to the cost of getting and crushing their stone, the machinery employed—which is a common crushing-battery, consisting of twelve heads of stamps (four stamps in each mortar), with about 2ft. of copper plates on the riffle-tables, and the rest of them covered with blankets—is really so defective that a very large percentage of the gold is lost. There is not even a single berdan to crush the blanketings. The amount of pyrites in the quartz is considerable, and from the statements of those connected with the mine the samples of pyrites that have been analysed have proved to contain a large amount of gold. Indeed, there is not at present a mining company in the colony who is using a more defective crushing-plant.

The situation of the mine and the natural advantages for getting the stone taken to the battery are such that this mine should be worked as cheaply as any in the colony. At present there are four men and a battery-manager employed in crushing the stone, and the amount of stone that goes through the battery per week, working twelve hours per day, averages only from 45 to 50 tons. It would pay this company ten times over to discard the present plant and erect a modern battery, with ten heads of stamps, a small Giant rock-breaker, two Challenge ore-feeders, and three Frue vanners. With such a plant they could crush from 100 to 120 tons of stone per week, working the same time as they do at present, and all the labour required would be at the most two men, and possibly only one man and a boy; and, in addition to this, the amount of gold obtained from the stone would be greatly increased.

It is with such primitive modes of working as this company adopt that many of the mines in the colony prove failures. Indeed, if there is not a large percentage of gold in the quartz, mines cannot be worked with profit by a primitive process. This company appears to have a good property; but, unless it is managed and conducted on different principles, there is no chance of the property becoming so remunerative an investment as it ought to be. Every mine should be worked on the most economic principles, and to do this improved machinery and appliances are required; and also, during the time that the upper levels are being worked a lower level should be constructed, and the lode opened out to such an extent that when the whole of the upper workings are stoped out the workings can be carried on in the next level without any diminution in the supply of quartz, to keep the crushing-plant fully employed.

The average number of men employed by the company is eighteen, and the amount of gold obtained during last year was 900oz.

Maori Point Quartz Company.—This company has been wound up during last year, and thei machinery sold. Any one visiting the so-called mine which belonged to this company, with scarcely a trace of a quartz lode, cannot fail to be impressed with the idea that a great deal of blame rests on the promoters and those who recommended capital to be spent without the slightest chance of getting any returns to repay the investment. The formation of companies to work mines of this description has a most damaging effect on the development of legitimate mining enterprises in the colony, and only puts a very small amount into the pockets of the undeserving promoters.

ALLUVIAL MINING.

Pelorus District.

The mining population in this district has increased considerably during last year, owing to gold being discovered at Mahakipawa and Waikakaho. In June last year gold was discovered in the bed of the Mahakipawa Creek, about four miles up from its entrance into the Mahakipawa arm of the Pelorus Sound. This discovery was made by Charles Jackson, who had been prospecting in this creek for some time previous. The great cry nowadays is, that unless tracks be made the miners cannot get into the bush to prospect; but this discovery proves the fallacy of this. Mahakipawa Creek, at the head of Cullen's freehold, comes out of a gorge through which a person cannot travel when the creek is the least flooded, and even when the water in the creek is low it is only by jumping from boulder to boulder that one can get up it. The prospector had to carry all his provisions on his back through a thick dense bush full of supplejacks, on steep rocky sidelings, over high cliffs, crossing and recrossing the creek, to get up to the place where he found the gold. On my first visit to this new discovery it took fully two hours from entering the gorge to get to the prospector's claim, and the distance was only two miles. It is, without exception, the roughest piece of country in the colony for miners to get into to prospect without a track. It, however, affords gratification to find that men, after enduring severe hardships, get rewarded for their labour, and that the discovery of this field has been the means of affording profitable employment to a large number of men.

After it became known that gold was discovered in this creek, miners flocked from all parts of the colony; but, like a great many goldfields rushes, many went away disappointed, and characterized the field as a "duffer." This was not to be wondered at, seeing that the creek remained flooded for a long time after the rush set in, and could not be worked. Those that remained turned their attention to the terraces, where some very good claims have been opened up. On my last visit, in the beginning of May last, some of the claims in the shallow portion of the creek were worked out, but had given very good wages to those who had worked there.

The names of those who are in the prospectors' claim are Charles Jackson, Matthew Patterson, Hugh Patterson, William Campbell, and James Norton. The men hold as a prospectors' claim 1,000ft. of the main creek. The gold has been traced from this claim up to the head of the right branch, and down the creek into Cullen's freehold on the flat; but as the creek gets down towards this flat the ground gets deep and difficult to work. Shafts are sunk and pumping appliances erected, and the ground is only now being opened up in a fair way for working. The gold is all of a coarse character, and nuggety. Some pieces have been found weighing 30oz., while the generality of the gold is about as coarse as split peas. It was impossible for me to visit all the claims during my visit, but, from information received, the following is a list of the principal claims at work:—

Name of Party or Claim.	Approximate Depth of Ground.	Number of Men Employed.
	Ft.	
Corbitt and party	70	6
Hibernian Claim	45	6
Paterson and party	37	5
Wairarapa Claim	30	6
Barber and party	Not bottomed	4
Mills and party	36	6
Nesbit and party	36	6
Lyford and party	Not bottomed	6
Fisherman's Claim	14	4
Johnston and party	25	4
Cawte and party	10	7
Maori's Claim	12	4
Reader and party	26	6
Lorrey and party	26	4
Rush and party	26	6
Gregg and party	8	4
Prospectors	8	5
Jackson and party	26	6
Mackintosh and party	26	4
Pulman and party	10	4
Aldridge and party	12	4
Goulter's Claim	6	1
Honny's Claim	7	4
Hippolite Claim	6	6
Hen and Chickens Claim	12	8
Harrison's Claim	30	6
Widdon and party	18	4
Cotter's Claim	18	4
Maori Claim	10	4
Hungerford and party	10	3
Punch and another	12	2
Bulmer and another	8	2
Laird and another	12	2
	...	156

There are several other parties in the creek whose names my informant could not remember, and also a large number of claims on the terraces on both sides of the main creek. There must be about at least three hundred miners employed on the Mahakipawa side of the range, exclusive of the business people in the township.

Some of the creek claims are turning out remarkably well. Gregg and party get from £10 to £25 a week per man. This is said to be one of the best claims on the field. The Prospectors' Claim has not turned out so rich as expected. They got good gold when the claim was first opened, but they have had to go through a deal of ground that was very poor; but it is said that recently they have come on to good ground again. All the upper portion of the creek is being worked by tail-races; but, as the ground gets deep going towards Cullen's freehold, it is worked from shafts and driven out. Corbitt and party are lowest down the flat. They had at the time of my visit sunk a shaft to a depth of 70ft. on one side of the flat, and were driving an adit from the bottom of the shaft in the reef to cut the deep ground in the flat. This party, previous to commencing to sink this shaft, sank a shaft lower down the flat, and had a portable engine and pulsometer pump to lift the water; but the pump was far too small to contend with the water in the ground, and consequently they abandoned this shaft and came up to the place where they are now working. The parties working on the freehold pay the proprietor of the land from 10s. to 20s. an acre per month for the land they hold, with the right to mine thereon.

Waikakaho.—This is a creek on the opposite side of the saddle from the right branch of the Mahakipawa Creek, where gold was discovered about the end of last year by Hart and Gibson, who are termed by those working in this creek "the prospectors."

Commencing at the head of the creek, the following claims are being worked:—

Junction Claim.—This claim was held for some time, and an adit-level constructed, to work the ground as well as drain it; but before getting the adit in far enough to strike the wash-drift the original holders abandoned it. Another party has taken up this claim and continued the adit-level; but no gold had at the time of my visit been got. There were four men employed.

Whilley and Party.—This is a party of six men, who were sinking a shaft, but had not bottomed.

Tomlingson and Party.—They have erected an overshot water-wheel, which works two small pumps. They were sinking a shaft, but had not bottomed. Six men were employed.

West Coast Claim.—This claim is held by a party of six men. They were constructing an adit-level, which was in for 200ft., to drain the ground; but no gold had been got at the time of my visit.

Hart and Party.—This party sank a shaft for about 40ft., and constructed an adit from the bottom for 60ft.; but were beaten out by water. They are now constructing an underground tail-race to drain the ground, and were in for about 130ft. Four men were employed.

Burnet and Party.—This party and O'Leary's party have amalgamated their ground. They have erected an overshot water-wheel and two small pumps, and have sunk a shaft to a depth of 46ft.; but the pumps could not contend with the water, and they were unable to bottom. They have suspended operations and applied for protection for a time. There were eight men employed.

Annear and Party.—This party constructed an adit-level for 100ft., and then came back to the mouth of the adit and sank a shaft to the depth of 17ft., where they bottomed on the sideling reef, and got a little gold. The adjoining claim to this, held by Alexander and party, continued the adit until they struck the sideling reef, where they got a little gold; but neither party had got into the deep ground. There were eight men employed.

The next claim is held by two Maoris, and is under protection.

Booker's Claim.—This is a claim held by two men. They sank a shaft to a depth of 17ft., and got about 30oz. gold on a small portion on the bottom; but they were not able to keep down the water, and now they are constructing a tail-race to drain the ground.

Maoris' Claim.—There is scarcely any work done in this claim. The adjoining claim, the Prospectors', have offered them £250 for the ground; but they will not accept this offer. They are waiting until the prospectors work up to their boundary, when they will be able to get it drained.

Hart and Gibson (Prospectors').—The ground here is about 12ft. deep. They are stripping off the surface and sluicing the wash-drift. They have got about a thousand pounds' worth of gold out of the ground since it has been opened.

Alridge and Party.—This is a party of six men. They have sunk a shaft to a depth of 70ft., and bottomed on the sideling reef, but had not got into the deep ground at the time of my visit.

Sailors' Claim.—There are six men employed in this claim. They have erected an overshot water-wheel and two small pumps, and have sunk a shaft to a depth of 60ft., bottoming on the sideling reef, but have not yet got into the deep ground, where they expect to get gold.

Chip-in Company.—This company has an eight-horse portable steam-engine, which works a lift- and force-pump about 4in. in diameter. They have sunk a shaft to a depth of 60ft., and bottomed on the sideling reef. They intend to sink the shaft on the reef for some distance, and afterwards drive for the deep ground. There were ten men employed.

Perseverance Company.—This is the lowest-down company on the flat. They have sunk a shaft to a depth of 85ft., and got a little gold off the bottom. They have a ten-horse portable steam-engine, and a lift-pump 11in. in diameter. A well has been sunk in the reef, and a commencement made to open out from the shaft. There are about eighteen men employed by this company.

There are about eighty-eight men employed in alluvial claims on the Waikakaho side of the range, and if the Perseverance Company is successful in finding payable ground in their claim there is a considerable extent of ground in the flat that is likely to be taken up and worked. Taking both sides of the range, the discovery of these diggings has been the means of supporting about two thousand of a population, when the miners' families and business people are taken into consideration. The approximate amount of gold taken from the field up to the 31st March last was 2,300oz., which would represent a value of about £8,740.

CHARLESTON DISTRICT.

This field was opened in 1866, and a large amount of gold has been obtained at a very small cost. A few years ago the amount of money deposited in the banks by miners working on this field was far greater for the population than upon any other alluvial field in the colony; but it is like all other alluvial fields, the rich ground is getting worked out, and the population getting gradually less. Still, those that are now remaining—which are principally men with families—have settled down, acquired small pieces of land, and when they are not at work in their claims they are cultivating their ground, and thereby obtaining a very good livelihood.

Lately there have been several extended claims taken up on the flat between Charleston and the Back Lead. The ground here was partially worked on the surface in the early days, and they are now finding sufficient gold to pay for working it to a greater depth. Indeed, there is a large extent of ground on this flat which has never been properly prospected yet, and if the claims lately taken up prove payable for working, there is a good prospect of this field supporting a fair population for many years.

On the Back Lead, to which the Government water-race was extended three years ago, the Dublin City Company have a very good claim, which is estimated to take twenty years to work out. At the time of my visit a fourth share in the ground belonging to this company was sold for £350. They have been sluicing the ground since the race was extended, but they now find a large quantity of cemented sand which requires crushing before the gold can be extracted from it, and they are erecting a small crushing-battery of four heads of stamps to deal with this cement, which is to be driven by an overshot water-wheel 30ft. in diameter. This battery will be completed in about six weeks.

Weir Brothers' Claim.—This is a claim in Ballarat Gully which is proposed to be worked on the hydraulic elevating principle, and pipes are now being constructed to commence operations. The whole of the bed of this gully, as well as the beds of Argyle and Victoria Gullies, have been held for many years by parties having wide tables placed in the channel through which the muddy water and tailings coming from terrace claims pass, who are said to earn a good livelihood by merely collecting the gold from the blankets with which these tables are covered; but beyond this no attempt has been made to work the beds of the creeks, which must contain a great deal of gold, seeing that they are wide gulches cut out of the terraces where rich ground has been worked. Weir Brothers are now going to work the bed of the gully on the elevating principle; but, like many others, they are making a mistake by getting too small a plant, and not utilising the whole of the fall from the water-race, which is about 280ft. They are taking the water from the race and leading in on to the top of the terrace directly above where they intend working, which will only give them about 120ft. of head. They are getting pipes of only 7in. diameter, and intend lifting the tailings and wash-drift to a height of 15ft. If a proper hydraulic plant were constructed to work the bed of these gullies there would not be a better alluvial mining venture in the colony, but with a small plant they cannot expect to be able to work the ground so advantageously. However, it is a step in the right direction, and it will allow others to see that ground can be worked on the elevating principle, and they will profit by the mistakes made by those who first introduced the principle on this field.

On Brown's Terrace, which is on the north side of the Nile River, between the river and Croninville, a licensed holding of thirty acres has been taken up. The ground here is of a cemented character, and is said to contain a good deal of gold; but there is no water to be got to command this ground unless it be taken from the end of the Government race in pipes across the Nile River. But it is proposed at present to work the ground by crushing the cement, leaving the sluicing portions to a future time.

Nine-mile.—A number of people are employed working on the sea-beach. This beach has been worked for about eighteen years, and still continues to give remunerative employment. This is principally a settlement of Shetlanders, who have small pieces of land, and, residing near the sea-beach, are able to watch the action of the sea on the beach. The waves occasionally cut the beach away, leaving the gold and black sand on the surface, where they are easily collected. There are about nineteen claims on this beach, and generally after a south-west gale the owners are able to earn very high wages for a time, and then they cultivate their ground until another gale comes to cut the beach away again.

Further north than the Nine-mile there are about twenty claims taken up on the beach. One party—Arbuckle and party—has spent about £500 in constructing a water-race to bring in water to work the ground. Between this and Cape Foulwind there are about twelve special dredging-claims taken up, but there is no work done on them beyond a little prospecting.

Croninville.—There is no new ground opened up here, but those who have claims on this field are doing fairly well. In Flanigan and party's claim two shares changed hands at £350 and £400 respectively. Between this and Addison's Flat some new ground is taken up on Auckland Flat, and a water-race constructed. The party has been employed for about two years in bringing water on the ground and opening up the claim, and now they are in full work, and are said to be doing very well.

Addison's Flat.—This is a district where claims are likely to pay very well for working for many years. There is a large extent of new ground where no prospecting has been done. The whole of this flat has been under the sea at one time, as the gold is all found in a sea-beach wash. Where the known leads of gold were found all the shallow ground that was easily worked is worked out; but there is a large extent of deep ground on these leads yet that has never been touched on account of the large quantity of water there is to contend with. Very long tail-races have been constructed, and those who are using them are doing extremely well. Carmody and party of eight men, Hallaghan and party of eight men, Neil and party of five men, and Morran and party of six men, have been working here since Addison's Flat was first rushed. These parties are working the ground with tail-races, and lifting the large stones with trucks on an incline worked with a water-balance, the fine tailings and water going away from the tables down the tail-races.

Recently a number of special claims have been taken up on this flat with the view of working them on the hydraulic elevating principle, with very good results. When once this system of working is fully established in the district there will be a great deal of ground profitably worked that is now lying idle. The great difficulty that this field has hitherto had to contend with is that there is no fall for sluicing; but this system of working will obviate this difficulty.

Mace and Bassett's Claim.—This claim is situate at the end of the new road that was constructed about two years ago with a subsidy from the Mines vote. It is about two miles from the Westport–Charleston road, towards Cape Foulwind. The owners have constructed two large dams and a number of supply-races. They convey the water in wrought-iron pipes, 20in. in diameter, for about 7,000ft., and are working the ground on the hydraulic elevating system. Their elevating-pipe is 10in. in diameter, with a 3in. nozzle, and they lift the stuff 15ft. with a head of 75ft., which is far too small a head to lift the stuff this height satisfactorily; yet they are doing extremely well. It is said to be one of the richest claims in the district.

Fair Maid and Gladstone Claims.—This claim belongs to a Dunedin syndicate, which has spent about £7,000 in plant, dams, and water-races to work the ground. Ever since they commenced operations they have met with opposition from those residing in the neighbourhood, on account of their constructing a dam on the top of the terrace which was thought would probably break away and injure some property in the flat; but if such were to take place the only property that would be injured is that belonging to themselves. Plans of this dam were submitted by the Warden to the department for approval before they were allowed to construct it. After it was constructed the only place where a safe wash could be made was granted by the Warden as a water-right to some one else. It is disheartening to those who put in a large amount of capital to develop the field and to work the ground systematically to meet with so much opposition. Instead of putting barriers in the way, every encouragement should be given to those who embark their capital in mining ventures. The time has passed when mining can be profitably carried on with individual labour alone. It is only by working poor ground in a wholesale manner that it can be made to pay, and this entails a large expenditure in placing a good plant on the ground.

This company has a special claim of 100 acres adjoining the terrace on the upper end of Addison's Flat, about two miles towards Westport from Addison's Township. They have constructed a substantial dam on the top of the terrace, and a supply-race from one of the creeks coming out of the main range. The by-wash from the dam, constructed on the north side, is at too high a level, its bottom being only 4ft. below the top of the embankment, which in flood-time will tend to make the embankment of the dam unsafe; besides, it is constructed in such a place that when a quantity of water is flowing over, the ground will scour away unless well protected. Indeed, a heavy flow of water in this by-wash would cut away the ground back into the dam in one night. There is a natural by-wash on the south side of the embankment down a creek; but some one else holds a water-right out of this creek, so that the company cannot utilise the waste water from the dam if sent down in this direction.

A water-race is constructed from the dam to the edge of the terrace, and from this point the water is brought down to the claim in wrought-iron pipes, 18½in. in diameter, made of Nos. 12 and 10 BWG iron. At the bottom of the terrace there are two branch-pipes, 11in. and 15in. in diameter respectively, one for supplying water to the elevating-nozzle, and one for supplying water for the breaking-down nozzle, both nozzles being 3½in. in diameter. There is 240ft. head of water at the claim, and it is proposed to lift the material with this head to a height of 36ft. 6in., which is too high for the head to work satisfactorily unless a current of air is admitted into the bottom of the elevating-pipe. It has been clearly demonstrated that the lifting-capacity of the water is greatly reduced when the water and tailings are allowed to cover the opening at the bottom, showing that a current of air mixed with the water increases the force; and it is almost impossible to prevent the opening at the elevating-pipe being choked at times. A patent has been obtained in the colony by Mr. Robertson for an air-pipe connnected with the bottom of the elevating-pipe, to remedy this defect.

The material is elevated into a longitudinal box about 40ft. in length and 3ft. 6in. in width. This box is constructed with two bottoms, the upper bottom being a perforated iron plate $\frac{3}{8}$in. in thickness, with holes of $\frac{9}{16}$in. in diameter. The gravel and stones run over the top of the plates into a cage-hopper, while the fine stuff goes through the perforated plate on to the lower bottom and into a flume with angle-iron riffles, about 100ft. in length, thence down a tail-race for about 600ft. to a mixing-tank, where there are placed the same number of narrow chutes as there are tables for collecting the gold. There are eight tables, each 7ft. 6in. wide and 18ft. long, constructed on one side of the mixing-tank, and provision is made for an equal number to be constructed on the other side. The object in having a separate chute from the mixing-tank is to have an equal quantity of stuff on each table. The tables have splash-boards and ripples or drops every 3ft., and the space between these ripples is covered with plush, tanned with birch-bark. There is a narrow space left between each table sufficient for a man to walk between them so as to change the plush and wash the cloths. The tables have a fall of 2in. to the foot. At the head of the tables there is a tramway across the whole width, on which are placed the washing-tubs on trollies. When these are full the stuff is run along this tramway to the amalgamating-barrel. The residue and waste material from the tables passes down a tail-race for about half a mile, into Molloy's Creek.

The large stones and gravel that come over the perforated plates in the longitudinal box at the head of the elevating-pipe fall into the cage-hopper, under which trucks are placed, and when the hopper is full a door is opened in the bottom of the cage and the stones and gravel fall into the truck. These trucks are hauled up an incline to such a height as admits of sufficient dump to stack the stones and gravel. The other companies on Addison's Flat separate the stones and coarse gravel and lift it by a similar arrangement.

The whole of the works on the Fairmaid and Gladstone Company's ground are substantially constructed, and they have a very efficient plant to work the ground. They expected to be ready

to commence working in about fourteen days from the date of my visit, which was on the 23rd April. They had expended up to that time about £7,000. I have since learned that working has been commenced, and that there is about 80 cubic yards of material lifted by the elevating-pipe per hour, about one-half of which is stones and pebbles, which go into the hopper. Everything works extremely satisfactorily.

The same company have also taken up a claim on the Shamrock Lead, which is on the Charleston side of Addison Township, and have commenced to construct a water-race from the Totara River. It will be, when completed, about four miles and a half long, and will have a carrying-capacity of forty sluice-heads. About half a mile of this race is constructed. The Shamrock Lead was worked in the early days, but as it got into deep ground the water became too heavy to contend with. After going to a deal of labour and constructing a tail-race tunnel for over two miles in length, it was found to be too shallow to drain the ground; besides, it was constructed in places through fine-silt deposit, termed by the miners "blue reef," which oozed out between the laths in the tunnel and eventually rendered it altogether unserviceable, and consequently the deep ground was abandoned. Whether the ground is as rich as represented to be is a question which will only be solved when it is tested; but there is one thing in its favour—that is, a large amount of money was expended in trying to drain the ground before it was given up, and it is evident that the parties who were working on this lead originally knew that the gold was going in to the deep ground before they went to so large an expenditure in constructing a long tail-race.

Westport District.

Fairdown Company.—This company have been working their claim on the hydraulic elevating principle, but have found the ground so far very poor. On first commencing operations they had one of the men who had been employed for some time previous at Perry's Claim, Gabriel's Gully, as manager, and he, without any consideration that the character of the gold was entirely different from that found in Gabriel's Gully, constructed the same description of sluice-box and ripples that he had been accustomed to there to save the gold, and the result was a perfect failure. The company then employed another manager, one who had been accustomed to black-sand workings, and he erected a wide line of tables covered with plush, which answered very well; but there was not sufficient gold in the ground to pay for working. The company have now suspended operations for some time, and were at the time of my visit calling for tenders to let the claim on tribute.

Beach-claims.—There are a number of miners working on the sea-beach between Westport and Ngakawau. The sea has been cutting away a good deal of the land along the shore within the last three years, leaving the gold on the surface at low-water. This has been the means of giving profitable employment to a good many on the beaches for a considerable time past.

McQueen and Company.—This company have constructed a large pontoon and centre-bucket dredger in a lagoon a little distance back from the beach, about three miles on the south side of the Ngakawau River. It was at first intended to work this dredge with a turbine water-wheel, bringing the water from one of the creeks coming out of the main range—Mount Frederick. After constructing a great length of wrought-steel pipes of No. 20 B.W.G., with seamed joints similar to stove-pipes, they very soon showed they would not stand the pressure—the seams opened; and consequently the turbine was abandoned before they could get a trial to see whether the other gear was suitable or not. They are now erecting a steam-engine to drive the dredge, and expected to be in working-order in about a month from the time of my visit, which was on the 19th April last. The capacity of the buckets of the dredge is 9 cubic feet each, and when in full work the dredge is calculated to lift twenty buckets per minute. This would be equal to about 400 cubic yards per hour. The ladder on which the buckets are placed is 52ft. long, and can dredge to a depth of 22ft. below water.

The material is lifted about 16ft. above the deck of the pontoon into a hopper, from which there is a wrought-iron sluice-box extending over the stern end of the pontoon. This sluice is 6ft. in width, and has six half-round boxes across it at regular intervals. These boxes are 16in. wide and 8in. in depth below the bottom of the sluice, in which there is a pipe fixed, about 7in. in diameter, to lead the water and sand on to the tables below. On the top of these half-round boxes or depressions there are cast-iron bevelled-slot gratings placed—two rows of angular slots in each grating. The slots are about $\frac{1}{8}$in. wide on the upper side, and bevelled downwards so that the slots on the bottom side are about $\frac{3}{8}$in. wide. At the end of the hopper a large stream of water is forced in by a centrifugal pump, and the stuff as it falls out of the buckets is sluiced down the iron sluice-box: the coarse gravel and stones pass over the end, while the fine sand goes through the slots in the grating into the half-round depressions across the sluice, and runs down the pipe on to the tables below.

There are three circular tables below each downpipe, each 4ft. in diameter, covered with silvered copper plates. The tables are constructed on an incline from the centre downwards to the periphery, having a rim round the outer edge standing a little higher than the centre of table. These tables have a horizontal shaking-motion, by means of a crank having a 4in. throw, and worked at the speed of about 130 throws per minute. The waste material comes in over the top of the outer rim, and falls into a circular chute, and is carried away, while the gold is supposed to adhere to the copper plates.

These tables are something on the principle of McNeil's concentrator and amalgamator reversed. This amalgamator discharges in the centre of the table, whereas McQueen's discharges on the outside. The shaking-motion, along with their inclined plane, has the effect of causing all the particles of the greatest density to come to the outer edge, and therefore the discharge on the outside is not likely to prove a success in saving the gold; whereas the discharge in the centre, with the feed coming on the outer side, is likely to produce much better results, as the fine sand and light material travels up the incline instead of downwards. However, McQueen's tables have not yet been tested to prove their efficiency; but it is probable that they will share the same fate as the seamed water-pipes.

A great many dredging claims have been taken up, but no work has been done in them: the owners are awaiting the result of McQueen's, Wellman's, Brown's, and Taylor's dredges, to see whether they will prove a success or not. There will be no difficulty in getting dredges to lift a large quantity of material; the only trouble will be in properly treating the auriferous sand in order to obtain the gold after it is lifted, especially when the washing apparatus has to be placed on pontoons. These would have to be constructed very large to get a sufficient surface of tables to wash the quantity of material it is proposed to lift.

Almost all the available sea-beaches between the Arawata River, at Jackson's Bay, and the Oparara River, north of Karamea, have been taken up and applied for to work on the dredging principle; but they are simply held until it is proved whether the dredges are able to work them satisfactorily. There are four dredges now in course of construction—namely, McQueen's dredge, near the Ngakawau, which has already been described; Taylor's dredge, near Greymouth; Brown's dredge, at Saltwater Creek, about seven miles south of Greymouth; and Wellman's dredge, at the Saltwater Beach, about three miles south of the Waitahi River. All these dredges are different in principle, and the question is, which of them will do the work most economically and satisfactorily.

GREYMOUTH DISTRICT.

Taylor's Dredge.—This is erected on the inside lead, about three miles north of Greymouth. There is no pontoon connected with it, as with the other dredges; the whole of the machinery and washing appliances are erected on a travelling frame, which is fixed on wheels and moved backwards, as the ground is worked out, on iron or steel rails. The material is lifted by a centrifugal pump, of the Wellman pattern, on to a hopper, where the coarse shingle and gravel is separated from the fine sand, the latter being washed on a number of ordinary washing-tables covered with plush or blankets, the same as those used at the present time by the miners working on a small scale on the sea-beach. Alongside the travelling frame, on which the centrifugal pump and washing appliances are erected, there is a Priestman grab for lifting the large shingle and stones in the wash-drift as the working goes on; and as soon as one paddock is worked the travelling frame is moved backwards to admit of another paddock being taken out.

Mr. Taylor's plant at the time of my visit in April was expected to be completed in a few days, so that by now something will be known definitely respecting it. The sand-pump appeared to be too small to work satisfactorily, and the arrangement for separating gravel from the fine sand was rather defective; but as the working proceeds all defects will show themselves, and will be remedied in course of time. One thing is certain now, when attention has been directed to working these sea-beach leads, that machinery and appliances will be perfected in time to cope with the difficulties there are to contend with, and no doubt many of these ventures will be brought to a successful issue.

Brown's Dredge.—This dredge is in course of construction at the Saltwater Creek, about one mile south of Paroa, in the Grey district. The pontoon is constructed, and afloat in the creek. It is about 66ft. in length and 22ft. in width, and on it the whole of the machinery and washing appliances are to be erected. The dredging is to be done by what is known in America as the cataract pump, which is highly spoken off as a good dredger for deepening rivers and harbours. It has been used in America for deepening the Mississippi River, and is now employed in dredging New York Harbour. The manufacturers state that a 10in. pump, which is the size proposed to be used by Mr. Brown, is capable of raising 100 cubic yards of stones and sand per hour, allowing for stoppages.

At the time of my visit the machinery was not erected, but the following is an extract of a description of the dredging process:—

Cataract Pump.—These pumps have been used in America for about sixteen years, and are said to give great satisfaction as dredging-machines. They are constructed on the principle of a centrifugal pump. They have been used for dredging rivers and harbours, and for raising coal from sunken vessels, and are said to lift along with a large volume of water from 20 per cent. to 40 per cent. of any foreign substance, such as sand, gravel, stones, &c., in sizes nearly equal to the diameter of the suction-pipe. Two of these pumps are employed at the present time in dredging New York Harbour. The pump is fitted with the front and back head separately bolted to the case, having extended discharge-nozzles and double standards bolted on to a cast-iron bed-plate. The disc is made of bronze or steel, with a shaft of hammered steel; the shaft bushing, and gland being of bronze. There is ample means provided for the lubrication of the shaft. For lifting clear water an oil-cup is used; but when lifting sand and gravel a pipe is fitted through which a stream of water is forced through the inside bearing.

The makers, Joseph Edwards and Co., 416, Water Street, New York, give the following particulars:—

The pump requires no bottom grating or foot-valve, and will pass any foreign substance nearly the full size of the suction-pipe. It delivers a continuous and steady stream, and will discharge more water and material than any other pump in use; it is entirely self-contained, requiring a very light and inexpensive foundation, and ready access to the whole interior is obtained by simply slacking a few screw-nuts. The angle of suction and discharge can be readily changed to any desired position; also skilled labour is not required in running the pump.

The shaft does not go through the disc of the pump, but is merely screwed into the centre of the disc, the principal bearing being the stuffing-box in the casing. The shaft projects across two iron standards, between which a pulley is keyed on to the shaft for driving the pump. Whether these pumps will be a success for dredging the ocean-beaches remains to be seen; but, from the testimonials from those that have used them, there appears to be no doubt on this subject. The expense in working them, however, is a matter which will only be accurately known after they have been tested on the beaches.

The makers state that the water and sand can be easily discharged at a height of 30ft. above the surface of the water, but the pump itself should be set as near the surface of the water as possible—not more than from 3ft. to 5ft. from it. The cost of dredging on St. John's River, Florida, with a 9in. pump, was about 6½d. per cubic yard. This included all the cost of running-expenses, wear-and-tear of machinery, and all stoppages for repairs, and contingencies. The makers, however, state that the pumps ought to be successfully worked at a cost not exceeding 5½d. per cubic yard of sand and gravel lifted, which would be about equal to the value of 3gr. of gold. At this estimate, if the sand on the beaches averaged ½dwt. per cubic yard it would give handsome returns.

The following table is supplied by the makers, and gives the sizes, capacities, and price of the pumps up to a 12in. suction- and discharge-pipe :—

Size of Pump.	Suction- and Discharge-pipes or Openings.	Dimensions of Pulley.		Revolutions per Minute for the following Lifts. (Water-lift in Pump in feet.)									Working-capacities, Gallons per Minute.	Prices of Special Pump.
	Diam.	Diam.	Face.	4ft.	6ft.	8ft.	10ft.	12ft.	15ft.	20ft.	25ft.	30ft.		
No.	In.	In.	In.	Rev.	Rev.	Rev.	Rev.	Rev.	Rev.	Rev.	Rev.	Rev.		£ s. d.
4	4	8	8	410	430	450	465	485	515	560	610	655	500 to 600	31 5 0
6	6	12	8	310	320	335	350	365	385	420	455	490	1,200 to 1,600	46 17 6
8	8	16	12	255	270	280	290	305	320	350	380	410	2,500 to 3,000	72 18 0
10	10	24	16	205	215	225	235	245	260	280	305	325	4,000 to 5,000	104 3 0
12	12	30	18	185	190	200	210	220	230	250	270	295	6,000 to 7,500	140 12 0
15	15	...*	...	155	160	168	175	182	193	210	225	245	9,000 to 12,000	...†
20	20	...*	...	125	130	135	140	145	155	168	180	195	15,000 to 18,000	...†
24	24	...*	...	105	110	115	120	125	130	140	152	163	22,000 to 25,000	...†
30	30	...*	...	90	95	100	105	110	115	120	130	140	30,000 to 35,000	...†

* With thrust-bearing and coupling. † Other prices not quoted.

In taking this table as the quantity of water the pump is capable of lifting per minute it must be borne in mind that if it is lifting 40 per cent. of sand and gravel the power required to force this up along with the water is in proportion to its density or specific gravity: therefore, if the pump would lift 600 gallons of water 30ft. if it is mixed with 40 per cent. of sand and gravel the quantity lifted would only be equal to about 360 gallons. The capacities in the table are United States gallons, which are 0·83 of a gallon English measure.

The steam-engine which works the machinery is one of Robey's compound semi-portable under-type, of sixty-four indicated horse-power. This works the sand-pump, dynamo, and other appliances; also supplies steam for a winch which is used for raising and lowering the pump and working it from side to side. This winch, which has five barrels, to work as many ropes or chains, also works a submarine rake, which hauls the stones out of the way of the pump. This submarine grab or rake has teeth at the back and side, with roller in front. As soon as it is lowered down to the bottom the stones near the pump are raked in and drawn forward for some distance away from the pump; but as soon as the front chain is slacked and the grab or rake drawn back, all the teeth lie flat and the material is discharged at the spot, and the same process is again gone through as soon as the front chain is tightened. This rake or grab not only serves to remove the stones, but it also loosens the ground near the pump and makes the material easier to be sucked up. It has a roller in front to prevent it sinking too deep, and also to ease it over the bottom without dragging the fine material with it. It is worked from a light derrick-crane by the steam-winch.

On the sand and water coming out of the discharge-pipe it passes over a grating set at such an angle or inclination that the stones will roll down, while the fine material falls through into a box below. By this means all the coarse gravel and stones are removed before going into the main distributing-trough.

The appliances for saving the gold consist of a central trough or chute 40ft. long, 2ft. deep, 18in. wide, into which the material is discharged from the pump. On each side of the trough are twenty tables, ten above and ten underneath. At the end of each underneath table there is a mercury-trough, the contents of which are kept alive by a dynamo, into which the water and sand drops, and afterwards flows over a copper-plate amalgamator. In the central trough works a travelling rake, much on the same principle as a Californian pump, only that, instead of a belt being used, the travelling rake is carried round the drum by a fine steel-wire rope, so as not to catch the material. The object of this rake is as follows: All along at each side of the trough are orifices or openings 3ft. 6in. wide for letting the sand and water on the tables. The openings of the orifices are covered with fine wire, so that only the very fine sand is allowed on the tables. All the large material—which is about 80 per cent.—is kept in the central trough, and the rake acts by taking this rough material along and discharging it at the end. At the same time it keeps the sand from settling in the trough and thoroughly washes any material during its passage along the trough before it is lifted and discharged overboard. The operation of the rake is quite automatic, and it can be driven at any desired speed. This automatic separation of the material, down to the very fine sand which contains the gold, enables an enormous quantity to be dealt with, which could not possibly be done under ordinary circumstances. It also saves the wear of the blankets, as no rough material passes over them. It enables the fine gold to be saved, as the water and sand can be regulated on each side to discharge from ½in. to 5in., and, the rough material being shut in,

nothing disturbs the fine gold from settling on the tables. The sand and water flow over two sets of tables, the top lot covered with blanketing, and the underneath tables with cocoanut matting. The tables are so hung that they may be placed at any desired pitch, according to the material, and the whole forty tables can be altered in less than one minute. Any set of tables or any single table can be shut off without stopping the rest, for washing, or removal of blankets, or any other operation. The sand and water, after passing over the underneath table, drops into a trough with mercury. This mercury is kept bright and pure by a current of electricity, and the object of dropping the material into it is that every particle may be brought into contact with the mercury, especially any float-gold. From this trough it flows over an amalgam-plate, and from thence into the waste-launder, conveying it some distance behind the barge. There is to be a sixty-candle submarine electric lamp used for the purpose of examining the bottom when necessary.

Mr. S. Brown, of Wellington, designed the whole of the washing appliances, and is having them constructed in Wellington, the great object being to have the greatest surface of tables that can be got for the space that there is on the deck of the pontoon. There is no doubt that some alterations may be necessary when once the dredge is at work, when any defect in the washing appliances will soon be detected and remedied.

Westland District.

Wellman Dredge.—A dredge on the Wellman principle was first constructed in the colony at Alexandra for the purpose of working the Molyneux River; but the first pump that was placed on this dredge was far too small to be of any service. A larger centrifugal pump, with pipes 12in. in diameter, was substituted, and a commencement made to work the dredge at the junction of the Manuherikia and Molyneux Rivers. The dredge was said to do the work satisfactorily; but, unfortunately, the barge, or pontoon, on which the machinery and washing appliances were placed was too small to withstand the current of the river in flood-time. The pontoon filled with water and sank, and now lies at the bottom of the river.

Another dredge on this principle was constructed to work the sand-beaches at Waipapa, and it is said to give great satisfaction. This led to one of these dredges being got to work the black-sand leads on the ocean-beach near Saltwater Creek, between the Waiotahi and Wanganui Rivers, south of Ross. The machinery and plant was being shipped from Hokitika to this beach during my visit there in April last, and in the course of a few months ought to be in full work. There is very little difference in the principle of this dredge from that of the Ball dredger which was erected at the Five-mile Beach, south of Okarito, and proved a failure, on account of it being a mere toy. It did, however, show that the sea-beaches could be worked with success on this principle if the plants were larger, and has been the means of directing attention to these auriferous-sand leads along the ocean-beaches, which were hitherto looked on as valueless to work.

Kumara.

This is the largest concentrated alluvial goldfield in the colony, and one that will last for many years to come. There is a great depth of alluvial drift, which is in every place more or less auriferous. It is also a field—considering the large population which it supports—where the miners are doing better than anywhere else. This does not mean that the ground is nearly so rich as at Tinker's, in Otago; but there is only a limited population—about 200—the whole of whom are supported by the miners on the field. It is only the large supply of water on the Kumara field that enables the miners to make their claims pay for working. It would be interesting to know the exact amount of gold obtained last year from this field; but the approximate amount obtained by the miners using water from the Government race was 9,825oz., representing a value of £37,335; and this was obtained by an average of 174 miners—but this does not include the men employed in the bush getting timber for the claims.

The only drawback to this field is the limited dump for tailings; but the miners will have to get accustomed to less fall in their sluices and construct them of a greater width. The tailings reserve is getting gradually filled up, and the result is that the bed of the Teremakau will get gradually raised. A great deal of the fine sand and gravel will be carried down the river with every flood, but the large stones will not travel far: they only get shifted down a little, and stop there until another flood comes to carry them a little further. The department has seen this difficulty from the time the claims commenced to be worked, and now the fact comes to be realised by the miners on the field, especially by those who are using the sludge-channel. A great deal of ground can be worked at a higher level, and the tailings difficulty will never interfere with the working of some of the claims now that the river is proclaimed a channel for the deposit of tailings.

Recently some new ground has been opened up on the west side of the Hokitika–Greymouth road on the terrace facing the Teremakau River; but sufficient work is not yet done to prove whether it is payable for working or not. There is no doubt but that the lead of gold that is going through Dunedin Flat and Larrikin's will yet be traced, and a great deal of new ground yet opened up; or, possibly, it may be traced through the township towards the ocean-beach. It is very evident that where there are so large deposits in a basin with as yet a circumscribed area, it will not cut out there, but will be again found either higher up or lower down the flat.

The whole of the alluvial drift here is full of large rounded boulders, showing that it has been at one time subjected to a heavy torrent of water, and the character of the gold also proves that it has been carried for some distance and ground up and flattened by the rolling stones. A large bank or bar may occur wherein there is very little gold, and cause a break in the lead; but if the ancient watercourse can be traced that made all these alluvial-drift terraces, the lead of gold will be picked up again.

Seeing that there is a large supply of water now on this field, and every facility for the individual miner obtaining a livelihood, care should be taken not to grant large areas on this field to any party or company, as that will only mean re-letting the ground on tribute, the same as the Hum-

phrey's Gully Company are doing. This company receives from the tributers 66 per cent. of the gross yield of gold. The ground thus has to be rich to pay tributers for working, in order that they may obtain fair wages.

Waimea District.

The ground in this district is getting gradually less remunerative for working as the depth of the alluvial drift becomes greater on going back from the edge of the terrace; and many of the claims are worked in a primitive manner. The ground on the hill side of the Kumara–Hokitika Road, between Goldsborough and Stafford, is all worked with water from the Government race; but the total available head of water is not taken advantage of. As a rule the water is led down from the main race either to a dam close beside the workings, or else by a small cut or race down the terrace over the face of the ground to be worked; and in many of the claims canvas hose is still used. It is well known that the friction of water flowing through a canvas hose is a great deal more than through an iron pipe, and that really means that even the small head they are working with is considerably reduced by the extra friction on going through the hose.

There is a considerable area of auriferous-drift terraces yet to work in this locality, especially on the north side of the Waimea Creek, but there is not a good supply of water to be got on this side. One of the claims on Kelly's Terrace is paying remarkably well. The Wheel of Fortune Company have gone to a large expense in getting the ground properly opened out, but have not yet met with much success. However, this is a district which will give employment to a good population for a long time yet, but more capital is required to work the ground in an advantageous manner. The rich finds are gone, so to speak, and it is only by washing away the alluvial drift in a wholesale manner that the miners can expect to make good wages.

Arahura.

Humphrey's Gully Company.—This company have now been in existence for about six years, and since they commenced sluicing operations have been struggling against difficulties. According to the returns of gold from their claim, the ground ought to be made to pay well for working if they had a good supply of water, and this cannot be obtained before they extend their head-race to the Arahura River, which extension is estimated to cost about £25,000. The nominal capital of this company is £150,000, of which £77,000 was declared paid up, and the remainder has been expended on purchase of ground, construction of water-races, dams, and mining-plant, so that they have no available capital left to bring in a permanent supply of water, which is required to make their property of any real value. This company, like many more that have lately been formed with principally foreign capital, is greatly overloaded. Its promoters, in endeavouring to make money by floating it, have destroyed its commercial value. Had the £77,000 that was given away in paid-up shares been expended, or a part of it, in providing a large permanent supply of water, the company would now be in a prosperous condition. Now, when they want to increase their capital, they have found that shares will not be taken up unless the original capital be greatly reduced, as it would take exceedingly rich ground to pay interest on so large an amount.

Recently they have agreed to make the capital £80,000, giving 55,000 fully paid-up shares to the existing company, leaving £25,000 to be raised by contributing-shares to complete their works. These contributing-shares are to receive a preference dividend of 10 per cent. per annum out of the profits of the company in each year, and shall, after a like dividend has been paid to the holders of the 55,000 fully paid-up shares, share rateably with the others in any further surplus profits in each year. With this new arrangement it is expected that there will be no difficulty in raising sufficient capital to extend the head-race to the Arahura River, where they will get an unfailing supply of water.

At present the claim is let on tribute, but the quantity of available water is not nearly sufficient to work the ground advantageously, and the present small supply is intermittent. Yet, with all this, the company gets about two-thirds of the gross yield of gold from the tributer, which shows that the ground must be comparatively good. The value of gold obtained by the tributer for the year ending the 9th February last was £3,321 15s. Of this amount the tributer received £1,212 8s. 11d., leaving the company a profit of £2,109 6s. 1d. on the actual working of the ground; but the expenses of the company in maintaining the water-races, superintendent's salary, rents, and property-tax amounted to £714 3s., so that the actual profit on the working of the claim, not including directors' fees and charges, &c.—which amounts to the round sum of £716 14s. 3d.—was £1,395 3s. 1d. for the year, which would be over 5½ per cent. on the amount proposed to be raised by contributing-shares. If this company's property was held by one or two men with capital to bring in sufficient water to work the ground systematically, it would be one of the best mining enterprises in the colony.

Totara.

Ross United Gold-mining Company.—This company, after repeated trials to work the deep levels, suspended operations below the level of the drainage-tunnel some two years ago, and have never been in a position since then to erect a more powerful pumping-plant to cope with the water. Nearly one-half of their large capital, which consisted of £150,000, was absorbed in paid-up shares shares given to shareholders, and the remainder has been spent in machinery and in opening up the ground. The company have been for some time trying to get an additional capital of £20,000, either by issue of preferential shares or by re-forming the company, in order to sink a new shaft and erect more powerful pumping machinery; but so far they have not been successful in accomplishing this. The directors at the last annual meeting laid a proposition before the shareholders to put the present company in liquidation, and form a new company with a capital of £80,000, giving the present proprietors £50,000 in paid-up shares in the new company for their interest, the remaining

£30,000 to be raised by placing 20,000 shares in the market at £1 each, these shares to have a preferential claim of £10 per centum per annum on profits accruing from the working of the mine, the remaining 10,000 shares to be reserved for future issue if deemed expedient.

The operations of this company for the last two years have been carried on by tributers. Those working in the ground by means of shafts pay the company 10 per cent. of the gross value of the gold obtained, while those who are working the ground by means of the company's plant, elevators, &c., pay 35 per cent. of the gross yield of gold. There are two sets of elevators at work—one on the Ross Flat and the other at Donoghue's, in the Prince of Wales ground. The receipts from the tributers for the last year, ending the 31st December, amounted to £1,952 3s., and the sales of water from the races amounted to £154 17s. 6d., making the total receipts in round numbers £2,107; while their total expenditure was £1,929 10s., out of which £534 was for management, exclusive of the mine-manager's salary and expenses. This shows that the actual profit last year on the whole of the workings was £177 10s., which cannot be said to be a satisfactory result for a company with a large capital. To give the shareholders 5 per cent. on the capital the profits would have to be £7,500.

It is evident from the above state of affairs that the workings must be extended and the capital reduced in order to make the venture a payable concern, and it is with this view that the company propose to work the deep levels; but before they can do this an expenditure of £20,000 is required to provide a large pumping-plant, new winding-shaft, and a larger water-supply. There is no doubt there is a large amount of gold in this flat, but the question has yet to be solved whether it can be obtained at a profit. The price of labour, which is the great factor in the expense, is the same now as it was sixteen years ago, when the operations of the original companies were suspended, and the cost of mining-materials is also nearly the same. It is probable, however, with improved machinery, and working the ground on the tribute system, that it could be made a payable mining venture. If so it would be the means of giving employment to a large number of miners and others in this district.

Mount d'Or Company.—This is one of the most successful companies that ever carried on mining operations in the Totara district. Their claim is situated on the face of the range above Sailor's Gully, near Ross. The gold was traced up Sailor's Gully into the range, and after working the lower portion from the shaft and adit-levels, it was taken up as a sluicing claim. Since the construction of a water-race, and the claim opened up, it has been for several years steadily paying good dividends to the shareholders. During the last year, ending the 30th November, 1888, the yield of gold from the claim was 2,103oz., representing a value of £8,041, out of which £5,400 was paid in dividends, £1,200 was written off their property-stock and water-race, and a balance of £1,373 carried forward to the next year's account. There is a large extent and great depth of auriferous drift in this company's claim and in the Greenland Company's claim which adjoins it; but portion of the ground is at so high an elevation that it is impossible, unless at an enormous outlay, to bring a large supply of water on to the ground. The same description of wash-drift can be traced on terraces here and there to near the top of Mount Greenland, which is about 3,000ft. above sea-level, where a good deal of gold has been got, and where there is yet plenty of auriferous drift that would pay for working if a good supply of water were available.

There are still a number of mines at work in the creeks and terraces, some of which are said to be doing very well; but in general the ground is of a poor character, and many are only obtaining a mere livelihood. Since the suspension of mining operations in the deep levels in the Ross United Company's ground, a gloom has been cast over the district, and many have left to seek employment elsewhere.

Tuapeka District.

This is a field where mining operations have been successfully carried on, and a large amount of gold obtained; but at present mining is at a low ebb. The surface of the ground in the gullies, flats, and terraces still indicates the large amount of money and labour that have been expended in searching for and obtaining the precious metal; but the old shafts, tailings in the low ground, and bare surfaces on the terraces caused by hydraulic sluicing only mark the place where at one time a large mining population was located.

There are still a number of Chinese in the district working in the beds of the gullies and also on the flats. They box-sluice all the tailings and ground which has in some instances been three and four times turned over, and they seem now to get the most part of the gold by chipping up the bed-rock. There is no doubt some rich patches will yet be found in the cracks and crevices of the schist rocks which formed a natural riffle at the time when gold was deposited in the drifts. There are also several Europeans working here and there on the old diggings who seem to get sufficient gold for their labour, but no doubt many of them are only making small wages.

Gabriel's Gully Consolidated Gold-mining Company.—The only extensive gold-workings that are now in this neighbourhood are carried on by this company. They purchased the individual mining claims on the Blue Spur and also the Gabriel's Gully Sluicing Company's ground, in the bed of Gabriel's Gully, and now hold almost the whole of the ground in this locality in a special claim. They commenced operations in April, 1888, and since that date have been working the tailings in the bed of Gabriel's Gully on the hydraulic elevating system. At the time when they took over the claims there was a large quantity of sludge and mullock in the old paddocks or workings of the Gabriel's Gully Sluicing Company, deposited there by the breaking-away of a tail-race belonging to one of the cement companies. This also damaged the underground tail-race to such an extent that a large quantity of this sludge and mullock had to be lifted which contained but very little gold. The ground that has paid them for working was under the dray-road going up the gully. They also obtained a good quantity of gold from the ground on which the road was constructed outside of their own claim.

At the time of my visit there were two jets at work and another almost ready to commence working. The last jet may be termed a double one, inasmuch that the stuff is lifted from two levels; the bottom jet lifts it about 12ft. and the upper jet 35ft. These two jets, together with the water discharged from the nozzle to bring down the tailings into the well, are 800in., or twenty sluice-heads. The lower jet at work at the time of my visit was lifting the stuff about 30ft., and the quantity of water used was 500in., or twelve and a half sluice-heads. The other jet was elevating the stuff 50ft., and using between seventeen and eighteen sluice-heads of water. The company can get plenty of water to work the two single jets and the double one, but it is questionable if their underground tail-race is sufficiently large to carry away the tail-water. The water discharged by the jets has a head of 420ft.

Since the company commenced operations—about twelve months ago—they have obtained gold to the amount of about £6,000. Of this, they state £2,000 has been spent in permanent improvements which ought to come out of the capital, and they have £800 in hand. This showed that the expenditure, including £500 for water purchased, in actually working the ground has been £3,200, leaving a profit of £2,800. But a considerable amount of the gold was obtained from old tail-races, formerly belonging to the companies from which they purchased the ground. This has swelled up the gross returns considerably, and has enabled them to pay for permanent works out of the proceeds of the claim, which otherwise would have had to be taken from the capital. There are twenty-nine men employed in connection with the working of this claim and the maintenance of the water-races.

With regard to the future operations, there is no plan yet decided on for working the cement. It will take another twelve months before an opening can be made into the cement workings sufficiently large to admit of the cement being dealt with. The manager and directors state they are now up to the ground that the calculations were based on for floating the company, and they expect to get good returns from this out. It is to be hoped that their expectations will be realised, in order to give the foreign shareholders fair interest for the money invested, for it is only ruinous to the development of the mining industry to receive foreign capital for working ground that will not yield sufficient gold for the purpose.

Molyneux River.

There are a number of mines at work on the banks of the river and on the flats here and there all up the valley. The ground that has been held by G. Rigney for a number of years at the Horse-shoe Bend is now in a fair way of being worked. Messrs. Kirkpatrick and Eddie have either purchased this ground from Mr. Rigney or gone in with him to work it. At all events, the two former gentlemen have taken water from the Tallaburn to a height of about 275ft. above the river—that is, judging from appearances—and have conveyed it across the river in a wrought-iron pipe, suspended on two lines of wire-rope, two ropes being in each line. They have also constructed a concrete pier in the river, having a timber trestle on the top of the concrete pier to carry the weight of the rope and reduce the span. The work is very creditably done, but it strikes one that the concrete pier in the river is not sufficiently high to make the trestle on the top safe from being destroyed by floods.

This is the same ground that Mr. Rigney proposed to work four years ago, when he made an application to the Government for either assistance in shape of subsidy or loan of money to take the water across the river. The ground is said to be very rich, and it will take a number of years to work if the expectations concerning it are realised.

A little above the ground just referred to a company has taken up what is known as the Island block, and are making preparations to work it. They are to take the water from the Tallaburn Creek and carry it across the river in a manner somewhat similar to Messrs. Kirkpatrick and Eddie. There is no doubt but that there are a great many flats and terraces along the Molyneux Valley that will pay handsomely for working if mining operations are carried on systematically, and the ground opened up in a proper manner. The large amount of gold that has been obtained in the bed and from the banks of the river, and from the creeks flowing into the river on both sides, shows that the whole of this country is highly auriferous.

Dredges.—There are six dredges at work on the river between the Beaumont and Coal Creeks, some of which are doing remarkably well. The dredges belong to Brazil and party, Bennet and party, Pringle and party, Macdonald and party, Valentine and party, and Crookston and party; and the steam-dredge belonging to McQueen and Company, that has been for a number of years working on the river above Alexandra, has been taken to pieces and carted down, and is now constructed again to work in the river above Roxburgh. From information received from Brazil and party, they have been working for the last fifteen years on one mile of the river, and they sometimes made as much as £130 per man per month, and the lowest that they ever made has not been under £30 per month. This party state that the reason they cannot get so much gold as they did in former years is that the accumulation of shingle on the bed of the river is now so much that it takes a long time to get down to the payable wash-drift, or, in other words, there is now from 5ft. to 8ft. of shingle above the gravel-drift that they were working formerly, and this shingle keeps coming into the hole as the dredging proceeds, and mixes with the gold-bearing layers, and therefore a much greater quantity of drift-gravel has to be lifted to get the same amount of gold.

With regard to what the owners of the other dredges are making, nothing definite could be learnt, but some of them are doing equally as well as Brazil and party, and all of them are making good wages. The whole of the river is taken up in dredging claims; but those who have been dredging on the river for years state there are miles of the river taken up that would never pay to work with a dredge on account of the rough rocky bottom. A good number of river claims are under protection, pending the testing of the Wellman dredger; but there is no longer this excuse, as this dredger has been tested and found to act very well, but the one that was constructed was far

too small to work such a rapid-running river as the Molyneux. The hull for a dredge of this description requires to have a great beam and also length in order to have good buoyancy on the water, and leave plenty of room to get a sufficient length of boxes to wash the lifted material.

Hercules Company.—This is a company which has been formed in Otago to work the flat opposite the island below Roxburgh which is now termed Hercules Flat. Workings have been carried on here on the banks of the river for a number of years. The ground was held in small claims, and only one of the parties who held a claim here ever reached the bottom or bed-rock. They merely sluiced away the drift-gravel to such a depth as the water in the river would permit; but even in sluicing away the top gravel they found sufficient gold to pay fair wages, and the party who actually got down to the bed-rock by means of a water-wheel and Californian pump got in ten days gold to the value of £605 19s.

A company was formed, and purchased the whole of the claims, plant, and water-races, together with water-rights, for the sum of £6,500, and this company is called the United Hercules Hydraulic Sluicing Company. The original owners are so satisfied with the prospects of the ground that they have taken the value of the property in paid-up shares in the new company, and also agreed to pay the expenses in connection with forming the new company up to the extent of £150. The present company has a capital of £12,000, which leaves, after giving the original owners £6,500 in paid-up shares, £5,500 to put the claim in proper working-order.

They are at the present time extending the head-race to the Teviot River to get a large supply of water at a high elevation, and are also constructing steel pipes on the ground. A workshop, with bending-rollers, punching- and drilling-machines, has been fitted up, as well as a large tank to boil the coal-tar which is used to coat the pipes after they are made in 20ft. lengths. The manner in which the pipes are constructed, and the workmanship, would do credit to any boiler-making establishment in a large town. The ingenious manner in which the table is constructed to lay the plates on while the holes are punched, and also the trollies used in holding the pipes while they are being riveted, shows that Mr. J. R. Perry, who is consulting engineer to the company, is fertile in his resources, and can cope with any difficulty that he meets with in order to curtail manual labour and preserve economy.

The pipes for the main supply are 18½in. in diameter, made of No. 16 and 14 BWG steel plates. They are riveted together in 20ft. lengths, and, with the appliances there are, one man only is required to handle each of these lengths and rivet them together. They had at the time of my visit 2,000ft. of pipes constructed, and they require about 2,000ft. more to complete the main. The water is brought on to such an elevation that there will be 440ft. of head at the claim. The joints of the 20ft. length are made slightly telescopic, and over the joint is a band of steel 4in. broad, made a little larger than the outside of the pipe, as shown in sketches in my annual report for 1886–87, and filled with lead, the same as jointing a cast-iron pipe for a water-main.

The extent of ground this company has is thirteen acres, and they are going to work it on the hydraulic elevating principle. As stated before, none of the bottom-wash, with the exception of a little in one claim, has been taken, and from the depth there, which was about 16ft. below the surface of the water in the river, there is a large extent of ground stripped which ought to pay well for working as soon as the plant is completed, which they estimate will be in about three months. The systematic and permanent way in which everything is constructed shows that it is the intention of this company to spare no legitimate expense in putting a good plant on the ground. One thing is certain, they have a good man in Mr. Perry, who has the sole charge of the construction of the plant. He has had now considerable experience in constructing hydraulic elevating plants; and if he made mistakes at first he has paid for them, and bought experience is worth a great deal to any company, as they are likely to have a plant which will not only do its work, but things will not have to be constructed a second time, as is the case in a great many instances where inexperienced men are employed to superintend their construction and erection.

Roxburgh Amalgamated Mining and Sluicing Company.—This is a new company, which is said to be formed, with a capital of £30,000, to purchase the mining claims, water-races, and plants held by Anderson and party and Wright and party. The ground held by these parties in extended claims amounts to seventeen acres. The company also have a special claim of ninety acres at the back of these claims. The prospectus of the company was handed to me, but there is no data in it that gives the least information with regard to the value of the ground, or the amount of money or paid-up shares that is to be given to the parties mentioned; and without their ground, which is the frontage to the river, the back ground cannot be economically worked. During last year the frontage claims were worked, but the owners state they were principally engaged in running off the top-stuff, which pays small wages; and during the winter months, when the water is low in the river, they get good returns. Corlaw and party, who have the adjoining claim to the ground said to belong to the new company, have done extremely well this year, and the claims on the upper side of Corlaw and party have all made good wages.

There is little doubt that when the Hercules Company gets in full working-order the other claim-holders on the flats and river-banks will adopt a different style of working, for it is only by carrying on hydraulic sluicing operations on a large scale that poor ground can be made to pay, and by making the top-stuff pay good wages for working. The richer deposits can be worked in the same manner, and thus place the money in the shareholders pockets instead of frittering it away in expenses and wages.

Commissioners' Flat.—This is a flat situated about three miles above Roxburgh; twenty acres of it has recently been applied for as a licensed holding. Indeed, it will only be a question of time when almost every flat containing drift-gravel alongside the Molyneux River will be taken up and worked on a wholesale system that will most probably make them remunerative investments. The whole of the watershed of the Molyneux River is more or less auriferous, and extremely rich deposits of gold-bearing drifts have been found here and there along its course; and gold has been found in the bed of almost every stream that flows into it.

Cromwell District.

The principal mining operations in this district are carried on at Bannockburn. This place still maintains a good population. Some of the claims that are worked into the Pipeclay Gully Sludge-channel are paying fairly well, especially Tippet and party and Crow and party's claims. There are altogether about nine claims that are being worked by the aid of this channel. Ball and party are constructing a deep tail-race to Pipeclay Gully from the Kawarau River, which will yet take some time to complete. At Ball Hill, Templar's Hill, and Slaughter-yard several claims are being worked, giving good returns. At the latter place Hill and party have laid down about 2,000ft. of wrought-iron piping, and brought water on to the ground, where the prospects are said to be very good, and likely to give remunerative employment for a number of years. The Carrick water-race, which the Government subsidised to the extent of £9,250 to construct, was recently sold to Tolboys and party for £900, and at the time of my visit this party was putting it in good repair.

On the banks of the Molyneux and Kawarau Rivers there are a large number of sluicing claims, some of which are doing very well, and it is worthy of note that a special claim has been applied for on the Kawarau River at Horse-shoe Bend, near the Victoria Bridge. It is proposed to construct a tunnel through a narrow ridge, about 42 chains in length, to take the whole of the water in the Kawarau River, and thus leave about four miles of the river-bed comparatively dry. It is an undertaking that involves a large amount of capital, but one which there is reason to believe will be attended with success. In the early days, when gold was first discovered, there were very rich patches of gold got on the beaches, and on the banks of the Kawarau River, at this bend. To make an undertaking of this description successful the tunnel will have to be constructed large enough to carry the whole of the water in the river in flood-time, or else floods would continue time after time to retard the mining operations in the bed of the river, and would also damage the works.

Nevis.—This is a field from which a large amount of gold has been got, and where there are large areas of auriferous drift. Some of the claims here have changed hands at high prices; but, although there is an unlimited supply of water to be obtained at a good elevation, the old primitive system of working is principally adhered to. It is a field that is likely to give good returns for the expenditure of capital in mining ventures, where ground can be worked on a system to economize labour. Many of the old residents are strongly of opinion that there are rich leads of gold in the valley of the Nevis; but it requires more capital than is in the district to prospect and test the ground.

Black's District.

Ophir.

There is very little alluvial mining being carried on here at present. The construction of the drainage-channel which the Government subsidised to the extent of £1,150 has not been the means of much ground being worked. The flat where this drainage-channel was constructed was reported by the old miners in the district to contain a great deal of gold; but the ground that has been worked by means of this channel has so far been very poor in the precious metal.

A scheme is now on foot to construct a water-race from the Manuherikia River, commencing at a point a little above the junction of Muddy Creek, and terminating on the terrace above the flat at Black's. The length of the race according to a survey made by the Vincent County Engineer will be a little over thirty-two miles, and the height at the terminating-point above the flat about 177½ft., and it is estimated to cost £5,000.

A most ingenious prospectus has been issued to form a company of 20,000 shares of 10s. each to construct this water-race, which is to carry thirty-five sluice-heads of water, with about 8ft. of fall per mile for the open ditching, and there are to be six wrought-iron pipe-flumes or siphons, which in the aggregate will be 1,714ft. in length, and will have a fall of 27ft. The prospectus quotes the amount of gold got by some of the hydraulic companies at St. Bathan's, and draws attention to the prosperous state of Naseby owing to the construction of the Mount Ida Water-race, which cost the Government over £67,000, and has also cost £3,197 more money to maintain than ever was received from it by sales of water. The promoters of this scheme are Messrs. Fogarty and Flannery, who have taken up a special claim of sixty acres on Black's Flat, and have secured two water-rights from the Manuherikia River, one for thirty-five sluice-heads and another for twenty-five sluice-heads, for which they offer to accept the modest sum of £4,000, out of which £1,500 must be cash, and the balance in paid-up shares in the new company.

There is a great deal of ground on the range between the Manuherikia River and Ida Valley that will pay well for working by hydraulic sluicing if a good water-supply can be got at a high elevation; but the proposed water-race is at far too low a level to command much ground, and, judging from a cursory view of the line of the head-race, the available capital after paying the promoters—namely, £4,000—is totally inadequate to construct the water-race proposed, and it is very questionable if a permanent supply of thirty-five sluice-heads of water can be got from the Manuherikia River, where they propose to lift it. Any enterprise of this description which can be shown to be a legitimate undertaking deserves support: at the same time, those embarking their capital will do well to consider whether the price the vendors require for their interest is justifiable for the amount of work they have done and the money they have expended.

Tinker's.

There is only a small population on this field, but the average earnings of those who are working claims here are larger than on any alluvial diggings in the colony. It is only those who have water-rights that can work to advantage, as the large earnings are owing not so much to the richness of the ground as to the system of working. There are five companies or parties of miners, who have head-races, and a medium supply of water for eight or nine months in the year, and

these employ in the aggregate thirty-two men, who work the ground by hydraulic sluicing. During last year the amount of gold obtained by them was 2,830oz., representing a value, at £3 15s. per ounce, of £10,612 10s. The average earnings of those employed, supposing they were working every day, Sundays excepted, would therefore be nearly £6 7s. 7d. for each man per week, which is a large wage, especially when it is taken into consideration that they do not always work full time.

About two years ago the miners were not aware that the auriferous drift would go so far back into the range, and thought that when once they got back to what they term the granite-wash drift the gold would cease, or, at least, that there would not be sufficient in this character of wash-drift to pay for working; but they now find that the auriferous wash-drift continues as rich as that which they had previously. What the miners term granite-wash is the very old quartz-drift that is found at St. Bathan's, also on Mount Criffel and Mount Burster. Indeed, this field may extend round the foot of the range for a considerable distance. The same formation occurs at the Drybread diggings, which were considered at one time to be almost worked out. The companies and parties of miners referred to that were working claims at Tinker's last year are as follows:—

Mountain-race Company.—This was formerly known as the "Blue Duck." They have been working in different parts of their claim during last year, "washing away," as the manager termed it, "odds and ends," and the result of their working was 630oz. of gold, for six men employed in the claim. The quantity of water this company uses when the supply is available is fifteen sluice-heads, with about 100ft. pressure; but, as their water-right is an inferior one—that is, other rights take precedence before they can take the water—in dry weather the supply is sometimes as low as four sluice-heads. They have still about twenty-five acres of ground to work, which at the present rate of working the manager considers will take at least forty years. The whole of the ground has to a certain extent been prospected, and they have no hesitation in saying that it is all payable for working.

Matakanui Company.—This company constructed a head-race from Matakanui or Drybread Creek some two or three years ago, and are working in the alluvial drift-wash which joins on to the old quartz-gravel drift. During the year they have been opening up their ground, and have had a deal of dead work to do before commencing to work the ground systematically. They employ eight men, using eight sluice-heads of water, with about 120ft. pressure. They were washing up at the time of my visit, and expect to get about 300oz. of gold. The ground is 40ft. deep, and it will all have to be sluiced into the mining reserve purchased two years ago from Laidlaw and Crawford.

Undaunted Company.—This company has had eight men at work, using twelve heads of water when available, with a pressure of 250ft. head; but other water-rights take precedence of this right, so that sometimes the supply is as low as four sluice-heads. The ground is alluvial drift-wash about 60ft. in depth, and has to be sluiced into the same mining reserve as the Matakanui Company's ground uses. The yield of gold from these workings last year was 1,100oz.

Read and Party.—This party's ground is known as the Sugar-pot. It adjoins Thompson's Creek, and runs along the foot of the range, in the same run of old quartz-gravel wash as that on which the Mountain-race Company are working. They employ six men, using five sluice-heads of water, with a head equal to the depth of the ground, which is 100ft., and the result of last year's working was 400oz. of gold.

Simes and Morgan.—This party's is the last claim at work on the end of the old quartz-drift wash nearest to Clyde. The depth of their ground is about 130ft., which they work with about five sluice-heads of water, having a head equal to the depth of the ground. They employ five men, and last year 400oz. of gold was obtained from their workings. This party have taken up a licensed holding further round the foot of the range, adjoining their present claim, but no work is yet done on this ground.

John Ewing, of St. Bathan's, purchased some time ago a mining lease of ten acres that had been held by a miner named Foggarty for many years, although scarcely any work has been done, inasmuch as he could get no water to sluice with, as all the available water in the neighbourhood had been previously taken up. This ground lies at the foot of the range, between Simes and Morgan's and the Mountain-race Company's ground, and is known to contain rich auriferous-quartz drift. Since the purchase of this ground, Mr. Ewing, with the indefatigable energy which has characterized him in all his former mining ventures, has determined to get water to work the ground in a systematic manner. All the water-rights in the district were taken up, and he found he could not get a constant supply from any source. He therefore purchased the first right of water from Thomson's Creek, which has been held for over twenty years by the Rise and Shine Company, who are working ground on the New Bendigo side of the range. After paying a high price for this water-right he got a head-race surveyed at a high level, which gives him 450ft. head on the surface of the ground at his claim. He had at the time of my visit thirty-five men employed constructing the race, which is 3ft. wide at the bottom, 4ft. on top, and has a depth of 20in., with a fall of 24ft. per mile. It will have a carrying-capacity of over twenty sluice-heads. A great deal of it is rock-cutting, with high stone walls built on the lower side. No expense is spared to make work of a permanent character. When completed it will be three miles in length.

The water-race terminates on the top of a high spur, and from this point the water will be taken in wrought-iron pipes, which will be about 50 chains in length, to his claim. He has ordered 55 tons of steel plates from England, and as soon as this arrives will manufacture all the pipes on the ground. The main supply-pipe is to be 18in. in diameter. He has already expended about £4,000 in connection with this claim, and he estimates, before the pipes, head-race, and tail-race are completed, it will cost about £7,000. In addition to the above-mentioned claim he has also applied for a special claim of sixty acres adjoining the Mountain-race Company's and his own claim. The whole of this ground is alluvial wash-drift, and a portion of it is partially worked.

The ground where this special claim is applied for has never been thought much of, or it would have been taken up years ago; but no doubt Mr. Ewing has prospected it to some extent before applying for it. He is the most enterprising alluvial miner in the colony, and, what is more satis-

factory, all his mining claims worked under his own supervision have been made to pay. It is men of Mr. Ewing's stamp that are wanted in the colony, so as to carry on mining on a commercial basis, and show that it is an industry which can be conducted with profit by adopting systematic methods of working.

ST. BATHAN'S DISTRICT.

Cambrian's.—Very little mining is now carried on here: most of the ground that is payable by the adopted system of working is worked out. Only two or three parties have claims here, and they are said to be making only small wages.

Vinegar Flat.—There are three parties of miners here, doing fairly well. One of them—Thomas and party—has made about £600 per man during last year, and this was the result of nine months' work. About three months was lost for want of water during dry weather in summer, and frost in winter.

Vinegar Hill.—There are a few good claims on Vinegar Hill, and some of them would pay greater dividends if wrought on a more wholesale principle. Hughes and Morgan have been working over twelve months. They have not washed up yet, but expect to get good returns.

J. Ewing's Claim.—The washing-up of this claim after my former visit gave 700oz. of gold for the year's work, which left a profit of £1,200. During last year the owner stripped about 1½ acres of ground to as great a depth as his tail-race will take the stuff away. The ground is very deep, and the bottom will have to be lifted by a hydraulic elevator. Mr. Ewing has made arrangements to have two patent atmospheric elevators fixed, which are guaranteed to lift the material 30 per cent. higher than the ordinary elevator such as is used at Gabriel's Gully. The difference in this elevator is that there is a double nozzle, having a small space between them. The outer nozzle does not stand so high as the inner one, through which the water passes, and it is connected with a gas-pipe which, when screwed into the casting forming the nozzle, stands above the water in the well in a vertical position. The velocity of the water passing through the nozzle causes the air to rush in through the pipe, which has a cock on the upper end to regulate the supply. The elevating-pipe, instead of being fixed down on the casting forming the nozzle, is held a certain distance above by four collar-bolts having long screws on one end and double nuts to regulate the height. The ordinary elevator has a hole in the side of the pipe, having the bottom end placed down over the nozzle of the elevating-jet instead of the pipe being suspended above it. This atmospheric elevator has yet to be tried, and Mr. Ewing is the first to try it. It will cost him £100 for each elevator. The guarantee that he has is that each elevator will lift one and a half times as much water as is used for elevating, together with as much material as can be sluiced down into the well from a height of 25ft., with a head on the main supply-pipe of 280ft.

Very few miners can be found in this colony who would spend such an amount to try any new process—they would be quite content to adhere to the old system; but Mr. Ewing adopts more of the American idea—get the best appliances procurable, and save labour. It is only by this means that poor auriferous drifts can be made to pay for working. Indeed, not only in mining, but in every branch of industry the same principle applies. When the bottom is lifted from the ground Mr. Ewing has already stripped he estimates to have 800oz. of gold.

At St. Bathan's Mr. Ewing has arranged to have another atmospheric elevator, making in all three of them; but this one is to lift an equal amount of water to that used in elevating, together with as much material as can be sluiced into the well from a height of 57ft., the main supply-pipe having a head of 440ft. It will be interesting to know how these patent elevators act, and if they possess the advantages claimed for them.

St. Bathan's Basin.—There is still a small amount of work done here, but the claims are held with as little work being done as possible pending the completion of the sludge- or tailings-channel. One miner named Tiernan has a very primitive method of working, and has only one man along with himself, yet he managed to have £700 clear after paying all expenses, including the man's wages. Mr. Ewing has been stripping some ground ready for operating on as soon as a patent atmospheric elevator is erected. Whether the new elevator will do the work expected of it remains to be seen; but Mr. Ewing must be pretty confident that it is an improvement on the ordinary elevator before spending about £300 for three of them. He has also made arrangements to have one of his claims lighted up with electricity—namely, the one at Vinegar Hill.

St. Bathan's Sludge-channel.—This sludge-channel is being constructed slowly but steadily. Men have been constantly employed in washing away the ground and forming the channel. It has now reached that point where they expect to get sufficient gold in excavated material to pay for the expense of construction. Last year they obtained 70oz. of gold from the drift through which the channel passes, but from this forward a far greater amount of gold is expected out of this drift. The channel is constructed for over a mile in length, and the heaviest portion of the work is done. It has to be constructed for 20 chains further, but it is expected to be yet about two years before it is completed. This work was commenced in 1882, and has already cost £5,400, including a subsidy of £1,000 from Government.

Muddy Creek.—The sludge-channel that was constructed up this creek will be the means of a great deal more ground being worked, and also a considerable quantity of gold will be obtained. There are three companies working into this channel, some of which are doing remarkably well. The reason of the ground paying some of them well for working is not altogether due to the richness of the ground, but to the fact that very little labour is employed. Each of the companies has water-supplies of its own, and they make the water do the work.

The Scandinavian Company: This company, together with the M. and E. Company, constructed the sludge-channel, and are now getting well paid for their labour. The Scandinavian Company the year before last got 750oz. of gold, which enabled them to pay off the whole of their indebtedness incurred in constructing the channel, and pay a dividend of £4 8s. per share. They were washing up at the time of my visit, and from the amount of gold that they had in hand, and

what was still to lift from the tail-race, the year's produce will be about 400oz. The average number of men employed for the year has been between two and three. The number of shares in the company is 240, with a capital of £12,000.

M. and E. Company: This company's ground adjoins the Scandinavian Company's mining lease, and both companies are working at the same level. The new channel has given facilities for the ground to be worked at 45ft. greater depth than was possible before the channel was constructed. The present channel can be brought up to get an additional 25ft. greater depth; but they estimate that the amount of water and tailings going through it will cause the bottom to scour away to this depth with very little labour. The ground they have been working the past year is considered very poor. They employ the same number of men as the Scandinavian Company, and expect to get, when washed up, about 200oz. of gold. The number of shares in the company is 152, with a capital of £7,200.

Otago Company: There are twelve shares in this company, with a capital of £4,800. The shares are principally held by working miners. The ground is not so systematically worked as that of the two former companies: they cannot put the same quantity of material through the tail-race, although there is a larger number of men at work. They use the sludge-channel constructed by the two former companies, but did not contribute anything towards its construction, nor do they pay anything for using it, although it allows them to work their ground to a much greater depth than they otherwise could have done. The amount of gold obtained by this company the year before last was 240oz., and they expect something like a similar amount for the past year's work.

The whole of the ground worked by the three last-mentioned companies is of old quartz-drift, having scarcely any pebble in it larger than a good-sized marble, so that the whole of it is carried away by the water in the channel into the Manuherikia River. There are some parties of miners working at the end of the Muddy Creek channel, and they are said to be making fair wages. The miners in general in this district are doing very well, and it is a district where alluvial mining will be carried on with success and made a profitable undertaking when many other fields in the colony are worked out. Indeed, there is a large field from Tinker's to Naseby where comparatively very little has yet been done, and where the same character of quartz-drifts exist as at St. Bathan's Basin and at Muddy Creek. The difficulty in prospecting the country is the want of water. All the available water in the neighbourhood is held by those who are working here, and unless the ground be worked by hydraulic sluicing it is of too poor a character to work at all.

Mount Ida District.

Rough Ridge.

Several parties of miners are at work in this locality, but the scarcity of water prevents them from making high wages. R. Johnston has a water-race from a branch of the Manuherikia River, which comes on to Blackstone Hill. If this race were extended, there is no doubt a great deal more ground would be worked profitably.

Garibaldi Company.—The ground that this company holds has been partially worked and held for nearly twenty years, but it is at so high an elevation that a constant supply of water cannot be obtained from any stream in the immediate vicinity. They have constructed two small dams on the range, but the supply when water is plentiful is said to be only about six sluice-heads. They cannot work during the middle of winter on account of the frost, which not only makes the surface of the ground unfit for sluicing, but also decreases the supply of water. This is the first season that the company has been at work, and nothing is known yet how the ground will turn out, although it is reputed by a great many to be richly auriferous. This company was formed a little over twelve months ago, with a capital of £4,000, in 8,000 shares of 10s. each, of which 3s. 3d. has been called up. They have a claim of sixty acres, and the depth of the ground is about 60ft.

Naseby.

The gold-mining claims in the locality of Naseby are in general not rich—the ground requires to be worked systematically to make them pay fair wages; and the water this season has been so scarce that many of those using water from the Mount Ida Water-race had not been able to get any for eleven weeks prior to my visit. This, together with the small amount of gold in the ground, prevents the miners from making wages. Any one visiting this place cannot help noticing the primitive manner in which hydraulic sluicing is carried on, and must also notice that many men have a hard struggle to gain a livelihood.

The best of the ground worked last year in this locality was in Home Gully. Barnet and party did very well. This was a party which went to some expense in the onset to get iron piping to work the ground, and utilised most of the head that could be obtained from the water-race. Several parties of Chinese are also said to have made very good wages. Some of the Chinese miners have substituted iron piping for the canvas hose, and are utilising the whole head of water. This is a step in the right direction, and one which will no doubt be followed by those who can afford it; but the scarcity of water and the general system adopted for working the ground show that it is a hand-to-mouth existence with a good many. The general desire in this neighbourhood is to have the reservoir at the Wedderburn constructed, which is calculated to cost about £10,000. Very little mining is carried on at Spec. Gully, owing to the want of water. The manager of the water-race states that there is very little water to supply the claim-holders in that locality, as he can sell the whole of the available water nearer Naseby.

The Hydraulic Elevating Company have worked a considerable area of ground in the bed of Hogburn Gully, and it is said to have paid them good interest on the capital expended on the plant.

Mount Burster.—There are three claims on Mount Burster which have been worked for many years and have paid handsome dividends. Endor and Guffie's claim in former years produced gold to the value of £2,000 per man clear profit for eight months' work, and now averages from £7 to £8

per man per week for each man employed. The claim-holders here store water in dams, and are thus able to command about ten sluice-heads of water in each claim for a certain season of the year. The ground in Endor and Guffie's claim is about 65ft. in depth, of which 20ft. is auriferous; the best of the wash-drift being under thin horizontal beds of clay. They still have about twenty-five acres to work, which they estimate will take them from thirty to forty years. Only one of the other claims has been worked this season, and that is said to pay very well.

Cardrona District.

Fat Boy's.—This is a field on the opposite side of Ludgate Creek from Criffel, and where the same run of the old quartz wash-drift occurs as that found on Mount Criffel. There was considerable excitement about the discovery of gold in this locality some sixteen months ago, and several claims were taken up; but these have nearly all been given up with the exception of Nauman and party, who are still working and said to be getting gold; but whether the ground is made to pay wages for working is a question upon which no definite information could be procured. However, this party is employing either two or three men on wages, and the inference from this is that the claim is a payable one—that is, if there is not a small company in connection with this claim who are merely prospecting the ground. The system of working—namely, taking in a narrow cut from the face—bears out the latter idea—that it is merely prospecting the ground with the hope that a lead of gold bearing wash-drift may be discovered. This old quartz drift-wash seems to run towards Mount Pisa, and probably another lead of gold will be discovered in this direction. Talboys and party have expended a good deal of money in prospecting the ground with boring-rods, and fair prospects were obtained in two of the holes at a depth of 90ft., and the holes were continued to a depth of 120ft. without finding any bottom. This party has suspended operations at present.

Cardrona.

About seven months ago a new rush set in on the terrace where some rich auriferous alluvial deposits have been discovered. This has given an impetus to mining in the locality, and will no doubt be the means of other terraces being prospected which hitherto have been looked upon as barren ground. At the time of my visit there were eleven claims on gold, all of which may be termed good payable ground. In some of them the shareholders were reported to be making £20 per week each, and there are none of the others in which the owners cannot make good wages.

The claims which were on gold belonged to the following parties: Daniels, Savage, and Goldsborough, three men; Tovey and party, four men; Le Franky, four men; Jones and party, five men; Goldsborough, employing wages-man, two men; Robertson Brothers, three men; Austin and party, two men; Hudson and party, two men; Jacobs and party, two men; Williams and party, two men; Trip and party, four men; Salvation Army claim, five men: total, thirty-eight men. In addition to these there are a number of people prospecting ground and getting ready to open out claims, which seem to be situated in such positions that they can hardly miss being payable. The total number on the field is about 150, of which forty are Chinese. The approximate yield of gold from this field last year was 4,000oz.

About forty miles of water-races have been constructed to bring a supply of water on to the ground so that the claims may be worked by hydraulic sluicing. Jones and party have constructed a race from Toohey's Creek, which comes out of the Mount Criffel Range, and also picks up small mountain-streams along the sideling of the range. Morrow and party's race is also constructed along the same sideling, and is more of a catch-water race, but in ordinary weather it gives them sufficient water to work with; and Torrey and party have constructed a race from the Cardrona Creek. The latter race has the largest carrying-capacity and most permanent supply. The total carrying-capacity of these water-races is estimated to be eighteen sluice-heads, and their aggregate cost is about £6,000. There are also ten main tail-races constructed, which cost about £3,000.

The depth of the ground varies considerably, from 3ft. to about 60ft. There are only two claims being worked in the very deep ground, which is done from adits or tunnels in from the face. The rest of the ground, which is from 3ft. to 25ft. in depth, is worked by hydraulic sluicing with water from the races which have recently been constructed. This new ground was said to have been discovered in October last by Mr. Savage, but it is even questionable if some of the ground was not known to be payable for working some time previously. Indeed, some of the miners informed me that Mr. Morrow first discovered gold here in July last. The construction of these races to work the claims in this locality must have taken a good while, and if the ground was not known until October last the promptitude displayed by the miners in bringing in a supply of water deserves the highest commendation. The great desire of the miners here is that no freehold rights be granted, as there are great hopes of being able to trace the lead of gold for a considerable distance.

Prospecting is being carried on along the face of the Mount Criffel Range from this new rush downwards, and from information received from those in the locality gold has been found in several places, although not yet in sufficient quantities to pay for working the ground.

The discovery of lignite in the vicinity of Cardrona has proved a valuable boon to the inhabitants in this locality. Mr. McDougall and Son, as well as another person, have opened pits, or a quarry, up a small creek flowing at about right angles to the Cardrona, and about a mile and a half inland. The coal is brought down by drays to the Cardrona–Arrowtown Road, and thence a further distance of seven miles to the township, where it is delivered at a cost of £1 2s. 6d. per ton; and formerly lignite which had to be brought from Cromwell cost £4 per ton. The lignite is of good quality, and its discovery will be a great boon to those residing in this district, as well as to those on Mount Criffel.

Criffel.

There does not appear to have been any new ground discovered in this locality. Most of the miners that had payable claims when the rush took place are still at work, and the ground, although not quite so rich as formerly, is still paying them good wages for working it. Halliday and party, the prospectors, completed their water-race last season, and are busy washing this year. The first claim taken up by them is pretty well worked out. They purchased the Salvation Claim, and have about one-half of the ground in it washed away. Their water-race is constructed from the Ludgate and Pisa Creeks for a distance of about fifteen miles, and cost them about £2,500. This race has a carrying-capacity of about four sluice-heads.

Craig and party have also completed a water-race from the Ludgate Creek—lifting the water at a lower level than Halliday and party—which is capable of carrying two and a half sluice-heads. Its length is about ten miles, and its cost about £900.

With regard to the construction of both these water-races, the levels have been very badly taken, and the result is flat portions in the race, which overflow, while in other places the water flows at a high velocity. The races on the whole, therefore, do not carry so large a quantity as they ought to convey from the amount of excavation there is in the ditches.

The other miners at work on the field are—Hawthorne and party, Barker and Son, Fox Brothers, Graham and Robertson, Purchas and party, and some others—in all, about forty miners. The whole of these parties' claims have paid very well for working since they were opened out.

My attention was directed to the character of the gold on the Criffel field and of that found on Boundary Creek, which flows into the Cardrona River about four miles below the township, as if some relation could be established between these two places. The value of the gold on the Criffel is only £3 7s. 6d. per ounce, and of that from Boundary Creek £3 10s. per ounce, both samples containing silver; while the gold from Cardrona, and also from the Ludgate Creek, is worth £3 15s. per ounce. This would go to show that the gold that came into Cardrona, and also the Ludgate Creek, was not from the same run of ground as that from Mount Criffel and Boundary Creek, and that the character of the gold from the two latter places nearly coincided with each other, and might be traced into the same run of ground. This is a moot question, but one worthy the attention of the prospector in this locality. The approximate yield of gold from the field this season is about 1,000oz. There have been five main tail-races constructed on this field, the aggregate cost of which is about £2,000. The construction of the head and main tail-races was only completed in January last, so that very little sluicing was done up to this time. Now all the claims are in a fair way of being worked systematically, so that there is reason to believe that the yield of gold next year will be considerably increased. There are about fifty miners employed on the field.

ARROW DISTRICT.

Another attempt has been made to test the flat below the Arrow township; but the influx of water is too great for the machinery employed. A shaft has been sunk upwards of 30ft. in depth without any sign of bottom, and there is no chance of the bottom being reached with the present appliances. A great many miners and others are of opinion that at one time the Arrow River flowed in a different direction from that in which it now flows, and that it went through Miller's Flat into the Shotover River, and that the depth of sinking on the flat which they have been trying to test goes to bear out this theory; but, be that as it may, it will require powerful pumping machinery to work the ground, even should rich auriferous deposits be found in this direction.

Scoles Company.—This is a private company that took up the bed of the Arrow River about two miles above the township. They constructed a tunnel through a point to take the water of the river, in order to work the gravel-wash that lies on the bed-rock. After working for a considerable time the floods, coming at short intervals, filled up their paddocks time after time, so that they got disheartened and sold the claim and the plant. This was purchased by W. Scoles, one of the original shareholders, together with another gentleman, and they are now repairing the damage done by the flood, have widened the tunnel, and are constructing a stone dam to prevent the flood-waters in future from damaging their workings. They have a head-race constructed from Bracken's Creek capable of conveying about seven sluice-heads of water at an elevation of about 420ft. above their workings.

The system they have adopted for working the ground in the creek-bed, which is about 30ft. in depth, is Perry's hydraulic lifting process. There are two lifting-pipes and two supply-pipes, erected a short distance from each other, so that if any damage occurs to one they can work with the other; or, when cleaning up the tail-race into the one the other keeps the ground dry: but they have not been, so far, successful in finding sufficient gold in the ground to pay for working. Immediately previous to the last flood they came on solid ground in which there was payable gold, but never got the opportunity of taking off the bottom before the flood came and filled in all their working. They intend, before commencing to work again, to build a permanent wall to prevent a like occurrence taking place.

At the time of my visit the floods had levelled everything to such an extent that there was nothing to indicate where the workings were but the upright pipes, which project above the gravel-bed. The plant and works in connection with the claim have cost about £2,000.

Moody and Davis.—These are two Melbourne gentlemen, represented here by Mr. D. Miller, who is constructing a water-race from Skipper's Creek to Londonderry Terrace. They are also constructing a large tunnel to carry the water of the Arrow River, in order to work its present bed, below the junction of Soho Creek, or what is commonly known as the Roaring Billy. The tunnel is 8ft. wide and 6ft. high, and is being constructed on a uniform grade, so that the bottom of it can be pitched, and used to act as a tail-race to catch whatever gold there may be in the gravel-wash sent through. Mr. Miller estimates the cost of the tunnel and appliances necessary to commence sluicing

operations to be about £6,500. If this, together with Scoles's mining venture, proves a success, the whole bed of both the Arrow and Shotover Rivers will be taken up, and will give means of employment for a large population.

Shotover District.

Sew-Hoy's Company.—This is a company that is formed to dredge the Shotover River at the Big Beach. At the time of my visit the dredge was in the river, but was not at work. The floods in the river, a short time previous to my arrival in the district, left the dredge high and dry on a bank of shingle, but they have succeeded in getting her afloat again. Nothing is yet known as to the success or otherwise of this company; but, from information obtained in the locality, the dredge seems to be too small for the work it is expected to perform.

Skipper's Point.—This is held by Mr. J. Aspinall, who has now been working on the same point for many years, and, although he puts a large amount of drift-gravel through his tail-race every year for the quantity of water at his disposal, it makes but little difference in the appearance of the point from what it bore at the time of my previous visit. Taking last year's work as a basis, it will take a number of years yet to work out this claim, if all the ground prove payable for working. Mr. Aspinall manufactures all his hydraulic plant himself on the ground, and has, perhaps, the most complete plant in the district. He has lately been running off the top drift from his claim, which has a great depth, but has not been able to get to the bottom wash, where he is certain of getting good returns; but, notwithstanding this, he has done fairly well from the amount of gold obtained in washing the top drift only.

Upper Shotover.—There are a good many parties working in the branches of the river and terraces, most of which are said to be making fair wages. Very few miners who have been working in this locality of late years have left the district. They are satisfied that it is one of the best places for the individual miner in the colony.

Lower Shotover.

There is still a deal of ground in the vicinity of the Shotover River and Skipper's Creek that would pay handsomely for working if there were a good supply of water commanding it, so that hydraulic sluicing could be carried on in a wholesale manner; but the expenditure involved in constructing a water-race from a large permanent supply, such as from Skipper's Creek or the Shotover River, has prevented a work of this nature from being taken in hand. There is scarcely a terrace where wash-drift is found which would not pay for working if there were a good supply of water. The Shotover district has proved in bygone years to contain the largest extent of rich auriferous gravel-drifts there is in the colony, and at the present time there are still large deposits of gold found in the drift-terraces.

There is, no doubt, a large amount of gold yet to be found in the bed of the Shotover River—more than has ever been taken out—and the time will come when tunnels will be constructed and the river turned, so that a large extent of the present bed can be laid bare, so as to allow the bottom to be cut up. The workings in the early days could only be carried on with the aid of Californian pumps, and the influx of water in the paddocks sunk was so great in most instances that the wash-drift had to be lifted off the bottom in a certain amount of water, and very seldom was there any opportunity of being able to cut up a certain depth of the bed-rock, which is full of joints and crevices, which are bound to contain a large amount of gold, as these would act as the ripples in a tail-race. The Shotover River may justly be designated a gigantic tail-race or sluice separating the precious metal from the drift and rocks which have come into it from slips off the mountain-ranges; and, while the great volume of water carried the gravel and light material along with the stream, the heavy metallic particles were left behind to be discovered and collected by the ingenuity of man.

Londonderry Terrace.—Recently Messrs. Davis and Moody, a firm of bankers in Melbourne, who are largely interested in mining properties in different places in the Australasian Colonies, have taken up a portion of the Londonderry Terrace, which is a short distance below Skipper's Point. The firm are represented here by Mr. D. Miller, who is now constructing a water-race from the right and left branch of Skipper's Creek. The race is constructed on the northern side of Skipper's Creek, commencing about two miles below the Phœnix battery on the right branch, and about three-quarters of a mile below the electric plant on the left branch, and carries the water across the main creek in pipes to the opposite side. The water-race is constructed 2ft. 6in. wide at the bottom, 3ft. 6in. at the the top, and is 3ft. in depth. The ditch for a considerable length is cut out of the rock, the worst portion of it being through old slips; but where the slips are of a rotten character, or going through any bad ground, a double stone wall is built on the lower side of the ditch, and the space between the walls puddled with clay. Its carrying-capacity is calculated at twenty sluice-heads. The work is laid out very creditably, and is being carried on in a very systematic manner. At the time of my visit there were about two miles constructed. Whenever a gully crosses the line of race the water is carried across in iron pipes, which are manufactured on the ground at a very reasonable rate.

The pipes used for carrying the water across gullies, and for a siphon across Skipper's, about half a mile above its junction with the Shotover River, are 22in. in diameter, made of Nos. 14 and 16 BWG. iron in 18ft. lengths, with angle-iron flanges at both ends. The company supplies the sheet-iron, which they get delivered by contract at £15 10s. per ton at Skipper's Creek, and also the bolts and angle-iron flanges; and the cost of constructing the pipes and placing them in position on the ground is taken by contract at 1s. 3d. per lineal foot, including dipping the pipes in tar previous to laying them in position.

In addition to four licensed holdings which these gentlemen hold on Londonderry Terrace, under the name of the Londonderry Company, they have some claims on the terraces alongside Skipper's

Creek, where workings will commence as soon as the water is brought this distance. The length of the water-race, when completed to Londonderry Terrace, will be four and a half miles, and the cost of its construction is estimated to be £7,500. Mr. Miller estimates that before the claims are in working-order, with tail-races and hydraulic plant, it will entail an expenditure of £10,000.

The way that the work is progressing, and its permanent character, show that the undertaking is a *bonâ fide* one, and that no stone will be left unturned to make the venture a success.

Pleasant Terrace.—The principal workings on this terrace are carried on by Mr. R. Johnston, who has a water-race constructed from Pleasant Creek on to the terrace, which is capable of conveying about five heads of water; but in very dry weather the supply, which is merely a mountain one, is not to be depended on. Mr. Johnston's claim is said to contain rich deposits, but, owing to the small amount of water and other drawbacks, he does not appear to be able to get over much ground.

Stony Terrace.—The principal workings on this terrace are carried on by Messrs. Davis Brothers, who have constructed a water-race from Stony Creek capable of conveying about ten sluice-heads of water. This amount of water is used at the claim in two nozzles, one with 150ft. pressure and the other with 250ft., and they are able to run away with this quantity of water a large amount of stuff. The tail-race is, however, very short, being only about 200ft. in length, with a large quantity of drift passing through it. There is no doubt but that a considerable amount of gold is lost. This claim is said to be one of the best in the district, and the owners seem to work it on systematic principles, and are able to put through a large amount of material for the quantity of water at their command.

TIN-MINING.

Several reports have been circulated from time to time that tin had been discovered in the colony; but until very recently there has been nothing to lead one to suppose that it would be found in payable quantities. In the latter portion of last year some samples of tin-ore were forwarded from Stewart's Island for analysis, and proved to contain a high percentage of tin, and Professor Black, of the Otago University, visited the island at the request of the prospectors to test the value of their discovery, with the view of ascertaining the extent of ground where the tin-ore was found. The result was, a rush took place, and large areas of land were marked off all over the country with the view of obtaining mineral leases.

The country where tin-ore—cassiterite—has been discovered *in situ* is in the Remarkable Mountains, and it is also found in the alluvial drift-wash on the low undulating country on the southern and eastern side and slopes of the mountains down to the coast. On getting close to the coast the hills fall abruptly into the sea, leaving a large extent of tolerably low undulating table-land between the sea-coast and the mountains. These mountains can be seen for a long way off on account of the singular rock-protuberances with which they are studded. The Remarkables vary in height above the sea from 1,400ft. to 2,300ft., and are almost entirely bare of all soil and vegetation for some distance from their summits. They are formed of granitoid gneissic rocks, and present a striking contrast with the densely-wooded country between them and the sea. It is in the Remarkables that the tin-ore has been found *in situ* in massive beds of quartzite and mica. The small lodes or segregations in which the tin-ore has been found consist of a micaceous rock having bands of quartz running through it, and it is in these bands that the tin-ore is got; but there has scarcely been any prospecting yet done to determine what extent of lodes there are, or whether any of them will pay for working.

The mountain-range where the tin-ore has been discovered begins about three miles north of Port Pegasus, and extends for a distance of seven or eight miles in a north-easterly direction. The outcrops of the metalliferous belt can be traced along their summit, which consists of a soft micaceous schist, with bands of quartz containing cassiterite and wolframite. These minerals are generally associated with each other, and are somewhat alike in appearance and colour. Wolfram is troublesome to separate from the tin-ore on account of its specific gravity, which is a little more than that of cassiterite, the latter being from 6·4 to 7·1, and wolfram from 7·1 to 7·5. Wolfram can, however, be distinguished in the lode from the tin-ore by its lustre, hardness, and streak. It consists of tungstic acid, protoxide of iron, and protoxide of manganese. It has a submetallic lustre, and is of a dark-grey or brown-black colour; by scratching it, the streak will be dark reddish-brown to black; and its hardness is from 5 to 5·5: while the hardness of cassiterite or tin-ore is from 6 to 7, having more of an adamantine appearance, with the crystals tetragonal, and streak white or greyish-brown.

Some of the lode-stuff shown me at the Bluff on my return from Melbourne in March last resembled some of the lode-material in which tin is found in the Northern Territory of South Australia, being full of scales or flakes of mica, with tin imbedded in small crystals in the rock. Mr. Spence, the Commissioner of Crown Lands for the district, states that on going from Port Pegasus to Paterson's Inlet in February last he walked over the metalliferous belt, and distinctly traced the outcrop for a distance of several miles along the ridge; but that it had not been broken into in any place with the exception of two places on the south end of the range. As far as the future of this field is concerned regarding the existence of payable lodes, it has yet to be proved. There is not sufficient work yet done to enable any one to arrive at their value, or even to say whether those found will become payable for working or not.

Between the mountain-range and the coast the country is densely covered with stunted scrubby timber, consisting of what is termed bog pine—a species of yellow-pine—with manuka and rata, &c., and in some places there are belts of mutton-bird scrub which stand from 8ft. to 10ft. in height, forming a closely-tangled thicket which is very difficult and tedious to penetrate. In many places there is only a slight covering of soft peaty soil on the bed-rock, and in other places there is a little garnetiferous sand and gravel-wash, and it is in this wash-drift that stream tin-ore is found. The

The thickness of this drift varies considerably, from a few inches to 6ft., and in some places it is stated that the wash is 10ft. in thickness; but so far as is known about the field the latter depth is of rare occurrence. The tin-ore is found in this wash from sandlike grains up to the size of small peas.

The first discovery of stream-tin was made in Pegasus Creek and its tributaries, which were worked for gold many years ago, and, although very little was obtained, yet there has been a considerable amount of work done. The miners in washing for gold always found a considerable quantity of what they took for black sand, which is now proved to be tin-ore. The Pegasus Creek empties itself into the head of the north-west arm of Pegasus Harbour, and goes up from there through narrow flat valleys originally covered with manuka scrub, and it is in these valleys that the stream-tin was first discovered. Mr. McKay, the Assistant Geologist, states that stream-tin is also found to the south-west of the southern end of the mountain-range, at an elevation of 570ft. above sea-level; but at this place there was no garnetiferous sand in the wash as was the case with that found in the vicinity of Pegasus and Smith's Creeks, but the samples of tin-ore were coarser and cleaner than that obtained in the valley of the Pegasus. There was only, however, about a foot of wash, and the prospects washed seldom exceeded half an ounce of tin to a dishful of stuff. Mr. McKay also states that better prospects were obtained along Smith's Creek, and that stream-tin is widely distributed on the low ground and also on the table-land in the vicinity, and that it will continue to be found both towards the dip and along the eastern side of the range from the southern quarry to the northern outcrop and Black's lease. From the abundance and wide distribution of tin-ore in the alluvium along Pegasus Creek and to the east of the main watershed of the island Mr. McKay infers that richer deposits will be found *in situ*, and that, while prospecting should not be discontinued along the quartzose and micaceous rocks in the range, the granite and gneissic rocks to the eastward and westward should be carefully examined, especially the feldspar and quartz veins which abound in some parts of the granite area.

This portion of the country can only become valuable if it is proved to contain minerals payable for working; it is of little or no value for either agricultural or pastoral purposes. But, seeing that tin-ore is distributed over a large extent of country, although it may not be in many places in payable quantities, still the inference is that some rich finds of tin-ore will be discovered. It is a field to which it is of no use for any one to go unless he is prepared to undergo the hardship of a digger's life, and settle down to steady hard work. Although this discovery was made six months ago, there is very little work yet done in any of the claims. When the discovery was made known people flocked to the field in the highest state of excitement, owing to rumours being circulated about its great richness, and many apparently thought that all that was necessary to acquire a fortune was to mark off an area of ground and apply for a mineral lease. Very few *bonâ fide* miners have gone to the field, and very little work is done, the ground being principally held by "shepherding," with the view of other discoveries being made.

In regard to prospecting operations, the nature of the country and the difficulty in getting supplies and tools back in the interior, as well as its climatic conditions, will make *bonâ fide* prospecting a laborious task; but there is a probability of it being well rewarded. All that can be said of the field at present is that there are large areas of ground applied for under mineral leases, and scarcely any work done to determine whether it is payable for working or not.

In the Press Association telegrams from Invercargill, of the 10th June, the following appeared, which gives a clear and sensible view of the condition of things on the field, which is as follows: "Mr. Conliff, the Tasmanian expert, who has been prospecting the tin-claims at Pegasus for several holders, came over to-day, bringing samples of stream-tin that will pay to work—being equal to 70 per cent. of the metal, and to be got in quantity. He is of opinion that the field will turn out good, but disapproves of the way the country has been marked off into claims, as only a few can ever possibly be worth working. The movement has hitherto been more of a land-speculation than a search for minerals. Very few claims have yet been touched with the pick and shovel, and most of them are not worth spending money on. Even those that are payable will require a considerable expenditure of cash and time before a return can be obtained. The lode, he believes, will yet be found, and will probably be as rich as that of Bischoff, in Tasmania, but may take a great deal of labour to discover. The difficulty of getting supplies and plant up the mountain, and the climatic conditions, are much against the development of the field."

Up to the present time 138 applications have been received for mineral leases of 60 acres each; but, probably, when these come to be surveyed the areas applied for cannot be granted, as the ground is all pegged out in claims adjoining each other, and in many cases there are only from fifteen to thirty acres in the ground originally marked off. Should these mineral leases now applied for contain each, on an average, forty acres, this would make 5,520 acres that has already been taken up.

Several applications have been made to have roads and tracks constructed; but, until the field is more developed and something more known as to the value of the discoveries, it would be premature to incur any large expenditure. A subsidy has been given to a steamer to take the mails once a fortnight from Half-moon Bay to Port Pegasus. This will afford facilities for people to get to and from the mainland to the island.

THE CHLORINATION OF GOLD-BEARING SULPHIDES.

In my Australian report on the Newbery-Vautin process of chlorination reference was made to the fact that the process was not a new one, but only a slight modification of the Mears process, adopted in South Carolina many years ago. The following is an abstract of a paper read before the American Institute of Mining Engineers in July, 1887, by E. Gybbon Spilsbury:—

"The system, which is known as the 'barrel system' has been brought to its present state of perfection by Adolph Thies, to whom all credit for the improvement should be given. In reality it

is an outcome of the Mears process. The latter process, as is well known, consists in revolving the charge of ore to be chlorinated in a lead-lined barrel, supported on hollow trunnions, through which the chlorine generated is forced under pressure. This method, while fairly effective metallurgically, is very objectionable in some particulars, especially in the difficulty of keeping tight joints in stuffing-boxes and of preventing the consequent escape of chlorine gas through the works. The cost of repairs has also proved excessive.

"The system I have now adopted is extremely simple, and requires no tight joints liable to leakage. The chlorinator consists of a plain iron barrel, lined with lead, and provided with a man-hole on one side for charging and discharging the ore. The ore is charged in one-ton lots. The barrel is first partially filled with water, then a sufficient quantity of chloride of lime is dropped in, on top of which the roasted ore is charged. On top of the ore is poured the requisite amount of sulphuric acid, the man-hole cover is put in place and thoroughly secured, and the barrel is started to revolve. The reason for charging in this order is to prevent the sulphuric acid and chloride of lime from coming in contact before the barrel has been securely closed. When the charging is completed the barrel is started, and is kept revolving until the whole of the gold is dissolved. A very ingenious method has been devised, which enables the operator, by means of a clay pot-valve, to test from time to time without opening the barrel the presence of an excess of chlorine gas. With the sulphides I operated on, each one-ton charge consumed 20lb. of chloride of lime and 25lb. of sulphuric acid. The time occupied in chlorinating has so far been six hours, but as we gain experience I expect to be able to reduce the time by nearly one-half.

"When this operation is completed enough water is introduced to nearly fill the barrel, which is again revolved so as to thoroughly wash the ore and dissolve the chloride of gold. The barrel is then opened, and the liquor is decanted off upon large shallow filter-beds. Another wash-water is then put into the barrel, which is again revolved for a few minutes, and then decanted upon the filter. Ultimately the whole charge is turned down in the ordinary way, and a final wash-water is given on the filter. The result so far obtained has been remarkably successful. I append herewith the result of the last charges run. Each charge contained a little over a ton of ore of such fineness that 99 per cent. of it would go through a 100-mesh and 60 per cent. through a 150-mesh screen. The assays made of the roasted ore showed the value to be £7 14s. per ton. The assay of the tailings from first charge gave 6s. 6d. per ton; second charge, 4s. 2d. per ton; third charge, 3s. 5d. per ton; fourth charge, 2s. 2d. per ton; fifth charge, trace; sixth charge, 3s. 5d. per ton; seventh charge, trace; eighth charge, 3s. 5d. per ton.

"In order to further test the advantages of this system I tried one charge considerably heavier than the others, and endeavoured to filter it direct in the usual way. While I used for this charge nearly double the amount of wash-water, and while the time occupied in filtering was much more than the other charges required, the tailings resulting contained gold to the value of £1 3s. 7d. per ton. There seems to be no difficulty in filtering through a bed of ore from 3in. to 4½in. thick; but when the thickness of the bed is greater, then the filtering of such very fine material becomes almost impossible; hence the advantage of decanting.

"The precipitation is done in the usual manner, with protosulphate of iron. Our ores contain a considerable percentage of magnesia, which gave us a very voluminous precipitate. I find, however, that the precipitation of lime and magnesia may be entirely prevented if care is taken to have the tank solution slightly acidulated. The moment the solution is allowed to become neutral the magnesia begins to show in the precipitating-tank as a milky cloud, which, however, immediately disappears on a small addition of free acid.

"The cost of roasting, labour, chemicals, and power with us will never exceed 16s. 6d. per ton. So far, it has not attained that figure, some of my work having been done as low as 12s. 6d. per ton. The actual gold recovered in all cases within a few pence per ton of the full assay-value of the ore, less the amount shown by assay to have remained in the tailings. While the gold obtained in our stamp-mill and amalgamating-works is seldom purer than 897 fine, the gold obtained by this process is generally over 978 fine."

EVENDEN GOLD-GLEANER.

This machine has recently been invented and patented by Robert Edward Evenden, and a great deal of credit is due to the inventor for the ingenuity displayed in its construction. Test-trials of a small machine have been made at Wellington, and, so far, the results seem satisfactory. The patentee claims he can save 98 per cent. of the gold out of dense black sand; but this percentage seems to me too high for the machine to save, and if it comes up to 90 per cent., and can put through a large quantity of material, the patentee will be well recompensed for his invention.

The machine that has been exhibited and tested at Wellington is merely a model, made of galvanised sheet-iron, about 4ft. in diameter, which the patentee claims is capable of successfully treating about half a ton of black sand per hour; but he intends to have a machine constructed of either wrought- or cast-iron from 6ft. to 8ft. in diameter, which would appear to be a convenient size for ordinary use—that is, judging from the working of the present model. By the description of this machine already published in some of the newspapers in mining districts some people may be led to suppose that this machine separates the gold from the black sand entirely; but such is not the case. The machine is only a concentrator, capable of reducing the material in bulk and leaving nothing but the heavy, dense particles of black sand, gold, or other metals ready for further separation.

The machine is a circular pan with a dished or concave bottom, having vertical sides at its periphery, standing about 5in. high above the dished bottom of the pan. The dished or concave bottom forms the segment of a circle, having an angle or dip of about from 10° to 12° from the outer edge of the bottom to the centre, or, if the angle of deflection of the curvature of the bottom were taken from a horizontal line, it would be about 20°. There is a tube projecting inside the pan

for about 3in. above the bottom, and on the upper end of this tube there is a valve, which is regulated by a screw to allow the waste material to escape from the pan uniformly, and at such a rate as may be deemed desirable for the character of the material under treatment. On a level with the top of the projecting tube there is a horizontal circular plate fixed, having a few perforated holes near the centre to allow the waste material to come up from the pan at the centre and escape through the valve into the chute which carries away the waste product. A hopper is fixed at one side of the machine for feeding, so that all the material first enters the machine near its periphery.

The machine is therefore a circular concentrator, with an eccentric motion similar to that of the first stage of washing a prospect of alluvial auriferous drift in a black-iron or tin dish, and the number of moves per minute is regulated according to the character of the material under treatment. For heavy black sand it requires from sixty-two to sixty-five per minute. The motion necessary to produce good results is that which thoroughly mixes the water and material together, and keeps the sand in a state of suspension. The eccentric motion is given to the machine by four cranks placed horizontally under the bottom. There is a ring or band of wrought-iron fixed underneath the bottom of the machine, having a little less diameter than the pan. In the ring there are four holes which can be fitted with brass bushes for the crank-pins to work in. The machine is set on the top of these four cranks, and, the motion being communicated to one of them by gearing, the other three have to go round, and therefore keep the pan in a certain eccentric orbit or position. The throw of these cranks is about 8in.

This eccentric motion produces an action which tends to throw all particles of the greatest density and specific gravity towards the periphery of the machine, while the dished bottom has a counteracting influence, and tends to draw down the heavy particles to the centre of the pan. The effect of this is that the gold gets thrown towards the periphery of the pan until it gets on the bottom, and at once the dished bottom causes it to slide down towards the centre, while the lighter particles of sand are kept in suspension in the water and go through the valve in the bottom of the machine.

As far as can be seen of this machine in its present stage, it is well worth a trial, and, even if it does not come up to what the patentee claims for it, no doubt it will be improved on when once its defects are known. There are many machines invented which give satisfactory tests on a small scale, and when put in constant use are found wanting in some details, and this will most likely be the case with the Evenden Gold-gleaner or Concentrator when it is in constant work. Judging from the design and eccentric motion of this machine, it could also be made an amalgamator as well as a concentrator. The McNeil concentrator and amalgamator is something similar to this machine, only the bottom is convex instead of concave, all the waste material being discharged in the centre; and the machine has a similar motion to that adopted by Mr. Evenden. But all these machines are too slow in their action to get through a large quantity of material. They are more suitable for attachment to a crushing-battery than for working black-sand leads. A small machine on the Evenden principle would be very useful to those who are working on a large scale on black-sand leads to reduce the blanketings before they are treated in an amalgamating-barrel: or, if it were made an amalgamator as well as a concentrator, it would be a better machine to use for treating the blanketings than the ordinary revolving barrel at present adopted.

VALUE OF WORKS CONSTRUCTED.

The total value of works in progress and constructed by this department since the votes were placed under the control of the Hon. the Minister of Mines, including roads and other works for the development of the mining industry, either by way of subsidy or otherwise, has been as follows:—

Nature of Work.	Total Cost of Construction, or Amount authorised to be expended.	Expenditure, by way of Subsidy or otherwise, by Mines Department.	Amount of Liability by Mines Department on Works in Progress.
Up to Years 1882–83 and 1883–84.	£ s. d.	£ s. d.	£ s. d.
Water-races	29,252 1 11	14,853 9 5	14,398 11 6
Roads on goldfields	21,437 11 2	13,089 16 0	8,347 15 2
Roads and tracks undertaken by County Councils, subsidised by Mines Department	52,841 17 0	21,844 16 7	10,207 15 9
Works undertaken by prospecting associations, subsidised by Mines Department	13,216 13 4	3,350 0 0	3,400 0 0
Construction of drainage- and sludge-channels, subsidised by Mines Department	5,750 0 0	2,468 15 4	781 4 8
	122,498 3 5	55,606 17 4	37,135 7 1
1884–85.			
Water-races	4,846 1 9	14,596 2 9	4,648 11 6
Roads on goldfields	13,667 10 1	9,630 9 6	12,384 15 9
Roads and tracks undertaken by County Councils, subsidised by Mines Department	13,566 14 1	6,293 16 6	12,739 17 6
Roads to mines, other than gold, subsidised by Mines Department	4,594 10 0	111 19 0	2,888 1 0
Works undertaken by prospecting associations, subsidised by Mines Department	850 0 0	108 0 0	3,692 0 0
Construction of drainage- and sludge-channels, subsidised by Mines Department	4,050 0 0	1,050 0 0	1,931 4 8
Diamond and other drills	3,600 0 0	1,858 0 0	..
	45,174 15 11	33,648 7 9	38,284 10 5
1885–86.			
Water-races	3,660 4 9	6,063 2 3	6,964 4 4
Roads on goldfields	27,543 18 8	12,360 14 9	27,567 19 8
Roads undertaken by County Councils, subsidised by Mines Department	14,773 2 3	13,043 15 9	12,477 9 2
Roads to mines, other than gold, subsidised by Mines Department	1,551 19 10	4,327 0 10	490 12 8
Works undertaken by prospecting associations, subsidised by Mines Department	11,860 18 0	1,999 5 7	6,389 5 9
Construction of drainage- and sludge-channels, subsidised by Mines Department	10,051 14 9	3,994 16 6	6,995 9 9
Schools of Mines	2,160 9 7	1,260 9 7	900 0 0
	71,602 7 10	43,049 5 3	61,785 1 4
1886–87.			
Water-races	..	1,928 14 4	3,466 0 8
Roads on goldfields	12,453 3 5	22,229 16 1	17,791 7 0
Roads and tracks undertaken by County Councils, subsidized by Mines Department	12,613 4 8	7,415 19 6	10,455 1 5
Roads to mines, other than gold, subsidised by Mines Department	..	306 1 0	110 13 1
Works undertaken by prospecting associations, and companies, subsidised by Mines Department	15,671 19 6	4,521 7 3	4,618 4 7
Construction of drainage- and sludge-channels, subsidised by Mines Department	5,549 14 6	6,207 18 0	672 6 10
Diamond and other drills	422 15 6	422 15 6	..
Schools of Mines	3,183 7 1	3,383 7 1	700 0 0
	49,894 4 8	46,415 18 9	37,813 13 7
1887–88.			
Water-races	6 6 6	6 6 6	..
Roads on goldfields	6,860 4 3	17,281 11 3	7,370 0 0
Roads and tracks undertaken by County Councils, subsidised by Mines Department	2,998 15 0	8,012 5 2	3,942 4 2
Roads to mines, other than gold, subsidised by Mines Department	..	14 5 4	..
Works undertaken by prospecting associations and companies, subsidised by Mines Department	6,456 8 0	2,838 19 11	924 8 0
Construction of drainage- and sludge-channels, subsidized by Mines Department	..	1,110 4 11	2,054 10 6
Schools of Mines	1,859 3 7	2,221 19 4	337 4 3
Aids to treatment of ores	1,200 0 0	390 18 3	209 1 9
	19,380 17 4	31,876 10 8	14,837 8 8

VALUE OF WORKS CONSTRUCTED—*continued.*

Nature of Work.	Total Cost of Construction, or Amount authorised to be expended.	Expenditure, by way of Subsidy or otherwise, by Mines Department.	Amount of Liability by Mines Department on Works in Progress.
1888–89.	£ s. d.	£ s. d.	£ s. d.
Roads on goldfields	10,253 5 3	4,304 3 9	13,218 11 6
Roads and tracks undertaken by County Councils, subsidised by Mines Department	7,318 1 0	2,466 16 8	5,195 6 1
Works undertaken by prospecting associations and companies, subsidised by Mines Department	474 0 0	236 0 0	687 8 0
Construction of drainage- and sludge-channels, subsidised by Mines Department	..	54 10 6	..
Wharves, contributions by Mines Department	589 19 5	96 6 0	343 13 5
Aids to treatment of ores, subsidised	..	209 1 9	..
Schools of Mines	895 16 10	1,188 6 10	44 14 3
	19,531 2 6	8,555 5 6	19,489 13 3
SUMMARY.			
Water-races	37,764 14 11	37,447 15 3	..
Roads on goldfields	92,215 12 10	78,896 11 4	13,218 11 6
Subsidised tracks and roads	104,111 14 0	59,077 10 2	5,195 6 1
Subsidised tracks and roads, other than on goldfields	6,146 9 10	4,759 6 2	..
Prospecting	48,529 18 10	13,054 12 9	687 8 0
Drainage-channels*	21,401 9 3	14,885 5 3	..
Diamond drills	4,022 15 6	2,280 15 6	..
Wharves	589 19 5	96 6 0	343 13 5
Treatment of ores	1,200 0 0	600 0 0	..
Schools of Mines	8,098 17 1	8,054 2 10	44 14 3
	324,081 11 8	219,152 15 3	19,489 13 3

* The vote for altering drainage-pump, Thames, is deducted this year from cost of drainage and sludge-channels, £4,000 subsidy, £2,000.

The foregoing tables show the value of new works undertaken last year was £19,531 2s. 6d., as against £19,380 17s. 4d. for the preceding year, which is nearly the same amount as for last year, while the actual expenditure last year was £8,555 5s. 6d., as against £31,876 10s. 8d. for the year previous. This shows the expenditure to be £23,321 5s. 2d. less last year. This is in a measure accounted for by a great many of the works having been only recently undertaken, and a great portion of the expenditure the year previous was for liabilities on works in progress in 1886–87, which was paid in 1887–88. The liabilities on works in progress during last year are £19,489 13s. 3d. The total value of works constructed, in progress, and those authorised at the end of March last for the six years that the votes have been under the control of the Hon. the Minister of Mines amounts to £324,081 11s. 8d., and the grants and subsidies paid on those amount to £219,152 5s. 2d., leaving a liability at the end of last year, as previously stated, of £19,489 13s. 3d.

The works authorised last year have been principally roads to open up the country not only for the development of the mining industry, but also many of these roads and tracks, when constructed, will tend to open up lands. It is impossible to get the mining industry properly developed without roads and tracks into the back-country; and, generally, where the auriferous, argentiferous, and metalliferous lodes are found is in a mountainous, broken country, where it requires a network of roads to give facilities to carry on mining. This industry is gradually getting on a more solid basis, and when a proper treatment of the ores that occur in this country has been thoroughly established, and a fair percentage of the metals in the ores obtained, it will afford profitable employment to a far larger population than is engaged in it at present. It is an industry that requires a large amount of skill and capital to carry on successful operations, and until lately it has been treated as one where men of all callings and professions are qualified to carry on equally as well as experienced men, the great test being if they were fortunate enough to strike a rich lode, and by this means make a claim or mine pay for working. These were considered as high qualifications, enabling them to conduct works of large magnitude, whereas there are many good men who have charge of mines that cannot be made to pay for working, and the fault is in many cases attributed to the manager.

The knowledge that the miners are gaining respecting the different metalliferous ores, and the progress made in machinery for their treatment, will, in a few years, establish the mining industry in this country on a firm and satisfactory basis, and cause more attention to be given to it by those who have capital to invest. Every encouragement should be given to develop the mineral wealth of the country to those who show their *bonâ fide* intention of working the ground, but care has also to be observed not to allow the ground to be held, as in many instances, for years, with the intention of reaping a reward on other people's labour. Indeed, in some instances, ground is merely taken up by mere speculators who have nothing to invest in opening it up, but hold it merely with the view of forming a company, getting paid so much cash and so many paid-up shares, far in excess of the value of the property.

Some mining properties have been placed from this colony in the London market, and loaded to such an extent that unless they prove to be extremely rich they can never pay interest on the capital, and this will eventually tell against the colony when capital is required for legitimate mining enterprises.

Annexed is a list of works authorised, in progress, and constructed, taken from the departmental records, showing the total cost, expenditure, and liabilities.

I have, &c.,

HENRY A. GORDON, M.A.,Inst.,M.E.,
Inspecting Engineer.

LIST of WORKS on GOLDFIELDS undertaken wholly by the Mines Department, or by Subsidies to County Councils, Local Bodies, and Prospecting Associations, in Progress on the 31st March, 1889.

Locality and Nature of Works.	Total Cost, or Amount authorised.	Amount of Contribution paid by Mines Department.	Amount due by Mines Department on Works still in Progress.
NORTH ISLAND.			
ROADS (SUBSIDISED).			
Coromandel County.	£ s. d.	£ s. d.	£ s. d.
Old saw-mill towards Matawai	300 0 0	100 0 0	66 13 4
Extension of Paul's Creek track	300 0 0	..	150 0 0
Harbour View track extension	300 0 0	..	150 0 0
Mercury Bay Road	1,100 0 0	60 0 0	490 0 0
Tiki to sea-beach at Wilson's	300 0 0	..	150 0 0*
Mokepoke Gully track	100 0 0	..	50 0 0
Matarangi Goldfields track	400 0 0	..	200 0 0
Widening and extending Manaia Road	200 0 0	..	100 0 0
Kapanga to Paul's Creek	200 0 0	..	100 0 0
Marabel to Tiki	200 0 0	..	100 0 0
McLaughlin's Road	100 0 0	..	50 0 0
	3,500 0 0	160 0 0	1,606 13 4
Thames County.			
Karaka Creek to Lucky Hit	600 0 0	167 5 3	132 14 9
Waiotahi towards Mercury Bay	616 3 0	261 5 6	99 9 10
Waiomo Creek to Tapu	1,500 0 0	659 1 10	90 18 2
Puriri to New Discovery	200 0 0	..	100 0 0
Te Mata Road	200 0 0	..	100 0 0
Hikutaia towards Marototo	400 0 0	73 17 7	126 0 0
Alabama Creek track	60 0 0	..	30 0 0
Paroquet Mine to Waiomo Battery	250 0 0	..	125 0 0
Rocky Point Road	280 0 0	..	140 0 0
	4,106 3 0	1,161 10 2	944 2 9
Ohinemuri County.			
Road from battery tramway to Waihi gold- and silver-mines	300 0 0	..	150 0 0
Maratoto track	100 0 0	..	50 0 0
	400 0 0	..	200 0 0
SOUTH ISLAND.			
ROADS (SUBSIDISED).			
Marlborough County.			
Mahakipawa Creek track	450 0 0	46 10 0	178 10 0
	450 0 0	46 10 0	178 10 0
Waimea County.			
Baton to Karamea horse-track	100 0 0	..	50 0 0
Punt over Motueku River	100 0 0	..	50 0 0
	200 0 0	..	100 0 0
Buller County.			
Extension of track, Oparara to Fenian Creek	100 0 0	..	50 0 0
	100 0 0	..	50 0 0
Inangahua County.			
Larry's Creek to Lyell	1,980 0 0	423 10 0	566 10 0
Devil's Creek to Globe Company's Mine	750 0 0	..	375 0 0
Globe Hill to Merrijigs	1,560 0 0	..	780 0 0
	4,290 0 0	423 10 0	1,721 10 0
Grey County.			
Deep Creek to Bell Hill	800 0 0	365 10 0	34 10 0
Track to Black Ball Diggings	800 0 0	40 0 0	360 0 0
	1,600 0 0	405 10 0	394 10 0
ROADS CONSTRUCTED WHOLLY BY MINES DEPARTMENT.			
Wakawau to Manara	1,000 0 0	1 18 0	998 2 0
Whangamata Road	150 0 0	141 10 6	8 9 6
Aorere Valley to Karamea and Mokihinui	23,460 12 8	18,453 0 8	5,007 12 0
Cobden to Seventeen-mile Beach	2,886 1 4	2,652 1 4	234 0 0
Bridle-track to Upper Anatoki	722 8 0	705 16 0	16 12 0
Improving tracks, Collingwood to Takaka, Motueka, &c.	11,194 10 10	10,578 19 10	615 11 0
Jackson's Bay to Cascade and Gorge Rivers Districts	5,345 16 9	4,570 6 9	775 10 0
Arthur's Point to Skipper's	11,547 14 1	8,284 9 1	3,263 5 0
Grey Valley to Teremakau	900 0 0	..	900 0 0
Cedar Creek Road Extension	1,500 0 0	..	1,500 0 0
Contingencies	265 5 1	265 5 1	..
	58,972 8 9	45,653 7 3	13,319 1 6
WATER-RACES.			
Argyle Water-race	7,653 15 1	7,653 15 1	..
Nelson Creek Water-race	957 16 7	957 16 7	..
Waimea-Kumara Water-race	10,765 10 3	10,765 10 3	..
Mikonui Water-race	13,997 1 4	13,997 1 4	..
Mount Ida Water-race	3,100 0 0	3,100 0 0	..
Contingencies	639 12 8	639 12 8	..
	37,113 15 11	37,113 15 11	..

LIST of WORKS on GOLDFIELDS, &c.—*continued.*

Locality and Nature of Works.	Total Cost, or Amount authorised.	Amount of Contribution paid by Mines Department.	Amount due by Mines Department on Works still in Progress.
	£ s. d.	£ s. d.	£ s. d.
WHARVES.			
Repairs to Wharf, Coromandel	300 0 0	..	150 0 0
Anikiwa Jetty, Marlborough	289 19 5	96 6 0	193 13 5
	589 19 5	96 6 0	343 13 5
PROSPECTING SUBSIDIES.			
Kapanga Gold-mining Company (Limited)	20,000 0 0	337 0 0	663 0 0
Deep-level Tunnel, Manaia	500 0 0	225 12 0	24 8 0
	20,500 0 0	562 12 0	687 8 0
Schools of Mines	8,098 17 1	8,054 2 10	44 14 3

Summary of Works.

	£ s. d.	£ s. d.	£ s. d.
Roads (subsidised)—			
Coromandel County	3,500 0 0	160 0 0	1,606 13 4
Thames County	4,106 3 0	1,161 10 2	944 2 9
Ohinemuri County	400 0 0	..	200 0 0
Marlborough County	450 0 0	46 10 0	178 10 0
Waimea County	200 0 0	..	100 0 0
Buller County	100 0 0	..	50 0 0
Inangahua County	4,290 0 0	423 10 0	1,721 10 0
Grey County	1,600 0 0	405 10 0	394 10 0
	14,646 3 0	2,197 0 2	5,195 6 1
Roads wholly constructed by Mines Department	58,972 8 9	45,653 7 3	13,319 1 6
Water-races	37,113 15 11	37,113 15 11	..
Wharves	589 19 5	96 6 0	343 13 5
Prospecting subsidies	20,500 0 0	562 12 0	687 8 0
Schools of Mines	8,098 17 1	8,054 2 10	44 14 3
Totals	139,921 4 2	93,677 4 2	19,590 3 3

HENRY A. GORDON, M.A.Inst.M.E.,
Inspecting Engineer.

LIST of WORKS on GOLDFIELDS constructed wholly by the Mines Department, or by Subsidies to County Councils, Local Bodies, and Prospecting Associations, and completed prior to the 31st March, 1889.

Locality and Nature of Works.	Total Cost.	Amount of Contribution paid by Mines Department.
NORTH ISLAND.		
ROADS (SUBSIDISED).		
Coromandel County.	£ s. d.	£ s. d.
Improving road to Iona and Just in Time Companies' Mines	200 0 0	133 6 8
Making and improving track from Tokatea towards Kennedy Bay	320 0 0	213 6 8
Golden Belt Track	100 0 0	50 0 0
Tokatea Road (repairs)	300 0 0	150 0 0
Making and improving track from Golden Belt to Tiki	239 3 3	159 8 10
Making road from Ring's Bridge to Kapanga Mine	150 0 0	100 0 0
Making road to Kapanga Mine	132 0 0	88 0 0
Temporary track from Tokatea Saddle to Waikoromiko	50 0 0	33 6 8
Continuation of track from Success Company's Mine to top of main range	80 0 0	53 6 8
Completion of road from Tokatea Saddle to Tokatea Battery	50 0 0	33 6 8
Widening road from Matawai to Vaughan's Claim	357 0 0	238 0 0
Improving track, Mercury Bay to Waitai	100 0 0	66 13 4
Continuation and improving Waikoromiko Track	150 0 0	100 0 0
Emily Battery to Rocky Creek	60 0 0	40 0 0
Track, Bismarck Battery to Kennedy Bay	200 0 0	133 6 8
Road up Manaia	675 10 6	450 7 0
Extension of Vaughan's and Vizard's Tracks	150 0 0	100 0 0
Vizard's towards Marebel	200 0 0	133 6 8
Extending and widening Waitaia Road	100 0 0	66 13 4
Makarau to Waiau	1,600 0 0	1,066 13 4
Waikawau to Tiki	500 0 0	333 6 8
Manaia to Tiki	500 0 0	250 0 0
Paul's Creek to Cabbage Bay	200 0 0	133 6 8
Waikawau Creek Track	100 0 0	50 0 0
	6,513 13 9	4,175 15 10
Thames County.		
Making new road from Ohinemuri River to Karangahake Quartz-mine	650 0 0	433 6 8
Dray-road to connect Otanui Mines with crushing-battery at Maungawherawhera Creek	710 0 0	473 6 8
Improving roads from Waitekauri Road to Katikati Road	250 0 0	166 13 4
Improving road up Karaka Creek to Lucky Hit Company's Mine	263 1 0	175 7 4
Improving road to upper mines, Waitahi	258 18 10	172 12 7
Karangahake to battery	300 0 0	200 0 0
Ralph's Battery, Waitekauri	399 1 0	199 10 6
Otanui Road to mines	299 18 0	199 18 8
Road to Wicks's Battery	70 0 0	46 13 4
Rocky Point Road, Tararu	300 0 0	200 0 0
Thames Borough boundary to hematite mine	350 0 0	233 6 8
Widening road from bridge over Hape Creek to Otanui Mines	183 17 0	122 11 4
Track, Karangahake Goldfield	784 1 0	522 14 0
Kauaeranga Valley to Otanui	470 7 0	313 11 4
Tapu Road to mines	81 17 9	54 11 10
Tauranga Road to Karangahake Bridge-site	341 5 0	227 10 0
Karangahake Bridge	229 6 6	152 17 8
Track up Maungakerikeri Creek	93 4 4	62 2 11
Thames Borough boundary to Hape Creek No. 2	600 0 0	300 0 0
Upper Karaka Road	179 13 0	119 15 4
Repairing flood damages, Waiotahi, Moanataiari, Karaka, and Collarbone Roads	350 0 0	175 0 0
Sea-beach to Waiomo	750 0 0	375 0 0
Te Papa Gully Road	75 0 0	37 10 0
New Find to Waiomo Battery	110 0 0	55 0 0
	8,099 10 5	5,019 0 2
Ohinemuri County.		
Jubilee Mine Track	118 0 0	59 0 0
Track up Tui Creek	306 0 0	153 0 0
Prospecting-track, Whangamata and Waitekauri	200 0 0	166 13 4
Tramway, Karangahake to Railey's Reduction-works	400 0 0	200 0 0
Strengthening bridges, Waihi Road	200 0 0	133 6 8
	1,224 0 0	712 0 0
Piako County.		
Extension and completion of Te Aroha Tramway	18,000 0 0	12,000 0 0
Tramway to Fergusson's Battery, Waiorongomai	1,500 0 0	1,000 0 0
Road, Waiorongomai	497 17 0	331 18 0
Track to claims at Buck's Reef	55 5 6	36 17 0
Track, Fern Spur to Butler's Spur	231 17 9	154 11 10
Tracks up Stony Creek, Te Aroha Goldfield, &c.	54 0 0	36 0 0
	20,339 0 3	13,559 6 10
Hutt County.		
Road to connect Otorongo Bay with Albion Company's battery, also to connect Terawhiti Quartz-mine with battery	509 16 6	210 17 0
Road, Makara Junction to Terawhiti	450 0 0	225 0 0
	959 16 6	435 17 0

LIST of WORKS on GOLDFIELDS, &c.—*continued.*

Locality and Nature of Works.	Total Cost.	Amount of Contribution paid by Mines Department.
SOUTH ISLAND.		
ROADS (SUBSIDISED).		
Tuapeka County.	£ s. d.	£ s. d.
Making road from top of Terrace to Waipori Bush	300 0 0	200 0 0
Road, Beaumont to Remarkable Bush	300 0 0	200 0 0
Improving road from Waipori Township to antimony-mines, Lammerlaw Ranges	200 0 0	133 6 8
Waipori Township to Waipori Bush	200 0 0	133 6 8
Clutha River to Campbell's	76 9 0	50 19 4
Waitahuna to copper-mine	200 0 0	133 6 8
Road to open up quarry for Waitahuna Bridge	160 9 10	106 19 11
Waipori Road, *viâ* Bungtown	566 8 10	283 4 5
	2,003 7 8	1,241 3 8
Southland County.		
Improving tracks from Mataura to Nokomai	75 0 0	50 0 0
Improving road, Waikaka to Leatham	150 0 0	100 0 0
Improving road from Waikaka Township to Leatham Creek	30 0 0	20 0 0
Improving road from Waikaka to Waikaka railway-siding	150 0 0	100 0 0
Widening and improving bush-track to Waikawa	150 0 0	100 0 0
Waikaia to Whitcombe	150 0 0	100 0 0
Waikaka to Switzer's	150 0 0	100 0 0
Road near Waikaka Township	150 0 0	100 0 0
	1,005 0 0	670 0 0
Westland County.		
Improving track, Butcher's Creek to Gentle Annie Terrace	225 10 0	163 13 4
Bridle-track to Kanieri Lake	719 11 0	359 5 6
Bridle-track to Eel Creek	168 9 0	84 4 6
Tunnel-track, Galway Beach to Gillespie's Beach	437 5 0	218 12 6
Road from Duffer's Creek, Greenstone Road, to fifteen-mile peg, Christchurch Road	726 9 0	480 4 6
Continuation of track, Back Creek to Eel Creek	249 4 0	166 3 4
Bridle-track, Duffer's Creek, Bowen and Okarito Road, to sea-beach	333 18 0	222 12 0
Ross Borough boundary to Mount Greenland	1,280 15 0	853 16 8
Track, Kanieri Lake to Humphrey's Gully	279 2 0	186 1 4
Track, Larrikins to Loop-line Dam	449 11 0	299 14 0
Rough Wainihinihini to Upper Dam	450 0 0	300 0 0
Browning's Pass to Reefs	3,311 6 0	2,207 10 8
Okarito Forks to Teal Creek	600 0 0	400 0 0
	9,231 0 0	5,941 18 4
Grey County.		
Road from Notown to Deep Creek	1,100 0 0	550 0 0
Road from Langdon's to Moonlight	1,600 0 0	800 0 0
Contribution from goldfields vote towards main road	2,296 6 6	2,296 6 6
Track, Waipuna to Clarke's River	1,200 0 0	800 0 0
Track, Cameron's to Cape Terrace	700 0 0	466 13 4
Road, Limestone to Maori Creek	800 0 0	533 6 8
Red Jack's to Nelson Creek	601 17 6	401 5 0
Barrytown to Deadman's	2,240 0 0	1,493 6 8
German Gully to Arnold's Flat	120 0 0	60 0 0
Baird's Terrace to Lake Brunner	400 0 0	200 0 0
Hatter's Terrace Road	1,000 0 0	500 0 0
Irishman's to Lake Brunner	2,400 0 0	1,200 0 0
Hatter's Terrace	600 0 0	400 0 0
	15,058 4 0	9,700 18 2
Marlborough County.		
Track, Deep Creek to Dead Horse Creek	68 0 0	45 6 8
Waimea County.		
Road to open up Table Diggings	260 0 0	130 0 0
Inangahua County.		
Dray-road from Soldier's Creek to Devil's Creek	647 0 0	431 6 8
Dray-road from Inangahua to Rainy Creek Battery	909 10 0	606 6 8
Dray-road from Capleston up Little Boatman's Creek	379 0 0	252 13 4
Dray-road from Capleston up Main Boatman's Creek	697 0 0	464 13 4
Dray-road from Westport Road to Inangahua River	224 5 0	149 10 0
Track from Devil's Creek to Big River	134 3 6	89 9 0
Track from Waitahu River to Capleston	358 0 0	238 13 4
Survey and expenses	250 0 0	166 13 4
Track from Cariboo to Big River	728 0 0	364 0 0
Dray-road up Murray Creek to United Inglewood Claim	3,472 0 0	2,314 17 4
Road from Reefton to Big River *viâ* Devil's Creek	614 0 0	307 0 0
Road up Big River	922 19 0	615 6 0
Continuation of dray-road up Little Boatman's Creek	169 7 6	112 18 4
Road from Capleston to Larry's Creek	640 0 0	426 13 4
Track to connect Capleston with Lone Star	75 0 0	50 0 0
Crushington te Globe Company's workings	403 0 0	201 10 0
Snowy Creek Track	85 15 0	42 17 6
Reefton to Big River	1,792 0 0	1,194 13 4
Glenroy to Horse Terrace	254 0 0	122 10 0
	12,755 0 0	8,151 11 6

LIST of WORKS on GOLDFIELDS, &c.—*continued.*

Locality and Nature of Works.	Total Cost.	Amount of Contribution paid by Mines Department.
	£ s. d.	£ s. d.
Buller County.		
Deviation of road from Candlelight Flat to Deep Creek, Charleston	370 0 0	246 13 4
Road from Orowaiti Lagoon to North Terrace	256 18 6	171 5 8
Prospecting track from Razorback to Paparoa Range	100 0 0	66 13 4
Track from Seatonville to Larrikins	438 9 6	292 6 4
Waimangaroa to Denniston	787 0 0	393 10 0
Road to connect alluvial workings with Charleston Road	400 0 0	266 13 4
Track, Four-mile Creek towards Grey Valley	300 0 0	200 0 0
Road to connect alluvial diggings north of Deadman's Creek	278 0 0	185 6 8
Ngakawhau to Mokihinui, *viâ* beaches	100 0 0	66 13 4
Road to connect Ngakawhau Railway with Mokihinui Coal Company's workings	193 0 0	128 13 4
Lyell Bluff to Victor Emmanuel Claim	650 0 0	433 6 8
Beach, Little Wanganui to Mokihinui	300 0 0	100 0 0
Cape Foulwind Road	450 0 0	300 0 0
Road up Nile Valley	56 16 4	28 8 2
Denniston extension	850 0 0	425 0 0
Promised Land towards Motueka	380 0 0	190 0 0
Road over Gentle Annie	200 0 0	100 0 0
Extension, Lyell Creek to Low-level Tunnel	60 0 0	30 0 0
Extension of track 50 chains south of Brighton	140 0 0	70 0 0
Continuation of road, Deadman's Creek	437 17 0	218 18 6
Ngakawhau Railway Station to Mokihinui	50 0 0	25 0 0
Addison's Flat towards ranges	20 0 0	10 0 0
North Terrace to Oparara Diggings	500 0 0	333 6 8
Extension of Croninville Road	100 0 0	50 0 0
Waimangaroa to sea-beach	80 0 0	40 0 0
	7,498 1 4	4,371 15 4
Taieri County.		
Mullocky Gully to Silver Peak	499 15 0	333 3 4
Lake County.		
Track, Skipper's to Phœnix and Scandinavian Reefs	292 2 3	194 14 10
Track to connect scheelite-mine with Lake Wakatipu	225 0 0	150 0 0
Arrowtown to Macetown, construction	225 0 0	150 0 0
Arrowtown to Macetown, maintenance	150 0 0	100 0 0
Invincible Quartz-reef Track, Rees River	300 0 0	200 0 0
Rees Valley to company's workings	61 7 6	30 13 9
Pack-track, Criffel Diggings	50 6 6	33 11 0
Left-hand Branch Road, Skipper's	63 9 10	31 14 11
	1,367 6 1	890 14 6
Waitaee County.		
Track, Colac Bay to Round Hill	200 0 0	133 6 8
Pack-track to Round Hill, Colac, and Orepuki	1,050 0 0	500 0 0
	1,250 0 0	633 6 8
Maniototo County.		
Road to Serpentine Diggings	136 10 0	91 0 0
Pig and Whistle to Clarke's Diggings	200 0 0	133 6 8
Shepherd's Hut Flat to Vinegar Hill	100 0 0	66 13 4
Kyeburn Peninsula to Main Road	82 0 0	41 0 0
	518 10 0	332 0 0
Collingwood Road Board.		
Road, West Wanganui	300 0 0	200 0 0
Bridge over Aorere River	173 14 0	115 16 0
	473 14 0	315 16 0
Fiord County.		
Dusky Sound Tracks	300 0 0	200 0 0
Waitaki County.		
Road, Naseby to Livingstone	41 12 0	20 16 0
DIAMOND AND OTHER DRILLS.		
Inangahua County Council (diamond)	2,000 0 0	1,000 0 0
Springfield Colliery Company (diamond)	1,250 0 0	625 0 0
Westland County Council (tiffin)	350 0 0	233 0 0
Diamond drills for prospecting purposes	422 15 6	422 15 6
	4,022 15 6	2,280 15 6

LIST of WORKS on GOLDFIELDS, &c.—*continued.*

Locality and Nature of Works.	Total Cost.			Amount of Contribution paid by Mines Department.		
	£	s.	d.	£	s.	d.
AIDS TO PROSPECTING.						
Construction of low-level tunnel, Terawhiti	750	0	0	150	0	0
Queen of Beauty Company, prospecting deep levels	300	0	0	150	0	0
Caledonian Low Level Company, prospecting deep levels	300	0	0	150	0	0
Red Hill Gold-mining Company, prospecting deep levels	600	0	0	300	0	0
Caledonian Low Level Company, low-level tunnel	2,700	0	0	300	0	0
Lyell Creek Extended Company, low-level tunnel	300	0	0	150	0	0
New Cromwell Gold-mining Company	250	0	0	100	0	0
Deep Level Association, Waipori	450	0	0	300	0	0
Little Boatman's deep-level tunnel	600	0	0	300	0	0
Oterongia Prospecting Association	198	17	2	99	8	7
Vincent County	137	9	0	68	14	6
Tapanui Prospecting Association	25	0	0	12	10	0
Tuapeka County	12	0	0	6	0	0
Maniototo County	500	0	0	250	0	0
Pullar, Shelmerdine, and Basan	400	0	0	200	0	0
Royal Oak Association	300	0	0	150	0	0
Star of the East Quartz-mining Company	150	0	0	75	0	0
West Coast Prospecting Association	300	0	0	150	0	0
McBride and party	169	2	2	84	11	1
McLean and party	66	0	0	33	0	0
Deep-level Tunnel, Tokatea	700	0	0	350	0	0
Deep-level Tunnel, Owharoa	300	8	0	200	5	4
Deep-level Tunnel, Tapu	1,200	0	0	600	0	0
Deep-level Tunnel, Cedar Creek	1,207	10	0	603	15	0
Manuka Flat Prospecting Association	200	0	0	100	0	0
Red Hill Minerals Company	437	19	10	218	19	11
Tuapeka Prospecting Association	277	0	0	138	10	0
Cardrona Prospecting Association	800	0	0	400	0	0
Cromwell Prospecting Association	500	0	0	250	0	0
Coromandel County	550	0	0	275	0	0
Thames County	309	18	0	154	19	0
Thames Borough	200	0	0	100	0	0
Buller County	146	12	6	73	6	3
Inangahua County	488	7	0	244	3	6
Westland County	1,000	0	0	500	0	0
Grey County	871	15	2	435	17	7
Deep-level Prospecting Association, Waipori	432	9	8	216	4	10
Waipu Prospecting Association	180	0	0	90	0	0
Hokianga County	100	0	0	50	0	0
Vulcan Smelting Works, Onehunga	30	0	0	15	0	0
Ohinemuri County	100	0	0	50	0	0
Waitaki County	29	5	0	14	12	6
Waihemo County	85	9	0	42	14	6
William Fox and party	711	1	8	355	10	10
Kirk and party	176	9	10	88	4	11
Hodge and party	98	13	8	49	6	10
Carey and Hyndman	441	9	4	220	14	8
Don, Boyce, and party	107	16	0	53	18	0
Quentin McKinnon	58	10	0	29	5	0
Bullion Mine, Deep-level Tunnel	300	0	0	150	0	0
Sutherland and party	30	0	0	150	0	0
Contingencies	484	15	10	242	7	11
Inangahua Low-level Tunnel	6,966	0	0	3,000	0	0
	28,029	18	10	12,492	0	9
WATER-RACES.						
Water-main, Bull's Battery	350	0	0	100	0	0
Round Hill, Water-race	200	19	0	133	19	4
Tomkiss's Water-race	100	0	0	100	0	0
	650	19	0	333	19	4
DRAINAGE- AND SLUDGE-CHANNELS.						
Drainage-channel, Lawrence (total cost, approximate)	3,000	0	0	2,000	0	0
Subsidy towards purchase of Messrs. Laidlaw and Crawford's freehold in Spotti's Creek, to allow tailings to be deposited (Tinker's Diggings)	500	0	0	400	0	0
Damage by floods, Thames	1,000	0	0	500	0	0
Sludge-channel, Smith's Gully, Bannockburn	1,000	0	0	251	1	0
Round Hill Sludge-channel survey	52	19	7	52	19	7
Compensation to J. Costello, damage done by tailings	788	0	0	788	0	0
Long Gully Sludge-channel	150	0	0	100	0	0
New Pipeclay Gully Sludge-channel	1,547	18	0	773	19	0
Kumara Sludge-channel, No. 2	2,762	17	2	2,762	17	2
Ophir Tail-race	2,300	0	0	1,150	0	0
Lawrence Drainage-channel	1,150	0	0	956	14	0
Muddy Creek Channel	2,000	0	0	1,000	0	0
St. Bathan's Channel	2,000	0	0	1,000	0	0
Tailings-outlet, Maerewhenua	1,595	4	0	1,595	4	0
Ross Sludge- and Storm-water-channel	1,554	10	6	1,554	10	6
	21,401	9	3	14,885	5	3

LIST of WORKS on GOLDFIELDS, &c.—*continued.*

Locality and Nature of Works.	Total Cost.	Amount of Contribution paid by Mines Department.
AID TOWARDS THE TREATMENT OF ORES.	£ s. d.	£ s. d.
Testing-plant, School of Mines, Thames	1,200 0 0	600 0 0
	1,200 0 0	600 0 0
ROADS WHOLLY CONSTRUCTED BY GOVERNMENT.		
Construction of road, Arrowtown to Macetown	9,270 6 8	9,270 6 8
Road to open up Woodstock Goldfield	1,000 0 0	1,000 0 0
Ahaura to Amuri	2,504 19 7	2,504 19 7
Waikaia Bush Road	1,000 0 0	1,000 0 0
Waitahuna Bridge	750 0 0	750 0 0
Merrivale Tracks	500 0 0	500 0 0
Mokihinui to Specimen Creek	1,238 7 5	1,238 7 5
Wilberforce Quartz-reef Road	1,830 17 7	1,830 17 7
Opening Mokau River	552 8 0	552 8 0
Lyell to Mokihinui	5,098 8 6	5,098 8 6
Brighton to Seventeen-mile Beach	1,789 7 2	1,789 7 2
Wangapeka to Karamea	2,000 0 0	2,000 0 0
Hatter's Terrace to Bell Hill	500 0 0	500 0 0
Cedar Creek Road	3,000 0 0	3,000 0 0
Owen Valley Road	2,208 9 2	2,208 9 2
	33,243 4 1	33,243 4 1
ROADS TO OPEN UP MINES OTHER THAN GOLD.		
Aniseed Valley to Champion Copper-mine	4,963 10 6	4,116 10 6
Richmond Hill to Copper-mine	315 16 0	209 4 0
Track, Ohinemuri Coal-seam	267 3 4	133 11 8
Road, Kanieri Coalfield	600 0 0	300 0 0
	6,146 9 10	4,759 6 2

Summary of Works.

	£ s. d.	£ s. d.
Roads (subsidised)—		
Coromandel County	6,513 13 9	4,175 15 10
Thames County	8,099 10 5	5,019 0 2
Ohinemuri County	1,224 0 0	712 0 0
Piako County	20,339 0 3	13,559 6 10
Hutt County	959 16 6	435 17 0
Tuapeka County	2,003 7 8	1,241 3 8
Southland County	1,005 0 0	670 0 0
Westland County	9,231 0 0	5,941 18 4
Grey County	15,058 4 0	9,700 18 2
Marlborough County	68 0 0	45 6 8
Waimea County	260 0 0	130 0 0
Inangahua County	12,755 0 0	8,151 11 6
Buller County	7,498 1 4	4,371 15 4
Taieri County	499 15 0	333 3 4
Lake County	1,367 6 1	890 14 6
Wallace County	1,250 0 0	633 6 8
Maniototo County	518 10 0	332 0 0
Collingwood Road Board	473 14 0	315 16 0
Fiord County	300 0 0	200 0 0
Waitaki County	41 12 0	20 16 0
	89,465 11 0	56,880 10 0
Diamond and other drills	4,022 15 6	2,280 15 6
Aids to prospecting	28,029 18 10	12,492 0 9
Water-races	650 19 0	333 19 4
Drainage- and sludge-channels	21,401 9 3	14,885 5 3
Aids towards treatment of ores	1,200 0 0	600 0 0
Roads wholly constructed by Government	33,243 4 1	33,243 4 1
Roads to open up mines other than gold	6,146 9 10	4,759 6 2
Totals	184,160 7 6	125,475 1 1

HENRY A. GORDON, M.A.Inst.M.E.,
Inspecting Engineer.

RETURN showing the VALUE of the SALES of WATER and EXPENDITURE on, and Collateral Advantages derived from the working of, the Water-races constructed and maintained by Government, during the Year ending the 31st March, 1889.

Name of Water-race.	Value of Sales of Water and Channel-fees.	Expenditure on Maintenance.	Profit or Loss.	Cost of Construction.	Total Cost of Construction.	Percentage on Capital invested.	Average Number of Men employed.	Approximate Amount of Gold obtained.	Value of Gold obtained.	Average Weekly Earnings of Men after deducting Value of Sales of Water and Channel-fees.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£		Oz.	£ s. d.	£ s. d.
Waimea ..	1,416 6 8	860 2 5	*556 4 3	118,762 11 8		0·5	93	2,869	10,902 4 0	2 5 1
Kumara	6,716 6 10	1,024 1 9	*5,692 5 1	37,400 2 11	173,363 7 1	15·2	174	9,825	37,335 0 0	3 6 4
Kumara Sludge-channel	1,095 3 3	4,285 6 2	†3,190 2 11	17,200 12 6		..	..	150	570 14 9	..
Nelson Creek ..	427 1 8	1,384 9 3	†957 7 7	..	90,722 10 8	..	23	744	2,845 16 0	2 0 5
Argyle	497 5 2	396 19 10	*100 5 4	..	14,701 15 3	0·7	20	628	2,402 2 0	1 16 7
Mikonui ..	‡29 3 4	..	*29 3 4	..	25,644 9 6	..	..	..	..	..
Totals ..	10,181 6 11	7,950 19 5	2,230 7 6	..	304,403 2 6	..	310	14,216	54,055 16 9	2 13 3

* Profit. † Loss. ‡ In construction. The receipts are not included in taking out the average earnings of the men employed.

HENRY A. GORDON, M.A.Inst.M.E.,
Inspecting Engineer.

APPENDIX I.

No. 1.

WARDENS' AND WATER-RACE MANAGERS' REPORTS.

Mr. Warden NORTHCROFT to the UNDER-SECRETARY of MINES.

SIR,— Warden's Office, Thames, 4th May, 1889.

I have the honour to forward herewith statistical returns for the Hauraki Mining District for the year ended 31st March last, together with a general report on the district.

I am glad to be able to report favourably of the future prospects of this large and important district, and though there is no material improvement in the production of gold, that is partly owing to the fact that many of the mines have withheld their ore, waiting to see what some of the new processes might be able to do rather than submit to the large loss incurred in treating by the ordinary battery process. This particularly applies to the upper portion of the district—Karangahake, Waihi, and Te Aroha—where large and extensive plants are in course of erection.

At Karangahake, the Crown Gold-mining Company are erecting a plant containing stone-breaker and Lamberton mills, and the ore will be treated by the Cassell Company's patent process.

At Waihi, a plant for roasting and then grinding in the McKay pans and settlers is in course of erection.

At the Tui, the Champion Gold- and Silver-mining Company are erecting large works, and propose putting up furnaces.

At Waiorongomai, the Mount Aroha Company have erected the most complete reduction-plant in the colony, at which ore will be treated by the following methods: Dry and wet crushing, concentrating, desulphurising, chloridising, amalgamating by pans, and smelting. This plant can treat from 600 to 700 tons per week.

Though the year has not been as prosperous as I anticipated, yet that a decidedly firmer tone exists, and, I think, a determination to, and an understanding that we must in the future, mine on more scientific and business-like principles is admitted. Gold at the Thames must be looked for at much deeper levels than heretofore, where richer deposits are again expected to be reached; and there is a disposition on the part of English and Australian capitalists to invest in ground that has proved auriferous in the past, but where hitherto the deep levels have been left untouched for want of capital to undertake the necessary expense connected with deep-sinking. It is encouraging to those who have thus far done any work of importance on the old abandoned auriferous ground that they have found gold; and year by year they find that, with care, and the scientific knowledge gained by long experience, that the mullock from waste heaps containing free gold only, some of the battery proprietors can make 1dwt. 2⅔gr. per ton pay. Mr. Peter Hansen, of the Kuranui battery, has treated 12,610 tons of stuff from the mullock-tips, which have yielded 700oz. of gold. This gave a profit after deducting all working expenses and allowing for wear-and-tear of plant; and now, coming on to better stuff on the solid on the Kuranui Hill, he gets a better return.

"Parkes's process" has proved a failure, and disappointed all its supporters. It was looked forward to by the Karangahake, Waihi, and Te Aroha miners as a solution of the difficulty they had laboured under for many years—*i.e.*, only getting in most instances half the bullion from their complex and refractory ores, and in many not even that. Mr. Parkes had samples of the ore from the Tui District sent to him in England. These he treated there, and claimed to have discovered a process of smelting by which, at a cost of not more than £2 per ton, he could treat any of the ores in that district, even the most complex and refractory. As the lodes are large and average from £4 to £20 per ton in value, it meant a "big thing" for the miners and mine-owners; but after building a furnace and running it for three weeks it had to be shut down and abandoned by Mr. J. M. Chambers, the enterprising gentleman who had introduced Mr. Parkes and his process, the loss being too great. This proved a great check to the mining industry, for the mine-owners and miners had pinned their faith to the "Parkes process" for dealing with our complex and refractory ores, he having, they were informed, successfully treated the same class of stuff in England.

The "Cassell process" is as yet untried, therefore the future must decide its suitableness.

It is unfortunate that in the initiation of most of these untried processes so much capital is wasted. The promoters usually set about the erection of the plant by putting up buildings and offices of the most expensive kind, as though there was not a shadow of a doubt of its ultimate success, and finding work for twenty years to come; whereas if it were tried on a smaller scale, and care and economy used, the cost would be small, and the loss and disappointment of the shareholders in proportion, and the mining industry as a field for investment would, as it deserves to do, stand higher with foreign capitalists than at present. Similarly with our mines: Generally, on the disposal of a mine to foreign capitalists, a new manager, one who is a stranger to the district, often without even colonial mining experience, is sent to take charge. He commences by the erection of expensive works—for the most part unnecessary and unproductive—before the mine is opened up and it is ascertained whether or not the output will justify the expense. The paid-up capital is absorbed in buildings, tramways, and batteries; and the shareholders refuse to advance any more money on such an apparently barren venture. The expensive plant is sold for "a song," and a mine

abandoned that, with the exercise of a little care, forethought, and judgment, and by the owners feeling their way gradually at first, would in time become a valuable property, and not only have recouped the outlay and repaid the shareholders, but probably added considerably to the wealth of the country. Such has been the fate of many mines on this field in the past, and, the same causes being still at work, will, I am afraid, be so in the future. It not only destroys confidence in our mining industries, but damages our credit as a colony.

New Finds.

There have been several new discoveries during the year, but none as yet have proved of much importance. The first was reported last June by a half-caste who had found what appeared at that time to be a valuable discovery between Tairua and Mercury Bay. In prospecting in the ranges he discovered several large reefs yielding from 3dwt. to 4dwt. of gold to the ton. In following these up he came on what appeared to be a nice milling lode, which yielded 10oz. of free gold to the ton, worth £3 13s. 6d. per ounce—a high price for our gold; but after working at it for a few months it was found to change its nature and become highly mineralised: and its future development must depend on the introduction of some scientific method of extracting the minerals.

Some miners prospecting on the east coast found a rich deposit of sand at the mouth of the Karo Creek, about four miles north of Tairua, which went a little over 4dwt. to the ton, and started sluicing; but they found the layers of sand thin, and also found it difficult to save the fine gold with their appliances, and, though they have not abandoned it, I do not think they are earning much. It is a debatable point whether the gold has come down the river or been washed up from the sea; some miners are inclined to the one theory, some to the other, there being so many small islands in the vicinity showing several quartz leaders.

On the promontory between Whangapoua and Mercury Bay several gold-bearing reefs have been found.

At Matarangi, the prospectors have done a good deal of work and sent 26 tons of ore to be treated, which, though not very rich, was very encouraging, yielding 37oz. 10dwt. of gold. If these reefs prove payable they will no doubt quickly develop into a large field; but, unfortunately for the mining industry of the colony, they run into the Kauri Syndicate Company's freehold.

At Kuaotuna and Otama auriferous reefs have been found, but very little work has been done on them yet, they being held in claims and worked by working miners, who cannot do much without the assistance of the capitalists.

All these latter finds, you will see on referring to a map, are directly opposite to Coromandel, on the east coast, which would lead one to suppose the whole of the peninsula there was auriferous, for gold has been found on the Coromandel side as far as Waikoromiko and Te Tiki.

Coromandel.

Some of the leading claims have done very well this year, and I think, from the renewed energy shown, a better yield may be looked for next year.

Several special claims have been applied for on the intake between the old Union Beach Mine and Preece's Point, and, as there are some nice-looking reefs cropping out in several places on these saltwater flats, which apparently are the Kapanga and Union Beach as well as other known auriferous reefs, there seems little doubt that if they were sunk on they would pay. What points to this being so is, that Mr. Snowden some years ago got very good gold on the promontory known as Preece's Point, where the reefs make dry land again, but was prevented carrying on mining by the high terms of the proprietor, and by the water; but I think the day is not distant when we shall see several good paying mines on the intake.

The yield of gold for the year was 8,090oz. 3dwt. 2gr.

Manaia.

Blackmore's is the only claim that has done anything of any importance. They have sent several parcels of picked stuff to Coromandel and Auckland for treatment, but from the difficulty of getting the quartz to a battery—there being none nearer than seventeen miles, and no cart-road from the mines to the battery—the ore has to be very rich to pay for transport, &c.; but, as some other nice-looking reefs have been discovered in this locality, and the Victoria Mine has been bought with the object of putting up pumping machinery, the mine being rich but very wet, I hope at no distant period to see a battery erected, when tons of stuff now thrown away will be treated, for there is an unlimited supply of water.

Mata.

A battery has been erected here since my last year's report, and some of the ore crushed, with a yield of 62oz.; but, unfortunately, through disputes among the shareholders, followed by law-suits, it has been at a standstill for some time, which has retarded mining operations there.

Tapu.

Lately some very nice gold has been found here on Mr. Newby's selection, and on the opposite side of the creek a sluicing claim of thirty acres has been taken up. The gold is good but very light and flaky. Owing, however, to the difficulties existing between the settlers and the miners as to working lands which have been taken up under the homestead system, mining operations have been almost at a standstill; however, 43oz. 12dwt. was returned by the Tapu battery, and at least half that quantity brought to the Thames.

Waiomo.

This district has been at a standstill for some time past, waiting the erection of further plant. The Paroquet Company have a battery consisting of twenty-one stamps and six berdans, but they are adding some of the Watson and Denny pans. They are also erecting a wire tramway,

which will greatly facilitate the conveyance of quartz to the battery. The yield of gold from this company's mine last year was 295oz. 19dwt., and it would undoubtedly have been larger but for the before-mentioned reason.

There are a great many reefs in the district, but they are not rich: they will therefore have to be worked with care and economy, or the balance will be on the wrong side.

Thames.

This includes the whole of the area between the Kauaeranga and Tararu Streams, in which there are seven special claims, eighty licensed holdings, and fully thirty claims held under miners' rights.

The future of this part of the field depends on deep sinking with much better and more economical pumping machinery, the present being far too expensive, and in many instances taking nearly the whole of the gold won from the mine to pay the Drainage Board's account. Could a more improved kind of pump, driven by water, be substituted for the Big Pump the cost would be considerably less, and the profits of the mines greater, and many that now barely exist would then pay well.

I think in a short time this part of the field will yield considerably more gold than it is now doing, as several lost leads have been picked up in different parts. On the Una Hill, between the Karaka and Hape Creeks, Mr. Styak and party, in driving, cut the Balmain reef, which showed gold freely. Up the Waiotahi Mr. Kersey Cooper, owner of the Fame and Fortune special claim, has cut "Fox's" leader, which is carrying very rich specimen-stone; and at Tararu also a lost rich reef is believed to have been picked up. Lawrie and party, who found it, have some very nice specimen-stone, but have not done enough work yet to decide as to its permanency. These discoveries are encouraging, because some of our best mines were at one time "duffered," and other parties, through perseverance, came on the lost lode—the Saxon. The Prince Imperial and Lone Hand are examples.

In the event of the special grant to mine under the foreshore being granted by the Hon. the Minister of Mines, large and extensive pumping machinery will have to be erected, which will undoubtedly drain all the other mines to a great depth, when such mines as the Queen of Beauty, Piako, and others at the foot of the hill, from Hunt's Old Shotover to beyond the Waiokaraka, will be worked to a much greater depth; and reefs that have had to be abandoned owing to the water and the want of proper pumping machinery, as the Queen of Beauty, will be in full work again, yielding handsome returns to the owners, and many mines will be paying as good dividends as the Saxon, which during the year has paid £6,250 in dividends. The gold-return for the year was 35,796oz. 2dwt. 10gr.

Puriri.

This part of the field has lately been taken up again by a few miners, who have found what they think is good payable ore, and a battery has been erected. Years ago some very good gold was got from here, but the payable lodes were lost in some instances, and the miners left for more attractive places; but I think there is a probability of this part of the district doing very well in time to come. The return of gold was 139oz. 4dwt.

Tairua.

There are not many men working in this part of the district, the gold being very patchy and the rich ore running in small veins. The gold return was 76oz. 5dwt.

Maratoto

Has been the most disappointing of any of the finds on this peninsula, for when discovered the reef showed, where first struck, a very rich vein of rubble; but, unfortunately, it was only a patch, which pinched out as the reef ran down into hard country. The manager, Mr. J. H. Moore, has done a great deal of work on the Maratoto Company's holding; but only to prove, unfortunately, that there is not much ore of any value in the property. They intend to erect a small plant to treat 100 tons of ore they have on hand. This is the only claim which has done any work worth speaking of for a considerable time. In the other parts of the district, the reefs being too poor to warrant much expenditure of money, nearly the whole of the holdings taken up on the first rush have since been forfeited.

The Australian gentlemen who purchased the Maratoto prospector's property deserved better success, and it is to be regretted that the hopes raised on its discovery were not fulfilled; for, through their manager, they have shown a care in expenditure not often met with on our goldfields. They first thoroughly prospected their holding, so that they might definitely know what quantity of ore they had on their property, which has undoubtedly saved them many thousands of pounds. When this company have crushed what they now have on hand it is probable this district will be abandoned, unless, meanwhile, something rich is struck, which, I think, may hardly be expected on the Maratoto side of the divide.

Karangahake.

In this district the Woodstock battery is treating ore by the McKay pans; but the majority of the mine-owners and miners are waiting to see what the Cassel Company's process can do. They are erecting a large plant at the Crown mine, but I fear the mistake so often made before of spending very large sums of money on works not immediately productive is being repeated. They are putting up buildings of a very substantial character, though it is not yet ascertained, as far as I can learn, whether or not the process is suitable to the class of ore they have to treat. They have also committed the same mistake so many others are chargeable with—of having erected their plant in the wrong place, at least that is the opinion held by many.

If this (the Cassell Company's) process can do all that is claimed for it, and at the cost stated (12s. per ton), Karangahake will more than treble its population under a year, and the bullion return increase itself fourfold, for there is a great quantity of very rich ore—but of a refractory nature, which will cost about 15s. per ton to mine and crush—fit for treatment by this process; therefore if their figures are correct, and they can do what they claim, the profit should be a very large one. Should it prove a success it will be found that the works should have been placed at the foot of the hill, in the vicinity of the old La Monte plant, where the ore could have been easily brought to it. Now, should wet weather set in I am afraid they will have to suspend operations, as I do not think they will be able to drag their plant and the necessary timber over the hills to where the works are being erected.

The Kenilworth Company have sold 36 tons for export, the assay value of which was £107 per ton.

The Ohinemuri yield of gold for the year was 3,678oz. 18dwt. This includes Karangahake, Owharoa, Waihi, and Waitekauri.

Owharoa.

In this locality very little has been done since my last report. A party of tributers are working in the Smile of Fortune Mine on a number of quartz leaders, intermingled with sandstone, which is easily crushed. This part of the field certainly deserves more attention from those connected with mining than it receives at present. The yield of gold for the year was 780oz.

Waitekauri.

The old Waitekauri battery and mining property has changed hands, having been bought by a New South Wales gentleman, and is protected pending the completion of negotiations. Adjoining, on the Jubilee special claim, Mr. Kersey Cooper is erecting a fine battery of ten stampers, five berdans, two pans, one settler, and shaking-tables, on which to treat a large quantity of quartz boulders and washdirt shed from the big quartz blow. In cleaning up the gully forming a portion of this claim Mr. Cooper expects to find the reef that shed the gold got some years ago by sluicing.

On the opposite side of the ridge Mr. Chappel, an Australian gentleman, is putting up a plant on the Mangakara Creek to treat the boulders and washdirt from the Scotia Creek, when he also expects to find the reef which shed the gold got here by sluicing. Mr. Chappel also intends establishing a new process, called "The Lockwood and Chappel Carbonated-hydrogen Process," which, so far as I am aware, has only been tried in a very small experimental way. Mr. Lockwood claims to have achieved great results; but the ore in this locality is mostly free-milling.

Waihi.

Mr. Russell, of the Waihi Company, informs me he can mine and treat all the Waihi ore at a cost of not more than £1 5s. per ton. As the average value of the Waihi Company's ore is about £8 per ton, and the ore from the Martha and Silverton mines is worth considerably more, if he can mine and treat these at the price stated it will leave a very handsome profit; but I am afraid he is perhaps oversanguine, and that on going more closely into details he will find the profit not quite so great. This company have done a great deal of work; but through being in too great a hurry, I am sorry to say, put their plant up in the wrong place. They had intended to use steam only, but now have decided to bring in water, which will cost fully £2,000; but, unfortunately, through the plant being where it is, the loss in the fall will be very considerable and the power greatly reduced; but even with these drawbacks the water-power will reduce the expenses and help to insure its being a success. If this process can do what Mr. Russell claims for it, the plant they are erecting will be sufficient for the whole of the Waihi District, and find employment for two or three hundred men at least. There are awaiting treatment out in this locality about 3,600 tons of ore, worth £25,200, less £1 5s. per ton for crushing, which will leave a balance of £20,700. If this plant works successfully it will make a marked difference in our gold-returns for the district next year.

Te Aroha.

In this part of the district very little ore has been treated. Owing to its refractory nature mine-owners have contented themselves with getting their ore out and waiting to see what the Mount Aroha Reduction-works could do for them. There are some large reefs here, but, as a rule, of low grade, and it is a question whether many of them will pay; but with the present reduction-works that matter can soon be decided.

The Champion Company have some nice ore, and are erecting a self-acting wire-tramway to carry it from the mine to the flats, where it may be treated by smelting or conveyed to the Waiorongomai Reduction-works. They have also decided to send 200 tons to England to be treated, that they may learn which is the most profitable method.

The Mount Aroha Company have a large quantity of ore out to treat, besides 30 tons of concentrates; but, unfortunately, they have not enough water to drive the whole of their machinery at this time of the year, and intend before next summer to do part of the driving by steam. Their reduction-works are very complete; and, to insure success, they are making arrangements to bring carbonated lead from the Broken Hills in Australia. These works should make a very marked difference in our gold-return next year, for they can treat from 600 to 700 tons per week. Besides these five works, Mr. Ferguson, of the New Era Battery, is adding Cassell's process to his plant. The batteries were stopped two-thirds of the year, pending alterations; but with these drawbacks the gold reached 1,112oz. 15dwt., besides 50 tons, worth fully £250, sent out of the district for treatment.

There are several holdings taken up where the gold was first discovered, but none of them have produced anything worth reporting.

OCCUPATION-LICENSES.

There is a disposition on the part of many miners and others to take up land on occupation-licenses. Many have been applied for, but as yet not dealt with; but in cases where the lands are at long distances from the settlements, and broken, fifty acres, the maximum that can be granted by Regulation Clause K, is not sufficient. I am of opinion that this maximum might be increased to two hundred acres, and the area granted within this limit be left to the Warden's discretion. Near Coromandel, Thames, and many other places the area would necessarily have to be smaller, from four acres upwards; but in the isolated parts of the district fifty acres is not enough to induce any one to settle on the land.

SITTINGS OF COURTS.

Courts: Wardens' and Resident Magistrates' Courts are held weekly at the Thames, fortnightly at Te Aroha, and four-weekly at Coromandel. The business done was—Applications for licenses, 181; granted, 194; forfeited, 80. Cases heard in Warden's Court, 294; miscellaneous applications, 664; civil cases, 360; criminal cases, 498: civil fees, £264 7s.; criminal fees, £53 6s.; fines, £91 4s. The gold revenue was £7,082 2s. 8d., and the number of miners' rights issued, 1,326. The above figures do not include Paeroa or Whitianga, only Resident Magistrates' Courts being held there.

I have, &c.,

H. W. NORTHCROFT, Warden.

The Under-Secretary, Mines Department, Wellington.

No. 2.

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

SIR,— Inspector of Mines' Office, Thames, 25th April, 1889.

I have the honour to forward the following report on mines in the Hauraki Mining District; also returns showing the quantity of quartz-gold obtained, and approximate value, for the year ending the 31st March, 1889:—

The returns of gold obtained show that on the whole there has been a decrease; but if the valuable quartz (awaiting treatment) stacked at the mines in the Te Aroha, Karangahake, Maratoto, and Waihi Districts had been operated on the return would have shown a considerable increase on last year's returns, both in quantity and value, notwithstanding that the average price of gold in the Thames, Ohinemuri, and Te Aroha Districts for the past year is 2s. per ounce less than the average price for the previous year.

COROMANDEL DISTRICT.

Tokatea Ranges.

Tokatea Mine (30 acres: Mr. John Binney, manager).—This mine is entirely worked on the tribute system, and, with the exception of two men who have worked on a leader at the low-level, the operations of the remainder have been carried on on small leaders near the surface. Fourteen tons of quartz have been crushed for a yield of 459oz. 15dwt. of gold. An average of twenty men have been employed during the year.

Queen of the North Mine (21 acres: Mr. Carlo Blasch, mine-manager).—This mine is also worked by tributers. Seven tons of quartz have been obtained from small leaders near the surface, which yielded 166oz. of gold. Seven men have been employed.

Bachelors Mine (2 acres).—Owned and worked by Messrs. Bennet and McNeil, who have crushed 2½ tons of quartz for a yield of 52oz. of gold. Two men have been employed.

Rob Roy Mine (two men's ground).—Also worked on tribute from small veins near the surface. Three tons of quartz have been crushed for a yield of 25oz. of gold. Two men have been employed.

Royal Oak Mine (8 acres: Mr. Peter Reid, manager).—In this mine the leaders are small and the country (rock) hard. The operations in the low-level workings by the wages-men employed by the company have been successful during the year, and 3 tons of quartz crushed for 388oz. 11dwt. of gold, while the tributers working nearer the surface have won 6 tons of quartz, which yielded 400oz. of gold. Four wages-men and six tributers have been employed.

Bismark Mine (formerly The Gem; 29 acres: Mr. E. Dugend, manager).—The workings in the mine are at the fan-level, which was formerly used by the Tokatea Company. There have been 2 tons 9cwt. of quartz and 140lb. of specimens crushed for a yield of 160oz. of gold. Six men have been employed.

West Tokatea Mine (30 acres: Mr. Peter J. Tierney, manager).—This mine is the property of the West Tokatea Gold-mining Company (Limited) (registered in London). The manager informs me that this company intends to thoroughly test the low-levels by driving two or three tunnels, and to import machinery for the purpose of crushing large quantities of quartz from the main Tokatea reef, which runs through the ground. Prospecting has been done on several of the reefs and leaders. Four tons of quartz have been crushed for a yield of 45oz. of gold. Two men have been employed.

Regan's, Ogilvie's, Scanlin's, Mayflower, Simms's, Mason's, Rathbone's, Waverley, Pilot, The Kaipawa, Success, Stirling Castle, and Young American Claims.—These have also been worked, but I have been unable to obtain the actual yield from each.

KAPANGA BLOCK.

Kapanga Mine (60 acres: Mr. Francis Hodge, manager).—This mine has been satisfactorily worked, and the anticipation of an increased yield has been realised. There have been 1,947 tons of quartz crushed for the return of 5,188oz. 2dwt. of gold, value £14,928 18s. 4d., not including 40lb.

weight of specimens, forwarded to the Melbourne Exhibition, and which were valued at £400. The main shaft has been sunk 40ft., and has now a total depth of 540ft. Driving has been carried on at the 300ft., the intermediate, and 420ft. levels on Scotty's Reef, the thickness of which is 2ft. 6in. This reef has also been stoped out at the 300ft. level, and there is a winze being sunk from that level to the 420ft. level on this (Scotty's) reef. Stoping has been carried on on the Kapanga Reef (2ft. in thickness) over the 420ft. level; 1,150ft. of driving on the reefs, 400 fathoms of stoping-out, and 350ft. of cross-cut driving have been done. The main shaft is to be sunk to a depth of 550ft. before another level is opened up. The mine is well worked, securely timbered, and well ventilated, and its appearance leads to the anticipation of another successful year. Seventy men have been employed.

Scotty's and North Kapanga Mine (60 acres: Mr. J. D. Colebrook, manager).—This mine lies on the line of the reefs to the northward of the Kapanga. Surface-prospecting has been done. The drives Nos. 1, 2, and 3 have been respectively driven 100ft., 50ft., and 30ft., as well as a low-level 200ft.; but no gold has yet been found. Six men have been employed.

South Kapanga Mine (13 acres: Mr. Thomas Blair, manager).—An attempt was made to work this mine from the shaft, but the affairs of the company have become disturbed, and work has been suspended for some time. This mine is on the line of the Kapanga and Scotty's Reefs, and the locality warrants further expenditure in sinking their shaft to prospect them.

Conquering Hero Mine (30 acres: Mr. P. J. Tierney, manager).—This mine is the property of the Colville Company (Limited), London, but prospecting works have not yet been commenced. A large capital is required, as a shaft will require to be sunk.

Kauri Block.

Just in Time Mine (30 acres).—This mine is also the property of the Colville Company, and a shaft will have to be sunk before the ground can be prospected at the deep levels.

Coromandel Mine (39 acres 1 rood 13 perches: Mr. Francis Hodge, manager).—This mine is the property of the Coromandel Gold-mining Company (Limited). The pumping-engine which was erected last year is working very satisfactorily, and the Palmerston shaft has been sunk to a depth of 100ft. below the 180ft. level. The operations now in progress are—driving the levels at the 280ft. level to drain the main reefs below the 180ft. level, and to admit of opening up under and in the line of the runs of rich gold which were worked in the upper levels. The reefs to hand are the Green Harp, of a thickness of 2ft. 6in.; Black Reef, 2ft.; McDonald's, 9in.; Cross Reef, 1ft. 3in.; Lynche's, 9in. The amount of driving done on reefs has been 332ft. 8in.; cross-cutting, 120ft.; old levels cleaned out, 70ft.; rise in winze, 28ft.; and sinking, 60ft. Forty-five men have been employed.

Tiki District.

Calliope Mine (8 acres freehold, 30 acres leasehold—not in the goldfield: Mr. C. W. Gale, manager).—This mine was formerly known as the Maribel. Mining operations have been carried on with more vigour during the past year. Ninety-four tons of quartz yielded 195oz. of gold. Nine men have been employed.

Colonist and Edith Claims.—Both these claims are being prospected by a few men, but the results have not yet been of much consequence.

Matawai District.

Castle Rock Mine (5 acres: Mr. James Vizard, manager and owner).—The low-level has been extended 150ft., and is now in a distance of 600ft., which should be nearly under the shot of gold worked in the level above, and there is every probability that the seam of gold will extend downwards to this level. Four men have been employed.

Matawai Battery.—The owners of this battery have constructed a dam in the creek for the purpose of storing water to give sufficient power to drive the stamps during the day-time. The battery has been overhauled and repaired, so that quartz can now be successfully treated. This will enable the owners of claims to obtain returns from their quartz, which of late they have been unable to do.

Manaia District.

Manaia District Claim (6 acres: owned by Blackmore and Ruffin).—The owners are now engaged driving a low-level from the south side of the range, and expect to be able to reach shortly the run of gold worked in the upper levels. Six tons of quartz yielded 49oz. of gold. Four men have been employed.

Star of Auckland Mine (3 acres: adjoining the Manaia Claim, and owned by Mr. Wm. Jones).—1 ton of quartz yielded 2dwt. or 3dwt. of gold.

Several claims have been worked in this district, but up to the present with no really payable results.

Matarangi District.

This is a district on the peninsula between Whangapoua and Mercury Bay. The Prospectors' Claim is the only one in which payable gold has yet been discovered. The reef is from 2ft. to 3ft. in thickness, and 26 tons of quartz yielded 37oz. 10dwt. of gold.

Gold has also been discovered at Kuaotunu and at Otama. The reefs yield a fair prospect when the quartz is pounded in the mortar and washed in the dish; but as very little work has yet been done it cannot be determined whether the reefs will be payable or not. There is, however, such indications in this district as warrant the belief that payable gold will ultimately be discovered. The main range, between Otama and Waitaia, shows large outcrops and boulders of rock, which Mr. Montgomery, of the School of Mines, says are the description of quartz known as the "buck reef," or "flinty." This would lead to the belief that a large "buck reef" runs along the range, and

that the reefs found at Kuaotunu and Otama are probably branches running into the main reef. Gold is also found in black sand on the beach, thus proving that a reef is on the coast under low-water mark; but the gold is not in sufficient quantities to pay for the cost of stripping and washing in the creeks. It is of a coarse nature, and was discovered many years ago at Waitaia, and prospecting is still being carried on in this district.

Boat Harbour.

Gold has been discovered in quartz reefs, but not in sufficient quantity to entice the miners to work the claims marked out. Gold is also found in black sand at a place between Boat Harbour and Tairua River; but, although several parties occasionally take to sluicing at that place, only one party—Campbell and Company—have a payable strip of beach. Other parties, such as the Korea Beach Sluicing Company, who have been working there the last six months, complain of the heavy stripping; and the general run of the sand only goes about 4dwt. to the ton, which is not payable.

The future prospects of the Coromandel District, I consider, are encouraging. The Kapanga may be still expected to give good payable returns, and the prospecting-works of the Coromandel Company, being carried on on the reefs immediately under the old, rich runs, will probably add to the next year's gold-return. With the exception of the Just in Time, Conquering Hero, and the West Tokatea Mines, which belong to English capitalists, there does not appear to be any likelihood of the expenditure of foreign capital on any of the mines. The Calliope Mine, at the Tiki, Vizard's Mine, at Matawai, and Blackmore and party's Mine, at Manaia, will in all probability yield more gold next year; and the mines on the Tokatea Ranges still have large numbers of small, rich veins to work on. Many localities in Coromandel are well worthy of being prospected, but local capital is not sufficiently expended in that direction, and until foreign capital is introduced to work the ground in a systematic manner the resources of the district will remain as at present—undeveloped.

Thames District.

Saxon Mine (17 acres: Mr. T. A. Dunlop, manager).—This mine has again been very successfully worked, and the returns of gold have given a handsome profit, £6,250 having been paid in dividends. The No. 5 Level, which is just above water-level, has been driven 753ft. A portion of this level is driven on No. 1 Reef, and a cross-cut continued 110ft. to No. 2 Reef, on which 90ft. of driving is done. A winze has been sunk on each reef from No. 4 Level, but stoping operations have not yet been commenced at No. 5 Level. The No. 2 Reef is a strong body of quartz, about 4ft. or 5ft. in thickness, and good specimens are frequently obtained. Driving for 2,184ft. has been done and 1,100 fathoms of reef stoped out. Some 8,200 tons of quartz yielded 7,683oz. 9dwt. of gold. Sixty-nine men have been employed. This company intend to make provision to have the water-level lowered another 75ft., and to open another level from the shaft. A rock-drill is to be used in driving the new level in order to more expeditiously open up another block on the reefs. The show of gold at the present low-level warrants further expenditure, and the returns should assist in maintaining future good yields of gold.

New Prince Imperial Mine (7 acres 1 rood 20 perches: Mr. Dawson Crawford, manager).—The operations in this mine have chiefly been confined to working on the reefs and leaders on the upper levels. Of quartz obtained by the company's men, 300 tons yielded 307oz. 10dwt. of gold, 557 tons by tributers yielding 642oz. 10dwt. of gold. Ten wages-men and twenty tributers have been employed.

Trenton Mine (22 acres: James Coutts, manager).—The new shaft has been sunk to a depth of 557ft., and a chamber opened at that level. The south cross-cut from the Cambria is to be extended to cut the Saxon Reefs. A rock-drill is being used in driving this cross-cut. The prospects of this mine are good, as in the Saxon Mine the reef has been profitably stoped out up to the Trenton boundary. Eight men have been employed.

Waiotahi Mine (19 acres 3 roods 5 perches: Mr. James E. Smith, manager).—The workings in this mine are still on the reefs and veins between Nos. 3 and 4 Levels—500ft. of driving cross-cuts and 1,500ft. of driving on reefs and leaders. There have been 840 fathoms of reefs stoped out, and 2,335 tons of quartz raised and crushed for a yield of 2,844oz. 10dwt. of gold. Four tributers who were employed for a few months obtained 30 tons of quartz, which yielded 55oz. 18dwt. gold. Forty men have been employed.

New Manukau Mine (3 acres: Mr. James E. Smith, manager).—The chief workings in this mine are on the same level and on the same description of reefs as are worked in the Waiotahi Mine. On reefs and leaders 360ft. have been driven, and 100 fathoms of reefs stoped out for 297 tons of quartz, which have yielded 577oz. 15dwt. gold. Tributers have worked on veins from the surface down to a depth of 150ft., and have stoped out 125 fathoms of reefs for 285 tons of quartz, which yielded 475oz. 15dwt. gold. Six wages-men and seven tributers have been employed.

Moanataiari District.

Old Caledonia Mine (9 acres and 12 perches: Mr. F. James, manager).—This mine has been worked by wages-men and tributers, the operations being confined to the reefs and leaders between No. 1 and No. 3 levels. There were 532 tons of quartz crushed on the company's account for a return of 333oz. 1dwt. gold, and the tributers crushed 412½tons of quartz for a yield of 1,019oz. 3dwt. gold. Eighteen wages-men and twenty tributers have been employed.

Moanataiari Mine (100 acres: Mr. G. S. Clarke, manager).—Work in this mine has been chiefly done by tributers. Seventy-five tons of quartz crushed on account of the company yielded 40oz. 19dwt. gold, while 1,782 tons of quartz crushed on account of tributers yielded 2,765oz. 7dwt. gold. The Moanataiari Gold-mining Company (Limited) that owns this property has been re-formed and named the New Moanataiari Gold-mining Company (Limited). Calls are now being made to

obtain funds and continue prospecting operations in the ground. The proposed works and those now in progress are—the prospecting of the large Cambria Reef at low levels from No. 4 Level of the Cambria shaft; reopening the main-tunnel to the face, a distance of 3,000ft.; and prospecting the two large reefs intersected in the Point Russell and Golden Age sections; also, reopening the cross-cut from main-tunnel to Nonpareil section in order to connect the tunnel with the deep-workings when carried out on Cambria Reef. Should the company be successful in any of the above workings, the whole of the old workings (which are now closed up) will again be opened. Ten wages men and sixty tributers have been employed.

Kuranui No. 1 Mine (7 acres 2 roods 12 perches: Mr. Samuel Turtle, owner).—This mine has been worked by tributers, with payable results. Six men have been employed.

Kuranui No. 2 Mine (13 acres 1 rood 37 perches: Mr. Robert Comer, owner and manager).—The operations in this mine have been confined to workings by tributers chiefly on small veins from the surface to the Moanataiari Tunnel-level. There has been 1,055ft. of driving done on leaders and 570ft. in prospecting cross-cut drives, and 850 fathoms of leaders has been stoped out. There were 1,585 tons quartz crushed, which yielded 2,093oz. 5dwt. of gold. Fifty-five tributers have been employed. The owner has purchased a battery of twenty stamps, and is having it erected on the mine. It is his intention to crush large quantities of soft rock near the surface containing many small veins of quartz, and also all old mullock-tips which may be available. He estimates that a yield of 2dwt. per ton will pay all expenses and give a fair profit.

Kuranui No. 3 Mine (6 acres 2 roods: Mr. P. C. Hansen, manager).—This mine comprises a portion of the old Kuranui Mine. The owners, for the purpose of cheap crushing, had their battery thoroughly overhauled and water-power put on, and have thereby been enabled to profitably deal with a large tonnage of low-grade material. The old mullock-heaps which had been deposited during the past twenty years in the Shotover Creek contain many small seams as well as a certain amount of loose quartz. This is all sent to the battery, and 12,610 tons have been crushed for a returu of 700oz. 8dwt. of gold. The mullock-tips are connected with the tunnel by passes, and 70 tons a day are sent to the battery and crushed. The return of 1dwt. 2⅔gr. of gold per ton is the lowest from any material previously crushed in this district which has given profit over working-expenses. When the mullock-tips are exhausted it is intended to crush a belt of soft rock 40ft. in width containing numerous veins of quartz. The tributers, who have been working in different parts of the mine, crushed 245 tons of quartz for a return of 399oz. 4dwt. of gold. Sixteen wages-men and twelve tributers have been employed.

Reuben Parr Mine (20 acres: Mr. R. Comer, manager).—In this mine the workings are chiefly under the Point Russell Tunnel-level. The mine is entirely worked by tributers, who crushed 172 tons for 460oz. 8dwt. gold. Eight men have been employed.

Caliban Mine (7 acres 3 roods 27 perches: Mr. J. R. Hunter, manager).—The chief work done in this mine has been crushing mullock and quartz obtained near the surface. There were 250 tons crushed for 87oz. gold. Five men have been employed.

Dixon's No. 1 Mine (3 acres 2 roods 19 perches: Mr. Edward Waite, manager).—In this mine the owners are employed chiefly in working over the old stopes in Dixon's Reef (which was a rich reef worked in the early days of this goldfield) and on a leader discovered in the hanging-wall of the reef. There were 593 tons crushed for 332oz. 12dwt. of gold; and a party of tributers crushed 130 tons for 68oz. 2dwt. Five men (owners of the mine) and four tributers have been employed.

New Alburnia Mine (10 acres 3 roods 11 perches: Mr. T. Gilmour, manager).—A considerable amount of work has been done in the upper levels of this mine, and to a depth of 160ft. from the surface. There have been 340ft. of driving done and 216 fathoms of reef stoped by wages-men, and by tributers 500ft. of driving and 1,044 fathoms of reef stoped for a total return of 916 tons of quartz, which yielded 1,507oz. 12dwt. of gold. Seven wages-men and thirty tributers have been employed.

Cambria Mine (15 acres 2 roods 17 perches: Mr. H. W. Moore, manager).—A considerable amount of work has been done, chiefly above No. 4 level. Seven different reefs and veins were operated on, the work done being 421ft. of driving cross-cuts and 260ft. on leaders. Three hundred and eighty fathoms were stoped out and 1,680 tons quartz has been crushed, which yielded 2,135oz. of gold. Twenty-nine men have been employed.

New Whau, Lincoln Castle, West Coast, and Perseverance Mines.—These and several other claims in the district have been worked for moderate returns.

Waiotahi District.

New Fearnought Mine.—This company are still driving and prospecting several leaders, but as yet without payable results. Two men have been employed.

Pinafore Mine (2 acres 2 roods 7 perches: D. E. O'Sullivan, manager).—The owners crushed 52 tons quartz for 156oz. gold, and tributers 21 tons for 42oz. of gold. Three wages-men and three tributers were employed.

Fame and Fortune Mine (55 acres: E. Kersey Cooper, manager).—This mine is the property of an English syndicate, and promises success. There have been 3,000ft. of old levels cleared out and repaired, and 400ft. driven on reefs. A block has been opened in Fox's leader which will take eighteen months to work out. Twenty tons of quartz yielded 45oz. gold. Eighteen men have been employed.

Blanche Mine (6 acres and 27 perches: Mr. H. W. Moore, manager).—A party of tributers crushed 135 tons quartz for a yield of 96oz. 12dwt. of gold. Eight tributers have been employed.

May Queen Mine (30 acres: Mr. H. W. Moore, Manager).—This land has recently been taken up. A contract has been let to sink a shaft 100ft.

Thames Mining and Prospecting Company's Special Claim (78 acres: Mr. T. H. Crawford, manager).—This company have cleaned out and repaired 600ft. of old drives, and they are now driving on the new Atlantic Reef close to the old rifle-range. They also intend sinking a main shaft about half way up the gully behind the county reservoir at Irish Town.

KARAKA DISTRICT.

City of Adelaide Mine (12 acres and 30 perches: Mr. T. Clarke, manager).—Operations in this mine have been steadily carried on during the year by the owners. There have been 200 fathoms of reefs stoped out from blocks opened over the low-level, and 391 tons of quartz yielded 470oz. of gold. Eight men have been employed.

City of Manchester Mine (3 roods 28 perches: Messrs. J. Scott and W. Taylor, owners).—In this mine 31 tons quartz were crushed for 63oz. 18dwt. of gold. This mine has since amalgamated with the Lone Hand.

Lone Hand Mine (3 acres and 12 perches: Mr. T. H. Barclay, owner).—One ton of quartz crushed for 58oz. 10dwt. gold. Tributers crushed 12 tons for 67oz. 1dwt. of gold.

The above mines, the Lone Hand and City of Manchester Mines, are now amalgamated and held by the Lone Hand Gold-mining Company (Limited), and the first work of importance to be commenced is driving a low tunnel from the Rocky Point tunnel. This level will give 90ft. of backs on the City of Manchester Reef (which runs through the mine for about 1,000ft.), and also open up the same depth of a block on the small leaders and flinties from which so much gold has been obtained in the upper levels of the Lone Hand section. There is every probability of an increase in the yield of gold from this mine, as, in addition to the known reefs, another reef containing rich gold was discovered by Mr. Barclay in the Lone Hand section at the present low-level.

Hokianga Mine (2 acres and 36 perches: Messrs. Jenkins and party, owners).—There has been 26½ tons of quartz crushed for a yield of 71oz. of gold. Three men have been employed.

Lucky Hit Mine (39 acres: Mr. John G. Vivian, manager).—This mine comprises the Auckland and Enterprise licenses, near the head of the Karaka Creek. A considerable amount of work has been done, and several very promising reefs are opened up. The returns were obtained chiefly from the Commercial Reef, which is about 2ft. in thickness, and the Little Johnny leader, from 2in. to 18in. in thickness: 90 tons 10cwt. of quartz and 42lb. of picked stone were crushed for 236oz. of gold. Seven tributers have been employed.

Prosperity Mine (29 acres), *Little Nell Mine* (30 acres).—A low-level prospecting-drive is being put in on each, without present results.

Claremont, E and M, Garland's, Mudlark, Sandstone, Jordan, Venture, Start, Helping-hand, and Hopeful Mines.—These claims have been worked with moderate results, and a large area has been prospected.

UNA HILL AND TE PAPA.

North Star Mine (8 acres: Robert Harvie, manager).—This mine has been steadily worked, entirely on the tribute system. There has been 250ft. of driving done on headers, and 360 fathoms stoped out for 246 tons of quartz, yielding 594oz. of gold. Fifteen tributers have been employed.

Magnolia Mine (5 acres: Mr. Henry Rabe, manager).—This mine is chiefly worked by tributers. There are numerous leaders and small veins of quartz worked upon. One hundred and fifty tons of quartz yielded 205oz. of gold. Twenty tributers are employed.

Just in Time and Ringleader Claims.—These claims are prospecting on different leaders, but, up to the present time, without payable results.

TARARU DISTRICT.

Sylvia Special Claim (50 acres).—This claim is situated on the Ohio Creek, and is the property of an Australian syndicate. A low-level has been driven for a distance of 1,027ft.; and the Little Agnes reef has been cut at a depth of 150ft.; but a great flow of water is coming from the reef, so that work will not be commenced on the reef until the bulk of the water drains off. Six men have been employed.

Norfolk Mine (33½ acres, licensed holding: Mr. John Bice, manager).—Thirty-six tons of quartz yielded 70oz. 3dwt. of gold. Four men have been employed.

Lowrie brothers, prospectors, have been engaged in the upper part of Tararu Creek, and have met with some encouragement, as they have made application for a licensed holding. They obtained 10oz. of gold from a small parcel of picked stone.

OTUNUI DISTRICT.

Eureka Mine (30 acres: Mr. John Wilcox, manager).—This mine has been entirely worked by tributers. Four hundred and seventy-nine tons of quartz crushed for 115oz. of gold. Eight tributers have been employed.

PURIRI DISTRICT.

Puriri Mine (late Surprise: Mr. J. McInnes, manager).—This mine has been worked by a party who have now taken up a licensed holding of thirty acres. There has been 650ft. of driving done on reefs, and 100 fathoms stoped out for 140 tons of quartz, which yielded 139oz. 4dwt. of gold. Six men have been employed.

Old Prospectors, Hidden Treasure, Polly, Ivanhoe, Ruby, and Antiquary Claims.—These claims are occasionally occupied, but the returns, if any, have been very small.

TAIRUA DISTRICT.

Decide Mine (4 acres 3 roods 21 perches: Mr. Finlay McLiver, manager).—In this mine 184 tons crushed for 76oz. 5dwt. of gold. Five men have been employed.

WHANGAMATA DISTRICT.

Goldwater Mine (16 acres: Mr. M. Kelly, manager).—The quartz in this mine contains a large percentage of silver, and is difficult to treat effectually. Thirty-one tons were crushed for a return of 1,256oz. 10dwt. of bullion, the value of which is not yet ascertained.

Other mines in this district have been given up, but the land will probably be occupied again if a battery is erected.

Waiomo District.

Gem Mine (20 acres, licensed holding: Mr. S. M. Hutchinson, manager).—A large amount of work has been done on their leader, which varies from 6in. to 18in. in thickness. There were 309 tons of quartz crushed for a yield of 295oz. 19dwt. Six men have been employed.

Paroquet Mine (28 acres 1 rood 15 perches: Mr. J. Lawrence, manager).—The drives of this mine have been repaired, and preparations have been made to stope out the reef. A wire tramway 81 chains in length has been constructed from the mine to the battery, and the battery (twenty-one stamps and six berdans) thoroughly overhauled and fitted with two Watson and Denny's pans and other improvements, but the works have not been completed so as to enable any quartz to be crushed from the mine. Twenty men have been employed.

Ostrich Mine.—This is also being prospected, but no gold has yet been obtained.

Tapu Creek.

Kelly's Claim (on No. 3 Creek), *Centennial* (on No. 2 Creek), *McMahon's* (on No. 2 Creek), *Sheridan's* (near the old Havelock), *Rogers's* (at the Panama Route).—These have been worked, but with indifferent success. Total quantity of quartz crushed was 64 tons, yielding 43oz. 12dwt. Small parcels of coarse gold are still obtained by washing in the creeks.

Tapu Sluicing Claim (30 acres, licensed holding).—This land is taken up for the purpose of working the surface-clay, which contains gold. The water-race which conveys the water to drive Pepper's battery has been continued a distance of 550 yards to a site adjoining the claim; and a puddling-machine, to be driven by water-power, is being erected. Water will also be used to convey the clay in a flume to the puddling-machines.

Mata Creek (Tapu).

Gentle Annie Mine (10 acres, licensed holding: Henry Baker, manager).—The battery for which the owners were in treaty was erected by Fraser and Sons, Auckland. Thirty-seven tons of quartz crushed for 31oz. gold, valued at £1 4s. 3d. per ounce. No further work of any consequence has been done since the quartz was crushed.

Mata Mine (19 acres and 30 perches: Mr. W. McPeake, manager).—The block of ground opened up by the low-level was stoped out on the run of gold. Twenty-four tons of quartz yielded 31oz. of gold. Five men have been employed.

Te Aroha District.

Te Aroha Silver- and Gold-mining Company (Limited): (Mr. John Howell, superintendent; Mr. John Goldsworthy, mine-manager).—Operations in this mine have been steadily carried on, but the work done has chiefly been in driving levels and opening up the ground on the various reefs, so that on the completion of the machinery a large tonnage may be on hand to forward to the mill. The area held by this company is: Special claim, 140 acres; licensed holdings, 85 acres 1 rood 12 perches: or a total of 225 acres 1 rood 12 perches. The lowest level driven is 450ft. from the surface. There has been 1,903ft. of driving done, and 416 fathoms of reef stoped out. For 1,381 tons of quartz crushed the yield was 1,112oz. 16dwt. of gold; and 692 tons of quartz crushed and concentrated for 67,398lb. of concentrates, from which the gold is not yet extracted. There have been 216 men employed. There is a considerable number of reefs in this ground—notably, the Silver King reef, 3ft. to 6ft. in thickness; Goldsworthy's Reef, 2ft.; Hero Reef, 2ft. to 4ft.; Canadian Reef, 20ft.; May Queen Reef, 3ft.; New Find Reef, 5ft. to 14ft.; Galena Reef, 3ft.; Virginia City Reef, 2ft.; New Reef, 4ft.; and, as blocks of ground are opened up on most of those reefs, the large amount of quartz necessary to keep the plant at work continuously can be supplied. The plant, now about completed, is one of the most comprehensive in the Southern Hemisphere, and will include the following methods of treatment—viz.: (*a*) Dry and wet crushing; (*b*) concentrating; (*c*) desulphurising; (*d*) chlorodizing; (*e*) amalgamating by pans; (*f*) smelting. From 600 to 700 tons of stone can be treated per week.

Colonist Mine (10 acres: H. H. Adams, manager).—The low-level on this reef (Hero), which is 8ft. in thickness, has been driven some distance, and a large tonnage of quartz broken out, none of which can be treated until the Te Aroha Gold- and Silver-mining Company's plant is completed. Five men have been employed.

New Era Special Claim (164 acres: Peter Fergusson, manager).—This mine has been protected pending negotiations with a Glasgow syndicate to purchase the property. Mr. P. Fergusson, who has lately arrived from Scotland, comes prepared to expend several thousand pounds sterling in opening up the mine and in erecting improved crushing-plant in addition to that which is already on the ground. The proposed works that are to be carried out in the mine are, to put in two drives 100ft. on the foot-wall and 100ft. on the hanging-wall of the Premier Reef, and cut through the reef in several places; between these drives to sink 80ft. of winzes in the reef. Test-parcels of quartz are also to be taken from the Inverness, Silver King, Phœnix, Vermont, and Wellington Reefs, which run through the ground. A Lamberton grinding-mill is also to be erected, and the mode to be adopted for extraction of the gold is the Cassell's process, which is, using a solution of cyanide of potassium as a solvent for the gold and silver. Twelve percolating-tanks are to be erected for this purpose. The manipulation of the ore will be under the superintendence of an expert, who is now on his way from Scotland.

Champion Gold and Silver Mines (Limited) (36 acres 1 rood: Mr. C. A. Cornes, manager).—A large amount of work has been done in opening up the mine. Three different levels have been driven on No. 1 Reef, and winzes sunk to connect them. The depth from the surface to No. 1 Level is 60ft., from No. 1 to No. 2, 59ft., and from No. 2 to No. 3, 35ft. (this latter is being sunk a further

105ft.). Large blocks of the reef, which is from 7ft. to 8ft. thick, are thus opened up ready for stoping out thousands of tons of quartz. There are two other reefs in the ground—No. 2, 4ft. in thickness, and No. 3, 2ft. 6in. in thickness; but there has not been much work yet done on them. A self-acting wire-tramway, 120 chains in length, is being constructed by Mr. Johnson (who has already erected tramways of this kind in the southern goldfields) to convey quartz from the low-level to the flat. It is intended to send some of the ores to Waiorongomai for treatment at the Te Aroha Company's works, and also to forward 200 tons to England to be dealt with by the Champion Company in London. There was no return from 36 tons of ore sent to Parkes's furnace, at Karangahake, as his process was a failure. Eleven tons of ore exported realised £6 10s. Thirty-six men have been employed.

Ruakaka Mine (60 acres: Mr. John A. Dobson, manager).—Two reefs found in this mine have been prospected. About a hundred tons of quartz are stacked at the mine. Seven men have been employed.

Prospecting.—A great deal of prospecting has been done on reefs in this district, but, as the country is very rough and broken, and no machinery being yet available in the neighbourhood, very small parcels only have been tested. The ores are chiefly of a complex nature where the reefs have been opened up.

The popularity of Te Aroha as a sanatorium is still maintained; the revenue from baths amounted to £454 11s., and 21,708 baths were taken during the year ending on the 31st December, 1888.

Karangahake District.

Crown Mine (60 acres 1 rood: Mr. N. Coward, manager).—This mine is the property of the New Zealand Crown Mines Company, and is now being further opened up. No. 1 Tunnel on No. 1 Reef has been extended 80ft. on the reef, which is about 3ft. in thickness; and from No. 1 Tunnel on No. 2 Reef a rise is being put up on the reef to prove the value of the block on the back of the tunnel, and a winze 84ft. in from the rise is being sunk in the bottom for the same purpose: this reef is also 3ft. in thickness. No. 2 tunnel, which is 95ft. deeper, is also being driven on this reef. Further works to open up the mines and to prospect new ground will also soon be undertaken. Preparations are being made to use the ground tramway for conveying quartz to Railey's battery-site. The company have chosen this site as being the only available one on their property for the purpose of erecting stone-breakers and their new crushing-plant. Lamberton mills are to be used for reducing the quartz, and the Cassell Company's treatment is to be adopted for extracting the gold and silver from the crushed quartz. The crushing-plant, which has been sent from Glasgow, is now being conveyed to the ground, and will be erected at an early date. The Cassell's Company are also erecting a suitable plant near the mills for the purpose of treating the crushed quartz, an agreement having been made that the Crown Mines Company shall hand over the quartz after being reduced to fine powder, and the Cassell's Company shall then treat it by their process and return to the Crown Company a large percentage of the bullion contained in the quartz at an agreed percentage on the yield.

Woodstock Mine (11 acres: Mr. John McCombie, manager).—This mine has been worked by tributers. A large block of the reef near the surface has been stoped out, and 101 tons of quartz have been crushed for a yield of 449oz. of gold. Six men have been employed.

Ivanhoe and Truro Mine (43 acres: Mr. C. Percy Cox, owner; Mr. John McCombie, manager).—A considerable amount of work has been done in these mines since the present owner became possessed of the property. Prospecting-drives have been put in to test some of the reefs. Two hundred and twenty feet of driving has been done, and 37 tons quartz treated for 43oz. of gold. Forty tons of quartz have been obtained by tributers, but have not yet been crushed. Eight wages-men and two tributers have been employed. A small battery has been erected on the mine—four stamps and two pans and settlers. The pan-treatment seems to be satisfactory, and yields a large percentage of the assay-value of the ores. To prevent loss by floatage the water which is used by the stamp-mill is conveyed to reservoirs and settled; and when sufficiently clear the same water is again used. A considerable amount of gold is thus obtained from the slimes.

Kenilworth Mine (14 acres: Mr. John McCombie, manager).—This mine has been worked on tribute. There have been 150 tons of quartz obtained. Of this, 36 tons have been sold for export, the assay-value of which is £3,400. The remaining portion of the quartz is still in hand, and is to be forwarded part to Waiorongomai and part to Mr. C. P. Cox's mill at Karangahake for treatment. Eight tributers have been employed.

Adeline Amalgamated Gold-mining Company.—This comprises the Adeline, Rose, Diamond, Josephine, Dubbo, and Bonny Jean Claims. This company's property is under offer to an English syndicate, and have some prospects of introducing English capital to work their mine.

Several other mines have been worked occasionally, but the best mode of treating the ores in this district is yet unsolved.

Owharoa District.

Smile of Fortune (12 acres 3 roods: C. S. Farmbe, manager).—This mine has been entirely worked by tributers. The quartz has been chiefly obtained from No. 3 Reef, which consists of a mass of stringers of quartz running through the sandstone in all directions, and from 1ft. to 10ft. in width. Several small leaders have also been worked on, for fairly payable returns. There were 1,138 tons of quartz crushed for 780oz. of gold. Eight tributers have been employed.

Prospecting.—Two parties have been prospecting, but as yet with no payable result.

Waitekauri District.

Waitekauri Mine (9 acres 3 roods: Thomas Gordon, manager).—Very little work has been done in this mine for the year. There were 276 tons of quartz crushed for 85oz. of gold. Three tributers have been employed

Jubilee Mine (special licensed holding; 103 acres: E. M. Corbett, manager).—The operations in this mine are confined to the surface. A battery to be driven by steam-power is being erected. It will consist of ten stamps, five berdans, two pans, one settler, and shaking-table. There is a large quantity of quartz and wash-dirt in a gully directly over the battery-site, as well as a big blow of quartz. This will first be operated on, and, as several rich boulders have been crushed in past years from the gully mentioned, there is every prospect that payable returns may be had. Twenty men have been employed.

Welcome Mine (3 acres and 31 perches).—Birney and party have worked this mine in conjunction with the True Welcome Claim. They have driven cross-cuts 230ft. on the reef, which is from 3ft. to 4ft. in thickness. Sixty-five tons of quartz crushed for 75oz. of gold, and 1 ton 12cwt. complex ore realised £30 at Parks's Reduction-works, Karangahake. Forty tons await crushing.

Eclipse Claim.—This is one man's ground, worked by H. Skeen. He has driven 300ft. on reefs and leaders, and crushed 30lb. picked stone for 5oz. of gold. He has 30 tons awaiting treatment.

Mangakara Mine (Mr. W. S. Ralph, manager).—Operations in this mine have been confined to driving a low-level tunnel under the old Diamond workings. Four men have been employed.

Australian Mine.—This is a special claim of 93¾ acres. This claim has been taken up by Messrs. Chappell, Lockwood, and McGuire. A battery of ten stamps is being erected on the Mangakara Creek, to be driven by water-power. It is the intention of the owners to crush the boulders and wash-dirt in Scotia Gully, a branch of the Mangakara; and in working up the bottom of the gully they expect to cut the reef from which those boulders have been shed. They also intend to erect a plant to treat refractory ores on a new principle. The ore is first reduced to the size of beans, and afterwards washed in a closed oven, into which superheated steam is introduced. They claim that by this method the whole of the base metals are carried off, leaving the gold and silver in a state to be easily amalgamated.

Young New Zealand Mine.—Two tributers have been employed, who have met with fair success. The level has been extended under the old workings, and a block of payable reef is now opened up.

Waihi District.

Martha Extended Mine (10 acres: Mr. John H. Moore, manager).—This mine has been worked by tributers, who have chiefly been employed at the old workings near the surface. There have been 2,000 tons of quartz crushed for 500oz. of gold. Sixteen men have been employed.

Britannia Mine (30 acres).—This mine adjoins the Martha to the north-east. A drive was put in by the shareholders from the old Young Colonial tunnel on the line of reef, and a winze sunk 56ft. The reef was found to be about 14ft. in thickness, 7ft. of which gives very good prospects. The mine has since been purchased on account of the Waihi Company, and the quartz will be treated at their works.

Silverton Mine (11 acres: E. Quinn, manager).—A considerable quantity of quartz has been obtained by stoping out a block on the south side of the winzes sunk last year. No quartz crushed. Six men employed.

Waihi Mine (172 acres: Mr. J. W. Walker, manager).—A large amount of work has been done in the above mine, but all over water-level. About 2,400 tons of quartz are stacked on the surface awaiting treatment. This has been roughly classed and assayed, and the value ascertained to be £10 per ton all round. The main shaft has been sunk 130ft., and a pumping- and winding-engine and gear erected. The crushing-machinery—consisting of four open roasting-furnaces, two stone-breakers, one set of roller-mills, two Globe ore-crushers, four Frazer's pans, eight 5ft. amalgamating-pans, one cleaning-up pan, and four settlers—has been erected, but, owing to the large expenditure in driving the machinery by steam-power, and also on account of the Globe mills not being suitable in every respect, the ores have not been treated in any large quantity. It is the intention of the manager to construct a dam and water-race in order to obtain water-power for driving the crushing-machinery, and until this is done no large quantity will be crushed. In the meantime a level will be opened from the shaft on the lodes at 100ft. below the present lowest level. The manager, Mr. J. W. Walker, is of opinion that, "if the lodes there equal in value the ore in sight on the present levels, the permanence of an extensive rich new mining-field will have been established beyond a doubt." Sixty-eight men have been employed.

Maratoto District.

Maratoto Mine (30 acres: J. H. Moore, manager).—A large amount of work has been done in this mine, but the runs of rich ore have not been of such extent as was apparent when first driven on. On the reef 400ft. of driving has been done, and 250ft. of prospecting cross-cuts. Five tons of quartz has been crushed, and 20 tons sold, the value in all being £1,000. There are now 100 tons rich ore in hand, and it is the intention of the company to erect a small plant to treat the quartz. Fifteen men have been employed.

The other claims and licensed holdings taken up in the district are mostly abandoned. The Kowhai and Quale are at present protected, but very little work has been done since last report.

Drainage.

The Big Pump still continues to drain the 400ft. level, but it is probable that the water-level will be lowered a further depth of 100ft. in view of the Saxon Company requiring to drive another level for a block of the reefs at present under water. The cost of drainage has been lately much reduced under the present manager, Mr. W. Phillips, the average working-expenses at present being about £240 sterling per month.

Tribute System.

The working of the mines is carried on here to a very considerable extent on the tribute system. The percentage paid by tributers to the companies or mine-owners varies from 5 per cent. to 25 per cent. on the gross yield of gold; the average may be estimated at 12½ per cent. In very few instances do the companies or private owners of mines give any assistance to tributers in the way of advances whilst prospecting-works are being carried on. Some parties of tributers are very well remunerated, whilst others frequently run in debt to the storekeepers for food for their families and for mining requisites.

A better return would no doubt be obtained from many of the mines worked on tribute if the owners would encourage those willing to take tributes by advancing a small sum weekly whilst prospecting-works were going on, to be paid back when payable returns were obtained.

There are 426 men employed on the tribute system in the district: 50 at Coromandel, 326 at Thames, and 50 in the Ohinemuri District.

The proportion of gold obtained by tributers has been about one-seventh of the whole at Coromandel, one-third of the whole at Thames, and seven-ninths of the whole at Ohinemuri.

Accidents.

Two fatal accidents occurred during the year. A young man named Albert Charles Ashby, while engaged in stoping in a claim at Hape Creek, on the 12th September, 1888, was killed by a fall of rock from a "soapy head" in the hanging-wall of the reef.

The other accident occurred at Waihi Mine, Waihi. On the 3rd November, 1888, a miner named William Simms was in the mill-house on a stage screwing up a bolt; the spanner slipped, and he fell to the floor. His spine was fatally injured, and he died on the 10th November.

General Remarks.

The prospects for the coming year are such that an increase in the yield of gold may be anticipated. The Coromandel District prospects I have already stated to be most encouraging. The runs of gold in the Saxon, Waiotahi, Lone Hand, and other mines at the Thames are still rich. The Trenton Mine will shortly be opened on the Saxon reef, where good gold was left on their boundary.

Prospecting-works are being carried on in the Caledonian and Moanataiari Mines, and in many other parts of the field. The May Queen and Thames Mineral Companies are both about to sink shafts to work the Waio-Karaka reefs. The Kuranui Hill will still yield a good return. The new mines at Tararu, Waiomo, Mata, and Puriri should also add considerably to the annual return of gold. The Crown Mines Company and Ivanhoe, at Karangahake, the Waihi Company, at Waihi, the Jubilee and Australian, at Waitekauri, with the new and improved processes they have adopted, will be able to treat the large quantity of ore that is already won, as well as the current output; while at Te Aroha the Te Aroha Company's plant will soon be ready to deal with their own ores and any complex or refractory ore that may be brought to them for sale or treatment.

The chief obstacle to the progress of the southern portion of the district, where the ores are of a complex or refractory nature, should be solved during the next twelve months, as amongst all the different processes which will be in operation a means of treating every description of our ores should be ascertained. Should such be the case, the only remaining question to be set at rest would be whether there is a sufficient quantity of gold and silver in the large reefs to pay for the expense of their extraction.

I have, &c.,

George Wilson,
Inspector of Mines.

The Under-Secretary, Mines Department, Wellington.

Comparative Return of the Quantity of Quartz crushed and Gold obtained in the Hauraki Mining District for the Years ending the 31st March, 1889, and 31st March, 1888.

Name of Sub-district.	Year ending 31st March, 1889.					Year ending 31st March, 1888.			Increase of Gold.	Decrease of Gold.	Total Decrease of Gold.
	Quartz.	Specimens.	Mullock.	Tailings.	Gold.	Quartz.	Tailings.	Gold.			
	Tns. ct.	T. c. lb.	Tons.	Tons cwt.	Oz. dwt. gr.	Tons cwt. lb.	Tons. cwt.	Oz. dwt. gr.	Oz. dwt. gr.	Oz. dwt. gr.	Oz. dwt. gr.
Coromandel ...	2,147 11	1 5 3	...	...	8,090 3 2	1,923 0 0	...	6,773 11 12	1,316 11 14	...	...
Thames ...	25,649 12	2 9 101	15,024	6,689 11	35,796 2 10	25,797 13 42	7,021 13	35,948 14 13	...	152 12 3	...
Ohinemuri ...	3,486 0	...	...	308 0	3,678 18 0	2,165 7 12	223 0	3,405 14 0	273 4 0	...	...
Te Aroha ...	1,381 0	...	...	...	1,112 15 0	5,722 0 0	1,444 0	2,917 16 0	...	1,805 1 0	...
Diff. in 1888-89	...	...	...	...	...	...	...	...	...	...	367 17 13
Totals ...	32,664 3	3 14 104	15,024	6,997 11	48,677 18 12	35,608 0 54	8,688 13	49,045 16 1	1,589 15 14	1,957 13 3	367 17 13

N.B.—The above return shows the amount of melted gold.

		Oz. dwt. gr.	Oz. dwt. gr.
Average product of quartz per ton, at	..	1 3 22	39,088 1 12
" specimens per pound, at		0 15 0	6,294 0 0
" mullock per ton, at	..	0 1 12	1,126 16 0
" tailings per ton, at	..	0 6 5	2,169 1 0
Total return	..	..	48,677 18 12

APPROXIMATE RETURN showing the estimated VALUE of GOLD actually obtained and of QUARTZ won but not yet treated in the HAURAKI MINING DISTRICT for the Year ending 31st March, 1889, and 31st March, 1888.

Name of Sub-district.	Year ending 31st March, 1889.						Year ending 31st March, 1888.		Increase for 31st March, 1889.
	Gold obtained.	Value per Ounce.	Specimens sent to Melbourne Exhibition.	Quartz exported.	Quartz won but awaiting Special Treatment.	Total Value.	Gold.	Value.	
	Oz. dwt. gr.	£ s. d.	£ s. d.	£ s. d.	Ton. £ s. d.	£ s. d.	Oz. dwt. gr.	£ s. d.	£ s. d.
Coromandel ...	8,090 3 2	2 16 2	400 0 0	...	...	23,119 8 4			
Thames	35,796 2 10	2 12 6	40 0 0	...	...	94,004 12 0	49,045 16 1*	133,649 16 0†	...
Ohinemuri	3,678 18 0	2 12 6	...	3,400 0 0	2,614 13,140 0 0	26,197 2 6			
Te Aroha	1,112 15 0	2 12 6	...	...	700 3,500 0 0	6,419 19 4			
Diff. in 1888-9 ...	...	...	...	...	...	...	...	...	16,091 6 2
Totals ...	48,677 18 12	...	440 0 0	3,400 0 0	3,314 16,640 0 0	149,741 2 2	49,045 16 1	133,649 16 0†	16,091 6 2

* Tonnage exported, 36½. † The value of gold is the actual price paid by the banks; but an additional 3s. per oz. (absorbed in duty and other charges) may be added to show the real value, which would be—for 1889, £158,209 1s. 11d., and for 1888, £141,006 13s. 5d.; showing £17,202 8s. 6d. increase for 1889.

N.B.—The average price of gold in 1888, for the whole district, was £2 14s. 6d.; and the average price for year ending 31st March, 1889, was, for Coromandel, £2 16s. 2d., and for the Thames, Ohinemuri, and Te Aroha, £2 12s. 6d. The difference in value of the latter may be accounted for in consequence of a larger quantity of silver being now saved than was formerly the case.

No. 3.

Mr. Warden ALLEN to the UNDER-SECRETARY of MINES.

SIR,— Warden's Office, Blenheim, 25th April, 1889.

I have the honour to forward you my annual report for the goldfields under my charge for the year ended 31st March, 1889. The returns already forwarded to you will show a considerable increase in the amount of revenue collected and of business done for the past year.

Since my last report a great deal of excitement has been caused in this district by a small rush to a portion of that large tract of auriferous country that for many years has been known to exist in Marlborough.

Sometime during the month of May, 1888, it was reported to me by one of Jackson's party, who for three or four months previously had been prospecting for gold in Cullen's Valley, that payable gold had been found by their party in the small stream known as Cullen's Creek. Very soon afterwards the whole of this creek and its various branches was pegged out as creek claims by holders of miners' rights. The boundaries of this district were shortly afterwards considerably extended, and now the whole of the country in which payable gold has at present been found has been included within the Marlborough goldfields district.

Since the first discovery of payable gold in Cullen's Creek parties who have been crowded out of this valley, or who did not care to undertake the amount of labour required for working these creek claims, have spread over the country; and payable gold has been found in other valleys, amongst others, Waikakaho, Bragg's, Arm-chair or Top Valley, and in other places. For several years miners have been at work in Onamalutu and a few other valleys on the north bank of the Wairau. With the exception of the Wakamarina, Cullen's, Waikakaho, Onamalutu, and a small portion of Top Valley, the attempts to find gold in other places can be described as little more than surface scratchings.

The novelty of "new gold discoveries" is fast wearing away, and it requires something out of the ordinary way, nowadays, to create a rush on a large scale. There is always a certain amount of something akin to gambling-excitement connected with gold-digging that will attract a certain portion of the community and, as long as there is a chance of "getting on gold," will chain them to the spot. In our small rush we have had the usual mixture of miners, new-chums, and loafers. Those who came expecting to heap to themselves riches by just stooping to pick up nuggets, and the greater part of those who hang on to the outskirts of a mining crowd, have left, and most of the miners have now pretty well settled down to hard work. At various times and in divers places there have been genuine finds of nuggets, varying from a few pennyweights to 26oz.; and this glorious uncertainty has no doubt encouraged and produced a large amount of very creditable work.

There is plenty of room in Marlborough in the known auriferous country for a large population of miners, but it will be of little use for men to come who have nothing to live upon while doing the preliminary prospecting-work, or who do not understand their work, or who are not prepared to encounter great difficulties in the shape of genuine hard work.

The greater part of the auriferous valleys or gullies in this district are fairly accessible, but the difficulties commence when the men arrive on the ground. In a large portion of this goldfield that may be considered open terrace-country, and in most of the mountain gorges, miners will have to be prepared to undertake moderately-deep sinking, and will encounter obstacles in the shape of immense rocky boulders that have to be blasted and carried away piecemeal. No doubt similar difficulties are met with in other districts. I think that many of the miners, after giving this district a fair trial, will conclude that they may go further and fare worse. In the gullies and gorges the gold is found in the gutters of the existing creeks, or on the terraces in the old beds of the creeks. Sometimes it is found in payable quantities on high terraces, or even on the mountain spurs, deposited on the bed-rock far away from any sign of old creek-beds.

I now proceed to report concerning the various subdivisions of my district. In doing so I can only mention a few of the principal claims or workings, and must pass over many others that are equally deserving of notice.

Queen Charlotte Sound

(A portion of the old Marlborough goldfield known as the Ravenscliff Goldfield).

In the way of gold-mining there is nothing worthy of notice in this district, with the exception of the ground held under license by the New Zealand Antimony- and Gold-mining Company (Limited). This company took up a block of land of thirty acres, formerly held by the Ravenscliff Company, near Jackson's Head. During the past twelve months they have not done much work, and the work they have done has consisted principally of clearing out and repairing the drives and shafts and other workings abandoned by their predecessors. The manager informs me that a rich patch of payable stone has been discovered. They have employed on this work about half a dozen men, and have cleared out about 500ft. of drives, and also retimbered a considerable portion. They have stoped-out about 20 tons of quartz, which has been shipped to England in order to satisfy the company as to the payable nature of the stone.

Before I close my report of this district I have much pleasure in giving you the following satisfactory report of the Antimony Mine at Endeavour Inlet. I am very much indebted to the present manager for the information, as follows: About fourteen months ago the New Zealand Antimony Company (Limited) purchased and took over all the property of the Endeavour Inlet Antimony Company, including all their right, title, and interest in the parcels of ground leased by the last-named company. During the past twelve months the New Zealand Company have employed on the average about seventy-five men. During the same period they have completed the following works: They have driven about 2,000ft. of tunnelling and about 200ft. of cross-cutting; 300ft. of winzes sunk; 60 chains of iron tramway formed and laid; 20 chains of wooden tramway formed and laid; 150 chains of water-race constructed; 10 chains of fluming; 3 chains of large wooden shoot, built on high tresselling; and a large dam has been built for the storage of water. In preparing the foundation of this dam it was found necessary to excavate through loose gravel, with a heavy flow of water, for a depth of 35ft. The work has been satisfactorily completed, and is found to answer all purposes required. In addition to the foregoing works, 2,000 tons of antimony-ore have been brought to grass. During the past twelve months this company have done a very great deal of dead work necessary for developing the mine. Four new long tunnels have been driven to open up the lodes at low-levels. Two of these have now intersected the lodes, with highly-satisfactory results. Two others are approaching the point where the lode is expected to be cut. Machinery employed: Crushing—One of Blake and Marsden's stone-breakers (the manager reports that after three years' trial he finds this a splendid machine); one of Freisbiex and Lucop's patent pulverisers (not exactly suitable for the work). Dressing—Three of Wearne's patent ore-jigs, giving great satisfaction. New machinery on the ground for erection: One of Marsden's new patent fine crushers; one of Jordon and Common's patent three-compartment ore-dressers. Furnace used—A twelve-crucible refining-furnace, and, in course of erection, four of Fitzherbert's new patent furnaces. Motive-power—One Pelton's water-motor, which at present gives fifteen-horse power. It is, however, about to be connected with a new higher level water-race that will increase the power to about thirty-horse power. This company have provided the necessary accommodation for their work in the shape of a wharf, ore-sheds, dressing-sheds, smelting-sheds, and a most complete laboratory with necessary appliances, workshops, and cottages for their men. There is also a good school upon the company's premises, attended by about thirty children.

Wakamarina.

The original Marlborough goldfield, once the scene of a large rush, now almost a deserted district. There is very little to report concerning this portion of the new Marlborough goldfield. Two or three companies have been formed for working portions of the Wakamarina—two river-claim companies, one quartz-reefing company. One river company has not done any work at present; the reefing company have let a contract for driving a low-level tunnel, not yet completed; and as to the third, the Maori Gorge Company, although they have carried on their work very creditably, it has resulted in a loss to the company. The claim held by this company was a rocky gorge, or rather a large pot-hole in the river-bed. They have cleared out the gravel for some distance, for a depth of about 80ft., and on reaching the bottom the result, as far as finding gold was concerned, was almost nil. It was fully expected by shareholders and others that a rich deposit of gold would be found on this claim: the result has been very unexpected and disheartening. If this had turned out well several other claims in the Wakamarina River would have been worked, and a fair number of men employed. Notwithstanding the failure of this claim, I am still of opinion that this old district will yet turn out well. There is a large tract of unworked and unexplored country yet in the Wakamarina, and in all probability payable reefs will yet be found there. With the abundant water-supply, it would answer to sluice on a large scale. A few alluvial miners are still at work, making wages; but in the temporary excitement of the new rush the name Wakamarina seems almost to have drifted out of existence. It may be interesting to those who are inclined to speculate in cleaning out smooth rocky-bottom river claims to note briefly the proceedings of the Maori Gorge Company. They have employed on the average about twelve or thirteen men for nine months; they have removed from the bed of the river about 3,000 to 4,000 tons of gravel; they have expended upon machinery, and labour, and plant about £1,000: and they have found about 17oz. of gold. The only satisfactory result to the company may possibly be that they have gained a great amount of experience.

MAHAKIPAWA.

The diggings in this district consist for the most part of creek or rather gorge claims, and a few terrace claims. From the fact that Cullen's Valley, above the boundary of the level freehold land, is for the most part a densely-wooded mountain-gorge, and also from the fact that the small mountain-streams in this valley have in ages past, before the mountains were covered with bush, been driven hither and thither to seek fresh beds and outlets by large slips from the precipitous sides of the neighbouring mountains, and further from the fact that these slips have at various times deposited immense masses of broken rocks and *débris* in the gullies in which are found the present creek-beds, it will be easily seen that miners in their necessary labours to try and reach the original bed-rock have rather a lively time of it. However, the hope of finding gold has done what no other inducement could possibly have accomplished. It has drawn men to the spot and compelled them to undertake and complete such a large amount of heavy work that in very many instances their efforts so far as trying to find the bed-rock are concerned, have been crowned with success, and more or less of the precious metal has been brought to light. I must say that I think it is fair to conclude that in only a few instances has the result more than paid the men for their time and labour, and in very many instances I am afraid the gold has cost more than its value to collect. Roughly estimated, I believe the gorge to be about six or seven miles in length.

At one time there may have been six or seven hundred men on the ground. There may be now about fifty or sixty claims worked, and probably two hundred and fifty to three hundred alluvial miners. At present nothing more is used in the way of machinery than Californian (spear) or Douglas pumps—some worked by hand, others by water-wheels. In two places I found the genuine old-fashioned cradle at work. It is almost impossible to say how much gold has been obtained. From information I have received I estimate the quantity at from 2,000oz. to 3,000oz. Unless more terrace-ground is discovered the alluvial claims in this gully will soon be worked out. Many of the claims are on gold, but almost all the creek claims are at the mercy of the weather. If it rains for a few days the stream becomes a small mountain-torrent that quickly rises so as to flood and cover up the existing creek-workings, and on the water subsiding it has been found that shafts, paddocks, and races are smoothly buried beneath a mass of shingle, stones, *débris*, and rubbish of all kinds that has been carried down from the higher claims; and the miners have almost to commence their work afresh.

The alluvial workings extend for some distance on to the freehold land at the entrance of Cullen's Valley. There is a small extent of level land and comparatively low fern-covered hills. Several of the spurs have been worked, and in some cases payable gold has been found. Several parties are sinking shafts on the flat: the difficulty they have to contend with is "water." I have not heard what has been the result of the work on the flat land.

Before mentioning the reefs in this district I may shortly say that the Waikakaho district is something like the Mahakipawa district. It is situated on the other side of the mountain-range, and opens out on to the north bank of the Wairau. It is a much longer and larger valley than Cullen's Valley at Mahakipawa. There are several miles of open country, very limited in width, before the bush-covered gorge commences, and there are one or two long valleys or gullies branching off from the main stream. The branch that has been most worked at present is the right-hand branch. Here Hart and party first discovered payable gold. It is generally considered that this Waikakaho Valley will prove richer than the Mahakipawa side. At present there is only one claim, Hart and party's claim, that has repaid the men for their work. Hart and party were fortunate enough to peg off the shallowest ground in the creek. They were not long before they came upon payable gold, and, comparatively speaking, theirs has been an easy claim to work. I am inclined to think that if it had not been for their occasional rich finds a great number of the miners would long ago have deserted the right-hand branch of the Waikakaho. When the reliable information has on several occasions been carried up and down the creek that "Hart and party are on good gold again," it is contrary to human nature to imagine that miners, at all events, however gloomy their prospects may have been, could possibly do otherwise than "wire-in" again to try and find a continuation of that nugget-strewn gutter that had been discovered by Hart and party. Up to the date of my report—the 31st March—I do not think more than three claims in the creek have bottomed.

The alluvial claims in the Waikakaho may be classed as gorge-creek and terrace claims, and level-ground-creek and terrace claims. There will be about six or seven miles of level ground of very limited width before the gorge-claims commence. The level ground has not yet been fairly tested. I can only mention three claims on the level ground—the Wellington Claim, the Chip-in Claim, and the Perseverance Claim.

The Wellington Company have sunk about 60ft. through shingle, but have not yet bottomed. They have erected a 16ft. water-wheel, and fixed up a pump that at present keeps the shaft tolerably free from water.

The Perseverance Company have applied for a special claim of about eight acres. They have employed on the average twenty-four men for a period of six months. They have sunk a shaft about 90ft. deep—7ft. 6in. by 3ft. 6in. They have a ten-horse-power portable engine and a plunge-pump, about 10in. bore. The last accounts received were that they had struck the reef, and, after sinking a 7ft. well-hole, they proceeded to drive in search of the gutter. They had found fair indications of gold.

The Chip-in Company held one terrace and four creek claims. They have employed on the average seven men for six months. They have sunk a shaft about 88ft.—4ft. 6in. by 3ft. 6in. At present they have gone through clay, shingle, and, towards the bottom, large boulders. They have bottomed on the siding-reef, dipping 1 in 3; they have sunk into the reef about 7ft., and intend to drive through it in search of the gutter. They have tried two small engines, one eight-horse and one four-horse power, working two small pumps. They found no gold in the reef. It appears to

me that they are working on too small a scale; the shaft should have been larger, the pump larger, and a more powerful engine is required. No doubt these extra appliances will be provided if the circumstances justify the outlay. Should these three companies discover payable gold on the level ground, the greater part of the open level valley will be taken up and worked. There is plenty of gold to be found in this valley and on the terraces. The problem to be solved is, what will it cost to obtain it?

There is nothing particular to report concerning the other divisions of my district, as far as alluvial mining is concerned. Several valleys up the north bank of the Wairau are being prospected. The Onamalutu has been worked for some years, and just now miners are inclined to give the Arm-chair Valley a turn. I am informed that there are about fifty men now in this valley. I have not heard the results of their work. If payable gold is found there abundance of room will be provided for a large number of miners.

Quartz-reefing District.

Up to the date of my report I can only give a very limited amount of information concerning the reefing claims. About forty applications have been received for licensed holdings, varying from twenty to thirty acres each. Out of this number about half a dozen have been withdrawn, and out of the number for which licenses have been issued I do not suppose half a dozen will be worked. Leaders freely showing gold have been found in several places: there is no scarcity of quartz veins and leaders. At present good solid unbroken gold-bearing quartz reefs are the exception not the rule.

I have obtained the following reliable information to about the middle of March:—

Jubilee Claim.—Lot of trenching done, without satisfactory results.

Mahakipawa Claim.—Shaft sunk 75ft. to cut reef by driving before starting a deep-level drive. Reef appears to be 2ft. to 3ft. thick, showing good gold.

Just in Time Claim.—Trenching for reef, at present without satisfactory results.

Lucky-hit Claim.—Trenching for reef; one leader discovered, 6in. to 1ft. thick, showing gold freely.

Kapai Claim.—There are three so-called reefs on this claim. No. 1 Reef or Leader has been sunk on for a depth of about 30ft., showing good gold. No. 2, only trenched, with fair prospects of gold. No. 3 Reef is about 9ft. thick, showing gold freely. This company have started a tunnel on No. 3 Reef to test the reef.

Waikakaho Claim.—Adit-level driven along reef, which is described as from 3ft. to 6ft. thick, showing gold freely. Distance driven, 64ft.

Southern Cross Claim.—Only work done trenching to trace reef, described as being 2ft. to 4ft. thick. Does not show gold well, but fair prospects can be obtained by crushing and washing.

No work has been done on the other licensed holdings requiring notice in my report.

Future Prospects.

Reefs.—At present uncertain. The country is very much broken up, and time alone will decide the question as to whether a sufficient quantity of payable stone will be found in the Waikakaho-Mahakipawa Ranges to justify any of the companies in expending much money on machinery for working their claims. The stone that has been found appears in some cases to be of very good quality; the question of quantity remains yet to be proved. I understand that one company is prepared to go on with the work if the results of their testing operations are satisfactory. The ranges from Jackson's Head to Birch Hill may be described as reefing country. There is plenty of room for prospecting in this direction.

Alluvial.—The prospects, I think, are very fair. There is no doubt about the gold being deposited in the valleys, and that there is a large extent of auriferous country in Marlborough. The cost of getting the gold appears to be a secondary consideration. If miners are only satisfied that it is there they will sooner or later obtain it.

I think it is a mistake to allow auriferous country to pass out of the hands of the Government. There are a few hundreds of men now employed in gold-digging in Marlborough upon land that would bring in little or no revenue under any other circumstances, and as far as I have seen of miners I think that there is not a more creditable branch of the working community in New Zealand than the genuine gold-miner.

I have, &c.,

The Under-Secretary, Mines Department, Wellington. J. Allen, Warden.

No. 4.

Mr. Warden Gibbs to the Under-Secretary of Mines.

Sir,— Warden's Office, Collingwood, 4th April, 1889.

I have the honour to transmit herewith the usual annual returns, for the year ending the 31st March, 1889, pertaining to the Collingwood, Takaka, and Motueka portions of the Karamea Mining District, Collingwood.

There is little that is new to report of this part of my district. The alluvial workings keep up their usual steady yield of gold, with little fluctuations either in the number of men employed or the gold obtained.

Quartz.

There is some active prospecting in progress at the quartz ranges on some licensed holdings lately taken up on what is supposed to be a good reef. This reef has been followed some 35ft. to 40ft. down, and is said to be improving, and is gold-bearing all through. A parcel of this quartz is being brought down to be crushed in a one-stamp battery at the Hæmatite works, Parapara. The Johnsons United Company keep steadily at work, and are about putting up extra stampers. The Red Hill Company, after erecting some very expensive machinery, and building some two or three

miles of a most expensive water-race and flume for ten heads of water, are now at a comparative standstill. They hold, by their own applications and transfers to them from others, five separate licensed holdings under the Mines Act, amounting in the aggregate to some sixty-three acres, and about two thousand acres under mineral leases granted by the Waste Lands Board, of Nelson. On none of these licensed holdings (with one small exception) has any work been done, the exception referred to being a small attempt at alluvial mining on a licensed holding of 8 acres 1 rood 15 perches taken up at the old Richmond Hill ground, and on the line of their water-race, which is completed about half-way along its proposed course.

MINERAL LEASES.

The locking-up of such large areas under mineral leases granted under Appendix C of the Land Act, without provision being made in such leases to insure the working of the minerals, is a serious drawback to the progress of this district. As far as I know, not a pick or shovel has been used by the settlers or by any one employed by them on any of the numerous holdings as mineral leases from the date of their being granted to the present time. There is, no doubt, much auriferous ground within these blocks—perhaps not very rich, but capable of paying small wages—all lying idle.

There has been lately issued from this office, under the Mines Act, three prospecting-licenses for minerals other than gold and silver: two of these licenses are for 640 acres each, and one for 400 acres. These blocks are outside the usual gold-workings, and are quite different from those granted under Appendix C of the Land Act. They give no pre-emptive right to a lease; therefore before a lease can be obtained the ground must be prospected, whereas in this district the invariable practice has been that shortly after a prospecting-license is granted by the Land Board a lease is obtained, without any prospecting having been done. In the case of any licenses to work minerals being granted by the Warden it would be well if power was given to insert some conditions to insure their proper working.

TAKAKA.

In this sub-district there is just at present a little extra activity prevailing, and some fairly paying claims are in work on the Anatoki, Onespie, and the Waikaramumu. There are also a few claims being worked in the Upper Takaka.

MOTUEKA.

In this but-lately-added part of my district the Mount Arthur table-land is the only part now under my charge, the Bâton and Wangapeka being dealt with by the Warden in Nelson. On the Mount Arthur one licensed holding has lately been issued: this block is said to contain a quartz reef. This application was opposed by a party who asked for a prospecting-license (for minerals) over and covering the same ground. They have since that time obtained a mineral prospecting-license over an adjacent auriferous block from the Waste Lands Board, of Nelson, as I am informed by the applicants' agent, with a view to finding some asbestos that is pure enough to pay for the working. Asbestos has been long known to be there, but the position is rather inaccessible.

COAL.

The Wallsend Mine, at Collingwood, is still turning out a steady yield of coal, employing some twenty men. The other part of this coalfield is still locked up and untouched by those who hold it under lease.

I have, &c.,
WM. GIBBS, Warden.

The Under-Secretary, Mines Department, Wellington.

No. 5.

Mr. Warden GREENFIELD to the UNDER-SECRETARY of MINES.

SIR,— Warden's Office, Nelson, 3rd April, 1889.

I have the honour to forward herewith the usual annual returns for the year ended 31st March, 1889, for the Bâton and Wangapeka districts, within the Karamea Goldfield.

As I have only recently been appointed Warden in charge of these districts, I have nothing special to report.

I have, &c.,
ALFRED GREENFIELD, Warden.

The Under-Secretary, Mines Department, Wellington.

No. 6.

Mr. Warden BIRD to the UNDER-SECRETARY of MINES.

SIR,— Warden's Office, Westport, 23rd May, 1889.

I have the honour to forward herewith the statistical returns for the year ending the 31st March, 1889, and also a report on the Karamea District generally. As regards ordinary mining but little alteration has taken place throughout the district, but I believe the number of miners engaged has increased, and the results from their labours are satisfactory. A vast amount of work has been done and capital expended to work some large areas granted as special claims at Addison's Flat and other localities, notably the following:—

The Fair Maid Gold-mining Company.—This company was formed to work partially-worked-out alluvial gold-bearing ground near Black Ball Creek, Addison's Flat, and to purchase John Landy's rights. The work of putting the claim in order was commenced in June, 1888, and washing was begun on the 17th May, 1889. The works comprise a water-race to carry forty heads, lifting its water out of Black Creek, and running over the elevated terraces above Addison's, a distance of four miles, when it delivers into two reservoirs, one of which was built by John Landy and the other constructed by the company. The dam for the latter is a most substantial structure, 156

yards long by 26ft. high at the centre, and contains 16,000 yards of earthwork and puddle. From both these dams are races capable of carrying twenty heads to the edge of the terrace overlooking the claim at an elevation of 230ft., where the water is delivered into wrought-iron pipes 18½in. in diameter, and by them carried on to the claim. No fall for the tailings from the claim being obtainable without expensive tunnelling, it was decided to work by means of a "jet pump" or "Californian Gravel-elevator," which dispenses with the necessity of a tunnel by raising the wash to an elevation that allows of it being treated for the extraction of the gold. The water and wash, after leaving the pump, runs over strainer- or hopper-plates, through which the water and sand pass on to ripples and plush-tables, while the coarse gravel left on the plates is discharged into trucks, and raised by water-power to the dump. A hydraulic crane (not yet erected) will be used to remove boulders and roots that interfere with the working. The total length of head- and tail-races connected with the claim is six miles, and area of reservoirs when full about twenty acres. There are 220 yards of 18½in.-diameter pipes, 110 yards of 15in.-diameter pipes, and 110 yards of 11in.-diameter pipes. The jet pump is 15in. in diameter, and consumes eight heads and a half, exclusive of the breaking-down nozzle, which will consume as much more. The tables are 112ft. wide, half only, or 56ft., being yet erected. These tables are invented and patented by the mine-manager, and built in eight separate sections, so that any one can be shut off for washing-up or repairs without interfering with the working of the others or the mine, which is a marked improvement over those in ordinary use on the Flat. The maximum rate of working attained up to the present time is 60 yards of hopperings per hour, and, if we allow the wash to consist of half hopperings and half sand, the gross discharge of the pump would be 120 yards lifted 36½ft. per hour, or nearly 1,000 cubic yards per shift of eight hours. The works were laid out and the machinery designed by Mr. Thomas Waters, while John Guthrie is mine-manager, and superintended the building and construction.

Day Dawn Special Claim.—Next in importance, or of equal importance, is the Day Dawn special claim at Addison's Flat, the property of Messrs. Mace and Bassett. The lessees commenced to put the claim in working order about the 1st February, 1888. In connection therewith they have acquired and constructed seven reservoirs, whose total storage capacity is estimated at about thirty million cubic feet. They have secured water-rights leading to the reservoirs, the principal of which is from the Waimea Creek, this being a pretty constant supply. Several of their other rights are from smaller creeks, from which they derive a large and important supply of water, having ample means of storing it during rainy weather. They estimate that with their storage capacity they could use twenty-five heads of water for ten hours per day throughout the year (that is, 25 cubic feet per second for ten hours per day). The ground they are working is too low to work by the ordinary method in general use here, that is, by driving a tunnel to carry away tailings; they have therefore adopted the hydraulic-jet system similar to that used by the Fairdown and Fair Maid Companies. In connection with this plant they have laid down about 6,000ft. of steel-fluming 18⅝in. in diameter. The steel sheets were specially imported. The pipes were manufactured and laid by a local firm (Hardley and Sons) in a very satisfactory manner. The castings were turned out by R. J. Sparrow and Co., of Dunedin. The water-pressure they have at their command is about 110ft.; the height they raise the stuff is 15ft. They have brought up, for carrying sand, a tail-race about one mile long, with an average depth of 10ft.: this race taps the reef at the claim. They have therefore acquired sufficient fall to work out about 1,200ft. of their ground without shifting. They separate the stones from the sand by the method generally adopted here, and raise them by means of a water-balance lift, and tip them on "duffer" ground. They are now contemplating opening their claim in a second place, their water-supply being sufficiently good to allow them to do so. I am informed that the results from the ground already shifted give, approximately, 3s. per cubic yard including everything, stripping stone, &c., which is considered very satisfactory.

During the last twelve months several large areas have been granted as dredging-claims, but no work has been done on them as yet.

New Era Company.—On this company's ground the works are well advanced, and dredging will be commenced at a very early date. The plant consists of a steam dredge, built principally of steel-plate and angle-iron, with compound-engine, fitted with the latest improved appliances. It is proposed to work the whole of the ground to greater or less depths, as may be deemed advisable as operations proceed. Mr. Gillon is the manager of the company, and he informs me the capital invested is over £7,000.

Great Republic, Nile, and Beaconsfield Gold-mining Leases.—Prospecting has been carried on vigorously, but the results up to date have not been very satisfactory. Still many of the shareholders are sanguine of success in the long-run.

An effort has been made to float a company in London to work various leases at Mokihinui, as it was found impossible to raise sufficient capital locally; but up to the present time no definite news on the subject has been received.

Fairdown Gold-mining Company.—Since March, 1888, this company has made extensive alterations to their plant, which is now in thorough working order, and capable of treating a very large quantity of wash-dirt. Very little gold has, so far, been extracted from the ground, the experimentary nature of the works rendering numerous alterations necessary, and so delaying profitable work. Owing to these difficulties the company became financially embarrassed, and deemed it advisable to suspend operations for a time, and let the claim on tribute. An offer of 20 per cent. of all gold obtained has been accepted from a good party of miners, who will start washing about the end of May.

Denniston Quartz-mining Company.—A shaft 150ft. in depth has been sunk and several cross-cut tunnels have been driven, but without success. A reef has lately been discovered on the surface; but, so far, has not been sufficiently developed to enable a test of its value to be made. This reef is bearing in the same direction as the Beaconsfield Company's reef, which is situate at a level some 1,700ft. lower, and it is surmised that the lodes are identical. Several leaders have been discovered highly charged with pyrites, and on being tested are found to contain payable gold,

LYELL SUB-DISTRICT.

In reporting upon this portion of my district for the past year I must say there is little calling for special mention.

As is well known, Lyell depends in a great measure upon the United Alpine Company's Mine for its support, and as during that time the company referred to was engaged upon dead work, and employing but few hands, business and mining matters have been in a comatose condition. However, with the striking of the reef in the No. 7 Level, and the consequent probable recurrence of monthly dividends in the near future, a better state of things may now be looked for. But as long as the Lyell shall place its dependence upon the one mine it cannot be otherwise than a place of but mean pretensions. At a time, therefore, when interest is excited in the place an endeavour should be made to have others of the mining properties thoroughly prospected. The United Alpine Company has been driving its No. 7 Level to intersect the reef worked in the upper levels. The company's surveyor calculated that the distance required to be driven was 2,085ft., and what is supposed to be the extreme south end of the reef was met with at a distance of 2,080ft. No gold was to be found in the stone. The level is still being extended, and it is reported that quartz of a more promising character is now being met with. It may therefore be reasonably expected that in a short time the United Alpine will again be classed amongst the dividend-paying mines of the colony. A portion of the mine was let on tribute, and was at first payable, although latterly not so.

Tyrconnell and United Italy Mines.—These mines are being worked in an amalgamated manner by a party of miners who have them on tribute. They have had two crushings out of the United Italy ground, both proving payable; and are now engaged blocking out stone preparatory for another. The Tyrconnell ground has not, I understand, been entered upon by them yet, their low level not having been extended that distance.

The Lyell Creek Extended Company.—There is no work being done at present on the ground held by this company, the contractors engaged in driving the low-level tunnel having thrown up the contract some time since. The tunnel is now in about 2,800ft. I am told that it is the intention of the company to resume work shortly.

Captain Cook Company.—This company is also in a state of inactivity. A portion of the United Alpine Company's No. 7 Level passes through this lease, and tenders are now called for by the Captain Cook Company for the driving of a cross-cut of 40ft. therefrom.

There is nothing of importance to chronicle in the matter of alluvial mining. A small rush set in about December last to the north bank of the Buller, about five miles from here, but with unprofitable results to all excepting the prospectors. There was some talk lately of good gold being found in New Creek, and a few parties have gone there. A number of miners are scattered here and there all along the banks of the Buller, making, I believe, wages, if nothing more.

In the Murchison sub-district a large number of alluvial miners are employed, a good proportion being Chinese.

There has been a considerable increase of miners (including Chinese) to this district during the past eighteen months. Glencairn, at its zenith this time last year, is now well-nigh worked out; but the banks of the Matakitaki, as for years past, still affords profitable employment to a large number of men. A party of seven men have a dredge at work upon this river, and, I am informed, earn an ounce of gold per man per week.

Concluding with the Owen, I may say that at the date of the last report hopes in it as a gold-producing district had already been sadly blasted, and people were then finding consolation in the fact of silver lodes being discovered. Not a great deal has been done during the year towards the opening-up of these lodes, although a number of licensed holdings have been granted for the purpose of working them. It would, however, appear that they are still looked forward to as the salvation of the district. But little attention is now given to the gold-mining industry, a few men only being employed prospecting on the Enterprise and Wakatu special claims. Two shafts have been sunk on the Wellington and Silver Stream holdings, both of which are now upon stone; but work has been discontinued pending the registration of the companies as an amalgamated concern. Work has also been discontinued upon the Welcome licensed holding. Outside of the claims here mentioned, I am told that there is no work, in the nature of prospecting or otherwise, being done. I might mention that Mr. Sangster, licensee of the Mount Owen Company, sent to England some time since a ton of silver ore for treatment: the result of the test should shortly be known.

The Charleston sub-district still employes a large number of miners, but nothing has transpired during the past year of sufficient importance to report upon. The special claims mentioned in my last report are still held by the applicants, who, I am informed, are endeavouring to form companies to work them with the newest dredging appliances.

In conclusion, I must say I think, taking the district as a whole, the prospects are most favourable, and I believe the return of gold for the next twelve months will far exceed that of the past few years, and the number of men employed at mining or in connection therewith will be greatly increased.

I have, &c.,

The Under-Secretary, Mines Department, Wellington. FRANK BIRD, Warden.

No. 7.

Mr. Warden BIRD to the UNDER-SECRETARY of MINES.

SIR,— Warden's Office, Reefton, 22nd May, 1889.

I have the honour to forward to you herewith the statistical returns for the year ended 31st March last, together with a report generally upon the condition of the different mines, and the results of the operations during the year.

In concluding my last report I mentioned that at that time the district looked remarkably well, and that, judging from the appearances of the mines then about to commence crushing, there was a hope of improvement. This prognostication, I much regret to say, has not been borne out by results, and it is perhaps but small comfort to know that some of the claims mentioned, whilst not being remunerative, are yielding sufficient to pay expenses; and so long as the crushings do not result in loss there is always hope of improvement. During the year, one by one, the mines in the Boatman's district, which a few years ago was one of the most productive portions of the district, have suspended operations temporarily, until at the present time very little work is being done there.

Name of Company.	Calls made.	Dividends declared.	Stone crushed.	Yield.	Value.
	£ s. d.	£ s.	Tons cwt.	Oz.	£ s. d.
Keep It Dark Quartz-mining ...	...	10,000 0	8,315 0	5,059	19,731 0 0
Globe Gold-mining	...	1,800 0	7,005 0	3,625	14,138 0 0
Supreme Gold-mining	816 13 4	...	...	...	...
Eureka Extended Quartz-mining ...	650 0 0	...	...	...	...
General Gordon Quartz-mining ...	150 0 0	...	...	...	...
Nil Desperandum Quartz-mining ...	862 10 0	287 10	1,408 0	624	2,435 13 1
Happy Valley Gold-mining... ...	600 0 0	...	...	...	...
Bannockburn Gold-mining	200 0 0	...	...	...	...
Eclipse Gold-mining	100 0 0	...	...	...	...
Homeward Bound Ext'd Gold-mining	1,450 0 0	...	...	...	...
Venus Extended Gold-mining ...	...	600 0	2,078 0	1,680	6,479 1 7
Gallant Gold-mining	750 0 0	...	...	...	...
Triumph Gold-mining	200 0 0	...	...	...	...
No. 2 South Keep It Dark Gold-mining	1,000 0 0	400 0	515 0	412	1,615 19 6
Sir Francis Drake Gold-mining ...	4,500 0 0	...	1,475 0	295	1,158 11 2
Scotia Gold-mining	1,100 0 0	...	0 17	12	46 1 0
Hard to Find Gold-mining	600 0 0	...	...	...	...
New Britannia Gold-mining ...	125 0 0	...	...	...	...
Inglewood Extended Gold-mining ...	1,100 0 0	...	620 0	266	1,034 15 0
Reform Gold-mining	600 0 0	...	36 0	22	83 7 0
Merrijigs Gold-mining	500 0 0	...	...	...	...
Argosy Gold-mining	375 0 0	...	...	...	...
Lone Hand Gold-mining	800 0 0	...	...	...	...
Londonderry Gold-mining	150 0 0	...	...	...	...
Empress Gold-mining	800 0 0	...	...	...	...
New Era Gold-mining	250 0 0	...	...	...	...
Chicago Gold-mining	50 0 0	...	...	...	...
Just in Time Gold-mining	1,166 13 4	...	453 0	397	1,361 16 9
Inkerman Gold-mining	2,250 0 0	...	...	...	...
South Hopeful Gold-mining ...	533 6 8	...	48 0	52	207 1 9
Argus Gold-mining	500 0 0	...	34 0	48	191 13 10
Inangahua Low-level Tunnel Gold-mining	400 0 0	...	...	..	...
Caledonian Extended Quartz-mining...	166 13 4	...	...	...	...
Walhalla Extended Quartz-mining ...	100 0 0	...	...	...	...
Reward Quartz-mining	50 0 0	...	...	...	...
Hudson Quartz-mining	100 0 0	...	...	...	...
Prince of Wales Quartz-mining ...	50 0 0	...	...	...	...
Welcome Quartz-mining	3,750 0 0	...	937 0	1,707	6,730 7 7
Specimen Hill United Quartz-mining	583 6 8	...	...	...	...
Phœnix Extended Quartz-mining ...	133 6 8	...	...	...	...
Big River Extended Quartz-mining ...	1,200 0 0	...	335 0	443	1,730 8 2
Progress Quartz-mining	3,000 0 0	...	1,915 0	987	3,873 5 2
Lone Star Quartz-mining	1,800 0 0	...	...	...	...
Multum in Parvo Quartz-mining ...	...	...	...	...	...
South Wealth of Nations Quartz-mining	750 0 0	...	...	...	...
Pandora Quartz-mining	300 0 0	...	329 0	292	1,152 13 2
Lord Edward Quartz-mining ...	200 0 0	...	...	...	...
Golden Hill Quartz-mining ...	1,200 0 0	...	...	...	...
Golden Treasure Quartz-mining ...	800 0 0	...	78 0	38	146 14 10
Fiery Cross Extended Quartz-mining	806 5 0	3,600 0	2,983 0	2,495	9,788 1 10
Royal Quartz-mining	600 0 0	...	...	...	...
New Golden Point Quartz-mining ...	300 0 0	...	...	...	...
Dauntless Extended Quartz-mining ...	200 0 0	...	...	...	...
Wealth of Nations Extended Quartz-mining	...	...	...	209*	816 6 7
United Devonshire Quartz-mining ...	250 0 0	...	...	...	...
	38,918 15 0	16,687 10	28,564 17	18,663	72,720 18 0
Alluvial gold	...	...	...	4,140	15,863 18 6
				22,803	88,584 16 6

* From tailings.

During the year calls have been made to the extent of £38,918 15s., and dividends to the amount of £16,687 10s. have been declared, the calls exceeding the dividends by £22,231 5s. The quantity of quartz crushed was 28,564 tons, from which 18,663oz. of gold was obtained: each of these items shows an increase on last year. The value of the gold obtained during the year was, exclusive of alluvial gold, £72,720 18s., some £6,700 in excess of last year. The yield of alluvial gold seems slightly on the increase, 4,140oz., of a value of £15,863 18s. 6d., being obtained during the year. From the opening of the district to the 31st March last 434,520 tons of stone has been crushed, yielding 342,896oz. of gold, valued at £1,330,460, out of which dividends to the amount of £439,531 have been declared. The yield of alluvial gold has been 95,955oz., valued at £349,604. The total gold-production is 438,851oz., valued at £1,680,065. Reference to the preceding table will show the calls made during the year, the dividends declared, the quantity of stone crushed, and its yield and value.

I will now proceed to give a short account of the works carried out in some of the mines:—

Devil's Creek.

Globe.—At the date of my last report the reef had just been struck. It has since been driven on 200ft. The mine has been opened out, and crushings have since been continuous with fair results, 7,005 tons having been sent to the battery, yielding 3,625oz., or an average of a little over ½oz. to the ton. On the Eastern Reef 190ft. was driven at a depth of 180ft., the stone averaging about 6ft., carrying payable gold. A winze is now being started on this reef from No. 1 to No. 2 Levels. A tunnel about 450ft. in length was driven to connect the Western Reef with the main shaft. A winze has been sunk from the surface on this reef to a depth of 80ft., and good gold is showing in the stone. This reef has been driven on 40ft., and the stone is about 8ft. wide, also showing good gold. On the present level the company have, it is calculated, about three years' work. The company, with the desire of rendering the mine more profitable, are erecting, at a cost of about £1,100, six Triumph concentrators, and the result will be looked forward to with interest. Since its formation the company have crushed 25,075 tons of stone, from which 12,497oz. of gold has been obtained, valued at £49,053, and have declared £13,050 in dividends thereout.

Progress.—On the battery-level a tunnel was started to intersect the Eastern Reef, which it was estimated would be reached in 1,200ft. When the tunnel was in about 700ft. the course was altered in order to strike the Western Reef, calculated to be struck in another 760ft., and it has recently been struck according to the measurements given. On this Western Reef a winze was sunk to a depth of 150ft., and the stone taken therefrom—204 tons (17 cubic feet in the solid to the ton)—was separately crushed, and yielded 156oz. 12dwt. 12gr. The sinking of this winze was continued down to the level, with which it has been connected, and here the reef is found to be 30ft. wide. This will give about 220ft. of backs. There are three reefs in this ground, known as the Eastern, Western, and Black's Reefs. There is about 100ft. between each reef, and each reef is about 120ft. long. The winze mentioned in my previous report as being sunk on good stone was on the Eastern Reef. The company, having excellent prospects before them, decided to enlarge the battery. The old battery was taken to pieces, and re-erected with fifteen additional heads, which will be driven by a fifty-horse-power engine recently imported from Home. The company intend erecting another five heads, making thirty in all, with which they should be able to crush 280 tons per week. The company have crushed from the time they started 4,605 tons for a yield of 2,854oz. of gold, or an average of over 12dwt. to the ton. From these figures some idea will be given of the value of the mine. They are also erecting one of Frue's concentrators, and should this be a success others will be added. The battery is now nearing completion, and should start a long and prosperous season of crushing in about six weeks' time.

Rainy Creek.

Inkerman.—The reef on which this company originally started having run out, and efforts to pick it up again having failed, the company, after a short period of inactivity, sent out a prospector, who was successful in finding a reef running north-and-south. They thereupon took up two new holdings. On this reef a winze was sunk 100ft. on stone, and an intermediate level was opened out at 76ft., and was driven north and south 180ft. without a break. The reef is small, averaging about 18in. It was then decided to connect this reef with the battery by means of an aerial tramway some 65 chains in length. In the course of the construction of this tramway, in making an excavation for one of the trestles, another reef was bared 70ft. away from the former find. A winze has been sunk on this 30ft., and from the bottom of the winze a tunnel has been driven along the reef for a distance of 40ft. This reef will probably junction with the former reef in about 50ft. This stone is about 2ft. 6in. wide. Both reefs show gold plainly.

Supreme.—The property of this company formerly belonged to the Rainy Creek Company, and was bought at auction. The purchasers formed a company under the above title. Good stone was discovered on the eastern boundary of the claim, between this claim and the Inkerman Company. A winze was sunk on the reef to a depth of 40ft., when, having to cope with too much water, further operations in this direction were discontinued. A tunnel was then started to strike the reef at a depth of about 180ft., and this has been driven about 360ft., and an uprise to meet the bottom of the winze is now in course of construction. The company own a fifteen-head battery and can therefore commence crushing-operations as soon as the mine is opened up.

Merrijigs.

The O.K., Golden Lead, and Merrijigs Companies have for some time past been prospecting a peculiar and extensive formation of an auriferous character, consisting of sandstone intermixed with quartz leaders. The formation is of unknown width: it has, however, been proved at least 60ft. wide on the boundary of the O.K. and Merrijigs. It was first discovered in the O.K. In the Golden Lead a tunnel has been driven a distance of 80ft. across the formation, at a depth of 70ft.

from the surface, and good gold has been found throughout, and it is said to be getting better as it is being driven through. In the Merrijigs Claim a tunnel was started to strike this formation at a depth of 280ft. This tunnel has been carried in some 600ft., and the same formation has recently been struck, and here again it is found to contain gold. This proves the formation for a length of about 2,700ft. The formation is so peculiar—and a novelty, as far as I am aware, in the history of mining in this colony—that it would be hazardous to express an opinion as to its value; but, apparently, it is of such vast extent and so easily crushed (as I am informed, an ordinary battery would crush twice as much of this stuff as it would of quartz) that, with corresponding crushing-power easily available, it would seem to be one of the most important finds of recent years in the district. Further developments are being awaited with interest.

Sir F. Drake.—During the year a fifteen-head battery, driven by steam, has been erected at a cost of some £4,000. The uprise from No. 2 Level to connect with the winze was constructed; and, the mine being opened up, crushing commenced—not, however, very successfully. The gold is found to be very fine; and, owing to base minerals being associated with the stone, the ordinary appliances are not sufficient to save all the gold. The returns so far are only just about sufficient to pay working-expenses.

Scotia.—This claim has recently come into prominence owing to the rich character of the stone found. The reef was traced on the surface nearly the full length of the claim. A winze 84ft. deep was sunk 30ft. from the south boundary, and solid stone carrying rich gold was struck at a depth of 43ft. Another winze, 70ft. deep, was then sunk 180ft. further north, at a higher elevation of 45ft.; and the solid stone was struck at 23ft., and here again good gold is showing. A tunnel has been driven 360ft. to connect with the south winze, and the reef has been driven on for a distance of 67ft., the stone averaging about 2ft. in width. A tramway, 20 chains in length, to connect with the Drake battery is now nearing completion. From the richness of the stone and the facilities for crushing the prospects of the claim are exceedingly good.

Gallant.—The winze, 300ft. from the north boundary, has been sunk to a depth of 150ft. A level was started to intersect the reef about 30ft. below the bottom of the winze. This tunnel struck the reef in about 250ft., at a distance of about 175ft. north of the winze. A contract has been let to drive to the perpendicular of the winze, with which it will be connected by an uprise. At the bottom of the winze the stone is 3ft. 6in. in width, and where intersected in the level 18in. This company will be able to crush at the Drake battery: the cost of connecting will be small.

Big River.

Big River.—A winze was sunk on stone to a depth of 90ft. Before a crushing was taken out a tunnel was driven a distance of 250ft. to connect with the bottom of the winze. A trial-crushing of 200 tons was taken out from in and around the winze, and yielded at the rate of 15dwt.: this would have been payable if the reef had continued, but unfortunately it did not. At the termination of this crushing, prospecting was continued on the surface. North-east, and a distance of 60ft. from the winze, a few leaders were met with, and after following them down some few feet a winze was sunk, and the reef followed down to a depth of 90ft., the stone averaging about 2ft. The level was then extended 100ft. to connect with this winze. The reef was followed for a further distance of 60ft., and averages fully 30in. At present the stone in the stopes is small and broken. Some months ago a new make of stone was found on the surface about 450ft. south-west of the last-mentioned winze. A winze is now being sunk on this stone, which averages about 4ft.: this winze is now down 75ft. After sinking another 5ft. a cross-cut will be put in on both sides to ascertain if there is another block of stone near at hand. The present reef is worth about 10dwt. to the ton.

Murray Creek.

Keep It Dark.—On striking stone on the north block, stoping up was commenced. A winze has been sunk 100ft. on the middle block. A winding-shaft has been sunk from No. 3 Level, 522ft. from the main shaft, to a depth of 130ft.; and at 120ft. the manager opened out to intersect the reef, and is now driving towards the bottom of the winze, which it is expected will be reached in about 65ft. There is about twelve months' work still between Nos. 2 and 3 Levels. The results of last year's crushing are very satisfactory, having yielded to the shareholders £10,000 in dividends. The mine at the present time is looking exceedingly well, and promises to continue. Up to 31st March last the company had crushed 97,068 tons for a yield of 53,913oz., value £209,707, and have declared £100,083 in dividends.

Low-level Tunnel.—Work has been suspended for some little time past. Recently an arrangement was entered into by the company with a miner to find a payable body of stone which in the early days of the district he discovered in a gully in close proximity to the line of the tunnel. The arrangement appears to be a fair one, the prospector receiving the ordinary sum paid in the district for driving and sinking, he being restricted to distances, and if successful this is to be supplemented by a bonus of a thousand shares.

Golden Treasure.—The old company of this name, having exhausted their capital, sold their property to a Reefton syndicate, who formed a new company under the old name to work the claim. After a considerable outlay in effecting necessary repairs, the new company commenced operations by taking out a crushing from what is known as the North Block, from which in years gone by stone had been taken which yielded 1¾oz. per ton. This crushing only yielded 4dwt. to the ton. Operations, therefore, in this part of the mine were discontinued. A small crushing was then taken from the south end of No. 3 Level: this also proved poor. The No. 6 Level was then extended north in the hope of picking up the rich North Block; but after driving some little distance this work was temporarily suspended. Attention was next directed to a tunnel 750ft. in length (driven by the old Band of Hope Company some twelve years ago), 300ft. south of Golden Treasure main shaft, and a winze 250ft. deep in connection therewith. This winze had been sunk on payable

stone by the Band of Hope Company, a trial-crushing yielding 27dwt. to the ton; but on driving on the level a large reef was struck, a crushing from which only yielded 4dwt. to the ton. On the affairs of the company being wound up, the first Golden Treasure Company purchased the ground. The present company cleared out and repaired this tunnel and winze, and from the winze put in a cross-cut of 40ft. at a distance of 170ft. from the level, from which 170 tons of stone was taken, yielding 15dwt. to the ton. A second cross-cut is being put in 50ft. lower down, so that sufficient stone may be raised to fully employ the ten-head battery. An uprise from the level was started, and after rising 16ft. the reef was struck, showing good gold. It is intended to drive a level from the main shaft, of 200ft., to connect with the western end of present workings. When this has been done an uprise of 200ft. will be required.

Inglewood.—The uprise having been carried through and connected with the upper level, stoping out stone was commenced. Owing to the expense in taking out the stone, the work being done by day-labour, and the rather small yield, it did not pay. The company then let a contract for raising the stone, and under this system it yields a small profit. There is about fifteen months' work on this level.

Venus.—Having opened up the reef on No. 3 Level, stoping out stone was commenced, and they have had intermittent crushings during the year, having sent to the battery and crushed 2,078 tons, which yielded 1,680oz. gold. The main level is now being extended on the line of reef.

Energy.—The tributers have taken out about 2,000 tons during the year, and crushed it at the Venus battery, with payable results.

Boatman's.

Welcome.—The second winze, mentioned in my previous report, which at that date had been sunk 60ft. from No. 8 Level, was continued until a depth of 130ft. was reached, and it was then connected with No. 9 Level. The reef in the winze and level proved broken and irregular. Stoping and driving on the reef between the intermediate and No. 8 Level was continued up to the beginning of August last, when work was suspended owing to the broken nature of the reef. During the year 937 tons of stone was crushed for a yield of 1,707oz., valued at £6,730 7s. 7d. Owing to the broken character of the reef, this yield was not sufficient to enable the company to declare any dividends. A block of stone left by the company in former years under the No. 6 Level, about 100ft. in length by 40ft. in depth, was next taken out, which was completed about the middle of December last. Work was then suspended, as efforts were being made to effect the amalgamation of this with the adjoining claim—the Homeward Bound Company; but this, so far, has not eventuated. This company has since its initiation up to the 31st March last crushed 26,427 tons of quartz, the yield being 62,391oz., valued at £243,561 2s. 11d.

Lone Star.—This claim is situated on the top of the main range, between Boatman's Creek and the left-hand branch of the Inangahua River. The south reef, which is on the fall of the range towards the left-hand branch, has been traced 200ft. on the surface. A tunnel 50ft. in length was driven on the reef, and a winze sunk 40ft. A trial-crushing of 20 tons yielded 35dwt. to the ton. Another reef to the north was discovered on the top of the main range, and traced for 180ft. Two winzes, 70ft. apart, were sunk on the stone to a depth of 80ft. each. An intermediate level was driven along the reef, and extended north and south from the winzes 180ft. A low-level tunnel was driven from Boatman's Creek side a distance of 760ft., and an uprise of 120ft. constructed to connect with the winzes. An aerial tramway is in course of construction to connect the mine with the Just in Time battery. This should be finished in June, and crushing commenced in July. The average width of the stone is 2ft. The low-level tunnel will be continued to strike the south reef, which should be met with in another 250ft.

Fiery Cross.—The reef unexpectedly discovered on the 450ft. level was not very extensive. However, during the year the company have crushed 2,983 tons, and obtained 2,495oz. gold, out of which they declared £3,600 in dividends. For some little time past they have been engaged in opening up another 150ft. level on the south block. This will be completed in about three months' time, when crushing will commence. During the year this company amalgamated with the Hopeful Extended Company.

Just in Time.—The east and west reefs met with in the extension of the intermediate level, 113ft. from the bottom of the main shaft, did not prove of any great length, and were soon worked out. Little or no work is now being done in the mine. The sinking of the main shaft, in conjunction with adjoining claims, will possibly be the next work taken in hand.

General.

A fair amount of prospecting is being carried on throughout the district. The large amount of calls made during the year may in a measure be accounted for by the erection of new machinery for Sir F. Drake, Inkerman, Progress, Globe, and Lone Star Companies, which it is confidently hoped will be reproductive. I am glad to notice that steps are gradually being taken to introduce new gold-saving appliances. The Globe and Progress Companies lead the way in erecting concentrators, and, if these save the amount of free gold that it is claimed they will save, they will unquestionably materially increase the yield from these claims.

The incoming year opens with fair prospects. The Keep It Dark and Globe are well opened up, and will be continuous producers; the Golden Treasure and Inkerman are in a fair way; the Progress, Scotia, Lone Star, and Fiery Cross will very soon be crushing, and possibly others before very long.

I cannot conclude without once more thanking the legal and mining managers for the useful information they have on this and all other occasions so willingly given.

Ahaura District.

Since last year there have been three rushes—viz., Ford's Creek, Nelson Creek, and Shellback Creek (Moonlight).

Ford's Creek (Blackball).—The result has not been according to anticipations. At the first there were about two hundred men in full swing, but that number has now dwindled down to about a hundred, and only a few of the claims are paying fair wages—viz., £4 per week per man.

Nelson Creek.—This rush has proved a duffer, but there are still a large number of miners employed in the neighbourhood.

Shellback Creek.—This rush was chiefly made by Chinamen, and I am informed that all the claims are paying well.

Orwell Creek.—The Napoleon Hill Company have again struck good gold, and are paying the shareholders £8 per week per man.

Waipuna.—A large claim of about a hundred acres has been granted, which will open out this country, and the shareholders are sanguine of good results.

An unusually large number of applications—840—were made in the Warden's Court for the year, which I think is an indication that the district has improved.

I know of no other circumstance of importance worth reporting that has occurred in this sub-district since it was placed under my charge; but I believe the majority of the miners engaged (about 780) are making fair wages, and from present appearances the yield of gold for the past year will be at least maintained, if not exceeded, during the coming one.

I have, &c.,

The Under-Secretary, Mines Department, Wellington. FRANK BIRD, Warden.

No. 8.

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

SIR,— Nelson Creek, 10th April, 1889.

I have the honour to make the following report on the inspection of quartz-mines at Reefton:—

Progress Quartz-mine (15th April, 1889).—There has not been any stone crushed from this mine for some time past, as all the payable stone from the top level to the surface has been taken out. The low-level tunnel which was being driven at the time of my last report is still in hand, and is now driven 1,435ft., which is known by calculation to be very near the reef. A winze is being sunk in the old workings to meet the new tunnel, and is now down 177ft., following the reef all the way, and is calculated to be within some twenty odd feet of the level of the tunnel. The winze and tunnel are expected to meet shortly at a depth of 205ft. below the old workings. The reef in this mine is said to be 24ft. thick in places, and generally very large. It is estimated to take sixty men five years to work out the stone now known to exist from the low-level tunnel to the old workings; and in order to keep that number of men employed about the mine large additions are being made to the crushing-plant. The battery-house is being enlarged, and additional stamps added (in all twenty-five), to be driven by a new compouud steam-engine of fifty-horse power. A paddock to hold 400 tons of stone is also being built. The total outlay in preparatory work for this level is said to be £7,000. This is likely to prove one of the most prosperous mines in Westland.

Globe Quartz-mine (15th April).—From the low-level tunnel cross-cut the reef has been followed about 400ft., where it is 6ft. thick. This is not so thick as it was at a higher level and near the surface. There is a main shaft sunk from the surface at a distance of about 140ft. from the east boundary of the Progress lease, and 275ft. deep, where it is 27ft. south of the reef. All the stone is sent up this shaft to the surface, from whence it is conveyed by a short tram to the aerial tramway, which in turn carries it to the battery about a mile and a half distant. The cages in the shaft are worked by wire-rope from an overshot water-wheel at the battery, and, notwithstanding this great distance over hill and dale, is completely under control of the man in charge. Steel rope of 2½in. circumference is used. The shaft is 9ft. 6in. by 4ft., divided into three compartments—one of which is used as a ladder-way from No. 1 to No. 2 Levels, a distance of 120ft. The ladders are strongly made, with iron rungs, and are otherwise in accordance with the Act. The chamber in No. 2 Level is very strongly made. The stopes between No. 1 and No. 2 Levels are being well timbered. The lode is very erratic—in some places it is a few feet thick, and in others as many yards. All the workings are very dry and well ventilated. The lode-walls are much more solid in this mine than in many of the mines in the district. The company is erecting a large building for concentrators, which are now on the ground ready to fix in position. This will be the first plant of its kind erected on the Coast, and is looked forward to with much hope, as it is a well-known fact that a large percentage of gold is lost in the tailings from all the batteries in the district. There are thirty-seven men employed at the mine and eight at the battery.

Big River Extended Quartz-mine (16th April).—Mining operations are now confined to the reef known as the New Find, which is situate on the west side of the old lode about 300ft. distant, and as far as prospected it runs parallel with it. The new reef, however, dips to the west, while the old one dips to the east. There is still another reef, 3ft. thick, west of the New Find about 300ft., and carrying gold. A winze has been sunk 40ft. on this, which is found to dip to the east. The New Find is being worked from a tunnel driven into the hill-side a distance of 350ft. to the reef, and along the same a length of 40ft. The present workings are about 100ft. below the surface, and run nearly north-and-south. The reef is about, on an average, 3ft. thick. The country is very much broken and disconnected. It is a most difficult reef to follow—very erratic. There are very few men employed just now. The workings are dry and well ventilated. The reservoir referred to in my last report has been constructed, and therefore a fairly good supply of water is now available at all times.

Nil Desperandum Quartz-mine (17th April).—No. 3 Level is now being worked, or, rather, prospected. The line of reef is being followed to the south, where detached blocks of good stone are being taken out. There are only six men employed in the mine. The air is good and the tunnels well

timbered. There are no safety-catches yet attached to the cages: I wrote to the legal manager on this matter on the 29th October, 1888. A serious accident happened in this mine yesterday morning to a miner named Woods, and it is feared he will not recover: the spine is seriously injured. I questioned Woods as to how it happened, and examined the spot in the mine where the accident occurred. Woods said, if any one was to blame it was himself. I think he did not take sufficient notice of the hanging-wall, and sound it carefully. It must have been very loose for some short time before it fell. A set of timber was ready to fix in position, and preparations were being made to put it in the spot where the rock came in from the side.

Wealth of Nations Extended Quartz-mine (17th April).—This mine is working on No. 1 Level from the "flat," and nearly 150ft. below the river-bed, and 700ft. below the original or first workings. Blocks of stone are from time to time met with, following the track of reef, which is now driven 300ft. north of the main shaft. Most of the work done since my last annual report has been prospecting. There are only twelve men employed at battery and mine. The battery crushes for the Nil Desperandum, Pandora, and No. 2 Keep It Dark. The air is good and mine dry. The Act is complied with.

Venus Extended Quartz-mine (17th April).—The lode is being stoped out between and from No. 3 to No. 2 Levels, which gives 200ft. of backs. No. 3 Level tunnel is driven 937ft., and follows the reef 250ft. The present work is confined to prospecting and extending the levels along the reef at different levels to the north. There are only thirteen men in the mine, and nine at the battery. The ventilation is good. A copy of the Act is at the mine, and books are kept, also a plan of mine-workings.

New Mines, Happy Valley.

Inkerman Quartz-mine (18th April).—The work is now confined to the new reef, which is about a quarter of a mile west of the old workings. A shaft has been sunk on the new reef to a depth of 100ft., and the reef opened out at 80ft., and levels driven north and south. The first stone from the lode is now being conveyed to the old battery by an aerial tramway 75 chains long, over hill and dale. No crushing has yet been done. There are sixteen men in the mine, and ten otherwise employed, at the battery, &c. The stone is at present hoisted up the shaft by a horse-whip. The reef is very uneven in thickness, but will average about 18in. It is supposed to be a continuation north of the Scotia and Gallant reef. The manager, Mr. McCallam, was not on the mine on the day of my visit.

Hard to Find Quartz-mine (18th April).—This lode is situated to the west of the Scotia. A level tunnel is now being driven to the line of reef, which has been traced a considerable distance along the surface. The tunnel is now in 180ft., and the contractors have to drive another 20ft., at which point they expect to cut the reef. A winze has been sunk on the reef from the surface, following the reef, to a depth of 56ft. The lode is 2ft. thick, and only about 20 chains from the Sir Francis Drake battery. There are only two men employed at present.

Scotia Quartz-mine (18th April).—This mine is supposed to be on the same line of reef as the Inkerman, Gallant, and others, but south of the first, and on the north boundary of the latter. A low-level tunnel has been driven 320ft. to the reef, at which point it is 72ft. below the surface, and preparations are now being made to open out the lode here. A tramway to convey the stone from the mine to the Drake battery is now under contract—equal to 24 chains. There is also a stone paddock being constructed, capable of holding 100 tons. There are two winzes sunk on the reef, 180ft. apart, in both of which the reef exists, and is said to be good. R. Naysmith has been lately appointed manager.

Sir Francis Drake Quartz-mine (18th April).—This is on the same line of reef as the Gallant. Portions of the lode have been taken out on No. 1 Level, and the present workings are between No. 2 and No. 1 Levels; No. 2 Level tunnel is 260ft. to the reef, where it is 152ft. below the surface. The stone is conveyed on 29 chains of tramway to the Drake battery of fifteen head of stamps driven by a steam-engine, the coal for same being procured 31 chains from the battery, to which a tramway is laid. There are eighteen men employed in the mine, seven at the battery, and two at the coal-seam, which is from 3ft. to 4ft. thick, and only from 1ft. to 5ft. under the surface, lying flat. A plan of the workings is kept at the mine, but no books or copy of the Act. The manager, Mr. Wright, has promised to comply with the Act.

Gallant Quartz-mine (18th April).—The Gallant joins the Scotia on its south boundary. A winze has been sunk on the reef from the surface to a depth of 114ft., where the reef is about 3ft. thick. A contract to drive a low-level tunnel has just been let, which, when completed, will be about 32ft. below the bottom of the winze. The present contract is to start from the end of a tunnel previously driven, and will be, when completed, about 464ft. This tunnel is quite close to the Scotia tunnel and tram, on which it is intended to convey the stone to the Drake battery. There was not any person on the mine at the time of my visit.

Happy Valley Quartz-mine (18th April).—This, the most southern of the Happy Valley mines, appears to have had very little done towards developing it since my last visit. There is just now some preparatory work going on to test the southern end of the lode. This mine also will get the stone crushed at the Drake battery.

Inglewood Quartz-mine (19th April).—This mine is being stoped out between the low-level tunnel and the old workings. This gives 179ft. along the lay of the reef. The lode is about 2ft. thick, and the mine well ventilated. There are two shifts of eight men each, and four men at the battery. The low-level tunnel through which the stone is conveyed to the battery is 1,430ft. in length, to which should be added 135ft. along the reef to the south. Books and Act are kept at the mine.

Golden Treasure Quartz-mine (20th April).—This was the old Band of Hope Mine. It is being worked from a tunnel driven from the level of the Murray Creek road, and is 650ft. to the reef. Stoping is going on at 160ft. above the tunnel. There are thirteen men in the mine and

three at the battery. The battery (fifteen stamps) was known in the early days of Reefton as the Westland. This mine has been idle for the last fourteen years: work was resumed about a month ago. The mine appears to be carefully worked, and is well ventilated. The reef is rather lumpy, and pinches out in places.

Energy Quartz-mine (20th April).—This is the old Energetic Quartz-mine, which is now being opened by a party of tributers. The old low-level tunnel, driven from the level of the Murray Creek road opposite the battery, has been repaired, and through this the stone is conveyed to the Venus battery. The tunnel is about 500ft. to the present workings. The average thickness of stone is about 3ft., and twelve men are employed one shift per day. No books and no copy of the Act are kept at the mine. The manager has promised to attend to these matters at once.

BOATMAN'S.

Fiery Cross Quartz-mine (22nd April).—A blind shaft is being sunk on No. 3 Level at 450ft. below the surface, and is now down 103ft. It is intended to sink this shaft 150ft. Further south there is a winze down 150ft., at which level it is intended to open out. On the south boundary there are six men stoping out a block of stone. On No. 5 Level there are four men driving north prospecting for the reef. There are in all twenty-three men employed in the mine. The air is good since breaking into the old Just in Time workings. New cages, with spring-catches, have been in use about nine months. Books and Act kept at the mine. This is the only mine working just now at Boatman's.

Keep It Dark No. 2 (23rd April).—The shaft is sunk on the south boundary to 280ft. level, where the mine was opened and worked to some extent; but the stone pinched in to a few inches only, and proved to be not good enough to follow up. A winze is now being sunk north of the shaft 50ft., which is already down 103ft., and the lode is looked for within a few feet. There are only two shifts of two men each working in the mine. There is considerable water percolating into the shaft, which has to be lifted from the 280ft. level in tanks: 7,500 gallons are lifted every twenty-four hours. The shaft was sunk at the expense of three companies—viz., No. 2 Keep It Dark, Pandora (it is on the boundary of these two claims), and South Wealth of Nations. The last two named have ceased work, and do not now contribute to the cost of pumping. The stone in the Pandora ran out very quickly on the level opened out on. The company, however, continued the drive south for a distance of 216ft. This drive was then continued south an additional 250ft. by the South Wealth of Nations—getting small blocks of stone carrying gold all the way, but too poor to pay. At present the manager does all the surface-work, including working the engine.

Keep It Dark Quartz-mine (23rd April).—The main shaft has not been sunk since my last annual report, but a new chamber and short poppet-heads have been made over a blind shaft sunk 130ft. deep at a spot 522ft. north of the main shaft and at the 500ft. level. A chamber has been made at the 120ft. level in the blind shaft, from which the lode will be worked and the stone hoisted by the wire-rope from the main shaft to the 500ft. level, and then from that level to the surface, as before. The present workings are being carried on between No. 2 and No. 3 Levels, where there is from six to eight months' work in sight. The average number of men is about thirty. Books and Act kept at the mine. A new cage, with safety-catches, has just been made, but is not yet in the shaft.

ACCIDENTS.

I have two accidents to record since my last annual report. H. Hoskins was killed on the 6th September last in an uprise from the low-level tunnel in the Inglewood Mine. The uprise was driven 179ft., and then a hole was drilled 10ft. or 12ft. to tap the water in the old workings overhead. After the water had been running some twenty-four hours, the manager and Hoskins went up the uprise to examine the spot, and the manager (who was leading), when near the top, put up his hand to remove some boards overhead. While this was being done, Hoskins turned round on the steps with his back to the manager, who, after removing the boards, put up the lighted candle to see if the hole was clear. An explosion of gas immediately took place, which shot Hoskins head first to the bottom of the uprise. The manager clung to the ladder, but was badly burnt. (2.) Woods, a miner, was seriously injured in the Nil Desperandum Mine on the 16th April. He had only commenced his shift about half an hour before in the main level, and was getting the floor of the drive cleaned up in order to put in a set of timber, when a slab of rock flaked off the side and crushed him very badly—so badly, indeed, that I fear he cannot recover. I think ordinary care would have prevented the accident.

I have, &c.,
J. Gow, Inspector of Mines.

The Under-Secretary, Mines Department, Wellington.

No. 9.

Mr. Warden KEDDELL to the UNDER-SECRETARY of MINES.

SIR,— Warden's Office, 25th May, 1889.

I have the honour to forward under separate cover the statistical returns asked for in your circular letter No. 16, 14th March, 1889, and to submit the following general report on the condition of the mining district under my charge. Upon the whole I think that mining has made steady and gradual progress, and I am informed that there is a proportionate increase in the yield of gold in the district.

ARNOLD, NOTOWN, DUNGANVILLE, AND BARRYTOWN.

All applications and mining business connected with these sub-districts are dealt with at the Greymouth Warden's Court, and there appears to be no falling-off of business, and the public do not seem to have suffered much, if any, inconvenience from the closing of the Courts at these places.

Blackball.

This portion of the Westland District is on the boundary-line between that part under Mr. Warden Bird and that under my charge, and probably will have been referred to in his report. A great impetus has been given to mining in that neighbourhood owing to heavy finds—amongst them some nuggets, one weighing about 70oz.; and there are several new claims which have recently yielded good returns.

New River and Paroa.

At the former place systematic workings by large parties have commenced. Some extensive water-races taking supplies from this river have been granted, and have been carefully surveyed, for the purpose of working what has been known as the "Stony Lead," long since given up for want of fall and water in sufficient quantities. At Paroa the same population find a living, with little or no difference in results.

Kumara.

Here there has been no decrease in numbers, and work has been steadily pursued through the year, which was most favourable for sluicing, the rainfall during the whole of the year 1888 being unusually heavy. The sludge-channel is rapidly filling up, and it has been proposed by the miners that a wing-dam should be made in the northern bank of the Teremakau River to throw the current of the stream on to the south bank and so cause a scouring of the mouth of the sludge-channel, or, as an alternative, to construct a new sludge-channel. This subject has been, I understand, brought to the notice of Mr. Gordon, Inspecting Engineer, on the occasion of his recent visit to the field. Something in one or other of these directions requires to be done, or a large area of payable ground must remain unworked.

A considerable amount of prospecting within a limited area has been done during the past year, but without any great result so far. A large sluicing claim has been opened on the north side of the Teremakau River, adjoining what is known as the Warden's Reserve. The first washing-up is anxiously looked for, and if successful a large quantity of ground on the bank of the Teremakau will be taken up.

Greenstone.

At this place the large special claim granted December, 1886, has passed into the hands of a strong company, and is well held in the district. They are making a permanent and extensive tail-race, which will enable them to work the whole area; and, as the prospects of their ground at Duke's Terrace are well known, and, in fact, the ground has only been left so long unworked owing to the largeness of this undertaking and its expense in order to create sufficient fall, I have every confidence in its ultimate success.

Waimea and Stafford.

The ordinary mining work in this district has made steady headway. The special claims taken up for dredging the old ground have alone remained *in statu quo*, for reasons referred to elsewhere under that head.

The Wheel of Fortune Gold-mining Company have carried on work almost uninterruptedly; but without the success their efforts appear to have deserved. The sister claim on Kelly's Terrace has been worked by tributers (party of eight), who have been on rich stuff for some time. A short delay took place recently, owing to an accident to their pumping-gear; but through the kind permission of the Hon. the Minister of Mines this mishap was soon rectified by the services of a diver, and work soon resumed. The tribute has, I understand, but a few months to run, when the company will recommence work on its own account. The yield has been as much as £16 a week per man.

A number of licensed holdings have been granted to the Teremakau Gold-mining Company at the Taipo Range, and great hopes are entertained of the reefs discovered there. In July last a party of miners commenced sinking a prospecting-shaft on the flat above Goldsborough, on the Kumara Road, and, in order to drain the same, applied for a tunnel (a drainage-tunnel) to the Waimea Creek. This led to an action on the part of other miners who had a tail-race in the same creek, and several cross-actions delayed work until these disputes were settled in the Courts, occupying some three or four months. Their pertinacious resistance of the actions, and the amount of work they have done in connection with the claim, lead me to believe that their prospects are good. Should they be successful, which can only be tested by their washing-up, I believe there will be opened up some twenty or thirty acres of land hitherto unworked, and which for want of fall cannot be worked by the ordinary sluicing-process. This party (Corbett and others) have made a tramway, which commences from the bottom of their shaft, up a gradual incline, then crosses the road, and follows some distance along it to their washing-paddock. A lot of dead work has been done, and in about twelve months from the commencement of their occupation they will be able to judge whether their venture is a success.

Hokitika.

There is very little to report on within this sub-district. Here, as I have reported elsewhere, the progress has been steady—a number of rights applied for and dealt with. The old Kanieri Water-race, once held by a local company, and which originally cost a large sum but was never completed, has been applied for and granted to a strong party of Chinamen. Their intention appears to be to work on a large scale, and results ought to help to swell the present year's returns. At Rimu and Woodstock no change is apparent. Population is steady—for the most part settled down in comfortable homesteads.

Ross.

There has been little movement in mining matters since last report; but, at the same time, no falling-off. The reefs at Cedar Creek have attracted public attention lately, a new reef having been

discovered in the William Tell showing gold in what is believed to be payable quantities. The Mont d'Or still continues to pay handsome dividends. A new scheme is on foot to work the deep ground on Jones's Flat by the Ross United Company, but it has not yet matured.

SPECIAL CLAIMS (DREDGING).

In my report for the year ending the 31st March, 1888, I referred to the number of special claims that had been applied for on the beaches extending along the whole front of my district from Barrytown to the Wanganui River, the pioneer of this class of mining in this district being Mr. Taylor, whose claim is immediately north of Greymouth; and I hoped that this year I should have been able to report an appreciable progress and some favourable results. Many things have militated to prevent this—mainly the question as to which of the few offered to the public was the most suitable machine, it being unanimously agreed that any plant would entail a large first cost of ready money. The machines mostly favoured by public notice were the Ball dredger and the Wellman. An experiment was made with one of the former at a point south of the Arahura River, but it turned out a failure, and thus caused a delay in selection by those special-claim holders awaiting results. A second large machine was next set up in the Okarito district; but, after an expenditure of, I am informed, about £5,000, it had to be abandoned, and public attention is now directed to the Wellman machine now in course of erection by the patentee for the owners of a special claim at Saltwater, also in the Okarito district. It is to be regretted that this experiment is to be made in that remote and inaccessible locality instead of on proved ground in which, as I understand, the same owners are interested, and which is easy of approach. It is a very great undertaking to land heavy machinery in an open roadstead at any time; but the chances of suitable weather at this season of the year are remote, and there are only two steamers usually at Hokitika, where the plant has been delivered, that can be made available, and either would have to be withdrawn from its own proper trade to undertake the work. Again, neither of these vessels can approach near the shore, and one portion of the machinery, at least—the boiler—is of such dimensions and consequent weight that it is a question whether it can be landed at Saltwater as a whole. The work under the most favourable circumstances must be attended with great risk, and, as before stated, it is to be regretted that the machine was not erected on ground more easy of access. The experiment is of the utmost importance. The first machine was a mere toy, and the Ball dredger has not been tried on its merits. On the other hand, it is stated that the Wellman has proved a signal success in the south of the island, at Waipapa. It is an undoubted fact that immediately one of these machines proves it is able to bring the gold to the surface a great impetus will be given to this class of mining, and money has been promised from the English financiers to promote these ventures on such an assurance of profit. For my part, I am inclined to believe that, granting the ability of these machines to do the work they guarantee, there is one difficulty these claimholders will have to face—a difficulty common to all processes dealing with fine auriferous sands—*i.e.*, the saving of the gold. These centrifugal pumps are all worked at a great velocity; they promise to raise from 20 to 50 tons per hour: under these circumstances more than ordinary care will be necessary in the construction and management of the tables or other gold-saving apparatus.

On the Saltwater (Paroa): Messrs. Brown and Byrne's Application.—The company to whom the special claim has been assigned have commenced preliminary operations by building a large punt on which to place the machinery, which is now expected from England. The process to be adopted by this company is, I understand, one mainly designed by Mr. S. Brown; and I learn by the papers that it is so far favoured by those interested that similar machinery has been ordered from England to be placed on a special claim immediately south of Greymouth, which has been lately floated on the London market. The necessary capital required for any of these ventures has been estimated at from £3,000 to £7,000, and I think £5,000 would be a fair estimate to calculate on. If this is the case, it is hardly to be wondered at if, in the depressed circumstances of the colony during the past two years, the owners of these special claims have been idle, watching the results of the trials of these pioneer machines. When these claims were first started I followed the example of my predecessor in the Hokitika district, and allowed the very minimum number of men that could be advantageously employed, and fixed the rental at 5s. per acre. Since then the Hon. the Minister of Mines has withheld his approval of special claims unless the rental and labour conditions were made the same as in licensed holdings. At the request of certain applicants for special claims in the Totara sub-district, and a few elsewhere, I postponed dealing with the subject till an appeal they had made to the Minister was decided; and I did so as many of these applications were for swampy land, which could not be worked at all except by powerful machinery, and as the enforced employment of one man to two acres pending the arrival of the machinery, which would in all probability have to be procured from England or America, would be, I considered, a useless tax on the industry. To pay at all, considering the large first outlay, these claims must be of great extent. Many of them are of fifty or more acres. To find work—beneficial work—for twenty-five men immediately on the grant being completed would be impossible. When the machinery is on the ground the labour clause as at present could work no hardship, since machinery, at the lowest estimate under Rule 242, would represent eighteen men.

I have, &c.,

JACKSON KEDDELL, Warden.

The Under-Secretary, Mines Department, Wellington.

No. 10.

Mr. Warden MACFARLANE to the UNDER-SECRETARY of MINES.

SIR,— Warden's Office, Okarito and Jackson's Bay, 1st May, 1889.

I have the honour to forward herewith the statistical returns for the year ending the 31st March, 1889, together with annual report on mining matters in the mining district under my charge.

Okarito.

The number of men at work in this district corresponds with that of last year. At Lake Mapourika and the Waiho River prospects are improving. At the latter place, below the Forks, three parties are on very good gold; others are sinking on the same line, but have not yet proved the continuance of the run. On the terraces on Cook's River a number of men have taken up claims and are busy opening out. Under ordinary circumstances the terraces on this river would profitably employ a large number of men, and would pay well; but the difficulties to be overcome in the shape of immense boulders and water often render what is known to be rich ground unremunerative. A party of prospectors were out for a short time at the head of the Waiho, and picked up some heavy gold; but spasmodic efforts of this kind will never reach the much-desired goal—viz., the reefs from which the Waiho gold is derived. This river and Cook's are the richest on the Coast, and should be carefully and systematically prospected above where the terrace-gold is found; but to succeed the effort must be well-directed and sustained.

Beach-mining.

Up to date thirty-five special claims for dredging purposes have been granted, covering an area of 1,076 acres, the cost of which, in survey-fees, grants, advertising, &c., amounts in round numbers to £705, and the rental for the first year to £269. Contrary to expectation, none of the claimholders have so far succeeded in placing a workable plant on their claims. The Okarito Gold-dredging Company were the first in the field with their machine; but, unfortunately, the Ball dredger imported from England for this beach, and from which so much was expected, proved too small as regards the pump, as well as deficient in power, and after about three months' unsatisfactory work the machine was condemned and the company went into liquidation. Subsequently the claims and plant were sold to the Five-mile Beach Dredging Company (Limited). This company has taken the precaution to satisfy themselves of the value of their claim by having the ground tested by a series of bores, the result of which, I hear, has been highly satisfactory, and it is understood that larger and more powerful machinery will shortly be set to work on their claim.

The Three-mile Beach.—The prospecting mentioned in my last year's report on this beach has been completed by Mr. Edward Brooke-Smith with most satisfactory results. Rich leads of gold have been found below the old worked ground, and the position and extent of the same have been determined. The grantees of the special claim on this beach are an English company—the New Zealand Beaches Company (Limited), who, having been satisfied as to the value of the ground, and having received evidence of the suitability of the Wellman dredge for the work to be done, have already ordered a large plant, which it is hoped will be in full work before the end of the year. The wisdom of a careful and systematic prospecting of beach claims before incurring the expense of costly machinery is well exemplified by the results of the work done on the Three-mile Beach. Large areas of some of the claims have been shown to be almost barren of gold, including portions where old residents predicted the likelihood of rich deposits being found, while in other parts the leads have been traced with such certainty that no doubt will exist as to the best place to commence operations and the best plan of working the ground: thus costly mistakes and disappointments will be avoided. Mr. Edward Brooke-Smith, the energetic representative of the New Zealand Beaches Company (Limited), is to be congratulated on the success that has attended his exhaustive tests of the company's claims. This being an English company, and the first investment of English capital on the Coast, the measure of success that will follow the working of the Wellman dredge on this claim will be looked forward to with great interest. I have every confidence that when fairly at work the result will be so satisfactory that further investments of English capital in this and cognate ventures on the Coast will follow. The Saltwater Beach-dredging Company are busy erecting a powerful Wellman dredge on their claim, the contract-price being £3,160. This machine is similar to the Wellman now successfully at work at Waipapa. Great delay has arisen in connection with landing the plant, &c., and it will be well on in June before the machine is started. A great many of the grantees on other beaches are waiting to see whether this machine will do the work. No doubt is entertained as to the capability of the machine to lift the sand, but doubts are freely expressed as to saving the gold. This, no doubt, is a matter of the first importance, but the difficulty is not insurmountable. I hope to see this machine in full work some time in June, when the question will be decided, and if successful other claimholders will follow suit with similar appliances. On other beaches prospecting is being carried on by boring; but, as none of the holes have been put down over 30ft., the question of payable gold at lower levels is still undecided.

Jackson's Bay.

No new discoveries have been reported during the year, and the men at work on the beaches and in the gullies are mostly working ground left in the earlier days, when gold was more easily obtained. Two special claims have been granted, to be worked by dredging machinery. The claims are being prospected by boring, previous to getting machinery. Nothing further has been done towards getting the 200 tons of nickeliferous sand to send Home, as suggested by Johnson, Matthey, and Co., of London; no one being willing to undertake the work at the price. I am still endeavouring to find the metal in the matrix in sufficient quantity to pay for crushing; but, although we find it in many of the mineral lodes of the Olivine Range, the matrix is too hard and the metal too finely disseminated to be payable. Mr. R. Paulin, of Dunedin, and party of four men have been for the last four months prospecting: they are now on the head-waters of the Arawata. I am not in a position to report as to their success or otherwise: they are well found in tools and provisions, and contemplate being out another five months. I trust Mr. Paulin will be amply rewarded for his persistent efforts to explore this block of country. This is his third year.

Roads and Tracks.

The unfinished state of the main road between Jackson's Bay and the Hollyford is a great inconvenience to settlers and a drawback to the district, and I trust the Government will see their way

to at once push on this most necessary work. Settlers have suffered severely from great floods—the heaviest we have seen since the settlement was founded. The enormous quantity of shingle and sand brought down by the flooded river has made travelling both difficult and dangerous; and the wholesale destruction of root-crops will bear very hard on the settlers this winter. It is therefore desirable that if any road-work is to be done it should be put in hand as soon as possible, so that the settlers may be able to supplement their scanty crops by their earnings at road-making.

COAL.

During the past year the valuable deposits of bituminous coal known to exist to the east and south of Arnot's Point, near the Haast, have commanded considerable attention, three prospecting areas having been applied for and granted. Since the grants were made a number of men have been employed in surface-prospecting, with gratifying results. Outcrops of from 5ft. to 10ft. seams have been uncovered, and several of the seams, even at the outcrop, show a first-class solid coal resting on great beds of fire-clay. Up to date only surface-prospecting has been done, but the results are so satisfactory that a more thorough and systematic examination by diamond-drill is desirable, not only in the immediate neighbourhood of the known outcrops, but of the country to south and west of Ship Creek. That a coalfield exists within the areas held is quite certain, and indications noted would therefore warrant further exploration at lower levels. A continuous series of disturbing causes is observable on the eastern or inland side of the coal-basin, traceable along the great anticline ridge that separates the coal-measures of the West Coast from the metamorphic rocks to the eastward, due to the intrusion of the serpentines and olivines of the Cascade Valley, and the granites of the Wakapohai and the Paringa and other points further north. At the points observed this disturbance has thrown the coal-measures up to an angle of 25°, with a westerly dip. On the coast-line, at Tauperekaka Point, an outburst of volcanic rock similar to that found near Dunedin, at Banks Peninsula, and at the Thames, but showing distinct columnar structure, occurs as an isolated patch, altering and tilting the measures to the eastward. However, this disturbance appears to be merely local, as at a short distance to the south we find the sandstones lying at an angle of 10° and dipping to the west, so that the further we go south and away from the influence of the volcanic rocks the more likely we are to find the coal in its normal position. It is therefore more than probable that the flat country lying between Jackson's Bay and Arnot's Point, covering an area of thirty miles long by an approximate width of seven miles, will prove on examination to be one vast coalfield. The present topographical features of the bight known as Open Bay are due principally to the grinding and disintegrating action of the six great ice-streams that issued during the ice-period from the rivers Haast and Landsborough, Okaio, Turnbull, Waiatoto, Arawata, and Cascade, and that here combined and formed one immense glacier, ploughing its way across this thirty miles of country composed mainly of the coal-rocks, and thence out to sea; with the result that what was originally a series of low rounded hills has been, with the exception of Mounts Mosquito and McLean, and other smaller mounds, converted into plains which, on the retreat of the glaciers, were subsequently covered with river-shingle and alluvium, three-fourths of which is now covered by magnificent forests of red- and white-pine (rimu and kahikatea) and other valuable timbers.

That so promising a field for commercial enterprise should remain unappropriated and neglected so long can be accounted for only by supposing that those in a position to undertake such ventures are ignorant of the wealth awaiting intelligently-directed effort. The development of this coalfield, together with the utilisation of the extensive and untouched forests on the seaboard, and the magnificent black-birch (*Fagus fusca*) forests with which the valley of the Arawata is timbered to an altitude of 1,000ft. and covering a distance of eighteen miles in length, should commend themselves to those looking for profitable investments. This forest is easily accessible, the timber is first-class Government timber of great size, and there is ample water-power available on the spot to convert the raw material into a marketable commodity. With a harbour like Jackson's Bay—the only natural harbour north of the Sounds—where vessels of any tonnage can come and go when they please without waiting for tugs or tides, and with an ever-increasing demand for coal and timber for export where it can be shipped in vessels of sufficient capacity, the wonder is that the advantages and wealth of this district have been so long overlooked.

I have, &c.,
D. MACFARLANE, Warden.

The Under-Secretary, Mines Department, Wellington.

No. 11.

Mr. Warden REVELL to the UNDER-SECRETARY of MINES.

SIR,— Warden's Office, Lawrence, 16th April, 1889.

I have the honour to furnish the following general report upon the portion of the Otago Mining District under my charge, together with the statistical returns for the past twelve months.

TUAPEKA SUB-DISTRICT.

Beginning with the Blue Spur claims, I have to report that in April, 1888, the Blue Spur and Gabriel's Gully Consolidated Gold-mining Company took possession of a portion of their ground included in the purchase, and paid 10 per cent. on the remaining portion, lying principally towards the back of the claim, at Munro's Gully, with a right of completing the purchase in twelve months, otherwise the ground to be forfeited: and in the meantime the owners could work the ground for their own benefit.

The Consolidated Company have been working the ground formerly occupied by the Tailings Company, opening up a regular face to the adjoining claims. The local directors appear to be in difficulties with the London board, and, so far, it is rather doubtful whether the Consolidated Company will carry on the working, or go into liquidation.

The other claims in Munro's Gully and Tuapeka Flat above its junction with Munro's Gully are making average wages. The several extended and ordinary claims held in Tuapeka Flat and Tuapeka West, on the banks of the river, are making fair wages, and in some instances good yields have been obtained.

At Wetherstones the miners, both European and Chinese, are mining on the Wetherstones Flat and up the gully towards the saddle crossing into Gabriel's, and are making average returns.

The Wetherstones Cement Gold-mining Company has been wound up, and the plant, machinery, and claim sold to pay off liabilities.

At Waitahuna there is nothing of importance to report. Five licensed holdings and gold-mining leases are in full work, and several extended claims held on the river flats and adjoining low terraces are yielding fair returns. Eight men's ground has been taken up recently by Arnold Sturm as an ordinary quartz claim; but the speculation is rather doubtful.

In the Beaumont district Messrs. Edie and Kirkpatrick have taken up a special claim of twenty-eight acres on the south-west side of the Clutha River. They have constructed a head-race from the Tallowburn, three miles in length, and crossed the Clutha River by fluming, at a cost of £1,500. They are now bringing up a tail-race to work their claim, which, from the favourable prospects already obtained, promises good returns.

On the Clutha River there has been only one ordinary dredge, owned by Cowan and party; but it has not been regularly worked for the last three or four months. The four special claims taken up on the river, and held respectively by the Austral Company, Mr. Brown, Mr. Woods, and Mr. Tockel over twelve months, have been standing in abeyance awaiting the definite results of the working of Wellman's dredge. I believe it is the intention of one or two of the owners to abandon their interests therein.

Waipori Sub-district.

The population is estimated at four hundred. There have been four applications for licensed holdings on quartz-reef and eight special claims on alluvial ground. Of these, five special claims (containing 534 acres) and two licensed holdings have been granted. The others are under consideration or awaiting the Mining Surveyor's report. Mr. Hazlett, who held a special claim of 1,500 acres on the Waipori Flat for one year, which expired in the beginning of March, has taken up one of these special claims, containing 300 acres, immediately below the Waipori Township, and purposes working the ground with a steam-dredge. Pearse and party have a claim on Jutland Flat, and are preparing ground for the erection of steam-power and an elevator to work their claim.

Mining is gradually extending towards the Lammerlaw, to the north-west of Waipori, and also at Post-office Creek, situate at the lower end of Waipori Flat, about seven miles to the south-east of the township.

The Canton Reef has been taken up by Eaton and party, who have erected a large wheel for pumping, and intend to start mining when they have sunk about 64 feet, of which 56 feet have already been put down. From the prospects previously obtained good returns are expected.

The Lammerlaw Antimony Company took up fifty-nine acres on the Lammerlaw, which had already been prospected. The local company have accepted an offer from a Home syndicate, but so recently that the full particulars have not come to hand as yet. Mr. James Campbell has been granted a mineral license to search over 320 acres adjoining the above company's license for twelve months from September, 1888.

At the Canada Reef, Murphy, Gillon, and Thompson worked an ordinary quartz claim for some time, but in consequence of the ground not turning out as expected they have been compelled to abandon their claim. The crushing machinery has been sold, and removed to the Nenthorn district. Messrs. Kerr and McLean hold a licensed holding over 16 acres in the same locality, but so far they have done very little work therein.

At Adam's Flat a few Europeans and Chinese are engaged in mining operations when water is obtainable, and on the south branch of the Tokomairiro River and at Glenore there are only a few claims at work, making small wages.

Tapanui Sub-district.

Only thirteen miners' rights were issued during the past twelve months. The principal mining centres are at Waikaka and Scrubby Terrace. Mr. Thomas Ritchie has a special claim of 180 acres in the former locality, which is being prospected with the intention of putting up a steam-dredge or otherwise applying machinery to work the ground.

In February last, the Pomahaka River being very low, some seven or eight miners started working, and made from £3 to £6 per week for about three or four weeks, when the river rose and they were obliged to desist.

Gold in small quantities has been found in several places throughout the district, but, being situate on private property, the owners will not permit the miners to work thereon without paying a weekly fee, and then only in certain places.

Waikaia Sub-district.

Mining operations continue about the same as reported last year. Two special claims have been granted during the year. The one immediately below the township has done no work, and is awaiting heavy steam-power to prove the ground. That on the Winding Creek has recently begun to work, but the results are not yet known.

The extended claims held in Welshman's, Moffat's, and adjoining gullies are being worked with good results. The claims held on Hospital Hill just above the township by Europeans and Chinese are yielding a very good return.

At the Upper Waikaia a few claims are being worked with good results, but there are other claims which are only yielding bare wages.

At the Nokomai there has been rather a falling-off in mining. A great portion of the ground has been deserted. The principal claims are now held by Europeans in Paddy's Gully, whilst the Chinese are employed on the river flats.

The Waikawa mining district has been transferred to the charge of Mr. Warden McCulloch, at Invercargill.

GENERAL.

It will be necessary to make some amendments in the Mining Act as regards the number of men to be employed on special claims and licensed holdings, for the new methods and improvements in mining and machinery are being gradually adopted, and consequently larger areas will be taken up.

Sittings of the Resident Magistrate's Court have been held weekly at Lawrence, fortnightly at Milton and Gore, and monthly at Balclutha, Tapanui, and Waikaia, and on alternate months at Clinton and Kaitangata.

The yield of gold for the Tuapeka district is estimated at 12,086oz.; Tapanui, 650oz.; and Waikaia, 2,000oz.

The attached returns show the number of miners' rights, licenses, registrations, &c., issued during the twelve months, together with the number of cases disposed of at the several Courts, and the estimated population of the district.

I have, &c.,
W. H. REVELL, Warden.

The Under-Secretary, Mines Department, Wellington.

RETURN showing the Number of Miners' Rights, Licenses, and Registrations issued during the Year ending 31st March, 1889.

Nature of Right issued.	Tuapeka.	Tapanui.	Waikaia.	Total.
Miners' rights...	894	13	321	1,228
Consolidated miners' rights	...	...	2	2
Business licenses, at £3	1	...	2	3
" £1 10s.	...	...	1	1
Water-race licenses, at 5s.	55	1	25	81
" 2s. 11d.	88	2	39	129
Registrations, at 20s.	2	...	...	2
" 10s.	30	...	...	30
" 5s.	9	...	...	9
" 1s.	401	4	223	628
Applications for licensed holdings	5	...	...	5
Licensed holdings granted	2	...	...	2
Applications for special claims	9	1	1	11
Special claims granted	5	1	1	7
Applications for mineral licenses	...	...	...	...
Mineral licenses granted	...	...	...	...
Applications for occupation-licenses	3	...	1	4
Occupation-licenses granted	...	...	...	...
Mining applications	280	...	196	476

RETURN showing the Revenue collected for the Year ending 31st March, 1889.

	£	s.	d.
Warden's department	1,105	0	0
Rent under deferred payments...	755	18	8
Resident Magistrate's Court (goldfields)	321	9	0
" " (outside goldfields)	489	7	6
Licensing fees	59	19	0
Total	£2,731	14	2

RETURN of Cases in the Resident Magistrates' and Warden's Courts for the Twelve Months ending 31st March, 1889.

Courts.	Civil Cases.	Criminal Cases.	Warden's.	Totals.	Revenue.		
					£	s.	d.
Lawrence	113	91	13	217	200	8	0
Tapanui	108	53	...	161	109	7	0
Waikaia	56	28	10	94	62	6	0
Outside Goldfields—							
Milton	106	31	...	137	91	18	0
Kaitangata	9	37	...	46	18	16	0
Balclutha	103	24	...	127	98	3	0
Clinton	42	43	...	85	44	10	6
Gore	297	59	...	356	263	16	0
Mataura	...	13	...	13	4	8	0
Total	834	379	23	1,236	893	12	6

The population of the district is estimated at 22,448 souls, who are located as follows:—

—	European.	Chinese.	Total.
Tuapeka	3,750	400	4,150
Waipori	270	130	400
Waitahuna	1,100	100	1,200
Waikaia	1,013	180	1,193
Milton district	4,440	40	4,480
Kaitangata	960	3	963
Balclutha	890	...	890
Balclutha district	1,817	20	1,837
Clinton	1,561	...	1,561
Gore and Gordon	1,550	10	1,560
Gore district	1,630	60	1,690
Mataura district	2,500	24	2,524
Grand totals	21,481	967	22,448

No. 12.

Mr. Warden Hickson to the Under-Secretary of Mines.

Sir,— Warden's Office, Clyde, 17th May, 1889.

I have the honour to submit the following report on the Dunstan and Wakatipu goldfields districts under my charge for the year ending 31st March, 1889, together with the usual statistical returns for the same period.

Clyde and Alexandra.—Nothing in ordinary mining matters has occurred here during the last year to warrant any special notice. About the same number of men are employed as last year in this pursuit, a few of whom are doing well, while the balance may be set down as earning from £2 to £3 per week.

I have not the slightest doubt but that the alluvial deposits in this locality are quite as rich in gold as those in many other parts of my district, but there seems to be a lack of energy among the holders of water-races, combined with a persistent inclination to adhere to the primitive methods of working this ground, instead of a desire to utilise the modern appliances so successfully adopted by their neighbours. The time, however, must come when a very much larger mining-population will be profitably employed here.

Dredging.—At the time of my last report there were one steam- and three current-wheel dredges at work in the Molyneux between Clyde and Alexandra. Since then, however, the number has been reduced to two current-wheels, the Dunedin Gold-dredging Company having removed its properties to Coal Creek, about twenty-five miles lower down the river; the remaining two seem to be constantly working, with, I am given to understand, profitable results.

I am sorry to state that the Wellman Dredger, upon which, to some extent, the immediate future prosperity of the district depended, sank at her moorings in the Manuherikia River during the floods of last spring; fortunately, however, not before sufficient work had been done to prove that the machinery was capable of doing all that the patentee, Mr. Wellman, claimed for it. Several unsuccessful efforts were made to lift her again, but the continual swollen state of the river, together with the absence of suitable appliances, proved insuperable obstacles, and she still remains submerged.

Bald Hill Flat.—From twenty to thirty miners are engaged here, and, although nothing sensational has been discovered during the past year, all have succeeded in making fair wages.

Roxburgh.—There is more genuine activity showing here at present than has been seen in this locality for many years past. Since my last report two large companies have been floated—namely, the United Hercules Hydraulic Sluicing and the Roxburgh Gold-mining Companies. The former company is now erecting a plant, upon the most-approved principle, to sluice the bank of the River Molyneux at Hercules Flat, about a mile lower down than the Town of Roxburgh, on the eastern side. This ground has already been proved to be payable while worked by the ordinary methods, and it is therefore expected that extraordinary results will accrue from the introduction of the new and costly plant now nearly completed.

The Roxburgh Gold-mining Company has secured a special claim of ninety acres on the east side of the river opposite Roxburgh, but, before commencing sluicing operations, I believe it is intended to construct their dam or reservoir at the Dismal Swamp. This is a large undertaking, and will cost a considerable amount of money, as the area proposed to be covered by water, ranging up to 20ft. deep, is 1,500 acres. If the undertaking is successfully carried out, however, the conservation of such a large body of water cannot fail to be of immeasurable benefit, not only to the company immediately interested, but to all the race-holders of the Teviot Stream, who, thereby, will be enabled to command a full supply to their races at all times of the year.

The same number of river-bank claims are still at work as when I reported last year. Several of the holders of extended claims have surrendered their certificates in favour of licensed holdings. All appear to be doing well, and there is an air of prosperity and enterprise about the whole place pleasing and satisfactory to look upon.

Horse-shoe Bend.—Since my last report an English company has been formed to work the ground known as the Island Block, a freehold owned by Mr. Joseph Clarke: two special claims

have also been secured by the company, one at each end of the block. About a hundred men are now employed in bringing in water and otherwise making preparations for sluicing operations on the hydraulic principle. I do not know anything of the gold-bearing qualities of the ground proposed to be sluiced away, but as agricultural land I believe its value can be no more than equalled in Otago. Some prospecting has been done, however, and I presume the company must be well satisfied with the result, judging by the large amount of money now being expended.

Dredging.—There are seven dredges upon the river in this district, six of which number are in active operation, while the seventh is the Dunedin Gold-dredging Company's steam-dredge, lately removed from the vicinity of Alexandra, and now being reconstructed with a view to commencing work at Coal Creek. From reports, I believe that this class of mining still continues to give satisfactory returns for the capital and labour expended.

Cromwell.—The condition of mining matters in this portion of my district has not varied materially during the past year, and, although no appreciable advancement has been made, it is satisfactory to note that no serious retrogression has to be reported.

Bannockburn.—This place continues to be the most important centre of operations. Miners are steadily and, it is believed, remuneratively employed. The Pipeclay Channel is proving beneficial to a considerable number of sluicers, and in this manner is giving some return for the large amount of money spent upon it.

Nevis.—Operations here continue almost without any alteration. Some little stir was made early last spring in the way of more fully developing portions of the district, which has been so neglected for years past. It is the opinion of most of the old residents that there is a very large tract of country in the Nevis Valley which would give splendid returns on capital invested for introducing some of the more modern appliances, and I think it is probable that ere long something definite may be done in this direction.

Kawarau.—The banks of the river towards the Kirtleburn, including the latter, are being worked with success, some Chinese on the Kirtleburn having obtained more than ordinarily good returns.

Mount Criffel and Fat Boy's.—Accounts from both these localities are somewhat vague and conflicting. At the first-named, water has been brought on the ground by Craig and party and Halliday and party, but not in quantities at all commensurate with the requirements of the place, and, as a consequence, the price charged for it is exceedingly high. The yields from some of the claims are stated to be very satisfactory. At Fat Boy's the Eldorado Company is carrying out its prospecting, in the face of many difficulties, with considerable energy, and great hopes are still entertained of the results of its operations. Talboys and party have expended a considerable sum of money in testing their ground by means of boring-rods, and fairly good prospects were found in one or two seams, at a depth up to 90ft. The continuance of these operations, however, was found to entail a greater cost than could be borne by a small party, and they have reluctantly ceased operations pending further developments by the Eldorado Company.

Lindis.—An increase in the number of miners in this locality has taken place during the year, but the actual results of the workings have not reached me.

Quartz Reef Point.—The terraces and adjacent gullies here keep up a fair yield, the miners all appearing to be in most comfortable circumstances, the majority having good residences.

Wakatipu.

General.—Although there is very little of importance to report with reference to this division of the goldfields under my charge, I am glad to be able to state that there is a considerable amount of activity displayed in the various mining localities embraced therein, the business of the offices at Queenstown and Arrowtown having greatly increased: nearly twice as many applications for mining privileges were lodged than has been the case for many years past. The revenue for the year too has also substantially increased.

Moke.—This district is in exactly the same position with regard to mining matters as reported last year, with the exception that one party are prospecting Moke Flat by means of the boring-rods and apparatus hired from the County Council. As yet, I am sorry to say, their efforts have been unsuccessful.

Lower Shotover.—The claims in this locality have been taken up principally for dredging. Only one dredge, however, has been placed here as yet, the returns from which are very encouraging.

Arrowtown.—Alluvial miners here generally are doing well, but no important finds have been made during the past year. The Last Chance Company tried to bottom its river claim, but were compelled to desist, the water being too much for them. The company is now about to bring in a tunnel tail-race of nearly a mile in length, which will, when completed, it is supposed, drain their claim. Messrs. Davis and Moodie are here, as at Upper Shotover, doing extensive works. They are now driving a tunnel, some 600 yards long, to drain the river, so as to work a portion of the bed.

Gibbston.—The old Kawarau River-diversion Company's special-claim grant and tunnel certificate have been cancelled, but the privileges have been applied for by and granted to another party, and I hope to have something to report about this venture in my next.

Cardrona.—Mining has been very brisk in this district during the past year, and a large quantity of gold has been obtained, one party alone having netted £1,000 per man for this year's work.

The want of water is a great drawback to extensive operations in this locality. Some races are about to be constructed, however, and when these are completed the present population of miners—viz., 140—will be nearly doubled.

Quartz.

Obelisk Range.—White's Reef continues to produce payable stone. During the year 800 tons has been crushed, yielding 799oz. of retorted gold, valued at £3 17s. 10d. per ounce, out of the proceeds of which the company declared dividends amounting to £1,000.

A considerable amount of prospecting has been done about this locality, and two or three licensed holdings have been taken up; but sufficient time has not elapsed to prove the nature of the finds.

The prospecting claim of Crossan and Gavan, about a mile to the east of, and upon the same line as, White's Reef, shows excellent stone. This property, which is equal to anything here, has been badly worked from the time it was first pegged. It is a pity to see property of this description in the hands of inexperienced men.

Carrick Range.—But little activity is noticeable here. A special claim, embracing the ground formerly held by the Star of the East and the Elizabeth Companies, has been granted, and prospecting is being carried on, but with what result I have not been able to ascertain. Lawrence and party are getting good payable stone from the line of reef formerly held by the Caledonian Company; and on the same line Watson and Ridland are getting good prospects, and have erected a small crushing-plant.

Bendigo.—The only claim in active operation here is that of the New Cromwell Company, upon which a shaft has been sunk to a depth of 320ft. I believe it is the intention of the company to reach a depth of 600ft. The work has been attended with many difficulties, and is being carried out in a most permanent and workmanlike manner.

Skipper's.—Quartz-mining in this part of the district is at present at a very low ebb. The collapse of the Phœnix Extended and Maori Point Gold-mining Companies has caused this branch of mining to be viewed with distrust. At the Phœnix Mine prospecting is being actively carried on, the enterprising owner, Mr. G. F. Bullen, having purchased the Phœnix Extended Company's ground. The Gallant Tipperary is at present the only paying mine in this locality, the company having just declared a small dividend. The Cornubia is a promising reef, but will take some time to develop.

Lake Wakatipu.—The Invincible Mine is now being worked on tribute, the tributers doing well. During the year 1,361 tons of quartz was crushed, yielding 500oz. of retorted gold.

Macetown.—The only company now in actual work is the Sunrise Lease Gold-mining Company, composed of a party of local people. The stone obtained from this lode has yielded 1oz. to the ton.

AGRICULTURAL.

The farmers throughout the whole of my district have every reason to be gratified with their crops this year, the yields in all cases having been better than for many years past.

I have, &c.,
JAMES HICKSON, Warden.

The Under-Secretary, Mines Department, Wellington.

No. 13.

Mr. Warden WOOD to the UNDER-SECRETARY of MINES.

SIR,— Warden's Office, Naseby, 17th May, 1889.

I have the honour to forward herewith the usual statistical returns for the Mount Ida District for the year ending the 31st March last.

NASEBY AND KYEBURN.

In these subdivisions there is nothing fresh to record. The former, which is in a great measure dependent for its water-supply on the Mount Ida Water Trusts Race, suffers severely from damage to the race, which happened through a flood on the 11th August last, and no water was available for two of the best months in the year. If it had not been for this accident the past year would have been the best for many years back, the late spring keeping up the supply of water well into January. From that time up to the end of March water was very slack, and little was doing. Spec. Gully has hardly come up to expectations, but returns fair wages after paying for water.

HAMILTON'S AND SOWBURN.

From these subdivisions there is no change either in population or results. The Rescue Company, formed to work the tailings at Hamilton's, have constructed a large tail-race, and will commence work now water is available.

SERPENTINE.

The Golden Gully Company has done a good deal of work, but much of it has been in the nature of prospecting. Their crushings have been a disappointment, as they crushed a lot of casing, &c., that they thought would more than pay expenses. This was doubtless a mistake. I hope, however, that better times are coming for them, as the manager informs me that, besides the main pass to the shaft, which is up over 40ft., they have two other rises from the low level, both up about 40ft.; that it is a fair-sized reef, showing gold; and that if they had a battery of their own on the ground and could commence crushing in earnest, there are years of remunerative work before the company from stone which is in sight.

HYDE AND MACRAE'S.

From the former place there is nothing fresh to report. There was some prospecting last winter in the locality of the Fillyburn, where good gold had formerly been obtained; but the rich reefs of Nenthorn attracted away the population. The Mareburn or Mount Highlay Reef has been floated into a company, and a head-race three miles long, capable of carrying three Government heads of water, has been constructed. The machinery, consisting of a ten-head battery, to be driven by a

Pelton water-wheel, vertical pressure 275ft., is all on the ground and half erected, and they expect to commence crushing by the middle of June. The mine is connected with the battery by an aerial tramway across the Mareburn. As the ground is easily worked, this company should soon be on the dividend-paying list.

Nenthorn.

This is a new discovery since my last report. In November last McMillan and party reported that they had discovered a quartz reef at the head of Nenthorn Creek, about eight miles south-west of Macrae's Township, and considerable prospecting was undertaken by a party of seventeen persons, formed in Naseby, the result being that several reefs were discovered in the locality, some proving very rich. A number of licensed holdings were applied for, and sixteen granted, at the last quarterly sittings of the Warden's Court at Macrae's, on the 26th March last. The richest of these is the Crœsus Company, on which more prospecting has been done than on any of the others taken up about the same time. This company are erecting a ten-head battery to crush the stone from their own mine, to be driven by water-power, and hope to commence crushing about the second week in June. They are working three shifts getting out stone, and have over 100 tons at grass. The reef is over 2ft. wide, and shows very rich stone. The Victoria Company, which has lately been registered, have also a valuable property. They sent over to the School of Mines, Ballarat, for reduction, 2 tons 15cwt. of stone, taken 12ft. to 15ft. below the surface, which turned out 2oz. 19dwt. 14gr. per ton. The gold is reported by Professor Smith, of the school, to be of very good quality, equal to 21½ carat. The stone is said to have been taken fairly out, and not picked, so that the prospects of the company may be said to be very satisfactory. After paying all expense of cartage, railage, shipping, freight, and charges for crushing at Ballarat, there was a net profit of over £12. There are three shafts down about 30ft. on the line of reef, the last showing more gold in the stone than previously obtained. The reef is 2ft. thick at the 30ft. level. There is a second line of reef running through the property, but it has not been prospected to any depth. These reefs are about 4 chains apart. The prospectors, McMillan and party, were the first to try a test-crushing at Kincaid and McQueen's battery, in Dunedin, which I understand gave a return of nearly 3oz. to the ton. The Nenthorn Consolidated Company also sent two or three tons to Melbourne, which was reduced at the Footscray Works, with a result of from 2oz. to 3oz. per ton. A Dunedin syndicate have proposed to the mine-owners to erect a thirty-head battery, to be driven by electric power, generated at the Taieri River and conducted about twelve miles by wire to the battery, and crush at 12s. per ton. If this is successful—which electrical engineers think it should be—the success of the Nenthorn is established. I hear from good authorities that Nenthorn should rival the Thames for rich reefs. In the first week in April a fresh reef was discovered about two miles south of the Crœsus Company's holding. The richest claim on this is the Eureka, in the prospects from which they are getting very rich stone.

St. Bathan's.

Matters here are pretty much in the same state as when I last reported. The new main tailings-channel is not yet completed, but getting well on towards being sufficiently advanced to be made use of. It is considered that in another year the claims will begin to benefit by the increased fall obtainable. The first gold obtained—about 70oz.—was got this year, and it is expected that from this out the gold obtained will at least pay expenses. A dissolution of the Dunstan Creek Water-race Company's partnership has taken place, and the property was purchased by the United M. and E. Company, adjoining claimholders, at £2,200. The best ground of both these companies, as of all the claimholders in St. Bathan's Basin, has been worked to the level of existing outlets; but rich returns are expected when the new channel admits, as it will do, of tail-races being worked 70ft. deeper. Mr. John Ewing, who has been elevating for the past two years from a depth of 20ft., is now putting down an elevator to raise 57ft. A bargain for the supply of elevators to do this with a pressure of 440ft., and raise at the same time along with the gravel a quantity of water equal to that discharged by the elevating-nozzle, has been made by Mr. Ewing with Mr. Charles Robertson, the patentee of Robertson's patent atmospheric nozzle. By this invention, it is asserted, 30 per cent. more work can be done than by the ordinary "Perry" elevator now in use. Mr. Ewing appears to be the first to give the invention a trial. On the Muddy Creek section of these diggings, on which, pending the construction of the St. Bathan's Channel, the greater portion of the water-supply of the place is used, great bodies of alluvium continue to be sluiced down the Muddy Creek Channel into the Manuherikia, by the Scandinavian Water-race Company, the United M. and E. and the Otago Companies, as well as by a number of small parties of miners. I am assured that the ground washed away by the above companies does not average 1gr. per cubic yard. This has to be carried three miles, through a channel having a fall of only 1 in 60, to the Manuherikia River, and yet a profit which gives fair interest on capital invested is made; but only the best appliances, and strictly economical management by managers who know what they are about, will do it. The Scandinavian Water-race Company during the year paid dividends amounting to £4 8s. on each £50 share.

Cambrian's and Vinegar Hill.

The former has still a few parties at work, making small wages. Vinegar Flat is giving from fair to exceedingly good returns to a number of parties of working miners, the best being those obtained by Watson, Thomas, and Co., whose ground is said to be yielding at the rate of 1,200oz. per acre. The party consists of only three men. The ground, being in a stony flat, is not gone over quickly; still, they are making £10 per week per man employed, and the ground is likely to last for many years. On Vinegar Hill Hughes and Morgan, whose phenomenal returns in proportion to capital and labour employed have been recorded in former reports, are said to have been working ground as rich as ever they did. They are just on the point of cleaning up after running nearly a year. Mr. J. Ewing, on the north slope of the hill, is still obtaining good returns from very poor

ground by wholesale and systematic treatment. He has to deal in the course of his work with particularly intractable formation, but manages, by ingenious manipulation with the best appliances, to get over a surprising amount of very deep ground. He is putting down on this holding a new elevating-plant, to lift from a greater depth than hitherto—28ft. This is also to be fitted with Robertson's patent atmospheric nozzle, by the aid of which, under a pressure of 290ft., 160in. of water in the ejector-nozzle is guaranteed to lift 240in. used in the face. Mr. Ewing has also had erected an electric-lighting plant for night-work, which is continuous during most of the year. It is greatly to be wondered at that electric lighting in hydraulic mining is not more common, as in it night-work is the rule. The cost of the plant is a bagatelle in comparison with the gain from the workmen seeing what they are about, and being able to direct their jets with as much accuracy as by day. The cost of Mr. Ewing's plant is little over £100 for a 2,000-candle arc-light. The quantity of water required to run it at a pressure of 200ft. is so small that it is discharged through a $\frac{3}{8}$in. nozzle—it amounts to about one-eighth of a Government head. With such material as he has to deal with, Mr. Ewing estimates that the new light will enable him to do double the work at night.

Tinker's.

I have to report, as usual, good returns from all the companies carrying on operations here. Messrs. Sims and Morgan, for eight months' work on the auriferous "granite-wash," as the miners call it, obtained a profit after payment of all expenses, working a face of fine drift 180ft. high. The Mountain-race Company, working what they thought to be very poor ground, had a profit of over £1,000; the Undaunted Company, about £2,000; and the Sugar-pot Company, £1,000. The Matakanui Company, a working copartnership of seven men, obtained 400oz., and a number of smaller parties equally good results. Mr. John Ewing, of St. Bathan's, has a large water-race from Thompson's Creek nearly completed, and has during the year purchased a valuable additional water-right—that of the Rise and Shine Company at Bendigo Gully. His race will be the highest at Tinker's, and will give 500ft. pressure. A special claim of sixty acres has been applied for by him, comprising ground that should be highly remunerative with the supply of water and appliances he is bringing to bear on it. Mr. Ewing has had thirty to forty men employed on the work during the last six months. His water-race is taken across country probably the most difficult any water-race has yet been constructed through in the colony. No fluming is used, the race being blasted out of the solid rock, and carried across hollows on masonry. The race is three miles long, and of that the difficult country is two miles. This portion will cost nearly £2,000 per mile. To convey the water from the race to the ground to be operated on, 18in. steel pipes are being manufactured by Sparrow and Co., Dunedin. The race is constructed to carry twenty Government heads. The whole of the Tinker's mining properties have been put under offer to Mr. Vincent Pyke, M.H.R., at prices which aggregate £99,000. I understand this has been done at the instance of that gentleman, with a view to placing them on the London market. There can be little doubt but that this would be a payable venture if not too heavily loaded; but it seems to me almost a pity that a prosperous community like Tinker's should have two-thirds of its workers turned adrift and its homes broken up to give place to an English company with its manager and a few hired men, even if the vendors get considerably more than their properties are worth in the local market. Any company purchasing the properties would have to look for its profit to employing larger streams of water than are used at present, and working them with fewer men. This could undoubtedly be done with great advantage to the company itself, but not to the district.

Ophir and Black's.

I reported last year that a company to work an auriferous deposit here had been floated under the name of the "Green's Reef and Seam Workings Company." This company has not so far been successful. It has had little over a year's existence, but now appears, from what I hear, to be on the eve of entering upon the last scene of its existence, though rapidly achieved, and so common in the history of gold-mining companies—winding up. It has all but spent its capital, and in doing so has given considerable employment in the district, has brought together an incongruous collection (for the purposes intended) of useless machinery, has treated for the extraction of gold in a more or less unscientific manner some hundreds of tons of rock and earth, but has so far failed to extract anything approaching what will pay, as the total result of the year's operations is under 5oz. of gold. The methods employed for extraction have been very faulty; but that could be remedied: the chief trouble is that the deposit represented to contain payable gold has been found not to do so.

A company—the Ophir Water-supply and Gold-mining Company—has been recently floated the object of which is stated to be to bring in a large water-supply from the Manuherikia River at a point a short distance below the crossing of the main road, Naseby to St. Bathan's, along the western slope of the Blackstone Hill, and across the Poolburn Gorge to Ophir, to work Ophir Flat and the auriferous spurs and terraces above it. The race is to be some thirty miles long, is to carry about thirty-five Government heads of water, and is to deliver its supply about 300ft. in vertical height above the flat. The capital of the company is £10,000; but out of this the promoters take £4,000, leaving only £6,000 for work. The capital of this company seems to be far too small for the enterprise.

Blackstone Hill and Rough Ridge.

It is difficult to get information regarding the few small parties of miners working in isolated localities around Blackstone Hill; but most of them are supposed to be doing fairly well. At Rough Ridge the Great Eastern Company has been the only one crushing during the year. It has obtained fair returns. The property has recently been handed over to a London syndicate that has purchased this mine and the other mines on the Ridge, and ere long it is expected that operations on a large scale to develop the mines and to erect powerful machinery of the most ap-

proved type to crush the quartz and extract the gold (a great portion of which is known, under the present manner of treatment, to be lost) will be erected. It is greatly to be desired that, for the credit of the district, this company, which is said to have given a very large sum for the properties, may be able to make the venture pay. I have, &c.,

J. Nugent Wood, Warden.

The Under-Secretary, Mines Department, Wellington.

Return of Miners' Rights, Licenses, Registrations, &c., issued during the Year ending the 31st March, 1889.

—	Naseby.	Black's.
Miners' rights, at 5s.	891	
Business licenses, at £1 10s.	4	
" " £3	1	
Water licenses, at 5s.	79	
" " 2s. 6d.	305	No particulars to hand.
Registrations, at 10s.	2	
" 1s.	598	
Machine-site, at £1	1	
Licensed holdings granted	24	
Special claims granted	2	
Mining privileges applied for	*385	115

* This number does not include 215 applications for Maerewhenua—making a total for the Mount Ida District of 600.

Return showing Revenue collected in Warden's Department.

	£	s.	d.
Warden's department (including Black's)	1,306	6	7
Deferred payments, Naseby	984	10	4
Agricultural leases, Naseby	120	11	8
Mineral leases	5	0	0
Mining surveys	645	6	0
Total	£3,061	14	7

No. 14.

Mr. Warden Stratford to the Under-Secretary of Mines.

Sir,— Oamaru, 1st May, 1889.

I have the honour to forward herewith statistical returns for the Marewhenua Mining District for the year ending the 31st March ultimo, and to report that the mining population maintains its usual average.

The Pioneer Water-race during the past year has been reconstructed, at a cost of at least £1,500, to bring an extra supply of about six heads of water, which will prove very acceptable on an alluvial diggings, where so much depends on the water-supply.

Mr. Henry Howe, one of the pioneers of this field, has constructed an immense reservoir to keep the surrounding claims working when water becomes scarce in the creeks. The principal *modus operandi* is sluicing, but some few are driving.

I will conclude by stating that it has been proved long since that there is an extensive field of alluvial wash quite payable as wages-ground at Maerewhenua, and room for at least three hundred instead of seventy men—the latter being the present population—if only a race were constructed from the Otakaiki to bring in about twenty to twenty-five heads of water, the reserves thrown open for mining, and the creeks running into the Waitaki proclaimed outlets for tailings. I have no doubt that private enterprise would find the money to bring the water to the field if the Government would remove the obstacles alluded to. The miners here are a quiet, orderly people—mostly married men with families, who keep cows, grow vegetables, and are altogether desirable settlers.

I have, &c.,

The Under-Secretary, Mines Department, Wellington. H. A. Stratford, Warden.

No. 15.

Mr. Warden Carew to the Under-Secretary of Mines.

Sir,— Warden's Office, Dunedin, 3rd May, 1889.

I have the honour to forward herewith the annual returns for the Hindon subdivision of the Otago Mining District for the year ended the 31st March, 1889.

In doing so I regret to say that the hopes entertained at the date of the last annual report of an early change for the better in the mining prospects of the district have not as yet been realised. The company recently formed with Melbourne capital for the development of the quartz lodes in the district, and who have taken up a large area of ground, have not yet commenced crushing. Their machinery, however, is in a forward state, and it is expected that a thorough trial will soon

be made. Pending the starting of the company's batteries, only a comparatively small quantity of stone has been crushed during the year at the battery formerly owned by Lyders and party, but now the property of the new company. Approximately the amount put through is 200 tons, yielding an average of 8dwt. of gold to the ton. It is the firm conviction of the promoters of the company that the results of their operations will prove in every respect satisfactory.

The alluvial deposits in the district still afford remunerative employment for a varying number of miners acquainted with the locality.

Nothing further has been done towards the proper testing of the antimony reef referred to in the report of last year.

The agriculturists in the district have perhaps fared better than during the previous year, although they have much to contend with in consequence of the rather bleak situation of a great portion of the land and the somewhat inferior quality of the soil.

The total present population of the district is estimated at a little over three hundred.

I have, &c.,

The Under-Secretary, Mines Department, Wellington. E. H. Carew, Warden.

No. 16.

Mr. Warden McCulloch to the Under-Secretary of Mines.

Sir,— Resident Magistrate's Office, Invercargill, 3rd May, 1889.

I have the honour to forward herewith the usual statistical returns for the district of Orepuki and Longwood, and to submit the following report on mining matters in the sub-districts under my charge for the year ending the 31st March, 1889 :—

Orepuki.

These, I believe, are the oldest workings in this part of the district. The original workings were on beach-deposits, but the run of gold, extending inland, was followed up, and the workings have proved of a permanent nature. Of late years the miners have combined mining with farming and grazing pursuits, with the result that the community is a fairly prosperous one, and for the most part attached to the locality. There is little difference in the yield of gold from year to year, and there have been no changes, as far as I am aware, during the past year, to call for notice. There are about a hundred and thirty miners (all Europeans) in this division of the district.

Roundhill.

As far as I can ascertain, the yield of this locality still keeps up to the average of former years, and I believe the yield of gold generally from Orepuki and Roundhill has not varied materially for the last eight or ten years. In the opinion of practical miners, the ground already worked is but a fair sample of the general character of the surrounding district; but the progress of the field has been retarded by scarcity of water and by want of fall. The first of these causes will no doubt be greatly obviated by the bringing-in of Berndson's and Port's races, with some thirty-five or forty Government heads; and the necessary rights have been acquired, and a company, as I am informed, is in course of formation, for the purpose of bringing up a main sludge-channel to the workings at Roundhill, which will do away in a great measure with the complaint of want of fall.

The registered rights in this neighbourhood are getting very numerous and complicated, which in a great measure accounts for the number of mining disputes adjudicated on during the year.

Longwood.

On this subdivision there are not now more than a dozen miners at work (with the exception of those recently employed on the races mentioned above) in spite of the very encouraging prospects that have been obtained through a long series of years. I am glad, however, to report that during the past year a company styled the Longwood Sluicing Company has been formed, with a capital of £1,000, for the purpose of sluicing a portion of the abandoned quartz leases at Longwood, which caused some excitement and expenditure of money in 1880. This company are now engaged in bringing water from Cascade Creek, in connection with Berndson's water-race, at a considerable expense. As soon as they have got the water in, I understand the company will commence sluicing the old lease known as Printz's or the Longwood Reefing Company's Claim, out of which some 200oz. of gold was taken in 1880, and which was then abandoned. This is a sure way of testing this part of the district, which has long been supposed to be highly auriferous; and it is confidently hoped that the company will meet with the success it deserves.

Waipapa.

This sub-district commences about fifty miles to the eastward of Orepuki and Longwood, and in it I include the area lying between Fortrose, at the mouth of the Mataura, and Waikawa, bounded on the north by a line parallel to and one mile distant from high-water mark (as described in the *New Zealand Gazette*, 1888, page 674).

The Waipapa Creek Gold-mining Company have got their dredging machinery (Wellman's) in full operation, and it is working very satisfactorily. The returns up to this time are, I understand, just covering expenses, as the machine is still running through old worked ground left by a rush from Invercargill to the Waipapa Creek some years ago. In a few days more, when maiden ground is reached, good returns are confidently expected.

I have not forwarded a set of statistical returns for this subdivision, as I had intended, mining operations here (excepting the Wellman dredger) being so unimportant, but I mention, in case it may be required for statistical purposes, that the style of the company is "The Waipapa Creek Company," registered under "The Companies Act, 1882;" total amount of capital paid up, £5,000;

number of men employed, fifteen, besides those engaged cutting wood for the engine; and the engine is twenty-horse power, employed in driving the dredging machinery. There were, besides that of the Waipapa Creek Company, six special claims held on the Waipapa Beach up to the 31st March last, for some of which, as I understand, machines are under order. Besides the hands at work with the dredger, there are about ten miners working on the Waipapa Beach or in its vicinity, two on Haldane's Beach, and about fourteen or sixteen at Waikaroa engaged in sluicing the sandhills, which, as some of them have been worked before, do not yield a good return.

I have, &c.,

The Under-Secretary, Mines Department, Wellington. H. McCulloch, Warden.

No. 17.

Mr. J. Dand, Manager, Waimea-Kumara Water-race and Sludge-channel, to the Under-Secretary of Mines.

Sir,— Kumara, 22nd April, 1889.

I have the honour to report on the working of the Waimea-Kumara Water-races and Sludge-channel for the year ending 31st March, 1889, as follows:—

Waimea Race.

The revenue derived from the sales of water for the year amounts to £1,416 16s. 8d., and the expenditure on maintenance to £860 2s. 5d.; leaving a credit balance of £556 14s. 3d. on the year's transactions.

In consequence of some of the old claims having been worked out recently, the result of the last year's transactions is not quite so satisfactory as it was the previous year; there is, however, a prospect of new claims being opened up shortly that will be the means of causing a steadier demand for water than there has been for some time past. The average number of men using water from the race during the year was ninety-three. Flumes and tunnels have been maintained in efficient repair, and the whole race kept in good working-order; but some of the box-planking may need renewing within the ensuing year.

Kumara Race.

The sales of water from this race for the year amount to £6,716 6s. 10d., and the expenditure on maintenance and contingencies for the same period amounts to £1,024 1s. 9d.; leaving a credit balance of £5,692 5s. 1d. on the year's transactions.

Thirty-four claims have been supplied with water, and of this number eighteen have private tail-races, the other sixteen being connected with the sludge-channel. Water continues to be in good demand not only by new claims opening up, but also by larger supplies than formerly being used in claims that have been in operation for some years. This increase in the quantity of water used by parties has been deemed necessary in most instances through loss of fall, new tail-races having to be driven with less grade than those first put in, so that the bottom of the back ground could be reached; however, the system, as invariably adopted here, of putting large bodies of water, together with a corresponding quantity of *débris*, into a narrow sluice, where the saving of gold should be the first consideration, is one that cannot be commended. The race and branches are in good repair.

Sludge-channel.

The channel-fees for the year amount to £1,095 3s. 3d., and the value of gold-dust obtained from the channel to £570 14s. 9d., making the total receipts £1,665 18s.; and the expenditure for the year amounts to £4,285 6s. 2d.

The working of the channel during the year has been carried on with but little interruption either from want of water or loss of fall for tailings; the Teremakau River bed, however, has now been so much filled up that the prospects of a continuance of the same results for another year are, indeed, far from encouraging, as the drop at the end of the boxes has now become so limited that the river has to be entirely depended on for carrying away the tailings; so that dry weather will be likely to affect the working of the channel in future.

I have, &c.,

J. Dand, Manager, Water-races.

The Under-Secretary, Mines Department, Wellington.

No. 18.

Mr. John Gow, Manager, Nelson Creek Water-race, to the Under-Secretary of Mines.

Sir,— Nelson Creek Water-race, Hatter's Terrace, 5th April, 1889.

I have the honour to forward my annual report on the Nelson Creek Water-race, and mining generally in this locality, for the year ending the 31st March, 1889.

Most of the easily come-at-able and known payable blocks of ground suitable for the individual miner are now washed away; therefore many of the miners have lately spent much time in prospecting new ground near the line of race, where one claim is being opened, and another will be opened as soon as a branch race is constructed to it. The shallow flats along No. 3 Creek and all its tributaries are nearly all washed away. There is, however, a considerable extent of ground to be worked on the lower end of Try Again Terrace, but which is held by a few miners only.

The Brian Boru Claim, in Brian Boru Gully, was being worked on a small scale till the great flood on the 11th of last month levelled everything.

The Long Tail-race Company (referred to in my annual reports of 1887 and 1888) has at last opened out near Mr. Potts's hotel, and the result of their first wash-up is reported to be splendid.

The working shareholders inform me that they can wash from 2dwt. to 3dwt. per dish from the face 4ft. high in the wash, and much more from a dish taken from the bottom. The shareholders are quite elated with the prospect before them, and well they may be, seeing that they hold in all about thirty acres of as likely-looking ground as that opened. The tail-race is deep enough to drain away from the deepest part of the paddock opened. The shareholders have had several meetings with a view of agreeing as to the best method of working the ground. Many plans have been suggested, and amongst them Perry's hydraulic system has been discussed, and an application made for ten heads of water from the Government race. I learn to-day that they have not yet fixed definitely on any plan—they cannot agree.

Edward Hailey (referred to in my last annual report) has not yet formed the company to work his lease. I understand that he is in Melbourne trying to float a company there. I do not think the ground will be allowed to lie idle much longer, as others are now anxious to secure the lease to work it by Perry's hydraulic system, if the water can be got from the Government race.

There is another large claim held on the flat between Hailey's and the Long Tail-race Company; but, as it has an immense quantity of tailings on it, it is thought it will be worked by a tail-race, and driven out in the ordinary way by timbering.

Mr. Roche's hydraulic claim in No. 3 Creek is still working under difficulties. There being no escape from big floods, he, of course, has suffered much by several floods during the year, and the two floods during last month did him much damage. The workings are now approaching Welshman's Creek, where something better than ordinary grounds is looked for.

Three maintenance-men are constantly doing repairs on the flumes and bridges. When extensive renewals have been made the bridges may be considered good for some time to come.

The renewal of timber in the tunnels is made every week, and therefore it may be considered in passable working-order. The open ditching from end to end is in good order.

Trial-water is freely given to open out new and old ground wherever there is a prospect of future sales; but the uncertainty of any one of my present customers' claims paying for any definite time makes it a most difficult matter to estimate approximately the revenue for the year.

Herewith please find tables showing the revenue and expenditure on account of Nelson Creek Water-race maintenance by the Government from the 1st April, 1888, to the 31st March, 1889; also revenue and expenditure for the first and last six months of the year, the number of men employed by the race, their average earnings, and the approximate quantity of gold obtained by them, and estimate of receipts and expenditure for the year ending the 31st March, 1889.

I have, &c.,

The Under-Secretary, Mines Department, Wellington. J. Gow, Manager.

No. 19.

Mr. D. Doyle to the Under-Secretary of Mines.

Sir,— Charleston, 6th April, 1889.

I have the honour to forward report for the twelve months ending the 31st March, 1889, on the working of the Argyle Water-race.

The receipts for sales of water have been an improvement on last year's receipts, although not up to what I expected at the commencement of the financial year, owing to different causes, principally through men not working anything like full time. The time actually worked in sluicing during the year averaged eighty-five days per man, which was less time than was made last year.

There were several slips and breaks in the supply-races during the year; but these were repaired at a very small cost. The fluming in these races is beginning to get pretty well decayed, and timber will have to be got during next year to put them in a state of thorough repair.

During the latter part of August last year several very heavy shocks of earthquake occurred, the effects of which could be seen very plainly. At Ballarat Creek they left an open fissure about 60ft. long and 4in. wide., so that a small sapling could be put down for about 5ft. In some places there were small fissures in the main race, and the joints in the siphon across Ballarat Gully were shaken considerably; but on the whole very little damage was done.

One of the principal parties who use the water from the race—namely, O'Leary and party—have knocked off to erect a battery to crush their cement, as they have a very fair quantity of it in their claim. They expect twenty years' work before them, and, from the returns they got from Auckland, where they sent 5 tons to be tested, they should be able to make very fair wages for the time to come. This claim has paid very fair wages for the last twenty years to different parties, and it is expected to turn out equally as well for the next twenty years.

Although the returns are not up to estimate, they are an improvement on last year, showing £100 5s. 4d. over working-expenses. Add to this for free water £59 5s., and it will bring the returns up to £159 10s. 4d.

Herewith please find tabulated returns showing results for periods ending the 30th September, 1888, and the 31st March, 1889. I have, &c.,

The Under-Secretary, Mines Department, Wellington. D. Doyle, Manager.

No. 20.

The Chairman, Mount Ida Water-race Trust, to the Hon. the Minister of Mines.

Sir,— Office of Mount Ida Water-race Trust, Naseby, 20th May, 1889.

I have the honour, in compliance with section 25 of "The Mount Ida Water-race Trust Act, 1886," to forward the annual report of the Trust for the year ending the 31st December, 1888.

The Trust commenced the year with a credit balance of £298 4s. 2d., but the severe floods which occurred during the spring, which caused considerable damage to the head-race, absorbed this sum in repairing the breaks, leaving a balance to credit of only 3s. at the end of the year.

In August last a large slip took place in the Wedderburn, which was put in repair at a cost of over £70, by substituting iron piping instead of rebuilding the race. Extra expense has also been incurred in the construction of a channel in Home Gully to prevent the tailings from spreading over freehold properties and to confine them to the reserves. This extra work, including bridges over the channel, and £25 as compensation, was constructed at a cost of over £175.

During the dry season about 35 chains of the sludge-channel was washed up at an expense of £167, from which gold worth over £300 was obtained.

The revenue received from sales of water during the year amounted to £1,085 5s. 1d., or £269 19s. 5d. less than last year. This deficiency is accounted for by the severe break in the head-race mentioned above—occurring at the time when water was plentiful—and the consequent loss in sales until repairs were effected.

The supply of water is still inadequate to the demand. Including the dry summer months, and frosts of winter, about four months in each year are lost for mining purposes. To utilise to advantage this lost time the Trust would again respectfully bring under your notice the desirability of constructing the proposed reservoir at the head of the Eweburn, to conserve the storm-water. This reservoir, according to surveys made, would supply thirty Government heads of water for sixty-six days, at the very time of the year when it was most in request, and when it could be best used to advantage. The construction of this reservoir formed a part of the original Mount Ida Water-works supply scheme, and had the work been constructed as proposed considerable sums of money would have been saved in maintaining the race each year, and the revenue of the Trust would have been largely augmented by consequent continuous sales of water.

The quantity of gold produced in the County of Maniototo for the year ended on the 31st March last, on which gold duty was paid, was 12,400oz., amounting to £46,500.

I have, &c.,

J. Nugent Wood,

The Hon. the Minister of Mines, Wellington. Chairman, Mount Ida Water-race Trust.

APPENDICES TO WARDENS' REPORTS.

No. 1.

STATEMENT showing the REVENUE of the GOLDFIELDS collected in the several DISTRICTS, and the GOLD DUTY of the COLONY of NEW ZEALAND, for the Period from the 1st January to the 31st December, 1888.

District.	Miners' Rights.	Business Licenses.	Water-races, Sluices, &c.	Gold-mining Leases, Rents, and Royalties.	Registration.	Fees and Fines, Wardens' Courts.	Miscellaneous.	Totals.
AUCKLAND.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Coromandel ..	182 0 0	6 0 0	0 5 0	221 0 0	..	1 5 0	7 6 0	417 16 0
Te Aroha ..	73 15 0	43 0 0	0 5 0	2,025 14 9	17 7 6	9 17 0	16 5 9	2,186 5 0
Thames ..	506 16 0	4 10 0	103 0 0	3,744 1 10	26 16 0	29 13 0	424 11 0	4,839 7 10
Totals ..	762 11 0	53 10 0	103 10 0	5,990 16 7	44 3 6	40 15 0	448 2 9	7,443 8 10
NELSON.								
Owen's ..	5 10 0	7 10 0	0 10 0	169 10 0	0 9 0	..	318 11 3	502 0 3
Collingwood ..	54 5 0	..	17 7 6	149 12 0	16 10 0	4 16 0	2 19 6	245 10 0
Westport ..	96 0 0	10 10 0	21 15 0	878 5 0	10 13 0	4 15 0	410 7 0	1,432 5 0
Charleston ..	89 0 0	..	22 7 6	91 11 0	16 1 0	18 8 0	10 5 6	247 12 6
Ahaura ..	206 17 0	6 0 0	36 0 0	143 10 0	39 14 0	16 6 0	6 16 6	455 3 6
Reefton ..	127 10 0	387 0 0	22 10 0	1,875 11 3	19 6 0	4 1 0	570 10 3	3,006 8 6
Wangapeka ..	18 15 0	..	1 15 0	15 0 0	1 14 0	..	7 14 6	44 18 6
Lyell	26 10 0	..	6 17 6	181 15 0	1 7 0	0 19 0	44 17 0	262 5 6
Motueka ..	4 15 0	..	..	..	..	..	..	4 15 0
Murchison ..	73 12 0	6 0 0	13 0 0	..	3 12 0	1 14 0	5 5 6	103 3 6
Totals ..	702 14 0	417 0 0	142 2 0	3,504 14 3	109 6 0	50 19 0	1,377 7 0	6,304 2 3
WELLINGTON.								
Wellington ..	..	..	..	..	..	..	5 0 0	5 0 0
MARLBOROUGH.								
Havelock ..	277 10 0	18 0 0	5 15 0	68 6 8	10 7 0	13 6 0	25 2 6	418 7 2
CANTERBURY.								
Christchurch ..	..	..	..	0 10 0	..	..	2 0 0	2 10 0
WESTLAND.								
Hokitika and Kanieri	138 11 0	9 0 0	18 10 0	42 0 0	13 14 0	12 0 0	7 17 4	241 12 4
Greymouth ..	321 0 0	12 0 0	62 0 0	353 2 6	34 2 0	14 16 0	59 6 6	856 7 0
Ross	46 0 0	3 0 0	11 10 0	409 5 0	2 7 0	6 0 0	235 5 1	713 7 1
Stafford ..	72 15 0	..	15 5 0	98 7 0	3 15 0	4 4 0	46 17 6	241 3 6
Kumara ..	197 15 0	15 0 0	7 15 0	179 5 3	18 12 0	8 0 0	66 16 0	493 3 3
Jackson's Bay ..	3 5 0	..	0 10 0	..	0 3 0	..	16 5 0	20 3 0
Goldsborough ..	49 0 0	..	25 10 0	..	8 17 0	8 3 0	6 16 0	98 6 0
Okarito ..	25 0 0	7 10 0	3 0 0	215 0 0	3 2 0	..	0 13 0	254 5 0
Totals ..	853 6 0	46 10 0	144 0 0	1,296 19 9	84 12 0	53 3 0	439 16 5	2,918 7 2
OTAGO.								
Black's ..	57 5 0	..	14 12 6	136 10 0	8 4 0	8 10 0	39 17 0	264 18 6
Tapanui ..	3 15 0	..	0 5 0	..	0 2 0	1 4 0	0 10 0	5 16 0
Hindon ..	32 10 0	6 0 0	3 2 6	189 4 9	3 14 0	0 17 0	60 7 8	295 15 11
Naseby ..	199 0 0	9 0 0	48 0 0	703 18 0	23 3 0	15 19 0	102 19 8	1,101 19 8
Roxburgh ..	64 5 0	..	11 5 0	119 12 6	8 6 0	7 0 0	101 16 6	312 5 0
Alexandra ..	49 15 0	..	9 15 0	88 10 0	8 11 0	2 10 0	24 11 0	183 12 0
Clyde	27 15 0	13 10 0	9 17 6	138 12 6	2 7 0	2 15 6	37 9 8	232 7 2
Pembroke ..	46 10 0	7 10 0	0 10 0	..	0 15 0	..	0 1 0	55 6 0
Cromwell ..	172 15 0	24 0 0	34 5 0	126 3 6	22 4 0	19 9 6	63 15 6	462 12 6
Queenstown ..	108 11 0	21 0 0	19 10 0	950 19 11	18 1 0	16 10 6	256 8 0	1,391 0 5
Arrowtown ..	89 0 0	1 10 0	21 17 6	538 0 6	20 11 0	11 17 0	53 0 6	735 16 6
Lawrence ..	220 10 0	3 0 0	23 17 6	341 19 0	38 1 0	11 17 0	101 13 6	740 18 0
Switzer's ..	87 5 0	6 0 0	13 7 6	81 10 0	12 9 0	16 3 0	3 9 0	220 3 6
Orepuki and Longwood	157 15 0	22 10 0	25 15 0	65 14 0	20 2 0	28 13 6	21 10 6	342 0 0
Maerewhenua ..	27 10 0	..	8 15 0	21 4 0	5 16 0	2 17 6	0 12 0	66 14 6
Totals ..	1,344 1 0	114 0 0	244 15 0	3,501 18 8	192 6 0	146 3 6	868 1 6	6,411 5 8
Grand Totals ..	3,940 2 0	649 0 0	640 2 0	14,363 5 11	440 14 6	304 6 6	3,165 10 2	23,503 1 1

T. H. HAMER,
Accountant.

No. 2.

STATEMENT showing the REVENUE of the GOLDFIELDS collected in the several DISTRICTS, and the GOLD DUTY of the COLONY of NEW ZEALAND, for the Period from 1st January to 31st March, 1889.

District.	Miners' Rights.	Business Licenses.	Water-races, Sluices, &c.	Gold-mining Leases, Rents, and Royalties.	Registration.	Fees and Fines, Wardens' Courts.	Miscellaneous.	Totals.
AUCKLAND.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Coromandel ..	14 10 0	1 10 0	..	94 10 0	..	1 5 0	1 0 0	112 15 0
Te Aroha ..	9 5 0	3 0 0	0 10 0	328 1 0	5 1 0	5 19 0	22 10 0	374 6 0
Thames.. ..	63 5 0	..	38 10 0	450 5 4	3 17 0	3 14 0	400 8 0	959 19 4
Totals ..	87 0 0	4 10 0	39 0 0	872 16 4	8 18 0	10 18 0	423 18 0	1,447 0 4
NELSON.								
Motueka ..	1 15 0	..	0 5 0	..	0 1 0	..	0 3 6	2 4 6
Collingwood ..	14 5 0	..	4 7 6	32 1 0	7 10 0	1 6 0	0 19 0	60 8 6
Westport ..	32 10 0	..	3 17 6	58 5 0	3 2 0	4 12 0	67 13 0	169 19 6
Charleston ..	23 15 0	..	5 7 6	18 9 6	4 11 0	2 0 0	2 3 0	56 6 0
Ahaura	43 15 0	1 10 0	7 15 0	24 0 0	11 18 0	3 3 0	0 18 6	92 19 6
Reefton.. ..	61 0 0	63 0 0	4 2 6	228 5 0	3 11 0	4 12 0	20 4 0	384 14 6
Wangapeka ..	7 15 0	..	1 15 0	..	0 9 0	..	5 5 6	15 4 6
Lyell	7 15 0	..	1 5 0	58 10 0	0 8 0	..	0 14 6	68 12 6
Murchison ..	17 5 0	1 10 0	3 10 0	..	0 6 0	0 2 0	1 6 6	23 19 6
Owen's	0 15 0	..	0 2 6	91 10 0	0 10 0	..	187 14 0	280 11 6
Totals ..	210 10 0	66 0 0	32 7 6	511 0 6	32 6 0	15 15 0	287 1 6	1,155 0 6
MARLBOROUGH.								
Havelock ..	25 5 0	1 10 0	3 0 0	244 11 10	4 8 0	5 8 0	296 11 0	580 13 10
WELLINGTON.								
Wellington ..	..	..	..	..	..	..	2 0 0	2 0 0
CANTERBURY.								
Christchurch ..	..	..	..	..	..	..	..	..
WESTLAND.								
Hokitika and Kanieri	37 5 0	7 10 0	4 10 0	7 10 0	2 14 0	0 10 0	25 1 6	85 0 6
Greymouth ..	72 5 0	4 10 0	9 7 6	14 14 6	9 17 0	4 9 0	1 19 0	117 2 6
Ross	9 10 0	..	2 15 0	143 10 0	0 19 0	0 18 0	64 10 0	222 2 0
Stafford.. ..	15 15 0	2 0 0	4 7 6	23 0 0	1 4 0	2 4 0	59 14 0	108 4 6
Okarito	8 10 0	1 10 0	1 2 6	59 0 0	0 7 0	..	0 4 0	70 13 6
Greenstone ..	21 10 0	..	3 10 0	19 1 3	3 4 0	4 10 0	..	51 15 3
Kumara ..	72 0 0	7 10 0	2 2 6	60 2 6	5 17 0	2 11 0	4 9 0	154 12 0
Goldsborough ..	16 5 0	..	6 10 0	..	2 12 0	0 6 0	1 11 0	27 4 0
Jackson's Bay ..	2 0 0	..	..	..	..	..	2 0 0	4 0 0
Totals ..	255 0 0	23 0 0	34 5 0	326 18 3	26 14 0	15 8 0	159 9 0	840 14 3
OTAGO.								
Black's	15 15 0	..	2 2 6	15 0 0	1 14 0	0 11 0	0 12 0	35 14 6
Tapanui ..	0 15 0	..	0 5 0	90 0 0	0 2 0	..	0 1 0	91 3 0
Hindon	7 5 0	3 0 0	0 10 0	0 15 0	0 4 0	..	3 11 9	15 5 9
Naseby	56 15 0	7 10 0	11 12 6	120 0 5	7 3 0	1 19 0	1 5 6	206 5 5
Alexandra ..	22 5 0	..	2 2 6	4 0 0	2 19 0	1 16 0	23 2 6	56 5 0
Clyde	2 5 0	..	1 12 6	..	0 10 0	1 2 6	..	5 10 0
Roxburgh ..	13 10 0	..	5 5 0	101 6 0	2 19 0	2 13 6	51 7 6	176 15 0
Cromwell ..	36 0 0	4 10 0	5 0 0	44 0 0	5 16 0	2 6 0	23 15 0	121 7 0
Queenstown ..	24 5 0	3 0 0	6 15 0	301 18 1	3 17 0	3 11 6	27 1 0	370 7 7
Arrowtown ..	24 10 0	..	2 12 6	110 2 6	3 3 0	1 17 0	3 9 0	145 14 0
Lawrence ..	54 0 0	..	5 15 0	67 12 6	8 13 0	3 13 0	91 3 0	230 16 6
Switzer's ..	25 10 0	4 10 0	2 10 0	..	2 10 0	1 17 0	0 13 6	37 10 6
Orepuki and Longwood	27 0 0	3 0 0	5 12 6	30 2 0	4 19 0	12 10 0	16 16 0	99 19 6
Pembroke ..	9 15 0	..	0 5 0	..	0 3 0	..	..	10 3 0
Maerewhenua ..	4 10 0	..	0 7 6	..	0 6 0	..	..	5 3 6
Totals ..	324 0 0	25 10 0	52 7 6	884 10 6	44 18 0	33 16 6	242 17 9	1,608 0 3
Grand Totals ..	901 15 0	120 10 0	161 0 0	2,839 17 5	117 4 0	81 5 6	1,411 17 3	5,633 9 2

T. H. HAMER,
Accountant.

No. 3.

COMPARATIVE RETURN of REVENUE derived from the GOLDFIELDS in the several DISTRICTS of NEW ZEALAND during the Years 1887 and 1888, showing INCREASE or DECREASE under each Head of Revenue.

District.	Miners' Rights.	Business Licenses.	Water-races, Sluices, &c.	Gold-mining Leases, Rents, and Royalties.	Registration.	Fees and Fines, Wardens' Courts.	Miscellaneous.	Gold Duty.	Totals.
AUCKLAND—	£	£	£	£	£	£	£	£	£
Year 1887	602	10	72	2,446	307	23	141	3,149	6,750
Year 1888	763	54	104	5,991	44	41	448	3,065	10,510
Increase	161	44	32	3,545	..	18	307	..	3,760
Decrease	..	..	..	..	263	..	..	84	..
WELLINGTON—									
Year 1887	..	..	..	..	..	..	..	..	..
Year 1888	..	..	..	..	..	..	3	..	3
Increase	..	..	..	..	..	..	3	..	3
Decrease	..	..	..	..	..	..	..	..	..
NELSON—									
Year 1887	654	476	174	2,876	80	39	983	3,719	9,001
Year 1888	703	417	142	3,505	109	51	1,377	3,826	10,130
Increase	49	..	..	629	29	12	394	107	1,129
Decrease	..	59	32	..	..	..	..	..	..
MARLBOROUGH—									
Year 1887	34	3	6	29	3	1	19	90	185
Year 1888	278	18	6	68	10	13	25	100	518
Increase	244	15	..	39	7	12	6	10	333
Decrease	..	..	..	..	..	..	..	..	..
CANTERBURY—									
Year 1887	..	..	..	53	..	..	4	1	58
Year 1888*	..	..	..	..	..	..	..	..	..
Increase	..	..	..	..	..	..	..	..	..
Decrease	..	..	..	53	..	..	4	1	58
WESTLAND—									
Year 1887	784	62	165	576	75	43	232	5,753	7,690
Year 1888	853	47	144	1,297	85	53	440	6,805	9,724
Increase	69	..	..	721	10	10	208	1,052	2,034
Decrease	..	15	21	..	..	..	..	..	..
OTAGO—									
Year 1887	1,311	105	291	2,381	120	125	496	7,034	11,863
Year 1888	1,344	114	245	3,502	192	146	868	6,961	13,372
Increase	33	9	..	1,121	72	21	372	..	1,509
Decrease	..	..	46	..	..	..	..	73	..
Total Increase	556	..	..	6,002	..	73	1,286	1,011	8,710
Total Decrease	..	6	67	..	145	..	..	..	..

* No Return.

T. H. HAMER,
Accountant.

No. 4.

COMPARATIVE RETURN of the TOTAL AMOUNTS of GOLDFIELDS REVENUE (exclusive of Gold Duty) collected in the several Districts during the Years 1887 and 1888, and the Quarters ending 31st March, 1888 and 1889 respectively, showing the INCREASE or DECREASE in respect of each District.

District.	Years 1887 and 1888.				Quarters ending 31st March, 1888, and 31st March, 1889.			
	1887.	1888.	Increase.	Decrease.	1888.	1889.	Increase.	Decrease.
AUCKLAND.	£	£	£	£	£	£	£	£
Coromandel	378	418	40	..	26	113	87	..
Te Aroha	1,301	2,186	885	..	335	374	39	..
Thames	1,922	4,839	2,917	..	1,298	960	..	338
NELSON.								
Motueka	..	5	5	..	2	2	..	..
Owen's	298	502	204	..	6	281	275	..
Collingwood	254	246	..	8	60	60	..	..
Westport	646	1,432	786	..	361	170	..	191
Charleston	248	248	..	..	69	56	..	13
Ahaura	287	455	168	..	128	93	..	35
Reefton	3,194	3,006	..	188	458	385	..	73
Wangapeka	35	45	10	..	12	15	3	..
Lyell	201	262	61	..	38	69	31	..
Notown	65	..	..	65	28	..	..	28
Murchison	54	103	49	..	44	24	..	20
MARLBOROUGH.								
Havelock	95	418	323	..	21	581	560	..
WESTLAND.								
Hokitika ..	206	242	36	..	67	85	18	..
Kanieri ..								
Greymouth	460	856	396	..	173	117	..	56
Ross	487	713	226	..	197	222	25	..
Stafford	203	241	38	..	67	108	41	..
Okarito	36	254	218	..	11	71	60	..
Greenstone	84	..	..	84	22	52	30	..
Kumara	347	493	146	..	159	155	..	4
Jackson's Bay	7	20	13	..	..	4	4	..
Goldsborough	107	98	..	9	22	27	5	..
OTAGO.								
Hindon	108	296	188	..	31	15	..	16
Naseby and Black's ..	1,188	1,367	179	..	331	243	..	88
St. Bathan's	168	..	..	168	55	..	..	55
Alexandra	90	184	94	..	61	56	..	5
Clyde	185	232	47	..	74	6	..	68
Roxburgh	195	312	117	..	111	177	66	..
Cromwell	490	463	..	27	149	121	..	28
Arrowtown	377	736	359	..	170	146	..	24
Queenstown	1,116	1,391	275	..	418	370	..	48
Pembroke	11	55	44	..	15	10	..	5
Lawrence	498	741	243	..	197	231	34	..
Switzer's	165	220	55	..	62	38	..	24
Tapanui	5	6	1	..	..	91	91	..
Orepuki and Longwood ..	232	342	110	..	112	100	..	12
Maerewhenua	..	67	67	..	..	5	5	..
WELLINGTON.								
Wellington	..	3	3	..	5	2	..	3
CANTERBURY.								
Christchurch	57	..	..	57	2	..	..	2
Totals	15,800	23,497	8,303	606	5,397	5,635	1,374	1,136
Net increase ..	..	..	7,697	..	..	..	238	..

T. H. HAMER,
Accountant.

No. 5.

STATEMENT showing the AMOUNT of GOLD DUTY credited to LOCAL BODIES during the Year ended 31st December, 1888, and the Quarter ended 31st March, 1889.

Local Body.	For the Year ended 31st December, 1888.	For the Quarter ended 31st March, 1889.
	£ s. d.	£ s. d.
COUNTIES—		
Bruce	19 10 7	7 4 8
Buller	1,174 15 5	400 14 10
Clutha..	2 2 3	1 10 0
Collingwood	285 1 9	76 12 6
Coromandel	610 5 1	105 11 3
Fiord	..	1 16 0
Grey	2,762 17 6	979 7 2
Inangahua	2,294 19 0	733 9 9
Lake	1,060 12 1	339 8 0
Maniototo	1,287 8 1	177 14 2
Marlborough	99 13 2	390 17 5
Ohinemuri	245 13 9	4 5 4
Piako	118 18 0	0 4 6
Southland	472 8 4	147 7 2
Taieri	44 8 4	7 12 11
Thames	1,105 15 3	288 14 2
Tuapeka	1,480 9 1	370 7 1
Vincent	1,650 14 7	636 18 10
Waihemo	120 15 1	22 2 11
Waikouaiti	2 17 7	17 19 4
Waimea	70 13 8	75 5 1
Waitaki	94 2 11	155 5 3
Wallace	656 12 2	21 17 5
Westland	3,064 8 1	889 1 3
	18,725 1 9	5,892 5 8
BOROUGHS—		
Alexandra South	61 11 1	15 14 2
Hokitika	32 6 6	54 15 6
Kumara	371 8 11	171 5 7
Naseby	7 5 3	0 19 3
Ross	575 0 4	158 10 0
Thames	984 8 11	406 19 6
	2,032 1 0	808 4 0

No. 6.

SUMMARY of the QUANTITY and VALUE of GOLD ENTERED for DUTY for EXPORTATION from NEW ZEALAND, from 1st April, 1857, to 31st December, 1888.

Product of the Goldfields in the District of	Entered for Duty at the Port of	During the Quarter ended 31st December, 1888.		Entered for Exportation to the 30th September, 1888.		Total entered for Exportation from New Zealand to the 31st December, 1888.	
		Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
		Oz.	£	Oz.	£	Oz.	£
Auckland	Auckland ..	9,839	39,341	1,569,118	5,844,181	1,578,957	5,883,522
Wellington	Wellington ..	..	..	188	706	188	706
Marlborough ..	Picton	27	98				
	Nelson	54	196				
		81	294	55,592	214,340	55,673	214,634
Nelson	Nelson	1,194	4,433	1,646,747	6,533,646	1,647,941	6,538,079
West Coast ..	Nelson	202	766				
	Westport ..	1,003	3,983				
	Greymouth ..	14,911	59,644				
	Hokitika ..	6,668	26,673				
		22,784	91,066	3,460,100	13,740,921	3,482,884	13,831,987
Various	Christchurch ..	..	..	24	96	24	96
Canterbury	Dunedin ..	..	..	24	96	24	96
Otago ..	Invercargill ..	1,898	7,592				
	Dunedin ..	9,272	37,051				
		11,170	44,643	4,644,956	18,329,879	4,656,126	18,374,522
	Totals ..	45,068	179,777	11,376,749	44,663,865	11,421,817	44,843,642

Department of Trade and Customs,
Wellington, 28th January, 1889.

H. S. McKELLAR,
Secretary and Inspector.

No. 7.

RETURN of the QUANTITY and VALUE of GOLD ENTERED for DUTY for EXPORTATION from NEW ZEALAND for the Years ended 31st December, 1887 and 1888.

Ports.	During the Quarter ended—				Totals for Year 1888.		Totals for Year 1887.	
	31st March, 1888.	30th June, 1888.	30th September 1888.	31st December, 1888.	Quantity.	Value.	Quantity.	Value.
	Oz.	Oz.	Oz.	Oz.	Oz.	£	Oz.	£
Auckland	10,953	7,167	7,327	9,839	35,286	139,808	30,697	121,564
Wellington	..	..	..	..	..	..	3	12
Picton	..	..	..	27	27	98	..	..
Blenheim	..	..	612	..	612	2,232	944	3,400
Nelson	1,125	698	1,327	1,450	4,600	17,476	3,647	13,711
Westport	2,699	2,659	2,034	1,003	8,395	33,553	9,547	38,187
Greymouth ..	18,510	11,456	18,185	14,911	63,062	252,244	55,036	220,503
Hokitika	4,685	7,402	8,345	6,668	27,100	108,396	33,325	133,299
Dunedin	13,777	19,298	15,212	9,272	57,559	229,003	62,739	249,531
Invercargill ..	959	848	849	1,898	4,554	18,160	7,516	29,233
Riverton	..	..	..	..	..	..	415	1,660
Christchurch ..	..	24	..	..	24	96	..	..
Totals for 1888 ..	52,708	49,552	53,891	45,068	201,219	801,066	..	..
Totals for 1887 ..	64,616	40,889	53,471	44,893	..	..	203,869	811,100

Department of Trade and Customs,
Wellington, 28th January, 1889.

H. S. McKELLAR,
Secretary and Inspector.

No. 8.

RETURN of the QUANTITY and VALUE of GOLD ENTERED for DUTY for EXPORTATION from NEW ZEALAND, from 1st April, 1857, to 31st March, 1889.

Entered for Duty at	Produce of the Gold-fields in	During the Quarter ended 31st March, 1889.		Entered for Exportation to the 31st December, 1888.		Total entered for Exportation from New Zealand to the 31st March, 1889.	
		Quantity	Value.	Quantity	Value.	Quantity.	Value.
		Oz.	£	Oz.	£	Oz.	£
Auckland	Auckland ..	6,413	25,398	1,578,957	5,883,522	1,585,370	5,908,920
Wellington	Wellington ..	..	..	188	706	188	706
Auckland	Marlborough	1	4				
Blenheim		1,009	3,995				
Picton		691	2,547				
Nelson		43	160				
Greymouth		33	132				
		1,777	6,838	55,673	214,634	57,450	221,472
Nelson	Nelson ..	985	3,680	1,647,941	6,538,079	1,648,926	6,541,759
Nelson	West Coast	193	733				
Westport		3,539	14,156				
Greymouth		18,653	74,610				
Hokitika		7,641	30,566				
		30,026	120,065	3,482,884	13,831,987	3,512,910	13,952,052
Christchurch	Various ..	..	..	24	96	24	96
Dunedin	Canterbury ..	..	..	24	96	24	96
Dunedin	Otago	20,373	80,630				
Invercargill		817	3,266				
		21,190	83,896	4,656,126	18,374,522	4,677,316	18,458,418
Totals		60,391	239,877	11,421,817	44,843,642	11,482,208	45,083,519

Department of Trade and Customs,
Wellington, 11th April, 1889.

H. S. McKELLAR,
Secretary and Inspector.

No. 9.

COMPARATIVE RETURN of the QUANTITY and VALUE of GOLD ENTERED for DUTY for EXPORTATION from NEW ZEALAND for the QUARTERS ended 31st March, 1889, and 31st March, 1888.

District of	Quarter ended 31st March, 1889.		Quarter ended 31st March, 1888.	
	Quantity.	Value.	Quantity.	Value.
	Oz.	£	Oz.	£
Auckland	6,413	25,398	10,953	43,449
Marlborough	1,777	6,838	..	..
Nelson	985	3,680	367	1,365
West Coast	30,026	120,065	26,652	106,565
Otago	21,190	83,896	14,736	57,657
Totals	60,391	239,877	52,708	209,036

Department of Trade and Customs,
Wellington, 11th April, 1889.

H. S. McKELLAR,
Secretary and Inspector.

No. 10.

STATEMENT showing the PRICE of GOLD per OUNCE, PRICE charged per TON for CRUSHING QUARTZ or CEMENT, and PRICES charged for WATER per SLUICE-HEAD per WEEK, during the Year ending 31st March, 1889.

Mining District.		Price of Gold per Ounce.	Price charged per Ton for crushing Quartz or Cement.	Price charged for Water per Sluice-head per Week.	Remarks.
		£ s. d.			
AUCKLAND—	North Hauraki	2 10 0 to 3 1 6	8s. to 14s.	..	..
	South Hauraki	2 10 0 to 3 10 0	5s. to 7s. 6d.	£3	40in. by 1in.
	Ohinemuri	2 8 0 to 2 18 0	5s. to 7s. 6d.	£3	..
	Te Aroha	2 13 0 to 3 5 0	6s. 8d.	..	..
MARLBORO—	Pelorus and Wairau ..	3 13 6	..	..	..
NELSON—	Wangapeka	3 0 0 to 3 15 0	..	..	..
	Charleston	3 17 0	..	£2 15s.	40in.
	Inangahua	3 16 0 to 3 19 3	8s. to 10s.	..	..
	Collingwood	3 12 6	10s. to 15s.	..	..
	Westport	3 16 0 to 3 17 0	..	..	..
	Lyell	3 15 0	10s. to 12s.	..	..
WESTLAND—	Hokitika and Kanieri ..	3 16 0	..	£3 to £1 10s.	40in.
	Waimea				
	Totara and Ross	3 16 6	..	£3	40in.
	Stafford	3 16 6	..	£1 10s.	40in.
	Greymouth	3 16 6	..	£3	..
	Kumara	3 16 0	..	£2 10s.	..
	Ahaura	3 16 0	..	..	..
	Okarito	3 16 0	..	..	..
	Jackson's Bay	3 16 0	..	..	..
OTAGO—	Hindon	3 15 0	15s.	..	..
	Tuapeka..	3 15 0	..	..	..
	Dunstan..	3 15 0	£1 10s.	£1	60in.
	Longwood	3 8 6	..	£1	40in.
	Orepuki and Roundhill ..	3 16 6	..	£1	40in.
	Arrow (Wakatipu Goldfield) and Queenstown	3 15 0	12s. 6d. to 15s.	..	20in. by 20in.
	Mount Ida	3 15 0	..	£1	16in. by 1in.
	Macrae's, Hyde	3 15 0	..	£1 to £3	60in.
	Hamilton, Serpentine ..				
	Maerewhenua	3 15 0	..	£1 6s. 8d.	40in.
	Cromwell	3 15 0	..	£1 10s.	20in. by 2in.
	Waikaia	3 12 0	..	10s.	60in.
	Tapanui	3 12 0	..	£1 4s. to £1 10s.	8 hours.

No. 11.

TABLE showing the NUMBER of GOLD-MINING COMPANIES REGISTERED under "The Mining Companies Limited Liability Act, 1865," and Amending Acts, the Joint-stock Companies Act, and "The Mining Companies Act, 1886," upon 31st March, 1889.

Mining District.	Under "Mining Companies Limited Liability Act, 1865," and Amending Acts.			Under Joint-stock Act.			Under "Mining Companies Act, 1872."		
	No.	Nominal Capital.	Paid-up Capital.	No.	Nominal Capital.	Paid-up Capital.	No.	Nominal Capital.	Paid-up Capital.
		£	£		£	£		£	£ s. d.
AUCKLAND—									
Te Aroha	2	220,000	177,456¼	..	..	..	2	95,000	31,493 8 0
MARLBOROUGH	..	..	..	..	..	..	2	10,500	1,300 10 0
NELSON—									
Westport	..	..	..	..	..	..	9	215,137	36,031 8 4
Lyell	2	48,000	20,900	..	..	..	5	126,000	81,758 6 8
Owen	..	..	..	3	47,000	766	1	6,000	1,085 0 0
Inangahua	..	..	..	..	..	..	56	948,750	319,942 14 0
	2	48,000	20,900	3	47,000	766	62	1,295,887	438,817 9 0
WESTLAND—									
Hokitika and Kanieri ..	..	..	..	1	150,000	137,620	..	..	..
Stafford	1	12,000	5,437	..	..	..	6	36,600	9,145 0 0
Ross	15	228,000	161,250	..	..	..	10	90,000	20,386 0 0
Kumara	1	16,000	7,433	..	..	..	1	7,000	2,300 0 0
	17	256,000	174,120	1	150,000	137,620	17	133,600	31,831 0 0
OTAGO—									
Cromwell	2	137,000	3,500	..	..	..	..	..	..
Dunstan..	..	..	..	..	..	..	5	38,225	19,388 12 0
Lawrence	6	52,300	31,042	..	..	..	..	..	..
Mount Ida	..	..	..	..	..	..	13	177,000	48,288 0 0
Orepuki and Longwood ..	..	..	..	..	..	..	2	2,750	2,250 0 0
Totals	8	189,300	34,542	..	..	..	20	217,975	69,926 12 0

No. 12.

RETURN showing the AVERAGE PRICES of PROVISIONS and LIVE STOCK for the Year ending 31st March, 1889.

Mining District.	Beer.	Brandy.	Bread—Wheaten.	Butter—Fresh.	Butter—Salt.	Cheese.	Coffee.	Flour.	Grain—Wheat.	Live Stock.					Meat.			Milk.	Rice.	Salt.	Sugar.	Tea.	Tobacco.	Wine.
										Cattle—Horned.	Goats.	Horses.	Sheep.	Swine.	Beef.	Mutton.	Pork.							
	Per. hhd.	Per gall.	Per lb.	Per lb.	Per lb.	Per lb.	Per lb.	Per 100lb.	Per Im. bushel.	Per head.	Per head.	Per head.	Per head.	Per head.	Per lb.	Per lb.	Per lb.	Per qt.	Per lb.	Per lb.	Per lb.	Per lb.	Per lb.	Per gallon.
AUCKLAND—			d.							£		£			d.	d.	d.	d.	d.	d.	d.			
North Hauraki	100/	25/	2	1/9	1/6	/9	2/	15/	..	5–15	10/–20/	3–40	10/–15/	20/–60/	6	5	6	6	3	1	3–6	1/6–3/6	6/6	24/
South Hauraki	87/–100/	25/–30/	2	/10–1/	/8–/10	/7–/10	2/	13/–15/	4/6-5/6	7	10/–15/	5–50	10/–15/	20/–60/	4	4	6	4	3	1	4	2/–3/	6/–7/6	15/30/
Te Aroha	100/	25/–30/	2–2½	/9–1/6	1/	/8	2/	12/	5/6	4–8	5/	2–8	11/	15/–30/	3–5	5	5	4	3½	1½	3½	2/–3/	6/–10/	18/–40/
MARLBOROUGH—																								
Queen Charlotte Sound																								
Pelorus ..	110/120	25/	2	/8–1/	/8–/10	/8–1/	1/5-1/8	14/	6/	1–6	5/–20/	1–30	5/–15/	5/–60/	4	4	6	6	3	1½	4	1/6–3/	6/	15/
Wairau ..																								
Baton	..	..	..	/8	..	/7	2/	15/	..	4–5	..	9	9/	8/–10/	3	2	4	..	4	1½	4	2/–3/	6/	..
Sherry and Tadmor ..	..	..	..	/8	..	/7	2/	15/	..	4–5	..	9	9/	8/–10/	3	2½	4	..	4	1½	4	2/–3/	6/	..
NELSON—																								
Wangapeka	..	..	..	1/	..	/9	2/	18/	..	4–5	..	9	9/	8/–10/	4	3	5	..	3	2	5	2/6–3/	6/	..
Collingwood	100/	30/	2	1/	/7	/8	2/	16/	6/	..	..	..	8/–15/	5/–50/	3½	3½	6	6	4	1½	3½	2/6	6/6	20/
Inangahua	130/	24/	2½	1/9	1/3	/9	1/9	18/	7/	6–9	30/	10–35	7/6	60/–80/	6	4	8	6	4	2	4	3/6	8/	20/
Lyell	140/	25/–26/	3	1/6	1/6	1/	2/	20/	10/	6	10/	10–15	10/	40/	5	5	8	6	5	4	5	3/	7/	18/–20/
Murchison	120/	25/	2½	1/	/10	/10	2/	20/	7/	4	20/	15	10/	25/	4	4	5	4	3	3	5	3/	6/	12/–18/
Westport	113/	25/	2	1/3-1/6	1/2	/8	2/	15/	5/	4–8	..	10–50	15/	10/–40/	6	6	6	6	3	2	5	2/6	6/6	23/
Charleston	130/	26/	2	1/6	1/3	/8	1/9	10/–17/	6/	9	15/	20–30	16/	30/	6	6	8	6	5	2	4	2/6–3/6	6/–8/	16/
Ahaura	150/	25/	2	1/3	1/	/9	1/6	16/	6/	70/–140/	20/	10–25	12/	60/	4	4	8	6	4	2	4	2/6–3/	6/	15/
WESTLAND—																								
Stafford	140/	25/	2	2/	1/3	1/	1/6	16/	6/	9–10	10/	5–40	15/	40/–120/	6	6	6	4	4	2	4½	3/6	6/6	25/
Waimea ..																								
Hokitika and Kanieri	100/	25/	2	1/6	1/2	1/	2/	16/	5/6	6–10	10/–20/	7–20	13/–20/	40/–80/	6–8	6	8	6	4	2	6	2/6	7/	25/
Ross	110/	26/	2	1/6	1/3	/9	2/	17/	8/	7–14	10/	10–15	14/	40/–90/	6	5	9	6	4	2	5	2/–3/	7/	20/–30/
Okarito	160/	26/	3	1/6	1/3	1/	1/9	16/–18/	7/	7	10/	10	20/	20/–100/	5	5	9	4	4	2	5	2/6	6/–8/	14/–20/
Kumara	120/	23/6	2	1/6	1/3	1/	1/8	20/	6/	8–12	20/	10–30	15/–18/	40/–100/	5	5	8	6	3	2	5	3/	6/–8/	22/
Greymouth	90/–110/	26/–30/	2	1/6–2/	1/–1/9	1/–1/3	1/9–2/	12/–15/	6/–6/6	6–9	15/	5–50	6/–20/	15/–60/	5–6	5–6	6–8	6	3–4	2½–3	3½–6	2/6–3/6	6/–6/6	15/–35/
Jackson's Bay	..	30/	..	1/	1/	1/	1/6	15/–18/	6/	60/–110/	..	6–15	20/	20/–100/	5	5	6	1/	4	2	5	2/6	6/6	..
TAGO—																								
Hindon	95/	25/	1½	1/2	1/2	/9	1/6	14/	3/6	..	..	8–30	10/	..	5	4	6	4	3	2	5	3/	7/	..
Tuapeka	100/–160/	27/	1½	1/	/10	/8	1/6–2/	12/	4/0	120/	..	8–20	2/–12/	5/–50/	6	5	5	3	3	1	3¼	2/	5/6	20/–25/
Tapanui	90/	24/	1½	/10	/9	/6	2/	9/	3/4	2–8	..	4–20	5/5–8/	10/–60/	6	5	6	3	4	1	4	2/6	6/	18/
Cromwell	100/–120/	24/	2	1/6–2/	1/–1/6	/10–1/	1/9	12/	4/6–5/	3–10	..	5–40	5/–15/	..	6	6	6	6	3	2	4	2/–4/	5/–7/	15/
Clyde ..																								
Alexandra ..	120/	26/–30/	2	1/–1/6	1/–1/3	/8	1/6–2/	14/	4/–5/	50/–140	..	7–25	5/–15/	20/–90/	5	3½	8	4–6	4	2	4	2/6–3/6	7/	18/–35/
Roxburgh ..																								
Black's	120/	26/–30/	2	1/3	1/3	/9	1/6–2/	14/	4/0	5–7	..	7–25	2/–15/	30/–100/	5	3½	8	5	5	2	4½	3/	6/	18/–35/
Queenstown	110/	28/	2	1/4	1/	/9	2/	13/	3/6–4/	5–10	..	10–30	3/–10/	20/–100/	6	5	7	6	3	2	5	3/	6/	6/–30/
Orepuki and Longwood ..	100/	25/	1½	/7	/6	/6	2/	14/	4/	6–7	20/	5–20	6/–8/	30/–60/	6	4	6	4	5	1	3½	1/8–3/	6/	20/
Arrow (Wakatipu Goldfield)	120/	30/	2	1/4	1/	/9	2/	13/	3/6–4/	5–10	..	5–20	2/–10/	20/–100/	6	5	7	6	3	2	5	3/	6/	6/–30/
Mount Ida	90/–120/	27/	2	1/3	1/3	/10	2/	22/–25/	3/6–4/	..	15/	..	..	..	6	4	8	5	5	2	4	2/9	6/–7/	16/
Maerewhenua	120/	30/	1½	1/	1/	/8	1/9	15/	4/	80/	..	15	10/6	40/	5	2½	4	4	4	2	4	2/6	6/	20/
Waikaia	140/	26/–30/	2	1/	/10	/8	2/	14/	4/	2–5	..	5–18	4/–7/	15/–30/	4	3	6	4	5	2	5	3/4	6/	20/–27/

No. 13.

TABLE showing the AVERAGE RATE of WAGES per WEEK for the Year ending 31st March, 1889.

Mining District.	General Managers.	Legal Managers.	Mining Managers.	Engineers.	Engine-drivers.	Stokers.	Blacksmiths.	Carpenters.	Miners.	Labourers.	Boys.	Chinese.	Agricultural Labourers.	Domestic Servants.
AUCKLAND—	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
North Hauraki	£5 to £10	£1 to £2	£4 to £5 10/	£3 to £4 10/	2 8 0	2 0 0	2 10 0	2 8 0	£2 2/ to £2 8/	2 0 0	15/ to 20/	..	2 0 0	10/ to 12/
South Hauraki	£24 to £50	1 0 0	£4 to £6	£3 to £3 12	3 0 0	2 8 0	3 0 0	2 14 0	£2 2/ to £2 8/	1 16 0	10/ to 30/	..	£1 5/ to £1 10/	7/ to 12/
MARLBOROUGH—														
Wairau ..	..	1 0 0	4 10 0	0 11 0	0 9 0	0 8 0	0 10 0	0 10 0	0 9 0	0 7 0	0 10 0	..	1 0 0	10/ and keep
Pelorus ..														
NELSON—														
Collingwood	4 10 0	1 0 0	4 10 0	3 10 0	2 11 0	2 8 0	2 14 0	2 14 0	£2 2/ to £2 8/	2 2 0	..	..	£1 to £1 10	10/ to 15/
Inangahua	7 0 0	£1 to £3	£5 10/ to £6	£4 10/ to £5	3 10 0	3 0 0	£4 10/ to £5	£4 10/ to £5	3 0 0	3 0 0	2 0 0	..	1 10 0	1 0 0
Charleston	..	..	4 10 0	..	..	..	3 0 0	3 10 0	3 0 0	3 0 0	1 0 0	..	1 10 0	10/ to 15/
Westport	..	1 0 0	5 0 0	5 0 0	3 0 0	2 14 0	3 0 0	3 0 0	3 0 0	2 14 0	0 15 0	1 0 0	1 0 0	0 12 0
Lyell	..	10/ to £2 10/	6 0 0	..	..	..	£4 5/ to £5	4 10 0	3 3 0	£2 8/ to £3	0 12 0	..	1 0 0	0 15 0
Ahaura	..	..	4 0 0	..	..	..	3 12 0	3 12 0	3 0 0	£2 5/ to £3	..	..	£1 5/ to £1 10/	10/ to £1
Murchison	..	10/ to £2	£4 to £6	..	..	..	3 0 0	3 0 0	3 0 0	£2 8/ to £3	5/ to 10/	1 17 6	1 0 0	0 15 0
WESTLAND—														
Waimea and Stafford ..	..	4 0 0	4 0 0	..	..	..	4 0 0	4 0 0	3 0 0	3 0 0	1 10 0	2 10 0	1 0 0	..
Hokitika and Kanieri ..	£4 to £6	1 0 0	£4 to £5	5 0 0	4 0 0	3 0 0	4 0 0	4 0 0	3 0 0	3 0 0	1 10 0	1 10 0	15/ to £1	10/ to 15/
Ross	5 0 0	1 10 0	4 0 0	4 0 0	..	..	4 0 0	4 0 0	3 0 0	2 0 0	2 0 0	2 0 0	3 0 0	10/ to 17/
Kumara	4 10 0	2 0 0	4 10 0	..	4 0 0	..	4 0 0	4 0 0	3 0 0	3 0 0	1 10 0	1 5 0	1 10 0	10/ to £1
Greymouth	..	1 0 0	£4 to £6	£4 to £5	£3 to £3 10/	£2 10/ to £3	£2 10/ to £4	14/ to 16/	3 0 0	7/ to 10/	10/ to 15/*	1 10 0*	£1 10 to £2*	10/ to £1*
Okarito and Jackson's Bay	5 0 0	4 0 0	4 0 0	4 0 0	3 0 0	2 10 0	3 10 0	3 10 0	£2 10 to £3	£2 10/ to £3	1 15 0	..	£1 to £1 5/	0 15 0
OTAGO—														
Hindon	4 0 0	2 5 0	3 0 0	6 0 0	3 0 0	..	2 0 0	3 0 0	2 8 0	2 0 0	1 0 0	..	£40 to £50	£30 to £35
Tuapeka	£3 to £4	£1 5/ to £2 10/	£3 to £5	£3 to £3 10/	2 10 0	£1 15/ to £2	2 5 0	£2 8/ to £3	2 2 0	£1 16/ to £2 2/	0 10 0	£1 to £1 10/	15/ to £1	0 12 6
Tapanui	..	..	..	..	..	..	3 0 0	3 0 0	2 8 0	2 2 0	10/ to 15/	0 15 0	1 0 0	8/ to 10/
Cromwell	5 0 0	1 0 0	5 0 0	4 0 0	3 10 0	£2 10/ to £3	4 0 0	3 12 0	£2 10/ to £3	£2 8/ to £2 14/	10/ to £1	£1 5/ to £2	£1 to £1 5/	8/ to £1
Clyde														
Alexandra ..	£3 to £4	10/6 to £1 1/	£3 to £4	3 10 0	2 10 0	2 2 0	3 15 0	3 15 0	£2 2/ to £3	2 2 0	10/ to £1 5/	1 10 0	1 0 0	7/6 to 15/
Roxburgh ..														
Black's	£4 to £5	10/6 to £1 1/	4 0 0	3 10 0	3 0 0	2 8 0	3 10 0	3 10 0	2 4 0	£2 2/ to £2 8/	10/ to £1 5/	1 16 0	£1 to £1 5/	8/ to 15/
Waikaia	2 10 0	..	2 10 0	3 10 0	2 10 0	..	2 10 0	3 0 0	2 5 0	2 0 0	0 12 0	1 0 0	1 0 0	10/ to 12/
Orepuki and Longwood ..	..	2 0 0	3 0 0	..	2 10 0	..	..	..	2 2 0	1 16 0	0 15 0	1 10 0	15/ to £1	0 10 0
Arrow	5 0 0	1 0 0	5 0 0	3 10 0	3 0 0	3 0 0	3 0 0	4 0 0	3 0 0	2 8 0	10/ to £1	1 16 0	1 0 0	10/ to 15/
Queenstown	6 0 0	1 0 0	5 0 0	4 0 0	3 0 0	2 10 0	4 0 0	4 10 0	3 0 0	2 8 0	10/ to 15/	£1 to £1 10/	£1 to £1 5/	12/ to 15/
Mount Ida	..	..	£3 10/ to £4	..	..	..	3 0 0	£3 to £3 12/	£2 8/ to £2 14/	2 2 0	0 15 0	2 8 0	1 0 0	10/ to 15/
Maerewhenua	..	..	..	..	..	..	..	3 0 0	2 10 0	..	..	..	..	..

* With board.

No. 14.

NUMBER of MACHINES employed in ALLUVIAL and QUARTZ-MINING, and the VALUE thereof, for the Year ending 31st March, 1889.

Mining District.	Machinery employed in Alluvial Mining.												Machinery employed in Quartz-mining.								
	Puddling Machines.	Whims.	Whips or Pulleys.	Sluices, Toms, and Sluice-boxes.	Water-wheels.	Hydraulic Hose.	Pumps.	Dredges.	Quicksilver and Compound Cradles.	Derricks.	Stamp-heads crushing Cement.	Boring Machines.	Steam-engines employed winding, crushing, &c. No.	Steam-engines employed winding, crushing, &c. Aggregate h.p.	Crushing Machines.	Stamp-heads.	Water-wheels.	Whims.	Whips or Pulleys.	Derricks.	Berdans.	Approximate Value of all Mining Plant included in this Return.
																						£
AUCKLAND—																						
North Hauraki ..	..	..	..	..	..	..	..	..	..	..	..	..	8	210	7	65	3	..	..	..	..	25,000
South Hauraki ..	..	..	..	..	..	..	..	..	..	..	..	..	29	800	20	440	19	..	18	47	342	67,500
Te Aroha ..	..	..	..	..	..	..	..	..	..	..	..	..	..	200	2	40	9	..	..	..	..	27,000
Totals ..	..	..	..	..	..	..	..	..	..	..	..	..	37	1,210	29	545	31	..	18	47	342	119,500
MARLBOROUGH—																						
Wairau .. / Pelorus ..	..	..	..	130	9	..	30	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,850
NELSON—																						
Sherry and Tadmor	..	..	..	40	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	45
Baton	..	..	..	75	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	35
Wangapeka ..	..	..	..	70	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	30
Collingwood ..	..	..	..	..	..	..	..	..	..	..	..	..	2	25	3	20	1	..	..	..	..	3,700
Inangahua ..	..	..	..	..	..	..	..	..	..	..	..	..	16	333	186	315	16	2	3	..	64	138,130
Charleston ..	..	..	..	80	3	70	..	..	50	..	13	..	..	..	..	..	..	..	..	..	..	3,000
Lyell	..	..	..	40	..	40	..	..	..	..	..	..	..	..	6	63	2	..	..	..	..	16,000
Murchison ..	..	..	..	80	..	22	..	1	..	..	..	..	..	..	2	20	..	..	..	..	..	10,500
Westport ..	..	5	..	52	6	31	..	1	..	..	..	..	..	..	3	25	3	..	..	..	..	11,000
Ahaura	..	..	..	1,450	4	480	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9,200
Totals ..	..	5	..	1,887	13	645	..	2	50	..	13	..	18	358	200	443	22	2	3	..	64	191,630
WESTLAND—																						
Stafford	..	..	1	3,000	2	450	2	..	24	..	..	..	..	..	..	..	..	..	..	..	..	4,000
Ross	..	..	5	60	..	60	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	10,000
Hokitika and Kanieri	..	..	..	2	25	90	..	30	..	..	..	..	..	..	..	..	..	..	..	..	..	2,300
Greymouth ..	..	..	..	2,750	4	800	50	2	60	3	..	6	2	10	..	..	..	..	..	..	..	10,300
Kumara	..	7	20	150	4	90	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3,000
Totals ..	..	7	26	5,962	35	1,490	52	34	84	3	..	6	2	10	..	..	..	..	..	..	..	29,600
OTAGO—																						
Tapanui	..	..	..	20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	20
Hindon	..	..	..	10	..	2	..	..	..	..	..	..	1	20	2	20	1	..	..	..	..	4,000
Tuapeka	..	..	..	500	15	10	30	1	..	..	75	..	..	..	20	4	1	..	..	..	..	8,000
Cromwell ..	..	..	..	300	..	130	2	1	..	..	..	1	1	12	6	30	1	1	..	..	..	30,000
Clyde, Alexandra, and Roxburgh	..	1	2	320	9	4,000	10	9	..	1	..	..	..	..	3	16	1	..	..	..	..	30,000
Black's	2	2	2	300	2	3,000	2	..	..	..	..	..	..	..	1	..	..	..	..	..	..	6,500
Orepuki and Longwood	..	..	..	520	1	160	..	..	..	..	..	..	..	..	1	2	1	..	..	..	..	2,000
Waikaia (Switzer's)	..	..	..	501	5	24	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4,025
Arrow	..	..	..	300	..	60	5	1	..	..	..	..	..	1	4	4	37	3	..	..	..	14,500
Queenstown ..	..	..	..	450	..	50	..	1	..	..	..	..	..	1	8	7	100	..	..	..	..	30,000
Naseby	..	..	..	200	..	85	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,750
Kyeburn and Clarke's	..	..	..	70	..	20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	500
Hamilton's and Sowburn	..	..	..	70	..	25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	450
Hyde and Fullerton's	..	..	..	15	..	10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	200
Macrae's, Strath-Taieri, and Shag Valley	..	..	..	50	..	15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	150
Maerewhenua ..	..	..	..	65	..	30	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	690
Serpentine ..	..	..	..	26	..	5	..	..	..	..	..	..	..	..	1	5	1	..	..	..	..	600
St. Bathan's, Ida Valley, and other localities	..	..	..	60	..	40	..	..	..	..	..	..	..	..	1	10	..	..	..	..	..	2,500
Totals ..	2	3	4	3,777	32	7,666	53	13	..	1	75	1	2	34	47	98	143	4	..	..	..	135,885

SUMMARY.

Auckland	..	..	..	..	..	..	..	..	..	..	..	..	37	1,210	29	545	31	..	18	47	342	119,500
Marlborough ..	..	..	..	130	9	..	30	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,850
Nelson	..	5	..	1,887	13	645	..	2	50	..	13	..	18	358	200	443	22	2	3	..	64	191,630
Westland	..	7	26	5,962	35	1,490	52	34	84	3	..	6	2	10	..	..	..	..	..	..	..	29,600
Otago	2	3	4	3,777	32	7,666	53	13	..	1	75	1	2	34	47	98	143	4	..	..	..	135,885
Totals ..	2	15	30	11,756	89	9,801	135	49	134	4	88	7	59	1,612	276	1,086	196	6	21	47	406	478,465

No. 15.

TABLE showing approximately the NUMBER, DESCRIPTION, and VALUE of the WATER-RACES, TAIL-RACES, DAMS, RESERVOIRS, and GROUND-SLUICES in Operation during the Year ending 31st March, 1889.

Mining District.	Water-races.				Tail-races.		Dams.		Reservoirs.		Ground-sluices.		Approximate Total Cost.
	No.	Length in Miles.	No. of Sluice-heads.	Approximate Cost.	No.	Approximate Cost.	No.	Approximate Cost.	No.	Approximate Cost.	No.	Approximate Cost.	
AUCKLAND—				£		£		£		£		£	£
Hauraki North ..	8	3	20	1,250	..	..	..	..	..	..	..	..	1,250
Hauraki South ..	20	21	110	80,000	1	10	5	450	1	600	..	..	81,060
Te Aroha ..	6	5¾	21	8,200	..	..	..	..	..	..	..	..	8,200
Totals ..	34	29¾	151	89,450	1	10	5	450	1	600	..	..	90,510
MARLBOROUGH—													
Pelorus	45	39	71	7,880	22	1,700	18	450	..	..	..	..	10,030
NELSON—													
Wangapeka ..	22	21¼	54	23,100	10	150	5	..	..	..	..	..	23,250
Collingwood ..	97	89	152	3,200	41	600	58	1,720	..	..	..	..	5,520
Inangahua ..	158	132	1,233	37,464	330	20,988	387	13,792	..	..	..	..	72,244
Charleston ..	312	166	428	25,108	222	8,662	471	11,000	1	3,000	80	3,000	50,770
Westport ..	137	217	1,060	35,850	79	8,015	152	5,133	..	..	..	..	48,998
Lyell	26	26	197	9,214	14	424	15	661	..	..	..	..	10,299
Murchison ..	71	74	232	6,408	17	612	32	1,074	..	..	..	..	8,094
Ahaura	513	456¼	1,453	54,833	543	40,436	513	13,925	..	..	..	..	109,194
Totals ..	1,346	1,181½	4,809	195,177	1,256	79,887	1,633	47,305	1	3,000	80	3,000	328,369
WESTLAND—													
Hokitika & Kanieri	303	190	411	16,000	192	1,500	208	1,480	..	..	50	300	19,280
Ross	130	100	350	30,000	170	2,000	56	1,140	30	19,000	60	600	52,740
Kumara ..	190	100	360	22,000	185	15,000	60	4,500	11	7,000	50	800	49,300
Greymouth ..	950	713	1,171	48,000	604	8,372	660	6,900	..	..	51	1,100	64,372
Jackson's Bay ..	6	6½	16	800	2	300	..	..	..	..	..	..	1,100
Okarito	19	21	68	2,100	6	600	6	250	..	..	..	..	2,950
Stafford.. ..	450	300	800	30,000	500	6,000	600	7,000	50	1,000	700	2,000	46,000
Totals ..	2,048	1,430½	3,176	148,900	1,659	33,772	1,590	21,270	91	27,000	911	4,800	235,742
OTAGO—													
Hindon	29	39	51	3,965	13	600	32	80	..	..	14	90	4,735
Tuapeka ..	214	582	764	11,640	325	4,175	230	4,600	..	..	..	..	20,415
Tapanui ..	3	20½	3	680	3	10	1	20	..	..	..	..	710
Clyde	36	119	89	8,150	19	450	20	450	..	..	..	..	9,050
Black's	87	335	287	24,700	79	12,200	61	5,600	..	..	..	..	42,500
Queenstown ..	125	175	600	65,000	160	5,000	40	1,500	11	550	..	..	72,050
Alexandra ..	56	260	173	14,600	39	1,900	39	1,050	..	..	..	..	17,550
Roxburgh ..	79	185	254	16,500	74	8,560	45	2,500	..	..	..	..	27,560
Cromwell ..	205	658	705	65,800	220	6,300	80	1,500	..	..	..	..	73,600
Waikaia ..	115	311	393	9,904	266	3,153	144	3,479	..	..	38	275	16,811
Orepuki and Longwood	229	250	529	15,000	110	5,000	100	1,350	..	..	120	2,200	23,550
Arrow (Wakatipu Goldfield)	95	170	230	10,000	200	5,000	30	1,800	30	*	20	200	17,000
Naseby	65	290	208	46,000	..	..	..	..	..	..	..	..	46,000
Kyeburn & Clarke's	85	300	315	10,300	..	..	..	..	..	..	..	..	10,300
Hamilton's and Sowburn	31	106	80	5,500	..	..	..	..	..	..	..	..	5,500
Hyde & Fullerton's	18	90	64	10,150	..	..	..	..	..	..	..	..	10,150
Macrae's, Strath-Taieri, and Shag Valley	30	48	55	4,100	..	..	..	..	..	..	..	..	4,100
Serpentine ..	36	88	93	5,000	..	..	..	..	..	..	..	..	5,000
Maerewhenua ..	21	175	49	15,500	21	986	26	1,875	..	..	..	..	18,361
St. Bathan's and Ida Valley	95	315	345	32,000	..	..	..	..	..	..	..	..	32,000
Totals ..	1,654	4,516½	5,287	374,489	1,529	53,334	848	25,804	41	550	192	2,765	456,942

SUMMARY.

Auckland	34	29¾	151	89,450	1	10	5	450	1	600	..	..	90,510
Marlborough ..	45	39	71	7,880	22	1,700	18	450	..	..	..	..	10,030
Nelson	1,346	1,181½	4,809	195,177	1,256	79,887	1,633	47,305	1	3,000	80	3,000	328,369
Westland	2,048	1,430½	3,176	148,900	1,659	33,772	1,590	21,270	91	27,000	911	4,800	235,742
Otago	1,654	4,516½	5,287	374,489	1,529	53,334	848	25,804	41	550	192	2,765	456,942
Totals ..	5,127	7,197¼	13,494	815,896	4,467	168,703	4,094	95,279	134	31,150	1,183	10,565	1,121,593

* Included in dams.

No. 16.

RETURN showing the REVENUE and EXPENDITURE on account of CONSTRUCTED WATER-RACES maintained by the Government, from 1st April to 30th September, 1888, and from 1st October, 1888, to 31st March, 1889.

Name of Race.	1st April to 30th September, 1888.			1st October, 1888, to 31st March, 1889.			Balance due on Water Account.
	Revenue.		Expenditure.	Revenue.		Expenditure.	
	Water sold.	Actual Receipts.		Water sold.	Actual Receipts.		
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Nelson Creek ..	176 18 4	176 18 4	778 7 0	250 3 4	250 3 4	606 2 3	..
Waimea-Kumara ..	4,046 0 11	3,996 5 2	842 16 9	4,086 12 7	3,937 14 6	1,041 7 5	126 14 1
Kumara Sludge-chan.	512 17 6	494 19 1	2,338 17 4	582 5 9	545 15 8	1,946 8 10	2 1 3
Argyle, Charleston ..	269 13 8	280 7 11	203 3 8	227 11 6	193 11 3	193 6 8	2 12 6
Mikonui	..	25 0 0	..	..	4 3 4	..	..
Totals ..	5,005 10 5	4,973 10 6	4,163 4 9	5,146 13 2	4,931 8 1	3,787 5 2	131 7 10

No. 17.

RETURN of CASES in the WARDENS' COURTS, and COSTS AWARDED, for the Year ending 31st March, 1889.

Mining District.	Number of Mining Disputes adjudicated on.	Aggregate Amount of Value.		Amount of Costs awarded.	Cases wherein Judgment has decreed Specific Performance.
		Claimed.	Recovered.		
AUCKLAND—		£ s. d.	£ s. d.	£ s. d.	
North Hauraki	25	281 16 8	27 1 11	4 11 0	
South Hauraki	213	801 0 0	682 0 0	27 16 0	
Te Aroha	55	76 0 0	66 0 0	10 18 0	
MARLBOROUGH	33	880 0 0	..	32 10 6	31
NELSON—					
Collingwood	6	35 0 0	..	2 13 0	
Inangahua	5	17 7 6	..	2 2 0	
Lyell	..	..	..	..	
Westport	12	37 0 0	..	46 11 0	
Charleston	20	147 12 5	48 10 3	4 14 0	
Ahaura	14	30 0 0	15 0 0	31 11 0	
Murchison	2	15 0 0	5 0 0	7 0 0	
WESTLAND—					
Kumara	11	15 0 0	..	19 10 0	
Greymouth	25	139 15 2	63 10 2	53 16 0	
Hokitika and Kanieri .. Waimea	15	15 0 0	0 0 6	22 10 0	
Stafford	19	27 1 0	4 4 0	66 6 0	9
Jackson's Bay	..	..	..	..	
Ross	4	14 10 0	10 0 0	18 0 0	2
OTAGO—					
Tapanui	..	..	..	..	
Hindon	2	..	..	0 8 0	
Tuapeka	14	25 0 0	..	13 8 0	
Cromwell	14	219 0 0	66 2 6	13 2 0	6
Alexandra	11	..	..	2 11 0	
Roxburgh	8	50 0 0	5 0 0	17 12 0	
Black's	9	2 12 0	..	19 9 0	3
Clyde	4	..	..	1 12 0	
Waikaia	10	55 0 0	0 10 0	9 16 0	
Orepuki and Longwood	32	202 6 6	2 1 6	91 14 2	14
Arrow (Wakatipu Goldfield) ..	29	717 1 9	317 15 0	59 9 0	8
Queenstown	25	157 15 0	157 15 0	35 12 0	6
Naseby	25	151 9 2	5 5 0	93 0 0	1
Maerewhenua	..	..	..	..	
Totals	642	4,112 7 2	1,475 15 10	708 1 8	80

Mines Department, 1st June, 1889.

H. J. H. ELIOTT,
Under-Secretary of Mines.

No. 18.

RETURN of the NUMBER of MINING LEASES or LICENSES and AGRICULTURAL LEASES in Force on the 31st March, 1889, the EXTENT of GROUND LEASED or held under LICENSE, and RENTAL per ANNUM.

Mining Leases.									Agricultural Leases.								
Mining District.	No.	Gross Acreage.			Rental per Annum				Mining District.	No.	Gross Acreage.			Rental per Annum.			
		A.	R.	P.	£	s.	d.				A.	R.	P.	£	s.	d.	
AUCKLAND—									AUCKLAND—								
Hauraki North ..	..	..			..				Hauraki, Ohinemuri	94	4,476	3	2	321	5	0	
Hauraki South ..	165	2,026	3	27	1,755	0	0										
Te Aroha ..	43	1,221	0	39	588	10	0										
	208	3,248	0	26	2,343	10	0										
MARLBOROUGH—																	
Wairau and Pelorus	26	1,426	1	39	352	2	9										
NELSON—									NELSON—								
Collingwood ..	5	64	2	18	66	0	0		Collingwood ..	4	253	3	10	25	12	0	
Inangahua ..	62	885	3	26	925	0	0		Inangahua ..	8	301	1	20	30	12	0	
Charleston ..	26	150	1	24	144	0	0		Charleston ..	23	542	2	24	45	11	6	
Ahaura	5	83	2	12	53	0	0		Westport ..	16	1,376	0	34	140	4	6	
Westport.. ..	16	151	3	30	154	0	0		Lyell	4	75	1	26	7	12	0	
Lyell	7	92	3	28	96	0	0		Murchison ..	8	666	3	31	67	19	0	
Murchison ..	4	62	3	17	65	0	0		Ahaura	17	1,223	3	29	116	1	0	
Owen's	..	..			..				Hokitika & Kanieri	2	90	0	0	4	10	0	
	125	1,492	0	35	1,503	0	0			82	4,530	1	14	348	2	0	
WESTLAND—																	
Jackson's Bay ..	2	150	0	0	37	10	0										
Okarito	35	1,076	0	0	269	0	0										
Hokitika & Kanieri	3	123	3	16	54	0	0										
Kumara	14	500	2	29	171	5	0		WESTLAND—								
Stafford	11	467	0	0	98	2	0		Greymouth ..	5	327	1	36	31	0	0	
Greymouth ..	..	..			..				Kumara	3	158	2	13	19	17	6	
Ross	..	..			..				Ross	2	22	1	19	2	15	0	
	65	2,317	2	5	629	17	0			10	508	1	28	53	12	6	
OTAGO—																	
Waikaia	1	137	1	22	69	0	0										
Cromwell ..	13	322	1	30	128	0	0										
Hindon	12	263	2	18	152	0	0		OTAGO—								
Tuapeka	35	755	1	0	381	12	6		Waikawa ..	1	100	0	0	12	10	0	
Black's	11	248	1	22	132	10	0		Tuapeka ..	61	12,913	1	32	2,664	10	11	
Clyde, Alexandra, and Roxburgh	29	1,116	1	17	322	10	0		Cromwell ..	36	3,692	0	0	440	17	0	
Naseby	79	1,449	0	15	795	0	0		Black's	3	384	1	13	48	5	0	
Arrow (Wakatipu Goldfield)	8	59	0	15	51	0	0		Clyde, Alexandra, and Roxburgh	60	2,640	3	0	275	4	6	
Queenstown ..	..	..			..				Mount Ida District	14	2,041	3	18	256	0	0	
Maerewhenua ..	13	241	2	16	29	12	0		Arrow (Wakatipu Goldfield)	23	976	3	35	120	2	6	
Tapanui	1	180	0	0	90	0	0		Queenstown ..	30	536	1	5	67	14	6	
	202	4,773	0	35	2,151	4	6			228	23,285	2	23	3,885	4	1	
Totals ..	626	13,256	2	20	6,979	14	3		Totals ..	414	32,801	0	27	4,698	3	7	

APPENDIX II.

COAL-MINES OF NEW ZEALAND.

(Extracts from Reports of Inspectors.)

NORTH ISLAND.

Mr. H. A. Gordon, F.G.S., Inspector of Mines, to the Under-Secretary of Mines.

Sir,— Mines Department, Wellington, 15th January, 1889.

I have the honour, in compliance with section 59 of "The Coal-mines Act, 1886," to forward my annual report, for the information of the Hon. the Minister of Mines, on the following coal-mines in the North Island: namely, the Kawakawa, Kamo, Whauwhau, Waikato, Taupiri, Taupiri Reserve, and Miranda.

Kawakawa District.

1. *Kawakawa Mine.*—This mine is situate at Kawakawa, in the Bay of Islands district. The workings have been carried on for a number of years, and, although the annual output has not been large, owing to the irregular character of the seams, and the faults met with, the total output from this mine up to the end of December last had been about 648,625 tons of marketable coal. Of this amount, 33,145 tons is the output for the past year. The previous year's output was 35,078 tons, which shows a decrease last year of 2,933 tons; and it is to be regretted that the present prospects of the mine show that further falling-off during the present year may be expected. The seam as it goes down towards the dip gets very irregular in thickness, and finally cuts out to about 1ft. in thickness in places, which cannot be worked remuneratively.

The coal that is being worked is from Nos. 2 and 3 Levels. From No. 2 Level the principal workings consist of taking out the pillars. This requires a very strict supervision, on account of the treacherous nature of the roof, which necessitates a large amount of timber being used in the mine in making pig-sty pillars, and for props. From No. 3 Level the coal is being worked in bords; but the thickness of the seam is so small—about from 2ft. to 2ft. 6in.—that the coal is costly to procure, and the time is not far distant when the coal-workings in this mine will be suspended unless some fresh seam be discovered that is not known of at present.

The workings in this mine are carefully carried on, and there is very fair ventilation in all the working-faces, and the manager, Mr. T. P. Moody, deserves the highest credit for the able manner in which he has carried on the mine, which is a very difficult one to work. During the ten years Mr. Moody has had the management of the mine there has not been any very serious accident.

On the 13th May a small body of sulphuretted-hydrogen gas was found in the far workings in the No. 2 Level. The manager was extending the level, and struck a large influx of water, amounting to about 250 gallons per minute, which, together with the other water from the mine, the pumps —two 12in. lifts and an 8in. Tangye—were unable to cope with; consequently the workings in that level were stopped, and a concrete dam constructed to stop back the water. In constructing this dam an opening was left near the bottom to allow a passage for the water until the dam was completed. On the completion of this dam arrangements were made to stop up the opening, and the workmen, accompanied by the manager and underviewer, were proceeding to have this done when one of the workmen, J. H. Moore, held a naked light near the opening, when the gas lighted and singed Moore slightly about the face. No explosive gas has heretofore been met with in this mine—the only gas there has been to contend with was carbonic-acid gas; and the gas met with on this occasion was not the explosive gas—carburetted-hydrogen—that is usually met with in coal-mines, which is a light gas, and is detected first in the roof of the workings, its specific gravity in relation to air being 0·555. This gas met with here is not usually found in large quantities in coal-mines. Its specific gravity in relation to air is about 1·174; therefore it would be near the floor of the workings, as was the case in this instance. The manager states definitely that there could be no mistake about this gas on account of its smell—namely, that of rotten eggs. The gas had been formed, no doubt, from the decomposition of iron-pyrites in the coal.

Messrs. Moody and Belgrave, the manager and engineer for the company, have constructed a very ingenious machine for lifting the columns of pumps in the shaft, whereby a great saving of time is effected. When anything goes wrong with the pumps, so that the column has to be lifted, it is slung by a heavy chain which is attached to the end of a long screw about 4½in. outside diameter, and worked by the machine referred to. The machine is driven by a belt and pulley from a small portable engine which is placed alongside the poppet-heads near the shaft. This pulley, with reduced geared wheels, turns a small spur-wheel, in which there is a screwed boss that acts as a nut for the long screw already mentioned. By this means the screw is worked and the column raised or lowered as the case may be. There is also a horizontal screw which moves the machine horizontally. This machine is fixed on a frame which is bolted to the top of the cap-pieces of the poppet-heads, and both the vertical and horizontal actions are worked by the portable engine. The cost of construction was £345. Annexed is a copy of a photograph showing the machine in position.

Whangarei District.

2. *Whauwhau Mine.*—This mine is distant about three miles and a half from Whangarei. The old workings are now abandoned, and a commencement has been made near the air-shaft to open out some blocks of coal which could not be readily worked from the lower adit-level. The output

from this mine for the year ending the 31st December was 4,718 tons, while the output for the previous year was 8,473 tons, thus showing a decrease in the output last year of 3,755 tons. It is only a question of a short time when the whole of the coal which can be got from this mine will be taken out. The ventilation cannot be said to be defective, but the heat that is generated by the decomposition of lime in the roof and bottom of the bords is very considerable, and renders the mine extremely hot to work in. The workings here are, however, not extensive, and the coal that can be worked will shortly be taken out.

3. *Kamo Mine.*—This mine is situate about one mile distant from the Whauwhau Mine and four miles from Whangarei, on the road going to the Bay of Islands. The output from this mine during last year was 14,373 tons, while the output the year previous was 6,792 tons, thus showing an increase in last year's output of 7,581 tons.

On my visit to this mine in January, 1888, in company with Mr. McLaren, the late Inspector of Mines, there were no workings being carried on; only a few men were employed in the original workings in taking out some pillars that had been left. I found at that time that a portion of the old workings was on fire, and ordered the manager, in conjunction with Mr. McLaren, to put proper stoppings in all the openings and shut the burning portion off. This was done, and no work is now being done in the old workings. The workings from the shaft commenced in April, 1888, and, after improving the ventilation to some extent, they have been extending the lower levels and working the coal out in bords. On my recent visit of inspection in December last the ventilation was extremely defective, but in other respects the workings were carried on satisfactorily as regards the safety of the workmen employed in the mine. I requested the manager, Mr. Joseph Geary, to have the ventilation remedied at once, and have also written the agent of the colliery, Mr. Joseph Bell, to the same effect. There is a considerable amount of coal in this mine, but it is of a soft and friable character; but it ought to be a very good household coal, and, having about from 8ft. to 9ft. thickness of seam, it should be made a remunerative mine for working.

Waikato District.

4. *Waikato Mine.*—This mine is situated about three-quarters of a mile above Huntley, on the opposite site of the river. The old workings are now abandoned: all the pillars of marketable coal that could be worked with safety have been taken out, and the whole of the workings are now carried on from the new adit-level on the opposite side of the hill.

The new workings are systematically laid out, and there is good ventilation everywhere, and everything has been done to comply with the provisions of "The Coal-mines Act, 1886." The new adit-level is constructed through 183ft. of hard limestone rock, 259ft. of metamorphic clay-slate, and 71ft. of fire-clay; and this adit is connected with the wharf on the Waikato River by a light tramway 42 chains in length, having a 2ft. gauge. The output of coal from this mine during last year was 9,720 tons, while that of the year previous was 11,240 tons, thus showing a decrease on last year's output of 1,720 tons.

5. *Taupiri Mine.*—This has heretofore been the principal coal-mine in the Waikato District. The output during the last year was 33,202 tons, while that of the former year was 29,601 tons, thus showing an increase in last year's output of 3,601 tons. The whole of the coal on the south side of the main adit is worked out, there being only pillars about 30ft. square left. The workings at the time of my last visit of inspection—19th December last—were confined to the taking out of pillars, the whole of the coal being worked previously by bords. The pillars are to be left intact under the lake or lagoon, but the manager expects to have the whole of the pillars worked out in other portions of the mine during the present year.

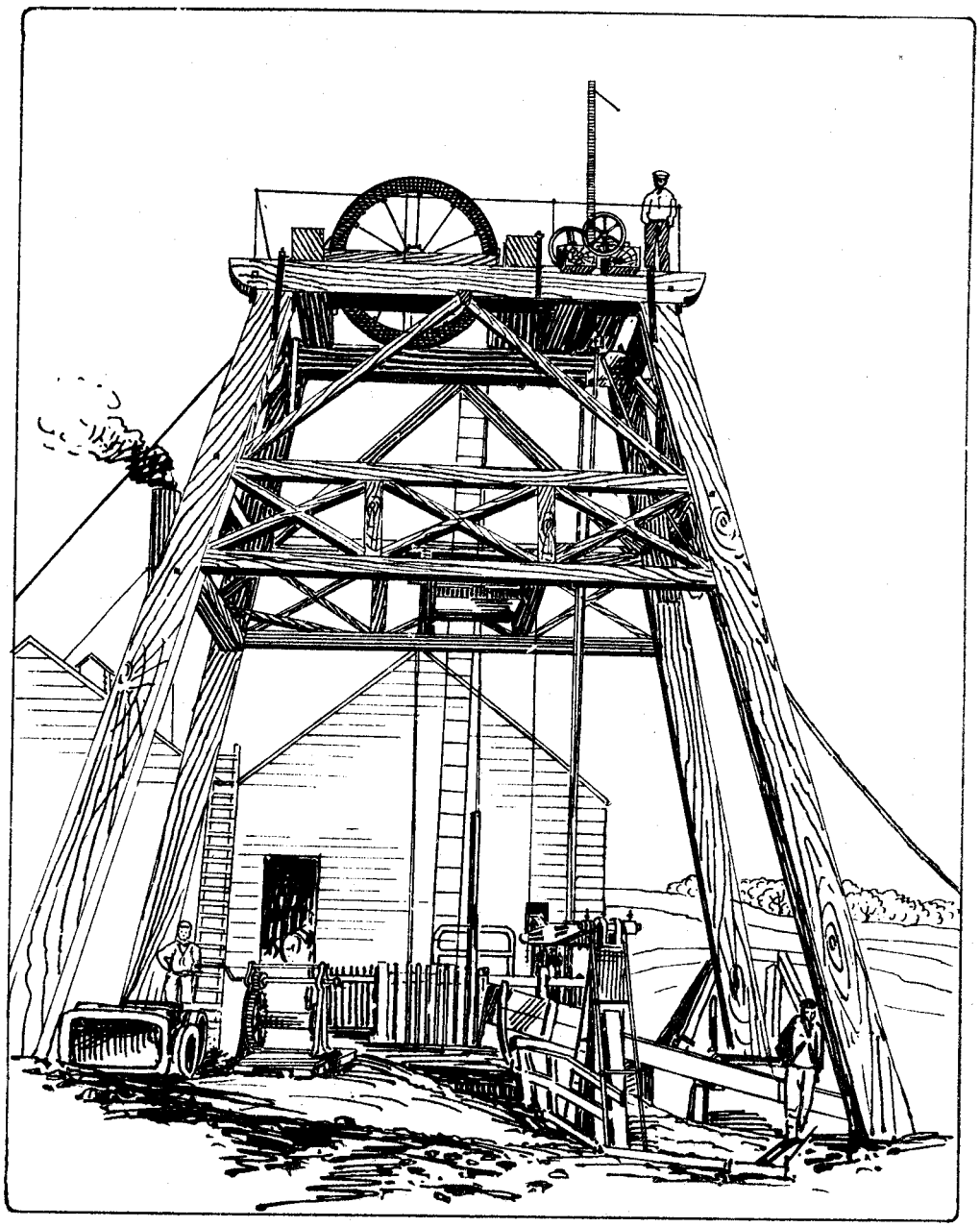
A commencement was made to sink a shaft on the company's newly-acquired property near the railway-line by driving sheet-piles through the drift which has to be gone through; but this principle of sinking has not proved a success. It was found that the shaft could not be constructed through the drift in this manner, and it was therefore abandoned. Arrangements had been made at the time of my visit to sink a new shaft with cast-iron cylinders 10ft. 6in. in diameter. This newly-acquired property consists of seventy acres, of which twenty acres has been proved by bore-holes to contain coal from 6ft. to 48ft. in thickness. The area of coal worked by this company is about forty acres.

On the 9th January, 1888, a portion of the mine was on fire; but as soon as it was discovered it was quickly stopped up, and the fire was kept under. Some time ago the stopping was opened to ascertain if the fire was fully extinguished, but it was found still smouldering, and the stoppings were replaced again.

On the 3rd February a miner, James Russell, met with a fatal accident by a fall of coal from the face. He and his mate, William Dunn, went into the face after dinner and were standing in front of the face when Dunn commenced sounding the coal to see if the face was safe, and as soon as he had done so he jumped back, but a large piece came down and fell on Russell and killed him. The coal in some parts of the mine has sooty seams, as was the case in this instance, and it came away suddenly before Russell had time to get out of the way.

On the 23rd July the water from the swamp broke into the workings, on account of a dam giving way which kept the water back. A new dam was at once constructed, and on the 27th of the same month the hole where the water came in was filled up again, and working was resumed.

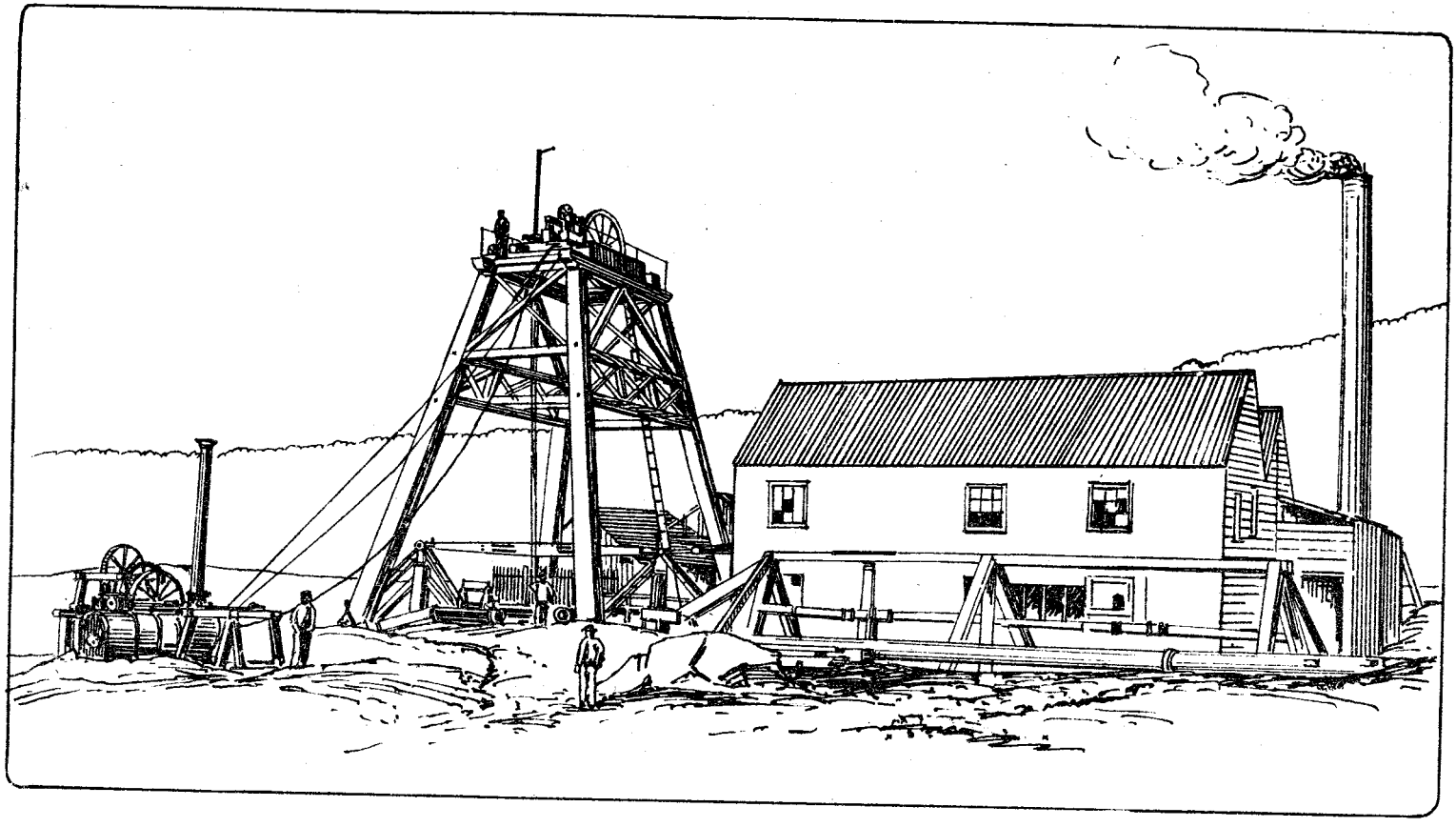
On the 19th November last one of the wooden stoppings was found to be on fire, but luckily it was observed before any great damage was done. From the appearance of the charred wood there is little doubt that this was the work of an incendiary; but the manager could not trace it to any one. It is impossible that this stopping could have taken fire unless some one had deliberately set fire to it, and then it could not have been easily accomplished. The mine is fairly ventilated, and the manager, Mr. Collins, seems to use every means to work the mine with due regard to the safety of the workman and in compliance with the provisions of the Act.



T. P. MOODY & BELGRAVE'S

ORIGINAL SCREW-LIFTING PUMP COLUMN MACHINE

Kawakawa Colliery, Bay of Islands N.Z.



T. P. MOODY & BELGRAVE'S

ORIGINAL SCREW-LIFTING PUMP COLUMN MACHINE

Kawakawa Colliery, Bay of Islands N.Z.

6. *Taupiri Reserve Mine.*—This mine is situated on the University College reserve, about three miles from Huntly, close to Lake Kimihia. The mine is worked from an incline adit. Two working-levels are opened out at right angles to the incline, and the coal worked on the bord-and-pillar principle. The output from this mine last year was 8,780 tons, while the previous year's output was 2,226 tons; thus showing an increase in last year's output of 6,554 tons. The workings of the mine are well laid out, and there is fair ventilation in the lower workings, but it is rather sluggish in the upper, which the manager promised to have remedied. The incline adit is constructed to the edge of Lake Kimihia, and it is the intention of the company to work the coal under this lake; but so far there are no workings in this direction. When mining operations under the lake are commenced the strictest supervision will have to be exercised, as there is not a large cover on the top of the coal, and the ground above the seam is, as a rule, very treacherous—liable to come away without any warning—and necessitates about 4ft. of solid coal being left on the roof, which is difficult in many instances to estimate, on account of the depressions and irregularities in the roof-covering. The coal is hauled up the incline adit by a steam winding-engine having two 12in. cylinders and a 2½in. steel-wire rope, and thence conveyed by a railway constructed by the company to a siding on the Government line, and taken to market.

This mine was opened in June, 1887, and the output up to the present time amounts to 9,006 tons. The manager, J. Ord, has done everything in compliance with the Act.

7. *Miranda Mine.*—This mine is situate about fourteen miles to the eastward of Mercer, at the head of one of the tributaries of the Waikato River, called the Maramarua Stream or Lagoon. The coal is brought from the mine down this lagoon in barges, which are towed by a shallow-depth stern-wheel steamer; and the coal from the barges is placed in the railway-trucks at the company's wharf alongside the railway, near the junction of the Maramarua Stream and the Waikato River. The mine is worked from a shaft, which is 210ft. in depth; there is also a new air-shaft constructed, 10ft. in diameter and lined with bricks throughout, with a good connection between the shafts, so that the whole of the workings are well ventilated. There has, however, been no daily record-book kept, nor plans of the workings, at the mine. The manager, Thomas Cater, left the company's employ on the 30th September last, and Thomas Shaw was appointed in his stead; but no notification of this was given, as required by section 18 of "The Coal-mines Act, 1886." The agent has been written to on this subject. The operations in this mine at the present time are very limited—only six men were employed below ground and two men on the surface. The output of coal last year was 4,600 tons, while that of the year previous was 5,300 tons.

The total output of coal from the mines in the Kawakawa and Waikato Districts for last year was 108,538 tons, as against 98,710 tons for 1887, thus showing an increased output last year of 9,828 tons.

ACCIDENTS.

There was a fatal accident at the Taupiri Mine on the 3rd February, 1888. A miner, James Russell, and his mate, on returning after lunch to the bord where they were working, were standing in front of the face, and on sounding the coal it was found to be loose, and a piece of it fell on Russell and killed him. His mate, William Dunn, managed to jump back and get clear. There was no blame attached to any one. Mr. McLaren examined the mine after the accident occurred, and attended the inquest.

I have, &c.,

HENRY A. GORDON, Inspector of Mines.

The Under-Secretary, Mines Department, Wellington.

SOUTH ISLAND.

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

SIR,— Office of Inspector of Mines, Dunedin, 7th March, 1889.

I have the honour, in compliance with section 59 of "The Coal-mines Act, 1886," to make the following report for the information of the Hon. the Minister of Mines:—

As an interim report was sent in on the 12th April, 1888, and the present report deals only with the period terminating on the 31st December last, there is only between eight and nine months' work to be considered.

During this period my ordinary official duties have occupied, with the exception of some of the usual holidays, the whole of my time. During October I was, as reported at the time, about three days attending at the Supreme Court as a witness, under subpœna, in the case of Logan *versus* the Corporation of Dunedin.

The statistical tables will be sent in with the supplementary report. I must call your special attention to the difficulty experienced in obtaining the statistics which, by section 60 of the Act, are legally due. On the 14th January I forwarded to every mine a circular and return, with an addressed envelope. In spite of this trouble, which is purely a work of supererogation on my part, there were on the 5th instant twenty-five mines whose returns had not arrived. According to custom I append herewith remarks on the various coal-mines.

8. *Wallsend Colliery, Collingwood.*—On the 10th December, 1888, twelve men were employed below ground, being divided between the north side and the dip. The roof is good, and the air was sufficient, though dependent on natural causes. It is a question whether the absence of motive-power does not constitute a breach of the Act, for the direction of the air-current must periodically change as the temperature of the mine exceeds or falls below that of the outside atmosphere, and at these periods the air of the mine must necessarily be stagnant. Special rules were exhibited, but the names of the owner and Inspector were not appended. An approved lamp has been obtained, but, as mentioned last year, no copy of the Act is exhibited. A daily report is kept, and the plan duly posted.

10. *Mokihinui Coal-mine, Mokihinui.*—On the 7th May, 1888, I visited these works, but no coal was coming out. The railway, which is a thoroughly substantial work, has been continued up Coal Creek. In August, Mr. Straw, the manager, wrote stating that work had been commenced in what is known as the "Hut Seam," but in December last, when I was in the locality, no coal was coming down. The output for 1888 was only 124 tons, but before long this property will probably be doing much to assist the production of coal in this locality.

Westport Ngakawau Coal-mine, Ngakawau.—This is the old Albion Coal-mine, which I have not visited since 1878. A new company has taken up the ground, and the owners propose to work the old mine—in which, as will be remembered, the coal was very soft—for coking purposes. The railway will be continued by the company from the Government terminus at Ngakawau to the shoots. On the 27th November nine men were employed at this work.

11. *Haylock and Young's Mine, Waimangaroa.*—Opposite the abandoned Wellington Coal Company's mine, and on the left bank of the Waimangaroa River, Messrs. Haylock and Young have cleared out an old adit with the intention of commencing a mine. At the time of my visit, on the 30th November, coal-sales had not commenced, and there was nobody about.

12. *Coalbrookdale Colliery, Westport,* has been twice visited since April last. On the 9th May, 1888, about fifty men were at work at the far end of the rope-workings, over what is known as the wooden bridge, across the right-hand branch of the Waimangaroa. The coal from this district is brought to the main haulage-road by a stationary engine. In this part of the field the measures dip very capriciously and are much troubled by faults. Across the same stream, lower down, where it is crossed by an iron bridge, an excellent area of coal is in process of development.

On the 27th and 30th November the mine was again inspected. Owing to the large demand, double shifts were at work, both in the mine and on the inclines. As the incline-drums are fitted with indicators, and the wagons carry lamps, there has been no difficulty. Beyond Burnett's Face a number of men were working pillars under a bad roof. In the Iron Bridge district the coal is very thick, but the ventilation was not by any means first class: a measurement gave 5,692 cubic feet per minute for about sixty-two men, a return which, even supposing the current to be absolutely perfectly guided, would give less than 92 cubic feet per man per minute.

The statutory reports appeared to be well kept, and the men who make the monthly inspection, under General Rule 47, have reported uniformly favourably for the last six months, with the exception of one trifling mention of the defective ventilation. Riding in trucks up the incline does not seem to have entirely ceased, and in October Mr. Brown made an example of one miner who undertook the dangerous journey. He was brought before the Resident Magistrate at Westport, and fined altogether £1 17s.

The output for 1888 shows an increase of 14,229 tons over the previous returns, and amounts to 130,171 tons, which has been raised without serious accident, the only casualty reported being in December, when John Dick was slightly injured by a fall of coal. The occurrence would not, in the ordinary course, have been reported, but the man subsequently caught cold, and, inflammation of the lungs having set in, Mr. Brown was apprehensive of trouble in the event of a fatal termination to the illness, which was naturally not due to the accident.

13. *Murray Creek Coal-mine, Reefton.*—In the last annual report the probability of eventually discovering explosive gas in this field was dealt with at some length, and it was remarked, "It requires only a combination of unfavourable circumstances to produce a fatal result. When these do eventuate, the coal-workers of this neighbourhood will perhaps acknowledge that gas does exist." As bearing on this subject I may perhaps refer to the fatal gas-explosion which occurred in the Inglewood Quartz-mine, in this immediate neighbourhood, on the 6th September, 1888, without in any way wishing to intrude on the duties of my colleague, Mr. Inspector Gow, who investigated the occurrence, and whose report will no doubt throw a good deal of light on the subject. I was not fortunate enough to take any part in the investigation of what must be considered a very interesting, if regrettable, episode in quartz-mining, so cannot venture an opinion, but the importance of the subject tempts me to give a few particulars of similar occurrences, the knowledge of which may help to prevent their repetition on our goldfields. So far as I am aware there is only one other similar explosion on record in this colony, which took place in July, 1882, in the Albion Quartz-mine, Paparoa Range, and was not investigated. This was free from fatal results. In other countries, however, explosive gas is known to occur in metalliferous deposits, as, for instance, at the Van Lead-mine, Llanidloes; at the Silver Islet Mine, on Lake Superior; at Monte Catini, in Tuscany; and at several of the Saxon mines. It also occurs plentifully in Great Britain, at the Mill Close lead-mines, in Derbyshire, where the deposit of lead-ore occurs in dark-limestone beds, immediately below the Yoredale shale, that separates the limestone from the millstone grit. This shale, whenever it occurs in bands of 25 to 35 fathoms in thickness, gives off gas, and on the 3rd November, 1887, an explosion occurred. Mr. Stokes, F.G.S., Her Majesty's Chief Inspector of Mines for the Midland District, has, as usual, been good enough to send me his report, containing a full account of this accident, which was due to a dynamite shot in close proximity to an accumulation of fire-damp. The roof of the level was thrown down, and five men were killed by the fall. Safety-lamps were used in the stopes, and every precaution taken to keep naked lights away from the gas. As an example nearer to this colony, I may mention the explosion which occurred in 1886 in the Eldorado Quartz-mine, Victoria. The gas was supposed in this case to have been derived from the subaqueous decomposition of timber in an adjoining claim, or to have drained through with water.

The Murray Creek Mine is now worked more nearly in accordance with the law. A daily report is kept, which, though imperfect, is better than nothing; an Evan Thomas lamp is used, and a copy of the Act exhibited, to which, however, only the name of the manager is appended. The air seems good, and timber is not spared.

14. *Lankey's Gully Coal-mine, Reefton,* has been visited on two occasions since my last report. On the 2nd May, 1888, the Act was disregarded, though the air was good, and a Davy lamp was said to be at the hut. On the 24th November an approved lamp was at the mine, and a proper

report was kept; the timber also was good, and a copy of the Act was exhibited; but, unfortunately, the mine had been gutted and was in a bad state. On the 7th August Mr. Aston, one of the working partners, was injured by a fall of coal, and was off work for three months.

15. *Boatman's Coal-mine, Boatman's*, has also been examined twice, but without any good effect, for the Act is disregarded.

16. *Burke's Coal-mine, Boatman's.*—The above remarks apply in this case. It is useless to examine these mines from year to year without any result. Unless legal proceedings are to follow repeated futile warnings, it would appear better to avoid the mere formula of inspecting the workings and writing to the owner letters which have no effect.

17. *Phœnix Coal-mine, Reefton.*—Some slight effort has been made to comply with my requests. A copy of the Act was hung up when I was there in May, and a report, consisting solely of the date and the information "All secure" repeated from day to day, had been written. The timber was good and air plentiful. A new man was in charge at that time, no notice of the change having been sent. On the 12th September, 1888, I wrote to the owner, and on revisiting the mine on the 24th November found things exactly the same, except that the copy of the Act had disappeared.

18. *Inglewood Coal-mine, Reefton*, commenced on the 1st October, and consisted in November of an adit about 40ft. in length. It is situated on the left bank of Murray Creek, above the Phœnix, which is on the other side.

19. *Progress Coal-mine, Reefton*, was reported last year as being in a dangerous condition. On the 3rd May, 1888, the place was better timbered, and a second outlet had been commenced. The working-place also was narrower, but the occupant was engaged holing below a loose mass of coal, with two slips apparently meeting in the coal.

At my last visit to Reefton the place was stated to be standing.

Grey Valley Coal-mines.

The most important event to be mentioned in connection with this locality is the amalgamation of the mines under the name of the Grey Valley Coal Company. This large business is now carried on under the management of Mr. Martin Kennedy and Mr. James Bishop, the former of whom occupies the position of managing director, and the latter that of general manager of the works. It is gratifying that both the commercial and engineering departments of so large an undertaking are in such excellent hands.

20. *Brunner Coal-mine, Greymouth.*—In April, 1888, there was nothing particular to report. The air was good, and the miners had recently made an examination, resulting, with very slight exception, in a favourable report. Only on one point had I to call Mr. Bishop's attention to the provisions of the Act, and this was with reference to safety-lamps. An ordinary Clanny lamp was used by the roadman, and, as this type is not approved, its use is illegal.

On the 19th November a second inspection was made, the miners being at that time distributed among the extreme rise pillars and those in the old central block, the removal of which was stopped in March, 1882. Since that date the ground has thoroughly settled, and the danger then apprehended does not now exist. At my last inspection the fireman had an unprotected Davy, to which the objection to the Clanny also applies.

On the 4th June Mr. Bishop took legal proceedings against a miner who had negligently let a truck run down an incline without attaching the chain. He was fined 10s. and costs.

During the early part of the year Mr. Bishop was engaged in prospecting further up the river from the Brunner Mine, in a 12ft. seam, dipping east at 13°, being in fact a faulted area, forming part of the east wing of an anticline which exists here. The coal, however, was not marketable, and the works were eventually abandoned.

21. *Coal-pit Heath Colliery, Greymouth.*—In my last report this mine was described as nearly at a standstill, only four men being at work. Since that time, however, it has been carried on with renewed energy, the increase being greater for the year than that of any colliery in the Island. In April, 1888, fifty-eight men were employed below ground, and the air was, as usual, ample in quantity, there being an intake of 16,636 cubic feet per minute into the No. 2 Level; but it was very unduly warm, owing to the presence of steam-pumps in the main intake. The register of boys was incomplete, there being no separate mention of those employed above ground. The plan was not kept at the mine, and, though spragging was tolerably regularly attended to, in some cases the timber was set so nearly vertical as to be useless for that special purpose. With regard to the ventilation, I suggested to Mr. Elliott that, in default of moving the pump, it should be built off, and ventilated by an overcast into the return. The refuge-holes, too, which were in some cases made receptacles for rubbish, were mentioned. In a letter written subsequently I called attention to these points, and also to the fact that an unprotected Davy was not an approved lamp. In July Mr. Elliott wrote stating that the steam-pipes in the shaft would be covered, and that alterations would be made at the pit-bottom to prevent so much steam going into the intake; also that the refuge-holes had been cleared out, the register of boys properly kept, and the Davy lamps protected. The plan, he also informed me, had been sent back to the mine.

On the 5th November Mr. T. Alexander, who was formerly manager of this mine, had resumed the position, under Mr. Bishop, but no notice of the change was sent to me. Though the pumps were still in their old position, some pipes in the shaft had been replaced, and preparations for the entire removal of the machinery were progressing. On the completion of these, it was proposed to bring the steam down the backheading.

The Coal-pit Heath dip will probably be extended up-hill through the Brunner ground, and one result of the amalgamation will be to abolish the old and inconvenient Coal-pit Heath winding-shaft, and to send all the coal by an engine-plane into the Brunner. The old shaft will then be used solely as a downcast.

During my inspection I failed to find any gas, and the bords were moderate in width, one being, however, 24ft., which is excessive. Plan up to date. As mentioned in my report of the 5th May, 1885, the method of unhooking the set of trucks at the top of the engine-plane was unsafe; and, although I sent a sketch of an automatic detaching-gear to Mr. Alexander, nothing was done until Mr. Bishop took charge, when one was put on. The old back-head of the main incline having fallen in, it becomes necessary, in order to avoid having the steam-pipes in the main incline, to drive a new road, which will be undertaken. The cage is still unfitted with safety appliances to prevent its fall down the shaft (General Rule 23). As this has been the subject of some correspondence with the head office, I need do no more than record the fact.

22. *Tyneside Colliery, Greymouth,* was in April last a little better in condition than when visited during the previous year. The Act was still not properly exhibited, and the machinery report was unsigned; nor was there any approved lamp. The furnace, too, was distinctly insufficient, being built only of stones and clay, with an outlet among timber. In reply to a letter on these points, Mr. Hodgson wrote that they were attended to. On the 16th November Mr. Dando was in charge, and the place was better ventilated, brattice-cloth being freely used. The ground was full of faults, and the quantity of water too great for profitable working. Two sets of special rules were hung in the smithy, but the names of the former owner and manager were appended. A new furnace had been erected, but by no means in accordance with the law. Reports and a plan were kept, the latter undated. A few days later this mine was closed down.

23. *Greymouth Wallsend Colliery, Greymouth.*—On the 26th April, 1888, the ventilation was as follows (fan running twenty-three revolutions):—

Main east intake	21,511	cubic feet per minute.
Main west return	15,015	" "
Total	36,526	" "

In one place the air registered a velocity of 31ft. per second—a very excessive rate, especially as a Davy lamp appeared to be used by the fireman, and, as is well known, these are unsafe in an explosive mixture having a velocity of 6ft. to 10ft. per second. The measurement above referred to was made in the main return from the dip, which gave 11,315 cubic feet per minute, and, as the whole return for the west side was only 15,015 cubic feet per minute, the small balance of 3,700 cubic feet per minute was left for the rise workings—an obviously inadequate quantity, as was proved on examination. Shots in leading places were not fired, Mr. Elliott informed me, until the preparations for firing had been examined and approved by a deputy; and in the dip, where the volume of gas given off was considerable, no explosives were used. The mine appeared to be carefully managed. The code of signals painted on a board or plate near the pit-bottom had become almost illegible, and the safety-cages which were referred to in last year's report had not been provided, as in the case of the Coal-pit Heath Colliery. This formed the subject of correspondence with the head office.

On the 12th May an accident, which was owing to the negligence of two miners, occurred here, and was followed by prosecution of the offenders. Both occurrences are dealt with elsewhere in this report.

On the 26th July Mr. Elliott wrote that a new signal-board was being made, and also cases for the Davy lamps.

The last inspection was made on the 20th and 21st November, 1888, when the air on the west side was still somewhat deficient, though in other parts of the mine amply sufficient. This was explained as being due to the presence of water in the return air-way. The water had accumulated during the temporary and unavoidable stoppage of the pump. To prevent a recurrence, Mr. Bishop, who had taken charge, proposed to sink the rise-shaft to the level of the other, and to have buckets always in readiness in case of failure of the pumps. Some of the refuge-holes on the east side required cleaning out: it is very important that this should be done where the seam is so steep and tubs heavy. The mine generally appeared at this time to be well worked, and spragging was excellently carried out.

24. *Springfield Colliery, Springfield,* was visited in April and October, and, as usual, calls for no remark. The Act appears to be generally thoroughly observed, and the number of men employed is only seven or eight. Mr. W. Moore, who has been for many years connected with the management of the mine, has left.

25. *Canterbury Colliery, Sheffield.*—On the 17th October, 1888, I found the old mine on the point of closing, three men being ordinarily employed. Mr. Austin had erected a ventilating apparatus which appears to me worthy of record. About 300ft. of wooden box-piping, measuring 8in. by 10in. inside, and terminating in a wooden chimney, in the bottom of which was a double-burner broad-wick kerosene lamp of the type used for cooking, gave, Mr. Austin stated, a very good ventilation. With a little alteration in the way of an iron or drain-pipe chimney, it seems to me this might be made to ventilate many prospecting drives and works of that nature.

A new shaft 5ft. 7in. in diameter, the commencement of which was duly notified, had been sunk to a depth of 150ft. It is proposed to put down a drive 480ft., to cut the coal and connect with this shaft. A two-horse-power pump has been placed on the ground, and, as the Hawkins River, which was formerly the great obstacle to trade, has been bridged, we may hope for an increased output for the current year.

26. *Homebush Colliery, Glentunnel.*—The last report on this mine was distinctly unfavourable, principally on account of there being no artificial ventilation, no approved lamp, and no survey for sixteen months. At my last visit, in October, 1888, there was still no furnace or other mechanical means of ventilating the mine, and the main return air-way was unnecessarily tortuous and small. Work was suspended on that day on account of a fall in the main road. The plan had been recently made up, but it did not seem quite accurate, so I abstained from taking a copy. With the exception of ventilation, the mine appeared to be in good order.

29. *Stobwood Coal-mine, Rockwood.*—In August Mr. Nimmo wrote, stating that a flood had so seriously damaged the mine that it had been closed on the first of that month.

30. *Whitecliffs Coal-mine, Whitecliffs.*—In May, 1888, Mr. Leeming wrote that he had abandoned the old drive, and commenced a new mine on the same lease, which I visited in October, finding the workings in a 5ft. 6in. seam, without any return air-way. An approved lamp was on the ground, and a copy of "The Mining Act, 1886," which Mr. Leeming had procured in error. The plan was nine months old; but, as only five men and two boys are employed, it would appear unnecessary, speaking strictly according to the Act, to keep one at all. A daily report was kept, and altogether the inspection was very satisfactory.

31. *Mount Somers Coal-mine, Mount Somers.*—It was somewhat surprising, on visiting this mine on the 22nd October last, to find that Mr. Jebson had done little or nothing to observe the Act. There was no safety-lamp at this mine, though one was said to be at the house of Mr. Wright, the owner. A plan was stated to be at Mr. Jebson's house, but, as only four men are employed below ground, it is unnecessary, under section 40, subsection (4). No report was kept, nor was any copy of the Act exhibited. Mr. Jebson was still acting as manager and contractor, in contravention of section 18. On the 9th November Mr. Wright wrote that, as Mr. Jebson's contract has expired, he was legally in charge of the mine.

36. *St. Andrew's Coal-mine, Papakaio,* was in August closed by a quantity of sand and gravel. Mr. Nimmo duly reported this occurrence, and also wrote on the 29th September stating that mining had been resumed.

37. *Ngapara Colliery, Ngapara,* was not visited during 1888, and is merely mentioned to record the fact that the owner, Mr. James Nimmo, died in October last. Mr. Nimmo was a mine-manager of great experience and skill, who, although never engaged in any of the larger colonial enterprises, had been in charge of extensive undertakings elsewhere: his death is a distinct loss to the mining community.

38. *Shag Point Colliery, Palmerston.*—Inspected 6th July, 1888. A heavy weight had overspread the lower-seam workings in May; and the north side, comprising five bords, had closed in, the south side having suffered somewhat less severely. Even at the time of my visit the ground seemed hardly settled. On the south side the air was pretty good, on the north side *nil.* Daily and weekly reports were kept. The new shaft is used for a downcast, and ventilates the upper-seam workings alone, in which were, at the time of my visit, about twelve men, whose air depended on about 6 chains of brattice. In the other workings the air was dependent on about 2 chains of brattice, and was consequently sluggish. I pointed out to Mr. Williams that I did not think it advisable, for the safety of the men and ventilation of the mine, to depend so much on brattice, and he stated his intention of driving another road below the existing level. My views on the subject were repeated in a letter of the 9th July.

On the 2nd November, 1888, the lower-seam workings were still approached by a brattice-road, only three of the south-side bords being at work—the other had fallen in. At the extreme rise the air was as nearly as possible stagnant, while in the lower places it was much better: the fact was, the latter were properly stopped off, while the top bord but one was only fitted with a screen, which leaked very much. I traversed, with Mr. E. Clarke, underground manager, the air-course from the top bord, and found it in places almost impassable. The main intake from the north shaft measured on this occasion 997 cubic feet per minute. In the upper workings I found the air at the top moderate, and some roads to cut off the brattice nearly finished. A road was also being driven across the old workings towards the manager's house, to form an additional communication. It was also proposed to drive a new air-course, for the purpose of avoiding contact with the foul air which at present intrudes on the main level. Mr. Williams has an idea of working to the boundary and coming back with the coal. In my opinion this would solve most of the difficulties under which the mine has so long laboured.

The reports were duly kept, and the Act appeared to be observed. When Mr. Williams has perfected the ventilation, which seems really to be improving, there will be little or no fault to find.

39. *Allandale Colliery, Palmerston.*—Mr. McIntosh has been engaged in developing the colliery during the year, and has discovered some new and apparently valuable seams. It is intended, I believe, to lay down a tramway to the main line, when the coal, which is of the excellent quality usually produced in the district, will no doubt become more generally used. In June, 1888, there were no proper refuge-holes, and no names appended to the Act. An approved lamp was on the premises, but no report was kept. In September I found that the report was kept, but not signed. Air and timber moderately good.

47. *Kyeburn Coal-mine, Kyeburn.*—In August, 1888, Messrs. McCready and Coombes wrote that on the 19th of that month somebody had maliciously removed timber in their drive, causing it to collapse.

50. *Alexandra Coal-mine, Alexandra South.*—On the 1st November, 1888, Mr. Thomson wrote that the shaft was fenced and covered at the brace, and that there were sloping ladders in the air-shaft.

54. *Dairy Creek Coal-mine, Clyde.*—In April, 1888, Mr. Collins wrote that he had procured a safety-lamp, and would keep the regulations.

65. *Fernhill Colliery, Green Island.*—In April, 1888, the Silverstream Water-race, which supplies the City of Dunedin, broke into this mine, flooding a portion of the workings. Mr. Gray reported the occurrence, which was unattended with personal injury, and which subsequently became the subject of an action in the Supreme Court. As already stated, I was summoned under subpœna to give evidence on the case, which lasted several days.

On the 4th July, 1888, the men were all employed in the old drive at the terminus of the aerial tramway, as the recently-used exit from the mine had become damaged by the flood already referred to. The air was not very good, as a communication for ventilating purposes required

completing. The plan was not on the works, nor was a copy of the Act exhibited. The requisite names were not attached to the rules. I directed Mr. Gray's attention to these points—verbally at the time, and subsequently by letter.

66. *Green Island Colliery, Green Island.*—On the 12th July, 1888, Mr. E. G. Allen, agent for the colliery, wrote asking permission to have the plan made up annually, instead of every three months. In reply to a communication to the head office, forwarding the application, I received a letter stating that the extension of time was prohibited by the Act, but calling attention to the exemptions under section 40, subsection (4). On the 28th August Mr. Allen called, and pointed out that, as only six men and a boy were employed below, the mine appeared to come within the exemption; at the same time he promised that the survey should be occasionally made. On the 13th September I found six men below ground carrying on the workings in the district east of the railway-line. A copy of the Act was at the mine, but not exhibited; air not very good; approved lamps on premises. The manager informed me on this occasion that he had purchased a business which would prevent his constant attendance at the mine, and wished to know whether it would be requisite for him to attend every day. As the "control and daily supervision" of a manager furnished matter of controversy in Great Britain for a number of years after the passing of the 1872 Act, I was glad of the opportunity to obtain a decisive opinion on the matter: such was contained in your letter of the 27th September, 1888, as follows: "It is clear that section 18 of 'The Coal-mines Act, 1886,' requires daily personal supervision of the manager."

On the 10th October, 1888, I found the mine mostly closed in, a heavy weight having come on the end of the level. The Act was still not properly exhibited, and no names were attached, and there was little or no air. Mr. Richardson was away.

67. *Saddle Hill (Christie's No. 1) Coal-mine, Saddle Hill.*—As stated to be probable in last year's report, this mine has been abandoned, and on the 26th September the material was being taken out.

68. *Saddle Hill (Christie's No. 2) Coal-mine, Saddle Hill.*—On the 26th September, 1888, I found this mine at work, with a shaft for a second outlet. No report had been kept for some time, owing to the manager having been incapacitated by an injured hand for writing. The air was good. Copy of Act not brought over yet from No. 1 Mine. On the 12th October I found a boy of eleven driving a horse out of the mine. He was not regularly employed, but merely amusing himself. It is, however, dangerous for children to work about mines.

69. *Saddle Hill Colliery (formerly known as McDougall's).*—On the 12th September, 1888, Mr. McDougall gave up working this mine, and sent me notice on the 15th October. When I looked round on the 26th September the drive had fallen in nearly to the mouth, and was entirely unfenced. The shaft-mouth was very insecurely protected, a few slabs thrown across being the only fence. The property is in the hands of the National Bank of New Zealand, and on the 1st October I wrote to the manager at Dunedin, requesting attention to the insecure state of the drive and shaft, and mentioning the necessity for registering the plan.

70. *Glenochiel Coal-mine, East Taieri.*—At this small colliery the Act is not kept, as I have frequently stated on former occasions. Every means other than prosecution has been tried, and, as the institution of that final resource is in the hands of the Minister, I must leave the matter where it is.

71. *Walton Park Colliery, Green Island.*—Special rules have at last been established for this colliery, which is, as usual, carefully worked. On the 10th October the only omission consisted in the absence from the exhibited Act of the names properly to be added. On the 13th December William Jordan had two fingers crushed by a prop which he was endeavouring to set.

72. *Abbotsroyd Colliery, Green Island.*—In the winter of 1888 Mr. Freeman commenced a new shaft to ventilate the far workings. In September, however, before the connection was established, a fire broke out near the main level. Mr. Freeman sent me word immediately, stating that he did not anticipate any danger to the mine, as, if the air-way became choked, they would get good warning by the smoke coming back on them. On this point I was not quite satisfied, as the fire was smouldering close to the main level. The pillars are very thin, and in the event of the fire breaking through the men would have been completely shut off from all chance of escape. I visited the mine on the day following the evening on which the notice arrived, and got Mr. Freeman to put a man on at night to keep watch on the main road. This was on the 26th September. To connect with the new shaft it was required to drive 55 yards; but the air was very bad. I visited the place several times during the next few days, and on the 5th October the air was so impure that the men had to come out. On the 8th October Mr. Freeman reported that a new fire had been discovered by the watchman about 6 a.m. on the 6th, close to the main level. This naturally prevented the men working in the far end, and when I was at the mine on the 10th they were all engaged close to the mine-mouth. The Act is generally kept, and the ventilation will probably be better when the new shaft and furnace get to work.

73. *Mosgiel Colliery, East Taieri.*—Well worked, and the Act generally observed.

74. *Brighton Coal-mine, Brighton.*—On the 15th September I found that Mr. Walker had done nothing to observe the law. The mine is on a very small scale; but at the same time there are no absolute exceptions under the Act. Mr. Walker wrote on the 26th September saying he would get a safety-lamp at once. He had, it appeared, applied at a shop in Dunedin, and had been asked three times the English price, which he rightly considered excessive.

77. *Fortification Coal-mine, Milton.*—As mentioned in previous reports, this mine has been for some time badly worked. The natural result has taken place, and the workings were abandoned in August last.

81. *Benhar Coal-mine, Balclutha.*—In August, 1888, Mr. Nelson wrote that, as the east side of the mine threatened spontaneous combustion, it had been shut up, and only the west side was being worked.

84. *Kaitangata No. 1 Colliery, Kaitangata.*—This shaft has not been used for drawing coal during the year, but has been enlarged and relined; a Tangye pump has also been placed at the bottom. On the 6th June Mr. Shore wrote asking for permission to work temporarily in the shaft without a safety-hook, as Mr. Watson (the general manager) was at that time in England, and was expected out shortly with all the latest improvements in safety-gear. It appeared reasonable to delay the erection of an appliance of this sort until the best could be got, so I gave permission, without prejudice to withdrawing it if necessary.

85. *Kaitangata No. 2 Colliery, Kaitangata.*—The engine-plane workings comprised under the above name have, as usual, supplied the output. The ventilation on the 6th November was 27,300 cubic feet per minute in the main return. Most of the men were on the south side. To the dip of this district a communication has been made with the stone-drive from the old workings. The air throughout was good, and the mine in good order.

93. *Smyth's Coal-mine, Gore* (27th July, 1888).—Badly worked. Open-cast.

97. *Gore Coal-mine, Gore* (27th July, 1888).—The old tunnel. Standing.

98. *Gore Coal-mine, Gore* (27th July, 1888).—New open-work mine.

99. *Croydon Coal-mine, Croydon.*—Mr. Tweedie commenced working here on the 2nd May, and omitted to send me any notice. On the 13th August I visited the mine, and found two men working a 9ft. seam of coal, very full of backs. No copy of the Act was on the ground, nor any safety-lamp, though the workings were below ground. A report of an incomplete character was kept. Workings rather short of timber, in my opinion. In September working ceased.

103. *Cullen's Coal-mine, Waikoikoi.*—On the 16th August I visited this small open-work mine, which was started about a year previously. It is on a small scale, and will probably not do very much.

104. *Mainholm Coal-mine, Waipahi.*—This is on a much larger scale, and has been at work for two years. The seam is 14ft. thick, nearly level, and is worked open-cast. The coal is sent away by railway, to which it is carted over a bridge which is entirely unsafe, but which the local authorities seem unable or unwilling to repair.

105. *Mapp and McKenzie's Coal-mine, Pukerau* (28th July, 1888).—When visited, this min was full of water, and apparently abandoned.

106. *Pukerau Coal-mine, Pukerau* (28th July, 1888).—Messrs. Mapp, O'Hagan, and McKenzie have now acquired this property, and Mr. O'Hagan is manager, They have been careful to send the requisite notices. On the 28th July the mine was in good order, and the air good. The workings had been timbered. There was no copy of the Act at the mine, and the report was said to be at the house. I wrote requesting that it might be kept at the mine, and that the Act might be exhibited. Shortly after, Mr. McKenzie wrote that these points should receive attention.

McGillivray's Coal-mine, Otikarama, was visited on the 28th July, 1888. As it seems to be worked at present solely for the use of the owner I have not included it in the list. It is an open-work face.

107. *Enterprise Coal-mine, Pukerau* (28th July, 1888).—I was at this mine about a month subsequently to its commencement. It is situated about half a mile to the south of the Pukerau Coal-mine.

108. *Waimea Coal-mine, Riversdale,* was included in last year's statistical table, but had not at that time been visited. It is now an open-work quarry, the drive formerly worked having been abandoned.

109. *Otama Coal-mine, Otama.*—Open-work. Worked about three years. The owner lives at Gore, some miles away, and a boy of sixteen informed me that he sometimes works at the coal.

110. *Mataura Coal-mine, Mataura;* and

111. *Mataura Coal-mine, Mataura,* are both open-work mines, and were visited on the 27th July, 1888.

112. *McGowan's Coal-mine, Mataura.*—A new open-work mine on the south side of the river. Visited 14th August, 1888.

113. *Sleeman's Coal-mine, Mataura;* and

114. *Townshend's Coal-mine, Mataura,* are open-work lignite-pits, worked in both cases on a very small scale. They were visited on the 15th August, 1888.

117. *Sarginson's Coal-mine, Waikaka,* must not be mistaken for the old Sarginson and Telfer's mine on the reserve. It is situated on Mr. Sarginson's private land at Bird's Park, and is well worked by stripping.

118. *Nightcaps Coal-mine No. 1, Nightcaps.*—Visited 1st August, 1888. Only one man. Mine in good order, but weighting a little. I do not think a man ought to work alone in a place which is on the weight. Approved lamp used.

119. *Nightcaps Coal-mine No. 2, Nightcaps.*—In the end of 1887 Mr. Lloyd found a new 15ft. seam 9ft. above the old thick seam, and when I visited the locality in August, 1888, this was being worked. The output for 1888 has been very small—a decrease, in fact, of 6,354 tons: this was because the company was not successful in obtaining the railway contract. The Act was not hung up, but general rules were exhibited, and the mine was in good order.

120. *Wairio Coal-mine, Nightcaps.*—Visited 1st August, 1888, when it was open-work. Mr. Knight has, however, a tunnel, into which he retires when the weather is bad.

121. *Flett's Coal-mine, Nightcaps.*—A new open-work mine. Visited in August, 1888.

122. *Morley Village Coal-mine, Nightcaps.*—A new open-work mine. Visited in August, 1888.

124. *Hokonui Coal-mine, Winton.*—Visited 2nd and 11th August, 1888. On the former occasion I found twelve men at work below ground, and the Act not fully observed. I had to find fault with one man, whose name I did not ascertain, for working underneath a small piece of loose coal. On the latter date I visited the mine for the purpose of inquiring into a fatal accident which occurred on the 9th, and for an account of which I must refer you to the portion of this report devoted to details of accidents.

125. *Fairfax Coal-mine, Fairfax* (31st July, 1888).—The inspection of this mine was made under rather unfavourable circumstances, as I was unfortunately late in arriving, and, as it was a dark night, and the mine is worked open-cast, I was somewhat at a disadvantage. It appeared, however, to be, as usual, well worked.

126. *McDowall's Coal-mine, Fairfax.*—On the 31st July, 1888, I found that the surface had slipped over the mine's mouth, and the place was abandoned.

127. *Isla Bank Coal-mine, Fairfax* (31st July, 1888).—Open-work, but not well worked, the face being vertical, or even overhanging.

128. *Orepuki Coal-mine, Orepuki.*—On the 30th July, 1888, no mining was going on, but an extension of the tramway was in course of construction, and what mining had been carried out by the present owners was well done. The old shaft was properly fenced and secured.

129. *Popham's Coal-mine, Orepuki,* is situated in the bush on the banks of the Waimemea Creek, and is approached by the worst road I have seen in the colony, It was in July open-cast—a mere hole, very dangerously worked, by the river-bank. Mr. Popham stated, in reply to a warning letter, that he was only prospecting.

ACCIDENTS.

It is very gratifying to be able this year to record a substantial diminution in the number of accidents. Instead of thirty-one separate accidents, injuring thirty-four persons, of whom four died, we have seventeen separate accidents, injuring the same number of persons, or exactly half as many as last year. Unfortunately there were three deaths.

It is noticeable that the great reduction is in "falls," there being eight fewer accidents from this cause in 1888 than during the previous year. There are also four less owing to trucks below ground. Of the total decrease in persons injured, which is seventeen, ten may be credited to the Greymouth Wallsend, where, with practically the same output, only three men were hurt, as against thirteen in 1887.

As usual, I am indebted to Mr. Inspector Gow for a list of those accidents which are investigated by him on the West Coast. This enables me to give the following classification, and calculate death-rates, &c., when the returns come in:—

Classification of Accidents during 1888.

	Separate Accidents.		Persons injured.	
Below—				
Trucks	2		2	
Falls of roof and sides	9		9	
Gas-explosion...	1		1	
Falls of timber	2		2	
	—	14	—	14
Shafts—				
Sinking—	1		1	
	—	1	—	1
Above—				
Machinery	1		1	
Fell off coal-seam	1		1	
	—	2	—	2
Total		17		17

REMARKS ON ACCIDENTS.

At the time of my last report, in April, 1888, two lives had already been lost, both in what may be classed as prospecting-works, the total output of one being for the year *nil,* and of the other 30 tons. Since then one man has been killed at Hokonui Colliery. In the following remarks is given any information which appears of interest or likely to lessen the chances of similar occurrences in the future.

No. 3. John Kenyon, then underground manager at Shag Point Colliery, was injured on the 13th February last by a piece of timber falling on him while he was endeavouring to set it. He was off underground work for six weeks.

Nos. 5 and 6 were reported on in detail last year.

No. 8. On the 12th May, Robert Cherrie was very seriously injured at the Wallsend Mine by a runaway full truck. I was on the West Coast at the time, and was instructed to investigate and take proceedings under the Act if thought necessary. An inquiry proved that the cause of the accident was very simple. The seam is steep, and in the rise-headings the descending truck is lowered after being attached to a chain passed round a prop: the other end of the chain brings up the empty, and the arrangement is, in fact, a rough self-acting incline, on which the empty comes up, is filled, sent down, and then detached. In this case the full truck had become detached while at the top, no one apparently being able to give an explanation. At any rate, when two men (Jones and Turk) pushed it over the brow it ran away and severely injured Robert Cherrie, who was working below. As failing to secure a truck is a clear breach of Special Rule 54, I laid informations against Jones and Turk, and the cases, which were not pressed, were heard before Major Keddell, R.M., at Brunnerton, on the 21st May. As both defendants pleaded guilty, they were fined in the mitigated penalty of 10s. each, and costs 9s. It is obvious that without very secure hooks the above system of lowering trucks is distinctly dangerous; and in August Mr. Elliott wrote, in reply to a question from me, that a new pattern of crook had been adopted, which had so far never come loose.

No. 13. Fatal accident to Charles Bailey. This occurred on the 9th August, 1888. On the 2nd of the month I had inspected the mine (the Hokonui Coal-mine, Winton), as already stated. The fatality

was duly reported by Mr. McCulloch, R.M., and the manager, and on the 11th I inspected the place, and attended the inquest. It was simply the old tale of a clay back, and people who never will believe in the existence of these universal sources of danger until they see a man absolutely killed. I am weary of witnessing the needless loss of life and limb which is due to this cause. This was outcrop coal, with a very slippery roof, and yet the witnesses were unanimous that they could see no danger ahead. The manager gave evidence which requires notice: "I did not visit the men at all that day during working-hours, which are between 8 a.m. and noon, and 1 p.m. and 5 p.m. If I had visited the mine in working-hours that day, and had found a man holing with part of the cutting done, I should have, if I had deemed it unsafe, caused him to put in a sprag." This is what I complain of as filling the accident-lists. "If I had deemed it unsafe" is the point. My contention is that in this colony holing without sprags in any but some of the woody brown coals and lignites is invariably unsafe, and that, so long as managers delay to order timber until they see men in a position of imminent danger, so long will valuable lives be sacrificed to what is simply a stubborn disinclination to adopt any precaution which has the slightest suspicion of novelty about it. Mr. Shore informed me subsequently that he had visited the mine during working-hours, but had forgotten the fact when giving evidence. The verdict was "Accidental death."

Number of Coal-mines.

Last year we had 119 mines on the list, and this year 121; the increase is therefore 2. Fourteen mines have been struck off, and 16 added. Of the former Brockfield was the only one of any importance.

Methods of Working.

Worked by shafts—		
Steam-power used ...	7	
Horse-power ...	4	
	—	11
Worked by adit—		
Engine-plane ...	9	
Horse-power ...	11	
Self-acting incline ...	3	
Hand-power ...	44	
	—	67
Open-work ...		43
		121

Certificates.

The use of certificates will not become compulsory before the 17th August, 1889; but, as a very large number of service certificates was issued, the supply will probably be at first, and, indeed, for some time, quite equal to the demand. At the same time inquiries about examinations are being made, and there is a class of men in the colony who possess no certificates, and, being at present not in the position of managers, are anxious to qualify themselves. It is exceedingly difficult for such as these to obtain any assistance in this direction. The Otago University School of Mines, it is true, offers a very complete curriculum, but one of considerable length, and requiring as a commencement a good education. The lectures, too, are mostly held at hours when a student who is engaged in earning a living cannot attend. Certainly a good many are going in for a mining career, and I am pleased to have been the means of introducing two of these to Messrs. Bishop and Shore, of the Brunner and Kaitangata Collieries. At these works, where there is much to learn of a very useful nature, and where the learner will be sure of a good example, two students have commenced within the last few months to spend the recess, not exactly as articled pupils, after the routine we went through at Home, nor yet precisely as engaged on the staff of the mine. They will be, however, allowed to see everything about the works, and will assist the manager to the best of their power. The time spent thus will presumably be counted by the Examination Board under "The Coal-mines Act, 1886," as time spent underground in mines. This education will turn out, provided all things are favourable, an excellent class of managers, and, as it is upon these that the whole fabric of success in regulation and inspection of mines depends, I may be pardoned, perhaps, for dwelling for a short time on the subject.

I have, &c.,

George J. Binns,

Inspector of Mines.

The Under-Secretary, Mines Department, Wellington.

Mr. G. J. Binns, F.G.S., to the Under-Secretary of Mines.

Supplementary Report.

Sir,— Dunedin, 7th June, 1889.

I have the honour to make the following report on the coal-mines of this Island for the period commencing on the 1st January, 1889, and ending at the present date. The numbers refer to the table of statistics sent in on the 25th ult.:—

11. *Haylock and Young's Coal-mine, Waimangaroa.*—Visited on the 30th March. Nothing had been done since my visit in November, 1888.

12. *Coalbrookdale Colliery, Westport.*—On the 30th March, 1889, I made an inspection of this colliery, and found what is known as the "Wooden Bridge District" nearly worked out. Part of the coal has been denuded from the surface of the seam by a crack which has filled up the channel with auriferous gravel, from which the miners obtained a nice prospect of gold. In the Iron Bridge District, which is in process of being opened up, the coal is in places 27ft. thick, and is everywhere of excel-

lent quality. The air in this district was much better than at previous inspections, but by no means excessive in quantity. Still, it is guided by brattice-cloth, and the motive-power is a new furnace measuring 9ft. by 6ft., which insures a regular current. The intake to the south side of this district measured 11,480 cubic feet per minute for about forty-four men—an ample allowance if none were lost. The main return registered 27,349 cubic feet per minute, the usual return being, it was stated, 31,400 cubic feet when measured by the anemometer belonging to the Miners' Association.

The Act generally appeared to be very carefully observed, and a copy was exhibited, as were also special rules. Reports were kept, and if the men had been a little more regular in setting sprags there would have been no fault to find. In order to have plenty of new ground opened up the main endless-rope road is being continued for 70 chains, and beyond this will be a tramway 20 chains in length. By this means the Coalbrookdale area will be tapped and at least 60 bords commenced, all of which will be open to daylight.

On the 19th January, 1889, a very melancholy accident occurred on the surface-incline, illustrating once more the danger of even walking over this part of the works.

15 *and* 16. *Boatman's and Burke's Coal-mines, Boatman's.*—On the 7th January last I wrote to the owner of these two mines regarding his continued opposition to the law, and have since received no answer. I must therefore recommend that in the event of no improvement being evident at my next visit, legal proceedings be taken.

18. *Inglewood Coal-mine, Reefton.*—The manager wrote notifying his name and address, and stating that he had obtained an approved lamp.

20. *Brunner Coal-mine, Greymouth.*—On the 20th March only eighteen men were employed here, all working at pillars in the rise district. The places seemed carefully worked, and a large proportion of coal appears to be extracted.

21. *Coal-pit Heath Colliery, Greymouth.*—Inspected on the 16th, 21st, and 26th March, when sixty-eight men were employed below ground. The air was plentiful, and much cooler than has been the case for some time, as two of the pumps had been moved behind the shaft-bottom, and were ventilated into the return. The new drive, which will enable the coal from this mine to be hauled through the Brunner lease, was then within 5 chains of completion, but the abandoned places through which it was driven were not fenced. Reports kept, and the miners' inspection regularly carried out. A proper register of boys was kept, but no copy of the Act about the office. On approaching the fault, the seam, as will be remembered, separates into an upper and a lower division, and in the upper portion of the lower workings the latter was being worked. On the 26th March I examined the shaft, and found it generally in bad repair. It was stated to have been too wet to be examined on the 23rd, but there was no record of previous inspections, and altogether the subject seemed to receive insufficient attention. The cage-covers were not properly arranged: instead of being hung on a hinge, so as to be readily lifted by persons "within the cage" (General Rule 15), they were rigid, and it required the united efforts of the colliery fitter and another man for about fifteen minutes to remove one of the covers—finally another man had to be called in—and this took place when the cage was at the surface, in daylight. Below ground, I had occasion to point out that spragging was not properly carried out.

On the 27th April I communicated with Mr. Alexander, the manager, with reference to these points, and on the 21st May received a letter stating that all had been attended to except the cage-covers, which had been allowed to stand over in the expectation of cessation of winding at this shaft.

23. *Wallsend (Greymouth) Coal-mine, Greymouth.*—Since the commencement of the year this pit has been inspected once—viz., on the 18th, 19th, and 20th March. The air generally was pretty good, though not excessive in quantity. On the east side the return was 16,802 cubic feet per minute, and on the west side 25,200 cubic feet. We found gas in two or three places only. The mine was off work. On the 20th a couple of Settle's patent water-cartridges were tried, which, though apparently quite flameless, do not seem very satisfactory when their action in bringing down the coal is considered.

On the 19th March I examined the shaft, and found it in good order, with very little loose rock in any part. In one place a soft stratum has cut back, and a little brickwork will be required. The sliding gates at the pit-mouth were formerly too low, and seemed dangerous, but this has been provided against by the addition of a top rail. Reports are kept, Act and rules exhibited, lamps much better cleaned, and, generally speaking, the pit seems carefully worked. There are still no safety-cages.

29. *Stobwood Colliery, Rockwood,* is again at work, but has not been visited during the year.

32. *Wharekuri Coal-mine, Wharekuri* (6th February, 1889).—Worked then on a very small scale, and the Act mostly disregarded. Mr. Cairns had not obtained a safety-lamp, nor was there a copy of the Act at the mine. On the 11th February I sent a letter to Mr. Cairns requesting compliance with the law—in fact, a similar communication to that of the 16th December, 1887. If however, continued neglect of these notices is not to be followed by prosecution, sending them is a mere waste of time.

33. *Kurow Coal-mine, Kurow.*—Visited 6th February, 1889. The old drive had fallen in, and an open-work face in the bed of the creek was supplying the demand. No notice had been sent of a change in ownership. Near the old mine Mr. Wade, the new owner, has sunk a shaft 6ft. by 2ft. 6in., and 53ft. deep. I have written twice—on the 11th and 25th February—calling attention to sundry points; but no answer has been sent, and my concluding remarks on the preceding mine apply equally to this.

31. *Prince Alfred No. 1 Coal-mine, Papakaio.*—On the 7th February the mine was working as usual on a small scale. No Act exhibited, but a copy of the old special rules. Wrote to the owner on the 12th February.

35. *Prince Alfred No. 2 Coal-mine, Papakaio.*—Visited on the same date as the preceding. An approved lamp was on the ground. The air was very bad, owing, as was afterwards discovered, to

a flow of choke-damp from an old working, the stopping of which had the appearance of not having been clayed for a long time. No copy of the Act exhibited. Wrote on the 12th February.

36. *St. Andrew's Coal-mine, Papakaio.*—The rush of sand and gravel mentioned in my last report had on the 7th February been sufficiently cleared out to allow of work being resumed, and the workings were again opened, and, as usual, in good order. Act up and names attached. Report kept, and plan, up to August, 1888.

37. *Ngapara Colliery, Ngapara.*—The report was not kept regularly when I was there in February. Mine in excellent order, and plan kept. In reply to a letter sent on the 12th February, Mr. G. S. Nimmo, the new manager, stated that since my visit the mine had been daily examined with a safety-lamp, and the report kept.

39. *Hill's Creek Lignite-mine, Hill's Creek.*—On the 15th February there was nobody about; but the mine was worked so much overhanging as to combine all the dangers of a tunnel-mouth and an open-cast pit. I wrote afterwards warning the owner.

41. *Beck and McLean's Lignite-mine (formerly Lockhart and Beck's, Rough Ridge).*—Still open-work, and safely worked, the seam being stripped.

42. *Idaburn Lignite-mine, Rough Ridge.*—A new owner has taken this pit, and is following in the steps of his predecessor (who was killed) so far as careless working is concerned. In February the face was overhanging considerably. No notice of the change of management was sent until after my visit.

43. *Ida Valley Lignite-mine, Ida Valley,* was flooded last August, and has not been putting coal out since. Visited in February.

44. *Blackstone Hill Lignite-mine, St. Bathan's.*—Exceedingly well worked (open-cast) when I was there in February, but I have applied in vain for a notice of the name and address of the manager.

45. *Cambrian Lignite-mine (Jones's), St. Bathan's.*—No fault to find when I was there in February.

46. *Cambrian Lignite-mine (Dungey's), St. Bathan's.*—Seam overhanging; warned owner.

47. *Kyeburn Coal-mine, Naseby.*—On the 14th February I found the Act still imperfectly kept: no copy at mine, and no safety-lamp, the one in stock being kept at the house. A more or less complete report kept. Timber pretty good. Wrote to the manager.

48. *Perseverance Coal-mine, Kyeburn* (14th February, 1889).—Act exhibited, but no names attached. Mr. Archer expressed himself unable to understand the Cambrian lamp, so had not used it. The old mine was nearly worked out, and a lower level was in course of construction. Old special rules up. Good air and timber. Weekly report kept. On the 27th February I wrote to Mr. Archer, and received a reply that on the 12th March the tunnel was abandoned.

49. *Commercial Company's Coal-mine, Kyeburn.*—Visited in February; but is really on a very small scale, the return for 1888 being 6 tons.

50. *Alexandra Coal-mine, Alexandra.*—Visited 22nd February, 1889. The sloping ladders mentioned in my last report were properly fixed; brace covered; shaft fenced; approved lamp obtained, but had not been used. No report kept. A copy of the Act has been given to the one man employed, Mr. Thomson considering this sufficient under section 30. On the 27th February I wrote calling attention to the necessity for using the lamp daily and keeping a report.

51. *Macqueenville Coal-mine, Alexandra.*—Visited 22nd February, 1889. This small mine is now owned and worked by Mr. R. Lett, to whom I sent a copy of the Act. The ladders are 63ft. in length, and slightly sloping, but the bottom length is 51ft. without a platform. Mr. Lett has an approved lamp, which he promised to use. A wire-fence has been fixed all round the pit-bank, but the actual mouth of the shaft is unprotected. On the 28th February I wrote calling attention to all the points requiring attention.

52. *Earnscleugh Coal-mine, Clyde,* has not been worked much, and on the 21st February I found nobody employed. Mr. Emerson, however, showed me round. A copy of the Act was in the office, as was also an Evan Thomas lamp, both left by the late owner. A letter sent on the 1st March to the new owner elicited no reply for three months, but on the 5th instant a letter was received asking for a copy of the "Rules and Regulations for the Earnscleugh Colliery."

53. *Waikerikeri Coal-Mine, Clyde.*—In February, while I was there the mine was not at work, and Mr. Holt told me that the workings were full of choke-damp. I visited the shaft and found it properly fenced, and the requisite notices were nailed to the door of the hut.

54. *Dairy Creek Coal-mine, Clyde,* was not at work when I visited the locality on the 21st February, and the gate was locked, but a shaft was not properly fenced. On the 18th May, 1889, the owner wrote stating that the proprietor of the adjoining mine had allowed a fire to take place at the boundary, which had spread to this mine. He also requested me to go and inquire into the matter. On the 31st I wrote that it was impossible for me to interfere, and recommending action under section 55.

55. *Excelsior Coal-mine, Cromwell.*—Mine closed, as the coal pinched out.

56. *Bannockburn Coal-mine, Cromwell,* was formerly worked by Mr. R. Johnson, but on the 21st February I found it had passed into the hands of Messrs. Clarke and Burrowes, who had failed to send me notice. The old drive had been abandoned, and nobody was about. An excavation had been made among some old pillars near the former entrance, and the place was decidedly unsafe, there being no props or adequate pillars, while the ground is much faulted and knocked about. I met Mr. Clarke, the manager, who, in reply to my remarks about the bad order in which I had found the mine, stated that it was his intention to pull down the coal above the entrance, and set some props and stone packs. As the condition of the workings was somewhat serious, I wrote about it on the 1st March, and on the 20th Mr. Clarke sent me a notification of the name and address of the manager.

57. *Kawarau Coal-mine, Cromwell.*—Mine in good order. Powder kept in magazine. Report (which ought to be always at the mine) at house. Wrote on this subject on the 27th February. Visited 21st February.

58. *Parcell and Jones's Coal-mine, Cromwell.*—This is a new mine, of which no notice was sent, and work commenced about the end of October, 1888. On the 21st February the drive was just a short distance in, still in daylight. After my visit, a notice of commencement was sent; but, though I wrote about various points on the 1st March, no answer has arrived.

59. *Gibbston Coal-mine, Gibbston.*—Inspected on the 18th February. A good Evan Thomas lamp at the mine, but apparently not much used. I found no gas, making my examination early in the morning, before the place had been disturbed. Slack is used for filling in, which is very injudicious, as the coal is subject to auto-ignition. No Act exhibited or daily report kept, and the timber required renewing in places. This mine is 2,000ft. above the sea-level. On the 28th February I wrote *re* change of management, of which no notice had been sent; also about exhibition of Act, and keeping daily report; and on the 18th April received notice of name and address of the manager.

60. *Steele's Coal-mine, Gibbston,* is upwards of 3,000ft. above sea-level, and is worked by a drive about a hundred yards long. No Act kept at all. A notice was sent on the 1st March.

61. *Cardrona Coal-mine, Crown Terrace.*—Visited for the first time on the 18th February last. A fine seam, upwards of 20ft. in thickness, and dipping to the west at 35°. The surface-covering is removed by sluicing, the water for which is brought about a mile. On account of the great altitude (over 3,000ft. above sea-level) work can be carried on only in the summer. No notice of the manager's name has been sent, though I have asked for it.

62. *Birch's Coal-mine, Crown Terrace,* adjoins the preceding property, and was visited on the same day. The seam, which is worked by an adit, is the same as in the preceding mine, and the timbering is only moderately good. A keg of powder was in the mine, and the Act was unheard-of; I therefore sent a copy to Mr. Birch, calling his attention to the necessary points, and also forwarded a request for the output. Absolutely no answer has been received.

63. *Jones's Lignite-mine, Roxburgh* (22nd February, 1889).—Still open-worked. I have twice written in vain for the output, and once left word for Mr. Jones, who was away at my visit.

56. *Perseverance Lignite-mine, Roxburgh,* adjoins Jones's. The thickness and dip of the seam are ill defined, and the pit is not very well worked.

65. *Fernhill Colliery, Green Island* (30th January, 1889).—Act exhibited, with names attached; air good; plan not at mine. At that time the workings were in the extreme west, beyond the water-race. Another fall had occurred since the one mentioned in my last report, and I had to warn Mr. Gray that if any of these falls should result in loss of life a very heavy responsibility would rest on him as manager. Daily reports kept.

68. *Saddle Hill (Christie's No. 2) Colliery, Green Island.*—Inspected on the 24th April. The mine was in good order, and a copy of the Act exhibited, with the requisite names attached. A survey was being made.

69. *Saddle Hill (formerly McDougall's) Colliery, Green Island* (24th April, 1889).—No notice had been sent to me about the recommencement of this work. On inquiry it appeared that Mr. Adam Harris was working the mine. The old drive has, as mentioned in last report, fallen in, and a new road has been driven a little further down the hill. The workings were by no means secure, and there was nobody on the ground.

71. *Walton Park Colliery, Green Island* (24th April, 1889).—As usual, there was but little fault to find. The plan was undated, but Mr. Loudon stated that it had been made up within a fortnight. On inquiring into Jordan's accident, he informed me that nobody but himself was to blame. One of the old shafts was not very securely fenced, some of the sheet iron having been apparently removed, so I wrote about it on the 26th April.

72. *Abbotsroyd Colliery, Green Island.*—On the 30th January, when passing the new shaft, I observed that it was insufficiently fenced. In answer to a letter calling attention to this, Mr. Freeman wrote on the 23rd February that it had been made secure.

73. *Mosgiel Colliery, Mosgiel.*—Mr. Sneddon wrote on the 16th May that he had sunk a shaft for air on the east side.

75. *Bruce Coal-mine, Milton.*—On the 26th February Mr. Frank Duthie wrote on behalf of the owners, stating that he had reason to believe that an encroachment was being made on his lease. I recommended him to proceed under section 55.

76. *Kaitangata No. 2 Coal-mine, Kaitangata* (8th March and 29th May, 1889).—On the former occasion I found the mine in good order, the coal being derived almost entirely from the south side. The north levels were worked with lamps, and all other parts with open lights. The latter visit was for the purpose of investigating an unfortunate accident, which had on the previous day occasioned the death of one of the miners. Full particulars will be given in the proper place.

During this year the company has been engaged in driving a level in the same line as the engine-plane, with the intention of overcoming a fault which cut off the coal in the rise-workings. After driving about 500ft. they came upon a seam of coal 19ft. in thickness, and 150ft. below the main seam. This appears to be a discovery of great value, practically doubling the amount of available coal in the lease,

93. *Smyth's Coal-mine, Gore.*—In January Mr. Smyth informed me that he had started driving at this pit, which was formerly worked open-cast. On the 10th May, however, stripping had again been resorted to. The place was not very safely worked.

98. *Gore Coal-mine, Gore.*—Open-work. Visited 10th May, 1889.

105. *Mapp and McKenzie's Coal-mine, Pukerau,* has again been taken up—this time by Mr. James McKenzie, who is working underground. No notice was sent, and the manager was away when I was there in May.

106. *Pukerau Coal-mine, Pukerau* (11th May, 1889).—Mr. O'Hagan, the manager, has made considerable efforts to comply with the law, in which course he is ably seconded by his partners, Messrs. Mapp and McKenzie; these three constituting the whole staff of the mine. An approved

lamp has been purchased, a weekly report kept (it should have been daily), and the mine is in good order. Though no Act is exhibited, the names of the owners, manager, and inspector are painted on a board at the entrance.

107. *Enterprise Coal-mine, Pukerau.*—Now closed. No notice was sent, as required.

108. *Waimea Coal-mine, Riversdale.*—Inspected on the 13th May, 1889. Very unsafely worked. Overhanging the mouth of an old drive was a large block of coal, and underneath this was, if not precisely the working-place, at least the standing-place for carts and horses, and hence an occasional resort for men.

110. *Mataura Coal-mine (Beattie's), Mataura.*—On the 15th May, in this open-work mine, I found a boy nine years of age, and son of the lessee, pottering about "getting a bit of coal for the fire." Nobody was near, and if he continue to work he will probably be killed.

111. *Mataura Coal-mine (Town's), Mataura;*

112. *McGowan's Coal-mine, Mataura;*

113. *Sleeman's Coal-mine, Mataura;* and

114. *Townshend's Coal-mine, Mataura,* are all open-work mines, and were visited on the 15th and 16th May.

118. *Nightcaps No. 1 Coal-mine, Nightcaps* (7th May, 1889).—Only one man, engaged splitting a pillar. Copy of Act exhibited, and also general rules, but no names attached. Approved lamp on premises.

119. *Nightcaps No. 3 Coal-mine, Nightcaps* (7th May, 1889).—Worked partly in the old thick seam and partly in the upper seam mentioned in my last report. The workings were well timbered and ventilated. A copy of the Act was hanging up, but some of it had been torn out. This company has again secured a contract for the supply of the Railway Department, and the consequent increase in the number of men employed necessitates the adoption of special rules, which have been arranged, and will be sent up for approval.

120. *Wairio Coal-mine, Nightcaps.*—This now comprises two separate and distinct workings—(1) an open work, reported on previously, and (2) an adit, into which Mr. Knight retires during bad weather. They were both inspected in May last, and appeared to be well worked. Of course, it will be necessary to obtain an approved lamp, exhibit copy of Act, write daily report, &c., for the adit.

121. *Flett's Coal-mine, Nightcaps;* and

122. *Morley Village Coal-mine, Nightcaps,* are both open-work, and were visited in May last.

123. *Hokonui Coal-mine, Winton.*—On the 14th May, 1889, I found three men working, in addition to Mr. Somerville, the manager, who said that he had written the report, but was unaware of the position assigned to him by the secretary. The coal-seam is now less thick than it was at first, as the two upper divisions, which measured 37in. and 11in., have died out. There was no copy of the Act about the place, and there was a Mueseler lamp with a very rough bonnet. It seemed to me that hardly enough attention is paid to the present roof of the mine, which is composed of a carbonaceous clay, representing the upper portion of the original seam.

128. *Orepuki Coal-mine, Orepuki,* was on the 9th May worked on a very small scale, only one man being employed in addition to the manager; sometimes, however, two are engaged. An approved lamp was on the works, but had not been used. A daily report was kept, but no copy of the Act exhibited. The workings, which are to the dip of the seam, appeared safe.

129. *Popham's Coal-mine, Orepuki,* has not been worked lately.

New Mines.

There are, so far, seven new mines, only one of which is likely to be of much importance. This is the *Westport Ngakawau Colliery,* formerly known as the Albion; and, although it is mentioned in my report of the 7th March, it does not appear in the list for 1888. On the 1st April, 1889, I found one adit working in Mine Creek, six men being engaged on the coal. A Davy lamp was then used, as gas occasionally appears; but since, Mr. Marshall has obtained a dozen Cambrian lamps. The coal is soft, like the Albion seam, but still the roof is very good. It is proposed to make a communication with the old workings, which are on the other side of the creek. The ordinary West Coast Colliery Special Rules have been adopted, and will be sent up for approval.

Phillipps's Coal-mine, Kurow.—A new working, up the Awakino Creek, about a mile above the Kurow Coal-mine. The seam is ill defined, and, as the ground has been to some extent previously worked, care will be required. Notwithstanding a request to that effect, no notice of the manager's name has been sent.

Gibson's Coal-mine, Gibbston.—Merely prospecting, and no coal when I was there. Chiefly remarkable as being 3,360ft. above sea-level, on the saddle between Gibbston and Doolan's Creek. The indications appeared unfavourable.

Nightcaps No. 4 Coal-mine, Nightcaps.—A new open-work mine, belonging to the Nightcaps Coal Company. Visited in May.

Wairio No. 2 Coal-mine, Nightcaps.—Already referred to in connection with No. 1. It used to be worked some years ago.

Wallace Coal-mine, Nightcaps.—Formerly known as Reed's. An open-work mine at Nightcaps. Visited in May.

Accidents.

Already there have been two fatal accidents during the current year, but, unlike the two which occurred in the first three months of 1888, in prospecting works, these have occurred at two of the largest collieries in the Island. On the 19th January Charles Ribey, an engineer in the employ of the Westport Coal Company, was walking down the upper surface-incline, when a truck struck him, and caused injuries of which he died on the 28th. At the time of the accident he was in full possession of his faculties. It was in broad daylight, and he was thoroughly familiar with the

road; but, from the evidence, it appeared that a moment of forgetfulness or absent-mindedness resulted in an accident causing the death of a very promising young man. The occurrence was duly reported, and at the inquest the Mines Department was represented by the local police officer, whose report stated that the evidence proved "that there is no, or very little, danger in walking up or down the incline when the trucks are running, if ordinary care be taken."

On the 28th May a miner named James Howard was killed by a fall of coal at the Kaitangata Coal-mine. Immediate notice was sent to me, and I was at the mine on the 29th, and attended the inquest on the 30th. It appeared that the deceased was working at head-coal, in a bord where a sudden irregularity in the roof of the coal caused a diminution in the thickness of the seam, which, instead of being 10ft. thick overhead, was only about 18in. A small parting of carbonaceous clay caused a total want of cohesion between the seam and the roof; consequently a large piece of coal fell on Howard, causing fracture of the skull and instantaneous death. No timber was used, nor would any have been required with the ordinary thickness of seam. The bord was only 16ft. wide, and a little over 11ft. from roof to floor. The accident was due simply to an absence of timber, but at the same time the danger was brought about by an unforeseen occurrence, and it seemed to me that ordinary and reasonable precautions were taken. Mr. Shore in his evidence stated: "In view of the rolls that have occurred, and of the accident, I consider it would be prudent to use props. If props had been used the probability is that warning of the fall would have been given, and the accident avoided. . . . I never knew of a similar fall without some warning, and I do not see how this fall can have taken place without warning. . . . In future props will be used to prevent a recurrence of this sort of accident."

In addition to mining accidents, one fatality has taken place on colliery premises and one on an adjoining clay-pit. The former occurred at Brunnerton on the 6th April, Mrs. McGee being run over by a truck on the surface-railway of the Coal-pit Heath Mine. Major Keddell, Coroner, reported the matter to me, and eventually Sergeant Hanlon was appointed to attend the inquiry. The scene of the accident is not a public road, and notices are placed to prevent trespassers; but it is a common custom for people to pass that way, and the unfortunate woman was acting as no doubt she had acted on many previous occasions. The police officer furnished a report stating "the evidence adduced at the inquiry disclosed no blame to the Mines Department." The other accident took place at a clay-pit near the Homebush Colliery, James Jewell being fatally injured by a fall of earth. The place is quite distinct from the coal-mine, so the accident will not be included in our list.

On the 15th January a boy named Manderson was injured by a mine-truck on the surface-works at the Coalbrookdale Colliery. He had been sent away, but, with the pertinacity of childhood, returned and got run over. He was not employed on the work.

Prospecting.

Boring has been carried on at various places—notably at Lovell's Flat, where, I am informed, a seam has been struck; at Kaitangata, where the same satisfactory result is said to have been attained; and on the New Zealand Agricultural Company's estate near Waimea, where Mr. McAlister had in May last put down a bore for 400ft. and was continuing. Near Otakaia, too, boring has been carried on, but without any result.

Output of Coal.

For 1888 we have an output of 503,358 tons, an increase of 43,448 tons on the production of the previous year. As compared with a previous increase of 29,750 tons, this is very gratifying. The principal alterations in the output are as follows:—

Increases.—Coal-pit Heath Colliery, 17,201 tons; Coalbrookdale Colliery, 14,229 tons; Tyneside Colliery, 5,753 tons; Hokonui Coal-mine, 5,384 tons; Brunner Coal-mine, 4,451 tons; Abbotsroyd Colliery, 1,397 tons; Allandale Colliery (Palmerston), 2,060 tons; Saddle Hill Colliery No. 2, 1,633 tons; Shag Point Colliery, 1,445 tons; Whitecliffs Colliery, 1,434 tons; and Mount Somers Coal-mine, 1,230 tons.

Decreases.—Nightcaps Coal Company's mines, 6,354 tons; Pukerau Coal-mine, 1,463 tons; Wallsend (Greymouth) Colliery, 1,127 tons; and Saddle Hill (late McDougall's) Coal-mine, 1,122 tons.

As comparing the districts, we have an increase of 26,278 tons in the Greymouth field, and of 14,245 at Westport; while the Green Island and Malvern Districts show decreases of 973 tons and 280 tons respectively.

Number of Men.

The increase in output is followed by a large addition to the number of men employed. We had last year 1,417 men above and below, leaving the output per man at 355 tons, as against 393 tons in 1887, 328 in 1886, and 326 in 1885.

Death-rate.

For 1888 the death-rate was very satisfactory, if the term can be applied to what is always a matter of deep regret. The number of deaths was three; consequently the number of tons raised per life lost is 167,786, and the number of men employed per life 472, or at the rate of 2·12 per 1,000. In 1887 the figures were 114,977 tons and 293 men, or 3·41 per 1,000. In this respect we are still much behind Great Britain, where the death-rate for 1888 was 602 men, or 1·66 per 1,000. As will be seen subsequently, our death-rate for the past ten years is very nearly equally low.

Certificates.

On the 17th August next it will be necessary for all mines working below ground to have a certificated manager. On this point the Act says: "Provided always that it shall be lawful for the Inspector to grant a certificate of exemption from the operation of this section to any manager or owner whose mine does not, in his opinion, require a certificated manager or underground manager." This throws a vast responsibility on the Inspector, and, as will be observed on reading the report, it

si impossible for me, with the appliances at present available, to insure observance of the law in all these small collieries. From my own experience I consider that the smaller mines are usually much more dangerous to life than those worked on a large scale and employing thoroughly capable managers. Of the three deaths occurring last year, one was in a mine which had no output, and the others contributed 30 and 6,034 tons respectively. This makes 6,064 tons for three lives, and leaves 497,294 tons for no lives lost.

Looking at the sudden changes to which coal-mines are subject, being, perhaps, to-day perfectly safe and to-morrow eminently dangerous, I do not see my way to grant any certificates of exemption.

GENERAL REMARKS.

It is now a little over ten years since my appointment as Inspector of Mines, and I may be perhaps allowed to make a few remarks on the progress that has been effected in the coal-trade of this Island during that period. There were then—in the beginning of 1879—24 coal-mines on the list, employing a total of 352 men, and putting out 103,318 tons of coal per annum, or an average of 14·7 men and 4,305 tons of coal per mine. There are now 121 mines—not, be it understood, that this number indicates the real increase, but in the early days, before inspection, many of the small mines were not noticed. The output is 503,358 tons, or nearly five times what it was; and the 352 men have increased to 1,417. Still, the inclusion of the small mines, many affording employment for only one man during a portion of the year, has not reduced the average output of the mines and the average number of men employed so much as might have been anticipated. As against an average output in 1878 of 4,305 tons, we have 4,160 tons, and 11·7 men as compared with 14·7. The output per man is now much greater, being 355 tons per annum as contrasted with 293.

Altogether there have been, since the commencement of 1879, 227 coal-mines on the official list. Of these, twenty-four were included in December, 1878; leaving 203 since inserted. Of the 121 now on, twenty-one were there in December, 1878; so, of these 203 only 100 have survived.

The unusual facility for commencing a coal-mine in many localities leads to these numerous commencements, which so seldom come to anything. In many parts of Otago and Southland it requires merely sufficient capital to purchase the ordinary tools to become a colliery-proprietor; and the result is that an enormous number of men start in this line of business without, in many cases, any previous knowledge.

During the ten years 3,490,232 tons of coal has been raised by 10,180 men, twenty of whom have lost their lives by accidents connected with the work. (The Kaitangata explosion, prior to the enforcement of the Act, is of course not included.) This gives a death-rate for the decade of 174,511 tons and 509 men employed, or 1·8 per 1,000. As may be imagined from the steady increase of coal-output which has taken place, the various colliery districts have advanced very considerably. Collingwood—to commence at the north—has changed but little; West Wanganui, which was in 1878 at work, is now no longer producing coal; Picton, likewise, has given up the attempt to be a colliery town. Down the West Coast enormous strides have been made. Westport was ten years ago a sleepy little town with little or no coal-output. What is now the colliery-incline, capable of lowering over a thousand tons in sixteen hours, was then a rough track leading to a few huts and tents on the hill, where there is now a large colliery, employing 350 men and boys, and supporting a population of thirteen hundred souls. An endless rope, a mile and a half long, brings the coal from various parts of the field, and in a short time an extension will make this road 2 miles and 30 chains in length. Three hotels, as well as bakeries, stores, telegraph-station, and boarding-houses have sprung up, while the school has an attendance-roll of 190 children. A school of mines with two hundred members, a brass band, and cricket club have been formed; and the place has all the appearance of a busy colliery village.

The harbour-works have rendered the river safe and easy of access, and as they are carried further forward no doubt the depth of water will be sufficient to enable large vessels to enter. The coal, being certainly unexcelled by any in the world, will doubtless some day command a large export trade.

Greymouth likewise has assumed a very different position. In place of an output of 10,557 tons is one of 188,448 tons; and the few scattered houses about Brunnerton have grown into a prosperous town with many appliances of civilisation. In those days the small steamers of the Anchor Line were the principal traders. The barque "Examiner" once took 350 tons, but under exceptional circumstances; while the depth of water on the bar, which is now 17ft., was then 10ft. In December, 1888, the steamer "Pukaki" took 1,600 tons on 16ft. draught. This facility for loading has naturally caused a large reduction of freights, which have come down 60 per cent.; and insurance premiums have likewise been reduced, for, while formerly only a limited sum could be insured at £12 per cent., now risks are taken at £6 6s. The bar is also stated by Mr. Kennedy, who supplied me with these figures, to have been interrupted half its time, while now only about one-seventh can be considered unworkable.

Coming over to the east coast the change has not been so rapid. The Malvern district is now just about where it was, having had at one time a temporary expansion of trade. The Shag Point district, too, has suffered a diminution of output; while the Green Island district has increased its production about 50 per cent. Kaitangata produced 19,516 tons in 1879, which was the year of the great explosion; and in 1888, 52,378 tons. In the far south, Nightcaps, Orepuki, and Hokonui collieries have sprung into existence, and are doing their share to swell the output; while many small mines afford material assistance.

Altogether, looking at the history of the past ten years, with the signs of increased activity all around, there seems no doubt that at the end of a similar period the production of this Island will be a million tons per annum, employing nearly three thousand men.

I have, &c.,

GEORGE J. BINNS,

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

APPENDIX.

No. 1.

Statistics of Workings in Coal-mines, 1888.

NORTH ISLAND.

Name of Mine and Locality.	Name of Manager.	Number of Years worked.	Quality of Coal.	No. of Seams worked.	Thickness of Seams.	Thickness worked.	Dip of Seam.	System of Underground Working.	Number of Shafts.	Dimensions of Shafts.		Output delivered by	Output for 1888.			Approximate Total Output to 31st December, 1887.	Approximate Total Output to 31st December, 1888.	Number of Men ordinarily employed.			Power used for drawing Mineral.	Pumps.			Means of Ventilation.	Date of Inspector's Last Visit.
										Size of Shaft or Adit.	Depth of Shaft or Length of Adit.		Coal.	Slack.	Total.			Above.	Below.	Total.		Stroke.	Size of Barrel.	Height of Column.		
Kawakawa District.													Tons.	Tons.	Tons.	Tons.	Tons.									
1. Kawakawa	Moody, T. P. ..	24	semi-bitum.	1	2′ 6″ to 15′	2′ 6″ to 15′	1 in 6	bord and pillar	4	7′ x 10′	..	engine-incline	33,145	..	33,145	650,480	683,625	23	75	98	engine	6′	two 12″	247′	furnace	24/12/88
2. Kamo	Geary, Joseph ..	12	brown	2	4′ to 14′	4′ to 10′	varies	,,	3	15′ x 6′ and 12′ x 2½′	240′	shaft	14,373	..	14,373	132,759	147,132	6	36	42	,,	3′ to 7′	10″	268′	natural	22/12/88
3. Whauwhau	Love, Alexander	24	,,	1	5′ to 10′	5′ to 10′	,,	,,	1	6′ x 5′	1,300′	adit	4,718	..	4,718	62,835	67,553	7	6	13	horse	..	..	..	,,	22/12/88
Waikato District.																										
4. Waikato Mine, near Huntly	Taylor, E. B. ..	12	,,	1	6′ to 18′	6′ to 18′	,,	,,	..	adit 8′ x 9′ and 6′ x 6′	90′ and 60′	adit and self-acting incline	9,720	..	9,720	95,157	104,877	7	20	27	horse and self-acting incline	..	..	..	,,	19/12/88
5. Taupiri, Huntly ..	Collins, William	13	,,	1	5′ to 45′	5′ to 35′	,,	,,	6	adit 10′ x 6′	672′	engine-incline	33,202	..	33,202	265,005	298,207	12	48	60	engine and horse	2′ 6″ 2′ 0″ 1′ 6″ 1′ 6″	8″ 6″ 5″ 5″	110′ 110′ 112′ 112′	natural and steam exhaust upcast	19/12/88
6. Miranda, Bridgewater ..	Cater, T. ..	1 7/12	,,	1	53′	40′	1 in 5·67	,,	1	shaft 5′ x 14′	210′	shaft	4,600	..	4,600	5,300	9,900	2	6	8	engine	..	..	..	natural	20/12/88
7. Taupiri Reserve, near Huntly	Ord, J. ..	1½	,,	1	14′ to 20′	10′ to 16′	1 in 7	,,	1	adit 9′ x 6′ 3″ shaft 5′ x 4′	adit 583′ shaft 43′	incline adit	8,780	..	8,780	2,226	11,006	6	18	24	horse whim	No. 6 pulsometer	..	43′	natural	20/12/88

West Wanganui.																									
9. Wallsend, Collingwood ..	Walker, James ..	20	bitum.	2	2′ to 3′	all	W. 12°	longwall	..	..	..	adit	3,049	1,132	4,181	24,939	29,120	4	16	20	hand	..	..	..	natural	10/12/88
Westport.																									
10. Mokihinui, Mokihinui ..	Straw, M. ..	8½	″	..	..	..	..	..	..	..	..	″	316	..	316	725	1,041	3	6	9	″	..	..	..	..	7/5/88
11. Haylock and Young's, Waimangaroa	..	..	″	1	*	..	..	..	..	..	..	″	..	..	..	..	..	..	..	..	..	..	..	..	..	30/11/88
12. Coalbrookdale, Westport	Waters, T. J., Man. Engineer Brown, T., Mine Manager	10	″	1	Irregular, aver.18′	all	Irregular, generally E.	bord and pillar	3	6′ diam. 7′ ″ 6′ ″	140′ 48′ 40′	″	†98,590	31,580	130,170	428,433	558,603	80	327	407	engine, 45 h.p.	..	..	..	furnace	30/11/88
Reefton.																									
13. Murray Creek, Reefton ..	McGechie, D. ..	5	glance	1	17′ 6″	10′	W. 10°	″	..	4′ x 2′ 6″	45′ 6″	″	580	594	1,174	2,554	3,728	..	..	2	hand	..	..	..	natural	24/11/88
14. Lankey's Gully, Reefton	Lamberton, W. ..	11	″	1	8′	all	varies	″	..	..	..	″	650	35	685	3,728	4,413	1	2	3	″	..	..	..	″	24/11/88
15. Boatman's, Boatman's	Coghlan, J.	8	″	2	2′ 7″ and 1′ 7″	″	S. 30° W. 12½°	″	..	..	..	″	42	..	42	1,544	1,586	1	1	2	″	..	..	..	″	23/11/88
16. Burke's, Boatman's		7	″	1	19′ 3″	6′	N. 80° W. 29°	″	..	..	..	″	71	59	130	1,642	1,772	1	1	2	″	..	..	..	″	23/11/88
17. Phœnix, Reefton ..	Woods, P. ..	4	″	1	20′	10′	E. 30° to 40°	″	..	..	..	″	613	127	740	1,252	1,992	..	1	1	″	..	..	..	″	24/11/88
18. Inglewood, Reefton ..	Macilquham, J. ..	¼	″	1	8′+	8′	..	..	..	..	..	″	4	..	4	..	4	..	1	1	″	..	..	..	″	24/11/88
19. Progress, Reefton ..	..	9	″	1	12′	8′	S.E. 7½°	bord and pillar	..	..	..	″	480	..	480	614	1,094	..	1	1	″	..	..	..	″	3/5/88
Greymouth.																									
20. Brunner, Greymouth ..	Bishop, James ..	24	bitum.	1	8′ to 10′	all	S.W. 1 in 4	″	..	..	..	″	53,776	29,282	83,058	642,677	725,735	33	148	181	engine	..	..	..	Schiele fan	19/11/88
21. Coalpit Heath, Greymouth	Alexander, T. ..	12	″	1	16′	″	S.W. 1 in 4 (varies in parts)	″	2	10′ x 6′ 6′ diam.	280′ 75′	shaft	33,364	11,274	44,638	212,027	256,665	23	93	116	″ 90 h.p.	‡48″ ‡36″ ‡15″ ‡12″ §10″ §10″	10″ 6″ 6″ 4″ 6″ 6″	250′ 250′ 90′ 90′ 250′ 250′	″	16/11/88
22. Tyneside, Greymouth ..	Dando, M. ..	12	″	1	16′	″	S.W. 1 in 4	″	2	10′ 6′ x 6′	116′ 25′+12′	″	4,364	4,201	8,565	9,833	18,398	10	20	30	″	‖No. 4, 6, 8, 10	..	35′–50′	furnace	16/11/88
23. Wallsend, Greymouth ..	Bishop, James ..	12	″	1	16′	″	S.W. 1 in 4	″	2	11′ diam. 14′ ″	670′ 660′	″	36,259	15,928	52,187	66,943	119,130	32	112	144	″	¶3′ 6″ 3′	10″ 8″	650′ 150′	guibal fan	21/11/88
Malvern.																									
24. Springfield, Springfield ..	Lindop, A. B. ..	12	brown	1	7′ 6″	all	S.E. 1 in 6 to 1 in 12	bord and pillar	1	12′ x 5′ 2″	246′	shaft	1,471	562	2,033	61,314	63,347	2	5	7	engine	22″	8′	263′	steam	16/10/88
25. Canterbury, Sheffield ..	Austin, J. ..	26	″	2	2′ and 1′	″	S.E. 1 in 3	narrow	2	5′ diam. 5′7″diam	25′ 150′	adit	1,376	30	1,406	31,449	32,855	3	3	6	horse	12″	6″	150′	furnace and kerosene stove	24/10/88
26. Homebush, Glentunnel ..	McIlraith, J. A., Agent Brown, T., Mine Manager	16	″	1	7′	″	E. 10° S. 1 in 3	bord and pillar	2	3′ 6″ x 3′ 3′ 6′ x 3′	60′ 20′	″	3,364	182	3,546	75,225	78,771	2	6	8	″	..	..	..	natural	18/10/88
27. Snowdon, Rakaia Gorge ..	Gerard, W. (owner)	..	″	1	9′ 3″	″	N. 80° E. 32°	narrow	..	..	..	″	50	..	50	140	190	..	..	1	hand	..	..	..	″	26/7/86

* Prospecting only during 1888. † 35,131 tons of this was unscreened. ‡ Tangye's double-acting. § Double-acting, 4 rams to each set, 8 in all. ‖ Worthington Pumping Company. ¶ Lifting set, 250′; forcing set, 400′.

Statistics of Workings in Coal-mines, 1888—*continued.*

MIDDLE ISLAND—*continued.*

Name of Mine and Locality.	Name of Manager.	Number of Years worked.	Quality of Coal.	No. of Seams worked.	Thickness of Seams.	Thickness worked.	Dip of Seam.	System of Underground Working.	Number of Shafts.	Dimensions of Shafts.		Output delivered by	Output for 1888.			Approximate Total Output to 31st December, 1887.	Approximate Total Output to 31st December, 1888.	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.		
													Tons.	Tons.	Tons.	Tons.	Tons.									
28. Acheron, Lake Coleridge	Murchison, J. (owner)	21	anthracite	1	5′ 3″	all	S. 45° W. 18°	narrow	..	..	..	adit	40	..	40	155	195	..	..	1	hand	..	..	..	natural	26/7/86
29. Stobwood, Rockwood ..	Nimmo, G. S. ..	3	brown	1	7′ to 10′	6′	S. 12°	„	1	3′ x 1′ 10″	16′	„	150	..	150	343	493	..	1	1	„	..	..	..	„	11/8/87
30. Whitecliffs, Whitecliffs ..	Leeming, W. ..	8	„	1	5′ 6″	all	E. 5° S. 35°	„	1	4′ x 3′	40′	„	2,675	121	2,796	7,618	10,414	..	6	6	„	..	..	..	„	19/10/88
31. Mount Somers, Mount Somers	Jebson, D. ..	24	„	1	24′	8′	S. 60° E. 10°	„	..	..	..	„	2,557	53	2,610	5,541	8,151	1	4	5	„	..	..	..	„	22/10/88
TIMARU.																										
32. Wharekuri, Wharekuri ..	Cairns, W. B. ..	22	„	1	25′	14′	S. 60° W. 60°	„	1	4′ x 3′	80′	„	150	..	150	8,072	8,222	..	3	3	„	..	..	..	„	7/12/87
33. Kurow, Kurow	Wade, J. E. ..	9	„	1	19′	10′	N.E. 45°	„	..	..	..	„	150	..	150	1,125	1,275	..	1	1	„	..	..	..	„	8/2/88
OTAGO.																										
34. Prince Alfred No. 1, Papakaio	Willetts, John	19	„	1	8′	all	N. 50° E. 12°	bord and pillar	1	4′ diam.	42′	„	1,711	..	1,711	25,739	27,450	2	7	9	„	..	..	..	„	18/8/87
35. Prince Alfred No. 2, Papakaio		12	„	1	9′	„	E. 10° S. 1 in 5	„	2	3′ x 3′ 4′ x 4′	40′ 75′	„														
36. St. Andrews, Papakaio ..	Nimmo, John ..	10	„	1	6′ 6″	„	E. 13°	„	2	4′ diam. 4′ x 3′	26′ 60′ x 15′	„	1,290	..	1,290	9,297	10,587	1	3	4	horse	..	..	..	furnace	18/8/87
37. Ngapara, Ngapara ..	Nimmo, G. S. ..	10	„	1	25′	7′ to 8′	N. 5°	„	1	4′ 6″ x 2′ 8″	36′	„	849	..	849	7,821	8,670	1	2	3	„	..	..	..	„	6/12/87
38. Shag Point, Palmerston ..	Williams, W. H.	25	pitch	2	Upper— 1′ to 4′ 6″ 1′ to 5′ Lower— *1′ 6″ to 3′ †6″ to 2′ *1′ to 3′ 6″	all	E. 1 in 4	„	2	13′ x 5′ 6′ x 4′	247′‡ 162′	shaft	8,382	777	9,159	189,853	199,012	13	40	53	engine	24″	6″	170′	steam	2/11/88
39. Allandale, Palmerston ..	McIntosh, A. ..	1½	„	1	4′ 4″ to 5′ 6″	„	W. 44°	„	..	..	..	[plane engine-	1,552	564	2,116	56	2,172	4	6	10	„	..	..	..	natural	8/9/88
40. Hill's Creek, Naseby ..	McKnight, J. ..	24	lignite	1	10′	„	E. 25°	open	..	..	..	..	57	..	57	533	590	1	..	1	..	8″	3″	10′	..	16/3/87
41. Beck and McLean's (formerly Lockhart and Beck's), Rough Ridge	McLean, L. ..	2	„	1	15′+	15′	N. 5°	„	..	..	..	..	800	..	800	94	894	2	..	2	..	..	..	..	..	24/11/87
42. Idaburn, Rough Ridge ..	Andrews, R. ..	18	„	1	23′	all	N. 30° W. 3°	„	..	..	..	..	2,024	..	2,024	16,916	18,940	2	..	2	..	6″	2″	20′	..	24/11/87
43. Ida Valley, Rough Ridge	Turnbull, George	18	„	1	20′	12′	N.W. 20°	„	..	..	..	..	344	..	344	1,129	1,473	1	..	1	..	6″	2½″	15′	..	24/11/87
44. Blackstone Hill, St. Bathan's	Dunsmuir, A. ..	22	„	1	12′	all	N. 70° W. 5°	„	..	..	..	..	100	..	100	110	210	1	..	1	..	..	..	..	..	27/8/86
45. Cambrian, St. Bathan's ..	Jones, J. R. ..	27	„	1	40′	25′	W. 10°	„	..	..	..	..	800	..	800	10,088	10,888	3	..	3	..	..	..	..	..	27/8/86

46. Cambrian, St. Bathan's	Dungey, C.	4	lignite	1	16′	8′	N.W. 3°	open	..	..	..	..	920	..	920	1,640	2,560	2	..	2	..	..	..	..	..	27/8/86
47. Kyeburn, Naseby	McCready, D.	15	brown	1	25′	12′	S. 45° W. 40°	narrow	1	3′ x 2′	10′	adit	251	150	401	13,333	13,734	..	2	2	hand	..	..	..	natural	25/11/87
48. Perseverance, Kyeburn	Archer, C.	10	„	1	14	10′	S. 45° W. 40°	„	1	5′ x 2′ 6″	50′	„	590	60	650	4,566	5,216	..	2	2	„	..	..	..	„	25/11/87
49. Commercial Company's, Kyeburn	Archer, C.	6	„	1	8′	5′ 6″	S. 45° W. 70°	„	..	..	..	„	5	1	6	700	706	..	..	..	„	..,	..	..	„	25/11/87
50. Alexandra, Alexandra	Thomson, W.	9	„	1	12′	6′	N. 20° E. 1 in 7½	bord and pillar	2	5′6″x2′0″ 4′6″x2′6″	60′ 50′	shaft	675	..	675	10,464	11,139	1	1	2	horse	..	..	..	„	16/3/88
51. Macqueenville, Alexandra	Lett, R.	..	„	1	5′	all	S. 75° W. slight	„	1	4′ x 3′	62′	„	482	..	482	4,469	4,951	2	1	3	„	bucket			„	15/3/88
52. Earnscleugh, Clyde	Field, G.	12	„	1	14′	8′	S.W. 1 in 8	„	1	4′10″ x 3′	35′	adit	20	10	30	3,670	3,700	1	1	2	hand	..	..	..	„	22/3/88
53. Waikerikeri, Clyde	Holt, W.	7	„	1	20′	..	S. 1 in 1	stoping	2	3′ 6″ x 3′ 4′ x 3′ 6″	160′ 36′	shaft	291	..	291	17,435	17,726	1	1	2	horse	..	..	..	fan 18″ windsail	15/3/88
54. Dairy Creek, Clyde	Collins, C. T.	17	„	1	20′	10′	S. 45° E. 45°	„	2	4′ x 3′ 6″	36′	adit	86	..	86	3,637	3,723	..	2	2	„	..	..	..	natural	15/3/88
55. Excelsior, Cromwell	Clarke, A. W. N.	7	„	1	12′	7′	E. 6° S. 60°	„	1	6′ x 4′	58	„	330	..	330	1,782	2,112	..	2	2	hand	..	..	..	water-fall	14/3/88
56. Bannockburn, Cromwell	Johnson, R.	17	„	1	12′	6′	N. 70° W. 1 in 9	bord and pillar	1	6′ x 2′ 6″	..	engine-plane	60	..	60	8,568	8,628	..	2	2	engine	3′	6″	50′	natural	14/3/88
57. Kawarau, Cromwell	Pryde, J.	11	„	1	15′	7′ 6″	W. 1 in 4	„	2	4′ x 3′ 6′ x 2′	90′ 30′	adit	1,400	..	1,400	7,465	8,865	..	3	3	horse	..	..	..	„	14/3/88
58. Parcell and Jones's, Bannockburn	Jones, E.	¼	brown	1	10′ 6″	6′	S. 40° W. 12°	„	..	..	..	adit	..	..	..	..	..	..	..	..	hand	..	..	..	„	..
59. Gibbston, Gibbston	Macale, M.	21	pitch	2	7′6″ & 1′6″	all	W. 22½°	narrow	1	3′6″x3′6″	1 0′	„	900	..	900	12,170	13,070	2	3	5	„	..	..	..	„	13/3/88
60. Steele's, Gibbston	Steele, Henry	2	„	1	25′	„	S. 60° W. 35° to 40°	„	..	..	..	„	300	..	300	624	924	1	2	3	„	..	..	..	„	13/3/88
61. Cardrona, Crown Range	Macdougall, R. (owner)	4	„	1	20′+	20′	W. 35°	open	..	..	..	..	400	..	400	..	400	3	..	3	..	..	..	..	..	..
62. Birch's, Crown Range	Thomson, W.	3	„	1	10′	10′	W. 35°	narrow	..	..	..	adit	..	..	..	..	..	..	..	..	hand	..	..	..	natural	..
63. Jones's, Roxburgh	Jones, J.	18	lignite	1	25′	20′	W. 1 in 7	open	..	..	..	..	..	..	..	3,271	3,271	..	..	..	..	..	..	..	..	23/3/88
64. Perseverance, Roxburgh	Craig, James	1	„	1	indefinite	indefinite	indefinite	„	..	..	..	..	597	..	597	..	597	3	..	3	..	..	..	..	..	23/3/88
65. Fernhill, Green Island	Gray, James	11	brown	1	19′ 6″	7′	N. 10° E. 1 in 10	room and rance	1	4′9″x3′6″	40′+50′	adit	4,526	3,239	7,765	59,108	66,873	4	16	20	self-acting incline	..	..	..	furnace	4/7/88
66. Green Island, Green I.	Richardson, D.	16	„	1	14′	10′	E. 10° N. 1 in 10	„	..	..	..	„	3,125	2,000	5,125	99,877	105,002	1	5	6	horse	..	..	..	natural	10/10/88
67. Saddle Hill No. 1, Saddle Hill	Christie, D. L.	14	„	1	19′ 6″	11′	E. 1 in 10	„	2	4′ 8″ x 4′ 4′ x 4′	35′ 30′+10′	shaft	800	1,200	2,000	60,663	62,663	2	5	7	„	..	..	..	furnace	12/10/88
68. Saddle Hill No. 2, Saddle Hill	Christie, D. L.	2	„	1	19′ 6″	6′	E. 1 in 10	„	1	5′ x 2′	50′+10′	adit	633	1,000	1,633	..	1,633				„	..	..	..	natural	12/10/88
69. Saddle Hill, Saddle Hill	Harris, Adam	5	„	1	19′ 6″	6′	E. 1 in 10	„	1	5′ x 2′ 4″	35′	„	123	316	439	3,642	4,081	..	2	2	„	..	..	..	„	26/9/88
70. Glenochiel, East Taieri	Bryce Brothers (owners)	7½	„	1	20′	8′	varies	„	1	8′ x 4′	48′	„	284	50	334	2,646	2,980	1	1	2	„	syphon			„	12/10/88
71. Walton Park, Green Island	Loudon, J., General Manager; Lindsay, W., Mine Manager	18	„	1	18′	7′	E. 1 in 9	„	3	11′ x 4′ 12½′ x 4½′ 5′ x 4″	175′ 173′ 25′	shaft and adit	15,454	3,532	18,986	332,634	351,620	7	36	43	horses and engine	4′ 6′	11″	175′	furnace	10/10/88
72. Abbotsroyd, Green Island	Freeman, James	7½	„	1	16′	7′	E. 10° N. 1 in 10	„	2	4′ x 4 4′ x 4′	80′ 45′	engine-plane	8,860	4,250	13,110	111,146	124,256	6	18	24	engine	2′ 6″	6″	47′	„	10/10/88
73. Mosgiel, Mosgiel	Sneddon, James	4	„	1	15′	7′	S. 1 in 10	„	1	6′ x 6′	32′	„	2,300	3,174	5,474	6,254	11,728	3	7	10	„	syphon			natural	24/9/88
74. Brighton, Brighton	Walker, James	2	„	1	7′ to 14′	6′	S. 80° E. 6° to N. 20° E. 12°	„	..	..	..	adit	365	90	455	264	719	..	2	2	hand	..	..	..	„	15/9/88

* Coal. † Dirt. ‡ Now winding from 145′

Statistics of Workings in Coal-mines, 1888—*continued.*

Middle Island—*continued.*

Name of Mine and Locality.	Name of Manager.	Number of Years worked.	Quality of Coal.	No. of Seams worked.	Thickness of Seams.	Thickness worked.	Dip of Seam.	System of Underground Working.	Number of Shafts.	Dimensions of Shafts.		Output delivered by	Output for 1888.			Approximate Total Output to 31st December, 1887.	Approximate Total Output to 31st December, 1888.	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.		
Otago—*continued.*													Tons.	Tons.	Tons.	Tons.	Tons.									
75. Bruce, Milton ..	Hardwick, N. ..	14½	pitch	1	12′ 6″	6′	varies	bord and pillar	1	4′ x 3′	29′	adit	1,270	225	1,495	14,589	16,084	1	3	4	hand	..	..	..	natural	10/1/88
76. Real Mackay, Milton ..	Young, A. ..	20½	„	1	25′	8′	N.E. to E. 1 in 8	„	1	4′ 6″ x 3′	34′	„	627	..	627	13,281	13,908	..	2	2	„	..	..	..	„	10/1/88
77. Fortification, Milton ..	Reid, T. ..	5	„	1	12′	6′ to 7′	S. 60° E. 5°	„	..	..	..	„	180	..	180	1,604	1,784	..	1	1	„	..	..	..	„	10/1/88
78. Cannon's, Lovell's Flat ..	Cannon, T. ..	18	lignite	1	25′	20′	S. 20° W. 1 in 4	open	..	..	..	..	..	..	..	4,140	4,140	..	..	..	..	..	..	..	..	10/1/88
79. Paskell's, Adams Flat ..	Paskell, J. T. ..	24	„	1	8′	all	N.E. 1 in 6	„	..	..	..	..	16	4	20	289	309	1	..	1	..	..	..	..	..	10/1/88
80. Adams's Flat, Adams's Flat	Reid, J. ..	6	„	1	8′	„	S. 45° E. 12½°	„	..	..	..	..	224	..	224	532	756	1	..	1	..	..	..	..	..	10/1/88
81. Benhar, Stirling ..	Nelson, J. ..	25	brown	1	40′	10′	S. 17°	bord and pillar	1	4′ x 4′	48′	engine-plane	2,800	860	3,660	51,603	55,263	1	5	6	engine	steam-		jet	furnace	11/1/88
82. Morrison's, Stirling ..	Morrison, J. ..	2	„	1	6′	6′	E. 12°	„	..	..	..	adit	195	..	195	51	246	1	..	1	hand	..	..	..	natural	11/1/88
83. Rigfoot, Stirling ..	Aitken, J. ..	2	„	1	8′	8′	S. 12°	„	..	..	..	„	385	30	415	312	727	1	1	2	„	..	..	..	„	11/1/88
84. Kaitangata (No. 1), Kaitangata	Watson, W. P., Gen. Manager	13	pitch	1	30′	25′	W. 45°	„	1	13′ x 5′ 6″	392′	shaft	35,347	17,031	52,378	393,568	445,946	13	83	96	engine	..	..	..	furnace	21/11/87
85. Kaitangata (No. 2), Kaitangata	Shore, Wm. M., Mine Manager	5	„	1	10 to 34′	25′	W. 1 in 4	„	1	6′ diam.	210′+10′	engine plane									„	2′	5″	250′	..	6/11/88
86. Castle Hill, Kaitangata ..	Carson, M. ..	1¼	„	1	12′	8′	..	„	1	3′ 9″ x 2′ 6″	54′+4′	adit	1,011	103	1,114	44	1,158	1	2	3	hand	..	..	..	natural	13/1/88
87. Wangaloa, Kaitangata ..	Smith, J. ..	8	„	1	10′ 6″	6′	E. 1 in 6	„	..	..	..	„	42	20	62	790	852	..	1	1	„	..	..	..	„	13/1/88
88. Lesmahagow, Kaitangata	Sewell, R. M. ..	7	„	1	5′	all	N. slight	„	..	..	..	„	48	10	58	726	784	..	1	1	„	..	..	..	„	13/1/88
89. Crofthead, Kaitangata ..	Coulter, W. ..	2	„	1	14′	8′	N. 20° E. 10°	„	..	..	..	„	1,000	40	1,040	200	1,240	1	2	3	„	..	..	..	„	13/1/88
90. Wyndham, Wyndham ..	Genge, T. ..	11	lignite	1	3′	all	level	open	..	..	..	..	150	..	150	1,778	1,928	1	..	1	..	..	..	..	..	24/1/88
91. Parratt's, Wyndham ..	Parratt, T. ..	3	„	1	4′ 6″	2′	„	„	..	..	..	..	84	..	84	170	254	1	..	1	..	..	..	..	..	24/1/88
92. Menzies' Ferry, Wyndham	Morris, J. ..	8	„	1	3′ 7″	all	„	„	..	..	..	..	387	..	387	2,464	2,851	1	..	1	..	..	..	..	..	24/1/88
93. Smyth's, Gore	Smyth, W. ..	3	„	1	10′+	10′	W. 5°	„	..	..	..	..	100	..	100	50	150	1	..	1	..	..	..	..	..	27/7/88
94. Lieze's (jun.), Gore ..	Lieze, M., jun. ..	12	„	1	6′ to 7′	all	..	„	..	..	..	..	105	..	105	824	929	1	..	1	..	..	..	..	..	23/1/88
95. McKinnon's, Gore ..	McKinnon, A. ..	7	„	1	6′	6′	level	„	..	..	..	..	270	8	278	957	1,235	1	..	1	..	..	..	..	..	23/1/88
96. Hoffmann's (formerly Chittock's), Gore	Hoffmann, J. ..	6	„	1	15′+	15′	N.W. 5°	„	..	..	..	..	30	..	30	2,239	2,269	1	..	1	..	6″	2″	15′	..	23/1/88
97. Gore, Gore	Hunter, George ..	2	„	1	7′ 6″	5′ 6″	S.W. 6°	bord and pillar	..	..	..	adit	100	..	100	615	715	..	1	1	Land	..	..	..	natural	27/7/88
98. Gore, Gore	Hunter, George ..	1	„	1	10′+	10′	..	open	..	..	..	..	655	..	655	..	655	3	..	3	..	..	..	..	..	27/7/88
99. Croydon, Croydon ..	Tweedie, George	½	„	1	9′	9′	S. 60° W. 15°	bord and pillar	..	..	..	adit	326	10	336	..	336	1	1	2	hand	..	..	..	natural	13/8/88

100. Heffernan's, Gore ..	Heffernan, P. ..	10	"	1	12′	12′	W. 15°	open	..	..	..	..	170	..	170	292	462	1	..	1	..	..	..	..	..	23/1/88
101. Chatton, Chatton ..	Pacey, W. R. ..	12	"	1	10′	10′	S.E. 1 in 6	"	..	..	..	..	400	..	400	3,998	4,398	2	..	2	..	..	..	..	..	23/1/88
102. Chatton, Chatton ..	Pemble, Henry ..	11	"	2	26′ and 20′	all	90° strike N. and S.	"	..	..	..	..	900	80	980	8,000	8,980	3	..	3	..	..	..	..	..	23/1/88
103. Cullen's, Waikoikoi ..	Cullen, James ..	1	"	1	4′	"	N. 5°	"	..	..	..	..	30	..	30	..	30	1	..	1	..	..	..	..	..	16/8/88
104. Maniholm, Waipahi ..	Lischner, A. ..	2½	"	1	14′	"	E. 3°	"	..	..	..	..	900	..	900	..	900	3	..	3	..	6″ 6″ 6″	3″ 3″ 3″	22′ 22′ 22′	..	16/8/88
105. Mapp and McKenzie's, Pukerau	McKenzie, D. ..	2	"	1	7′ 6″+	5′	N. 20° W. 15°	"	..	..	..	..	256	..	256	65	321	1	..	1	..	..	..	..	..	28/7/88
106. Pukerau, Pukerau ..	O'Hagan, Charles	8	"	1	16′	6′	W. 1 in 10	bord and pillar	..	..	..	adit	291	..	291	15,545	15,836	..	3	3	hand	..	..	..	natural	28/7/88
107. Enterprise, Pukerau ..	McKenzie, James	½	"	1	7′	all	N. 60° W. 11°	"	..	..	..	"	165	..	165	..	165	1	3	4	"	..	..	..	"	28/7/88
SOUTHLAND.																										
108. Waimea, Riversdale ..	Carmichael, J. ..	3½	"	..	12′	"	N. 10°	open	..	..	..	..	1,300	..	1,300	1,050	2,350	3	..	3	..	..	..	..	..	14/8/88
109. Otama, Otama ..	Hunter, T. ..	3½	"	1	2′ 6″	all	level	"	..	..	..	..	150	..	150	..	150	1	..	1	..	..	..	..	..	14/8/88
110. Mataura, Mataura ..	Beattie, James ..	13	"	1	12′ 6″	8′	N.W. 4°	"	..	..	..	..	1,097	..	1,097	13,107	14,204	2	..	2	..	6″	3″	22′	..	27/7/88
111. Mataura, Mataura ..	Town, C. ..	2	"	1	13′	all	N. 70° W. 5°	"	..	..	..	..	1,441	..	1,441	1,402	2,843	2	..	2	..	6″	4″	15′	..	27/7/88
112. McGowan's, Mataura	McGowan, F. ..	1	"	2	3′ and 2′	"	N. 70° W. 1 in 8	"	..	..	..	..	89	..	89	..	89	1	..	1	..	..	..	..	..	14/8/88
113. Sleeman's, Mataura ..	Sleeman, C. P. ..	2½	"	1	4′	"	N. 70° W. 3°	"	..	..	..	..	120	..	120	50	170	1	..	1	..	..	..	..	..	15/8/88
114. Townshend's, Mataura..	Townshend, E. ..	1½	"	1	8′+	8′	level	"	..	..	..	..	32	..	32	123	155	..	..	..	..	..	..	..	..	15/8/88
115. Edge's, Waikaka ..	Edge, A. A. ..	10	"	1	14′	all	N. 60° E. 15°	"	..	..	..	..	150	15	165	160	325	1	..	1	..	..	..	..	..	23/1/88
116. No. 14, Waikaka ..	Edge, W. H. ..	1½	"	1	8′ 7″	"	W. 35°	"	..	..	..	..	40	..	40	..	40	..	..	..	..	..	..	..	..	23/1/88
117. Sarginson's, Gore ..	Sarginson, J. H. ..	2½	"	1	12′	12′	N.W. slight	"	..	..	..	..	48	..	48	62	110	1	..	1	..	..	..	..	..	17/8/88
118. Nightcaps (No. 1), Nightcaps	Handyside, W., Gen. Manager	8	pitch	1	2′ 4″	all	N.E. 1 in 7 to 1 in 2½	bord and pillar	2	6′ x 4′ 6′ x 3′	10′+16′ 135′	engine-plane adit	4,550	..	4,550	58,994	63,544	7	6	13	engine	3′ 9″	6″	135′	furnace	1/8/88
119. Nightcaps (No. 2), Nightcaps	Lloyd, John, Mine Manager	6	"	2	10′ and 15′	"	N.E. to E. 1 in 4 to 1 in 6	"	2	4′ x 3′ 6′ x 4′	50′ 58′+16′										horse	..	..	..	"	1/8/88
120. Wairio, Nightcaps ..	Knight, James ..	8	"	1	9′	"	N.E. 5°	open and bord and pillar	..	..	..	"	177	..	177	2,732	2,909	..	..	2	hand	..	..	..	..	1/8/88
121. Flett's, Nightcaps ..	Flett, S. ..	1	"	2	3′ 4″ to 5′ 6″ 2′ 3″	"	S.E. 10°	open	..	..	..	..	50	..	50	..	50	1	..	1	..	Cali	forn	ian	pump	1/8/88
122. Morley Village, Nightcaps	Alley, J. ..	2½	"	1	3′	"	S. 80° E. 5°	"	..	..	..	..	93	..	93	448	541	1	..	1	..	..	..	..	..	19/1/88
123. Morley Village, Nightcaps	Alley, J. ..	1	"	1	4′	"	N. 60° E. 5°	"	..	..	..	..	427	..	427	..	427	3	..	3	..	..	..	..	..	1/8/88
124. Hokonui, Winton ..	Shore, T. ..	2	"	1	12′ to 3′ 6″	"	W. 14°	bord and pillar	..	..	..	adit	4,888	1,146	6,034	650	6,684	9	11	20	hand	..	..	..	..	11/8/88
125. Fairfax, Fairfax ..	Graham, P. S. ..	10	lignite	1	5′ 6″	"	S.W. 1 in 20	open	..	..	..	..	596	..	596	5,281	5,877	3	..	3	..	..	..	..	..	31/7/88
126. McDowall's, Fairfax ..	McDowall, H. ..	3	"	1	5′	"	S.W. 1 in 20	bord and pillar	..	..	..	adit	314	..	314	1,070	1,384	..	2	2	hand	..	..	..	natural	31/7/88
127. Isla Bank, Fairfax ..	McIntosh, James	8	"	1	6′	"	N.W. 5°	open	..	..	..	..	200	..	200	420	620	1	..	1	..	..	..	..	..	31/7/88
128. Orepuki, Orepuki ..	Lindsay, J. B. ..	3	"	1	6′	"	S. 75° E. 15°	bord and pillar	..	..	..	adit	59	10	69	4,117	4,186	1	2	3	horse	..	..	..	natural	31/7/88
129. Popham's Cluny, Orepuki	Popham, James ..	1	"	1	3′	"	S. 12½° W. 8°	open	..	..	..	..	80	..	80	..	80	2	..	2	..	..	..	..	..	31/7/88
													478,730	135165	613,895	4,441,711	5,055,606	..	..	1689						
Output from mines included in former statements, and whose operations were suspended prior to 1887													..	..	..	..	133,433									
Output from mines included in statement for 1887, but whose operations have since been suspended													..	..	..	..	43,793									
Total																	5,232,832									

ACCIDENTS IN COAL-MINES.

No. and Date.	Name of Mine.	Locality.	Cause of Accident.	Above Ground.	Below Ground.	Fatal.	Non-fatal.	Name of Sufferer.	Remarks.
			North Island.						
1. Feb. 3	Taupiri ..	Waikato ..	Fall of coal from the face	..	..	1	..	James Russell	Inquest attended.
			Middle Island.						
1. Jan. 6	Tyneside ..	Greymouth	Fall of coal ..	..	1	..	1	A. Portray ..	Ankle slightly injured.
2. Feb. 10	" ..	"	" ..	..	1	..	1	J. Allen ..	Foot slightly injured.
3. " 13	Shag Point ..	Otago ..	Fall of timber ..	..	1	..	1	J. Kenyon ..	Setting timber.
4. Mar. 8	Brunner ..	Greymouth	Fall of coal ..	..	1	..	1	E. Stafford ..	Leg broken.
5. " 18	Earnscleugh ..	Otago ..	Asphyxiated in shaft	..	1	1	..	J. Statham ..	Inquest attended.
6. " 25	Bayles and Buckingham's	Canterbury	Fall of earth ..	..	1	1	..	T. J. Buckingham	No notice from Coroner.
7. May 9	Wallsend ..	Greymouth	Fall of coal ..	..	1	..	1	A. Williams ..	Collarbone broken.
8. " 12	" ..	"	Runaway tub ..	..	1	..	1	R. Cherrie ..	Prosecution (see Report).
9. " 23	Coal-pit Heath	"	Fall of coal ..	..	1	..	1	W. Mann ..	Leg broken.
10. June 7	"	"	" ..	..	1	..	1	W. Manderson	Head slightly cut.
11. Aug. 1	Brunner ..	"	Gas-explosion ..	..	1	..	1	Wm. King.	
12. " 7	Lankey's Gully	Reefton ..	Fall of coal ..	..	1	..	1	J. Aston.	
13. " 8	Hokonui ..	Winton ..	"	..	1	1	..	C. Bailey ..	Inquest attended.
14. " 14	Wallsend ..	Greymouth	Tub on incline ..	..	1	..	1	James Binnie.	
15. Sept. 18	Idaburn ..	Naseby ..	Fall off bench in openwork	1	..	..	1	R. Andrews ..	Not reported.
16. Dec. 3	Coal-pit Heath	Greymouth	Slinging machinery	1	..	..	1	J. Bremner ..	Finger broken.
17. " 13	Walton Park ..	Green Island	Fall of timber ..	..	1	..	1	Wm. Jordan	Two fingers amputated.
				2	15	4	14		

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