

1886.

NEW ZEALAND.

MINES STATEMENT

BY THE MINISTER OF MINES, THE HON. W. J. M. LARNACH, C.M.G.

DELIVERED ON TUESDAY, 6TH JULY, 1886.

Mr. Speaker,—

Sir, —In the Mines Statement which I had the honour of making last session I informed the House that I had determined to make myself acquainted with the practical details of the mining industry; and, having made a personal inspection of all the mining centres of New Zealand, I on that occasion thought it necessary to make the Statement somewhat of a descriptive character, following the events during the course of my first journeying through the mines of the colony; and in adopting that plan I had in view of the feelings of my friends the miners on the subject. No Mines Statement having been delivered previous to last year, I felt sure that the miners in every portion of the colony desired to have a description, however imperfect, of my visits to the many mining localities it was my duty and my privilege to inspect.

I now, Sir, propose to direct the attention of honourable gentlemen particularly to the great and increasing importance of the mining resources of New Zealand; and the more urgently do I do so at this period of time, while the colony, like other parts of the world, is suffering from that atmosphere of depression which has overshadowed it so long. But I ask, how much more severe would this straightened period have been, and how much more keenly would the monetary pressure have been felt from one extremity of our Islands to the other, had it not been for the soundness of our mining industry, and the steady and regular yield of our numerous rich mines, embracing not only gold, silver, copper, iron, zinc, tin, lead, antimony, and nickel, but

coal such as cannot be surpassed in quality in any part of the world, besides a large collection of other valuable minerals.

By an order of this House made on the 3rd day of August, 1869, on the motion of the late Mr. W. H. Harrison, I have found that it was ordered that certain statistical returns should be furnished to Parliament annually; and hitherto it has been the custom merely to comply strictly with the meaning of the order: but it has become apparent year by year that more special attention would have to be directed towards mining in the colony if it is desired by Parliament that operations in connection with it should be conducted on a practical and systematic, as well as upon a sound commercial basis.

MINERAL PRODUCTION.

Up to the present period the reports and statistics in relation to mining have referred almost exclusively to gold and coal: I now feel it a pleasant duty to direct the attention of honourable gentlemen to the enormous value of the several other mineral products found in this colony and exported from it, the value of which, it will be seen from the tables annexed, amounted on the 31st of December last to no less a sum than four millions of money, and, in addition to this, the value of New Zealand coal consumed within the colony to the same date may be reckoned at three and one-half millions sterling. These figures, I apprehend, are surely of great importance to the present well-being and future progress of New Zealand, and I venture to hope may have some influence upon the minds of honourable gentlemen when considering the moderate sums asked for in aid of carrying on a systematic and prudent course of developing the mining industry.

The quantity and value of gold entered for export, and upon which duty has been paid, and the several quantities and values of other mineral exported up to the 31st December last, may be seen in Table 1, while Table 2 will show the annual production of gold since 1857, and Table 3 will be found useful in showing the total quantity of mineral ores other than gold produced and exported year by year since 1853.

I may briefly refer to the totals of these tables, and the values of the several mineral productions—namely, gold, £42,327,907; silver, £118,322; copper-ore, £17,397; chrome-ore, £37,367; antimony-ore, £7,731; manganese, £43,103; hæmatite-

ore, £220; mixed minerals, £49,834; coal, £102,681; coke, £4,873; and, lastly, kauri-gum, £3,685,499: amounting in the aggregate to the grand total of £46,394,934.

Now, the total value of the exports of produce and manufactures of the whole colony during the year ending on the 31st December last was £6,591,911. Of this sum I claim in the interests of mining £1,311,394 for mineral products, being equal to one-fifth in value of the year's exports. If we deduct the value of the wool exported for the same period, £3,205,275, it will be seen that the value of our minerals is more than one-third of that sum, and is therefore equal to 39 per cent. of the value of all other natural and artificial products and manufactures; and if the total value be taken of the whole exports of the colony, which amounts to £125,050,369, from the time that minerals were first recognized as one of our most important natural products for exports, then the value of our mineral product equals 37 per cent. upon the large sum I have just named; or, to put the comparison into another form, by deducting the value of wool sent away from all other products except mineral for the same period, the result will show above 69 per cent. on such.

From this announcement of facts to honourable gentlemen, I have faith that they will at last realize what an all-important factor is the mining industry in respect to the past and future progress of New Zealand, and to any efforts already made, or that hereafter may be undertaken, in the direction of useful and practical colonization.

CAPITAL INVESTED BY REGISTERED GOLD-MINING COMPANIES.

I have thought it probably that there are some honourable gentlemen who from want of time or inclination may have been prevented from making themselves acquainted with some important particulars in relation to mining companies which I will now place at their disposal.

It may awaken surprise to learn that the capital invested in registered companies carrying on gold-mining operations up to the 31st March last amount to the nominal sum of £7,078,393, which was the aggregation of 451 companies engaged in alluvial and quartz claims; and the amount of paid-up capital in respect of the same is £1,575,983. Fifty-nine of these companies are registered under "The Mining Companies Limited Liability Act, 1865," the total paid-up capital of which amounts to £357,009; two others are under the Joint-stock Companies Act, with a paid-up capital of £21,080; and the remaining 390 are under the Mining Companies Act, with a paid-up capital of £1,197,894.

VALUE OF MACHINERY AND PLANT EMPLOYED IN GOLD-MINING COMPANIES.

As the chief consumers of capital invested at the first outset of mining companies are machinery and plant, which may include water-races and their contingencies, such as tail-races and ground-sluices, I will here allude to briefly.

The value of the above on the 31st of March last, excluding those water-races that have been constructed and are maintained by the State, amounted to £1,438,859. Of this sum machinery and plant claim £425,732; water-races, £698,606; while the cost of tail-races and ground-sluices appears as £179,396, and dams and reservoirs amount to £108,125.

The cost of the several water-races and their contingencies constructed and maintained at the expense of the State amounts to £343,188, which added to the total expended by private enterprise in the same direction, including cost of machinery and plant, the sum total appears at 31st March last, £1,782,047.

Now, Sir, let me claim the attention of honourable gentlemen for a few minutes, that they may be enabled to consider my remarks while I am placing some of the results of these apparent large outlays before them.

The total yield of gold from the various mining districts in the colony, made up to the close of our last financial year, and on which duty has been paid, appears to be 10,849,261oz., representing a value of £42,566,135; while the separate return for last year gives 233,068oz. obtained, of the value of £931,628, full details of which may be seen on Table No. 4 appended.

It is acknowledged that at least one million and a quarter pounds have been paid to the State by way of gold duty to dispense to the local bodies, and that the State has been greatly benefited indirectly in its fiscal revenue by the large consumption of dutiable commodities made by an enterprising, yet a distinct, class of colonists, whose occupation is mining. If, then, the colony were to fail at any time in offering facilities and encouragement to these worthy citizens of the mines, I feel assured that those among them who might be in a position to do so would leave the country for new fields abroad. For these reasons, therefore, I venture to think that I have shown to honourable gentlemen sufficient to cause them to hesitate before acting in any way that might tend to embarrass or cripple the industry.

The total quantity of quartz crushed during the past year was 94,016 tons, which yielded 111,432oz. of gold; while the quantity crushed during the previous year

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was 92,872 tons, which produced 88,299oz. of gold: thus showing in this branch of gold-mining a satisfactory increase in favour of last year of 23,133oz., full details of which may be found in Table 5. I look upon this improvement as particularly interesting; it gives evidence that quartz-mining—to my mind the future permanent gold- and silver-mining of the colony—is steadily increasing in many parts of New Zealand; and, although its development heretofore has been slow, its future importance and value to the colony are already assured.

MINING POPULATION AND EARNING.

Let me now call attention to the number of miners in active pursuit of their calling at our many goldfields on the 31st March last. As may be seen on Table 6, there were 11,178, while the miners similarly engaged during the previous year were 12,034. In respect to the number of men—and there were 856 less—which those figures show, and a consequent decrease of labour-power, it is satisfactory to find that the gold-product for the same period has increased. Of the number of miners following their avocation, 2,105 are engaged entirely in quartz-mining, as against 2,059 employed at similar work during the year previous. After careful observation I have come to the conclusion that quartz-mining is every year receiving more attention from the practical miner than alluvial digging, and there is no doubt about the average earnings of the quartz-miner being greater than those of the alluvial miner. For instance, the average earnings of miners on our goldfields last year appear equal to £80 5s. 5d. per miner, or £3 15s. per man more than for the previous year; but to those of my friends engaged in quartz-reefing—comparing the value of gold obtained from such workings against the number of men employed—the average earnings of each will amount to £185 5s. 5d.

QUARTZ-MINING.

Sir, it is my duty to direct attention to some of the principal quartz-mining companies now in operation in this colony, and among the foremost in importance are the following:—

The Cambria Company, at the Thames, with a nominal capital of £31,500, of which only £1,837 10s., are at the present time paid up. Yet, with this bagatelle sum paid up, the company has been enabled since January, 1884, to amass and declare dividends amounting to the respectable total of £69,260.

The Phoenix Company, at Skipper's, in Otago, the property of Mr. Bullen, of Marlborough, has recently struggled into a healthy state of existence after many years of lavish nourishment having been bestowed upon it by its faithful owner, who has determinedly for nearly twenty years endeavoured to prove the faith that was in him, that he possessed a very rich mine. After expending many thousands of pounds, and taking out of the mine some 15,000oz. of gold, the mine now promises to pay regularly and handsomely. This property particularly shows an instance where confidence in quartz-reefing and its value in the future has not been misplaced. It will perhaps be interesting to honourable gentlemen to ask their attention to the mode of working adopted at this mine. By the means of electricity the fundamental operations of the mine are set in motion and carried on, the details of which are fully set forth on page 19 of the report by the Inspecting Engineer.

Of some of the more prominent companies of the west coast of the Middle Island, I may mention the Welcome and Keep It Dark Mines, at Reefton, which are the principal dividend-paying properties in that district, and the Alpine Mine, in the Lyell district; particulars of which may be gathered from pages 35 and 37 of the Inspecting Engineer's report.

There are many other promising quartz-mines throughout the colony, which are showing signs of steady but sure progress; but to particularize each one, and refer to it separately, would I fear weary the House.

Before leaving the interesting subject of quartz-mining, I desire briefly to refer to the invention known as the "La Monte Process," for the extraction of gold and silver from ore; and I feel much cause for regret that the smelting-works erected on that principle at the Thames have failed to come up to the expectations that had been formed of them. The failure, however, seems fairly attributable to the want of cheap and proper fluxes; for, although the process gave a larger product of metal from the ore than any other method yet adopted in the colony has done, the cost of treatment under existing circumstances precludes it from use in operating upon ores of low grade, of which there are unlimited quantities in many portions of New Zealand. It is fair, however, to the promoters of the process to state that, through the erection of their works, the attention of the miners has been directed more closely to the richly-argentiferous ores which are now found to be abundant in the Ohinemuri district, and along the Hauraki Gulf to the Thames. I have little doubt, within a short period a new and valuable branch of mining, that has hitherto lain dormant, will be vigorously

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prosecuted. As illustrative of the great mineral richness of the large district of the Thames, I may here refer to the valuable discovery recently made at Waiomo, a trial-crushing of the stone having yielded at the rate of 75oz. of gold to the ton. With such evidence of the wealth in our mines, I hope the miners of New Zealand will pause before deciding to proceed to Western Australia; for, with the greater experience I have been enabled to gather by the visits I have had the pleasure periodically to make to the many mining centres and districts in this colony, I feel convinced that to the practical miner, as well as to the steady worker who is willing to follow the pursuit of mining, no better field can be found for the profitable occupation of their labours, nor no finer or more wholesome sphere for the well-being and exercise of their physical capacities, than exists in this colony.

ALLUVIAL-GOLD MINING.

In reference to alluvial mining, which is chiefly carried on in the Middle Island, I intend merely to direct the attention of honourable gentlemen to some of the principal fields, the foremost of which is Kumara, on the West Coast. By means of the water-supply provided by the State for the manipulation of this field, the yield of gold from it last year was 13,856oz. The large extent of ground yet unworked, with its great depth of drift-wash proved to be auriferous, is sufficient evidence that this field will give remunerative employment to a considerable mining-population for years to come.

One of the largest alluvial mining companies on the West Coast is the Humphrey's Gully, near to Hokitika, which has expended a very great amount of capital in bringing on to their lease a water-supply to wash or sluice the high terraces on the watershed of the Arahura River. This company will, I hope, be able to give profitable employment to a great number of miners for, I may say, a very long period of time.

Another model of mining skill and enterprise in alluvial workings is to be found at Ross on the property known as the Ross United Company; and I may say that at this mine are to be found the deepest alluvial-gold workings at present known in the colony. Recently, at a depth of 230ft. below sea-level, a layer of auriferous wash-dirt has been found upon the same bottom that the Cassius and Morning Star Companies did so well out of in former years; but the lead of gold was never before traced, as it has recently been, extending towards the ocean-beach.

In Otago our chief supply of alluvial gold is coming from Naseby, St. Bathan's, Tinker's, Cromwell, Clyde, Criffel, Round Hill, and Orepuki. The great drawback up to the present time with several of the best of these mines in respect to gold-producing is the want of water. The most recently-discovered field—Criffel—has suffered very much in prosperity for want of water; and from the altitude of these mines—4,000ft. above sea-level—the miners can only work for barely six months during the year, the ground being covered with snow for nearly the remainder. Notwithstanding all difficulties, Criffel has produced during the last year about 3,500oz. of gold of which we have an account, and I believe that a large quantity of gold from that district finds its way on to other fields, and is sold as gold from more favoured localities. Two water-races are now being constructed to the mines, and when these are completed and full of water the production of gold will be greatly increased, as the ground seems to be especially adapted for sluicing.

Waikaia—formerly Switzer's—is another important alluvial-mining centre; but unfortunately, the claims are chiefly held by Chinese—certainly the best claims are, and all the water-rights. The quantity of gold obtained last year from this field, as far as can be ascertained, is 2,064oz.; but I have little doubt a great deal is still in the hands of the Chinese. The number of these people employed as miners on our goldfields last year was 3,134; and at a moderate calculation I think they must have obtained fully one-sixth of the whole quantity of gold produced during that period. They contribute very little comparatively to the revenue of the colony, while most of the gold they succeed in obtaining they carry or send to their own country.

Knowing, as I do, how easily any steady worker, not necessarily a miner, can put together six to eight shillings per day on many of our alluvial goldfields by simply using a tin dish or an old cradle, and washing the alluvial drift found near the beds of the watercourses, I often wonder that there should be people in this country unemployed. I feel sure that if they would turn their attention from the large towns and centres of population and wend their way to some of our goldfields they would soon find how easily and independently they were enabled to make a good livelihood and enjoy an unlimited range of freedom of existence.

In respect to all alluvial mines it will be found that any details to which I have omitted to refer may be seen in the reports attached, by the Inspecting Engineer and the several Wardens.

COAL-MINES.

Second in importance to no branch of mining in New Zealand is that of coal, and it is most gratifying to find that our coal-mines are year by year making steady and sure progress. In 1878 our total output was 162,218 tons; while in 1884, a period of seven years—inclusive—it had reached 480,831 tons. The total production from our coal-mines last year, ending 31st December, was 511,063 tons, and the quantity imported 130,202 tons: making a total of 641,265 tons. Of this quantity I find that 51,427 tons are shown in the Customs returns as exports; but, in reality, 45,056 tons of the quantity were used for coaling the direct steamers for England, while 4,000 tons were used by the “Coptic” when war with Russia was threatened, thus making a total of 49,056 tons, the whole of which may be considered as having been consumed within the colony. The exports, therefore, of coal to markets outside of New Zealand during the last year were only 2,371 tons, while the actual consumption within it was 638,894 tons; and of this quantity 124,286 tons were imported. The consumption for the year 1884 was 622,921 tons, which shows an increased demand for last year of 15,973 tons. The quantity of coal imported during 1884 appears at 148,444 tons; while last year exhibits a decrease of 18,242 tons: leaving a total of 130,202 tons imported during 1885.

I cannot help expressing extreme regret that, at this period of the colony's history, our exports of coal to other countries should only amount to a few hundred tons, when, had the question of improving the West Coast harbours of Greymouth and Westport been taken into consideration at the time of the initiation of the public works scheme, and dealt with in a practical manner, as was done during the session of 1884, these harbours would long ere this have admitted vessels capable of carrying from two to three thousand tons of coal on one bottom; and, instead of the trifling export that is now being sent away, tens of thousands of tons would be exported annually, not alone to our neighbouring colonies, but also to other countries more distant; and I do not hesitate in predicting that the progressive export of coal from this colony annually in the future will be such as will place the status of New Zealand in respect to its total export of this commodity upon an equal footing with other portions of Australasia, where the effects of trade hitherto have placed them in an advantageous position in respect to the export of coal. I feel, Sir, that I cannot lay too much stress on the importance of nourishing our great coal industry, both in regard to the

advancement of colonization and concurrently with it the sound progress of New Zealand financially in respect to its future revenues.

I will now take the average increase of output from our coal-mines during the last eight years, which appears to be 49,835 tons per annum; while the decrease in coal imported for the same period shows 6,278 tons per annum. Although our producing-capacity under existing circumstances is enlarging itself rapidly, the present supply is far from sufficient to meet the demands within the colony. Numerous industries are quickly springing up, requiring an increased supply of fuel. Machinery of many kinds is constantly being erected in different parts of the colony the motive-power of which is steam, and therefore with us coal may be justly termed “the great motor of many industries.”

The number of coal-mines in operation last year was ninety-five—only one more than during the previous year; and it will be seen by referring to Table 8 that sixty-two of them produced 27,701 tons by employing 114 men, which gives an average of 243 tons per man; eleven other mines produced 35,966 tons with eight-four men employed, equaling an average of 428 tons per man; six other mines produced 32,339 tons with ninety-one men employed, giving an average of 355 tons per man; while sixteen mines produced 415,057 tons with 1,194 men employed, yielding an average output of 348 tons per man. The average output per man from the whole of the mines referred to in respect to the men employed last year was 345 tons per man. The reason for the apparently low average per man in reference to some of our mines is accounted for by the large number of lignite-pits that are being irregularly worked, consequent upon the demand for this class of coal being limited to household and other local consumption.

I beg to refer honourable gentlemen to Table 9, from which will be learned the increase and decrease of output respectively from the various districts or mines of the colony. Kawakawa shows an increased output of 6,898 tons; Waikato, 1,481 tons; Greymouth, 42,825 tons; Reefton, 460 tons; Koranui, 24,550 tons; Shag Point, 964 tons; and an increase is shown by several of the smaller lignite and brown-coal mines in Otago. But the principal decreases shown by mines in that district are notably the Walton Park, 7,035 tons; and the Fern Hill, 3,381 tons; while the Kaitangata shows an increase of 2,447 tons, and the Westport Mine, at the Buller, a decrease of 26,717 tons. This large decrease in the latter may be accounted for by an unfortunate system of “strike” which seemed to have been countenanced by the coal-miners at Westport

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and Denniston during the year. It will be remembered that the principal workings of the Shag Point Mine had to be abandoned about two years ago on account of the water from the ocean breaking into the mine, which necessitated a new shaft being sunk at considerable expense; that work having been accomplished and many difficulties surmounted, the mine is again in operation.

In the chief Canterbury mines there has also been a decrease. In the Homebush Mine, Malvern district, 3,256 tons; Whitecliffs, 2,448 tons; Springfield, 1,887 tons.

In the Southland district the Nightcaps Mine shows a decrease of 8,210 tons; while the excellent coal and shale mine at Orepuki exhibits an increase of 2,091 tons.

The large increase of output at the Greymouth mines is mainly attributable to the Brunner, owned by Messrs. Kennedy Brothers, and the Coal-pit Heath Company's mine. The former shows an increase of 25,633 tons, and the latter 14,289 tons; while a new mine recently opened on the Westport Company's property, and known as the "Tyneside," shows an output for the year of 2,903 tons. The Wallsend Company, now the Westport, which was originally initiated and started many years ago, has had to encounter some difficulties; but since the mine was taken over by the Westport Company work has been pushed on vigorously, with the object of speedily sending the coal to market. Two excellent shafts have been sunk to a depth of 600ft. each, and, without any exception, the best plant in the colony for pumping, winding, and otherwise working a mine to the greatest advantage is to be seen here. The company have bottomed on a magnificent seam of coal 17ft. to 18ft. in thickness, and immediately some extra modern machinery, now ordered from England, and necessary for facilitating the winning of the coal, arrives at the mine, operations on an extended scale will commence towards sending the coal to market; and, as the shafts are contiguous to the railway to the shipping port only distant about eight miles, I have little doubt that the export of coal from Greymouth during the next year will nearly have doubled its previous annual quantity.

It is an unquestionable fact that the rapid increase at Greymouth of its chief export is entirely owing to the encouragement given to shipping by the construction of the harbour-works, and the substantial improvements that are already apparent in its harbour. It is not many years ago that vessels drawing a little over 8ft. of water and carrying not more than two hundred tons of coal could with certainty at all times be piloted over the bar, whereas now it is seldom that less than 12ft. to 18ft. are found on the bar, thereby enabling steamers and other vessels carrying on one bottom from

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seven hundred to a thousand tons of coal to load, and leave the port without risk. When the harbour-works have been completed and more wharfage-accommodation provided, the increase of trade at this port will be so rapid and, in my opinion, so sound that the day is not distant when this Newcastle of the West Coast will rank second to very few of the chief towns of the colony in points of substantial prosperity, as it will, like its twin sister Westport, take a foremost place as a port for the shipment of one of New Zealand's finest bituminous coals, which is of such a high quality for gas-making purposes, while Westport coal is equally good for steam purposes, that either class of coal cannot be surpassed for their respective qualities in any part of the world.

The Collingwood District is perhaps the richest known mineral one in the colony, and it abounds in excellent bituminous coal; but the great difficulty in getting it shipped adds seriously to the cost and prevents it taking a proper place in our markets. Enormous deposits of rich iron-ore are *in situ* almost side by side with large coal-seams, the whole being surrounded with an abundant supply of the finest limestone. The output of coal from this district for last year shows a falling-off of 1,544 tons. I feel sure, however, were a moderate sum of money forthcoming towards the improvement of the Rua Tunewa River and supplying wharfage and shipping accommodation, a very large coal-trade would quickly spring up between Collingwood and Wellington and other ports in proximity.

While making special reference to bituminous coals, Table 10 will show that there was a large increase of output in that class—by 45,812 tons—over the production for the year 1884, and during the same period a reduction in the brown and lignite coals of 13,845 tons. As our bituminous mines become opened out, and their coal finds its way to market, it will most assuredly establish a preference for itself by its enormous heating-power, while its density gives it a lasting power. Of course, it will be evident to every thinking mind that our bituminous coals must soon take up a foremost position in respect to quality, and also in quantity, where steam has to be used as the motive-power, and the consumption of our lignite and brown coals will depend chiefly on local requirements for domestic use.

One of the chief difficulties that the proprietors of our bituminous-coal mines have at the present time to contend against, and may have for some time to come, until considerable harbour improvements have been effected, is the high cost of freights which prevents them from competing successfully in foreign markets with the

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coal companies of New South Wales; but whenever vessels of larger tonnage can be safely employed in our coal-trade the average cost of freight will be reduced, and thus enable the colony to have access to the best markets for the disposal of her finest coal. No doubt a limited quantity of Australian coal will always find its way to our principal ports as ballast in vessels trading with New Zealand; but this source of supply will become too insignificant to injure or retard the progress of an industry which, I believe, will show itself to be, in the near future, the largest and most flourishing that this colony can claim.

WATER-RACES.

Among the many important classes of public works undertaken in the colony, I look upon the construction of water-races, when prudently devised, as paramount to any other. I admit that some of our water-races might, with advantage to the interests of all concerned, have been better laid out and planned, and that much money has been misspent in that direction: at the same time, that does not establish the principle as a bad one of forming and fostering such works. While there are one or two races that have failed to reach expectation as revenue-producers, there are many that have paid a very fair return direct, exclusive of the indirect advantages which they have conferred upon communities as well as upon the State. Large tracts of land in this colony unsuitable for settlement by the agricultural or pastoral settler have been proved to be sufficiently rich in auriferous treasure to pay the miner a satisfactory return for his labour where the necessary supply of water is available to enable him to apply the system of hydraulic sluicing to work the ground; for, as some honourable gentlemen may be aware, under such a system the mineral richness of the ground is not so much the chief factor in producing profitable results as the quantity of water which can be brought to play upon a claim within a given time, so as to manipulate and work the greatest quantity of stuff from the face of a claim in the shortest possible time; therefore, the greater the quantity of water at a useful altitude the more powerful will be the motive-force brought to bear to aid the miner in working his ground.

The races constructed and maintained by, and under the control of, the Government are the Waimea-Kumara, Nelson Creek, Argyle, at Charleston, and Mikonui. There is also the Mount Ida Race, in Otago, which is controlled by a Trust, and to which the State has contributed annually £500 towards maintenance. The direct returns from the three first-mentioned races, although not large, may be considered

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satisfactory, the net profit being for last year £5,708, and the approximate quantity of gold for the same period obtained by means of these works appears to 20,198oz., the value of the duty on the same being £2,020, which, added to the direct profits earned by the races, will equal £7,728, or nearly 2 ½ per cent. on the cost of construction. If I state the position of the Waimea-Kumara by itself, it will show a direct profit equal to 4 ½ per cent. for last year on the cost of construction; and, apart from this result, a large revenue is received indirectly by the State from the steady population, which these works are the motive-power of sustaining in employment, and whereby a large amount of dutiable commodities are annually consumed.

The cost of water-races paid direct by Government is £467,834, and through local bodies £33,426, amounting in the aggregate to a total cost to the colony at the end of last year of £501,260. During the last four years, since the moneys voted for the purposes of these works have been under the control of the Minister of Mines, works have been undertaken to the value of £44,527, of which £35,513 have been paid. The liabilities on the 31st March last were £6,964, and the value of such works authorized and constructed during last year was £10,429.

DRAINAGE- AND SLUDGE-CHANNELS.

Subsidies have also been given by the State towards the construction of drainage- and sludge-channels where a heavy expenditure was necessary, and when it was found that the carrying-out of such works would not only relieve but facilitate the water-races in performing their functions, and thus aid in developing large areas of auriferous ground. Now, the total cost of the latter class of works, with their expansions and diversions, up to the end of last year amounts to £20,259, which includes the subsidy contribution authorized towards construction and repairs of £14,509, and of which £7,514 have been paid. The works of this nature constructed and in progress during last year may be estimated at £10,459.

I cannot leave the subject of water-races, their tributaries and contingencies, without pointing out how intimately they bear upon the interests of the respective counties in which any of them may be situated, inasmuch as each county is benefited indirectly *per se* by the revenues produced by such works according to the mining operations that may be initiated and encouraged by the facilities they afford. An increase in the number of miners' rights and in the quantity of gold produced in any district are two only of the many advantageous results to be looked for from having an

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abundant supply of water for mining purposes. I have come to the conclusion that all such works ought to be under the direct control of one or other of the local bodies, as I feel sure that any arrangement of the kind would tend to make them more valuable to the districts concerned, as well as to the county or borough, whichever body might be the administering one. With that view, I have already been in communication with the local bodies, and negotiations are still pending. Should any agreement be arrived at it would only be upon the understanding that the moneys necessary to repair or complete any of these works should be estimated and fixed, and be forthcoming from the State from time to time over a reasonable period, and beyond this liability the responsibility of the Government would cease altogether in respect to any such work that may be handed over to a local body. I consider that the more this proposal can be acted upon the more will communities have the system of local government strengthened, and the people will be enabled to control and manage the most important works, not alone for the benefit of themselves, but also of their respective districts.

ROADS AND TRACKS.

I think it will be universally admitted that roads and tracks are most necessary, and therefore the fundamental works, for developing the vast mineral wealth of the colony, and for promoting its settlement. It is primarily by such means that the country becomes opened up and pioneer miners and settlers have an opportunity of entering the primeval forest to prospect for and work the mineral deposits, or become settlers and cultivators of the soil. There are large areas of land—to the extent of several hundred thousand acres—in the southern part of the Middle Island, on a large portion of which I have evidence that minerals abound, and that there are tens of thousands of acres well fitted for settlement, much of which would readily be occupied if there were roads, or even decent tracks, dividing and intersecting different blocks of the country; and until provision is made on a sufficient scale to do good, practical work of this kind, we will have only ourselves to blame if that part of New Zealand remains a *terra incognita*. Let me impress upon the minds of honourable gentlemen that the bulk of our mineral lands are of a hilly or mountainous character, and in many districts covered with exceedingly dense forest, with undergrowth of scrub; and without a track upon which a packhorse can travel it is absolutely impossible to prospect, even in a primitive manner, any such land. If the route of a

proposed track is first carefully selected and laid off, then the track can in most instances be formed so as to admit of its being easily and inexpensively widened into a dray-road hereafter. I may say that this system has obtained with the Mines Department since it has had the control of any such work.

The cost of roads and tracks undertaken and constructed by counties on the goldfields since the votes pertaining to such came under the control of my office amounts to £54,137, out of which subsidies have been paid to the extent of £35,630; and the cost of similar works undertaken and wholly paid for by the department is £16,275. The estimated cost of roads and tracks under construction by the aid of subsidies, but which are not yet completed, is £27,045, of which sum £5,552 have been paid, and the existing liabilities on subsidies authorized for the work are £12,477. As for roads now undertaken by the department to be wholly paid for, these will cost, when complete, £46,374, of which £18,806 have been expended, and the liabilities stand at £27,568. Roads in course of construction to open up mines other than gold have been authorized to cost £6,333, of which £4,439 have been paid on account thereof, and the liabilities remaining on the same are £491.

So far as the Mines Department is responsible, the total cost of such works constructed and those in progress will be, when complete, £150,164. Of this sum £80,702 have been spent by the department, while the liabilities stand at £40,536. The estimated cost of such works in progress and completed during last year is £44,056.

AID TO PROSPECTING.

From time to time aid has been given to prospecting, with the object of developing the mineral wealth of the colony. The assistance has been extended to prospectin-associations, companies working at deep levels, and, latterly, under regulations made by the Governor-in-Council, based on recommendations to me by the Gold-fields Committee, to the local bodies, and, under special circumstances, to individual parties engaged prospecting the outlying districts. The sum authorized for this purpose since such votes have been under the control of the Minister of Mines is £11,847, of which £5,547 have been expended by way of subsidies; and, as subsidies were only sanctioned conditionally that works costing not less than £25,928 were carried out, a portion only of such works having been done, hence the small amount of money if has been found necessary to pay. I believe that well-organized prospecting-parties will yet do great good by new discoveries of our mineral wealth,

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and it is by aiding the *bonâ fide* prospector that we may expect to secure advantageous results.

DIAMOND- AND OTHER DRILLS.

Subsidies in aid of the purchase of diamond- and other drills have been given by the State to the extent of £1,858; but no expenditure under this head has been incurred during last year. The diamond-drill, in my opinion, is not altogether the machine likely to prove of general use to the miner; for it has been found out that, unless in boring for coal, or for other minerals, through rock of an uniform hardness it cannot be worked economically. Neither is the drill well suited for prospecting through lodes where Silurian rocks have to be bored—and many valuable metals are found frequently in such rocks. What is required to be practically useful to the miner for prospecting purposes is a strong and light portable machine that could be carried by pack-horses from place to place, and which would be capable of sending a bore-hole to a perpendicular depth of 500ft. Such a class of drill, I believe, can be found in America at a moderate cost, and I am now in communication with manufacturers in that country on the subject.

SUMMARY OF EXPENDITURE ON WORKS.

I will now briefly summarize my remarks by stating that during the last four years the total amount authorized for the construction of water-races, drainage- and sludge-channels, roads and tracks, diamond and other drills, and aid to prospecting on the gold-fields is £244,477, and otherwise paid by way of subsidies, the sum of £131,044; while the sum authorized for similar works last year appears £76,804, of which £41,789 have been paid, and there are remaining liabilities amounting to £60,885 to be provided for. Full details of first cost, expenditure, and liabilities may be seen in the several tables attached to the report prepared by the Inspecting Engineer.

SCHOOLS OF MINES.

Immediately after I had accepted office, about eighteen months ago, I thought it would be not only a very desirable course to take, but a most useful one, to make arrangements whereby the miners would have opportunities of receiving a certain teaching of scientific knowledge, to aid that which they had practically taught

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themselves, in respect to minerals and the various conditions in which they are usually found; and also that they should be taught the manner of testing different minerals in order to become acquainted with the natures of different ores that about in the colony, and with the kind of metal that any ore will produce. In my opinion, it was fortunate that such a man as Professor Black, of the Otago University, was in New Zealand, and that he was willing to place his services at my disposal, and ready to labour with the utmost enthusiasm in the direction and for the cause of establishing mining-schools in our various mining-centres. Professor Black commenced the first of his series of lectures during the early part of last year, after having received authority from me to do so, and during the present year he and his assistants have been enabled to complete another course of valuable and instructive lectures throughout our many mining districts.

It is with great satisfaction to myself that I feel justified in saying that the course of instruction sought to be imparted to the miners by Professor Black and his assistants has proved to be of enormous use and value to them; for there can be no doubt that before Professor Black had been among the miners, instructing them in what way to test any ore they were working, many of them were allowing metals of greater value to be carried away in what is technically called tailings, than were found in the gold and silver they saved. Who, for instance, was aware that in many of the auriferous ores being worked for years in the vicinity of the Thames, and in places along the Hauraki Gulf, that these, while rich in gold, were chiefly argentiferous, and contained more silver than gold? But the miner was only intent upon searching for the latter metal, and therefore allowed the former to run with the tailings from the battery, little dreaming of the great wealth that he was assisting to waste. All this has been changed since the advent among the miners of Professor Black, and reefs and claims that in many instances were barely paying expenses or entirely unremunerative are now giving excellent returns to their owners. During my visits to several of the mining-centres I was very much interested at observing the effect of Professor Black's lectures upon the minds of some of the young schoolboys in the districts. In most cases I found that the boys in a few days had really qualified themselves to apply tests correctly to ores in analysing them, and they had gained this knowledge simply by attending the lecture-classes. It occurred to me that this was a step in the right direction towards technical education.

Schools of mines, varying in degree according to population, have already been established in each of the chief mining districts, and they are being fitted up with a proper supply of chemicals and apparatus, suitable for testing the different minerals that may be found. Some of these schools have already borne excellent fruit, inasmuch as many miners have qualified themselves to test ores for metals, to test metals, and to test their purity; and they are also able to impart their knowledge by instruction to other miners. For further evidence of the good results that have been attained, I have pleasure in referring honourable gentlemen to Professor Black's report on the whole subject, wherein a full and detailed account of the duties of his staff will be found. This report, with others, will be laid on the table to-night. I may state that Dr. Von Haast has been instructed by the Mines Department to purchase several complete sets of mineralogical specimens in Europe, for the purposes of distributing the same to the principal schools of mines throughout the colony, and which will give to the miner an opportunity of having a knowledge of all of the most important mineral ores, and enable him by comparison to detect others of a similar character should he happen to find such while pursuing his ordinary avocation.

GEOLOGICAL DEPARTMENT.

Since the prorogation of Parliament last year the Geological Department has been transferred from the control of the Colonial Secretary to the Minister of Mines, and honourable gentlemen will find appended to my Statement a valuable report by Dr. Hector of the work performed by his office during last year. It will be observed that much inconvenience is suffered though want of room for carrying on the important duties appertaining to the Geological staff. I think that funds ought to be forthcoming for building a room suitable for a Mining Museum; for I am aware that Dr. Hector has already sufficient specimens of ores and other minerals to occupy a large space when properly arranged; and such a beginning would, doubtless, initiate the establishment of a mining school in this city; and I know of no more central place where such a school would prove so convenient and beneficial in that respect to the interests of New Zealand. I commend the subject to the consideration of honourable gentlemen.

MINES EXHIBITS FOR THE INDIAN AND COLONIAL EXHIBITION.

The circumstances of an Indian and Colonial Exhibition taking place in London during the present year was one, in my opinion, not to be neglected in the interests of the colony. Consequently, with the view of drawing attention to our varied mineral resources, and perhaps encouraging the introduction and investment of capital towards developing them, I had procured from different mining districts as many valuable exhibits as was possible in a limited time, and had them carefully forwarded to London to the care of Dr. Von Haast. Among the specimens sent were blocks of bituminous coal, showing the quality and thickness of the seams from whence it was taken; copper-ore and native copper, antimony, scheelite, auriferous quartz, argentiferous ore, and samples of gold taken from the different mining centres of the colony; and I feel glad to have notice that some of the London newspapers, in commenting on the several colonial courts at the Exhibition, state that "New Zealand mines exhibits compare most favourably with those of the other colonies."

It has been my wish since assuming office to have our mining laws, and every regulation appertaining to them, consolidated and provisioned in such a manner that one law for the leasing and working of mines other than coal, would obtain throughout the colony. I therefore had prepared during the recess a Consolidated Mining Bill, a Coal-mines Bill, and a Mining Companies Bill. The first refers to mining for all minerals not coal, repeals sixteen other Acts, and promises to be a most useful measure, as its provisions will apply to all parts of the colony, wherever mining is carried on.

The second Bill refers to the coal-mining industry, and provides for the leasing and better working of this class of mines. This is the first Bill introduced to the House proposing to deal entirely with the coal-measures of the colony and their management.

The third Bill purports to consolidate the several Acts now current relating to mining companies and their management; and, by repealing five other measures, I hope to provide a useful law for the whole colony.

If these three Bills become law, they will respectively give greater facilities for mining, by providing for a reduction in the fee for miners' rights and rents of ground held under lease; a more simple form of administration, greater security for workmen employed in the mines, and, lastly, imparting more confidence in the minds of shareholders and the public generally who may be desirous of investing money in

mining companies, by offering a better means of judging of the true position and affairs of any company or claim.

HANDBOOK AND MINING GUIDE.

During my occupancy of the office I have the honour to hold in connection with mines, I have felt the want of a hand-book that, at a glance, would give to the inquirer every information in respect to mining companies and claims, the mode of working and the class of machinery used in different mining districts, the areas of ground held under mining-leases and special claims, the number of miners practically employed upon each field, and the amount of capital invested in plant and machinery. Following my instructions the Department had been engaged in collecting material necessary for compiling such a work, and, when ready, I propose to issue illustrative maps with it, so that it will afford every possible information in relation to the industry. I cannot pretend that I shall be able to present for information a perfect work or guide, for difficulties have already been encountered in collecting reliable materials on which to frame the book; but, notwithstanding, I hope within a few months to be able to supply a much-needed want.

VISITS TO MINING CENTRES AND DISTRICTS.

During the recess I was enabled to visit the following mining districts: Tapanui, Waikaia, Maerewhenua, Tuapeka, Roxburgh, Clyde, Cromwell, Wanaka, Jackson's Bay, Haast, Paringa, Bruce Bay, Gillespie's Beach, Okarito, Big Wanganui, Ross, Rimu, Woodstock, Kanieri, Hokitika, Kumara, Stafford, Goldsborough, Greymouth, Reefton, Boatman's, Westport, Ahaura, and thence crossed over the Amuri Pass from Westland to Canterbury. I may here mention that this pass, in my opinion, offers no difficulties in the way of taking a railway from the West to the East Coast; and the road could be made to run through a large tract of excellent agricultural country, well fitted for settlement, with the advantage of a good climate, not nearly so cold as that of Otago. In visiting the West Coast goldfields I started from the head of Lake Wanaka and traveled northwards through the Haast Pass to Jackson's Bay, and thence to Ross, a distance of about two hundred miles; and, with the exception of the bridging of a few rivers, there are, I consider, no greater engineering difficulties in the way of forming a railroad along the entire route northwards from Wanaka to Hokitika than existed on the main road from Bluff to Dunedin.

Honourable gentlemen, I hope, will excuse me if I briefly refer to a very large scope of country that came within my notice. I allude to the western portion of Otago, where very few roads and tracks exist, comprising an area of five million acres. Of this quantity there are upwards of five hundred thousand acres of valley and hill-country, mostly under forest, but capable of being used for agricultural and pastoral settlement; and of this latter quantity about sixty thousand acres have been sold.

That beautiful stretch of *terra incognita* south of Ross comprises an area of 1,720,000 acres. Of this quantity 272,000 acres are suitable for settlement, of which six thousand acres are already sold, and three thousand acres are held under agricultural leases. In other words, the total area of land from the ocean-beach at Orepuki, near the Waiau, in Southland, and following a line to the lower end of Lake Te Anau and to the heads of Lakes Wakatipu and Wanaka, thence to the boundary of Westland near the Haast Pass, and again along the same boundary to a line running westerly to the ocean-beach near to Ross, appears to be 6,720,000 acres. Of this quantity there are suitable for settlement 772,000 acres, of which 66,000 acres have been sold, and three thousand acres are held under agricultural leases.

I have acquired this information from the Surveyor-General and from Mr. Mueller, the Chief Surveyor of Westland, one of the ablest officers in the Survey Department, having had the privilege of his company for several days when recently journeying through that portion of the colony. It may not be uninteresting to record here the great satisfaction that was evinced by the few settlers on the occasion of my visit, who have been for more than twenty years struggling to build a home in those distant localities. These people rarely see a stranger, and had never before seen a member of the Government among them. As many of them expressed themselves to me, they were almost without the means of communication with the large centres of population and the settled districts; they were absolutely without the necessary convenience of tracks—to say nothing about roads—to facilitate them in forming homes for themselves and their families; but my visit seemed to place before them a vision of hope that they were now likely sooner or later to be annexed to civilization, and thus share with other portions of the colony the benefits of fair and good government.

CONCLUSION.

In concluding my remarks, Sir, I feel that I owe an apology to honourable gentlemen for the time I have taken up in placing the foregoing facts with my views before them in reference to our mining industry; but my excuse is that the subject is perhaps virtually the largest, if not the most important, of any that concerns the present and future interests of New Zealand. I humbly claim to have a little knowledge of the systems of mining in this colony and other countries. In Australia I was one of a small community who first tried their hands at practical mining on the Turon River, near Bathurst, in New South Wales, during the winter, spring, and summer of 1851; and I had previously ridden over the renowned Ballarat, in Victoria, when it was but a sheep-run, and prospectors were then there trying to discover gold. I was there afterwards in the midst of the earliest and greatest rush of pioneer miners. I saw Beechwood, Sandhurst, Castlemaine, Inglewood, Dunolly, Maryborough, Fiery Creek, Pleasant Creek, and Ararat in their most busy and brightest days of gold-producing. During the months I spent on Ararat in 1857 there were over sixty thousand miners on the field, sending from it weekly, for a time, to Melbourne and Ballarat twenty-five to thirty thousand ounces of gold; and, although I never followed the occupation of a miner, with the exception of the time I spend at Ophir, on the Turon, I was engaged in a profession that brought me daily into contact with the miner and his claim, and I always felt that his welfare concerned my welfare and the well-being of the business that led me among so many mining communities in Australia prior to the spring of 1867, when I became a colonist in New Zealand. Since that time I have always taken an active interest in any industry that promised to promote the work of colonization, or otherwise benefit the colony. I feel a pleasure in saying that, in my humble opinion, comparing the resources and climate of many parts of Australia in which I have lived with those of New Zealand—and I feel pride in calling Australia my birthplace and the home of my early life—we have little to fear in the future. If we will only have confidence in ourselves and in the great resources of the country in which our lot is now cast, our task of assisting to build up a worthy and prosperous community will not only prove an easy one, but a labour of love. If I have wearied honourable gentlemen it has been unintentionally. My excuse for placing so many facts and figures before them is with the object of giving information, and enlisting their earnest sympathy in the direction of the great industry I have the honour to represent. If I have, even in a moderate degree, succeeded in this, my object will have been attained.