

1885.  
NEW ZEALAND.

## LECTURES ON THE GOLD FIELDS THROUGHOUT THE COLONY

(CORRESPONDENCE WITH PROFESSOR J. G. BLACK AS TO PROVIDING FOR).

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

Professor J. G. BLACK to the Hon. the MINISTER of MINES.

SIR,—

University of Otago, Dunedin, 4th May, 1885.

Consequent upon your request, made to me shortly after you assumed office, to make a lecturing tour on the goldfields of the west coast of the Middle Island, I have now the honour to submit my report thereon. This tour occupied two months, March and April, and was in continuation of a similar four months' tour on the goldfields of Otago.

I left Dunedin on the 23rd February last, and, proceeding overland, reached Greymouth on the 26th February. I there met my laboratory assistant, William Goodlet, whom I had sent by sea with the chemicals and apparatus. We proceeded by coach to Reefton, where I delivered a course of ten lectures on the following subjects: (1) How quartz-reefs were formed; (2) how gold came into the reefs; (3, 4, and 5) methods and appliances for saving gold, including, besides the common processes in use in the colony, the roasting and chlorine processes for extracting gold from pyrites and other sulphides, the manufacture and properties and uses of sodium amalgam, &c.; (6) the methods of testing and assaying gold-bearing minerals, quartz, tailings, pyrites, &c.; (7) copper ores, assaying the same, and copper-smelting; (8) antimony and lead ores, and the metallurgy of these metals; (9) silver and tin ores, and the testing of these and reduction to the metallic state; (10) the methods of testing metallic ores generally.

In the tenth lecture I was very efficiently assisted by two of my students at Reefton, Messrs. Gardiner and Casely, who volunteered to go on the platform with me and perform practically before the audience the tests that I was describing in my lecture. These two gentlemen were so thoroughly prepared with the tests for ores of mercury, silver, lead, antimony, tin, zinc, copper, and iron, that they had no difficulty in carrying into effect on the lecture-table, one on each side of me, the processes explained in my lecture; and they had acquired this knowledge during the preceding nine days in my testing-class at Reefton.

The lectures were in every case largely illustrated by practical experiments, including the manufacture of nitric acid, muriatic acid, sulphuric acid, ammonia, sodium amalgam, solution of gold in chlorine, precipitation of gold from its solutions, the testing on the lecture-table of the ores of the more important metals, the manufacture of quartz, and, indeed, everything that could throw light on the subject of the lecture.

The lectures at Reefton, as at all the other centres, occupied on each occasion from two to three hours, and were listened to with unwearied attention.

I also conducted a testing-class at Reefton, meeting every evening from 7 to 9. This class was attended by about nineteen students, consisting of mine-managers, battery-managers, and miners, with a few others. Seven or eight of the more enthusiastic of these spent the whole day with me analyzing the various ores. In this testing-class the students themselves did the work, and performed all the experiments and applied all the tests, under my direction. The first part of the work of this class was the testing of solutions containing sixteen of the more important metals, including silver, lead, mercury, gold, platinum, arsenic, antimony, tin, copper, cadmium, bismuth, iron, zinc, nickel, cobalt, and manganese.

Having mastered these solutions at two sittings, we proceeded to test ores containing the above-named metals; and at this kind of work my students worked hard and with an eagerness and intelligence that surprised me. In testing the metallic ores the students themselves did all the work—pulverizing the minerals, dissolving out the metals, evaporating the solutions, and precipitating them again with their appropriate reagents.

Whilst part of the students were going through these operations, the rest were taking full notes of the processes. At Reefton, besides testing the ores named above, the students analyzed coal, limestone, and clay, and made a percentage analysis of copper ore, antimony ore, and iron ore, in all of which they were interested, as they occur in the district. Here, also, as at all other places, the students made sodium amalgam, and reduced tungstic acid from scheelite. But the most

important piece of work done at Reefton, in the estimation of the battery- and mine-managers, was the amalgamation of the copper plates at one operation in such a way that they preserve their silver-brightness for any length of time without any tendency to form the green scum known to the miners as verdigris. They were all taken by surprise at the simplicity with which it is done. The great mistake that they had all been committing previously was in using nitric acid for cleansing the plates, and, worse still, the using of nitric acid in rubbing in the mercury on the plate.

In our experiments at Reefton we discarded the use of nitric acid altogether in curing the plates, as it necessarily produces the green scum so justly complained of. Instead of the acid we used only sand and water for cleaning the plates in the first instance rubbing them thoroughly till the surface was perfectly clean and bright. If any spot resisted the rubbing, we used a little diluted muriatic acid (half acid, half water), and in this case we splashed four or five buckets of water over the plate so as to wash away rapidly every trace of acid from it. The next step was to rub rapidly all over with a solution of caustic soda—say, twenty inches of soda-stick dissolved in a quart of water—rubbing in the soda energetically over every part of the surface of the plate. This effectually destroys all traces of acids that may be about, and prepares the plate for the next operation. This consists in pouring some mercury in which a button of freshly-made sodium amalgam had been dissolved over the perfectly-bright copper surface, and spreading it rapidly all over the plate with the same cloth with which the soda solution had been rubbed in. The mercury bites instantly, taking full possession of the copper. The mercury is then to be rubbed into the plate till it is dry. More of the mercury containing the sodium amalgam is poured on the plate, and spread and rubbed in as before. This is repeated till the plate cannot take in any more mercury. It is then in a thoroughly amalgamated state, and will not develop the green scum so troublesome to the battery-manager.

The sodium amalgam was made by half filling a teacup with mercury, warming it gently till the finger cannot bear the heat of the mercury, then putting in by small thin slices at a time about two-thirds of its bulk of metallic sodium, and pressing each piece under the mercury till it explodes or combines with a hissing noise. When the sodium has been all added, the mixture is allowed to cool slightly, and is then, while still liquid, emptied on a flat board or on a cold shovel, in small portions of, say, a thimbleful. These portions soon harden into the buttons referred to above, and constitute sodium amalgam of good quality. The sodium amalgam, like sodium itself, must then be preserved under kerosene or naphtha, in properly-corked bottles, till required for use. The battery-managers were delighted at the unequivocal success of this simple method of curing the plates.

In the rare cases in which sodium amalgam had been used for any purpose, they had been paying an exorbitant price for it (as much as 7s. 6d. per ounce in one instance), and now they can make it for themselves as described above at a cost of 4s. per pound.

The success of these experiments with the copper plates at Reefton secured a warm reception for the lectures all over the coast. On the last night of my stay twenty-one of my students formed themselves into a club, subscribing £1 apiece, and styling themselves, I think, the Reefton Mining Institute, for the purpose of procuring the necessary chemicals and apparatus, and prosecuting these studies among themselves.

The great interest taken in the subject and the importance of the district induced me to prolong my stay at Reefton to ten days in all. In the intervals of teaching I visited and went through the Inglewood Mine and the Keep it Dark and other batteries in the neighbourhood. I then proceeded to Boatman's, where I delivered four lectures, and conducted testing-classes as before. Here I was joined by Mr. Alexander Montgomery, M.A., who had been my own best student and my assistant in Dunedin for several years, and who, during the remainder of my tour, was of the highest service to me, especially in conducting my testing-classes, as well as in delivering lectures on the subject of reefs in general, mineral veins, faults, &c., in which the miners took a very intelligent interest. Mr. Montgomery was the best student of the School of Mines here, and has proved himself an able teacher of geology and mineralogy.

At Boatman's I had a lecture-class of about sixty, and a testing-class of twenty-six earnest students. Here, as at Reefton, I paid special attention to sodium amalgam and its uses, the curing of copper plates, and the chemistry and assaying of metallic ores. I had great assistance from Mr. Caples, an experienced explorer and prospector, and altogether a very intelligent man. With him, Mr. Montgomery and I visited the Welcome Mine, the Specimen Hill, and every battery in the district. Before leaving Boatman's a public meeting was held, under the auspices of Messrs. Caples, Beach, Barr, Gardiner, Raithby, Russel, and Rooney, to pass resolutions and form a club, which they called "The Boatman's School of Mines," subscribing 10s. a head, I think, for procuring the necessary materials for following out the studies they had thus begun.

From Boatman's we proceeded to Lyell, where I delivered two lectures, and, with Mr. Montgomery, examined the Alpine Mine, and conducted a large testing-class for four hours before lecture. I regretted that I could not prolong my stay at Lyell, as I was told of many important things in the district that I could not visit. Here also resolutions were passed pointing to the great need of technical instruction in mining matters.

From Lyell we took the coach down the Buller to Westport, through a valley unsurpassed, I should think, in any land for the beauty of its scenery and the luxuriance of its variegated bush. At Westport I delivered a course of four lectures and conducted a testing-class, as at Boatman's. Here also resolutions were carried in a large public meeting in favour of a liberal scheme of mining instruction in the mineral districts of the colony.

While staying at Westport, Mr. Montgomery and I visited and examined the coal-mines at Denniston and Koranui, staying at Waimangaroa to lecture to about eighty of the miners for three hours and a half. At Waimangaroa, also, a club was formed under the leadership of Mr. Brown, the underground manager of the Westport Company's mine. During my stay in the Westport District I was greatly indebted to Mr. O'Connor, M.H.R., Mr. Munro, Mr. Hughes, the Rev. Messrs.

Monro and Russel, and Dr. Thorpe, who interested themselves largely in the success of my mission.

We then proceeded to Charleston, at the request of a deputation of miners in that district. The two lectures and the testing-class formed there were well attended, and during our stay we visited the beach diggings carried on by an enterprising colony of Shetlanders, who have settled there permanently.

From Charleston we passed through Addison's Flat, where we halted two hours to show how to make and use sodium amalgam.

We then went by sea to Greymouth, where I delivered four lectures, and Mr. Montgomery one on the subject of "Mineral Veins," which he handled in a masterly way before a large audience. The testing-classes here, as well as the lectures, were well attended, and I learnt afterwards that the students after my departure met and formed a local school of mines of about twenty members. I then delivered a lecture at Nelson Creek to about eighty miners, and one at Brunner town to forty coal-miners. Mr. Montgomery spent a day visiting the coal-mines under the guidance of Mr. Bishop. Mr. Calders, Postmaster at Greymouth, put himself to a great deal of trouble in piloting Mr. Montgomery and myself through the district and in organizing classes.

From Greymouth we passed on to Kumara, where Mr. Seddon, M.H.R., had been making preparations and arranging trips and organizing classes for weeks before. The result was that here I had a testing-class of forty-nine members, the largest testing-class I had had since commencing in Otago five months before.

We stayed in Kumara seven days, I delivering six lectures and Mr. Montgomery two. The work done in the testing-class far exceeded anything I had ever done in so short a time, and was of the same satisfactory character as I had previously gone through at Reefton. After leaving I heard they had formed themselves into a school of mines, with over thirty members, subscribing £1 each; and they have instructed me to send to London for chemicals and apparatus to resume the work.

At the request of Mr. Guinness, M.H.R., I returned to Paroa and delivered a lecture for three and a half hours to about twenty-five miners. We then proceeded to Hokitika, arranging on the way for a lecture at Goldsborough before leaving the Coast.

At Hokitika preparations had been made to insure the success of the classes, Mr. Bevan, M.H.R., Dr. Giles, R.M., Mr. Mueller, the Mayor, Hon. J. R. Bonar, and many others warmly interesting themselves in the matter. I lectured three times at Hokitika, and Mr. Montgomery once. The testing-classes were also well attended, and a great amount of interest was taken in the whole course. Leaving Mr. Montgomery to lecture here, I proceeded to Ross, where I delivered three lectures to good audiences and conducted an enthusiastic testing-class.

So eager were the students for practice in testing, that I had not time to spare to visit the Cedar Creek reefs and Hokitika coal-beds. Mr. Montgomery, however, whom I left at Ross to deliver a lecture, visited these districts during the following two days. I then returned to Rimu, where I delivered one lecture and spent a day among the mines, and returned to Goldsborough, where I delivered my last lecture of the tour to an audience of about seventy.

I enclose herewith a tabulated statement of the places at which I lectured, the number of lectures, and the attendance approximately.

In every centre my great regret on leaving was that no means were available for carrying on the work I had begun. I never, in all my thirty-five years' experience as a teacher, came in contact with students so eager to learn and so directly interested in the subjects of instruction. It is no labour to lecture to such men. The lecturer is supported by the consciousness that the audience is in full contact with him throughout. It was, however, saddening to have to leave these men, forming clubs and calling them schools of mines, in every district subscribing their £1 each, knowing as I did how helpless they would be, even with their chemicals and apparatus, unless the means of instruction in the use of these materials were sent to them.

I wish specially to draw your attention as strongly as I can to the splendid opportunity that here offers itself to bring many hundreds of intelligent miners—able workers and good citizens—within the means of technical instruction of a kind most valuable to themselves, and which cannot fail in its results to recoup the colony a thousandfold the expense of affording it. Here we have, on the goldfields of the Middle Island, twenty mining schools spontaneously established, with their Chairmen, and Secretaries, and subscribed funds, trying to help themselves to the special knowledge which they now feel to be essential to any great success in their pursuits. The machinery is already there, and it only rests with the Government to set it in motion in such a fashion as will insure its permanency. This the Government can do by providing efficient instructors and fostering the movement by judiciously subsidizing local efforts.

I do not believe that in any country so many clubs of working-men in such numbers ever in so short a time sprang into existence for the laudable purpose of procuring technical and special instruction for themselves. It proves the previous deplorable state of the mining districts in this respect, and is the expression of a conviction that such a state of ignorance of the science that underlies their processes must no longer continue. The Government, I am convinced, cannot do too much for the encouragement, support, and extension of such movements as we have here.

It is in the operations of the workers that the material wealth of a country lies. No matter what mineral wealth a country possesses, it cannot be advantageously extracted except by specially-skilled workmen. Here we have in our colleges men able and willing to do good work in bringing the necessary instruction to the miner; we have the minerals and the miners; and what we require now is to bring the scientific knowledge of our science-teachers to bear on the minds of the miners. And this must be done by taking the information to the miners, and not by taking the miners away from their work to the existing seats of learning in the cities.

I have taken the liberty to suggest a scheme by which, at small cost to the colony, a good beginning may be made in this direction, and I now respectfully submit it for your consideration;—

TABULATED STATEMENT of Numbers that availed themselves of my Lectures and Testing-classes on my Six Months' Tour on the Goldfields of Otago and the West Coast.

Places.	Number of Lectures.	Maximum Attendance.	Minimum Attendance.	Average Attendance.	Testing-classes.
Lawrence ... ..	14	400	60	100	41
Waitahuna ... ..	1	200	200	200	No class.
Naseby ... ..	9	150	50	70	20
St. Bathans ... ..	1	40	40	40	No class.
Queenstown ... ..	3	35	20	25	12
Skipper's ... ..	5	70	15	25	15
Arrowtown ... ..	6	50	12	20	10
Cromwell ... ..	4	70	50	60	18
Bannockburn ... ..	6	100	60	80	25
Alexandra ... ..	3	70	40	50	No class.
Clinton ... ..	1	70	70	70	No class.
Reefton ... ..	10	200	50	90	19
Boatman's ... ..	4	100	40	60	30
Lyell ... ..	2	80	80	80	25
Westport ... ..	4	210	120	160	25
Waimangaroa ... ..	1	70	70	70	No class.
Charlestown ... ..	2	40	40	40	18
Greymouth ... ..	4	150	35	70	25
Nelson Creek ... ..	1	80	80	80	No class.
Brunner ... ..	1	38	38	38	No class.
Paroa ... ..	1	35	35	35	No class.
Kumara ... ..	6	120	60	80	49
Hokitika ... ..	3	150	80	100	22
Ross ... ..	3	80	40	60	25
Rimu ... ..	1	75	75	75	No class.
Goldsborough ... ..	1	70	70	70	No class.
Totals ... ..	97	2,753	1,530	1,848	379

ANNUAL COST of Scheme of Scientific Instruction on Goldfields of Middle Island.

Mr. Montgomery (the whole year)—

Salary ... ..	£400
Hotel expenses ... ..	150
Travelling expenses ... ..	80
Apparatus and maps, &c. ... ..	50

Total ... .. £680

Professor Black (six months)—

Salary ... ..	£450
Salary of assistant (six months) ... ..	40
Travelling expenses of both, including carriage of apparatus ... ..	100
Hotel expenses of both ... ..	180
Cost of chemicals and apparatus ... ..	50

£820

Total annual expenses, £1,500. Railway travelling free in every case.

SCHEME for West Coast. Mr. Montgomery, eight months, March to October inclusive; Professor Black and assistant, two months, March and April.

	Mr. Montgomery.	Professor Black.
Hokitika, Kanieri, Rimu, Ross ... ..	6 weeks	2 weeks
Stafford, Goldsborough, Kumara, Dillmanstown ... ..	6 weeks	2 weeks
Paroa, Maori Creek, Greymouth, Nelson Creek, Brunner, No Town ... ..	8 weeks	2 weeks
Ahaura, Reefton, Black's Point, Boatman's, Lyell ... ..	6 weeks	2 weeks
Westport, Denniston, Waimangaroa, Addison Flat, Charlestown	4 weeks	1 week
Collingwood, Mohikinui ... ..	4 weeks	1 week
Totals ... ..	34 weeks	10 weeks

SCHEME for Otago, November to February inclusive. Professor Black and Assistant, four months; Mr. Montgomery, four months.

	Professor Black.	Mr. Montgomery.
Lawrence, Bluespur, Waitahuna, Waipori ... ..	5 weeks	4 weeks
Naseby, Hamilton, Hyde, Kyeburn, St. Bathans, Tinker's ...	4 weeks	4 weeks
Queenstown, Skipper's, Macetown, Arrowtown ... ..	3 weeks	4 weeks
Cromwell, Bannockburn, Nevis, Clyde, Alexandra, Black's, Griffell, Serpentine ... ..	4 weeks	4 weeks
Totals .. .. .	16 weeks	16 weeks

In order to give full effect to the instruction in geology and mineralogy and ores it would be extremely desirable to provide a collection of typical well-selected and named specimens of two or three hundred of the most important metallic ores. These collections would cost about £10 10s. each in London, and I believe about twenty of them would be required on the goldfields, costing in all, landed here, about £250. Mr. Montgomery and I would undertake the distribution of these, and contributions would from time to time be made from the colony. These collections would form the *nuclei* of mineralogical museums, which would be necessary adjuncts of the local schools of mines.

I have also respectfully to recommend that where schools of mines are in active operation, Government should help them in procuring the necessary apparatus. This could be best done, I think, by Government requesting me to order from London apparatus and chemicals to the value of, say, £250, and then distributing these among the local schools of mines on the basis of, say, apparatus and chemicals to the value of £1 for every £1 subscribed by the local school. Mr. Montgomery and myself would manage the distribution of these as part of our duties; and it would be a great inducement to the local bodies to help themselves.

After the first year I do not think this would cost the Government more than £150 per annum, as the first cost of apparatus is the heaviest item.

These collections and the apparatus and chemicals thus provided would be thoroughly utilized by Mr. Montgomery and myself, as well as by the schools in our absence.

If the Government entertain these two proposals the cost for the first year will be—for

Twenty collections of minerals ... ..	£ 250
Chemicals and apparatus ... ..	250
	<u>£500</u>

It is very desirable that no time be lost in taking the necessary steps to carry out any scheme that may be adopted. It will be much easier to keep the local schools going by giving them a fair start now under Government auspices than it will be to resuscitate them if the present enthusiasm dies away for lack of the proper encouragement. I have therefore strongly to urge that Mr. Montgomery be appointed to the work without delay, and that he and I be authorized to order from London chemicals and apparatus and mineral collections as specified.

It will be necessary for myself also to know as soon as possible what reception the proposed scheme meets with, so that I may make preparation for any work assigned me.

I have also respectfully to suggest that, in view of the large correspondence I shall have with these goldfields, schools of mines, and miners generally, my letters and telegrams on matters in this connection be franked, and that the usual stationery be forwarded to me for these purposes.

I have, in recommending the scheme, to express my conviction that, if fairly carried out for three years, it will have a wonderful effect in not only greatly improving processes now in use, but also in discovering minerals of great value of which the miners are at present in total ignorance. It will also tend to equalize the advantages of special or higher education in the large cities and on the goldfields.

I have, &c.,

The Hon. the Minister of Mines, Wellington.

JAMES G. BLACK.

Professor BLACK to the Hon. the MINISTER of MINES.

SIR,—

University of Otago, Dunedin, 5th May, 1885.

I have the honour, in connection with my report to you of the 4th instant, to state my views as to how Mr. Montgomery and I should carry out our duties on the goldfields of Otago and the West Coast:—

Mr. Montgomery to have full charge of the schools of mines on the West Coast, and to be responsible for their efficiency.

Mr. Montgomery to enter on his duties at once, commencing in the Hokitika District, and during his six weeks' stay there conducting the schools of mines in the district (Hokitika, Ross, and Rimu). He will also visit and examine places of interest in connection with their minerals. He will then go through the same work in the Kumara District, working his way north so as to overtake the Greymouth, Reefton, Westport, and Collingwood Districts within the eight months of his stay on the Coast. He will in this way be able to stay for several weeks with every school of mines established on the Coast.

My duties would be to have full charge of the schools of mines on the Otago goldfields all the year round, devoting to them four months of my time from the 1st November to the 1st March; other two months of my time being devoted to co-operation with Mr. Montgomery on the West Coast. During the six months while staying in Dunedin I should, by correspondence and an occasional visit to the most accessible districts, guide the studies of the Otago schools of mines, and consult by letter with Mr. Montgomery on the Coast.

Mr. Montgomery would be with me in Otago four months, either always in the same district or in some other district, as would be found on more consideration to be most advantageous.

Mr. Montgomery and myself would have the same status and be colleagues in the work; and, from our antecedents, we should work together in perfect harmony.

10 months	{ Mr. Montgomery alone on West Coast from 1st May to 1st November. Mr. Montgomery alone in Otago from 4th November to 1st March.
6 months	{ I to be in Otago goldfields from 1st November to 1st March. I to be on West Coast from 4th March to 30th April.
2 months	Mr. Montgomery with me on West Coast from 4th March to 30th April.

I have, &c.,

The Hon. the Minister of Mines, Wellington.

JAMES G. BLACK.

Professor BLACK to the Hon. the MINISTER of MINES.

SIR,—

University of Otago, Dunedin, 5th May, 1885.

I have the honour, as a supplement to my report to you of the 4th instant, to point out Mr. Montgomery's qualifications for the office for which I recommended him: (1) In 1878 he obtained by competition a junior scholarship of the University of New Zealand; (2) in 1879 a senior scholarship in same; (3) in 1880 a senior scholarship in same; (4) in 1881 the degree of Bachelor of Arts (B.A.), University of New Zealand; (5) in 1882 the degree of Master of Arts (M.A.), with first-class honours in the subjects of chemistry and experimental sciences, in the University of New Zealand. All the above are first-class University honours.

Mr. Montgomery is, I believe, just twenty-four years of age, physically strong and healthy. (a.) He is the best student we ever had here. (b.) He, after completing his arts course, attended the school of mines here, and was the best student in all the subjects, including geology, mineralogy, blow-pipe, petrography (discrimination of rocks), and mining. (c.) He was my best student for two years, and afterwards my paid assistant for two years. (d.) He has since been for, I believe, about two years in the Public Works Department here, and has done a good deal of field-work. (e.) He took an important part with me in my West Coast tour, working hard and taking an active part in the whole proceedings. (f.) He delivered five lectures, of about two hours' length each time, on the subject of mineral veins, faults, &c., which were well received by large audiences. (g.) Mr. Montgomery, being so well qualified in every department, is able to organize and guide and conduct the schools of mines in a large district in every branch of study. (h.) Having been my assistant for two years he will be certain to co-operate with me heartily in carrying to success the schools-of-mines movement so favourably begun on the goldfields.

With these qualifications Mr. Montgomery's claims to an office such as that for which he is recommended (should such an appointment be created) are not to be equalled by any. It is satisfactory to have in the colony a gentleman of Mr. Montgomery's qualifications at this time.

I have, &c.,

The Hon. the Minister of Mines, Wellington.

JAMES G. BLACK.

The Hon. the MINISTER of MINES to PROFESSOR BLACK.

(Telegram.)

Wellington, 13th May, 1885.

Am much interested in your report on West Coast tour. Can we not arrange to let Auckland and Northern mines have share in our lectures part of year, or must I arrange separate staff, or increase yours? Would like to include whole colony in considering ways and means. Reply.

Professor Black, University of Otago, Dunedin.

W. J. M. LARNACH.

Professor BLACK to the Hon. the MINISTER of MINES.

SIR,—

University of Otago, Dunedin, 15th May, 1885.

I have the honour to acknowledge receipt of your telegram of 13th instant *re* lectures on the goldfields of the North Island.

I am afraid that I am already so heavily weighted with the West Coast and Otago that it would be unwise to undertake further responsibilities. I think, however, Professor Brown, of Auckland College, or Professor Bickerton, of Canterbury College, might be induced to take the North Island. I know that either of these gentlemen is quite competent to do all that is required, and it would be a great advantage to have one or both of them associated with me in the work. I have to recommend, therefore, that they be invited (first the one, and, if he declines, the other) to submit for your consideration a scheme for the North Island which they would be prepared to carry out. If these gentlemen prove impracticable, then, with a little additional assistance in the teaching power, I shall be glad to so modify the programme as to include the goldfields of the whole colony.

All I shall want for this purpose in addition to the requirements for the Middle Island, will be the services for six months a year of Mr. McLymont, my general assistant in my University work here. This would entail an additional expenditure of about £250 a year—namely, for Mr. McLymont's salary £100, and his travelling and other expenses £150—bringing up the probable cost of carrying out the extended scheme for the whole colony to £1,750 per annum, of which £990 would be salaries, and £760 cost of chemicals and other appliances and travelling and hotel expenses for the whole staff, as under—

Myself ... ..	£450
Mr. Montgomery ... ..	400
Mr. McLymont ... ..	100
Goodlet, my assistant ... ..	40
	£990
Travelling, with appliances, chemicals, &c....	265
Hotel expenses...	420
Cost of chemicals and apparatus	75
	£1,750

The time spent in each district would be as nearly as possible in proportion to the importance of the districts. Perhaps an apportionment in the following way would be satisfactory:—

	Otago.	West Coast.	North Island.
Myself and laboratory assistant (Goodlet) ... ..	12 weeks	7 weeks	7 weeks
Mr. Montgomery ... ..	12 "	20 "	20 "
Mr. McLymont ... ..	12 "	7 "	7 "
	36 weeks	34 weeks	34 weeks

Under this scheme I should have a shorter time in each district, but I should have the advantage of McLymont's assistance, which would fairly compensate for that.

From my experience of the goldfields I believe such an arrangement would work well, and under it we should be able to do a great deal of good sound useful work in the mining districts of the colony.

In the probable event of Mr. Montgomery being appointed Lecturer on Geology to our University here, this would take up two months of his time every year (June and July); and, in this case, I would propose to take one month of this from his Otago Goldfields, and two weeks each from his West Coast and Auckland duties. His appointment to the Geology Lectureship, while taking him away two months from his goldfields work, would, I am sure, benefit the goldfields indirectly, by better qualifying him, and giving him increased facilities and materials for carrying on his goldfields work.

My scheme, dated 11th instant, was forwarded to you before I received your telegram *re* North Island.

The Hon. the Minister of Mines.

I have, &c.,

JAMES G. BLACK.

