1885.

NEW ZEALAND.

LECTURES ON THE GOLDFIELDS THROUGHOUT THE COLONY.

[In Continuation of C.-2c.]

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

Professor J. G. BLACK to the Rev. Dr. STUART.

DEAR DR. STUART,— The University of Otago, Dunedin, 20th February, 1885.

I was going to write you on the subject of my lecturing tour on the Otago Goldfields when your post-card requesting me to do so reached me.

The following tabulated statement of the numbers that availed themselves of my teaching at the different centres will speak for itself. The numbers are only a close approximation, as I have not at hand the full statistics :—

——	Number of Lectures.	Maximum Attendance.	Minimum Attendance.	Average Attendance.	Testing Class.	All-day Class.
Lawrence	14	400	60	100	41	8
Waitahuna	1	200	200	200	...	...
Naseby	9	150	50	70	20	12
St. Bathan's	1	40	40	40	...	...
Queenstown	3	35	20	25	12	8
Skipper's	5	70	15	25	15	6
Arrowtown	6	50	12	20	10	8
Cromwell	4	70	50	60	18	13
Bannockburn	6	100	60	80	25	6
Alexandra	3	70	40	50	...	...
Clinton	1	70	70	70	...	...
Totals	53	1,255	617	740	141	61

Before commencing my tour I had sanguine hopes of its success, but the result far exceeded my anticipations.

The idea of going to the goldfields first occurred to me after a conversation with Mr. J. C. Brown, M.H.R. for Lawrence. At his invitation, I promised in May last to give three lectures to the Lawrence Athenæum and Mining Institute. On considering the matter subsequently I became convinced that I could not do much good in the way of giving useful information on the subject of the chemistry of minerals in a course of three lectures; and, as Mr. Brown had assured me that miners in all parts of New Zealand were greatly in want of, and would certainly highly appreciate, the kind of knowledge which he knew I could communicate, I resolved to test the matter on the goldfields, beginning with Lawrence, and overtaking, during the summer months, Naseby, the Lakes, and the Cromwell District; and resolving, if my success on the Otago Goldfields would be such as Mr. Brown predicted, to proceed afterwards to the goldfields on the West Coast.

With the view of protecting myself from pecuniary loss on this lecturing tour, and also with the view of being able to charge the miners merely nominal fees, I laid a proposal before Messrs. Pyke and Brown, M.H.R.s, whereby the Government would guarantee all expenses, including £50 to our laboratory fund, to pay for chemicals and payment of all my own and my laboratory boy's (Goodlet) expenses. The proposal was accepted, being, as I understand, recommended to Government by the Goldfields Committee, and I proceeded to Lawrence on the 4th November to carry it out.

The Lawrence people, and especially the members of the Athenæum and Mining Institute, exerted themselves wonderfully to make this beginning a great success, and I need not say they succeeded in doing so. Nearly all the mine managers, and about thirty-five of the miners, came regularly down from Bluespur and Wetherstones to attend the lectures, and many of them, both old and young, joined the afternoon and evening testing classes. Mr. Stenhouse, Rector of the

High School, had, before my visit, done splendid service in diffusing correct information about the purpose and scope of these classes, enrolling students and arranging generally for carrying out my proposals. A good example was set at once by the bankers, lawyers, doctors, and leading business people of Lawrence, many of whom did not miss one of the fourteen lectures delivered.

The teachers also, to the number of about fifteen, attended regularly. The Press at Lawrence, as, indeed, all over the goldfields, treated my scheme with the warmest advocacy, and great exertions were made to give the fullest reports of the lectures and of the work done in the testing classes. Indeed, to the goldfields Press I am under the greatest obligations for advocating and giving prominence to the scheme.

The example set by Lawrence was nobly followed by Naseby, Bannockburn, Cromwell, Alexandra, Arrow, and the other centres. There are many instances of miners riding in twelve to eighteen miles daily to attend the lectures; and at Naseby, Mr. Cogan, who had come in the beginning of the week on county business from Serpentine, some forty or fifty miles, stayed four days to work up the tests, and by his presence and influence convinced others that the movement was a step in the right direction.

At Naseby a great number of the leading residents took an active part in the classes—clergymen, bankers, teachers, doctors, business men, and miners attending day after day, and working harder than our ordinary students here to master the details of the subject. Over all the Otago Goldfields at least sixty miners gave themselves a holiday during the whole time of my visit at the various centres, so as to spend the whole day in testing the ores.

One of the most valuable features of my tour was the number of the excursion parties got up to visit the outlying fields. In these excursions from six to ten or twelve joined me, and our journeys extended to localities from twelve to thirty miles away. We often started—some in buggies, some on horseback—at 6 a.m., breakfasting on the way or at the scene of our visit. At Naseby we had quite a number of these most enjoyable and instructive excursions, got up by Messrs. Wilson, Brown, Petrie, McHutchinson, Guffie, Worsop, Johnston, Inder, &c.

In this way, and by spending every spare hour in visiting the mines and workings, I managed not only to say much on my own subject, but also to gain a great deal of useful information for myself. The intercourse between myself and the miners was always of the most direct and cordial description. I never engaged in any work in which I was supported by so many men of all shades of opinion so warmly as I have been throughout the whole of this tour.

The subjects of my lectures were such as the following:—

(1.) How quartz reefs were formed:
(2.) How gold came into the reefs:
(3.) How metallic ores in general were formed:
(4.) The formation of alluvial drifts:
(5.) The treatment of auriferous sulphides:
(6.) The chlorine process for extracting gold from pyrites:
(7.) Copper: its ores, tests, and smelting:
(8.) Lead and silver and their tests, and metallurgy:
(9.) The testing of metallic solutions:
(10.) Sodium amalgam: its manufacture, properties, and uses:
(11.) The amalgamation of copper plates, and their treatment to prevent the growth of green salts on them.

In the testing classes the students all assayed pyrites and quartz for gold; also the ores of copper, tin, lead, silver, iron, antimony, zinc, mercury. In some cases also water and coal were analysed, and scheelite. In these testing classes the students themselves did all the work: pulverizing the minerals, weighing the powder, dissolving or fusing it, precipitating, filtering, igniting, weighing, and calculating the results. At most of the centres visited I found arrangements had been made to insure the success of my classes.

At Arrowtown Messrs. Miller, Clark, Hornsby, Elliot, Sutherland, and Mackay had exerted themselves with this object, and formed the nucleus of an earnest and hard-working testing class. At Queenstown Dr. Douglas, the Rev. D. Ross, and Messrs. Wilmot, Hotop, Geisow, Ross, and Mehaffy took up the matter warmly, and carried it through in a most satisfactory way. At Cromwell Mr. D. McKellar and Dr. Stackpool had been at work for weeks before my arrival, and had everything arranged for commencing work at once. At Alexandra the Mayor, Mr. McDonald, and Dr. Lewis threw themselves heartily into the movement, and, joining the classes with the leading townsmen, gathered around me a large number of miners, who, during the three days of my stay, went through a good deal of useful testing.

From my experience on the Otago Goldfields, and from my intercourse with miners, I am convinced that unless the School of Mines here is speedily completed, so as to give a full curriculum in all mining subjects, the teaching staff would be with more advantage employed in teaching their subjects on the goldfields than they are here in our School of Mines. On the goldfields they will find plenty of eager, earnest, and intelligent students, who will bring a great deal of practical knowledge to bear on their more scientific studies. On the goldfields also there are the rock and alluvial formations, the mines and the minerals, and these are infinitely superior to sections and plans and diagrams on the blackboard for the purposes of real instruction in mining. Indeed, I never could understand how it is possible to teach the art and science of mining without the advantage of having the practice of mining and the reefs and drifts and mines themselves, and not mere pictures of them before the student. It seems to me quite impossible to dispense with these requirements in a thorough-going practical mining school. If the Council are unable to complete the mining school, by providing for instruction in geology, practical mechanics, and mine-surveying, it will, I think, be desirable to abolish the School of Mines here altogether, and to devote any means available to the support of technical classes in mining subjects on the goldfields. This might be accomplished in some such way as the following:—

Professor Ulrich to reside for six weeks each year in each of the following districts, viz., Lawrence, Naseby, Cromwell, the Lakes; during his stay holding himself available to all and sundry for advice and information on all mining matters, without fee. He might also deliver at each centre a short course of lectures on the geology and the gold-bearing formations of the district. He might also conduct blow-pipe and other classes for identifying minerals; and he could make himself very useful in visiting the mines and other works in the district, and discussing subjects of local interest in connection with the peculiar characteristics of the formations, and modes of prospecting, and getting the gold from them. In all this kind of work his services would be of very great advantage to miners; he would be thoroughly appreciated, and would find himself in a most congenial atmosphere.

Six months being thus spent on the Otago Goldfields, he might proceed to the West Coast and do the same kind of work for five months of the year there, dividing his time between the Reefton, Westport, Grey, and Hokitika Districts. He would thus have one month's holiday entirely at his own disposal. I would, for my own part, gladly undertake to devote the six summer months (our holidays here) to teaching metallurgy, assaying, testing, and the chemistry of minerals, on the goldfields, in conjunction with Professor Ulrich and under the same scheme, giving, say, six weeks to each of the four Otago centres named above, or, if it were desirable, giving four weeks to each of the Otago centres, as I have done this year, and two months on the West Coast.

Professor Bickerton might by-and-by relieve me on the West Coast; and Professor Brown, of Auckland College, might be induced to undertake the same work for the North Island Goldfields. If Professor Ulrich is unable to see his way to take part in the goldfields scheme, then the place assigned to him could be very well occupied by Mr. Alexander Montgomery, M.A., of this University. Mr. Montgomery is Professor Ulrich's most successful student in all his subjects, and knows, theoretically at least, all that Professor Ulrich has been teaching here. He has also been the best student in my chemistry, metallurgy, and testing and assaying classes here; and I consider him well qualified for this kind of work on the goldfields. The expense of carrying out a scheme of technical education of this kind should, I think, fall on the Government. It would, I suppose, be worked under the department of the Minister of Mines. I have no suggestion to offer regarding the position the University would occupy in the matter.

If the University Council could convert the present School of Mines into such an institution as is sketched above the same end would be obtained. As part of my scheme, I intend to ask the Government to import suitable apparatus and chemicals for the goldfields, and dispose of them in the way of subsidy to the working clubs or classes or local schools of mines that may be organized in the various goldfield centres. Such provision (subsidizing at the rate of £1 for £1, or even £2 for £1, subscribed) would enable these local clubs to maintain their laboratories in an efficient state. I am also going to ask Government to provide and import from Europe suitable collections of named characteristic specimens of all valuable minerals and metallic ores. These to be distributed among twenty or twenty-four goldfield centres, under the custody of some responsible Government or other official, and available to miners for the purposes of instruction. These local mineralogical museums could be rapidly increased by contributions from the museums in Wellington, Auckland, Christchurch, and Dunedin, and by the Geological Survey Department.

This goldfields scheme, if carried out for three years, will, I believe, create such a demand throughout the colony for scientific and technical instruction in mining subjects that the School of Mines in our University, if completed, will have a great deal of work to do as a training school for instructors in goldfields schools. It will, of course, in that case, be always the resort of those who are able to prosecute their studies in mining subjects to the highest degree; and to avail themselves of this means of qualifying themselves theoretically, and in some subjects practically, in those branches of knowledge which are indispensable to the highest class of mine managers. It is from this point of view highly desirable to complete the School of Mines here as soon as possible, but if that cannot be done, then, as I have taken the liberty to suggest, it will become a serious question whether the means available for supporting it would not, with more advantage, be expended in extending the goldfields scheme.

Summary of my proposals:—

(1.) Complete the School of Mines here, or suspend it for some years; or abolish it altogether.
(2.) Instead of the School of Mines here, organize a scheme for technical instruction on the goldfields of the colony.
(3.) Let the subjects taught be mineralogy, the blowpipe, mining, mine-surveying—all of which may be taught by one lecturer, and assaying, metallurgy, the testing of ores, and the chemistry of minerals—which can be taught by a second lecturer. Mathematics, so far as required, may be provided for by the masters of the local schools.
(4.) The following to be the centres for the purposes of this scheme: Lawrence, Naseby, the Lakes, Cromwell, Reefton, Grey, Hokitika, and Westport.
(5.) The mining lecturer (Professor Ulrich or Mr. Montgomery) to reside six weeks every year in each of these districts, and to hold himself available for advising and instructing miners in mining matters, and promoting their interests generally.
(6.) The chemistry lecturer to reside one month in each district, to carry on his teaching by classes and lectures.
(7.) Either the Government to organize and carry out some such scheme as this, or to enable the University to do so.

I have, &c.,

The Chancellor of the University of Otago. JAMES G. BLACK.

By Authority: GEORGE DIDSBURY, Government Printer, Wellington.—1885.