

No. 4.

Mr. A. MONTGOMERY, M.A., to Professor BLACK.

Sir,—

Thames School of Mines, Waiorongomai, 17th May, 1886.

In accordance with the instructions in your telegram of the 11th instant, I have to make the following report of my work since the beginning of the year:—

On the 4th January I went to Tauranga, to inspect the quartz-reefs that had been discovered in various parts of the county. I spent a week in visiting the various localities, and also gave a lecture in Tauranga to about two hundred persons. Specimens of stone from the various finds were assayed by me on my return to the Thames, and the results of these assays, together with my impressions as to the probability of finding gold in the district, were forwarded to the Mayor of Tauranga. I attach a copy of my letter to him.

Returning to the Thames on the 11th January, I had several consultations with the newly-elected committee of the Thames School of Mines Association, at whose disposal my services had been placed. A suitable temporary building was secured, and on the 25th January I began to give a regular course of instruction in practical chemistry, determinative mineralogy, chemistry, and geology. Many difficulties had to be encountered, the principal ones being caused by want of necessary apparatus. I was not able to give instruction in the very important subject of assaying while at the Thames, as I had neither furnace nor assay-balance, both essential requisites. As this branch of chemistry is of all others that which is of the greatest immediate value to the practical miner, the want of instruction in it was very much felt, and a great many men who would have attended classes in assaying put off coming at all to the lectures until such time as the necessary apparatus for that study should be procured. Nevertheless, over forty members entered for the classes. The average attendance at the determinative mineralogy class was about six, at practical chemistry and at lectures on chemistry ten each, and at lectures on geology twelve. The classes at the Thames were held continuously for seven weeks. I am certain that, if there had been provision for work in quantitative chemical analysis and assaying, there would have been a much larger attendance.

Leaving the Thames on the 22nd March, I went to the important mining district of Karangahake, where I remained four weeks, holding classes in practical chemistry and assaying, for a balance and portable furnace were obtained just before I left the Thames. The miners at Karangahake attended very well, many coming long distances in spite of very bad roads and bad weather. The average attendance was from fifteen to sixteen per day. From Karangahake I went to Waihi, and held classes there for a fortnight, the average daily attendance being about fourteen, which was very good considering the small population and the inclemency of the weather. The course of instruction, as at Karangahake, included wet and dry tests for the various metals, and fire-assaying. From Waihi I came on to Waiorongomai, where I am now. The course of instruction here will extend over about ten days, and I shall then go to Te Aroha for about the same time, and thence to Coromandel, where I shall stay three or four weeks, and then return to the Thames.

The Thames School of Mines Association has now bought a building suitable for a laboratory and lecture-room, and an assay-furnace is in course of erection, so that during the winter session I expect a large attendance of students. The secretary of the association has been asked to forward you all particulars as to the number of members of the association in the different centres, and no doubt will do so.

With regard to the results of the work already done I cannot say more than that a beginning has been made which in time will lead to good results if means are taken to continue the instruction. It would be difficult to find a district where scientific knowledge is more necessary than in the goldfields of the Coromandel Peninsula. Till very lately the only gold-saving appliance in use on the field has been the stamping-mill, a machine suitable only for free gold, but quite incapable of dealing with silver ores, such as those common at Karangahake, where the silver is often in the proportion to gold of 50 or 100 to 1. Even for free gold of the very fine character that occurs in many parts of the field the ordinary battery-process is not sufficient, as in an instance which came under my notice where a quantity of very rich stone was crushed in a good well-appointed battery, and then treated twice over in berdans, and yet nevertheless the tailings were worth at the rate of £56 per ton. At Karangahake, at Waihi, and at Whangamata there is a great deal of silver ore—all unfit for battery treatment. Again, at Tararu, Te Aroha, and Waiorongomai there is much galena, zinblend, and copper pyrites, carrying both gold and silver, ores which can only be treated by processes requiring considerable scientific metallurgical knowledge. At Coromandel, too, there is a great deal of ore containing arsenical pyrites and rich in gold, which cannot be satisfactorily saved by the processes in use. The ores are not in unusual or unknown combinations, nor are the difficulties met with new ones. They have been encountered and overcome repeatedly in various parts of the world. But our miners, with few exceptions, do not understand any process but that at present in vogue, and have not the requisite scientific knowledge to adapt foreign processes to their own necessities. A wide field of usefulness is therefore open to the school of mines here.

With regard to the future working of the school I may be permitted to make a few suggestions. The work done by the school of mines here suffers very much on account of its intermittent character. Classes are held for a fortnight or a month or more at a time, as the case may be, at a place, and then there is an interval of perhaps six months before the instructor can come round again. There is no provision for carrying on work during this interval, and till such is made no progress can be effected. If a small building were procured in each centre, and fitted with a portable "Universal" furnace, a balance, and a few chemicals, men might meet together—say, once or twice a week—to carry on work and make experiments. Such a building might also be utilized as a public library. The prime cost of establishing such little laboratories all over the goldfields need not be very great, and the cost of maintenance would be very small, and could doubtless be covered by local subscriptions. The present method of working entails very heavy travelling expenses, as