

November, 1885, very little was done, except to form committees to get Government aid for the schools they proposed to form. In November, 1885, I visited the Thames Goldfield with Messrs. Montgomery, Fenton, McLymont, and Goodlet; and the result of our five weeks' visit was the formation of the Thames School of Mines, with a Hauraki Gulf subscription-list of £512, and branch schools at Coromandel, Karangahake, Waiorongomai, and Te Aroha. During the same year, 1885-86, about £150 was collected on the West Coast for the purchase of chemicals and apparatus, and in Otago about £100 for the same purposes. In 1886-87 the Thames increased its contributions by fees and subscriptions for chlorination to I know not what amount; and the West Coast and Nelson schools increased their local contribution by an additional sum of £805, and Otago by £100. This great increase during the year that has just expired proves incontestably the strong hold that these schools have taken of the miners, and shows in a strong light the wrench that will be done to their best aspirations by their extinction, if such should be their fate.

I have written to the secretaries of the West Coast schools for more precise information as to the number of members that will be willing to join the classes on the revised basis shown in Table B of this report. But I am afraid there will not be time to have it ready for forwarding to you until it is too late for your purpose.

To meet the present requirements of the Middle Island, schools would be required at all the places mentioned in Table B. Within the last three months the miners at Takaka, in the Collingwood District, have collected £20 for the purchase of chemicals, the Nelson school has imported seventy pounds' worth of chemical appliances, and the schools at Boatman's, Orepuki, and Waipori have put in claims for appliances as a subsidy on additional local subscriptions for the purpose.

*The Requirements of the Miners for Technical Instruction.*—The rapid improvements now being made in gold- and silver-saving processes, and the extensive use of chemical substances in these, require special technical skill on the part of miners. The old methods alone will be available to our miners until they learn something about the chemistry of such substances as the following: Chlorine, sodium, sodium amalgam, nitric acid, muriatic acid, sulphuric acid, cyanide of potash, corrosive sublimate, saltpetre, chloride of lime, lime, common salt, carbonate of soda, iodide of soda, hyposulphite of soda, hyposulphate of lime; the action of these on each other, their actions on the metals and on the ores, when to use them, and how.

There has been a great deal of gold lost to the colony already from the want of such knowledge; and a great deal of most valuable ores are now allowed to escape down the creeks for the same reason. I am constantly getting samples of iron-pyrites, copper-pyrites, and antimony sulphide, all containing from 1oz. to 40oz. and 50oz., and sometimes to 100oz., of gold per ton; whilst there is no free gold visible in the stone. Blanketings also, from which the battery-manager has taken all the gold he can, are found to contain as much as 40oz. to 50oz., and in one case 201oz. per ton. Such tailings have, in many mines, been allowed to go down the creeks for many years. There has also been an enormous loss of gold and mercury, due to the sickening of the mercury and the fouling of the copper-plates. This loss is due to an imperfect knowledge of the causes of the flouing, and of the chemical substances that prevent it. There is also a great deal to learn about the removal of gold from old copper, old iron, and from the accumulations of rusty materials that are sometimes found at batteries long in use. Improper methods of roasting gold-bearing stone have also caused a great loss of gold. The introduction of the chlorination processes will require special trained skill in roasting our rich pyrites. This pyrites is a common thing on all our goldfields; and when it exists in sufficient quantity, and of a certain degree of richness, it is suitable for the chlorination process, the first step in which is roasting in a particular way, which the untrained miner is not acquainted with, and which he cannot learn correctly from books or descriptions. These, and all other processes, must be practically carried out in presence of the miners, and, indeed, by the miners themselves, to have any good results.

One of the most important kinds of knowledge for the miners in a country abounding in minerals is, of course, the knowledge how to find out whether a stone does or does not contain such metals as gold, silver, tin, lead, antimony, mercury, copper, zinc, platinum; also, whether it is scheelite, chrome-ore, manganese-ore, &c.; and, secondly, how to find out for himself what proportion of such metals a stone contains. It used to be considered a mysterious operation to find out these things. But in reality there is nothing simpler than to impart this knowledge to our miners. It is well enough known that miners bring a great amount of intelligence and aptitude and enterprise to whatever they engage in; and I know, from my experience among them, that hundreds of them learn very easily and very rapidly the processes of testing stone, both qualitatively and quantitatively, for these valuable constituents. Indeed, if such were not the case, I would have nothing to do with them.

But I am not going to trouble your Committee with details of the many directions in which valuable information is sown broadcast through the mining districts by these schools of mines. The miners in our colony are cut off from much communication with other mining countries; they have been here mostly for a long time without much infusion of new blood, and they cannot be aware of the present state of the mining industry and processes that in America and some parts of Australia make stone pay handsomely which they cannot touch here. The diffusion of accurate and detailed information on all mining matters all over the world will itself be a valuable factor in improving our processes.

*The Nature of the Work already done by the Schools of Mines.*—The amount of practical information which has been diffused among the miners of the colony cannot, of course, be stated in figures. I can, therefore, only point out what subjects are taught in the classes, and state generally that, in my own presence, something like three thousand individual miners in the colony have been present and have seen the experiments performed whilst these subjects were taught by myself and assistants. Nothing like that number of men are able themselves to apply the tests and repeat the experiments and interpret aright the results of them; but I can say that in the district under Mr.