

150. Do you think that a man could go over the huge continent of America and obtain complete information of all their hydraulic and other processes in a reasonable time?—He could travel over the principal fields in a reasonable time. The facilities for travelling in America are very great.

151. Do you not think you could get what you want from books, pamphlets, and drawings?—I belong to the American Institute of Mining Engineers, and get all their transactions, and also endeavour to obtain all books and periodicals on the subject; but I find that this information, so far as it is applicable to the colony, is very scant—that is to say, it is information that cannot be utilized to any great extent.

152. Do you not know that there is no country in the world where the details relating to all matters of mining are so complete?—I meant, when I said of the information I obtained from books and periodicals that it was scant, in regard to the mode of applying it. The same system that is laid down there and applicable to their circumstances is such that in many instances could not be applied here with the same success; and books, although valuable in imparting information, do not convey such clear and lucid ideas as actual realities.

153. *The Chairman.*] It is the practical working that you want to see?—Yes.

154. *Mr. Valentine.*] By seeing the practical working you would be in a better position to work up your information?—You might read up a subject, without seeing the practical working of it, and not be able to apply it. But, having seen the thing in detail, you can thoroughly master the subject, so that the whole thing becomes matured in your mind.

155. *Mr. Allen.*] Can a practical knowledge of all these details be got from a cursory visit to America?—Not unless the person sent has a practical knowledge of the subject he has gone to make inquiries about. But any one who has a practical knowledge of the subject which he has gone to make inquiry about is in a different position. He sees different systems at work, he takes notes of his observations on the spot, he brings back plans of all he sees, so as not to trust anything to his memory. That such a visit by a practical man to America would be very valuable to this colony I have no doubt whatever.

WEDNESDAY, 30TH NOVEMBER, 1887.

Mr. H. A. GORDON, Inspecting-Engineer, Mines Department, in attendance, and further examined.

156. *The Chairman.*] Yesterday we considered the best means of encouraging the mining industry, more particularly in reference to auriferous drifts; to day we propose to consider the second part of the subject, in regard to the extraction of gold from refractory ores. Can you give us any information on this part of the subject?—I think the colony wants information upon the following subjects: The best methods of treating the various classes of auriferous and argentiferous ores, their reduction by machinery, the best kinds of amalgamating machinery, the mode of working the lixiviation process, and with respect to the chemicals generally used in amalgamating pans, the various modes of working lodes; also information relative to hauling and pumping machinery, and on the ventilation of mines. First, with reference to the treatment of auriferous and argentiferous ores, the chief subject that will have to be considered is some cheap, simple, and effective method of treating such ores. We have large lodes of ores in New Zealand of low grade, but at the present time they are valueless, because the mode of treatment is too costly and they will not pay for the working. Not only is the treatment too costly, but we do not get anything like a fair percentage of metal from the ores. This applies in a greater degree to the Thames District, also to Te Aroha and Coromandel Districts, rather than to the southern goldfields. On the southern goldfields the gold is in a more free state, and not so much combined with other metals. But in the Thames, Te Aroha, and Waihi Districts a good many ores are very refractory, containing sulphides, selenides, tellurides, and chlorides; there are also cinnabar, galena, sulphur, and arsenic, all in the same lode. It is well known that these sulphides ores are also in many instances arsenious, and working these by the ordinary battery process has an injurious effect upon the quicksilver, as sulphur and arsenic destroys its affinity for the precious metals. So long as gold and silver are associated with sulphur or arsenic, the sulphur being so light carries off the gold with it; even after running through a series of settling-pits, you will find the sulphur carry away the gold. The character of the gold at the Thames, likewise, is different from that found in any other part of the Australasian Colonies; it is so finely divided, combined with silver, and so thickly disseminated through the stone, that there is not in the Australasian Colonies, so far as I am aware, anything to be compared to it. I am thoroughly convinced, from what I have seen of the modes of treatment on the Northern Goldfields, that, by the ordinary stamper process which is now in existence, if an average yield were to be taken, they do not get over 33 per cent. of the metal that the ore contains.

157. *Mr. R. H. J. Reeves.*] So that there is an absolute loss of 67 per cent.?—Yes: I am sure there is. I will give an instance in proof of it. They found at Te Aroha that, when the stone from the New Find Claim, when it was first opened, was crushed by the stampers, it contained about 2oz. to the ton. The tailings were subsequently treated in berdans, and they gave close on a similar amount; and finally they were put through berdans a third time, and found sufficient gold in them to pay: so that in many instances, I feel certain, they do not get anything like 33 per cent.

158. That applies only to refractory ores in those districts, and not all round the colony?—It applies to refractory ores; but I say that the ores are more refractory in the northern than on the southern goldfields. On the southern goldfields the metal is in a more free state. I am thoroughly satisfied that, unless roasting and chloridizing are resorted to—where sulphides are present—on some cheap scale, it will be impossible to treat sulphides advantageously. The main fact we have