

GOLD-MINING.

During the year a considerable part of my time was occupied in the performance of duties of a special character, which included the examination of several areas of lands comprised in the West Coast coalfields in connection with the proposal to establish State collieries, and the supervision of prospecting-works. These, in conjunction with the various other departmental and office duties, prevented my making my usual visits of inspection to several parts of the colony.

The reports of the Inspectors of Mines for the respective districts, and also those of the several Wardens, will be found very complete. These, together with the information which is published monthly by the Department in the columns of the *New Zealand Mines Record*, render a voluminous annual report from me altogether unnecessary.

QUARTZ-MINING.

Taking quartz-mining as a whole, the industry may be regarded as satisfactory. In the North Island the Waihi Company's mines have not only materially increased their output, but the developments carried on during the year have still further proved the value and permanence of the company's property. As pointed out in the report of Mr. Warden Bush, the large output of these mines would have been larger still had the work not been affected to some extent by labour troubles. Indications of a favourable character are also to be noted in connection with several other properties, and as these become more fully developed, and the most approved modern methods and appliances adopted for the treatment of the ores, the maintenance of the position occupied by this branch of the gold-mining industry will be fully assured. The success which has attended the scientific treatment of the complex ores raised at the Monowai Mine, Waiomo, and referred to in the reports of Mr. Coutts, Inspector of Mines, and Mr. Warden Bush, is very satisfactory, and should tend to encourage further enterprise in a similar direction. There are reefs in various parts of the colony which are of a somewhat complex nature, and if the ore from these were to be thoroughly tested, and the best method of treatment arrived at, there seems no reason why such should not be worked on a systematic and comprehensive method to a profit.

During a visit to the Reefton portion of the West Coast Mining District I was pleased to notice the manner in which working operations at several of the quartz-mines are concentrated. In all probability, the comprehensive methods adopted here more nearly approach the conditions mentioned in my last annual report (as desirable for the working of low-grade ores) than is the case in any other mining district in the colony, and the results obtained are ample justification for the procedure. In the case of the New Inkerman Mines regular crushing has not yet begun, but the property is being opened out at various levels and the body of stone well proved. The foresight displayed, and preliminary work accomplished before attempting to put out a large tonnage of ore, must result in the mines being eventually worked with economy.

Where fairly large bodies of low-grade ore exist, thoroughly comprehensive methods embodying concentration of operations, with consequent economy in expenditure for labour and material, must be adopted to make the working of such reefs a commercial success.

Quartz-mining in the Southern district has been very quiet during the last two or three years, the late "boom" in dredging having overshadowed every other branch of gold-mining for the time being. Quite recently, however, a little more attention has been directed to the reefs; and I cannot but think that, if the energy and enterprise which have characterized the mining and metallurgical research and subsequent development of some of the properties in the Northern and West Coast districts were to be devoted to the reef systems of the south, good results would be obtained. Reefs exist which could be worked economically if handled on a fairly large scale, but other methods than amalgamation are required to extract the gold contained. This is a matter which has not received the attention it deserves.

In another portion of this report I reproduce information recently issued by the Australasian Ore-concentration Syndicate (Limited), of 4, Bishopsgate Street Within, London, E.C., descriptive of the "Elmore" method of the concentration of ores by oil. This patented process is at work on a commercial scale at a copper-mine in Wales, which is said to have been a losing concern prior to the adoption of the "Elmore" method; and from copies of reports I have seen by eminent mining engineers whose reputations are firmly established throughout the mining world, there appears to be a reasonable prospect of the process meeting the requirements of some of the mines and undeveloped reefs of this colony.

In an examination of the plant at work in Wales by one well-known engineer it was found that about 85 per cent. of the values contained in the ore was saved by this process, as against 15 per cent. by ordinary water concentration as previously carried out with the best machinery that could be got. The ore in this instance was of low grade. Another report on a test parcel of ore by both the ordinary and the "Elmore" processes of concentration gives the following results: Recovery by water concentration, 32.62 per cent. of copper, 35.23 per cent. of gold; recovery by "Elmore" process, 85.10 per cent. of copper, 75.00 per cent. of gold. Results such as these will no doubt lead the managers of New Zealand mines to inquire into the question for themselves.

HYDRAULIC AND ALLUVIAL MINING.

With the exception of the commencement of sluicing operations in connection with the works of the Humphrey's Hydraulic Sluicing Company (Limited), at Humphrey's Gully, near Hokitika, there are no very important developments on an extensive scale to report for the year in this branch.