

various assays, cyanide tests, and observations made in the course of the trial, the most advisable treatment on the large scale for ore of similar character as the parcel sent, which may be by wet-crushing and amalgamation and use of the berdan or the cyanide process for the concentrates or by direct application of the cyanide process—i.e., by dry-crushing and leaching of the crushed stuff by cyanide solution of a certain strength. There seems to be a belief amongst some Otago mining men that the direct use of the cyanide process, as just explained, is advantageous for auriferous quartz of every description, but this is a great mistake. For the ore of most, if not perhaps all, auriferous reefs of Otago occurring in schistose rocks the direct process is quite unsuitable, and causes loss, owing partly to the general great diversity in the size of the gold particles enclosed therein, partly to its mullocky character or admixture of schistose rock. While the finest gold particles may yield to the cyanide solution in a few hours, the larger ones might require up to several days for this action, and consequently there is no limit fixable for the time of satisfactory leaching. And mullocky ore, or such mixed with schist, forms slimes so unctuous and impermeable that hardly any cyanide solution will filter through, even by the use of a strong exhaustor. For these reasons senders of ore parcels should not unreservedly demand the use of the direct process for their ore, as was done in some cases, but leave the advisability of its application to the judgment of the operating metallurgist; for, if they do so, it stands to reason that they have to be satisfied with the results of the extraction, however unfavourable these may turn out.

The work done for the public since the date of my last year's report—25th November—by Mr. P. Fitzgerald, and since his departure by Mr. A. Mosley, in assays, analyses, and with the testing plant, and by myself in the determination of minerals and rocks, was as follows:—

*Assays and Analyses charged at Fixed Rates.*

(Executed by Mr. Fitzgerald.)

December 14, 1895.—Two assays, one of quartz and one of concentrates, for gold; for Mr. R. Allen, Invercargill.

January 14, 1894.—Four assays of four samples of quartz for gold; for Mr. Gilbert, Christchurch.

January 15.—Four assays of four samples of quartz for gold; for Mr. Donald Reid, Dunedin.

March 31.—Assay of sample of quartz for gold; for Mr. R. Brunton, Waipori. Assay of sample of sandstone for gold; for Mr. Gilbert, Christchurch. Two assays of two samples of quartz for gold; for Mr. Reeves, jun., Dunedin. Assay of sample of quartz for gold; for Mr. Donald Reid, jun., Dunedin.

April 2.—Six assays of six samples of quartz for gold; for Mr. R. Lee, Dunedin.

April 9.—Cyanide test of concentrates for gold; for Mr. Donald Reid, jun., Dunedin. Assay of sample of quartz for gold; for Mr. G. H. Oatway, Dunedin.

April 14.—Four assays of four samples of pyritous quartz for gold; for Mr. G. H. Oatway, Dunedin.

April 15.—Assay of sample of concentrates for gold; for Mr. Proctor, Dunedin. Three assays of three samples of quartz for gold; for Mr. R. Lee, Dunedin. Assay of sample of pyritous schist for gold; for Mr. H. R. Wilkinson, Dunedin. Assay of sample of garnet sand for tin; for Mr. Pearce, Dunedin.

April 20.—Assay of concretionary iron-ore for gold; for Mr. Kirk, Dunedin. Assay of sample of sandstone for gold; for Mr. Kirk, Dunedin. Assay of sample of clay for gold; for Mr. Kirk, Dunedin. Assay of sample of marcasite for gold; for Mr. Kirk, Dunedin.

April 21.—Analyses of five samples of coal; for Mr. G. M. Barr. Thirteen assays of thirteen samples of quartz for gold; for Mr. A. Lorie, Dunedin.

April 23.—Assay of sample of quartz for gold; for Mr. R. Allen, Invercargill.

May 15.—Assay of concentrates for gold; for Mr. Proctor, Dunedin.

May 20.—Assay of sample from an alluvial deposit for gold; for Mr. Kirk, Dunedin. Nine assays of nine samples of quartz for gold; for Mr. P. Laing, Dunedin.

May 23.—Two assays of two samples of quartz for gold; for Mr. J. Trent, Christchurch.

May 29.—Two assays of two samples of quartz for gold; for Mr. P. Laing, Dunedin. Six assays of six samples of quartz for gold; for Mr. C. E. Pinder, Dunedin. Two assays of two samples quartz tailings for gold; for Mr. C. E. Pinder, Dunedin. Analysis of samples of shell marl; for Marshall's Pharmacy.

June 2.—Assay of sample of sandstone for gold; for Mr. Macfie, Dunedin. Assay of sample of tailings for gold; for Mr. C. E. Pinder, Dunedin. Assay of sample of tailings for gold; for Mr. L. O. Beal, Dunedin.

June 4.—Four assays of four samples of diorite rock for gold; for Mr. W. C. MacGregor, Dunedin. Assay of sample of quartz for gold; for Mr. Bair, Waitati. Two assays of two samples of quartz for gold; for Mr. A. Lee Smith, jun., Dunedin.

June 6.—Four assays of four samples of quartz for gold; for Mr. P. Laing, Dunedin.

June 8.—Two assays of two samples of sandstone for gold; for Mr. E. Kirk, Dunedin.

June 9.—Four assays of four samples of quartz for gold; for Messrs. Sargood, Son, and Ewen.

June 29.—Assay of sample of pyrite for gold; for Mr. Thomas, Christchurch. Assay of sample of quartz for gold; for Mr. J. A. Chapman, Dunedin.

July 29.—Assay of sample of tailings for gold; for Mr. R. Allen, Invercargill.

August 2.—Assay of sample of quartz for gold; for Mr. Walde, Queenstown. Three assays of three samples of quartz for gold; for Mr. J. Elliott, Roxburgh. Three assays of three samples of quartz for gold; for Mr. J. Begg, Westland. Assay of sample of sedimentary deposit from near the Wairongoa Mineral Springs for gold; for Mr. Thomson, Dunedin. Assay of a sample of quartz for gold; for Mr. G. L. Denniston, Dunedin.