

Rotomahana crater. In portions of this flat near Matamata the strata of this formation shows that it has been deposited in thin layers, as by the action of water; but on Mr. Smith's property it does not present that stratified appearance, but is more of a homogeneous mass. Shafts have been sunk in various places which show the depth of the deposit to vary considerably. In one of the shafts there is a layer of about 12ft. thick, then a layer of peat about 2ft. in thickness, and under this again is another layer of volcanic-mud deposit. It shows distinctly that there have at least been two distinct periods of volcanic eruptions, which have covered this large plain with such a heavy deposit, and there must have been a considerable time between the eruptions. Probably before these eruptions commenced the Hauraki Gulf extended for a long distance further inland and it got filled up with erupted matter; at least, it shows in some of the shafts that previous to the last deposit the surface of the previous one was of a swampy nature, by the fibres and pieces of wood that are intermixed in the layer of peat. On the surface in places the mud is formed into rhyolitic brecciated rock, and from this rock several assays were made which showed that it contained gold, silver, and copper. This led to shafts being sunk to test the material under the surface. Samples forwarded to Mr. Pond, of Auckland, for assay gave the following results:—

	Oz.	dwt.	gr.
Sample No. 1, Gold	17	19	8
Silver	4	8	4
Bullion per ton, 22oz. 7dwt. 12gr., worth £72 15s. 6d.			
Sample No. 2, Silver	0	19	4
Gold	A trace		

Samples taken by Mr. Wilson, Inspector of Mines, and assayed by Mr. Adams at Waiorongomai:—

	Oz.	dwt.
Sample No. 1, Gold	4	10
Silver	0	10
Bullion per ton, 5oz., worth £18 1s. 9d.		
Sample No. 2, Gold	1	12
Silver	1	6
Bullion per ton, 2oz. 18dwt., worth £6 13s. 6d.		
Sample No. 3, Gold	0	9
Silver	0	3
Bullion per ton, 12dwt., worth £1 16s. 6d.		

After this a large sample of the material was forwarded to Mr. Fraser to treat at his testing-plant at Auckland: an assay from this gave per ton:—

	Oz.	dwt.	gr.
Gold	0	10	0
Silver	9	14	4
Bullion per ton, 10oz. 4dwt. 4gr., worth £3 18s. 4d.			

The sample treated in the ordinary manner by grinding, roasting, and amalgamation gave at the rate of £1 14s., the bullion consisting of gold, silver, and copper.

Further samples were sent to Mr. A. Montgomery, School of Mines, Thames. The first sample tested only gave a trace of gold: the second sample gave at the rate per ton, gold, 2dwt. 12gr.; silver, 2dwt. 3gr.

Further assays have been made by Mr. Adams, of Waiorongomai, which gave at the rate per ton as follows:—

	Oz.	dwt.
Sample No. 1, Gold	2	8
Silver	0	6
Worth £9 13s.		
Sample No. 2, Gold	0	8
Silver	0	6
Worth £1 13s.		
Sample No. 3, Gold	0	5
Silver	0	4
Worth £1 0s. 8d.		

Recently one ton of this material was treated at Messrs. Firth and Clarke's battery in one of the berdans, which gave bullion to the value of 12s.

To examine this deposit closely, it is all of a crystalline structure, but nothing can be seen, even with a good microscope, that would lead to a supposition of its containing any gold or silver beyond a trace; but the precious metals are now found in so many forms and situations that it is very difficult to say what formation contains these metals and what does not. Judging by the appearance of this deposit, I should not anticipate any rich finds being got, and it is very questionable if any of it will pay by the ordinary method of treatment. Getting assays made of ore, and manipulating the ore on a large scale, are entirely different things where the ore is refractory. The present methods of treatment used in the colony will not give an average of more than 33 per cent. of the metals contained in the ore, and it is even very questionable if this percentage is obtained on the whole.

The following table will show the amount of quartz crushed by the various companies, as far as can be ascertained, from the Te Aroha Goldfield since it was opened, and the yield of gold therefrom; also the average yield of gold per ton from the various companies' mines:—