

The cloud thus formed discharged its contents for the greater part in a direction to the eastward of the mountain, reaching as far as Te Teko and Fort Galatea, and to the westward as far as Wairoa. The earth-shocks, however, during this period of the eruption do not appear to have been of extreme violence, or to have created much alarm beyond that part of the district lying in the immediate vicinity of the volcanic eruption; but shortly before four a.m. a violent outburst of a totally different nature was experienced, accompanied with loud reports that reverberated through the atmosphere to enormous distances. The first notice of this outbreak was an earth-shock that appears to have been much more widely felt than those previous, and chiefly in areas where hot springs occur. This development was attendant on the outburst of an immense volume of steam—carrying pumice-dust and fragments of rocks to an enormous altitude—which proceeded from the site of Rotomahana Lake, causing the formation of a dense cloud in the higher atmosphere, that spread in definite directions, its advancing edge being marked by electrical discharges of the most awe-striking character.

At first the wind was from the south-east, and the inhabitants of Rotorua appear to have been terrified by the approach of this hideous cloud, when suddenly the wind sprang up from the south-west and arrested its progress in that direction, turning it off towards the north-east, at the same time condensing the vapour of the cloud to such an extent that the suspended solid matter dropped on the surface of the earth in the form of mud, smothering the country, and leading to the disastrous results experienced at Wairoa.

By six a.m. the period of active eruption appears to have closed, and since then the display of energy in a modified form has also rapidly declined.

The following are the chief points which require notice in this report:—

I. Focus.

Tarawera Range, about 3,600ft. above sea-level, is an isolated and very conspicuous object in the scenery of the Lake District. It slopes from Tarawera Lake—the level of which is about 1,000ft. above the sea—and previous to the eruption rose very abruptly, with mural precipices and columnar rocks, especially on its western and southern escarpments. It was no doubt judging from this feature that Dr. Von Hochstetter was led to class Tarawera Mountain with the Horohoro Range, as being part of his older or submarine-formed volcanic series, and a remnant of the great plateau,* the surface of which denotes the original level of the country prior to the production of its present broken surface by the excavation of valleys, by the upbursting of volcanic mountains, and the consequent subsidence or breaking-in of large cavities that are now occupied by lakes. He nevertheless maps Mount Tarawera as belonging to his recent volcanic series, and also alludes to it in other parts of his work as being composed of obsidian.

I have never ascended the Tarawera Range, but have examined its slopes and found them to be composed of lavas of a high acidic or rhyolite type, in the form of floes intersected by dykes, and containing, amongst other rocks, large quantities of compact and vesicular obsidian. From this I conclude that the mountain really is one of recent volcanic origin, belonging to Von Hochstetter's new volcanic series, and that its abrupt outlines have resulted from fractures and subsidences of its flanks. According to this view it is natural to assume that the still-imperfectly-cooled mass of lava in the heart of this volcanic mountain has given rise to the long-continued (historically speaking) solfatara action at high temperatures that created the attractive wonders of the Rotomahana. It has been stated that no Native tradition exists of Tarawera having been the site of previous activity, but the range culminates in three distinct peaks, the meaning of the Maori names of which—according to Mr. Locke, M.H.R., and other authorities—clearly contradicts this assumption. This consideration has interest, as a sudden development of volcanic activity in a new locality, or in an ancient and greatly-denuded formation like the trachyte breccia that forms the Horohoro, would have been more serious and significant than the mere temporary revival of the expiring energies of a recent focus of volcanic force.

II. THE VENTS.

As viewed across Rotorua Lake, on the 13th, from the point where the Tauranga Road emerges from the bush, Tarawera Range appeared to have quite lost its former characteristic outline. The deep gap dividing Wahanga, the northern peak, from Ruawahia, the central one, was almost obliterated, and the abrupt, precipitous sides of the mountain were everywhere softened by great slope deposits of material ejected from the volcanic vents, consisting of stones and dust of a grey colour.

Along the edge of the range seven distinct points were seen to give off steam from flattened conical heaps of dark-coloured *débris*, and at intervals these vents threw off large volumes of steam and vapour, darkened to a reddish hue by solid matters, which were discharged to a height estimated at from 200ft. to 500ft. Four days later, when viewed from the eastward, the same range showed a similar appearance, allowing for the change in direction; but the cone on the summit of Ruawahia had evidently accumulated with greater rapidity than the others, and had acquired lateral cones, giving its outline a similar appearance to that of Rangitoto, near Auckland.

During two clear nights I watched the eruption from these vents, and could distinguish them against the sky with a powerful binocular telescope; but I never observed any illumination of the ascending steam clouds, as if from the surface of an incandescent mass within the vent, nor was there any sign of any outpouring of lava, either from these vents or from cracks or fissures in the sides of the mountain, during the time of my visit. In addition to the above-mentioned conical vent on the summit of the range, along its eastern side the line of fissure already alluded to was distinctly visible, emitting wreaths of steam. This line of fissure lay in an oblique direction, so that it appeared to gain in elevation along the sides of the mountain from north towards south, but not suffi-

* Vide Hochstetter, Reiseder Novara, I. 106.