soil in question further than that it is impervious to moisture. One and a half chains away is a salt-water spring."

Shortly after, Mr. T. W. Tiffen, of Wheturau, Gisborne, writing me in July, 1907, says, "I am sending you a sample of soil from my property which is in its way an agricultural curiosity. It possesses the peculiarity that, excepting to the depth of 1 in. from the surface, it appears never to get wet. This soil is found in patches. It is very light, and floats readily on water. Outside these patches the ground is now sodden with water. It has struck me that the explanation may be either that these are patches containing a large amount of pumice, or that it may be fuller's earth or something of the sort. I have watched these patches for six years, yet all through the winter they appear to be dry. I shall be glad to know what you make of it."

My report on the above stated, These small samples of fine sandy loams have been experimented with as far as their size would permit. The size of the particles, the combined water and the organic matter appear perfectly normal. The phenomenon is probably due to one of two causes: either to the way in which the air-spaces are locked in, or to the presence of some resinous or oily substances as from pines or other resinous trees. After ignition water is readily absorbed, as also after thorough kneading with water and subsequent drying, or after washing the soil with alcohol or ether. Ether extracts a small quantity of resinous substance from the soil. In order to extract enough of this resin for analysis a large amount of soil would be necessary—say, about 2 cwt.—but as the soil occurs only in patches it is hardly worth while.

Early in 1909 Mr. P. H. Lynch, of Pukutoatoa, near Woodville, left a sample of soil at the chemical laboratory with a statement that the soil over an area 6 yards in diameter would not wet, and that no grass or weeds would grow. An examination of the small portion showed that ether extracted from the soil 0·3 per cent. of a resinous matter, which united with alkali, forming a soap. The extract melted easily, with a smell of pine, and the ethereal solution was slightly acid. I reported in February, 1909, that the resin was probably derived from resinous trees originally growing on the site of the dry patch.

Up till this time the investigation was in an unsatisfactory state, owing to the smallness of the samples submitted. The discovery of fairly large areas of dry patches occurring at the Ruakura Farm of Instruction, on the portion situated on what was originally a part of the great Piako Swamp (now better known as the Hauraki Plains), has drawn fresh attention to the phenomena of waterproof soils. In this case there was no difficulty in securing