

Samples of the oil from Kotuku were submitted to Mr. B. C. Aston, Analyst to the Agriculture Department, and the following report on these was furnished by him to the Mines Department:—

“*Crude Petroleum.*—This is a brownish-black liquid oil, having a specific gravity of 0.921. It retains its liquid state when subjected to a temperature of 15° C. On fractionating by distillation it yields the following: Below 150° C. (light oils and naphtha) trace; 150–300° C. (burning oil s.g. 0.863)=37 per cent.; 300–400° C. (heavy oil s.g. 0.884)=42 per cent.; above 400° C. (tarry residue in retort)=21 per cent: total, 100 per cent.

“The sample has a higher specific gravity than most American crude petroleums, but this and the absence of light oils or naphtha might be accounted for partly by the exposure of the sample to the atmosphere in thin layers before it was collected, entailing volatilisation of the lighter fractions, with possibly some oxidation of the remainder. The oil contained in the first fraction is rather heavier than is usually used for burning purposes. That in the second fraction would probably find best application as a lubricant. The tarry residue could be used for fuel.

“I enclose samples of the various distillates from the oil, and trust that further search may result in the discovery of a lighter oil, having a larger percentage of low boiling constituents.”

REPORT ON THE KAIMANAWA RANGES, HAWKE'S BAY.

By ALEXANDER MCKAY, F.G.S., Government Geologist.

As instructed, between the 7th January and the 18th February of the current year I made an examination of the eastern part of the Kaimanawa Mountains lying between the Ngaruroro and Rangitikei Rivers, and of the high-level plains and downs between the gorge of the Taruarau River and the Rangitikei below where it leaves the higher mountain district within which it takes its rise.

PROSPECTING.

The principal object of the expedition was to examine certain parts where gold had been reported as occurring: Firstly, in the Upper Ngaruroro; and, secondly, in the valley of the eastern main branch of the Rangitikei (the Mangamaire Stream), and at other places in Rangitikei and Taruarau Valleys.

For more than thirty years gold has been reported as occurring in the Kaimanawa Ranges, and when, in 1870–71, the district was examined by Sir James Hector prospectors were then engaged in both the eastern and western parts of the district, and traces of gold—a few colours to the dish—had been obtained.

In 1898 I partly examined the western part of the mountain region, the slopes of the south-western Kaimanawas, and farther north some parts of the Tauranga-Taupo and Hinemaia Valleys. I also saw at Tokaanu a considerable amount of rocky material, brought from the higher part of the western mountains, but neither these nor a study of the rocks *in situ* impressed me highly as to the auriferous character of the country.

Much of what had been collected as quartz was of too flinty a character to give promise of gold, and frequently calcite mixed with a greenish rock had been mistaken for quartz. In the latter cubes of yellow iron-pyrites formed an attraction, and, I suspect, were sometimes thought to be gold itself. Even during the recent trip such samples were shown to me as gold-bearing quartz, and the contained pyrites referred to as proof of the auriferous character of the stone. Sir James Hector was informed by a prospector engaged in examining the western mountains that “he frequently obtained the *colour*, especially above the gorges, but that on following the river (Tauranga-Taupo) into the slate country, in the upper part of its course, he never obtained any specs of gold in the wash” (Geological Reports, 1870–71, p. 162). What little gold I saw taken in 1898 in the upper valley of the Hinemaia River occurred in wash of a volcanic character, mainly a porphyritic trachyte. The sources of the Hinemaia and Tauranga-Taupo are partly in the slate and sandstone mountains of the northern part of the Kaimanawas proper, and in 1898 I supposed that the gold found in the rivers running west into Lake Taupo had its source in the slate country to the south and east. Sir James Hector indicates the pyritous reefs associated with the slates and sandstones as the source of at least some gold, and such also seems to have been the conclusion arrived at by the various prospecting parties who at different times have examined the country.

Since 1871 till the present time several parties of miners and prospectors have made search for gold in these mountains, but the results have never been more than a trace of gold—a few fine colours to the dish of stuff. And, as regards the eastern parts of the district within the Rangitikei and Ngaruroro watersheds, it was from Napier that the chief prospecting parties were despatched, and there the chief interest in hoped-for discoveries was displayed. A prospecting association was formed, but this, as time went on and no important discovery was made languished, and within the past few years was dissolved. During the existence of the Hawke's Bay Prospecting Association, and since, applications have been made to the Minister of Mines for a survey of the Kaimanawa Mountains, and as the outcome of these I was instructed to examine the country, which I did during the months of January and February of the present year.

Leaving Wellington on the 7th January, on reaching Napier I made preparations for the journey inland, and arranged to be accompanied by Mr. Robert Yuill, who had twice previously been engaged on prospecting parties to the Kaimanawa Mountains, and who claimed to have obtained prospects of gold at several places in both the Rangitikei and Ngaruroro Valleys. On the 11th January I reached Kuripapanga, where the road to Inland Patea crosses the Ngaruroro River. Here some delay took place, and it was not till the 16th that a start was made for Owahakao Station,