

water, which issues from blue claystones, smells strongly of sulphuretted hydrogen. It deposits at the point of exit a black evil-smelling mud, whilst just below there is a scanty white deposit containing some sulphur and probably a good deal of carbonate of lime. The water is quite cold.

At Langdale, on the eastern side of Morrison's and Elder's Taipos, are eight or ten similar springs, all on Mr. Frenche's property, and in an area of about half an acre. There is, however, according to information supplied to the writer, no white deposit from any of these springs.

An analysis of water from a spring at Langdale (probably one of those just mentioned), made at the Colonial (now Dominion) Laboratory, and quoted by Park in his 1888 report, is as follows:—

	Grains per Gallon.
Solid matter (principally chloride of addium)	316.36
Iodine	0.81
Sulphuretted hydrogen	1.76

At Whakataki Saddle is a small spring said to be a "magnesia-spring," owing to the water having the taste and smell popularly associated with magnesia. It deposits a white substance, probably carbonate of lime. The peculiar smell and taste of the water are perhaps mainly due to carbon-dioxide.

About three miles and a half up the Okau Stream, which enters the sea three miles north of Whakataki, there is a spring the waters of which smell of sulphuretted hydrogen.

Possibilities of Petroleum.—From the foregoing paragraphs it will be noted that the indications of petroleum observed consist mainly of the petroliferous rocks near Aohanga, a number of hydrocarbon-gas springs, and mineral springs, the water of which generally carries sulphuretted hydrogen, with, at Langdale, sodium-chloride (common salt) and iodine. These indications are scattered over a wide extent of country. They are sufficient to justify the conclusion that petroleum exists within the area, but do not enable any inference as to the occurrence of it in quantity to be made. In certain parts of the area the shattered and faulted nature of the rocks, while not necessarily altogether unfavourable to the presence of oil, would lead one to expect more abundant surface indications than are actually seen. Elsewhere, however—for example, east of Carswell's—the surface rocks are a little disturbed, and are of a close-grained nature suitable as a cover for the oil-bearing rocks.

Since only a hasty examination of a comparatively small portion of the area was made, it is obviously impossible to offer more than tentative advice in the matter of prospecting. The district seems worthy of careful surface prospecting with a view to locating further indications. The portions that appear most promising are those in which hydrocarbon-gas springs occur—namely, east of Carswell's, and from Aohanga to Weber. In these districts a few bores of moderate depth might be put down. The petroliferous sandstone near Aohanga occurs in such a way as not to give a very favourable impression at first sight. The neighbourhood, however, ought to be carefully prospected for other outcrops of similar petroliferous rock. The prospecting operations should be followed or accompanied by a geological survey.

Coal.—South of Castlepoint a seam of coal 7 ft. or 8 ft. thick is said to occur, and to have been used in a smith's forge. Mr. W. A. McKay, however, reports only thin streaks and small pockets of coaly matter in the neighbourhood.* A very poor lignite (probably a carbonaceous shale) is said to occur at Reef Point, and the writer was informed of the existence of a 1 in. seam of anthracitous coal on the northern border of Mount Percy, near Mr. Barton's homestead. Indications of coal at the head of Okau Creek are also reported. These various occurrences are probably due to very local accumulations of vegetable matter. It is hardly possible that any really workable deposits of coal will be found in the eastern part of the area examined—namely, from Otahome Station to the Aohanga River.

Limestone and Cement Rocks.—The yellowish limestone near Taueru, which is said to contain 90 per cent. of carbonate of lime, is doubtless pure enough to afford material suitable for lime-making. In conjunction with the underlying mudstones it would probably afford material adapted for cement-manufacture. The shell limestone on Awatotoi Station is probably not pure enough for lime or cement. Near Ica calcareous rock suitable for cement-manufacture has been reported by Park, who quotes an analysis made by the Colonial Laboratory as follows:—

Carbonate of lime	76.41
Carbonate of magnesia	2.84
Alumina and iron soluble in acid	0.61
Alumina as part of clay	4.19
Silica as part of clay and sand	14.21
Water	1.74
	100.00

Phosphate.—It was reported to the writer that samples of limestone from Awatotoi Station (Mr. Morrison's) tested in the Dominion Laboratory contained several per cent. of phosphate. On inquiry at the Dominion Laboratory it was found that the sample tested contained a very small amount of calcium-phosphate, probably less than 0.2 per cent. The writer saw nothing to justify any detailed search for phosphate rock in this neighbourhood.

* "Report on the Geology of the Trooper Range, Castlepoint District, Wellington": Mines Report, 1899, C.—9, pp. 34, 35.