tufa or clay ironstone, which intersect the tufaceous clay in the neighbourhood of the great dyke, yield oil when broken; but whether these indicate the outlet of fissures which are vents by which oil escapes from a deep-seated source, or whether they are merely masses of bituminous ironstone, has not been ascertained.

"At the time of my visit [October, 1866] borings were in progress at three places. . . . Close to the main Sugar Loaf and to the foot of the cliffs is the Taranaki Company's bore, No. 1, . . . . which has been sunk with much trouble to a depth of 300 ft. The derrick stands at 10 ft. above high water, and for some time the water-level in the bore maintained this level, but after a time it sank suddenly to 32 ft., which would appear to indicate the existence of subterranean channels communicating with chambers where there is less than the external atmospheric pressure, owing, perhaps, to the condensation of oil-vapours. At 254 ft. a patch of grey ferruginous tufa, like those seen at the surface, was passed through, charged with oil, which was the only result. In this bore some patches of hard basaltic rock were encountered, but, on the whole, there was no decided change in the character of the agglomerate.

"The Taranaki Company's bore, No. 2, is on the island off the north headland, and is commenced on a shelf 20 ft. above the water-level. This island consists of ferruginous sands 50 ft., false-bedded like the sand-dunes at New Plymouth, and resting on 40 ft. of red tufaceous sand, which, again, rests on the agglomerate. In the section which is shown in the lower part of the cliffs of this island, the agglomerate is seen to be very distinctly interstratified with beds of indurated tufa and waterworn fragments of rock. The bore was, in October [1866], sunk to a depth of 145 ft., being 10 ft. in the sandstone, 95 ft. in the agglomerate breccia, 30 ft. in consolidated tufa, and a few feet more into the agglomerate again. A few oil-patches have been passed through, but no appreciable quantity has been obtained.

"The third bore is that of the Alpha Company, which is situated a short distance from the north headland. It is from this locality that most of the oil which has been chemically examined has been obtained. At 10ft. above high water, and close to the boulder-covered shore, into a high sandy cliff a shaft was sunk 60 ft. in the agglomerate, from the sides of which, at 44 ft. from the surface, oil was found to ooze. This shaft was continued by a bore-hole to a depth of 180ft., oil being got at 80 ft. and again at the extreme depth. When allowed to stand at rest, a considerable quantity of oil collected both on the surface of the water in the well, and also in the bore-tube, accompanied by the escape of gas. This oil was pumped into a tub along with the water, from the surface of which it was afterwards skimmed off. Recently, the well has been pumped more regularly, and yields, I am informed by the directors, about 50 gallons a week.

"The escape of gas in large quantities from under the sea at various spots among the islands would seem to indicate that the oil described as occurring in the ironstone seams is only a secondary deposit; and as we know, from what has been observed respecting the occurrence of bituminous products on the East Coast, that the inflammable gas and oil escape from the surface in localities where the most superficial bed is the marlstone [or lowest in the section as read in the Taranaki District] we must conclude that its source is from some more deep-seated stratum than any that have been [here] described, and that its reaching the surface at Sugar Loaf Point through the superincumbent formations must be dependent in some way upon the dislocations in the neighbourhood of the great igneous dyke.

"As there is every appearance of the formations *a*, *b*, and *c*, being more recent than the eruption of the dyke, and therefore not dislocated by it, it is just possible that the oil and gas may have escaped upwards as far as the base of these formations, when in that case it would be collected in reservoirs at a depth, I should surmise, of from 500 ft. to 700 ft. below the surface, although by following fissures such as those marked by the ironstone veins, it may rise in small quantities to a much higher level and even to the surface.

"What I would wish to impress with regard to these oil-wells, as I did in my former report on the subject, is, that there is no indication in the Taranaki District of the occurrence near the surface of the regular alternations of sandstones and shales which characterise the best oil-bearing formations. Under the marlstone formation, judging from analogy with other parts of the colony, there probably occurs a thick group of ferruginous clay and sandstone, which again rests on the same coal formation as on the West Coast of Nelson. Great interest will therefore attach to the investigation of the geology of the Mokau District, and of the country lying between the range of hills terminating on the coast at the White Cliffs, as in that area the underlying formations may be expected to occur, and I think it very probable that among them extensive carbonaceous strata will be discovered."*

Mr. Park, in his report on the Taranaki District, concisely describes the rocks from New Plymouth to Waitara, and thence to the White Cliffs, mentions little that was not previously noted by Sir James Hector, nor is there mention made of the occurrence of petroleum near New Plymouth in this or in a report of the following year, by the same author. See "Geological Reports," 1886–87, pages 24–73, and pages 167–182.

The later-made bore-holes put down by the New Plymouth Petroleum Company show clearly that at nearly 2,000 ft. from the surface the Miocene rocks of the White Cliffs were not passed through, and judging from a study of the borings preserved by the company I conclude that only the higher part of that formation has been passed through.

Comparing the material from the two bores at Moturoa, I conclude that the tertiary sedimentary strata of this part are in nearly a horizontal position, the evidence relied on being that similar rocks were obtained from equal depths below sea-level. The tertiary sands and marls over a wide district to the north and east of Mount Egmont lie at low angles, and dip generally to the south or south-west, and it is clear that between New Plymouth and the mountain the deeper-seated strata have been but little disturbed. Sir James Hector estimates the thickness of these

* Progress Reports, Geological Reports, 1866–7, pages 2–7.