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NEW ZEALAND.

PETROLEUM

(REPORT OF GOVERNMENT GEOLOGIST ON THE PRESENT CONDITION AND FUTURE PROSPECTS OF BORING FOR), AT NEW PLYMOUTH.

Laid on the Table of the House of Representatives by leave.

SIR,—

2nd September, 1898.

I have the honour to report that, as directed, on the 23rd August I proceeded to New Plymouth, and during the week following collected evidence bearing on the past history and the present prospects of boring for petroleum in the Taranaki District.

Respecting the discovery and the earliest efforts to obtain oil little or no information could be obtained other than that in the reports by Sir James Hector published in the "Abstract Report of the Progress of the Geological Survey of New Zealand" during 1866-67. At a later date boring was carried on to greater depths, the maximum depth in one of the two bores situated near the landward end of the Breakwater being 900 ft. From these bores oil was obtained, but apparently not in sufficient quantities to warrant the further prosecution of work at that place; and I could not learn what was the nature of the strata at 900 ft. from the surface, or whether the oil obtained from that depth originated from that or from a higher level. Subsequently, the New Zealand Petroleum Company determined upon a site half a mile more to the eastward, and here two bore-holes were put down to a depth of 2,000 ft., and as these proceeded approximately correct records of the strata passed through were kept.

In No. 3 bore the superficial sands and underlying volcanic agglomerate proved to be 275 ft. thick, below which sandy papa was entered upon and continued to a depth of 810 ft., when a bed of rather coarse quartz-sandstone was encountered. This passed, fine quartz-sand containing oil was met with at 915 ft. This was not an abundant supply, and the bore was continued to greater depths, care being taken to exclude the water and oil of the higher levels from the lower parts of the well as the bore was proceeded with. Between 1,900 ft. and 1,996 ft. oil and gas were again struck, and this time in such quantity as seemed to afford hopes of the ultimate success of the undertaking. To obtain the oil pumping had to be resorted to, and then it was found that the supply was intermittent. This failure of continuity of the yield of oil, it is supposed, arose from one or other of two causes—viz.: First, material sucked into and around the foot of the pipe, and thereby preventing the access of oil to the well; or, second, the drawing away of the looser sands of the porous oil stratum, and the coming together of the impervious strata above and below the oil-bearing bed. It need not be here inquired which of these two suppositions is the correct one. It will suffice to say an accident happened whereby the derrick was destroyed by fire, and the well has since then been closed down except occasionally, when the accumulated gases and some oil are allowed to escape, the latter being collected in tanks prepared for that purpose.

On the destruction of the derrick at No. 3 bore, the company procured fresh plant and commenced putting down No. 4 bore. This being only about 4 to 5 chains south of No. 3, passed practically through the same strata at the same depth, the difference of surface levels considered. At the 915 ft. horizon of No. 3 bore traces of oil were obtained, but the amount was considerably less than in No. 3 bore. At the greater depth of between 1,900 ft. and 2,000 ft. no oil was obtained, and, thus discouraged, No. 4 bore was, for the time being, abandoned, and a site chosen some distance further to the eastward, where a bore put down some 300 ft. failed, owing to the incoherent nature of the volcanic agglomerate passed through at that depth. The last effort of the company, the present bore (No. 6), is situated on a flat terrace a short distance west of No. 5 bore. This has been successful so far as the piercing of the volcanic agglomerate to the depth reached—about 140 ft.; but in this locality it has yet to be ascertained whether the thickness to be bored before reaching the papa-rock will be much greater than at Moturoa.

About five miles east of the Breakwater, and nearly in a line between the Breakwater and the Township of Inglewood, numerous gas-springs escape from a stratified formation composed of fine and coarse alternate layers of volcanic material that appears to have been stratified under water. Other gas-springs exist in the district—as, for instance, at and near the Township of Inglewood—but they were not visited.

In No. 3 bore, and in all subsequent bores, due precautions have been taken at proper intervals to prevent leakage of oil or water to the lower depths of the wells, and thus in No. 3 bore, while the oil is escaping slowly from the oil stratum at 900 ft., this does so outside the sheathing, while in the inner pipe inside the sheathing the accumulated gas and oil are under considerable pressure. Ample evidence of the great pressure under which the gas and oil from the deeper part of the