

(3.) ALLUVIAL GOLD.—Alluvial gold occurs in several parts of the subdivision, notably in Mullocky Creek, in Kimberley Creek, and other branches of Granite Creek, in Glasseye Creek, and, associated with leads of black sand, along the beach north of Little Wanganui River. In the past a considerable amount of gold has been won from the streams mentioned, but operations are at present confined to the beach, where "beach-combing" is occasionally resorted to after heavy weather.

The beds of loosely consolidated conglomerates associated with the upper members of the Oamaru Series carry a little fine gold, the reconcentration of which by small creeks has, it is likely, produced in some cases payable leads. The gold in Glasseye Creek, as well as much of that on the beach, is probably derived from auriferous veins in the Aorere rocks to the south of the subdivision. That in Kimberley Creek is apparently derived from auriferous wash deposited by the Karamea River in Pleistocene or early Recent times.

(4.) COAL.—Associated with the conglomerates in the upper beds of the Oamaru Series are thin seams of carbonaceous shale, or inferior lignite. These outcrop in the low hills bordering the coastal plain, but good exposures are rarely encountered. The largest seam noted by the Survey had a thickness of 1 ft.

(5.) MATERIALS FOR LIME AND CEMENT.—The bed of limestone occurring as one of the lower members of the Oamaru Series and outcropping along the base of the mountain ranges is nowhere of any considerable thickness. The quality of the rock is also so variable as to render it unfit for the manufacture of cement on a very large scale. Analyses that may show the suitability of certain of the calcareous claystones in this direction are not yet to hand.

(6.) PETROLEUM.—The claystones forming one of the lowest members of the Oamaru Series frequently yield a distinct smell of petroleum. Beyond this no other indications of the presence of mineral oil have been noted by the Survey; and, owing to the synclinal arrangement of the strata, it seems unlikely that a payable oilfield exists in this locality.

MR. J. H. ADAMS, ASSISTANT GEOLOGIST.

Except for a short interval during June, 1908, when he was engaged in office-work at Wellington, Mr. Adams has been continuously occupied in field-work in the Whatatutu Subdivision, Poverty Bay. His work in this area is now completed, and he is about to prepare a comprehensive report on its geology and economic resources. Mr. Adams's interim report for the season is as follows:—

WORK IN THE WHATATUTU SUBDIVISION.

The area which constitutes the Whatatutu Subdivision of Raukumara, Hawke's Bay, comprises the Mangatu and Waingaromia survey districts, and is a rectangle of 25 miles by $12\frac{1}{2}$ miles, thus having an area of $312\frac{1}{2}$ square miles.

The chief interest in the geological survey of this subdivision from an economic point of view arises from the occurrence of good surface indications of petroleum-oil at Waitangi Hill. With a view to locating the most suitable sites for tapping by deep boring the petroleum-bearing formation, a very detailed survey of the area has been made. Three favourable sites for deep boring have been located, on one of which, already proposed in a former report,* the Gisborne Oil Company is at the present time sinking a deep borehole.

During the past season operations have been extended over an area of some two hundred square miles, in which the principal watercourses are the Waipaoa, Mangatu, and Waihora rivers, the Wheao Stream, a portion of the Waikohu River, and the head branches of the Pakarae River.

Five shallow bores were sunk at Waitangi Hill to a depth of about 60 ft., in order to ascertain the nature of the rock below the surface material. One hole was sunk on what is now the site of the Waitangi borehole of the Gisborne Oil Company. Three are within a radius of 9 chains of this; the last is situated $21\frac{1}{4}$ chains away. Each of the first four holes had a small flow of water at about 10 ft., and showed claystone or argillaceous sandstone downwards from 40 ft. The last borehole was dry to 48 ft., and the claystone or argillaceous sandstone occurred downwards from 12 ft.

General Geology.

The formations occurring within the Whatatutu Subdivision have been classified as follows:—

Formation.	Age.
(a.) Whatatutu Series	Upper Miocene.
(b.) Waipaoa Beds	Pliocene.
(c.) River and terrace gravels	Pleistocene and Recent.

(a.) WHATATUTU SERIES.—Almost the whole of the rocks occurring within the subdivision have been classed under this heading, since no absolute evidence of stratigraphical unconformity was seen, nor do the fossils collected from all parts of the area vary sufficiently to indicate that such unconformity exists. There is, however, a certain association of beds which permits of the series being subdivided in ascending order as follows:—

- (1.) Clay-shale; chalky limestone; glauconitic sandstone.
- (2.) Claystone and argillaceous sandstone, with calcareous concretions.
- (3.) Claystone and argillaceous sandstone; limestone; conglomerate; fossiliferous argillaceous sandstone; coarse sandstone.

* Second Annual Report N.Z. Geol. Survey, 1908, pp. 11 and 35.