

iti Stream; and (3) south of upper Kahui Road, near the southern boundary of the subdivision. The largest of these deposits is that near German Hill, but even this is too small to be of any appreciable commercial value as a source of lime.

Roadmaking Materials.—The greater part of the Egmont Subdivision is well supplied with road-making material. Stone for that purpose is obtained from the stream-beds and from the conical hills which are abundant near Inglewood, and much more so in the Cape Egmont district. The Railway Department obtains ballasting-rock from the quarry on the eastern slope of Mount Egmont mentioned in last year's annual report. As yet nothing further has been done with respect to the Public Works quarry, also mentioned in the same report.

In the eastern part of Huiroa Survey District and in Ngatimaru Survey District volcanic rocks are absent, and the chief road-making material is supplied by a few bands of shelly limestone or conglomerate in the Onairo rocks. East of Tarata pebbly bands are not uncommon in the sedimentary rocks, and have furnished a considerable amount of material for the roads.

Petroleum.—Various indications of petroleum, chiefly in the form of gas-emanations, occur in the subdivision. Three bores* in search of oil have been drilled, these being (1) the Moa bore, near Inglewood; (2) the Norfolk Road bore, near the railway, several miles south-south-east of Inglewood; and (3) the Huiroa bore, near Huiroa. The last-named bore has reached a depth of over 4,200 ft., and boring operations are still continuing. Discussion of the petroleum prospects must be deferred to the detailed report on the subdivision now in course of preparation.

Water-power.—A considerable amount of water-power can be obtained from the various streams traversing the lower slopes of Mount Egmont and the Pouakai Range. The Ngatoro Stream supplies electrical energy for the lighting of Inglewood, and the Borough of Stratford, south of the subdivision, is similarly lighted by means of power derived from the Patea River.

2. GISBORNE AND WHATATUTU SUBDIVISIONS.

(By J. HENDERSON and M. ONGLEY.)

Work in the Gisborne Subdivision has been carried on for two field seasons under the charge of Dr. Henderson, who, however, has been occupied with other work during considerable portions of the two periods. Mr. M. Ongley, Assistant Geologist, has been responsible for most of the field-work. The survey districts of Uawa, Waikohu, Waimata, Whangara, Patutahi, and Turanganui, in all an area of about 790 square miles, have been examined in detail, and the writers have also made a brief inspection of Mangatu and Waingaromia survey districts, which were reported on by J. H. Adams in N.Z.G.S. Bulletin No. 9 (New Series), 1910. For the most part the weather has been favourable and the work has not been difficult.

TOPOGRAPHY.

The Raukumara Division forms the eastern portion of the old province of Auckland, and comprises a broad belt of moderately elevated country to the north of Hawke Bay, lying, for the most part, eastward of the dividing-range of the North Island. The area examined consists chiefly of uplands, now deeply dissected, but which still exhibit remnants of an ancient surface maturely sculptured during a time when the land stood considerably below its present level. The elevation of this ancient surface was intermittent, as is proved by the occurrence along the major streams of three well-marked terrace series. Corresponding with these are raised beaches near the coast at heights of about 560 ft., 220 ft., and 15 ft. respectively. There is also proof that the land once stood at a higher level than at present, and the infilled lower valleys of the old rivers form the only lowlands of the subdivision.

GENERAL GEOLOGY.

The oldest rocks of the Raukumara Division, consisting of beds of greywacke and argillite, referred to the Trias-Jura system, are exposed at various points along the mountain axis, and thence eastward in a general way younger formations appear successively as the sea is approached. In the Gisborne and the adjoining Whatatutu Subdivision these ancient rocks do not outcrop, although the various younger series are well represented. In descending order these are:—

Alluvium, terrace and subaerial deposits	(Quaternary)
Waipaoa Series	(Pleistocene).
Tawhiti Series	(Upper Miocene).
Turanganui Series	(Lower Miocene).
Waikohu Series	(Eocene ?).
Mangatu Series	(Cretaceous).

These formations, with the exception of the greater portion of the Quaternary and Pleistocene deposits, are of marine origin, and indicate that most of the area examined was under the sea during late Mesozoic and Tertiary times. Yet the unconformities separating the series one from another show that the geological record is by no means complete, and that several periods of deformation are represented.

Mangatu Series.—A thick series of beds believed to be of Cretaceous age forms the north-western portion of the Mangatu Survey District, where also occurs the highest land of the area examined. These rocks may be divided into a lower group consisting chiefly of shales, and an

* According to Mr. E. de C. Clarke's maps the New Plymouth Petroleum Company's Omata bore is on the eastern boundary of Wairau Survey District. (See N.Z. G.S. Bull. No. 14, 1912, pp. 37, 53, and maps.)