

sands, clays with lignite and fossiliferous greensands, is not known. A brown gravel, by some called the "Maori" or "Old Man Bottom," overlies the quartz-grits. It consists chiefly of pebbles of decomposed greywacke in an abundant clayey matrix, but contains numerous quartz fragments, probably derived from the underlying quartz-grits, as well as smoothly rounded but irregularly shaped boulders known as "Chinamen," which are portions of the quartz-grits cemented together with secondary silica. The "Maori Bottom" is overlain unconformably by gravels resembling it in colour and most other respects, but rather coarser and with a smaller amount of matrix. These gravels, in places, have a thickness of 20 ft.

Detrital gold is present in all the beds overlying the schists and greywackes. The upper brown gravels have been extensively sluiced, and parts of the Maori Bottom have also been worked. But probably the bulk of the gold won in the Naseby district was obtained from the loose gravels of the flood-plains which were enriched by the degradation of the older gravels, quartz-grits, and conglomerates. These in turn derived their gold from quartz reefs in the schists.

#### 18. GOLD AND PLATINUM IN THE OREPUKI DISTRICT. (Summary of Report by J. HENDERSON.)

A coastal plain, which rises gently from sea-level to about 120 ft. on its inland margin and varies from one to three miles in width, extends along the north shore of Foveaux Strait from Colac Bay north-westward to beyond the mouth of Waiau River. In parts the waves have encroached upon this plain till cliffs up to 80 ft. high have been formed, exposing the layers of buff-coloured gravel, sand, silt, and clay with lignite of which the plain is formed. These deposits were for the most part laid down as beach beds on an ancient shore, and contain auriferous leads.

Gold seems to have been discovered at Round Hill in 1868, and at Orepuki a little earlier. The first workings were on the beach and along the valleys of the streams crossing the coastal plain, the deposits then worked containing gold concentrated from the mass of old beach beds removed by sea and stream erosion. Old beach leads more or less parallel with the present coast and representing ancient shores were later discovered. The lead worked by the Groveburn Company is an example; this lead, which is truncated by the present cliffs at a point about two miles and a half west of the Waiau River, as it was worked westward was found to strike obliquely inland. The bottom on which this lead was worked was the surface separating the sands forming the lower part of the cliffs from the brown gravels forming the upper part. Similar leads have been extensively worked in the Orepuki district. Near Orepuki the claims near the inland edge of the coastal bench bottomed in part on Tertiary strata and in part on a decomposed surface of basic igneous rock (locally known as "granite"). The main bottom at Round Hill is also of basic rock (norite) decomposed to a depth of from 12 ft. to 20 ft. Several layers of gold-bearing sand occur in this locality, an especially rich one resting on a bed of lignite.

Platinum in small amount is associated with all the gold obtained in the Orepuki district. For many years, owing to the low price offered by the banks for impure platinum concentrates, the Round Hill Company was the only producer. The platinum saved is from 1 to 1½ per cent. of the alluvial gold. It is obtained as a residue after amalgamation of the gold, and is further concentrated by careful washing, the final concentrate being about two-thirds platinum. It is said that the platinum obtained when the Groveburn claim was working amounted to about one-eighth of the gold saved, and that on the beach near the mouth of the Waiau River the proportion was as high as one in four. The amount obtained by the Round Hill Company, by far the largest producer, is but 10 oz. or 12 oz. a year, the total annual production for the district being perhaps 20 oz.

Platinum is found along the coast of Southland from west of the Waiau to the Waikawa district, a distance of about ninety miles. Throughout it occurs in very fine scales, especially in the Waikawa district. According to Farquharson (*Trans. N.Z. Inst.*, vol. 43, p. 480, 1911) nuggets weighing as much as 2 oz. or 3 oz. were found at the mouth of the Waiau, but the present writer could get no confirmation of this statement.

The metallic grains known to commerce as platinum contain other metals in appreciable amount. According to Farquharson (*op. cit.*, p. 471) a sample from Orepuki had the following percentage composition: Platinum, 74.61; iridium, 1.30; palladium, 1.36; rhodium, 3.52; gold, 0.39; iron, 5.08; copper, 0.15; iridosmine, 14.32: total, 100.73.

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