

Dredging of the back leads, between the beach and the high ground at the back thereof, has not been attended hitherto with a very marked degree of success; but it is not to be thought of that the ground will remain unworked when the proper machinery for, and the correct methods of, working the ground has been ascertained. At some places these back leads should prove very rich, generally where the accumulation has taken place on the side of a bluff or projecting point of land.

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(a.) *High-level Old River Channels and Terraces.*—In the southern part of the district, between Ross and Rimu, it is doubtful whether gravel appearing on and near the road-line between Limestone Creek and the Half-way House, should be regarded as above or below the moraines that form the hilly country between the Totara and Rimu. Rimu Flat is, however, clearly an old channel of the Hokitika River, as has already been stated in another report.* Tunnel Terrace, in the Waimea, possibly also Quin's Terrace opposite Staffordtown, and part of Kelly's Terrace, should be referred to the action of the Arahura within the Waimea Valley. These, at most places, are possibly rearranged glacier deposits. Along the edge of the Upper Kapitea Basin, near Italian Gully and Callaghan's, there are auriferous deposits that should be referred to this period. A large part of the plain, from Kumara to the beach, has been due to the action of the Teremakau, though immediately under the Dillmanstown hills the surface may be due to more recent action.

In the Greenstone Valley, the old channel of the Teremakau, starting from abreast of the special settlement in the Teremakau Valley and running north to the Duke of Edinburgh Terrace, opposite the Greenstone township, thence passes again to the east side of the Greenstone Valley, and continues on this side to near the present junction of the Greenstone with the Teremakau, has left along this line a considerable area of high-level river-gravels that, at the present time, are being largely worked for gold. Before the Teremakau River channel or the Greenstone Valley had been cut down to their present levels the Teremakau must have wandered over the plains between Kumara and the sea, and at the same time deposited the high-level gravels on its northern bank, which are now being worked for gold from the mouth of the Greenstone and Cape Terrace to and beyond Westbrook, in the direction of Candlelight. A large area of high-level river-gravels extends from the foot of the granite mountains to the eastern foot of the high lands surrounding the sources of New River, between the Greenstone Valley and the Big Hohonu River (falling into Lake Brunner). These, however, do not appear to be gold-bearing, being for the most part reassorted glacier moraines, the material of which has been brought here by the Upper Teremakau Glacier, which, passing through the gap in the granite mountains, filled the basin of Lake Brunner, and formed a series of moraines on its west and south-west sides.

In the Grey Valley, old high-level river-terraces occur on the right bank of the river near to the Brunner Mine and Taylorville, and are at the present time being worked for gold in Sulky Gully. West of Taylorville these grounds reach a height of 440ft. above sea-level.

Above the Brunner Gorge, on the right bank of the river and west side of the valley, gravels of this description occur only as patches, till reaching the valley of Blackball Creek. In Blackball Creek the principal deposit of this description lies between the lower parts of Blackball and Ford's Creeks, and extends over the area on which the township is built and south-east of Kinsella's, near the point where each stream enters upon the Grey River bed.

To the right of the track, from Blackball to Moonlight, the Meg Stream has deposited high-level gravels between the upper end of German Gully and Healy's Gully, near the point where the Meg leaves the ranges.

In the valley of Moonlight Creek, high-level gravels are present from the terraces at the back of the township, across the head of Garden Gully, and thence extend along the foot of the range in the direction of the mouth of the Meg Gorge. Between the lower part of Slaty Creek and the Grey, below the junction of the Little Grey, it may be inferred that a considerable area of high-terrace country should be considered under this head; but the country has not been explored for the reason that there are no tracks through it except along the banks of Slaty Creek to Black-sand Creek and the bare country on the Paparoa Range. The same may be said of a good deal of country lying between the Little Grey and the Paparoa Range.

On the opposite south-east side of the Little Grey Valley there are no deposits that may be referred to under this head, till passing the Blackwater; the eastern side of the low grounds of the Little Grey Valley is bounded by high terraces formed by the action of the Big Grey. These terraces are of great area and altitude. They stretch back from the banks of the present river channel—a distance of between four and five miles. The first formed and highest terrace lies to the north-east of the Snowy River, and between Snowy River and the Blackwater; the terrace-gravels rest on "Old-man bottom." They show their distinctness in comparison with the "Old-man bottom" in that they have not yet been denuded and sculptured into sharp ridges and deep gullies, as almost everywhere is the case with the "Old-man" gravels. It is true that the Snowy River Valley has been excavated along the line between the fourth and third terrace, and that its tributaries form shingle gulches and gullies extending a short distance into the terrace on each hand; and on the end of the terraces, fronting the Little Grey Valley, gullies have also been cut into the third terrace. The second and first terraces are much as when first formed. Gold is generally distributed through the material of these terraces, and, as already stated, all the gold obtained from Snowy River has undoubtedly been derived from the third and fourth terraces.

On the opposite side of the Big Grey, from Mackley's station and Noble's Township to the Clark River and the foot of the Granite Ranges, gravels of like age and mode of formation stretch between the Big Grey and the Ahaura Rivers. On the south-east side of the Grey Valley a high-level terrace stretches along the foot of the hills formed of "Old-man bottom." This fringing high terrace extends up the main gullies running into the hills formed of "Old-man bottom"—as for instance,

* Goldfields and Mining Reports, 1893, p. 162.