

I.—RECENT.

Northern part of Westland.

(a.) *Glacier Deposits*.—Glacier deposits in course of formation are found only around the sources of the Hokitika River, and, as a factor in the liberation of gold liable to be carried to the coast-line, are of little importance. Neither are they of much consequence as affording gold directly from the morainic heaps, as these accumulate. The rocks concerned in the production of these morainic accumulations are, it would appear, not highly impregnated with auriferous quartz reefs, and, besides, the moraines themselves are accumulated in such distant and inaccessible parts of the country that they would require to be very rich in gold to tempt the miner to explore and work them.

(b.) *River Alluvia*.—In the Miconui and the upper part of the Totara Rivers gold-workings have been carried on in the beds and immediate banks of these streams; but in this southern part of the district it is Donnelly's Creek, Jones's Creek, and a number of small streams draining from the western part of the Mount Greenland block of mountains, that yielded gold in such quantities as made the Ross district famous in the early days of gold-mining on the West Coast. Some part of this gold was undoubtedly directly derived from the auriferous Maitai rocks of Mount Greenland, but there can be no question that the greater part, found in the recent wash of the beds and banks of the various streams draining from the western slopes of the range, was derived from gravels of older date present in the creek-valleys or resting on or forming the lower slopes of the outer hills.

In the *Hokitika Valley*, above Kanieri, there have been but few, and these unimportant, workings along the bed and banks of the main stream, or of its largest tributary, the Kokatahi River, and its various affluents. Recently it has been reported that payable gold has been got on the banks of the Hokitika, at or just below the junction of the Kokatahi. But if the Hokitika is to be regarded as an at-present-gold-bearing river, the gold-workings at Woodstock and the Kanieri Townships must be regarded as recent deposits due to the action of the Hokitika, and the geological evidence does not bear this assumption out. At Woodstock the gold-workings are in gravels that underlie glacier accumulations, and consequently are to be excluded from deposits coming under this head. On the opposite side of the river, at the Kanieri Township and Commissioners' Flat, the relation of the auriferous wash to the moraine-heaps is, in certain cases, that it passes under them, and in others that the gold of the superficial deposits should properly be considered as having been brought down the Kanieri River. Yet it is true that at the Kanieri Township the gold-bearing gravels on the immediate banks of the river and on the seaward side of the morainic hills may, without doing violence to the truth, be considered as being due to the action of the Hokitika.

Along the *Kanieri River* a considerable amount of gold-working has been carried on in beds of this age at, above, and below the Forks, and in several tributary streams, such as Coal Creek, Butcher's Creek, &c., but all of these streams derive their gold not from the rock matrices direct, but from older alluvial or glacier deposits that are to be found in that neighbourhood.

In the *Three-mile Creek* the recent alluvial auriferous deposits are wholly derived from alluvial or glacier detritus brought from a distance and deposited prior to the action of the present stream upon them. These older gravels being auriferous, and in certain cases very richly so, the result has been that the gravels of the bed of the Three-mile Creek and lower flats along the banks have yielded large quantities of gold, the Blue Spur Flat having maintained a large population for many years.

In the *Arahura Valley* gold has been worked along the bed of the stream and over parts of the low flats on its banks from below the Christchurch–Hokitika Road to the foot of the second gorge, and for a long time maintained a considerable population. Tributary streams joining the Arahura from the south have also yielded gold to a considerable extent from their modern alluvia. These are the several creeks between the Christchurch Road and Humphrey's Gully, Humphrey's Gully itself and MacDonald's and German Gullies, and others of lesser consequence farther up the valley as far as Caledonian Creek; all of these being auriferous, but indicate a prior existence of alluvial auriferous deposits, from which the gold in their beds and on their banks has been derived, and this since none of these creeks contain within their watersheds any solid rocks of a character likely to carry auriferous reefs or afford other than alluvial gold. On the north side of the Arahura Valley there is a considerable extent of alluvial land, stretching from the river bank to the foot of the southern Waimea Hills, over which gold may be found. The higher part of this terrace-plain may, however, be more properly treated of under another heading.

Along the *Kawaka River*, and in the flatter low grounds of *Fox's Creek*, beds and deposits of this age are known to be auriferous, but along the Kawaka River they have never to any extent paid for working, and in Fox's Flat the ground is too wet and deep to be readily worked, or worked for sufficient returns—at least, so says report in general. It is, however, an opinion strongly expressed by miners whose opinions are entitled to respect that Fox's Flat must contain rich deposits, seeing the Creek, where workable, and Fox's Hill were very rich diggings.

In the *Waimea Valley* the great bulk of the gold-workings are to be regarded as being in gravel-deposits of this age, for though it is quite true that the present stream passing along the valley could not and did not bring the auriferous wash into the watershed of the Waimea, after the Arahura abandoned this valley as its course to the sea, without question a considerable reassortment of the alluvia it left were effected by the waters of the present Waimea and its different tributaries. Yet such heavy deposits as are found in Tunnel Terrace and at other places in the valley must be referred to the action of the Arahura, and not to that of the Waimea, which is an inconsiderable and wholly modern river. Liverpool Bill's Gully and the right- and left-hand branches of the Waimea not having at any time been former channels of the Arahura, their alluvial gravels must be regarded as derived from glacier deposits or from the gravels of the "Old-man bottom," rearranged and concentrated by the action of the present streams in immediately modern times.