4. An area of semi-metamorphic and unaltered slates and sandstones that occupies part of the Waimangaroa Watershed, and thence extends through Mount William south across the Buller Valley as a narrow belt, the rocks of which are well displayed in these localities, and in the road-cuttings from the east bank of the Little Ohika for a quarter of a mile along the road through the Buller Gorge. A small area of slates invaded by granites, and also containing quartz-reefs, appears on the banks of the Buller River, between the Inangahua Junction and a mile and a half farther down the river.

These rocks occupy but a very limited extent of the total area recently examined within the Grey and Buller Watersheds, as far inland as the east slopes of the Brunner and Victoria Mountains, from the Buller to the Brown Grey, and west of a line from the Bog Saddle (leading from the Upper Grey into the Buller Watershed) to Lake Brunner. Within these limits, excluding the Matakitaki and Mangles Watersheds, all the important gold-workings of the Grey and Lower Buller Valleys are to be found, and no effort has yet proved successful to trace the gold to the schists and unaltered rocks of the Spencer Mountains and the main range to the south-west; and it does appear almost a necessity that the gold found in the low grounds of the westward region has been liberated from rocks confined to the western area.

The rocks of the higher part of the Paparoa Range, from the source of Slaty River and Bullock Creek to the Buller Gorge, are gneissic schists, passing sometimes into granites, and at other times into mica schist. Throughout, the whole of this series of rocks are remarkably barren in metalliferous ores, and it was in vain that they were searched for auriferous quartz-reefs or other indications of the presence of gold. As the rocks, on examination, are unpromising in appearance, this unfavourable view is confirmed by what has been the experience of the alluvial miner, whose trips into the so-called granite region, as regards gold-getting, have always been without success; and systematic and successful workings have never been carried on within the area covered by these rocks except in localities where it may be clearly shown that the gold has been derived from a distant and a different source.

The auriferous Maitai series of rocks, which are of Carboniferous age, must therefore not only be regarded as supplying gold to the creeks and mountain streams, of which they form the bed and bounding valley slopes, but also they must have largely contributed gold to those alluvial formations that are at some distance from slate areas, and that usually rest on tertiary clays or soft sandstone. Thus the presence of alluvial gold in the gravel deposits of the low grounds may indicate the source of the gold in one case as being in the neighbouring range, and in other cases as being at a considerable distance. For example, at Langdon's, Blackball, and Moonlight, on the north-west side of the Grey Valley, the gold is mostly derived from the slates of the adjoining range, while on the south-east side of the Grey Valley, from the Arnold to the Big Grey, it would be hard to say from what particular area of slate the gold of Nelson Creek, Orwell Creek, or Napoleon Hill has been derived.

These gravels on the south-east side of the Grey Valley extend into and along the same side of the Little Grey Watershed, and thence into the Inangahua Valley, along the east side of which they are found as far as Coal Creek. They form a belt of country varying from two to five miles wide, and the gravel formation is of great thickness—300ft. to 600ft. On these gravels, as a false bottom, rest the alluvial deposits of modern date, which constitute the wash of the many gold-mining localities that lie along this belt of older gravel formation. As to the south-east of the boundary-line of the gravel formation, very little gold-mining has been, and scarcely any is at the present time, carried on; it is a fair, nay, the only inference that may be drawn, that the gold in the superficial modern deposits of the creek valleys has been derived from the older gravels that underlie and form the surrounding hills. This, by those having any knowledge of the facts, will scarcely be denied; and naturally from this follows the inquiry: Are these older gravels likely to afford gold-bearing strata rich enough to pay for working (*in situ*) without the interposition of the natural processes of sluicing and concentration along the water-channels of the district, as has been in the case of the creek gravels already worked? Many miners believe they are auriferous, and would pay to work, but perhaps the greater number contend that no gold is to be got from the "Old-man bottom," the term by which the alluvial gold-miner designates these gravels.

I agree with the minority in this case, and am of the opinion that in many instances the "Old-man bottom" is worked under the belief that, in the particular instance, the gravels do not belong to the same series, but to a younger formation. Such differences of opinion might be maintained with a show of reasoning when the higher beds, or beds that outcrop at a low angle, are concerned; but when it can be shown that the auriferous stratum occupies the middle of the gravel series as developed in a particular locality, or it may be the lowest stratum, then it is hard to see how it could reasonably be contended that these gravels are non-auriferous. But while it may be admitted that the "Old-man bottom" is thus a source of gold to the younger drifts within the area over which it extends, the origin of the "Old-man bottom" itself, and the original source of the gold it contains, is a much more debateable question. This has at some length been discussed in a former report dealing with the northern part of the Westland District,* and need not be more than adverted to in this place.

Another condition of the occurrence of gold, and another form of mining, is the beach-workings and the mining of auriferous black-sand deposits at higher levels, and often at a considerable distance inland from the coast-line. Such deposits within the district examined are found over the greater part of the coast-line and immediately inland, but are more noteworthy in the northern and southern parts. The northern part, extending from the Buller River to Charleston, has yielded very large quantities of gold, and supported a large mining population for a long series of years, and is still very far from being exhausted. In the southern part of the district, from Greymouth to Canoe Creek, the recent black-sand deposits on the sea-shore and the raised beaches further inland have also been very productive, and are still yielding a large return of gold.

* "Geological Explorations of the Northern Part of Westland," Goldfields and Mining Reports, 1893, p. 132.