

greater elevation, especially on the west coast of New Zealand. Owing to the prevailing winds being in a somewhat westerly direction, the current conveying moisture in the atmosphere striking against the mountains would condense the vapour, and cause large bodies of water to flow into the ocean on the west coast. The well-rounded large stones that are met with in the auriferous wash-drift on the West Coast, and in the gravel beds all along from the Grey River to Ross, show that it required larger streams of water to shift and roll the large masses of heavy stones about than exist in that locality at the present day.

The gold found in the gravel-drifts may chiefly be attributed to concentration by the action of streams of water, and where the material has not been subjected to such action we can hardly expect to find gold in quantities sufficient to pay for collecting. The theory that large nuggets of gold can be deposited in gravel-beds in solution although feasible is still open to many objections, and is not conformable to the conditions met with in working runs or leads of gold, as for instance, wherever there is a large depression in a lead or vein of gold, forming as it were a miniature lake in the bed of a stream, the gold at this point generally gets less; or if it be found equally as good as in other portions of the lead, it is in a stratum of drift on the same hydraulic inclination as the general bed of the stream, showing that the flowing water carried on the work of concentration at such a level as the current could carry away the light material. In very few instances is rich auriferous wash-drift found on the bed-rock in depressions, or deep large holes in a stream, it is generally found on the slopes. But were the distribution of gold due to its flowing in solution through the drift gravels we should naturally expect to find it deposited where the current is obstructed, and at the bottom of depressions in the runs and leads, whereas the contrary action takes place in reference to its deposition.

It may as a general rule be taken that, wherever morainic matter is brought down by glacial action and cuts across the country, damming up rivers and streams and forming glacial lakes, the surface runs or leads of auriferous drifts will not be found on the up-stream sides of these deposits unless they are found at lower levels and of an older deposit. This particularly refers to Kumara. The large sharp angular stones met with in the drift at the head of Larrikins' Flat, and on the ridge running back from the low saddle, where the water-races cross towards the Christchurch Road, show that they have not been subjected to the action of rapidly-flowing water, and therefore the material has not had the chance of being concentrated by the action of a stream; and, although it may contain a little gold all through it, nevertheless until such time as the natural concentration of the material takes place through the agency of water it cannot be made profitable for working. All surface runs of auriferous gravels on the down-stream side of such deposits will be found to continue for distances commensurate with the force and volume of water used in producing concentration, and the length of time the stream continued in one bed. The older the deposit, and the greater length of time that rivers and streams have been flowing in one channel, the more continuous the runs or leads of gold; for, after all, the rivers and streams only act as ground-sluices. Considering the manner in which the different surface leads at Kumara has tailed out, gradually getting poorer as they got down the flat, it indicates that the channel of the stream was continually shifting, that the water was not confined for a long time in one channel, and therefore there is not a great prospect of finding rich surface leads between the present workings and the ocean-beach unless in the drifts of an older deposit; but if a deep run of auriferous gravel be found in the flat, the wash-drift will be of an older deposit, and leads may be traced along the ancient channels of the streams for long distances.

A considerable portion of the gold found on the ocean-beach southward of the Grey River, and also on the back leads running parallel with the ocean-beach, came no doubt from the Teremakau River, whether from its present channel or ancient course is of very little consequence; but it is probable that when the waters of the Teremakau cut through the immense barrier of the morainic deposit, and carried down a large quantity to the ocean, a considerable quantity of gold, concentrated from such deposit, has from time to time been ground up by the action of stones, boulders, and gravel rushing down with the current, being finally carried down and deposited with the ground-up material on the ocean-beach. No doubt the water of the river at the present time carries down a certain quantity of gold, but this quantity is infinitesimally small compared with that brought down in earlier ages. However, a large quantity of gold found on the ocean-beaches came from a much older deposit than these morainic drifts, possibly from land which has since disappeared to the westward in the ocean. This will be more fully gone into when dealing with the drifts found on the deep levels at Ross.

The question as to the depth the prospecting-shaft may have to be sunk before reaching the bottom cannot now be determined. We could not trace any inlet at a deep level going into this flat from the Teremakau River; but, judging from the manner in which the blue-reef is dipping on both sides, the gravel-deposit is not likely to be of great depth, and probably it can be drained by an adit-level from the Teremakau River. The difficulty in sinking the shaft to prospect the ground is the quantity of water likely to be met with in the lower drifts; for, if an old auriferous drift exists at a great depth and no impervious stratum met with in going down, the quantity of water is likely to be troublesome, and probably may require large pumping-machinery if the ground cannot be drained by an adit-level.

Seeing the probabilities there are of finding a deep lead or run of gold in this flat, and that the whole of the ground is held in mining claims, the owners of each of the claims have agreed to contribute a certain amount towards testing the ground; for should an older run or lead of gold be found here, it will greatly enhance the value of not only all the mining claims on the field, but also all property in the Township of Kumara, the business people being wholly dependent upon the mining community. The Government have agreed to subsidise this undertaking to the extent of pound for pound, but the difficulty has always been the cost of sinking a prospecting shaft, and of finding the means. Some held that the ground should be prospected by an adit from the river, and others by