

CLUTHA VALLEY.

The Clutha Valley may be said to contain the largest area of rich auriferous alluvial deposits there is in any valley in the colony. The whole of the watersheds of the Clutha River and its tributaries, from the source to below the junction of the Pomahaka and Waitahuna Rivers, contain highly auriferous drifts, and large quantities of gold have from time to time been ground up by attrition of boulders, shingle, and sharp sand, being carried forward by the volume and velocity of these streams; and, although there are still rich deposits of the precious metal in the beds of these rivers, streams, and valleys, there are considerable quantities carried down by the action of the Clutha River to the ocean which will never be recovered. The erosion of the valleys of these streams and rivers to their present depth has been a work of thousands of years. The rivers have shifted their courses from time to time, carrying on the work of concentrating the material by separating the lighter particles from the denser, and leaving rich auriferous layers here and there amongst the drift. The whole of the dredges working in the bed of the river are payable ventures, and some of these work the auriferous gravels in the river-beds and low-lying flats very successfully, and give good returns to their owners.

There are several large flats in the valley of the Clutha which are now being worked by hydraulic-elevators, where the fall is not sufficient to carry on sluicing by the ordinary method, and wherever a good supply of water can be got the ground can be worked very economically on this principle. In the Clutha Valley, where there is not a large percentage of boulders to contend with, two grains of gold to the cubic yard of material leaves a fair margin of profit on the workings. All the available streams are utilised to carry on hydraulic operations, either with elevators or sluicing in the ordinary manner, and if there were three times the present quantity of water to be got the whole of it would be utilised. The quantity of men employed, therefore, in working the alluvial drifts, especially in Otago, is simply limited to the quantity of available water. There are a number of claims being worked along the Clutha Valley, from the Horseshoe Bend, where Eddie and Kirkpatrick are working a claim by sluicing in the ordinary manner, and said to be giving them very good returns. It will only be necessary to refer to the principal claims in this valley, where the workings are carried on extensively.

Island Block Company.—This company has done a considerable amount of work, and have expended over £21,000 on the plant and claim. The place where they carry on their operations has been known for many years as the Island Block, on account of a rocky ridge running alongside the river on the western side for a distance of about three miles and a half; and on the western side of this ridge is a wide low valley between it and the main range. This ridge is termed the island: hence the name of the Island Block. Judging from the topographical features of the country, there seems no doubt but that the Clutha River at some time flowed at the western side of this island, as a distinct channel can be traced out of the present river-bed where the low ground on the southern end of the island or rocky ridge joins the low valley previously referred to and the river. After the company commenced operations, near the side of the river on the southern end of the island, they got into a deep gorge full of rough rounded river-wash in the bottom; and on the southern side of this deep gut, on the shelving reef, very rich auriferous drift was found. But there was very little gold found in the bottom of the deep gut, the best layers being higher up amongst the drift.

On taking a cut up from the river towards the main range they got off the run of the gold, and, after working over twelve months sinking paddocks here and there, they came on rich auriferous drift in the low valley on the western side of the island at the southern end; but it is really very questionable if they have got the original river-bed yet. The valley is from 20 chains to 35 chains in width, and it takes some time to get a cut put across this. Judging by the curve in the main range on the western side of the island, the river has at one time flowed close in to the foot of the range, and wherever a gentle curve inwards is found in the course of a stream, the water follows that curve. Hence, it seems to me, that probably the deep ground will yet be found between the present workings and the main range; although there is little doubt but that the river must have had different channels from time to time along the valley, and that the present workings are in one of these. The ground is about 40ft. in depth. At the time of my visit, in the centre of the paddock there was a deep gut, having the rock rising slightly towards the main range, but there was very little gold in the deep gut. The rich layers were a considerable distance above the bottom, from which very good prospects were obtained by washing a little of the drift on a shovel.

There is from 6ft. to 8ft. deep of rich alluvium on the surface of the ground, very compact, and forms a clayey substance which is difficult to get away, as it is not easily broken up, but rolls down the box or sluice in lumps to the elevator. This necessitates the layer of surface material being washed off by itself, as it would collect fine particles of gold were it to mix in the sluice with the auriferous gravels. The gold would adhere to the sticky substance, and be carried away with it down the sluice. The manager, Mr. C. E. Rawlins, informed me that he had got 720oz. of gold out of the paddock they were working in, and its dimensions were about 180ft. by 270ft., and an average of 39ft in depth. This is equal to $60 \times 90 \times 13 = 70,200$ cubic yards, and $\frac{720}{70200} = .0102564$ oz., or 4.92gr. of gold to the cubic yard of material worked, which is considered very rich ground to work on the elevating system.

To work this ground the hydraulic head of water is 750ft. It is conveyed for a mile and three-quarters in two lines of pipes, each 15in. in diameter. Thence these join on to one pipe 22in. in diameter, for a distance of 30 chains, and then in pipes 11in. and 9in. in diameter for a distance of 15 chains, to the paddock where they are working; but, although the hydraulic head is 750ft., the actual hydrostatic head, when working with one elevator, having the jet 2½in. in diameter, and the sluicing nozzle 2in. in diameter, the pressure shown by gauge was 230lb., which is equal to a head of 530ft. Therefore, the loss of head in this instance is 220ft.—that is, presuming that the pressure-gauge was registering correctly. The elevator was lifting material about 67ft. The discharge from a jet of