TUAPEKA.

There has been a great deal of gold got from this district since it was first opened in 1861, and for many years it afforded profitable employment to a large mining population; but the easily-worked alluvial deposits have now become exhausted, and more scientific methods are now adopted to work the ground, which in the early stage of gold-mining were not thought of. Gabriel's Gully, Weatherstone's, and Waitahuna were places that were dotted over with workmen well satisfied with the earnings they were getting by working their claims in the primitive style then adopted; but the scene now is entirely changed. Only a few miners are to be seen here and there, principally Chinese, turning over ground which has been worked and reworked, and is covered over with tailings, and yet there is sufficient gold left to afford them a livelihood. In Gabriel's Gully no trace of the shafts and paddocks are left. All the surface of the gully is covered over with tailings, and a few years ago many of the old residents, who had known the place from its earliest days, were astounded when J. R. Perry took up a claim in these old workings, covered with 30ft. to 50ft. of tailings from the Blue Spur and other claims, and they predicted that the proposed venture would prove a failure.

Notwithstanding these predictions, Mr. Perry commenced operations, and worked the ground on the hydraulic-elevating principle, which has now become the favourite method of working the low flats where the fall for tailings could not be got by ordinary sluicing. The system he adopted was not a new one; it had been used for years previously in working the drift-flats in America, but the principle there adopted was far from giving satisfactory results. Mr. Perry had, therefore, to contend with many difficulties, and to make experiments to perfect his plant to surmount the obstacles he encountered; at last, however, he was able to prove that his venture was a payable one, and to utilise the pressure of water to do the work that formerly had to be done by manual labour, and therefore invented a new system of mining, which is now adopted in many parts of the colony.

Gabriel's Gully Consolidated Gold-mining Company.—This is known locally as the Blue Spur Company, and is the only company with extensive workings in or near Gabriel's Gully. They purchased the properties of Mr. Perry's Tailings Company, the Nelson, Otago, Perseverance, Morrison, and Blue Duck Cement Companies, and also the Tuapeka and Waipori Water-race Companies, with the view of erecting extensive machinery to treat the cement in the Blue Spur; but since they commenced working in April, 1888, their operations have been confined entirely to the ground originally held by the Tailings Company, which is worked on the hydraulic elevating principle. Judging from the manner in which the cement has been worked, having the richest portions driven out and the ground burrowed in every direction like a rabbit-warren, it is questionable if their present operations are not carried on in the portion of their claim that will prove most remunerative.

At the time of my visit there was a scarcity of water, and only two nozzles were at work. One of these nozzles was in a paddock near the side of the road leading up from Lawrence to the Blue Spur. The bottom elevating-pipe lifted the material 14ft. into a flume 84ft. long and 3ft. wide, and then there was another elevating-pipe at the end of this flume, which lifted the material 60ft. into another line of boxes, which carried the tailings clear of the paddock and workings and deposited them in the bed of the gully. The second nozzle was working in a paddock where it was expected that the best of the ground was,—at least, what was pointed out to me on my former visit as the place on which their calculations were based as to the anticipated returns when the company was floated; but, alas! like many of these returns, the calculations had not been carefully made, as the place is one mass of stones from the old tips coming from one of the original companies' workings, which either have to be removed by manual labour, or broken up small enough to send through the elevating-pipe. The latter plan was adopted to get clear of these stones, but this adds materially to the cost of working, and the profits are nothing like what was anticipated.

There are two elevating-pipes at the upper paddock: the lower one lifts the material about 12ft., and the upper one 25ft.; and the tailings are deposited in the old worked ground, the tail-water going down the underground tail-race that was being carried up the bed of the gully on the bed-rock. Mr. Jackson, the company's general manager, informed me that he only got 7oz. of gold for a week's work in what was shown him as the best ground.

In reference to the quantity of material lifted, the manager stated that when he was lifting the material 87ft. 8in. in two lifts—namely, one 62ft. 8in. and one 25ft.—in 85 shifts, comprising 680 hours, he moved 26,920 cubic yards, which would be equal to 40,380 tons; and the gold obtained was 115oz. 11dwt. 16gr., representing a value of £433 8s. 9d., and the expenditure in connection with this work was £198 18s. This, therefore, shows that the quantity lifted to the height mentioned was equal to about 59·4 tons per hour, and that the value of the material was equal to about 2·58d. per ton, and the cost of the work was equal to about 1·18d. per ton. The quantity of water used was 350in.—$8\frac{3}{4}$ sluice-heads—with a head of 450ft., on the 62ft. 8in. elevating-pipe, and 400in. —ten sluice-heads—with a head of 375ft., on the 25ft. pipe. The quantity of water used on the nozzle for bringing the material to the well where the bottom elevating-pipe was placed was 150in. —$3\frac{3}{4}$ sluice-heads—with a head of 375ft.

In regard to the amount of work done with the quantity of water used it appears doubtful if the data supplied are reliable, inasmuch as there is no comparison between the percentage of power employed to lift the material in the 25ft. elevating-pipe and that used to lift the material in the pipe 62ft. 8in. To analyse this, it means that in the bottom 25ft. pipe 10 sluice-heads of water was used under a head of 375ft., which, disregarding friction entirely, would be equal to 426 theoretical horse-power, and the quantity of material lifted, being 59·4 tons per hour, is equal to 2,218lb. lifted to a height of 25ft. per minute, or 55,450lb. a foot high per minute. The quantity of water lifted is equal to the quantity used for elevating *plus* the quantity used in nozzle for breaking-down, namely, $10+3\frac{3}{4}=13\frac{3}{4}$ sluice-heads, or 1,289,062lb. lifted a foot high per minute, thus