

had to be used the company could only work about four hours per day, owing to the supply of water being insufficient, it having to be stored up for twenty hours in dams to enable them to get twenty heads for the four hours' work. From what I observed of this system of working I am convinced it will not be successful, as the cement is too hard to break, even with the pressure of water they have, and unless this description of stuff is finely broken up a large percentage of the gold will be carried away in lumps of cement among the tailings.

*Otago Company.*—This company has been at work for twenty-three years, and during that period have had a stamping-battery at work for eleven years. The cement is blasted with dynamite, and broken with hammers and picks to such an extent that it can be lifted into trucks, which are hauled up an incline with winding-gear attached to the turbine water-wheel which drives the battery. At the top of the incline the trucks run into a "kick-up," and are emptied into hoppers, each hopper feeding ten heads of stamps. Two men are employed in each hopper to break the cement sufficiently small for the stamps to operate on. Instead of using the ordinary punched grating that is employed in quartz-crushing batteries, there are vertical bars of round iron three-eighths of an inch in diameter, placed five-eighths of an inch apart, which is found by experience in crushing this class of material to be sufficiently close together. By this method they crush about 150 tons of cement in sixteen hours, or with two shifts of men per day. After the material gets through the grating it falls on inclined tables similar to those used for saving gold in quartz-crushing batteries. Then it goes away in a line of sluice-boxes or flumes, which have false bottoms, and the tailings are deposited in the bed of Gabriel's Gully. About as many workmen are employed at the stamping-battery as there are in the face. This company's cement averages from five to six grains of gold per ton, which is stated to be something like a fair average of the whole hill.

*The Nelson Company.*—This company has twenty heads of stamps; but they are now idle, as they find that by the present mode of working it will not pay for labour, wear and tear of machinery, with interest on capital; and are waiting to see if some new system of crushing can be devised to get through a much larger quantity, and reduce the labour employed in working the machinery.

*The Perseverance Company.*—This company has ten heads of stamps, but they have not been working for some time. They are sluicing the cement in the ordinary manner, employing men to break it up in the face before running it away.

*Morrison and Company.*—This company has a crushing-battery of fifteen heads of stamps; but, like the Perseverance Company, they have stopped the battery, and are now sluicing the cement in the ordinary manner.

The whole of these companies are at work on the Gabriel Gully side of the range. On the Munroe's side there are two crushing-batteries at work, each having ten heads of stamps; but only one of the companies is able to make it pay, the ground being better in one lease than in the other. At Weatherstone's the same class of cement is found, and one company has a crushing-battery; but this is now idle, as they experience the same difficulty in making their ground pay as the companies do at the Blue Spur.

*Waipori.*—This is an old diggings, but there are still about eighty Europeans and a similar number of Chinese engaged in mining, principally hydraulic sluicing; and some of the claims are still paying good wages. Among these are O'Brien Brothers' and Boulton and party's claims, which are situated on the north side of the Waipori River, about half a mile above the junction with Lamerlaw Creek. These claims are in a narrow gut of deep ground, having schistose rock on each side. This gut is from 100ft. to 200ft. wide at the top, and about 30ft. at the bottom, having a vertical height of from 60ft. to 90ft., the bottom of the gut being about 45ft. below the present bed of the Waipori River. The whole of the wash-drift in this gut is full of water-worn pebbles, principally quartz, and indicates that at some remote period it had been the bed of a large stream. The wash-drift is found in layers with gold distributed through it for the whole of the depth, and it is intermixed with a large quantity of the oxides of iron and manganese. The richest portion of the wash-drift is found within 25ft. of the bottom of the gut. To look at the surroundings, it is evidently the old bed of the Lamerlaw Creek, which at one time had been a deep gorge. The wash-drift on the top portion of this gut for about 40ft. deep has been sluiced away, and the bottom of the gut is now being worked by an inclined horse-tramway, which is used to haul up the wash-dirt to the surface, where it is washed in sluice-boxes, the water in the wash-drift being drained by Californian pumps driven by small overshot water-wheels. This gut is about thirty chains in length, and several claims have been at work here for the last seventeen years. O'Brien Brothers and Boulton and party have yet a number of years' work in their claims. In this district there is a good deal of cinnabar mixed with the wash-dirt. Some of it is as large as peas, but as a rule it is in small grains, having been broken up by boulders with the action of water. To form an estimate of the primitive mode of working that is still adopted in this district, the total quantity of stuff removed during the last seventeen years would not exceed 750,000 cubic yards. If the average time be estimated at twelve years, and the number of men employed about thirty, and to allow them to work for nine months out of every year, the quantity of stuff removed would amount to nearly nine cubic yards per man per day; but when it is taken into consideration that two-thirds of this amount of material was sluiced off with water, and that a sluice-head of water is capable of removing about five cubic yards per hour, it leaves the quantity of work done by manual labour to be very small; but even with