It will be seen from this table that the total cost of these works has been £343,187 11s. 3d.; the total receipts, £89,301 4s. 10d.; and total expenditure on maintenance, £69,851 17s. 2d.: leaving a profit of £19,449 7s. 8d. during the eight years that they have been in operation; the Mount Ida Race showing a direct loss of £2,840 12s. 9d.

MINING GENERALLY.

Otago.

Tuapeka.—Mining in this district is chiefly confined to alluvial workings, the chief centre of attraction being the Blue Spur, at the upper end of Gabriel's Gully, on a range between this and Munroe's Gully, known as the cement workings. This locality was a busy place twenty-four years ago: gold was found in every little gully and watercourse falling into each of those large gullies. Of late years the gold-working has been confined to the beds of the once rich Gabriel's and Munroe's Gullies, and to crushing the cement from the terraces. For a long time this cement was broken up with picks and hammers and sluiced away in the ordinary manner; but as time wore on this method was found too slow a process to make the ground pay reasonable wages for working. The richest of the ground was worked out first, and when that was done steps were then taken to work the poor-grade cement on a more wholesale manner. It was found that by breaking it up with hammers a great deal of the gold was carried in unbroken pieces away with the water in the sluice-boxes; and this led to the substitution of crushing-batteries. After the adoption of these batteries it was found that the poor-grade dirt paid the shareholders far better for working than the original method, and a good many of the claims gave for a number of years handsome returns to the shareholders; but as time passed on and the richer ground got worked, even this method is now found too slow a process to make poor cement pay, and steps are now being taken to introduce a new class of machinery to reduce the stuff more economically. During my recent visit to this locality many of the miners were greatly in favour of adopting stone-breakers to pulverize the cement; but these will be a failure, as they do not reduce the cement fine enough for sluicing. The general system that has hitherto been adopted in working that class of material has been to blast the cement with dynamite, fill it into trucks, which are hauled up an inclined tramway, and emptied into large hoppers at the stamping-battery, where two men are employed in each hopper to break the large lumps fine enough to put through the stamps. This method requires two men for every ten head of stamps; and the quantity of material crushed in this manner is about 150 tons in sixteen hours. The large amount of labour required to work the claims on this principle is found to be too great to make them remunerative. There are large hills of auriferous cement yet in this district that would be worked if a cheaper method of reduction was used; and there is no doubt that if improved machinery for crushing this class of material were introduced, it would open up a large field for the introduction of capital. Mining must be carried on in a systematic manner to make it a commercial venture that will pay good interest on capital invested. The days are gone by for miners to acquire a competency in a few years, working with the tub and cradle, or even the more advanced method of a small sluice-box. Before concluding my report I intend to give a description of machinery recently adopted in America for the reduction of ores; and this class of machinery is especially adapted for crushing the auriferous cement found in this locality. This class of machinery is not only much cheaper than stamps in the first instance, but the cost of wear and tear is infinitely less, and will reduce a far larger quantity of material with the same amount of power required to work it. In order to give a general idea of the principle on which the cement companies at present work their claims, a description of the principal companies may not be out of place.

The Extended Company.—This company has been continuing mining operations for twenty-three years, and during eleven years of this period they have used a stamping-battery consisting of twenty heads of stamps to reduce the cement sufficiently fine to allow the crushed material to be washed in a sluice-box. Recently their stamping-battery was burned down, and they did not consider it advantageous to erect another, as the cement was getting too poor to manipulate by this method. They are now breaking the cement with water coming from a hydraulic nozzle under 400ft. of head. Their workings being considerably under the surface of Gabriel's Gully, they use water to lift the sluiced material, on the principle known here as "Perry's." A large paddock is excavated out of the bed-rock, and into this paddock the whole of the material is sluiced from the face. An upright or slightly-inclined pipe, 15in. in diameter and 47ft. long, is placed from the bottom of this paddock to a flume, which extends for about two chains, and empties into another small tank, where a second inclined pipe of same diameter is placed, having a vertical height of 37ft.; thence the whole of the water and the sluiced material goes into a large flume, and is carried away as in an ordinary sluice-box, having ripples and false bottoms, to save the gold, the tailings being deposited in the bed of Gabriel's Gully. By these two lifts the whole of the water and tailings are raised a vertical height of 84ft. To accomplish this about twenty sluice-heads of water are required, having a head from 350ft. to 400ft. Five sluice-heads are employed in breaking the cement and sluicing it into the lower paddock. Then seven and a half sluice-heads are employed to raise the water and tailings to the first flume, 47ft. in height, and another seven and a half heads are employed to raise it from the second tank or paddock up to the main sluice-box, 37ft. in height. This system of working was only commenced at the time of my visit, so that very little was known respecting it; but with the large quantity of water that