

employment to a large population, and tend to relieve the depression under which the colony is now suffering.

Head of Lake Wakatipu.—The reefs at the head of the lake are doing very little. The Invincible Company's mine, which paid well when first opened out, is now let on tribute; the company cannot make it pay by employing wages-men. Whether the tributaries will do better remains yet to be seen; but the way in which this mine was worked at the time of my former visit to this district was such that nothing but rich lode stuff would pay the expense of working. The company was formed in 1880, with a capital of £21,000, of which £14,000 is declared paid up, and £2,665 paid in calls. The amount of dividends declared has been £4,025.

BLACK'S DISTRICT.

Green's Reef Company.—This company has now commenced operations, and intend to bring in a water-supply from Muddy Creek to work machinery for crushing the deposit. They propose to convey the water across the Manuherikia River, at the Gorge above the station, in wrought-iron pipes. The deposit which this company intend to work cannot be termed a quartz reef; it is merely a deposit of decomposed schist in very fine foliated layers, and interstratified with thin string-like veins of quartz running across the foliations in all directions. It is in these fine quartz seams that the gold is found. The deposit is about 30ft. wide, with a moderately hard schist wall on one side, and hard chlorite schist on the other. A small cut has been made, and the stuff taken out and washed in a long-tom and sluice-box, and the quartz taken out and stacked, to be hereafter put through a crushing-machine. The manager informed me that the company intend to work this deposit by putting the whole of it through a cyclone crushing-mill, which is going to be erected on the ground, and which will crush about 400 tons per week. As this will be the first of these mills in this colony, a description of it will not be out of place.

This machine is known in America as Wall's Crushing-rolls. It differs from the ordinary crushing-rolls in common use chiefly in the novel construction and arrangement of the crushing-faces, which consist of parallel corrugations extending across the faces of the shells, either parallel or inclined to their axis, the corrugations being rounded or curved with such proportions that, when intermeshed or rotated, any portion of the surface of each will press equally upon the counterparts of the opposite roll, and being held firmly in position by suitable steel gear, skipping of the crushing-faces upon each other, or upon the material to be crushed, is rendered impossible. A description of this machine was given in the *Mining and Scientific Press*, of the 4th February last.

It will be seen from the annexed plan that the meeting- or crushing-faces present at all times overlapping curved surfaces, between which the material is firmly held, and crushed by almost direct pressure, thus absolutely avoiding the grinding or uneven rapid wear of the face of the shell, and the consequent destruction of the ores by the production of refractory slimes, such as result to a disastrous degree from the constant grinding or rubbing to which all material is subjected in being reduced by common plain-faced roll attrition-mills and similar devices in common use.

For pan- or plate-amalgamation three pairs of these rolls will give a greater daily product than a crushing-battery of forty stamps, and they do not require more than one-fifth of the motive-power to work them, while the cost in the original outlay is not more than one-fifth the price of a forty-head battery; also the cost of tear and wear is but a mere fraction compared with that of stamps.

These rolls are coming into use in the Australian Colonies. Two sets have been sent to the Mount Perry Gold-mine, Queensland, which has similar ore to that found in the Mount Morgan Mine, near Rockhampton; one set has been purchased by the Australian Smelting and Reduction Company, Dry Creek, South Australia; one set for the Broken Hill Company, Silverton; and two sets for the Barrier Ranges Concentrating Company, New South Wales. Annexed is an illustration showing the principle of these rolls.

I have no doubt rolls of this description are a great improvement on the old-fashioned stamp-mills; but it is very questionable if they are the best description of machine to treat the whole of the material from the deposit found in the Green's Reef Company's ground. The soft slimy nature of the deposit will cause it to adhere to the rolls if crushed dry, and if water is used the amount of mud will be so great that it will carry the fine gold away with it. The deposit is one which could be sluiced down into a puddling paddock on the flat, and in this paddock the material could be broken up by having two hydraulic nozzles playing on it in opposite directions to each other; and when the whole of the soft decomposed schist was broken up into slime the muddy water could be gradually let away by having slip-boards in a sluice to draw it off, until nothing but the clean gravel remained in the paddocks. This system is adopted by Mr. John Ewing, at St. Bathans, to puddle thick bands of stiff clay, and proves very effectual at a small cost. After the material is puddled and the slime all run off, the gravel can be removed from the paddock and put through the crusher.

Corrigall's Reef.—This reef is again taken up by Mr. Green, who has been prospecting it for a considerable time, and discovered what he believes to be payable stone. He has lately purchased a crushing-battery of five heads of stamps that was at the Carrick Range, and is removing it to Black's to work this reef.

Ida Valley.—The deep lead at Ida Valley has been taken up as a special claim of fifty acres, and negotiations are going on with some gentlemen in London to float a large company, giving the present proprietors £4,000 either in paid-up shares in the new company or in cash for the property. The depth of the ground is about 200ft., and in this there is 21ft. of drift to go through. Several other claims are taken up there with the expectation of this company being floated.