

the Cassel process. The royalty paid for the use of the Cassel process is $7\frac{1}{2}$ per cent. of the value of the bullion extracted, which, however, does not include the value of the gold recovered by the ordinary battery process.

Red Mercury Company.—This company's operations last year were on the east and west branches of the Red Mercury Reef. The latter branch is stoped out, and in about four months' time the stopes on the east branch will be finished on the present level. A contract has been let for the construction of 500ft. of a lower level, which will give about 130ft. of backs. This level is now constructed for a distance of 240ft. The company purchased the crushing-plant formerly belonging to the Kuaotunu Company, which is erected in the flat at the junction of the roads to the Try Fluke and Just-in-Time Mines, which is about 50 chains from the end of the aerial tramway leading down from the mine. The crushing-plant consists of ten heads of stamps (American pattern), four pans, two settlers, and some berdans, which are driven by a powerful steam-engine. This is by far the best reduction-plant on the field. The price paid for the whole of the plant and building was £1,400. During the past year 2,291 tons of quartz was crushed, which yielded 2,307oz. 2dwt. of gold, and the average number of men employed during the year was twenty-four.

Great Mercury Company.—The operations of this company last year were confined to stoping on the Try Fluke Reef, and working out the stopes on the Red Mercury Reef. All the lode above the present level has been worked out, and another level is being constructed, which, when completed, will give about 100ft. of backs. This level was at the time of my visit constructed for a distance of 100ft. It is expected to cut the eastern branch of the Red Mercury Lode at about 190ft., and the western branch at 450ft. An average of twenty-four men were employed in this mine during last year.

In referring to this company last year it was stated that the manager, Mr. Pettigrew, assured me he was getting 87 per cent. of the gold out of the ore from his principle of pan treatment. This was questioned by me at the time as a most unlikely result. It has since been proved that he was getting only a very small percentage of the bullion in the ore. The company has now abandoned the use of the pans, having erected a Cassel plant to treat the pulverised ore after leaving the copper-plates. They have erected three working tanks, each 16ft. long, 12ft. 6in. wide, and 3ft. 6in. in depth. There are also two solution tanks, each 16ft. long, 12ft. 6in. wide, and 5ft. in depth; one of these is for the strong solution, or first filtration, and the other is for the second filtration or weak solution. The reservoir for making up the solution is 10ft. long, 9ft. wide, and 4ft. 3in. deep. About from seven to ten tons of solution is used for seventeen to eighteen tons of ore, and the strength of the solution used is from 0.3 to 0.6 per cent. Great difficulty has been experienced in treating the slimes from this company's ore, as the latter is very mullocky. The saving from the slimes does not amount to more than about 33 per cent. of the bullion they contain. The company is now endeavouring to allow the slimes to go into a large pit to settle. The ore is crushed wet, and after passing over the copper-plates it flows into a pyramidal box, having a pipe in the bottom which allows the heavy portion of the tailings or pulverised ore to pass through, and run into one of the cyanide working vats, the slimes with a great portion of the water passing over the top of the pyramidal box into the pit referred to. After the working vat is filled up, the water is drawn off, and the ore turned over by hand to loosen it, so as to prevent a coating of slimes interfering with the filtration. The present method of filtration is very unsatisfactory, and it appears to be the weak point in the Cassel system of treatment. Where there are slimes they absorb the cyanide, and hold the cyanide of gold which cannot be washed out of them. However, by the method at present adopted most of the slimes are separated from the pulverised ore, and a fair percentage of the bullion is extracted.

An average of thirty-three men were employed by this company during last year, and 2,312 tons of quartz was crushed, which yielded 2,304oz. gold; 1,190 tons of tailings were also treated at the Cassel plant, which yielded 461oz. 11dwt. gold, making the total gold returns 2,765oz. 11dwt.

Mariposa Company.—This company erected a crushing-plant last year, consisting of ten heads of stamps and three of J. Fraser's pans; but, after they started crushing it was found that only a small percentage of the bullion could be saved, hence crushing was discontinued for a time, and an arrangement has now been made to erect a Cassel plant to treat the tailings from the quicksilver tables with a cyanide solution. An average of twelve men were employed by this company last year. They have been working on the same line of lode as the Try Fluke Company, which is about 4ft. wide in their ground, and the ore averages by the ordinary battery process from 12dwt. to 15dwt. of bullion per ton. Only 300 tons of ore was crushed last year, which yielded 171oz. bullion, principally gold.

Just-in-Time Company.—This company has let their mine on tribute to Captain Richards, the late manager, who has had an average of five men employed. He has crushed 276 tons of quartz, which yielded 321oz. 18dwt. gold. There is no crushing-machine attached to this mine, the quartz being crushed at Curtis's Battery. This battery at the time of my visit to the field changed hands, Mr. Abbot being the purchaser for £600.

The foregoing are the principal mining properties at Kuaotunu, but there are several other companies and parties of miners who have obtained a good deal of gold, amongst which may be named the "Kuaotunu," "Irene," "Otama," "Black Jack," "Waitaia," "Invicta," "Excelsior," and others. A new claim has recently been opened in the Waitaia Block. This is called the "Aorere," and is held by a syndicate of nine persons. Ten tons of stone was crushed from this claim, which yielded 13oz. 13dwt. of gold, worth £2 18s. per ounce. The lodes, however, in this portion of the Kuaotunu field do not look so permanent as those running through the Try Fluke, the Mariposa, Red, and Great Mercury, Companies' claims. There are a number of lodes, some of which are very large, in different parts of the field containing gold, but it requires a cheap method of reduction and treatment to make them remunerative for working. Scarcely any work had been done in the Black Jack Claim, which was taken up when the field was first opened, until last year, when three men got out $37\frac{1}{2}$ tons of quartz, which yielded 154oz. 10dwt. of gold, being 4oz. 2dwt.