strong hessian cloth laid over the top, which acts as a filter. The vats are made of kauri timber, 3in. in thickness, the bottom is held together by six bolts of ¾in. diameter. The staves are about 3in. in width, jointed close, having the bottom rebated into the sides. Each vat is held together by five round-iron hoops, three of which are ⅞in. and two 1in. in diameter, having three turned buckles on each hoop. They are erecting thirteen of these vats, and two sumps of the same diameter, but 6ft. in depth. Each vat holds 30 tons of ore for treatment; and it takes about four days to fill a vat, treat the ore, and have it ready for filling again.

The precipitation boxes are 16ft. long, 2ft. deep, and 17in. wide, divided into twelve divisions, of which the first and last are sand-filters, to clean the solution going in, and to prevent any gold slimes from being washed out.

The manager states that it is too early yet to give the exact cost per ton treated, as they are reducing the cost every month. At the present time it amounts to about 13s. per ton. This includes drying, milling, treatment by cyanide, and all expenses, except the royalty paid the Cassel Company, from the time it leaves the mine-hopper until the bullion is in bars.

The Waihi Company has an Otis ore-crusher at work. The patentees claimed superior advantages for this crusher over any other in use, and that it would pulverise 17cwt. of quartz per hour, with a maximum of 8-horse power to work it. The experience of the Waihi Company is that it pulverises about 4cwt. of quartz per hour, and requires a great deal of attention; while the wear-and-tear is much greater than in a stamp-battery. After seeing this machine at work, and having a knowledge of its crushing capacity, it is one not to be recommended as an econom quartz-crushing mill.

During the year ended the 31st March last, 19,343 tons of ore have beer , which yielded 31,018oz. bullion by amalgamation, and 3,643oz. 5dwt. by the cyanide pro ıe Cassel Company, who purchased the tailings from the Waihi Company that it had st previous to November last for £5,000, have treated 1,425 tons, which yielded by the cyanid ss 1,126oz. bullion.

The total returns from all the claims at Waihi last year was 35,858oz. n, which was obtained from 19,458 tons of ore and 1,625 tons of tailings; while 208 mer employed on wages.

The following is a description of the Cassel Gold Extracting Company's Tailings Cyanide Works, Waihi:—

These works were completed about the end of February, 1894. They are situated in a hollow below the tailings dams, so as to allow the tailings to be run at a good grade into the percolators, and from there to be discharged by sluicing without the necessity for any lifting or re-handling. The building has a frontage of 116½ feet, and is 77 feet in breadth, and includes laboratories and offices situated in a lean-to at one end, and communicating with the main building. The laboratories are fitted up in such a manner that not only may the regular assays and tests in connection with the establishment be carried on there, but also all the experimental and research work of the New Zealand branch of the company. The bullion-room is separate entirely from the assaying department, and the manager has suitable offices on the premises; whilst there is also provision for sleeping accommodation for a portion of the staff.

The plant consists of eight circular percolators, 20ft. in diameter and 4ft. in depth (internal measurements), arranged in two rows, and having an intermediate discharge launder, towards which the vats have a slope of 2in. to facilitute the flow of solutions, and the sluicing out of residues. All the vats are built of specially selected and well seasoned heart-of-kauri, the timbers being 3in. thick. The sides are hooped with 1⅞in. iron bolts, connected and firmly screwed up by nuts and cast-iron boxes, there being three boxes to each ring. The bottom planks are bolted and dowelled tightly together independently of the sides. The filters at the bottom consist of a foundation of 2in. by 2in. slats, 9in. apart, covered by 1in. moulding, which supports the canvas strainer. This filter is very easily laid, and is most effective in practice. Each vat is provided with a cast-iron door, 18in. x 12in., fixed at the bottom of the side near the discharge launder, for the sluicing of residues.

There are two sumps of same size and design as percolators, and situated between percolators and front of the building, and on a sufficiently low elevation. The sumps are floored over. In the same line are placed the reservoir and cylindrical vacuum-chamber, 13ft. x 3ft. 9in., under which latter is provided a small rectangular tank, 12ft. by 8ft., by 18in. deep, capable of holding contents of vacuum chamber. The reservoir is 13ft. 9in. diameter by 5ft. deep (inside measurements), and is at such an elevation as to permit solutions to flow therefrom into percolators. There are three extractor boxes, 12ft. 8in. by 19in., with side discharge for slimes, and a settler for cleaning up.

The dissolver is an iron pan, about 3ft. 6in. diameter by 2ft. 6in. high, and is capable of dissolving four boxes, *i.e.*, 1,000lbs. of cyanide, per day. It is so arranged that the requisite amount of strong solution may be run into the reservoir by simply turning a handle.

There is a 4in. centrifugal pump for returning the solutions from the sump to the reservoir, and also an 8in. vacuum pump, which is capable of producing a vacuum of 26in. of mercury. The motive-power is supplied by a 4ft. Pelton, worked under a 60ft. head of water from the company's own race. The machinery runs very smoothly, and the water-supply is more than sufficient to enable the company to run both centrifugal and vacuum pump, and to sluice out their residues at one and the same time.

There is a line of piping running along above each row of percolators, with a connection at each tank for the hose and nozzle, and it is found that one man can empty a vat containing over 40 tons in two hours.

A tramway of about 300 yards connects the upper and lower tailings-pits with the works, and two sets of lines run over the top of each vat, so that the tailings may be equally distributed without the necessity for handling.