material led on to six small tables, about 20in. wide and 2ft. long, which are also covered with cocoanut matting. The whole of the table surface for saving the gold on this dredge is about 45 square feet.

The dredging engine is of compound type, having the high-pressure cylinder 9in. in diameter, and the low-pressure one 15in., the stroke of the piston being 20in. The engine for working the centrifugal pump, which has a disc of about 3ft. 6in., has cylinders of 7in. and 11in. respectively, with a piston-stroke of 16in., and travelling at the rate of 440ft. per minute, and the engineer informed me that it required a pressure of 90lbs. per square inch in the boiler to work the engines at this speed, with the steam cut off at five-eighths of the stroke, which shows that this large centrifugal pump, in order to raise about three sluice-heads of water 16ft. high, requires about eighty theoretical horse-power to work it. The engines are supplied with steam from a multitubular boiler, 15ft. long, and 5ft. in diameter, set in brickwork inside the hull of the pontoon, and fired below.

The washing appliances on this dredge are certainly the worst that has come under my notice, and yet with all this they can get about 36oz. of gold per week. The gold here is said to be scaly, with a good deal of it in fine particles; at the same time there is a good deal of heavy gold, some pieces of 6dwt. having been obtained. Were it not that there is a good deal of heavy gold, this company could not carry on dredging operations with the present washing appliances. There is a large quantity of big stones in the wash-drift, and these are raked down the sluice from the hopper and pass over the stern. Some of these boulders are so large that they stick firm in the ladder, and cause the friction-wheel on the vertical shaft to slip, until the stone is removed. One thing is certain, if there is much fine gold in the wash-drift, the most of it will be again deposited in the river at the stern of the dredge.

Taking the hull of this dredge, there has been so many alterations made since this dredge was first constructed, and additional weight placed on the punt carrying the dredging appliances, that the present depth of the punt does not leave sufficient margin of safety for men to be on this dredge during a heavy flood in the river.

Matakitaki Dredge.—This dredge is placed in the Matakitaki River, about five miles above its junction with the Buller. At the time of my visit to this locality this dredge was being strengthened, the framing and ladder being too light for dredging the bed of the Matakitaki River, where there is a large quantity of stones and boulders. It is said the wash-drift contains a fair amount of gold, and, if the dredge is made strong enough to work the ground, it ought to be made a profitable speculation for those interested in it. Information has subsequently reached me to the effect that the dredge is now working satisfactorily, and that fair returns are being obtained.

Otago District.

Waipori.

There are three dredges at work on Waipori Flat—namely, two belonging to the Waipori Gold Dredging Company, and one belonging to the Jutland Company. One of the dredges belonging to the Waipori Company was purchased from the Golden Bar Company, at the junction of the Shotover and Kawarau Rivers. The manager of the company states that this dredge is too small to work the ground on Waipori Flat economically. The hull is 75ft. long, with 18ft. of beam, and can dredge to a depth of about 22ft. The dredging-buckets have a capacity of 2¼ cubic feet each, and, when they are working at full speed, they dredge at the rate of fourteen buckets per minute. At the time of my visit they were dredging on a lignite bottom, the wash-drift being quartz gravel, with very few large stones.

The dredged material is lifted to a height of 16ft. above the deck, and dumped into a hopper which leads into a revolving screen having longitudinal bars 2in. wide and ⅝in. between. The coarse material passes through the centre of the revolving screen into a sluice which is 32ft. in length and 3ft. in width, fitted with iron riffles; the fine stuff passing through the slots into a box, which distributes the material on to tables set at right angles to the revolving-screen, and covered with cocoanut matting. There are five tables at each side, each 2ft. 6in. wide and 10ft. long. These tables empty into another longitudinal sluice, fitted with iron riffles, the sluice being 36ft. long and 3ft. in width. The centre sluice has a fall of 15in. to 12ft. and the side sluices have a fall of 12in. to 12ft. The washing appliances, although far from perfect, are much improved since dredging was first used as a means of obtaining gold from alluvial drifts. The separation of the stones and shingle from the sand is fairly well carried out, and the fine material coming through the revolving screen is very well distributed over the tables; but the quantity of material passing over these tables is far too great for their capacity as gold-collectors. When a large quantity of material has to be sent over the tables it requires the volume of water to be in proportion, and fine flaked gold has not much chance of being caught on the cocoanut matting. For these tables to act as good gold-savers the material must pass over them in a very thin film, and with as little water as possible, in order to keep them clear. Taking the capacity of each bucket to be 2¼ cubic feet, and that they come up two-thirds full, and fourteen buckets per minute, the average quantity of material lifted would be 46 cubic yards per hour, and the surface-area of the tables to save the gold from this quantity of material is 250 square feet. This may seem a tolerably large surface-area of tables, but the length of tables has not nearly so much to do with saving gold as their width, as, for instance, a table 6ft. wide and 42ft. long would have a surface-area of 252 square feet; but as the whole of the material would have to be confined to a width of 6ft., the material would have to pass over in seven times as thick a film as it would do were the tables 42ft. wide and 6ft. long, and therefore far more gold would be got by the tables being wider. The revolving screen used on this dredge is about 12ft. in length, and 3ft. or 3ft. 6in. in diameter, having ⅝in. perforated holes for allowing the fine material to get through, and it revolves at the rate of eight revolutions per minute. In order to distribute the material evenly on the tables there is a longitudinal box placed underneath the revolving-screen, and to get all the material from the screen