

the satisfactory manner it worked and the quantity of material it lifted that he has commenced to erect a similar plant at Nelson Creek, to test the ground in the flats and creek-bed, where very little working has ever been done. There is another water-race in course of construction, to bring water on to the ground on the west or opposite side of Nelson Creek to where the Government race is constructed. This work is undertaken by the Band of Hope Water-race and Gold Mining Company (Limited). They are lifting the water from the right branch of Nelson Creek, about two miles above its junction with the left branch. The size of the race is 4ft. wide in the bottom, and 2ft. deep, and is constructed with a fall of 8ft. per mile, which will be capable of carrying about twenty sluiceheads of water. The total length of race, when complete, will be about  $4\frac{1}{2}$  miles; and the cost of construction is estimated to be about £2,600. This company hold a mining lease of thirty acres, in what is known in this locality as the Deep Lead, which they intend to work, and, if they have any surplus water which they cannot use, they intend selling it to the miners. At Orwell Creek and Granville the principal workings are hydraulic sluicing, but there is very little water in this locality. The company that applied for a special claim of 200 acres, and got the same granted, on condition of bringing in a large water-supply to Orwell Creek, has either become defunct, or neglected to take up the lease, which has been returned by the Warden and cancelled.

INANGAHUA.—The quartz reefs in this district extend over a very large area of country. Some of them are profitably worked, while others have proved too poor for working at present. Among the principal dividend-paying mines in this district are the Welcome and Keep-it-Dark. The former mine has only lately been opened out on the first level below the main tunnel, or what the company terms No. 6 level. The quartz lode here is about 2ft. 6in. wide and averages from 1oz. to 2oz. of gold per ton. This company has gone to a great outlay in erecting underground steam-winding and compressed-air machinery. There is a tunnel driven into the hill for 2,600ft., at the end of which there is a chamber cut out, and poppet heads, winding, and compressed-air machinery erected. From this chamber there is a shaft or air-way to the surface, some 800ft. in length. The timbering in this chamber has been executed with considerable skill: the walls are vertical for about 15ft., and then it has a Gothic arch, having the timber adzed and fitted to the exact curve of the roof. A shaft has been sunk for 150ft. below the level of this chamber, and divided into three compartments, viz., two winding-shafts and one ladder-way. Then winzes and tunnels are constructed, with the aid of the compressed-air rock-drills, and the manager, Mr. Rooney, states that in driving all winzes and tunnels the rock-drills are a great saving in cost; but when the reef is narrow they are not worked much more profitably than by taking out the stone by the ordinary hand labour, but they assist materially in ventilating the mine. This company have erected a plant for crushing tailings, consisting of fifteen berdans, and a force-pump for lifting the tailings from the pit into boxes or shoots, which are placed above the level of the berdans. Two of these boxes are alongside each other, so that when the tailings-pump is filling one the other is being emptied into the berdans by a self-feeding apparatus. All the principal companies in this district have now compressed-air machinery erected for working their mines, and certainly have superior mining plants to any other portion of the colony. The underground diamond-drill belonging to the Golden Fleece Company, mentioned in my last report, has been erected and is at work in the 740ft. level. The Globe Company have erected a crushing battery of twenty heads of stamps, and constructed an aerial tramway to connect the hoppers for holding the quartz near the mine with the battery. This tramway is about 96 chains in length, and has to go over two ranges of hills in that distance. It consists of an endless-wire rope, kept about 10ft. apart horizontally by trestles and pulleys fixed up at certain distances along its length. At each end there is an inclined round shaft about 10ft. long, on the upper end of which is placed a grooved pulley about 10ft. in diameter, having the groove large enough to admit of bucket-clips on the wire-rope; and about 3ft. from the bottom of the shaft there is a brake-pulley from 4ft. to 5ft. in diameter, around which there is a brake band of iron worked with the necessary lever to regulate the speed and stop the motion of the tramway when required. These shafts and pulleys are fixed to wooden framing, and the shafts are set at about right angles to the inclination of the endless rope. The framing supporting these shafts is made so that it does not project quite as far as the large-grooved pulley which is overhead, in order that the buckets that are placed on the endless rope can work round these grooved pulleys clear of the framing. Trestles are erected about from 4 to 6 chains apart along the line of tramway, having small grooved pulleys, about 16in. in diameter, placed at each end of the trestle to carry the weight of the endless rope and buckets that are placed on it. These trestles are placed at a slightly higher level than the straight line of inclination of the rope, in order to make sure of there always being sufficient weight on the pulleys to prevent the endless rope swinging off by any jerking motion. There are sixty-six buckets, each capable of holding 2cwt. of quartz, suspended from the endless rope at equal distances. These are fixed to the rope by a suspension-rod with a square knee on the upper end sufficiently long, in the portion at right angles with the vertical rod, to have a semi-round clip to receive the endless rope on the upper side and work over the top of the grooved pulley on the lower side, and to have two holes at each side of the clip. On the top of this clip there is a cap-piece, likewise made in the form of a semi-round clip, which is bolted to the lower clip, having the rope between them with two screw-bolts: this holds the suspension-rods or bucket-carriers firmly to the rope. The lower ends of the suspension-rods are double-formed in shape of a bow, so as to come on each side of the buckets for carrying the quartz; each bucket is hinged to the bow, and held upright by a catch; but when emptying it the catch is knocked off, and the bucket turns over automatically. The tramway is constructed so that the perpendicular height and incline of the gradient at the end where the crushing battery is placed has a sufficient number of full buckets always going down to keep the endless rope in motion with the empty buckets going up, and the full ones on the ascending grade on the other side; or it can be worked by machinery at one end by gearing from the incline shaft on which the large grooved pulley is placed. There is an ingenious arrangement at the end where the hopper is placed, near the mine, by which the buckets that are fixed stationary on the endless rope can be filled when they are in motion. This consists of a frame, which stands on a level with