

anticipated that much of the ground which is now lying idle in the once prosperous Charleston gold field will be worked by sluicing to considerable advantage. The reconstruction of the Government water-race dam at Kumara has also been completed during the year, and the main race has been widened so as to admit of a larger supply of water being delivered to the claims upon the completion of the Government sludge-channel, which has recently been effected. This has led to a more general system of ground-sluicing there upon a large scale; and, as the channel appears so far to work well, we shall soon no doubt hear of considerable returns from this improved method of alluvial mining in that locality. This sludge-channel, or immense tail-race, is 85 chains in length, the lower half of the tunnel measuring 9 feet by 7 feet, with a line of rails on either side of the sluicing-box in the centre, the upper half being 7 feet by 7 feet, with a line of rails upon one side, the channel discharging its heavy load of water, stones, and *debris* direct into the deep bed of the Teremakau River below. Notwithstanding the apprehensions of the miners when this work was first designed, it has been found in practice that the fall as recommended by the Government engineers is ample. The fall as it now stands is 1 in 26 and 1 in 28; and this fact will no doubt be interesting to miners, as showing that in large tail-races, such as this is, the fall can safely be made much less than has been found necessary in the smaller tail-races which miners usually construct. This, it will be recognized, is of great importance, where it is necessary to make the most of the fall, so as to allow of further extensions of the channel as the tailings accumulate. The most remarkable circumstance in alluvial mining during the year is the recent revival at Woodstock, which is situated within a few miles of Hokitika, and only a short distance from the old workings at Kanieri. Here the discovery of payable washdirt at a depth of 50 to 60 feet soon led to further interest being taken in the matter, and later to a rush, which is now reported to amount to about 1,200 men. An account of this discovery will be found in Mr. Warden Giles's report in the appendix, and, as he remarks, "The circumstances of this discovery are suggestive of the vast extent of ground which may yet prove auriferous without going into the more inaccessible parts of the country to look for it."

The recent discoveries of deep leads in the Ida Valley and other mining districts of the colony in the vicinity of old workings are confirmatory of these observations.

Operations upon the special claim of 100 acres at Ross, referred to in last year's report, have been pushed on with vigour, the large drainage tunnel in course of construction having apparently already proved of advantage in draining the flat. A report by Mr. Cox, Assistant Geologist, upon the Woodstock gold field, the Ross special claim, and the Humphrey's Gully District, referred to by Mr. Warden Giles, follows this report in the appendix.

It will be seen from Mr. Warden Keddell's report that the work of dredging the Clutha River, at Roxburgh and Alexandra, still continues. The results at the former place have been very encouraging; but at Alexandra the dredging has not been so successful. There the Dunedin Gold-dredging Company have a very complete plant. The machinery is driven by a 70-h.p. engine, and 170 tons of stuff per hour can be lifted from a depth of 22 feet. The arrangement of dredging-buckets is upon the usual inclined-ladder principle; and at every third or fourth bucket there is a tooth of iron which strikes the river-bottom like a pick, and loosens the stuff for the buckets. The dredge is moored to four anchors; and, by means of clutches, worked by steam on board, the dredge can be brought to bear upon any portion of the river-bed.

The action of the steam dredge, so far as raising the stuff is concerned, is a great success; but the separation of the gold is in a measure only as yet in the experimental stage. Having so much stuff to treat, it has to be done by a wholesale method. It is received at the upper end of a revolving perforated cylinder, which allows the stones and coarser particles to pass through the other end to the river, the finer sand and gold finding its way through the perforations to a concentric revolving cylinder, which in its turn makes another assortment of the auriferous sand, the finer particles and gold again passing through its perforations to the revolving-pans, where it is triturated, and the gold amalgamated by