

exist; but it is only very recently that any but the most feeble attempts have been made to work them by tunnelling—a circumstance only to be accounted for by the scarcity of timber, which is necessary for the support of the super-incumbent earth.

73. Mining operations in the Dunstan Gold-field, inclusive of the Manuherikia district, may be divided into three classes viz.,—River beach workings, ordinary alluvial mining, and tunnelling. From the first, immense quantities of gold have been obtained, but the frequent rising of the river has rendered this branch of mining very intermittent and precarious. A machine has recently been invented for the purpose of dredging the bed of the Clutha itself, but it has not yet been practically tested. The following extracts are from the report of Mr. Mining Surveyor Coates:—

Classes of mining on the Dunstan Gold Field.

“Mining operations, in addition to ground and box sluicing, consist in tunnelling into the banks on either side of that part of the river between the township and the gorge, a distance of about five miles, and which description of mining has revealed the existence of the bed rock under a large area, and at levels in most instances above that of the river, together with other highly important information in reference to the future prosperity of that locality. From some tunnels worked under the bank at the north side of the river, and in the immediate vicinity of the township, gold, bearing a marked difference from that of any other portion of the district, has been obtained. Nuggets weighing from five to fifteen pennyweights have been occasionally found amongst the finer gold; from which circumstance, together with that of the rock bottom having been followed dipping gradually from the river, it is generally believed that a rich gutter exists at no great distance from the faces of the most extensive of these workings. For the purpose of striking the supposed lead a shaft has been sunk (Princess Alexandra) and bottomed at a depth of ninety-five feet, upon which about two feet of wash-dirt was found, yielding a prospect of ten grains to the tin-dish; but in consequence of the water which had to be contended with having been influenced by the rising and falling of the adjacent river, the prospectors determined upon suspending operations until the river subsided sufficiently to permit them to drive. The method of securing the shaft, although inapplicable in wet sinking, is nevertheless a valuable introduction, as instructive as it is novel, consisting of a framework or skeleton lining of timber, interlaced or plaited vertically and horizontally with New Zealand flax (*phormium tenax*). This structure, beyond a doubt, possesses many advantages where drift is not of too loose a nature, and under which condition, I consider that such a system of timbering would resist lateral compression, and the flax prevent detached stuff from falling upon the miners when at work. From the fact of the shaft having been satisfactorily bottomed, there can be no doubt of this new introduction coming into general use; and taking into consideration the extensive areas suitable to such method of sinking, together with the large supply of flax and small timber obtainable from the islands and banks of the Upper Clutha, this inexpensive mode of sinking will be a great advantage to mining generally in that neighbourhood.

Mr. Coates' Report on Mining operations in Dunstan District.

“In the auriferous localities at the south side of the Kawarau River, comprising the valley of the Bannockburn, Smith's, Adam's, and Pipeclay Gullies, mining operations consist principally of sluicing, for which purpose the streams of those several gullies and lateral branches have been diverted, and subdivided sufficiently to give employment to a large number of miners.

Bannockburn, Smith's, and other gullies.

“The late extension of the Dunstan gold-field has included in its auriferous localities a large extent of sluicing-ground upon the slopes and terraces on the east side of the Clutha, and extending from one to six miles above the junction of the Kawarau with that river.

Extension of Dunstan Gold Field.

“Besides the shaft in the vicinity of the township of Cromwell (Kawarau), which I have already mentioned, another has been sunk immediately under the slope of the Surface Hill, situated at the base of the Double-rock range. Having visited this shaft on the 23rd instant, I ascertained that a depth of one hundred and forty-three feet had been reached without water having been struck, and as yet no indication of bottom is perceptible in the drift which is being raised.

Shaft at Surface Hill.

“Notwithstanding that mining operations generally have received a severe check from the unsatisfactory state of the rivers for the past three months, it is universally admitted that the necessity resulting from it has been the prime cause of prospectors surmounting the difficulties and privations arising from the physical features of the most rugged portions of the country to the west of the Clutha, thereby adding considerably to the previously known auriferous ground in that direction. Between the Nevis and the Clutha rivers, the vast extent of rude and elevated country, known as the Carrick ranges, has received a good prospecting, from which it has been ascertained that many spurs and saddles of, as well as a considerable number of gullies in this area of mountains, are auriferous; and it is the opinion of those who have been compelled by the severity of the weather to abandon those localities, that upon the return of mild weather a large population will be attracted thither. Nor is it less reasonable to consider, that an equally bright future may be predicted for other elevated portions of the district, the Dunstan ranges, between this township and the northern boundary of the Dunstan gold-field, having, under the most difficult circumstances, contributed considerably to the gold obtained on this field, during the months of March and April.”

Country between the Nevis and Clutha proved to be auriferous.

74. Mr. Warden Keddell estimates the population of the Dunstan and Manuherikia districts at 4,400 souls, of whom 3,200 are miners. In a recent Report, that officer writes thus:—

“The principal attention of those miners who appear to have settled down permanently in the district, seems to be directed to sluicing workings. All the available streams have been diverted, and are now in use; and when the large tract of country payable under such a system of working is considered, there can be no doubt that for a very long time to come, hundreds of miners will find remunerative employment, independently of new discoveries.”

Sluice Workings.