

At Bullendale, near Skipper's, in the Shotover Valley, the Achilles Mine is about 2,300ft. above sea-level. The main lode has a bearing of east by north and an underlie to the northward, and a branch of it is known as the South lode. The north and middle lodes come together eastward, and the north and main lodes are approaching one another in underlie, and are likely to come together at depth. The main shaft is 150ft. deep, and an incline thence follows the main lode down for 97ft. at an angle of 39°. The gold occurs in shoots, which dip or pitch westward, and the main lode at its full size is 8ft. thick. Between the north and main lodes, where they approach one another, the manager, Mr. Evans, informed me that gold occurs in the intervening country rock, occasionally in sufficient quantity to make the stuff worth crushing.

The Gallant Tipperary or Nugget Mine is about two miles up the Shotover from Skipper's. The reef strikes west-north-west and underlies south-south-west. The shoot of auriferous stone, as worked from the lowest tunnel upwards, is 300ft. long, and pitches east-south-easterly towards the river. Its thickness in the upper workings has been as much as 30ft., and the average yield about $\frac{1}{2}$ oz. per ton. Some hitherto-neglected stone is now being stoped out, and is stated to be yielding 12dw. per ton; and another shoot, worked above, is expected to be met at 150ft. further in the tunnel. The shoots would be accessible at nearly 400ft. lower level by driving a tunnel from near the river, where the large and well-defined track of the lode can be seen crossing the bed and passing into the opposite bank.

It will be observed from the foregoing notes that auriferous quartz has been proved to occur in the metamorphic rocks of Otago at all elevations from 5,000ft. down to 1,100ft., and probably less, above sea-level—or a range in vertical height of nearly 4,000ft. Throughout the whole investigation I saw no instance of a reef having one or two well-defined walls absolutely disappearing, and, though doubtless the blocks or shoots of auriferous quartz may occur at wide and irregular intervals, I saw no evidences tending to preclude the hope that other shoots may be found by means of deeper sinking and further driving along the proved tracks of the lodes, while in so great an area and so difficult of access, off the regular roads, it is likely that many other reefs remain to be discovered by means of close and careful prospecting.

GENERAL SUMMARY.

The foregoing brief descriptions have, I believe, been sufficient to show the data on which my recommendations are based, and I conceive that these recommendations fulfil the actual objects of my inspection.

As regards the future of deep quartz-mining in New Zealand, I must confess to feeling less confident than I would were the rocks more similar to those wherein quartz reefs have so successfully been worked to great depths in Australia, but at the same time the evidences are such as to warrant me in the recommendations with respect to the fields where at present a feeling of uncertainty exists as to the probability of success in deeper explorations.

These recommendations, briefly summarised, are as follows:—

1. Thames Goldfield: (a) Boring in the vicinity of the Queen of Beauty shaft, and deep sinking should that boring show that rocks of favourable character continue downward; (b) extension of the Moanataiari tunnel; (c) prospecting ground beneath Post-tertiary deposits between Karaka and Hape Creeks.

2. Reefton Goldfield: (a) Deeper exploration and cross-cutting at the Keep It Dark Mine; (b) extension of the Low Level Tunnel; (c) deeper exploration at Welcome Mine at Boatman's Creek; (d) extension of Golden Lead low-level tunnel near Merrijigs.

3. Otago Goldfields: General, deeper, and longitudinal exploration on all the proved reefs. No particular one can be said to demand more special attention than others.

In many of the mines visited there is sufficient visible inducement to further working, and operations in that direction are in progress, but throughout all of them the following-up of "tracks" of reefs in search of other shoots than those already known is very advisable.

There is one more subject on which a few remarks may be permissible, and that is the recklessness as to the future which seems to have prevailed during the dividend-paying times of the various mines. All the inquiries made by me failed to elicit information as to a single instance where, during a prosperous period, there was a reserve fund established for future dead-work, or where such dead-work was steadily kept in progress during the working of rich blocks of stone. It would appear that in a large proportion of the mines the good quartz was stoped out from level to level, all the available proceeds beyond current expenses being divided, and nothing kept in hand for any future works of an extensive or costly character. This system, or want of system, has been in past times, and I fear often still is, followed in the Australian quartz-mines; and the sooner that mining directors and managers appreciate its ill effects the better. Assuming a mine to be dividend-paying, a moderate percentage deducted from the divisible profits would be missed by no one, and if placed to a reserve fund for future exploration, or directed immediately to dead-work, would tend to maintain confidence, and to prevent the subsequent tooth-drawing process of extracting calls from shareholders during periods of depression.

In conclusion, I beg to express my thanks to yourself, to the officers of your department with whom I have been associated, and to the mine-managers on the various fields, for the unvarying courtesy and consideration shown me during my investigations.

I have, &c.,

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Hon. A. J. Cadman, Minister of Mines, Wellington.

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