

80°–85° to the east. The usual thickness appears to be 3 ft. to 5 ft., but in places it widens to 14 ft. or more, and at the north end of the various levels is small. At the north end of No. 2 level the ground is disturbed, and at the present south end there is a considerable fault.

The lode has been opened up for a length of perhaps 800 ft. at No. 2 level, the mouth of which is, roughly, 440 ft. or 450 ft. above sea-level. Payable ore is reported to occur for almost the whole of this length. A winze sunk from No. 2 level to a depth of 101 ft. is also stated to carry payable though not rich ore. The quartz in places is much stained by black oxides of manganese; some is almost pure-white, some cream-coloured or brownish. Much of the quartz shows wavy bands of varying colour; some is fibrous-looking, some flinty. Every variety has its counterpart at Waihi, and, in short, the quartz so greatly resembles the oxidized ore of the Martha Hill at Waihi that hand-specimens from the two localities cannot be distinguished.

At the No. 1 or uppermost level a small but rich branch lode has been developed to some extent. A 6 in. vein was intersected in the main adit (No. 2 level) about half-way between the mouth and Muir's lode.

About 800 ft. west of Muir's lode is the nearly parallel Te Puke or Fleming's lode, a massive body of quartz which outcrops prominently on the crest of Fleming's Hill, and has therefore been well known for many years. It dips eastward, rather less steeply than Muir's lode, and will probably join it in depth. Fleming's lode is from 10 ft. to 60 ft. thick, and the quartz, like that of Muir's lode, is of exactly the same appearance as that of the Martha lode at Waihi. Many years ago several prospecting-adits were driven from the hillside into Fleming's lode, but the existence of payable ore in any quantity was not proved. In later years Mr. George Muir drove a crosscut through the lode not far below its outcrop, and also drove along the footwall for about 200 ft. The quartz from this footwall drive was in part payable.* Somewhere about the middle of Fleming's lode there is another band of quartz that is reported to be payable.

The further exploration of Fleming's lode is well worth while. There is a fair probability that one or more shoots of payable vein-matter will be found, and there is a possibility of both large and rich ore-bodies being found at some little depth.

Nearly a quarter of a mile south-south-west of the top of Fleming's Hill is an outcrop of bluish-coloured pyritic quartz. This is known as the "blue reef." It is probably a continuation of Fleming's lode, but does not look promising. A few chains farther south-south-westward a massive outcrop of quartz or silicified rock appears on the west side of a small rill draining to the Raparapahoe Stream. This is not known to contain more than traces of gold and silver.

5. THE PROGRESS MINES OF NEW ZEALAND.

(By J. HENDERSON.)

According to instructions I recently visited Reefton and examined the plans and claim of the Progress Mines. Owing to no work having been done in the mine for some months, water had accumulated in the lowest level and foul air in all, so that I was unable to examine the mine-workings. I had, however, visited the mine on several occasions between 1902 and 1914, and have personal knowledge of most of the excavations opened up to the latter date. The amount of exploratory work undertaken since 1914 has been comparatively small, so that the geological sections prepared by the mine staff, together with the statements of Mr. R. Stewart, mine-manager, have enabled me to form an idea of the country and structures exposed in such excavations as I have not seen. This work occupied me from the 1st to the 13th September, 1921, inclusive. It has not, in any essential, altered the opinion formed fifteen or sixteen years ago, that the lode had been cut off in depth by a north-north-west-striking fault, west of which, and at a higher level than the deepest workings, its continuation must lie.

The leases worked by the Progress Mines Company are some four miles south-south-east of Reefton, and occupy part of an extensive plateau now deeply dissected by drainage-channels. In the neighbourhood of the mine the general level of the plateau is from 1,650 ft. to 1,800 ft. above the sea, although the hills near-by rise to over 2,000 ft. The leased area is drained for the most part by Devil Creek and its branches, Oriental, Progress, Union, and Fossicker creeks, which flow in narrow steep-sided valleys up to 600 ft. deep. The present company has held this ground for about twenty-five years, in which period £326,562 has been paid in dividends. A further sum of £68,780 had already been distributed by companies that, prior to 1896, held parts of the same area. In all, over a million tons of ore have been extracted from the claims, all from the Progress lode, and this ore has yielded over £2,000,000 in gold.

On the surface the Progress lode, which outcrops along the south side of Oriental Creek, has a general east-and-west trend, except at its eastern end, where the strike is nearly east-south-east. Its dip is southward at about 60°. In depth, however, the length of lode having a south-easterly course increases at the same time as that striking east decreases. Thus in No. 8 level, about 1,000 ft. below the surface, the general strike is south-east and the dip south-west. The lode, which occupies a fissure in the rocks, consists of a number of separate shoots of gold-bearing quartz; the intervening portions of the fissure are filled with crushed country traversed by small quartz veins. Where the lode strikes east the shoots extend directly down the dip. Where the shoots enter a part of the fissure striking south-east, in addition to their dip, they have a southerly pitch. Thus, in spite of a change in course of the fissure, the shoots in plan have a nearly north and-south extension. Although decidedly irregular, the shoots, in a general way, like the shoots of the other mines of the Reefton goldfield, maintain their size and gold-content to the greatest depths reached by mining in this district.

* See Mines Statement, C.-2, p. 18, 1918.