

of both excellent and medium copper-ore and iron-pyrites. The largest block *in situ* of sulphide ore of good quality was 12 in. by 4 in., walled in by 12 in. of iron-pyrites on the one side and the country-rock on the other. In this way there occur several small patches of medium and good ore throughout the deposit. Where the reef is 5 ft. wide the iron-pyrites preponderate greatly, and the copper-ore is poor, the whole being interspersed with country-rock, both with and without copper. While the reef is small the walls are regular and well defined, but on gaining the larger dimensions they become very uncertain, more especially the foot-wall, and the lode gradually passes into the ordinary country-rock.

The associated red rocks continue on the strike noted, both to the northward and southward; but the copper-deposits do not extend in either direction outside a distance of 200 ft. But at right angles to its strike copper shows outside the reef (proper), and occurs in the reddish-black rocks, and as a surface stain in the form of a silicate of copper. Where the reef is largest this country-rock, impregnated with copper, is seen to be a mixture of sulphides of copper- and iron-ores, yellow copper-ore, and iron-pyrites, mixed indiscriminately. Including everything, at this point the deposit is fully 20 ft. in width; but the dimensions gradually get less and less as it is followed to lower levels, where also the cupiferous country-rock separates itself from the true reef, when that body gets to its narrowed limits of 18 in. between the two walls. At a still lower level this impregnated country ceases on the hanging-wall, and is so reduced on the foot-wall that, with reef included, it is about 10 ft. in width. Below this the reef proper disappears, and, as observed in the trench and on the opposite side of the creek, its continuation is seen to be the mineralised pug-vein of about 14 in. The walls of this pug-vein are without copper in any form, and consist of green rocks on the hanging-wall and stratified red rocks on the foot-wall. The green silicate of copper occurs throughout in greater or lesser quantities, but it is most abundant about the centre of the reef.

Regarding the deposits as from 20 ft. to 15 in. in width, it is seen to be bounded by greenish sandstones, interspersed with a few patches of red rocks on the east. The green rocks are full of quartz, but with no regular reefs, or even lengthy stringers, the patches of quartz having linearity in all directions. The strike of the beds is  $45^\circ$  west of north, and the dip  $40^\circ$  to the eastward. The bedding is thin—from 2 in. to 4 in.—well defined, though somewhat contorted. On the west the lode, together with the country-rock permeated with copper, is bounded by well-stratified red rocks, having a strike of  $40^\circ$  west of north, and a dip of  $45^\circ$  to the eastward. The thickness between the bedding is about 4 in., and much twisted. The colour is lighter than the same rocks nearer the lode, and the texture is finer. These beds follow the copper-deposits for their whole length, and from the creek-level continue up the sides of the spur to the top, passing over into the small gully adjoining, and thence on to the main ridge. To the south they cross a high spur, and into the several creek-valleys of the right-hand branch of the Makaretu which lie in that direction. These rocks can in all cases be distinguished from the overlying beds affected by copper, on account of the absence of stratification in the former and darker colour of the latter. The greenish sandstones occupying the east side of the lode are overlain with soft shales and sandstones at a distance of about 200 yards from the outcrop. Their strike is  $20^\circ$  west of north, and they dip to the eastward at  $40^\circ$ .

To the west of the copper reef, and underlying the stratified red rocks, is a body of the ordinary coarse sandstone of the Ruahine Range, interstratified in places with shales. The strike coincides with that of the lode and other rocks in their general direction, being  $45^\circ$  west of north, while the dip is to the eastward, at an angle of  $40^\circ$ . These sandstones extend west until within 300 ft. of the ridge, where they are seen to overlie another rib of red rocks belonging to the mineral belt, which continue to the top and cap the ridge without descending into the gully on the west. The strike is about  $40^\circ$  west of north, while the dip is not so well seen, but is about  $40^\circ$ , and to the eastward. This belt is approximately parallel to the rib in the gully below, but on following the ridge to the southward this upper rib gradually approaches the lower one and forms a junction with it as it rises out of the gullies to top the ridge.

In the underlying belt of red rocks some prospecting has been done, and a tunnel 14 ft. in length has been driven, and also some trenching, but so far without results. No sign of copper-deposits was to be seen. These beds are peculiar, and distinguishable from the rib carrying the lode, from the fact of the great quantity of thin black veins forming a casing to the red rocks, the result of pressure and slickensiding. The rocks of the parallel rib also possess this peculiarity, but to a much lesser extent.

The various creeks and the ridges were traversed with the object of tracing the continuity of the copper-deposits. Five creeks in all were examined, and, although in each case red rocks occurred in profusion, nothing of the reef, either as a solid ore-body or as a pug-vein, was to be found. The spur, on the north side of which the copper is located, rises on the strike of the lode 300 ft. above the lowest workings, and, although the belt of red rocks passes up and over this spur into the creek-valley beyond, nothing of the lode could be seen. It crosses this small gully, rises on to the main ridge, and passes over into the watershed of the left branch of the Makaretu River, where, however, it disappears without reaching the bottom of the gully.

To the northward the creeks are full of the rocks of the mineral belt, both as *débris* and in the solid. The gullies were examined in this direction for copper-ore, but without results. By following the ridge around the belt could be seen to strike in the direction of the Tukipo River. The loose stones and blocks of the underlying rib situated on the ridge disappear as the upper valley of the source of the Tukipo is neared. Exposures of rock could be seen corresponding to the rib overlying that carrying the lode, in the extreme north branch of the Makaretu, on the spur dividing it from the Tukipo. The valley towards the source of this has no red rocks, the strike of the easterly belt carrying it more towards the plains, while the westerly rib disappears before the Tukipo is reached. As red rocks are reported to be very plentiful in the Tukipo River where it