

In 1899 J. Malcolm Maclaren prepared a paper, which was printed with the Mines Report for 1900. This deals with the "Geology of the Coromandel Goldfields," and consequently with the area and the rocks here considered. Maclaren traced the soda felsites of Tokatea Hill, called by him ceratophyres,\* into the valley of Paul's Creek, north-west of Tokatea Hill, and describes the same rocks associated with a dyke-like mass of quartz porphyry on the east side of Tokatea Hill and Saddle, and thence similar rocks south along the west slope of the main range to the Golden Belt reef at the Tiki. With the exception of the belt of rock called quartz porphyry, Maclaren, in his section of it, does not show the existence of any dykes in Tokatea Hill, yet he was aware of the existence of that occurring in the No. 7 level of the Tokatea Mine, and which is intersected vertically under the higher part of Tokatea Hill, 1,000 ft. from the surface. Like others, he seems to regard the numerous outcrops of grey porphyritic rock on the east slope of the hill as belonging to the Tertiary volcanic rocks of the Kapanga group to the north, or of the Thames-Tokatea group as developed on the higher part of the Success Range to the south of Tokatea Saddle.

*Rocks of the Carboniferous Formation, Tiki-Tokatea.*—The lowest rocks, as well as those forming the upper part of the formation, are sandstones, occurring as grey, gritty, hard rocks, with dark, crumbling shales and mudstones interbedded. Nowhere within the area dealt with in this paper are the lower or higher rocks so exhibited as to be studied with advantage, and they are hardly, if at all, exposed at the surface on Tokatea Hill. In this northern part they are best seen in a small creek that lies north-east of the upper township. The rocks are thin-bedded and nearly in a horizontal position. On the road to the Success Mine similar rocks dip to the east, and on the spurs wither to a pale-yellow or buff colour. The same rocks are seen in Tiki Creek, near Frasers' Mill, where they overlie and underlie soda felsites, and form first an anticline and then a syncline as the creek is followed towards its source.

In the No. 7 level of the Tokatea Mine, which was driven west from the lower east slope of the hill, the Main Tokatea reef was cut at 2,000 ft. from the entrance, and the dark slaty beds dipping west were not reached till within some 200–300 ft. of the Big Reef. The tunnel at first, for a considerable distance, passed through what was thought to be ordinary volcanic rock, and then entered the light-grey felsitic rocks, which continued till reaching the slates forming the foot-wall of the Big Reef. It is very remarkable that apparently but one dyke was met with after entering the felsite rocks. This occurred at 1,600 ft. from the entrance to the tunnel, and is a light-grey coarsely porphyritic rock, which may be regarded as an andesite or a dacite. The crystalline rock at the entrance to the tunnel is in part the equivalent of a dark porphyritic rock that is seen in the road-cuttings to underlie the thick rib of rock described by Maclaren as a dyke of quartz porphyry. While thus at most but two dykes have been detected in the low level of the Tokatea Mine, there seem to be numerous dykes on the surface of the east slope of the hill. These are different rocks to those forming the Kapanga or Thames-Tokatea groups to the north and the south, and correspond in character to the numerous dykes met with in Cadman's and Tiki Creeks, further to the south. In the line of the low level, No. 7 tunnel, of the Tokatea Mine the Big Reef was cut 400 ft. west of the crest of the range, and about one-third of a mile to the east of it the quartz-porphyry dyke of Maclaren runs north and south parallel to the Big Reef. Between the quartz porphyry (called by me a rhyolite) and the Big Reef, with the exception mentioned, there seem to be no true slate or slaty shales, and some 1,200 ft. of the distance seems to be occupied by the soda felsites, which rise to the surface on Tokatea Saddle and nearly to the highest point of Tokatea Hill. On both sides of Tokatea Saddle the felsites are much crushed, and form breccia-beds associated with beds of greywacke, and these, with dykes or flows of more porphyritic rocks, constitute the country that carries the productive lodes and reefs of the Tokatea Goldfields.

As the productive part of the field east and west is contained between the Big Reef and the belt of rhyolite, denominated quartz porphyry by Maclaren, so also to the north it does not extend much beyond half a mile from the Tokatea Saddle, and in that direction also is bounded by a strong rib of rhyolite which, from the Kennedy's Bay Road, half a mile above the Royal Oak compressor, strikes west, or nearly at right angles to the north and south rib of rhyolite. On the Upper Waikoromiko Road the north and south rib of rhyolite slightly alters its direction, and passes under the Thames-Tokatea rocks of the higher part of the Success Range, south of which for a time no gold is found, and this is on both sides of the range the limit of the field to the south. North and south the field does not exceed one mile in length, and in an east and west direction it is less than half a mile. The north and south band of rhyolite presents various macroscopic characters in different parts of the line along which it is seen at the surface. Towards the north it is a white earthy-looking rock, with minute cavities such as effect the felsite tuffs of Rocky Point, near the Thames. At the waterfall in the tributary of the Waikoromiko, by which the road from Kennedy's Bay reaches Tokatea Saddle, it is still a light-grey rock, but is without the vesicles; and on the south side of the creek exhibits a columnar structure. Further south, on the higher part of the ridge continued from the waterfall to the Upper Waikoromiko Road, it exhibits flow structure on a gigantic scale. Again, further south it becomes a white, earthy, seemingly structureless rock, harder than in the extreme north of the line of outcrop, and here containing in places an abundance of minute bipyramids of quartz. Where it is lost sight of on the Upper Waikoromiko Road it again shows as a soft earthy rock. The under-surface of the outcrop dips to the west at an angle of 50°, and, so far as can be ascertained, it forms the underlying rock to the soda felsites, and is itself underlain by a less acid, dark, hornblende rock, the slates not being seen for some considerable distance either to the east or to the north.

\* Further analysis has not confirmed Maclaren's determination of soda felsite, and it is doubtful if the term should apply.