

water required by the surrounding district. In that year the height of its surface above sea-level (presumably mean high water) varied from 11 ft. to 14 ft., but in the early part of 1915, following the unusually dry season of 1914, its level was lowered to about  $2\frac{1}{2}$  ft. above sea-level. Since then, owing to a series of wet seasons and restrictions on the consumption of water, its level has slightly risen, and in September last was about 5 ft. above the sea-level.

The loss by evaporation has not been determined by observation and experiment, but probably amounts to over 80 per cent. of the rainfall, which on the average is 42.98 in. per annum. It follows that Lake Takapuna receives a large amount of water from sources outside its drainage basin. There is little reason to suppose that lowering the level of the lake will materially add to the amount of water entering by springs, though the increase of head thus caused may have a slight effect. Clearly, therefore, another source of water-supply will have to be sought by the Takapuna, Devonport, and other boroughs on the north side of Waitemata Harbour.

The question has been raised as to whether, in the case of the surface of Lake Takapuna being lowered below sea-level, there is any danger of an irruption of sea-water through the narrow belt of porous basaltic tuff that separates the lake from the sea. If the tuffs extend below sea-level, this will happen when the level of the lake is lowered to half-tide mark or thereabouts. If, on the other hand, the Waitemata claystones which underlie the tuff have their upper surface everywhere around the lake above sea-level, the lake is in a watertight basin, and its level can safely be lowered many feet. Mr. J. A. Bartrum, Lecturer on Geology to Auckland University College, holds the opinion that this is the case, and after I had been shown outcrops of the Waitemata beds on the seaward side of Takapuna and elsewhere, and had heard Mr. Bartrum's explanation of the finer points of the local geology, I was able to accept his view as probably the correct one. Since it will be some years before additional water can be brought to the North Shore boroughs from Rangitopuni Stream or elsewhere, it is to be hoped that this view will stand the test of time.

#### [5. UNDERGROUND WATER, TAHUNANUI, NELSON. (Summary of Report by J. HENDERSON.)

On the 22nd January last a visit was made to Tahunanui, near the Town of Nelson, in order to advise the Tahunanui Town District Council on the possibility of obtaining a supply of water by boring. Numerous wells sunk from 12 ft. to 20 ft. on the flats at Tahunanui reach the water-table, and are said to yield a constant, though small, supply of water, which, however, is not of first-class quality. Favourable conditions for artesian water are probably present in some part of the Tahunanui flats. The beds most likely to yield large amounts of good water are the gravels of the ancient buried valleys of the various streams that issue from the hills, and which once, when the land as a whole stood higher, flowed at a relatively lower level. O'Brien Creek probably has such an ancient valley or channel, which continues across the flats in a general north-westerly direction. A bore near the abattoirs should reach the nearly impervious bed-rock at a shallow depth. Farther north-west the depth to bed-rock will increase, and the position of the floor of the buried valley will be more uncertain. On the other hand, the quantity of water to be obtained from a deeper bore will probably be larger.

#### 6. ROLLING RIVER LODS. (Summary of Report by J. HENDERSON.)

The area being prospected by the Colossus Gold-mining Development Company was visited between the 17th and the 21st January last. Since it is included in the Motueka Subdivision, now being geologically surveyed in detail, and will be described in the report which will be written after the completion of that survey, the description now given will be brief.

A series of steeply dipping lodes striking in a general north-west direction crosses the northern end of the long precipitous spur or ridge between Blue and Nuggety creeks, headwater branches of the Rolling River, a tributary of the Wangapeka. Several lodes of another series, striking nearly north, outcrop in the valley of Connor Creek, a stream entering Rolling River from the east about 60 chains north from the junction of Blue and Nuggety creeks. The rocks traversed by the lodes are subchistose greywacke and argillite, quartzite, marble, and schist of Palæozoic age.

The lodes consist chiefly of quartz, and at a little depth from the surface contain grains, nests, streaks, and pockets of sulphides of iron, lead, zinc, and copper. In places some arsenic occurs. Gold and silver are present in varying amount, and appear to be associated with the sulphides. A large amount of alluvial gold has been obtained from the gravels of Rolling River and its tributaries.

The quartz veins traversing the spur between Blue and Nuggety creeks were probably first prospected late in 1869, when lodes known as Culliford's and Doran's were discovered. Later, serious mining was undertaken, a battery was built, and crushing began; but the gold-yield was small, and operations ceased. In 1888, outcrops about 20 chains south-east of Culliford's adit were unsuccessfully prospected. Again about ten years ago Mr. Van Bell, and after him the Colossus Gold-mining Development Company, prospected the lodes near Connor Creek, but nothing of value was found. Later, the Colossus Company prospected the Surprise, O'Malley, Raymond, McCarthy, and other lodes near Blue and Nuggety creeks. Of these the Surprise lode is the most promising, and has been explored by means of three adits for a length of about 350 ft. in plan. In the highest adit the lode is seen for about 50 ft. only. In the middle adit, 80 ft. below No. 1, and 250 ft. long, it is, on the average, between 2 ft. and  $2\frac{1}{2}$  ft. wide. In No. 3 adit, 40 ft. below No. 2, the lode has been followed for 90 ft.: here it is from 6 in. to 2 ft. or more in width.

Six samples were taken from the "back" or roof of No. 2 adit, and assayed at the Dominion Laboratory. The gold in these varied from nil to 2 dwt. 12 gr. per ton, with an average of  $22\frac{1}{2}$  gr., and the silver from 4 dwt. 2 gr. to 4 oz. 18 dwt. 7 gr., with an average of 1 oz. 5 dwt. 8 gr.

The samples were also tested for lead, zinc, and copper, and the average percentages were—Lead, 0.34; zinc, 0.19; copper, 0.05.

According to assays made at the instance of the company, the O'Malley lode contains a shoot of auriferous quartz about 15 ft. long, which was followed upward by a rise for 25 ft., and downward by a winze 20 ft. deep or more. The shoot is so short, and the width of the lode (12 in. to 15 in.) so small, that it cannot be worked at a profit.