

"From the results of these assays it will be seen how small an amount of the precious metals are present in the lead-ores. In no instance have I obtained in picked samples of galena more than 9oz. silver or $\frac{1}{2}$ oz. gold to the ton. The assays of the Waiorongomai sample are interesting, as they were both from one piece of ore. The sample of galena picked free from stone gave at the rate of 9dwt. 19gr. gold per ton, while the sample to which quartz was attached yielded the precious metal at the rate of 2oz. 5dwt. 17gr. per ton. This result is not surprising, as I have also examined samples taken from the Lucky Hit claim at Waiorongomai, where two veins of galena enclose a vein of quartz in which gold is plainly visible, making very pretty specimens; yet the galena itself is very poor in gold. The same circumstances apply to the Manukau sample, which, though in the vicinity of rich gold-bearing leaders, is very poor in silver, and contains no gold.

"*Zinc*.—I have already alluded to this metal as accompanying many of the galenas. It also occurs in the Tararu District in the shape of blende in the absence of lead; but only in small quantities in a few of the lodes. It is rather significant that in the presence of these baser metals the richer ones seem to disappear. I have already alluded to the absence of gold in the Manukau galena, though in the immediate vicinity of rich gold-deposits. The same peculiarity occurred in the Little Agnes claim at Tararu, where rich gold was found in the upper workings; but when the galena and blende came in the precious metals were apparently cut off; and, though the gold in the Lucky Hit claim occurred so closely adjacent to the galena, yet it was entirely distinct from it, and only accompanied it a short distance.

"*Antimony*.—In all parts of the peninsula we have this metal present in the form of stibnite. At times beautiful branching crystals are found in the vughs of the lodes: especially is this the case in the Tararu and Karaka districts. When so situated these crystals are not auriferous, but frequently have beautiful attachments of gold either interlaced through the needles of stibnite or studding the facets. In only one place am I aware of the massive variety of stibnite being found, and that was in the Hape Creek. In this instance the precious metals were absent, and the vein from 3in. to 6in. in width. In combination with silver I have already dealt with this metal.

"*Arsenic*.—This metal has been found in large quantities in the native state at Coromandel, in the Kapanga and Bismarck Mines. It is obtained in the vughs in the lodes in a reniform shape and foliated character. In almost every instance these masses contain gold, very often visible. The following assay shows the value of some obtained in the Kapanga Mine: Arsenic, containing—gold, 135oz. per ton; silver, 97oz. per ton. In the form of mispickel or arsenical pyrites we are best acquainted with it throughout the whole of the districts. Particularly is this the case at Coromandel, although the Moanataiari and Karaka also produce it in most of their lodes.

"*Mercury*, in the form of cinnabar, is occasionally met with in various parts of the field. From the Crown Princess Mine, at Grahamstown, I obtained several specimens, and from the Hape Creek some water-worn stones showing the presence of cinnabar. I have also received some from Te Aroha, Owharoa, and Coromandel, but in no instance is it present in large or defined quantities.

"*Platinum*.—The presence of this metal in the lodes is a matter of great interest, and, though of no practical value at present on account of its sparsity and the difficulty of recovery, still, it may occur in larger quantities, and prove of intrinsic value. To the present I have obtained it only in two places—the first in the Queen of Beauty Mine, where I met with it varying from $1\frac{1}{2}$ oz. to 10oz. per ton (Trans. N.Z. Inst., Vol. XV., p. 420), and again in a massive pyrites at Coromandel, where it assayed 16dwt. 8gr. per ton.

"*Manganese*.—This I have found at Karangahake, occurring under very peculiar circumstances in the form of wad in spherical nodules in hyalite. No seam or vein connecting them, they form very conspicuous objects in the white soft silica. When the City of Dunedin Reef, at Tararu, was being worked some years since it was well known as the Black Reef, owing this distinction to the presence of peroxide of manganese. At Cabbage Bay there is a large deposit of manganite having quartz-crystals interspersed throughout, and the same form is mentioned by Mr. Skey as occurring in small quantities at Tararu.

"*Nickel*.—I have found this metal in small quantities as a silicate in a foliated serpentine at Coromandel.

"*Iron*.—The presence of this metal in combination with sulphur is very general throughout the peninsula. In a few instances it occurs in a massive form, though not to a large extent. Again, it is occasionally found in a radiated form as marcasite, but generally throughout the reefs and the enclosing tufaceous rocks it occurs in small, well-formed, isolated crystals. To a slight extent it is also present as magnetite, which is obtainable in any of the streams through the disintegration of the rocks. In the form of hæmatite it is also found in several parts of the field, but not, so far as I am aware, in extensive deposits. In this state it has been used to a limited extent in the manufacture of hæmatite paint.

"*Carbon*.—In the form of graphite several small deposits occur at Coromandel, but they are all too small and impure to be of any practical value. It occurs also as a hydrous brown coal in several places at Cabbage Bay, where there is a large deposit, interspersed with bituminous shale in alternating narrow seams, thus making it valueless for commercial purposes. Again, in the Mata Creek, at a long distance back, there is another outcrop of coal, more compact and less charged with earthy impurities. Again, at the head of the Kauaeranga River, to the west of Table Mountain, is a larger deposit of the same class of coal outcropping in several of the creeks. At Paeroa is a still larger deposit of the same character, upon which a good deal of work has been done, proving it to extend over a considerable area. In this locality there are two seams overlying the main one, which has a thickness of about 4ft. Analyses which I have made of the coal I append:—