of the deposits and surrounding area as could be made at the season of the year, snow having already begun to fall in the district.

The deposits were discovered during the building of the Temiscaming & Northern Ontario, the government railway, which is now under construction from North Bay junction, on the Canadian Pacific, to the head of Lake Temiscaming. The road-bed of this new railway runs almost over the top of the first of the deposits discovered. The ore bodies lie five miles south of Haileybury, one of the two sister villages on the Ontario side of the northern part of Lake Temiscaming. Haileybury, following the railway, lies about 106 miles north of North Bay station, which is, by the Grand Trunk Railway, 227 miles north of the City of Toronto.

As the deposits were discovered quite recently, and the surface is now covered with snow, very little prospecting has been done in the surrounding area. The discoveries were made by men employed on the railway, and not by regular prospectors; hence the work has not been done as systematically as it might have been.

When I visited the locality, recently, four veins had been located in the vicinity of a small body of water known as Long Lake, which is not shown on existing maps. It lies about one-half mile south of the southern boundary of lots 8 and 9 in the first Concession of the Township of Bucke. The reports of other finds were not verified.

Each of the four veins visited was found to carry cobalt. Nickel also appears to be present in all of them; but as the weathering of the cobalt compounds masks, at times, the nickel colors, this latter metal was not definitely recognized in two of the deposits, although it doubtless occurs wherever the cobalt is found. Three of the veins are rich in native silver. The veins occur in unsurveyed territory, and, as the locations are as yet unnamed, we shall speak of them as Nos. 1, 2, 3 and 4. The outcrop of No. 2 lies about one-half mile southwest of No. 1, and No. 3 the same distance southwest of No. 2. The outcrop of the fourth vein is about one-half mile southeastward of No. 3.

Very little work has been done on any of the veins, and as the surface is pretty well covered with moss and soil, it is impossible to state what is their horizontal extent.

All of the veins cut through one or both of the formations known in the district as Huronian slate and breccia-conglomerate. The latter rock is considered to be composed of volcanic ejectamenta—grains and fragments of rock of various kinds which have become consolidated. The slate conglomerate of older Canadian writers, Logan and Murray, is a variety. The slate along the railway cuts, in the vicinity of Long Lake, contains occasionaly fragments of pink granite, which are, at times, a couple of inches or more in diameter. On the faces of some of the vertical cliffs, the well-banded slate at the bottom is found to pass gradually into massive breccia-conglomerate at the top, the fragments in the latter being of varied composition, and ranging in size from small grain-like fragments to pieces of rock a foot in diameter.

The presence of dikes or sheets of some of the darker-colored eruptives was suspected, but they were not definitely recognized. In the field they would resemble rather closely some of the more massive varieties of the slate and finer-grained breccia.

The slate and conglomerate have a slight dip, and the veins referred to cut them almost vertically. The strike of veins Nos. 1 and 3 is approximately northeast and southwest; that of 4 is east and west; that of 2, northwest and southeast, Diabase and gabbro invade these fragmental rocks in some parts of the district, and appear to underlie most of the area. About three miles to the northward of Long Lake, Silurian limestone overlies the Huronian, but the limestone is undoubtedly of younger age than the veins.

Vein No. 1 lies east of the railway track, at the edge of a swamp, about one-quarter mile north of the end of Long Lake. It has been uncovered at three points, which are within a few yards of one another. As the surface of the rock is low here, and little of it is exposed, it is difficult to tell much about the form of the deposit. Medium grained, dark-colored conglomerate is found on one wall. At the widest opening, the deposit has a width of over 6 ft., but the vein matter is more or less mixed with rock. The ore consists of niccolite, or the arsenide of nickel, and smaltite, the diarsenide of cobalt, together with much native silver. Niccolite contains, theoretically, 43.9 per cent of Nickel and 56.1 of arsenic. Smaltite carries 28.2 per cent of cobalt and 71.8 of arsenic. It may be added that the ore of nickel now worked in Ontario, the iron sulphide or pyrrhotite of Sudbury, in which nickel occurs not as an essential but as an accidental constituent, carries, on the average, less than 5 per cent of the metal. On weathered surfaces the vein matter is coated with the beautiful pink decomposition product, cobalt bloom. The green nickel stain is also seen on some surfaces, but is usually masked by that of the cobalt. This nickel compound is probably the arsenate, annabergite, but nickel silicate may also be present. The secondary mineral, arsenolite, was seen on some specimens. The native silver occurs as films, or leaves and fine threads, or moss-like forms, through the nickel and cobalt minerals, especially in the niccolite, as well as in cracks in the rock and in the calcite veinstone. In weathered portions of the ore the silver shows distinctly. Some lumps of weathered ore, weighing from 10 to 50 lb., carry a high percentage of silver. One sheet composed chiefly of silver, attached to a rock surface, had a thickness of nearly 0.375 in. and a diameter of about 1 ft. Professor Wm. Nicol has recognized the antimonial silver, dyscrasite, as was suspected in the field, in association with the native silver. He has also proved the presence of chloanthite, $Ni\,As_2$. It is associated with the niccolite, and also occurs, pretty free from cobalt, in some of the nodular masses in the calcite. The silver appears to have crystalized earlier than the niccolite, which has been deposited around it. The cobalt arsenide has formed still later than the niccolite.

Little laboratory work has yet been done on the specimens collected. Analyses of the ore, unless of samples representing a large quantity, are of little economic value, although they are of scientific interest. A sample showing native silver was found by Mr. A. G. Burrows to possess the following percentage composition: silver 26.24, value $5,237.60 per ton cobalt 8.34, nickel 5.26, arsenic 13,28. Another sample composed essentially of niccolite contained 5.02 oz. of silver to the ton, and nickel 26.64, cobalt 6.16, arsenic 45.64 per cent.

A small hand specimen of the rock, which occurs mixed with the ore and gives it the character of a brecciated vein, shows a sharp contact between the fine grained slate, ash rock, and a medium grained rock of similar composition.

As so little work has been done on this ore body, it is difficult to determine whether the three openings belong to one vein, or whether the ore occurs in a more irregular deposit, although the chief opening appears to be on a vein-like body. The ore is undoubtdly very rich, containing values in nickel, cobalt, silver and arsenic, and a comparatively small vein could be worked at a handsome profit.

On location No. 2 the ore-body is distinctly vein-like in form. The ore here is a mixture of smaltite, and probably some closely related arsenides of cobalt, such as safflorite, and niccolite. The only complete analysis which has yet been made of the ore from this locality was that of a sample from this vein. It was found to have the following percentage composition: Cobalt, 16.8; nickel, 7; iron, 6.3; arsenic, 69; rock matter, 0.9; total, 100. An average sample taken by the writer across the vein a one point gave the following percentages: Cobalt, 16.76; nickel, 6.24; arsenic, 66.60; sulphur, 3.37. Antimony and silver were found to be absent. This ore-body, unlike the other three