examined, carries no silver in the parts so far uncovered. Three openings have been made on the vein over a length of 300 ft. The massive ore has a width of 14 in., but vugs in the wall-rock, 2 ft. or more from the vein, are filled with cobalt bloom. The rock of both walls is slate. The walls are well defined, and the vein dips almost vertically, the strike being toward the southeast. The vein lies on the hillside, a few hundred yards east of Long lake and the railway, and, unlike ore-body No. 1, is at a height of about 70 ft. above the water level. Although the width of this vein is not great, the character of the ore is such as to make it promising, at the present prices of the metals contained in it.

The ore has a massive appearance, and a rather dark-gray color. where not coated with cobalt bloom. When examined carefully, however, in hand specimens, especially if a polished surface be examined with a magnifying glass, it is seen to be a mixture of a gray mineral, which is chiefly smaltite, and the reddish mineral, niccolite. Smaltite and the corresponding arsenide of nickel, chloanthite, are claimed by most authors to pass into one another by the substitution of cobalt for nickel, and *vice versa*. Niccolite, in the analyses quoted by Dana and others, carries only a small percentage of cobalt and iron, while smaltite and the other diarsenides of cobalt frequently contain much iron and nickel. In the ore under consideration, the cobalt and nickel appear to be, for the most part, in distinct compounds. In the analysis quoted, if we consider the 7 per cent. of nickel to exist as niccolite, and the percentages of iron and cobalt, 6.3 and 16.8, respectively, to exist as smaltite, the theoretical percentage of arsenic in the ore should be 68.47, instead of 69, as found by analysis. The percentage of niccolite by weight would be 15.94, or about one-seventh part of the whole by volume, since niccolite has a somewhat higher specific gravity than smaltite. The specimens, when examined with the magnifying glass, agree with this. The niccolite has crystallized earlier than the smaltite, which forms the ground-mass through which the niccolite grains are set.

Minute, brillant, silver-white or tin-white crystals occur sparingly, embedded in the wall-rock and in the ore. The crystals occur in cubes, and in combinations of this form with the pyritohedron, or rhombic dodecahedron, and octahedron. Prof. Nicol who has measured some of these on the goniometer has found them to be smaltite. The white or grey colored arsenides show a tendency to form globular or spheroidal masses, with a radiated structure. Some of these masses in the calcite have a diameter of over half an inch. The ore is at times somewhat porous, spaces being left between the globules, which are tarnished almost black on their surfaces. Where not coated with cobalt bloom, the weathered surface of the ore has a dark color, not unlike that of the wall-rock. On a fresh surface, the more massive ore ressembles mispickel, but is somewhat darker in color. Small grains of quartz are found sparingly in the ore. The proportion of nickel to cobalt in this case is less than that in No. 1. A more detailed study of the form and chemical composition of the minerals is being made.

A deposit carrying galena and copper pyrites lies a short distance southeast of vein No. 2. Very little of its surface is uncovered and no analyses have been made of the samples collected. Grains and small masses of copper pyrites were seen in the slate, in the railway cuts, in the vicinity of deposit No. 1.

Ore-body No. 3, so far as could be seen, is similar in character to No. 1. It lies at the southern edge of Long lake. The ore consists of native silver, smaltits and cobalt bloom, and, in all probability, niccolite also.

Vein No. 4, although having the smallest width of the four, is, in many respects, the most interesting of the group. Here a perpendicular bare cliff of rock, 60 or 70 ft. high, faces west. The vein, whose width averages not more than 8 in., cuts this face at right angles, and has an almost vertical dip. The vein is weathered away, leaving a crack in the face of the cliff 2 ft., in some places 4 or 5 ft., in depth. When I saw it first, it had not been disturbed. Thin leaves of silver up to 2 in. in diameter were lying on the ledges, and the decomposed vein matter was cemented together by the metal, like fungus in rotten wood. It was a vein such as one reads of in textbooks, but which is rarely seen, being so clearly defined and so rich in contents. It was found impossible to get a fresh sample of the ore with the prospecting-pick, the vein being so much decomposed. The weathered specimens, however, in addition to the native silver, contained cobalt bloom; and the unaltered ore will be found, in all probability, to consist of smaltite and niccolite, in addition to the silver. It may also be added that, in one part of the vein, a distinct banded structure was noticed. Across a distance of 8 in. there were 12 or 14 layers of ore lying parallel to the walls. At the bottom of the cliff the vein cuts thin, banded, dark-grey or greenish, at times almost black, slate, which has a slight dip. This slate passes gradually, so far as could be determined from the steep character of the cliff, into coarse breccia-conglomerate in the upper part. The fragments in the conglomerate consist of quartz, slate, granite and other rocks.

On some of the weathered surfaces of the native silver specimens there are small, black, spheroidal masses, with little luster. These appear to be the hydrated oxide of cobalt, heterogenite. Some of the deposits on the silver resemble asbolite. The carbonates of cobalt and nickel are also probably present. Antimony and sulphur have been detected in the ore of veins 1 and 2. Detailed analyses are required to determine the character of some of the silver-bearing minerals, which are present in small amounts. Bismuth, copper and manganese, in an association of ores such as we have in these deposits, are to be looked for.

These recently-discovered ore bodies lie about 90 miles northeast of the town of Sudbury, in the vicinity of which are situated the well-known nickel mines. The ore of the latter is of a different character from that of the Haileybury deposits, being essentially pyrrhotite and copper pyrites. The rock associated with the Sudbury deposits, which are not veins, but deposits of irregular shape, is norite, a variety of gabbro; the ore itself is claimed by most writers to be of igneous origin. It is thus seen that there is little in common between the ore-bodies of the two localities, with the exception that nickel is a characteristic metal of each. The Sudbury pyrrhotites carry a small percentage of cobalt in addition to nickel. The minerals niccolite, danaite, and other arsenical compounds, have been found in some of the Sudbury deposits, but only in small quantities.

It is of interest to note that a deposit of sulpharsenide of iron, mispickel, was discovered a few years ago near Net Lake, which lies about 25 miles to the southwestward of the Haileybury deposits. This mispickel, however, does not carry appreciable amounts of nickel, cobalt or silver.

On the Quebec side of Lake Temiscaming, about nine miles to the northeastward of the Haileybury deposits, an ore body, known as the Wright silver mine, was discovered many years ago by some of the early explorers of that region. During recent years, this deposit has been worked for its lead and silver contents. The deposit is unique in character, the wall-rock being Huronian breccia-conglomerate, the fragments in which are, at times, cemented together by argentiferous galena.

Silver-bearing galena with copper pyrites is also found on an island in Cross lake which lies southeast of Lake Temagami, and at Lady Evelyn Lake.