

of forty feet. The whole of this thickness is calcareous spar with galena, without any other matter. The appearances are the same with those presented in the adit. It would appear that the total width of the vein at the bottom of the shaft is not less than 19 feet, of which 6 feet are occupied with the argillaceous matter already mentioned, leaving 13 feet of veinstone and ore.

The walls, as seen in the shaft, are similar to those in the adit, and there can be no doubt that the intervening portion of the vein, not yet opened, must be of the same dimensions and character. The shaft indicates that the vein widens somewhat in descending into the earth, and there is no indication that its quality becomes deteriorated. From the nature of the containing rocks, it may be safely inferred that it is continuous to a greater depth than mining excavations will ever reach.

There is no appearance in the shaft or adit of any faults affecting the vein. In the former the dip of the gneiss on the north wall, was seen, in one place, to change to N. 60° E., at an angle of 45°, without affecting the vein.

In both the adit and the shaft the gangue is more coarsely crystalline toward the centre of the vein, and more banded toward the walls, and the quantity of galena appears to be greater toward the sides, especially the north side; but the whole thickness is sufficiently rich to be profitably mined.

The quantity of water in the adit and shaft is not excessive or threatening; and from the texture of the rocks and veinstone, I should not anticipate any serious difficulty from this cause.

The above openings are on vein No. 1, which is evidently the most important for immediate mining operations.

#### IV.—QUALITY OF THE VEIN.

The gangue in vein No. 1 is composed entirely of crystalline calcareous spar containing galena in crystalline grains and masses of various sizes.

Observing that the estimates of Prof. Chapman and Mr. Robb are somewhat different as to the percentage of galena in the vein, we carefully examined the heaps of ore and veinstone taken from the shaft and adit, and amounting to a quantity estimated at 1300 tons, and agreed that the galena might amount to from one-fifth to one-sixth of the weight of the whole mass of the unsorted material; so that out of the comparatively small and superficial excavations above described, at least 213 tons of galena had been obtained.

In order more correctly to estimate the value of the ore, an average sample of about 70 pounds was carefully selected, and having been broken and divided into portions, one of these was carefully washed, under my inspection, and gave 16.5 per cent of pure galena.\* I am con-

\*Dr. T. Sterry Hunt, F.R.S., of the Geological Survey of Canada, writing from Montreal, under date 9th May, 1868, says: "I have found my portion of the sample from the Frontenac Lead Vein, to contain, as near as may be, 16 per cent. of galena, which agrees closely with Dr. Dawson."