these geologists appear to have seen only the deposits at the foot of the rapids, whereas deposits of equal size and possibly of equal richness occur at the head of the rapids, one mile and a half farther up stream. These deposits occur on both banks of the river. They extend across the bed of the river at both places, and they stretch along the shore for about eleven hundred feet in each case. They reach in places fifteen to eighteen feet above the level of the river, but their full thickness cannot be estimated, as they extend below water level in almost every case. Nor could it be ascertained how far they extend inland from the banks of the river, but from the fact that the ore-belt is eleven hundred feet wide, and extends across the full width of the river, a distance of a quarter of a mile, the conclusion was reached that it will extend inland for a similar distance at least. This opinion can only be verified by boring or mining, and as many claims are staked back from the river information from drill-holes, etc., should soon be forthcoming as to the continuance of the ore inland.

In some places the ore is a soft, often botryoidal, vuggy limonite, in radiating, lumpy masses. At other places it is a dense, hard hematite, or a compact limonite. Again it passes into coarse breccia, composed of fluted, water-worn fragments of the Corniferous limestone, and rounded boulders of siderite, the whole cemented by limonite; or at other places it is a quartz conglomerate composed of small water-worn pebbles of quartz in a matrix of clay and limonite. Other phases show the ore as clay, impregnated by limonite, all stages of impregnation being found as shown by the following analyses:—

	Iron, per cent.
1. Clay of the country in general	2.46
2. Clay visibly reddened by the presence of iron oxide	6.30
3. Clay of ochreous color	11.38
4. Clay decidedly limonitic	28.25
5. Clay in appearance, but a low-grade limonite ore	33.19
6. Clay in appearance, but a good limonite ore	48.45

In the case of these clay-iron ores, the passage from one to another type is so gradual, and the clay characters are so well preserved, that there is no possible doubt of their forming one series. The deposits are of a mixed character, in some places the material being high enough in iron to constitute a good ore, but in other places the percentage of iron in the alluvial accumulations is quite low. The fact is well demonstrated by the following analyses of selected samples from the ore bodies:—

No.	Iron	S.	P.	Moisture	
1	52.45	0.14	0.08	1.16	Average of the best ore at the foot of the rapids on the north side.
2	52.10	0.11	0.14	0.94	Best ore below high water mark foot of the rapids on the north side.
3	41.68	0.15	0.12	1.7	Average ore from the foot of the rapids, south side.
4	37.35	0.16	0.13	1.56	Average of the best ore at the head of the rapids, south side.
5	36.68	0.60	0.09	1.42	Average of 850 feet of exposure at the head of the rapids, south side.

None of these would be a Bessemer ore, but some are well suited for open hearth treatment.

Regarding the origin of the ore, the writer is of opinion that it was derived from the oxidation of the Animikie siderite, found in place at the head of the rapids. This Animikie siderite is believed to exist at many places about the edge of the Paleozoic coastal plain. In reading the reports on the various rivers of this area one is impressed with the regularity with which iron-holding deposits occur about the edge of the basin, and it would appear that about the margin of the Paleozoic area, where the sediments are naturally thinnest, they are eroded in many places so as to actually expose the underlying siderite. The weathering of the siderite produced residual limonite and hematite, or supplied springs or other waters with a load of iron carbonate, to be carried to new resting-places, there to be oxidized and deposited as limonite, hematite or magnetite, the last of which was found in a few cases. Professor Van Hise, in his treatise on "Metamorphism,"* accounts for such deposits at follows:—

$4\,FeCO_3+2O+3H_2O=2\,Fe_2O_3,3H_2O$ (limonite) $+\,4CO_2$.
or $2\,FeCO_3+O=Fe_2O_3$ (hematite) $+\,2CO_2$.
or $3\,FeCO_3+O=Fe_3O_4$ (magnetite) $+\,3CO_2$.

It is possible that this Animikie siderite itself could easily become an ore. It is exceptionally high grade, as shown by the following complete analysis:—

SiO_2	Al_2O_3	FeO	Fe_2O^3	MnO	CaO
1.40	2.31	54.31	1.67	1.74	1.47
MgO	**CO_2**	**Carbon**	**S**	**H_2O**	**Sp.G.**
Trace	34.94	1.27	0.0	0.50	3.63

This analysis gives 43.27 per cent. iron, and by simply calcining the siderite over a Bunsen burner the carbon-dioxide was driven off, giving a product which analysed 63.74 per cent. iron. In many parts of Europe spathic iron ores, of much lower grade than this, are calcined; in some cases in open heaps, sometimes in continuous kilns, and sometimes in roasting furnaces, using gaseous fuels. It is possible, therefore, that with a high grade siderite, plenty of local fuel, for example lignite, or peat, or charcoal made from the birch forests of the north country, this siderite could be easily converted into a high grade ore, thereby reducing the freight rates to such a degree as would allow of the long haul necessary to bring them to the smelters. Without wishing to be too optimistic, it would appear to the writer that this is a phase of the question worthy of some consideration.

* Geo. Surv. Can.; 1875, p. 321.

COBALT ORE SHIPMENTS.

The following are the shipments of Cobalt ore, in pounds, for the week ended September 29th:—La Rose, 279,380; Cobalt Lake, 183,450; McKinley-Darragh, 120,600; Drummond, 120,000; Cobalt Townsite, 65,100; Hudson Bay, 63,000; Chambers-Ferland, 63,900; Right of Way, 61,500; Coniagas, 58,500; Nipissing, 63,980; Kerr Lake, 60,930. Beaver, 60,785; total, 1,253,125 pounds, or 626.5 tons. The total shipments since January 1st are now 38,561,578 pounds or 19,780 tons.

In 1904 the camp produced 158 tons, valued at $316,217; in 1905, 2,144 tons, valued at $1,437,196; in 1906, 5,129 tons, valued at $3,900,000; in 1907, 14,040 tons; in 1908, 25,700 tons; in 1909, 29,751 tons; in 1910, 34,041 tons.