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HISTORICAL METALLURGY NOTES

Ironworking in Upper Canada: Charles Hayes and the Marmora Works

by Rita Michael



The Marmora Ironworks was not the earliest ironworks in Ontario, but it was distinguished from other early works in a number of ways. It was established on an ambitious scale as a self-sufficient and, for the time, sophisticated community. In effect, it was an iron plantation on the scale and scope of those at Hopewell, Pa. and Saugus, Mass.⁽¹⁾ It was, besides, the only one of the few early ironworks in Upper Canada which operated almost to the end of the nineteenth century, albeit in fits and starts, and which used magnetic ores rather than bog iron ores (limonite). Furthermore, it is the only works which has produced archaeological interest over a number of years.

The ironworks is on the east bank of the Crowe River near Highway 7, on Lots 7 and 8, Concession 4, Marmora Township, Hastings County, Ontario. It is the property of the Village of Marmora, and the extant remains encompass about 2.5 acres of the original 2000 or so which made up the original grant.

The mineral riches of the Canadian Shield had been known since the days of the Jesuit missionary-explorers. A consortium headed by Alexander Henry and the Duke of Gloucester planned to exploit the copper near Sault Ste. Marie during the last part of the eighteenth century, but nothing came of the ven-

ture.⁽²⁾ This attempt may have grown out of Lord Dorchester's suggestion that private enterprise be encouraged in order that the iron ore which "abounds" in Canada might be exploited.⁽³⁾ John Graves Simcoe, the first Lieutenant Governor of Upper Canada, was also anxious to see ironworking develop. Simcoe was eager to encourage many enterprises, among which was "the development of iron mines"⁽⁴⁾ Governor Gore had been approached by John Mason for help with his ironworks in Norfolk County.⁽⁵⁾ Three Americans had applied for permission and support to erect an ironworks on the Gananoque River at the Falls to become known as Furnace Falls. They were granted 1000 acres of land in fee simple to encourage their endeavour.⁽⁶⁾ Sir Peregrine Maitland, only a few months after taking up his duties as Lieutenant Governor in 1818, intended to visit the "bed of iron ore on the Crow River."⁽⁷⁾ Maitland was to provide a good deal of support, both moral and substantive, to Charles Hayes when he came to Canada in 1820.

The first ironworking in the province seems to have taken place near Chip-pawa using local bog ores in the last years of the eighteenth century, but little is known about the operation.⁽⁸⁾ A few years later, about 1800, Sunderland, Sherwood and Jones, all Americans, set up a furnace on the Gananoque River in Landsdown Township, Leeds County. They exploited the local bog ores and used the river as their power source. However, Lord Selkirk tells us in a note in his 1804 journal that the works "is mis-managed." The quality of the bar iron was "not esteemed." The works closed down a year or two later, with Jones obtaining possession of the lands. Jones emerged from what probably was a power struggle for ownership, because Selkirk also notes that the "three men...do not agree amongselves (sic)."⁽⁹⁾

A few years later, an Englishman named John Mason obtained land in

Norfolk County. He set up a furnace on Potter's Creek at its entrance into Lake Erie. The area supplied bog ore and everything seemed propitious for a successful enterprise. However, Mason had trouble getting both skilled labour and materials at a reasonable rate. He seems especially to have had trouble with labour, for he complains to Robert Gourlay in a letter dated 1817 about many problems, but especially about labour. "They", meaning iron men, "are the very worst sort of men to manage, colliers not excepted. Not one in a hundred of them but will take every advantage of his master in power."⁽¹⁰⁾ Mason had asked the government to pay the passage of five or six families" from England, but was turned down. He was unable to find anyone "capable of working the furnace."⁽¹¹⁾ Mason died soon after leaving the works to his wife and son, who sold it to Joseph Van Norman about 1820. Van Norman was to make a success of the works using innovative technology and good management. When the bog ore ran out in the vicinity, it became uneconomical to operate the works and he abandoned it. He later bought the Marmora Works, investing a large sum of money, but he was unsuccessful. The ores were different from those used at Norfolk and required a different technology, which he never mastered.

Charles Hayes must have had connections in England which put him in touch with the financial possibilities of ironworking in Upper Canada. He had an agent in England who had worked for him at least throughout the years he was at Marmora, for he tells us in a letter that he blamed his financial situation on his "agent in London."⁽¹²⁾ However, it seems that Hayes over-extended himself by building too much too soon.

Hayes arrived in Upper Canada in the fall of 1820. He had been in communication with Maitland's secretary, Major Hillier, at various times prior to his ar-

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... He writes to Hillier in the spring to say he was deferring his arrival until the question of timber duties is settled.⁽¹³⁾ Upon his arrival he went to York to petition the governor for land on which to establish his works. He was granted 1200 acres with the provision that he would erect his works and provide accommodation for his labourers. He was also to reserve another 1200 acres in the area for fuel supplies.⁽¹⁴⁾ He would receive patent to the lands upon having fulfilled his obligation to the Crown by surveying several townships and reserving a percentage for wood-lots and for settlers. He cut a road 12 miles long during the winter of 1820-21 from between Lots 13 and 15 at the Sydney-Rawdon township lines north to the site of the ironworks.⁽¹⁵⁾ The transportation problem was one which would cause him the most trouble and which he did not solve during his tenure as manager.

An ironworks was required to satisfy a number of criteria in order to be an economically viable enterprise: 1) a nearby ore supply; 2) abundant water for power; 3) abundant fuel supply; 4) abundant limestone for flux; 5) a hill into which the furnace could be built so that a charging bridge could be attached to it from above; 6) near markets with cheap transportation; 7) sufficient capital to carry the project for at least three years; and 8) a supply of sufficiently skilled labour. All but the last three criteria seem to have been met at Marmora.

The works were located about 36 miles from Belleville, the nearest town on Lake Ontario. The Crowe River is not navigable below the falls at Marmora because of a series of rapids. The Trent River is the nearest suitable waterway for transport to the lake, but it also has a series of rapids which needed to be by-passed. Water transport was the preferred route to markets. Land transport was hazardous, time consuming and thus expensive. Hayes saw the possibilities of opening the Trent - Rice Lake route and informed Maitland that it could be made profitable through a toll system. The governor supported the proposition, but it was not begun immediately. Transportation, i.e. cheap transportation, remained one of the fundamental obstacles to the lack of success of the works. Hayes must have had difficulty finding people to take his products to the Kingston markets, because he "offered an extra 100 dollars to the transporter who takes the iron the furthest by water."⁽¹⁶⁾

The furnaces had been put in blast in March 1822.⁽¹⁷⁾ By summer of that same year, the *Kingston Chronicle* carried an advertisement for "mill irons" and "other heavy castings" at the price of 5 dollars per 100 lb cash.⁽¹⁸⁾ Thomas Whitaker was named as agent for Hayes. The following year, Hayes had expand-

ed his product line to include: single and double stoves; dog irons; sleigh shoes; cauldrons and sugar kettles; potash kettles and coolers; pots and bake ovens; cart and waggon boxes; and fanning mill irons.⁽¹⁹⁾ What sort of profit he made, if indeed he made anything at this early period, is not known. A profit of 2672 pounds is shown for the year of 1825 in the Manahan and Ridley Report of 1837,⁽²⁰⁾ but this may have inflated to impress the government with the works' potential. Marmora was not the only ironworks selling its products through the Kingston market. Les Forges du St. Maurice had an agent for its wares in the city and Samuel Shaw was also selling iron products among an assortment of wares.⁽²¹⁾

Hayes had started out with enough capital to erect a large number of buildings on his site. Besides the two furnaces, he had a foundry with two trip hammers and four forge fires, carpenter shop, charcoal house, blacksmith, grist mill, saw mill, tannery, bark mill, stone store, a dozen dwelling houses, sheds and barn, adding up to a substantial community. The return on his capital investment must have been slow and the needs of the works required a constant infusion of funds to meet wages and expenses. In an effort to find more cash, he offered for sale several lots suitable for dry goods or other tradesmen enterprises. Applicants had to submit a certificate of good conduct.⁽²²⁾ By October 1824, Hayes was forced to turn over all his real and personal assets in trust for the benefit of his creditors to Peter McGill, A. Manahan and Robert Hayes. He was to continue as manager of the works until his return to England to try and secure further funding, but he was unsuccessful and was never able to redeem his ironworks.⁽²³⁾

The origin of the labour pool at Marmora is not known, but it is likely that it was made up of recent immigrants, probably from Ireland and Britain. Hayes seems to have had the same sort of problems with his workers as did Joan Mason. In a letter to Hillier he writes that he was delayed by "Wicked combinations among my work people—whom I have no power to control."⁽²⁴⁾ Some of his workers were unskilled and inefficient, and he was "much plagued by them".⁽²⁵⁾ Drunkenness was part of the problem, because Hayes tried to prevent licensed taverns from operating in the vicinity of the works.⁽²⁶⁾ The environment was a harsh one and the men, perhaps not known to each other nor used to the process of ironworking itself, sought solace in alcohol. Unlike Les Forges du St. Maurice and other similar 'plantations' where a labour force was maintained through subsequent generations of workers and their descendants, Marmora was in the process of building a new labour force as well as a

business.⁽²⁷⁾ Besides coping with the cold and isolation of a Canadian winter, there were the black flies and mosquitoes of summer. Unfortunately, we know little about the relationships between owner and labour at Marmora, only that the worker was treated in a paternal manner. He was lodged on the site, provided with accommodation by the company, and must from necessity have purchased his food and clothing from the company store. He may have had a garden, but that would take time and effort to achieve. Alcohol abuse continued to be a problem through the Marmora years. Joseph Gander, an itinerant social minister, visited various people in the area of the works helping tend the sick and those trying to cope with alcohol abuse.⁽²⁸⁾

The Hayes years at Marmora amounted to little more than four, but they were years of incredible activity, carving out a new world. They were years of great financial loss and eventual despair. A renewed interest in the ironworks in the last few years has produced a better understanding of its history. Newly located maps indicate its physical layout and archival research is gradually fitting the Marmora puzzle together. With the addition of archaeology as a resource for producing further evidence, it is now possible to learn more about the technology used at this early period and through metallurgical analyses determine how successful that technology was.

In response to possible destruction in 1978, the regional archaeologist for the Ministry of Culture and Recreation, Phillip Wright, conducted testing on the site. The archival record was meagre and mis-interpreted. Testing was carried out in the north end in that area occupied by a large lumber mill owned by the Pearce Company at the turn of the century.⁽²⁹⁾ The buildings from this enterprise had obliterated most of the ironworks except, it appears, the foundation of the furnace house and the tailraces which serviced it and the forge. When the Pearce Company purchased the site in 1883, it did not destroy the furnace immediately. When it was destroyed is not known, but a house on Main St. has a stone from one of the furnaces set into its foundation. The stone is stamped "Farnley Ironworks Wortley Leeds." The owner of the house thinks it (the house) is about fifty years old. No doubt other stones were carried away and used for similar purposes.

In 1981, the author was approached to carry out further archaeological testing on the site. The Village of Marmora gave its permission, supported by the Marmora Historical Foundation. A number of problems militated against a 1981 season, not the least of which was determining priorities. When approached again in 1982, a plan was suggested in

which the site would be examined carefully to determine just what was on it. Topographical and physical maps would be needed to determine any subsurface archaeology that could be carried out.

Working through a grant from the Ontario Heritage Foundation and a federal Summer Work Grant, the site was surveyed with the help of five students, three of whom were from Marmora. The site is a difficult one—it is compressed between the 30-foot limestone cliff on the east and the Crowe River on the west. The road which services the site is now much higher than originally and consequently the furnace house area is swampy because water seeps from the cliff and has no outlet, as the tailraces are blocked. The site is further threatened by the fact that a chlorine holding tank is slated to be built behind the pump house, which will certainly cause more destruction. Ideally, the site should be designated an historic one and thus protected but, the village has not taken this step as yet.

Slag, iron and soil samples were taken and are being analyzed by the Metallurgy and Geography departments at McMaster University. The slag sample appears to be from a cold-blast furnace and it contains, besides the limestone, small pieces of unburnt charcoal. The ores used at Marmora had a high sulphur content and required special knowledge to be worked successfully. Charcoal may not have been the best fuel for this purpose, but the iron from Marmora was considered superior in every way, so perhaps the iron founder was able to maintain the correct recipe at this early period.

The ironworks underwent a number of rebuilding periods as owners changed with regularity after the Hayes years. However, no superstructures remain and archaeology will uncover the foundations only. This will be useful, nevertheless, as dimensions will be obtained and possibly fragments of discarded iron products, which can be studied. The problems of the furnace bricks must be

sorted out—their place of origin, cost and date imported. It would be useful to learn more about the workers, about their origins and about lifestyle at Marmora.

The cut in the limestone cliff at the southeast end of the site appears to have been man-made. Was it used to service the furnaces? The cut contains a high percentage of coal-black soil.

The proposed Phase II archaeological investigation will concentrate in the south end of the site, i.e. the area of the furnaces. The twentieth-century garbage will be removed, the area drained and the furnace area excavated. All this is tentative at the moment because of the status of the site.

The author is now completing a dissertation at the Master's level on the history of the Marmora Ironworks through the Department of History at McMaster University. It was felt that the site needed to be completely documented before further archaeology be carried out.

FOOTNOTES

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