The Trent River Ore Cars

This is a story about the wooden ore cars built by James Crossen for the *Cobourg, Peterborough & Marmora Railway & Mining Company* in the 1860's. The cars were designed to carry iron ore from Blairton Mine to Cobourg. Remnants of these early railcars have miraculously survived because of an operational mishap in 1881 at the railway's loading pier at Trent River Narrows. The accident left five of the cars submerged – and preserved! - in the river for the following 99 years. This is the story of *The Trent River Ore Cars.*

A New Name, A New Focus For The Railway: Iron Ore!

The story unfolds with the demise in 1861 of the *Cobourg & Peterborough Railway's* impossibly long (2.6 miles!) wooden bridge across Rice Lake. The loss of the link to Peterborough was a crippling blow to the railway and within a few years it was forced to reorganize, bringing in new investors and with them a new name: *The Cobourg, Peterborough & Marmora Railway & Mining Company (CP&MR&MC).* This strung-out title aptly reflected the railway's new focus: mining and shipping iron ore from the Canadian hinterland all the way to the centre of the booming steel industry in Pittsburgh, Pennsylvania.

The Plan For Getting The Ore Out

The strategy was to exploit the reserves of the "Big Ore Bed" located on the southwest shore Crowe Lake, near the village of Marmora. The idea was that railcars would carry the ore from the Blairton Mine (named after Blair, the largest shareholder of the railway at that time) to Trent River Narrows, where it would be unloaded into 60 ton barges. The barges would be hauled by the railway's steamship – the *Otonabee* (later the *Isaac Butts*) - from Trent River Narrows through the new lock at Hastings, to the wharf at Harwood. At Harwood, the ore would be transferred via "steam elevator" back into ore cars for the journey to the Cobourg harbour. At the harbour, the ore would be dumped directly from a raised trestle into waiting lake schooners for the trip across Lake Ontario to Rochester. More railcars would then take the ore on the final leg of its journey - from Rochester to Pittsburgh. The freight charge from Blairton to Pittsburgh was estimated to be $4 per ton at that time – equivalent to about $75 a ton in today's currency.

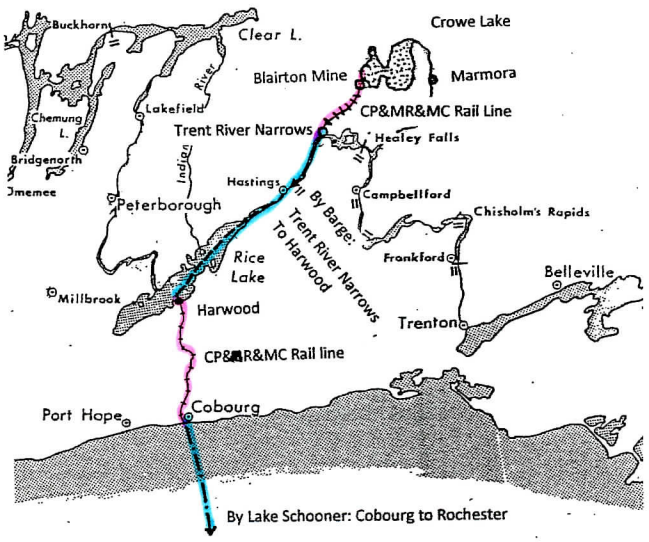

Figure 1: The CP&MR&MC Route For Shipping Iron Ore

Turning The Plan Into Reality

To make this long journey possible, new broad gauge track (5'6" between the rails) was laid from Trent River Narrows to Blairton. This track was not connected to the Cobourg – Harwood line, or any other line, so all materials associated with building the railway, and building the mine, had to be shipped to the end of rail in Harwood, then transported on barges out of Rice Lake and down the Trent River. Transfer facilities in the form of docks, piers and trestles were built at Trent River Narrows, Harwood, and Cobourg so that ore and other materials could be moved expeditiously.

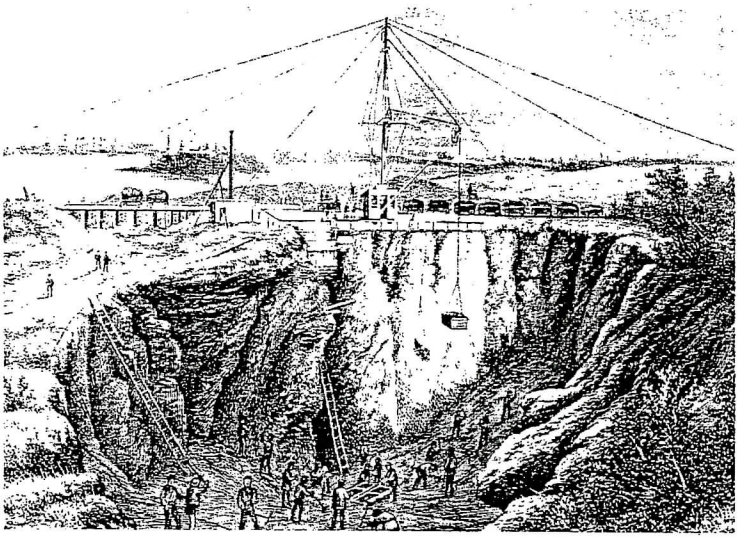

Figure 2: Etching of Blairton Mine

Production At Blairton Mine Begins!

Everything was in place by the spring of 1868, and production at Blairton Mine quickly ramped up to about 20,000 tons of iron ore per year by 1870. Much of the mining was done by hand, with ore being loaded into the railcars using planks and wheelbarrows. Mined rocks were selected individually, the plan idea being that those showing roughly 60% ore or better would be shipped. The others would be discarded, sometimes into the nearby lake. Trains of twenty five cars each made the journey between Blairton and Trent River Narrows,each railcar carrying 5 tons of ore. John Laskey Aunger, a manager at the mine, wrote that at peak times, three 25-car trains would make the 9 mile journey each day. To handle this tonnage, (since there was no storage capability at any of the three transfer points), the company used as many as eight barges on the Trent River Narrows – Harwood run, and had sufficient railcars in place at Harwood to keep the ore steadily moving on to Cobourg and beyond.

Crossen Railcars Haul The Iron Ore

The rail cars which hauled all of this iron ore were built by James Crossen of Cobourg – his first contract for the construction of rail cars. The arrangements for making these cars are documented in a book about Crossen's railcar building activities, *Wooden Cars On Steel Rails*, by Ted Rafuse. The cars were assembled near the Cobourg wharf using locally available wood (red oak) and iron fittings made by Crossen in his nearby foundry. Larger iron components – wheels, axles, bearings, coupling links, brake assemblies - were made elsewhere (see "Wheels" below), and brought to Cobourg for installation on the railcars.

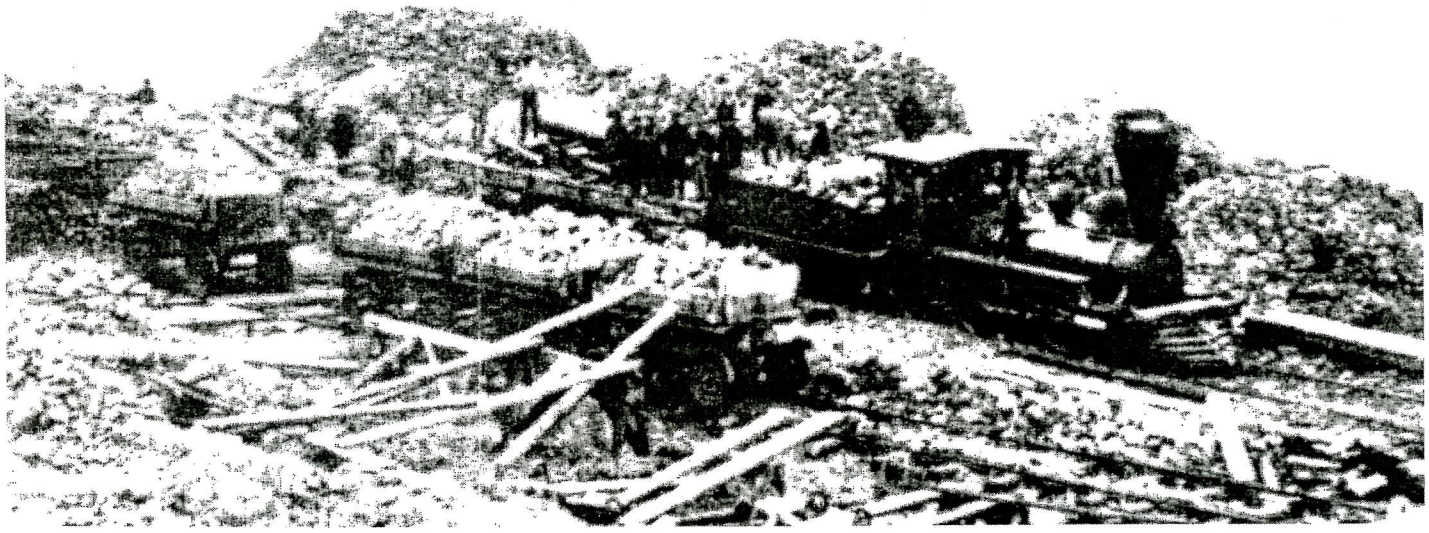

Figure 3: Ore Cars At The Blairton Mine

Market For Blairton Ore Declines

The railcars appear to have served their purpose well, as Blairton Mine grew to be the biggest iron ore mine in the country. But in 1873, the outlook for the mine darkened considerably with a) the onset of an economic depression, and b) the discovery of very large deposits of iron ore at the head of Lake Superior - in Minnesota and Wisconsin. The relatively small-scale output from Blairton Mine could not compete with this vast new source of iron ore – even though the reserves of ore at Blairton were far from depleted (and are still not depleted). Nevertheless, with a dwindling market for its ore, production at the mine declined. The last regular shipment of ore from the Blairton Mine was in the late 1870's.

The 1881 Accident

By the early 1880's, efforts were being made to wrap up operations at the mine, which included shipping out the final loads of stock-piled ore. It was during that period – in 1881 - that a fatal accident occurred at the loading pier at Trent River Narrows. As ore cars were being brought into position for unloading into the two barges sitting below the cribs, the train overshot the mark, and five ore cars went off the end of the pier into the river. One man was swept into the water and died. The story about the accident was reported in the newspapers at the time, but no attempt was made to retrieve the cars from the river: the mine was closing and the cars would not have been worth the effort required to hoist them out of the water. They remained submerged.

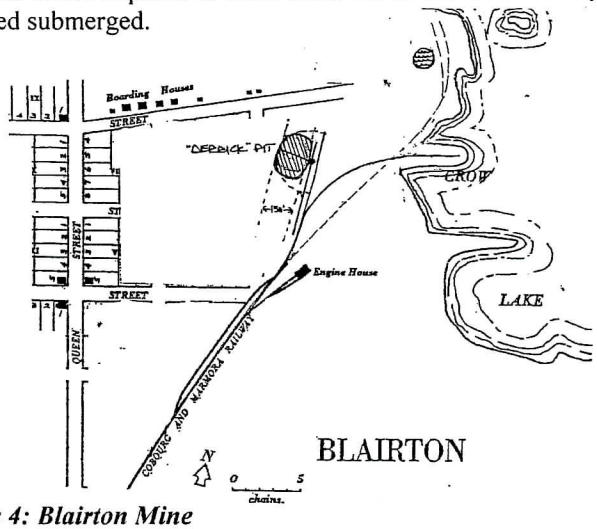

Figure 4: Blairton Mine

The Railway Struggles On

With the mine now closed, the railway struggled to survive, eventually being reorganized in the mid- 1880's as the Cobourg, Peterborough & Blairton Railway & Mining Company. In the 1990's, the CP&BR&MC was absorbed into the Grand Trunk system – which in turn became part of Canadians National in the 1920's. Blairton became a ghost town.

The Story Of The 1881 Accident "Resurfaces"

With the tracks taken up and the trains gone, the prominence of the story about the ore car accident at Trent River Narrows gradually receded. Details about what had happened were still passed along by those who lived in the area, but no one was entirely sure what lay on the river bed. It wasn't until 1980 - when the story came to the attention of a retired mining engineer Arthur Dunn - that the ore car story finally "resurfaced". Dunn was conducting research into the Marmora Iron Works, and was intrigued by the story from 99 years earlier. He managed to persuade Parks Canada to use their resources to retrieve the remains of the ore cars from the river - the Trent River being a federally regulated waterway.

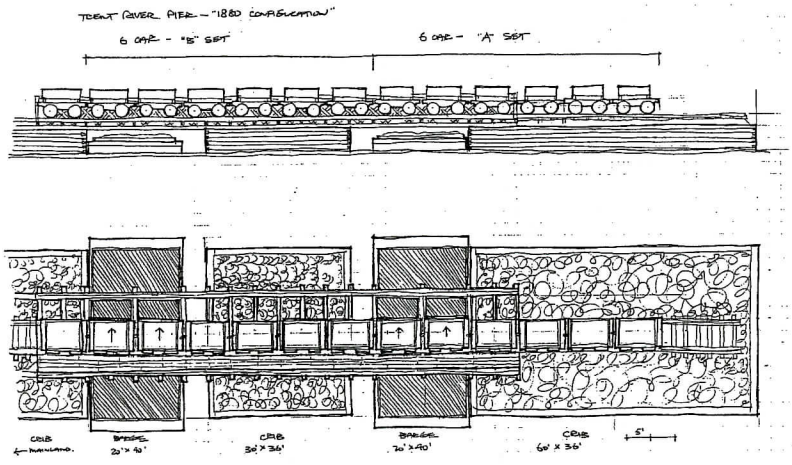

Figure 5:TRL Loading Pier: Site Of 1881 Accident

Parks Canada Retrieves Ore Cars in October 1980

The retrieval of the ore cars took place in October 1980, using Trent-Severn Waterway staff and equipment, along with the services of a commercial diver from Peterborough. The remains of four cars were removed from the water that day. One frame was largely intact, with wheels and axles. Another frame was missing its wheels. And there were additional sets of wheels and axles, broken bits of wood, and loose pieces of iron. Very roughly speaking, it was considered to be the remains of four cars. The remains of a fifth car – which had been identified months earlier - could not be located as the water on the day of the retrieval was particularly murky. Despite the fact that both frames had lost their ore boxes, and that the wood was considerably eroded from 99 years of water current running by, those involved with the retrieval were very pleased with what had turned up. Memos were soon in circulation at Parks Canada discussing how the remains of the cars should be restored so that they could be used for an exhibit. But officials were also worried about the deterioration of the wooden frames - now that they were out of the water - and so a decision was made to re-submerge the best preserved car in October 1980 until such time as a comprehensive restoration plan could be implemented. The car was duly re-submerged, but when Parks Canada divers went to check on this car in October of 1981, it was no longer in the place where they had left it submerged, and it could not be located. It was reported stolen, and it has not been seen since – above or below water.

Meanwhile, many of the remaining iron pieces – wheels, axles, bearings, brake rigging, latches, bolts, braces – were successfully restored. In some cases – the wheels, for instance – the restored pieces looked as if they were brand new!

Artefacts Are Warehoused

But despite having gone to the trouble of restoring so many of the iron parts, enthusiasm at Parks Canada for the idea of mounting a comprehensive exhibit telling the story of the ore cars waned; ultimately they chose to simply store the artefacts in their Service Centres. The only items finally chosen for exhibition were two iron wheels. They ended up displayed at the National Historic Site of The Forge Du St. Maurice near Trios Rivieres, since it was determined that the pig iron used in their manufacture in Montreal had originally come from St. Maurice. All of the other artefacts from the ore cars have languished at Parks Canada Service Centres (not open to the general public) for the past 33 years. Two wheel sets are being stored in the Quebec Service Centre, and the remaining artefacts are being stored in the Ontario Service Centre in Cornwall.

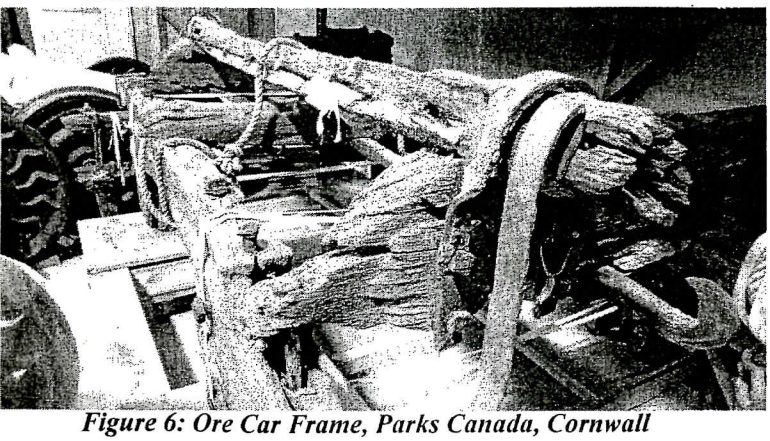

Figure 6: Ore Car Frame, Parks Canada, Cornwall

Recreating The Ore Cars From The Artefacts

I was fortunate enough to be able to view the artefacts in Cornwall, along with a colleague from the Sifton-Cook Heritage Centre, Ken Willocks. By closely examining the one remaining frame, together with all of the loose pieces of wood and iron, we were able to reconstruct what we think one of the cars originally looked like. Since there are no drawings available depicting these cars, and the one photo we have is taken from a distance, it was like putting together a jigsaw puzzle. One by one, we examined the various components.

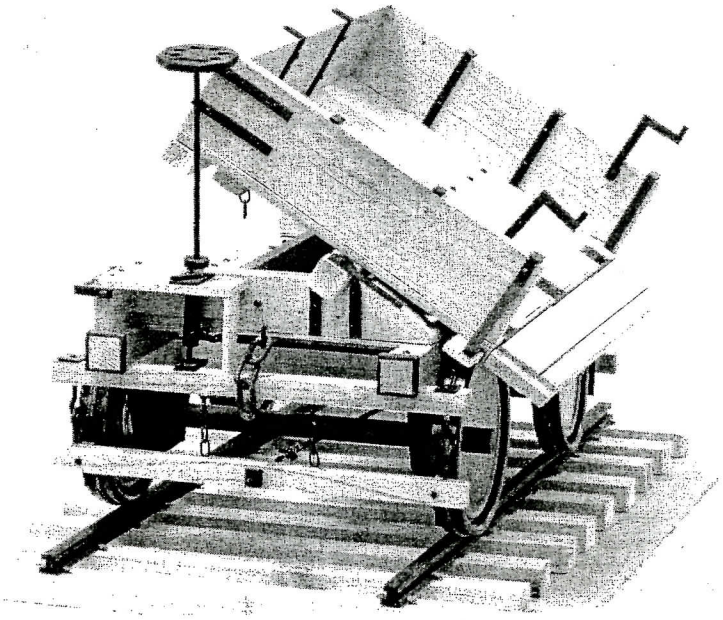

Figure 7: Reconstructed Ore Car

The Wheels

The iron wheels measured 36" in diameter – quite large, but apparently a size typical for that era. There is no doubt as to where and when the wheels were made: the stamp on the wheels clearly states "Montreal Car Wheel Works 1867".

The Bearings

The bearings were brass, housed in an iron casting, the complete assembly bolted onto the bottom of the oak frame. An analysis of one of the bearings showed that the brass was not properly formed, and that the bearing had in fact failed. Perhaps the failure of this bearing had something to do with the accident – its anyone's guess. (Like many aspects of this story, there is lots of room for speculation as to how and why things occurred as they did!)

The Frame

The car frames were made of red oak – no doubt sourced locally from the Cobourg area. Structural members are typically 6" thick, and 12" deep. The frame is 10' long, made rigid using notched cross members held in compression by 1" diameter iron rods.

The Ore Box

The ore box was roughly 6' wide x 8' long. I say "roughly" because none of the wooden pieces from the ore box remain intact. The boxes likely broke away from the frames upon impact with the water, and floated down the river. However,

iron braces that have survived would indicate that the three fixed side panels were made of a solid piece of red oak 14" high and 2-1/4" thick. The side panel which opened was about 10" high, hinged at the bottom, with latches at each end mounted inside the box. The box was fastened to a rotating spar, allowing the box to be tipped for unloading. Large diagonal notches on the lateral beams show that the box was designed to tip to one side only. The point at which the box was mounted to the spar was offset slightly towards the non-tipping side about 4", probably to increase the stability of the loaded box when the car was in motion, but still be roughly in balance so that men could raise up the box under their own power for dumping. There was a chain on the non-tipping side for fastening the box to the frame during transport.

The rotating spar was offset on the frame towards the tipping side about 12". This allowed the box to be tilted at a steeper angle, while still allowing the tilted box (and open door) to clear the large wheels. Because of these offsets, the car as viewed from either end is very much asymmetrical – ie the position of the ore box is distinctly offset towards the tipping side of the car. It gives the car an ungainly appearance, but the wheel base is so wide that the asymmetry does not seem to have affected the car's operation. Records show that at least 100 of these cars were made, so the design must have proven itself. There are no records of any other cars with this appearance, so this may have been an in-house design prepared by an official at the railway. The cars may well have been designed by John Dumble, who had a "hands on" approach to running the railway.

Whoever designed the cars, they look to be configured so that the ore box could be tipped by hand. The longitudinal spar was formed into a circle at each end, allowing it to rotate while resting on a cross beam, with a 2" deep circular recess cut into the beam. Perhaps some kind of lubrication was used to allow the spar to rotate more freely. An iron brace kept the spar properly aligned on the lateral beam. There was an iron handle on each end of the spar, no doubt used by the men to tip the ore box.

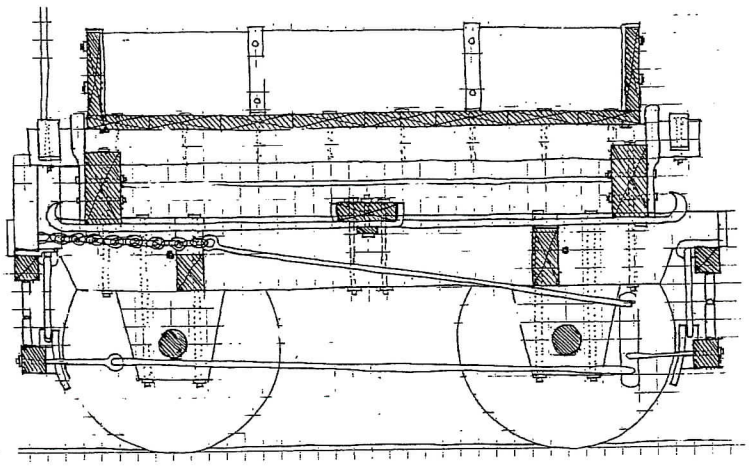

Figure 8: Sectional Drawing of Ore Car

Brakes – Not All Cars Had Them!

In looking at the picture of the cars at the mine, and looking at the remnants of the cars in Cornwall, it's apparent that only some of the cars came equipped with brakes. The frame at Cornwall clearly has a brake assembly, but none of the cars in the photo taken at the mine have brake rigging. So it may be that only a few cars on each train were fitted with brakes. Practice in England on early railways was to have one car at the rear of the train with brakes, and to keep the brakes on that car lightly set at all times, in order to take up any slack between the cars. So a fully loaded ore car at the rear may well have served as the "brake car" on the Blairton – Trent River Narrows line.

Certainly some cars did have brakes, and there are enough artefacts in Cornwall to fully reconstruct their brake rigging. One interesting feature: The handle on the stem winder was obviously designed to be removed, no doubt because it got in the way when the ore box was tipped to its limit.

Couplers: Three Links Of Chain

The artefacts in Cornwall indicate that the cars were coupled using three links of chain fastened on iron hooks positioned at each end of the car. The hooks were formed at the ends of long rectangular iron members, and these members were then fastened together at the cross member at the centre of the car's frame. The outside dimensions of each link of coupling chain were 8" long, and 5" wide. By calculation, this length of chain kept the cars just an inch or two apart from each other while in tension, a short distance so as to prevent damage upon starting or stopping the string of 25 cars – hence the need for the brake car at the end, to provide some tension. Some bumping inevitably occurred, so there were protective iron bands at each at the four points where the cars came into contact with each other.

Crude Iron Fittings

Many of the iron fittings that hold the car together have a rather crude appearance to them, and most likely were made by Crossen here Cobourg. Items which required more precision in their manufacture – wheels, axles, bearings, the brake assembly – look to be made elsewhere, probably at the same foundry in Montreal where the wheels were made.

What Will Happen To The Trent River Ore Cars Now?

For the time being at least, the ore car artefacts remain at the Parks Canada Ontario Service Centre in Cornwall. But since Parks Canada has no plans to display them, there mlay be an opportunity for other groups to form their own exhibits of the ore car artefacts. Given the Cobourg connection to these cars, the Sifton-Cook Heritage Centre has expressed their interest to Parks Canada in obtaining the ore car artefacts, But with or without the artefacts, the Heritage Centre will endeavour to tell the story of the Trent River Ore Cars – both through indoor exhibits, and through the outdoor model of the *Cobourg & Peterborough Railway* (and its later iteration, the *CP&MR&MC*). I encourage you to come and visit us at Heritage Centre to find out more about the Trent River Ore Cars!

George Parker
Cobourg, Ontario
March 1, 2014