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Cover Page Footnote

This paper is a part of my dissertation concerning the impact of the Lachine Canal on Montrealers during the 19th century. I would like to thank the old Port of Montreal Corporation for their authorization to use all the date we recovered during the five-year archaeolgocial project, as part of the redevelopment of the old section of the port of Montreal including the lower entrance of the Lachine Canal. My Ph.D. research was made possible with a grant from the Fonds pour la Formation de Chercheurs et l'Aide a la Recherche (FCAR). I would also thank the members of CNEHA conference for their support, and particularly Karen Bescherer Metheny for her splendid encouragement and the reviewers for their pertinent comments. A special thanks to Louise Iseult Paradis, my reasearch director, Gisele Piedalue, Parcs Canada, and Philip Smith for their comments and helpful text correction.

From the Warehouses to the Canal By Rail ca. 1830: The Lachine Canal, Montreal, Quebec.

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During archaeological monitoring of the lower entrance of the Lachine Canal by the Corporation of the Old Port of Montreal, archaeologists obtained data spanning approximately 170 years of development in the area. Indeed, the original canal, built between 1821–1825, has seen many transformations in its dimensions and in the spatial organization of the adjacent installations. This article focuses on a particular finding related to the first period of the history of the canal: the remains of privately owned short wooden track lines used for transporting goods from the warehouses along Common Street to the canal during the years 1825 to 1848.

Durant la surveillance archéologique de l'entrée aval du canal de Lachine par la Société du Vieux-Port de Montréal, les archéologues ont recueilli des données couvrant environ 170 ans du développement du canal. En effet, le canal original, construit entre 1821 et 1825, a subi des transformations autant dans ses dimensions que dans l'organisation spatiale des installations adjacentes. Cet article traite plus spécifiquement d'une découverte unique reliée à la première période du canal: les vestiges de plusieurs voies ferrées en bois privées ou "chemins de lisse" utilisées pour le transport des marchandises, entre les magasins et entrepôts localisés le long de la rue de la Commune et le canal, durant les années 1825 à 1848.

Introduction

There is a vast body of 19th-century canal and railroad literature. This literature deals with locomotive carriages and wagons, company histories and state lines but very little with architecture and civil engineering (Morriss 1999: 12). The competition between canal and railway goes back to the early 19th century, and it ends in many places in the United States by the construction of railroads over filled-in canals. In Canada, the railroad was built more as a complement to the rivers and canals than as a competitor (Modelski 1984: xi). The first Canadian commercial line, the Champlain and St. Lawrence railroad, opened to traffic in July 1836 and joined Laprairie on the St. Lawrence to St. Johns above the rapids on the Richelieu River. Even though built as a portage road, it did not stop the construction of the Chambly (1847) and St. Ours canals (1848) on the Richelieu River. Montreal had its first train in 1847, the Montreal and Lachine Line, built parallel to the Lachine Canal, during the same years as the canal's first enlargement. Indeed its construction was "to handle passengers and freight that could not wait for the slow transit through the busy waterway" (Andreae 1997: 100). The construction of these railroads and their rapid extension for long-distance transportation were possible with the introduction of the steam-powered trains. But tracks for transportation were used long before the appearance of the locomotive.

The use of wooden tracks, especially in mines, is documented and illustrated as far back as the 14th century (Lewis 1970; Parsons 1976: 153; White 1976: 41). Their use in North America is attested historically, and there is a short reference to them in some of the published American and Canadian studies on railways. But, in the descriptions of the structure of those tracks, I find no examples comparable to those we found in Montreal. Few remains of such wooden rails survive, and I have not found any published Canadian or American archaeological records of this type of construction. In Great Britain they were used since the 16th century principally to connect collieries to

canals (Cossons 1993: 271). So it is not surprising that remains were found there and that there are more published archaeological records of wooden tracks in the UK (Hughes 1991; Grenter 1993; Ayris, Nolan, and Durkin 1998; Jones 1987). Unfortunately, none of the British remains were directly comparable to those we found.

In that context, the purpose of this article is to publish the description of sections of the nine wooden roads found along the Lachine Canal in 1991. I will emphasize the archaeological context of these structures and offer an interpretation of the use of these short lines. Since I could not find comparable examples of this kind of track construction, I will emphasize the description of these artifacts more than the comparable aspects of this kind of construction. I will begin with a history of the canal in order to situate the archaeological and historical context of the findings.

Lachine Canal

The idea of a canal to by-pass the Lachine rapids was first recorded by Maisonneuve, the founder of Montreal, as early as 1651. The first attempt to build such a canal was carried out by the Sulpician seigneurs of the island of Montreal between 1680 to 1716 (Desjardins 1999: 76–77). In fact, two canals were built as indicated on a plan drawn by Chaussegros de Lery, the King's Engineer, in 1733 (ANC NMC 18241). The western one, known as "Le canal des Sulpiciens," joined the "Lac Saint-Louis" to the "Lac Saint-Pierre" and was never really finished. The eastern one, named "canal Saint-Gabriel," linked the "Lac Saint-Pierre" to "la Petite Rivière" and then to the Saint-Lawrence River. Indeed, this first canal was never officially used for transportation but served to bring water to the Sulpician flour mills in Ville-Marie during the 18th century.

The first Canadian transportation canals were the military lock canals built by the British army on the St. Lawrence River west of Montreal: Coteau-du-Lac built between 1779–1781; Rocher-Fendu; Le Trou du Moulin (without lock); and Faucille built in 1783. These pioneer canals were among the first lock canals built in North America (Heisler 1973: 17; Spangenburg and Moser 1990: 5; Shaw 1990: 1–29). The decision to build these canals followed a re-evaluation of Canada's defense and communication infrastructures ordered by Sir Frederick Haldimand, governor of Canada between 1778 and 1786. These canals insured more efficient transportation of men and merchandise to western military posts that had been established in the Great Lakes region in order to protect the new citizens loyal to the British crown settled in Upper Canada after the American Revolution (Cartier 1999: 7). The need to improve navigation on the Saint-Lawrence River became more intense with the increase of this agricultural population in the Great Lakes region in the early 19th century.

John Richardson proposed a bill in the legislature of Lower Canada for the construction of the Lachine Canal in 1796, without success. In 1815, the Legislature adopted the project of Sir George Prevost which included an association with the British Parliament. In 1819, as the project dragged on, a group of Montreal merchants formed a joint-stock company, The Company of the Proprietors of the Lachine Canal, and hired a British engineer, Thomas Burnett. Unfortunately, the Company did not succeed in selling enough shares, until finally construction began in 1821 under the auspices of the Government of Lower Canada, with help from the British Government as agreed in 1815 but according to the Burnett plan. This canal, opened in 1825, linked Montreal to Lake Saint-Louis, crossing the southern portion of the Island of Montreal by way of a lateral waterway. The early Montrealers were faced with the impetuosity of the Lachine rapids, known as "Sault Saint-Louis," and had been dreaming about the creation of an alternate passage since the 17th century. The canal opened a new era of direct communication by water between Montreal, the Great Lakes, and the interior of the continent to the West (FIG. 1).

The 1825 canal (FIG. 2) measured 13.5 km in length, 11.6 m in width at water level, and 1.5 m in depth. Seven locks (30.48 × 6.09 × 2.74 m) were built to cross the 14-m drop in water level. Three staircase locks were located at the Montreal entrance and two others at Côte Saint-Paul; there was a single lock at Saint-Gabriel and a regulating lock at Lachine.

This canal was primarily built for transit navigation so there was no place to berth boats

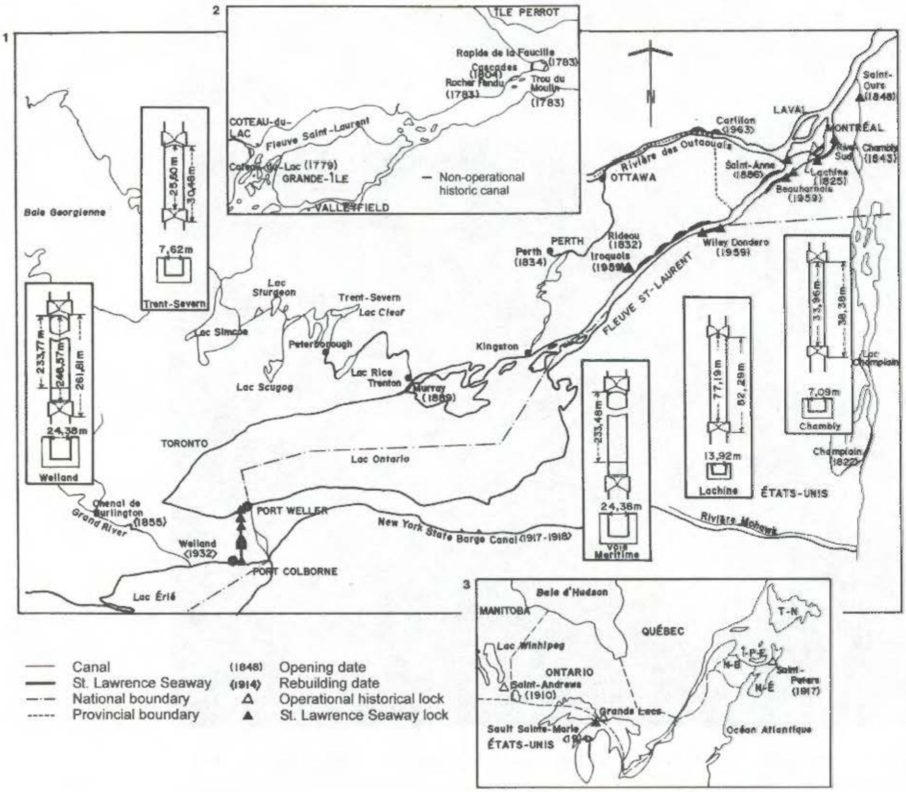


Figure 1. Location of the Lachine Canal in relation to Canadian canals. 1. South Ontario and Quebec region; 2. First Military canal; 3. Other canals. (*Atlas Historique du Canal de Lachine*, Parcs Canada, 1982.)

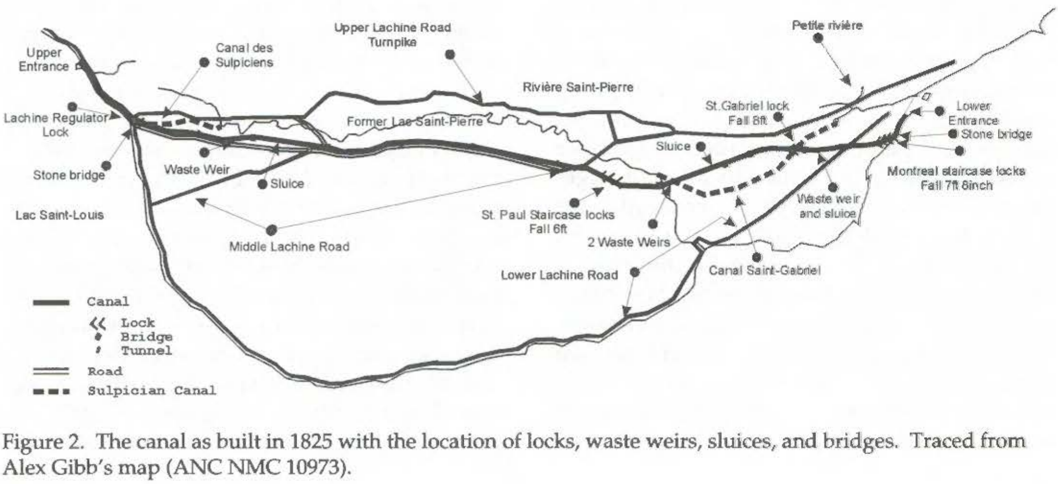


Figure 2. The canal as built in 1825 with the location of locks, waste weirs, sluices, and bridges. Traced from Alex Gibb's map (ANC NMC 10973).

Figure 3. Acrylic on canvas drawn by Benoit Léonard showing the Montreal locks ca. 1850. Reconstruction made from archaeological and documentary data. Property of the Corporation of the Old Port of Montreal.

along its bank. The growing volume of the traffic to and from the Great Lakes increased from 717 boats in 1825 to 4209 in 1833, which meant, in the short navigation season, from 3 or 4 boats per day up to 20 (Desjardins 1999: 121–122). Deriving from the toll rates reports (Tulchinsky 1960: 116–117), the cargo moving from the west were ashes, flour, pork, beef, butter, grain, firewood, hogs, sheep, and some passengers (average of 362 per year); going west the cargoes were mostly merchandise, liquors, and passengers (average of 4677 per year). Although the Lachine locks were larger than any others elsewere, they could not handle the usual boats sailing the lower St. Lawrence River. In consequence, the obligatory transshipment brought the need for better installations including new basins and warehouses. During the years 1831–32 at least two basins were excavated at which boats could stop to load and unload goods without interrupting circulation on the canal. These basins were situated between the Montreal locks and the Wellington Bridge.

The Lachine Canal was enlarged and heightened three times. The first major change was made between 1843–49 (FIG. 3), when a series of double-size locks ($60.96 \times 13.71 \times 9.84$ m) was added and the canal enlarged and deepened. Thirty years later (1873–85) the 1825 locks were replaced by new larger ones ($82.29 \times 13.71 \times 10.13$ m), with another deepening of the canal. The canal walls were raised in 1908–10 by 1.2 m, according to historical documents (Contant 1982: 198). These improvements illustrate the tremendous increase in maritime traffic on the St. Lawrence and its adaptation to the constant evolution of navigation standards. In the middle of the 20th century the canal could not be further adapted, however, and it was replaced in 1959 by the new St. Lawrence Seaway. The Lachine Canal was closed to transit navigation in 1965. The Montreal locks section was transferred to the

Figure 4. The arrow indicates the quay under which the tracks were recovered along Basin 2 at the lower entrance of the Lachine Canal. (Photographed by Pierre Beaudoin.)

Port of Montreal, which filled the canal and the locks in order to gain land for shipping containers. The rest of the canal was closed to commercial navigation in 1970.

The federal government in 1981 mandated the Corporation of the Old Port of Montreal to proceed with the revitalization and redevelopment of the Old Port. The Montreal locks section of the canal was then transferred to the Corporation in 1984. Public consultations held in 1985 recommended the protection of the archaeological remains. The impact study (Desjardins and Pothier 1989) pointed out the richness of the Montreal locks section. Archaeological monitoring of all the redevelopment was then mandated and took place from 1990 to 1992 (Savard 1992; Bergeron 1992).

The Archaeological Context

During the redevelopment of the Old Port of Montreal, in 1991, a retaining wall had to be rebuilt between Basin 2 of the Lachine Canal and De la Commune Street (FIG. 4). The trench required for that construction measured 300 m in length by 5–8 m in width. The archaeologists monitoring the project were thus able to investigate a continuous section of land along the canal (Savard 1992: 34–35).

The stratigraphic record testifies to the different phases of development of the Lachine

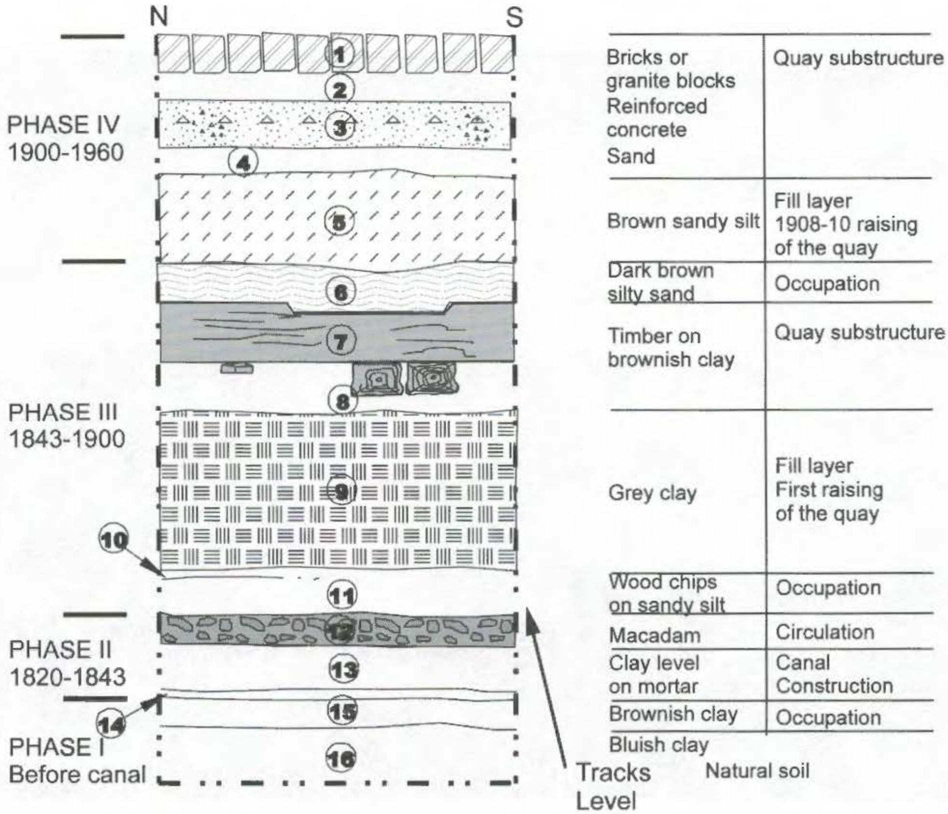


Figure 5. Stratigraphic profile indicating the position of the tracks in relation with the layers of fill from heightening of the canal wall.

Canal (FIG. 5), from the first construction level to the last occupational one. We can observe the last wharf made with brick levels (1) and concrete (3), each on a bed of sand (2, 4) over a layer of silt (5). These layers correspond to the raising of the canal wall around 1908–1910, but the pavings of bricks (marked Metropolitan Block, Canton, Ohio) and concrete were made around 1926–1928 (Desjardins and Poulin 1993: 58). We could observe, in a few places, the former wooden wharf immediately under the concrete at the level of layer 4. A sandy layer of occupation (6) over a wooden wharf (7) and two layers of clay (8, 9) represent the other phase. These are associated with the canal enlargement of 1843–48 when the quay was undoubtedly raised, and did not seem to change during the second half of the 19th century.

The five following layers correspond to the first phase of the canal (1821–1843). The street level is well marked by the gravel layer (12). This kind of surface was used since 1820 in Montreal and is known as macadamized road, derived from the name of John Loudon MacAdam (1756–1836), the engineer who designed it. A layer of mortar and fragments of stone (14) might be related to the construction of the canal between 1821 to 1825 since there was no other construction known in the immediate vicinity for that period.

The Railroads

The remains of nine parallel wooden tracks lines, running perpendicular to the canal, were uncovered in the trench discussed above. They lie on silt, some in conjunction with the layer

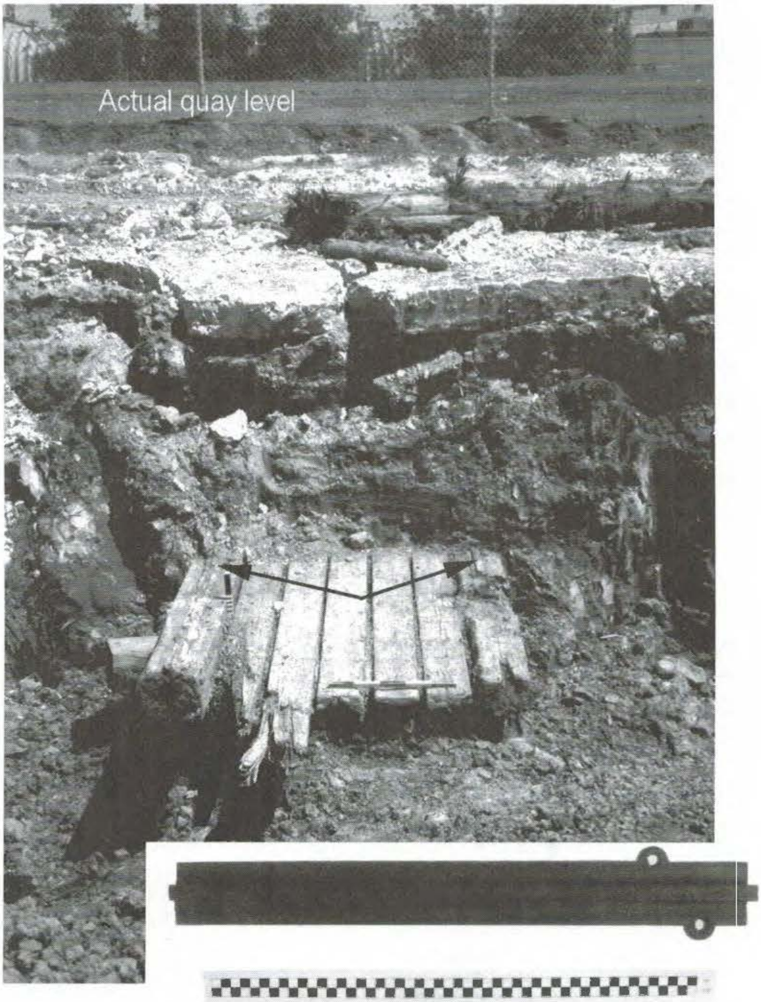


Figure 6. One of the railways as found. Bottom, section of inverted T-shaped cast-iron rail part. The arrow indicates the location of the iron rail part on timber. (Courtesy of Old Port of Montreal Corporation, 111G91R23T18 and HN11219939646.)

of macadam (FIG. 5.12), and over the canal construction layer which dates them after 1821. They were in a very good state of preservation (FIG. 6), indicating that they were not in use for a very long period of time. Timbers lying partly in mud silt and partly exposed to air will decay after few seasons. But in the absence of air, they will be preserved for a long period. A layer of clay covered the tracks and is probably responsible for the excellent preservation. This fill layer is associated with the enlargement and raising of the canal walls in this section, in the years 1847–49. Thus the tracks were constructed after the digging of the canal and abandoned just before the first enlargement. As the recovered sections were situated inside canal property limits they are undoubtedly related to the canal.

In general, the structure of the tracks is quite homogeneous. They are made of two parallel wooden runners fixed on timber cross sleepers. Longitudinal wooden planks that form a kind of platform cover the space between the rails. The plan and cross-section drawings of the best preserved tracks (FIG. 7) show some differences in the wooden structure especially at the location designated 111G3C22 where the central planks are sepa-

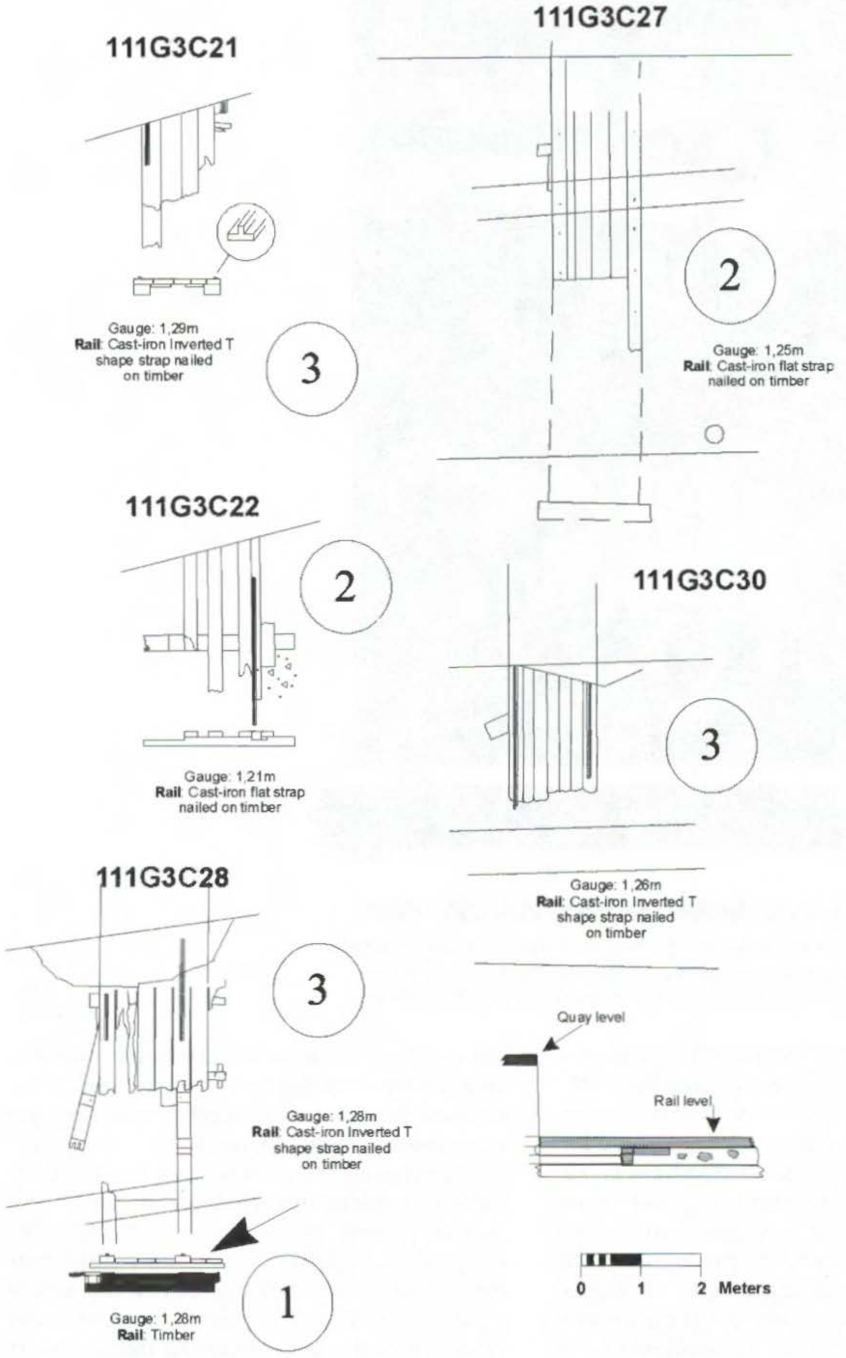


Figure 7. Drawings of the best preserved tracks. The circled numbers indicate the type of rail structure.

rated by an open space. The most significant difference is in the type of rail. They can be grouped in three types: one is essentially wood while the other two are iron-capped wooden rails—one a strap and the other an inverted T.

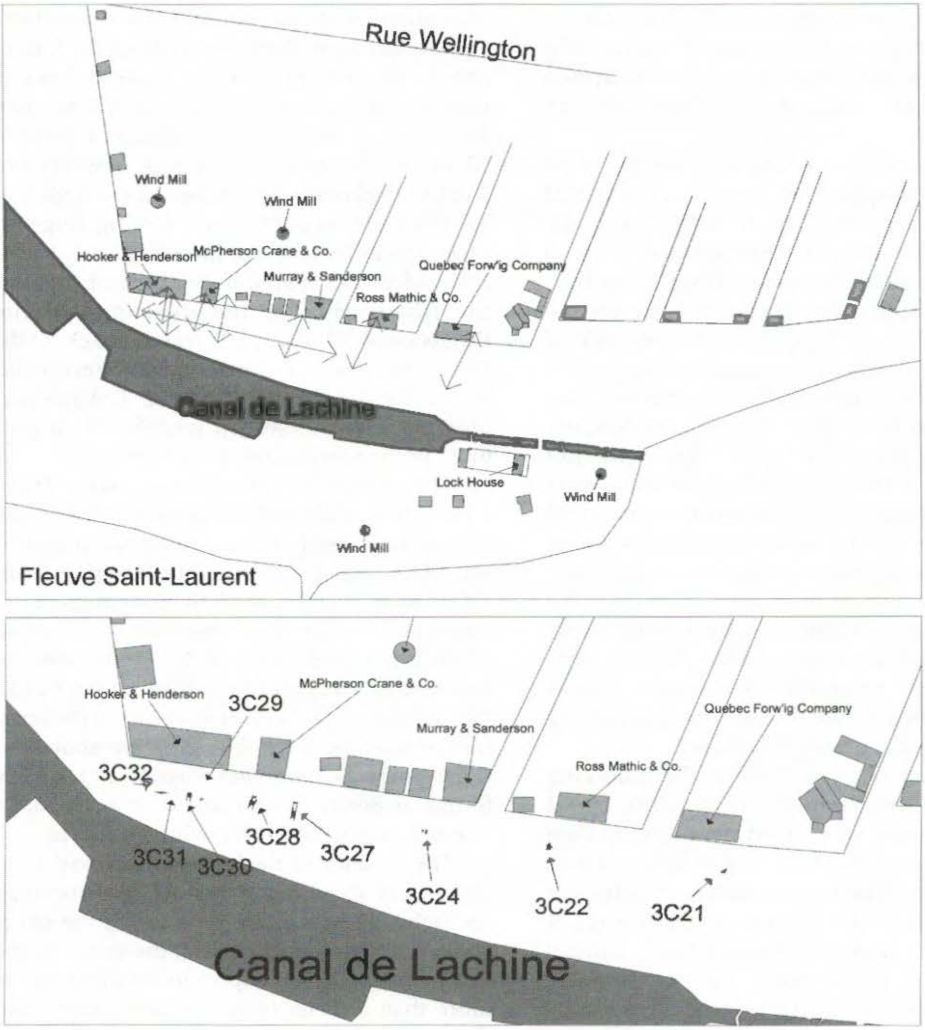
There is just one example of the first type (FIG. 7.1). A longitudinal timber measuring 23 cm in width by 16–17 cm in height forms the rail. The two rails are maintained from place to place by wooden crossties using a mortise-and-tenon joint. The distance between the crossties is 1.8 m. In spite of the presence of wood chips, it is not clear that there were planks between the rails. The wooden rail sections are end-joined with a pegged tongue-and-groove joint. The top surface of the rail was more or less flat, and no obvious wear was noted on the edges, as might be caused by a flanged wheel. The gauge is 1.28. A wooden drain lay alongside this section of railroad. This track lies at the same level as the macadam and was replaced by another structure (FIG. 7.1) using an inverted-T iron plate rail. It should be recalled that wooden tracks were also used by the first commercial railway lines in Canada, from 1837 onward.

The strap rail was built in the following way: a cast iron strap 5.2 cm in width by 1.2 cm in thickness was nailed on a longitudinal timber to form the rail. The wooden rail or stringer was nailed to a wooden crosstie. On track 111G3C27 (FIG. 7) the iron strap was not present but the nails were still there. Parallel to the nails, there was a 3-cm-wide mark carved in the wood. The position of the nails and their distance to the groove correspond to the dimension of the iron strap found on 111G3C22. The presence of the groove is probably caused by the use of a single flanged wheel. Possibly it was used without the strap, or the flange of the wheels was greater than the thickness of the iron plate. The strap rail track was quite popular in the United States between 1830–1840 (White 1976: 38–40). It was also used in England as early as 1767, but there the iron strap was double in width. The same is true of the one used by 1834 for the inclined planes of the Allegheny Portage Railroad in Pennsylvania. In this special case they used stone blocks instead of wooden crossties.

The last type of rail differs from the former one by the type of iron part. Indeed this one was an inverted-T shape instead of a flat bar. This seems to be the more common type (5 of 10, FIG. 8). The iron part is 6.5 cm in width and 3 cm in thickness, the flange is 2 cm high and 1.5 cm wide, and there are nailing rings on each side to fix it to the timber (FIG. 6). White (1976) does not mention this kind of rail, but the illustration of the drawings of the Delaware & Hudson RR trestle track 1828c shows that two T-model types were used beside the flat bar. The inverted T shape permits the used of flanged wheels which give more protection against derailment.

The gauge of the tracks varies from 1.21–1.29 m and does not seem related to the type of rails used. The gauge of the tracks in the 1840s was quite variable, ranging from 1.42–1.83 m (Morton 1847: 6). The gauge of the Canadian railway lines recorded by Andreae (1997: 208) varied from 0.762–1.676 m with the standard at 1.435 m. The recovered tracks did not correspond to any of the sizes mentioned for commercial lines. But they are about the same gauge as a wooden wagonway complex found at Bersham Ironworks, Wrexham, in Wales (Grenter 1993: 197), which is 1.25 m.

The sections of tracks were observed for a distance of about 2 or 3 meters. They continue on each side of the trench, crossing the street in one direction and toward the canal in the other. We could not expect to find sections of more than a meter or two in the direction of the canal because they would have been truncated by the construction of the second canal in 1848. But it may be possible to find sections under the present street level and in the adjacent lots. The rail sections are unequally distributed along De la Commune Street although more concentrated in the southern part. The exposure of over 150 m of in situ timber tracks at the site of the former Lambton or Bournmoor D Pit at Fencehouses, near Sunderland in England, shows the high degree of complexity that such railroads might present (Ayris, Nolan, and Dunkin 1998) and the



Lot Number	Company	Type of rail	Altitude (ASL)
3C21	Quebec Forwarding Co.	Inverted T shape	13,94
3C22	Ross Mathic & Co.	Flat strap	13,91
3C24	Murray & Sanderson	Indeterminate	13,77
3C27	Open space	Flat strap	13,99
3C28 sup.	McPherson Crane & Co.	Inverted T shape	13,90
3C28 inf.	McPherson Crane & Co.	Timber	13,64
3C29	Hooker & Henderson	Inverted T shape	14,45
3C30	Hooker & Henderson	Inverted T shape	14,05
3C31	Parallel to canal	Flat strap	14,33
3C32	Hooker & Henderson	Inverted T shape	13,94

Figure 8. Orientation, location, and identification of the tracks in relation to the companies located along Common Street ca. 1844.

unbelievable amount of information that we can get from these.

Interpretation

Initially, we supposed that these tracks were related to the reconstruction of the canal between 1843–49 (Desjardins and Poulin 1993: 21; Savard 1992: 35). But because of the number of tracks, their east-west orientation perpendicular to the canal, and their stratigraphic level, we discarded this hypothesis. Nevertheless, one railroad (FIG. 8: 111G3C31) situated around 40 cm higher than the others and oriented north-south, could have been used for the transportation of stones and earth during the reconstruction of the canal. Therefore, the railroads would have been in use between 1825–1849.

We superimposed the location of those railroads over an 1844 map illustrating the old canal (FIG. 8). It associates the railroads with stores and warehouses located along De la Commune Street. In 1844, the identified tenants were Hooker & Henderson, McPherson Crane & Co., Murray & Sanderson, Ross Mathick & Co., and Quebec Forwarding Company.

Three of these companies, Hooker & Henderson, McPherson Crane & Co., and Quebec Forwarding Company, were forwarding agencies. Hooker & Henderson, specializing in shipping and brokerage, was founded in January 1825 by James Henderson of Montreal and Alfred Hooker of Prescott. Henderson died 22 March 1845; Luther Hamilton Holton took his place, and the firm changed its name to Hooker & Holton (Klassen 1972: 387). This firm cooperated with Macpherson & Crane and H & S Jones to form a coalition that controlled the commerce on the Upper St. Lawrence River. Three of the tracks were oriented toward the property of Hooker & Henderson (FIG. 8).

McPherson Crane & Co. was the most important forwarding agency between 1830 and 1850. The principal shareholder was John Macpherson of Kingston who had establishments in Prescott and Montreal. Samuel Crane, an associate in a forwarding agency established in Lachine, joined the Macpherson company and founded around 1831 a new company under the successive names of Macpherson and Crane, Macpherson, Crane and Company, and S. Crane and Company (Pietersma 1972: 202). The company became associated with the Ottawa and Rideau Forwarding Company in 1836, thus gaining easy access to the new Rideau Canal. In 1841, Macpherson and Crane owned 40 barges and 5 schooners, the type of boats used on the Lachine Canal. Three of the tracks were oriented toward their property including the one with wooden rails (3C28 inf.).

We do not know a lot about the other companies but it seems clear that, like the former two, they were related to transportation on the Lachine Canal. The trade name of Quebec Forwarding Company is quite explicit. There is a track linked with each of these companies. The role of these companies in the forwarding, shipping, and brokerage business indicates that they were using the tracks for loading and unloading goods along the canal. The importance of at least two of the companies which controlled the commerce on the Upper St. Lawrence River justified the need for these efficient installations.

Much historical research has been undertaken in recent years concerning the history of the canal, but none pertain to the use of these primitive railroads. The only explicit mention of such railroads was found in the 1831 *Commissioners' Annual Report*. The merchants made a request to the Commissioners to build a new basin closer to their stores. The latter argued that it was not necessary because some merchants such as McPherson & Crane were using "railroads" to communicate between their stores and the canal. Supposedly, these railroads were installed following the Commissioners' recommendation the previous year. This reference confirms the existence before 1831 of such railroads to facilitate the transportation of goods by the merchants between their stores and the canal. Figure 8 shows that two tracks (3C28), one over the other, are in line with the McPherson store. The lower track seems the older according to the stratigraphic context, and is the only one with non iron-capped wooden rails which can be dated from 1830 or earlier.

The use of this kind of transportation was very popular if we look at the number of

tracks built side by side. The length of the recovered section is too short to see if these tracks were separate lines or a network. To know more about this it will be necessary to follow these tracks inside the blocks. Unfortunately this sector was massively built and the possibility of finding the old tracks is quite small.

The archaeological data about the tracks themselves provide information about the wheels running on them. Indeed the groove on the rails of one track and the inverted-T shaped iron plate might indicate that the wheels of the cars running on those tracks were flanged, although the wheels might have been made of wood, cast-iron, or wrought-iron. The Eagle Foundry situated in this area started producing cast iron wheels in 1832. At the present time it is difficult to make inferences about the type of cars used.

Another interesting point about these railroads is their particular mode of construction. They have the form of sidewalks, which is quite appropriate in this sector where the soil is silty and becomes quite muddy and slippery when wet. It would not be surprising to find that the wagons were horsedrawn, but we have found no traces of horseshoes or horsedung to confirm this. So, without such evidence, we must also consider the possibility of human traction as was often the case in the mines.

The 1830s also saw the development of the first locomotive railways. The first one in the Montreal region was built in 1836, between St. Johns and Laprairie. In 1847 the first locomotive railway was established between Lachine and Montreal, along the canal. Even if locomotives were known in the 1830s it is likely that the cost of these innovations was too great for use on so short a distance. Although the Eagle Foundry, situated on Queen Street near the lower entrance of the canal, specialized in the production of steam engines, it is not clear that locomotives were manufactured for the primitive railroad network. If so, the event would have been published in the contemporary newspapers; no such reference has been located.

Conclusion

The wooden tracks recovered along the Lachine canal illustrate the strong link between the canal and the commercial activities of the Montreal merchants. It shows their energy and their talent for innovation. These tracks are the earliest ones found in Montreal, and are probably the first evidence of the use of this kind of transportation in Canada. Montrealers of that period were indeed aware of all the new developments of an industrial nature, and evidence indicates that new technological innovations spread quickly.

I trust this article will promote an interest in primitive railroads such as those found along the Lachine Canal and help other archaeologists in the interpretation of this kind of structure. We were fortunate enough to find nine examples of these tracks, in a good state of preservation, which allowed us to recognize them as short wooden lines. The archaeological monitoring conditions did not always permit other such discoveries. I would be very interested to know about other comparable archaeological examples of such lines in connection with a canal or a port or in a mining context.

Acknowledgments

This paper is a part of my dissertation concerning the impact of the Lachine Canal on Montrealers during the 19th century. I would like to thank the Old Port of Montreal Corporation for their authorization to use all the data we recovered during the five-year archaeological project, as part of the redevelopment of the old section of the port of Montreal including the lower entrance of the Lachine Canal. My Ph.D. research was made possible with a grant from the Fonds pour la Formation de Chercheurs et l'Aide à la Recherche (FCAR). I would also thank the members of the jury for the student competition at the 1997 CNEHA conference for their support, and particularly Karen Bescherer Metheny for her splendid encouragement and the reviewers for their pertinent comments. A special thanks to

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References

Andreae, Christopher
1997 *Lines of Country: An Atlas of Railway and Waterway History in Canada.* The Boston Mills Press, Erin (Ont.).

Ayris, Ian, John Nolan, and Andrew Durkin
1998 The Archaeological Excavation of Wooden Waggon Ways Remains at Lambton D Pit. *Industrial Archaeology Review* 20: 5–22.

Bergeron, Mario
1992 *La surveillance archéologique au secteur Bonsecours en 1990–1991.* Société du Vieux-Port de Montréal, Montreal.

Cartier, François
1999 *Canal de Soulanges: d'un défi à l'autre-Meeting the Challenges.* Société de développement du canal de Soulanges, Vaudreuil-Soulanges.

Contant, Isabelle
1982 *Canal Lachine: dossiers structuraux. Évolution du site de la zone des écluses de Montréal.* Vol. 7. Parcs Canada, Québec.

Cossons, Neil
1993 *The BP Book of Industrial Archaeology.* David & Charles Books, Newton Abbot.

Desjardins, Pauline
1999 L'organisation spatiale du corridor du canal de Lachine au 19e siècle. Ph.D. diss., Université de Montréal, Montréal.

Desjardins, Pauline, and Louise Pothier
1989 *Étude de potentiel archéologique du territoire du Vieux-Port de Montréal.* Volume 1. Le Vieux-Port de Montréal, Montréal.

Desjardins, Pauline, and Christian Poulin
1993 *Les écluses de Montréal-Canal de Lachine.* Société du Vieux-Port de Montréal, Montréal.

Gordon, Robert B., and Patrick M. Malone
1994 *The Texture of Industry: An Archaeological View of the Industrialization of America.* Oxford University Press, New York.

Grenter, Stephen
1993 A Wooden Waggonway Complex at Bersham Ironworks, Wrexham. *Industrial Archaeology Review* 15(2): 195–207.

Heisler, John P.
1973 *The Canals of Canada.* Department of Indian Affairs and Northern Development, National Historic Sites Service, National and Historic Parks Branch, Ottawa.

Hughes, Stephen
1990 *The Archaeology of an Early Railway System: The Brecom Forest Tramroads.* Royal Commission on Ancient and Historical Monuments in Wales, Aberystwyth.

Jones, N. W.
1987 A Wooden Waggon Way at Bedlam Furnace, Ironbridge. *Post-Medieval Archaeology* 21: 259–262.

Klassen, H. C.
1972 Luther Hamilton Holton. In *Dictionnaire Biographique du Canada* 10: 387–391. Les Presses de l'Université Laval, Québec.

Modelski, Andrew M.
1984 *Railroad Maps of North America, the First Hundred Years.* Library of Congress, Washington, DC.

Morriss, Richard K.
1999 *The Archaeology of Railways.* Tempus Publishing Ltd., Arcadia, Charleston, SC.

Morton, A. C.
1847 Report on the Gauge for the St. Lawrence and Atlantic Rail-road [microform]. *Canada Gazette*, CIHM/ICMH *Microfiche series* no.38249, Montreal.

Pietersma, Harry
1972 Samuel Crane. In *Dictionnaire Biographique du Canada* 8: 202–203. Les Presses de l'Université Laval, Québec.

Savard, Mario
1992 *La surveillance archéologique au canal de Lachine en 1990–1991: Les écluses de Montréal—Dossier technique*, vol. 6. Montréal, Société du Vieux-Port de Montréal, document inédit.

Shaw, Ronald E.
1990 *Canals for a Nation: The Canal Era in the United States.* The University Press of Kentucky, Lexington.

Spangenburg, Ray, and Diane K. Moser
1992 *Connecting a Continent: The Story of America's Canals.* Facts On File, New York.

White, John H., Jr.
1976 Tracks and Timber. *IA, The Journal of the Society for Industrial Archeology* 2: 35–46.

Tulchinsky, Gerald J. J.
1960 The Construction of the First Lachine Canal, 1815–1826. M.A. thesis, McGill University, Montréal.

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