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Building the Burlington Bay Canal

The Staples Thesis and Harbour Development in Upper Canada, 1823-1854

Rod Millard

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Résumé de l'article

Cet article examine la construction du Canal de Burlington Bay, la première amélioration interne financée par le gouvernement du Haut-Canada. Conçu en 1824 pour créer une entrée a un port naturel situé à la tête du Lac Ontario, ce fut aussi un fiasco technique, financier et politique. En utilisant l'approche de la Staples thesis, cette étude explore les raisons des problèmes du canal.

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The Staples Thesis and Harbour Development in Upper Canada, 1823-1854

by Rod Millard

Abstract

This article examines the construction of the Burlington Bay Canal, Upper Canada's first government-financed internal improvement. Designed in 1824 to create an entrance to a natural harbour at the head of Lake Ontario, the canal was an engineering, financial and political fiasco. Using a staples thesis approach, this study explores the reasons for the canal's problem.

Résumé: *Cet article examine la construction du Canal de Burlington Bay, la première amélioration interne financée par le gouvernement du Haut-Canada. Conçu en 1824 pour créer une entrée a un port naturel situé à la tête du Lac Ontario, ce fut aussi un fiasco technique, financier et politique. En utilisant l'approche de la Staples thesis, cette étude explore les raisons des problèmes du canal.*

The Burlington Bay Canal was built to provide a harbour at the head of Lake Ontario. Designed in 1824 by a British engineer and constructed by an American contractor, the canal cut across Burlington Beach, a long narrow sandbar separating Lake Ontario from Burlington Bay, (renamed Hamilton Harbour in 1919), to form an entrance to a natural harbour. It was Upper Canada's first government-financed internal improvement, and an important factor in the rise of Hamilton. Together with other lower Great Lakes harbours, the Burlington Bay Canal was an essential part of the Great Lakes-St. Lawrence transportation system during the pre-railway era. By 1959, the canal gave Hamilton access to the St. Lawrence Seaway, the world's longest navigable inland water-way. During its construction in the 1820s and '30s, however, the Burlington Bay Canal was an engineering, financial, and political fiasco. It collapsed several times, cost more than expected, and generated political controversy. Were these problems due to local factors, or external forces, particularly the Imperial trading system before mid-century? To date, there is no scholarly study of the canal's construction and historical significance.[1]

The key to understanding Canada's

[1] For the historical importance of ports, see Adrian Jervis, "Introduction," *Port and Harbour Engineering*, edited by Adrian Jervis (Aldershot: Ashgate Publishing Limited, 1998), xiii-xxxiv. The most

development, according to Harold Innis, the principal proponent of the staples thesis, was its peripheral position within Imperial trading systems characterized by a discrepancy between European metropolitan centres and the North American hinterland. Although Innis did not have a theory, or model of economic growth,[2] he developed an original interpretation of Canadian history that focused on the international economy centred in Europe. He assumed that new countries develop in relation to older ones. Noting Canada's dependence on trade, he stated that "Canada has never been self-sufficient, and her existence has depended primarily on trade with other countries."[3] European demand for staple commodities initiated this trade; British industry later sustained it. Innis explained the dynamics of this process in the following passage:

> Into the molds of the commercial period, set by successive heavier and cheaper commodities, and determined by geographic factors, such as the St. Lawrence River and the Precambrian formation; by cultural considerations, such as the English and French languages; by technology, such as the canoe and the raft; by business organization, such as the North West Company and Liverpool timber firms; and by political institutions peculiar to France and England, were poured the rivers of iron and steel in the form of steamships and railways which hardened into modern capitalism. Improved transportation, increasing specialization in Great Britain, the spread of machine industry in relation to coal and iron, and migration of population to urban centres involved imports of wheat, live-stock, and dairy products from North America for foodstuffs, cotton from the United States and wool from Australia for clothing, timber from Canada and New Brunswick for housing, and raw materials for manufacturing, and exports of manufactured products. Steamships and railways lowered costs of transportation and

comprehensive study of a Canadian port is Christopher Andreae's, "Evolution of the Port of Quebec, 1858-1936" (Ph.D. diss., The University of Western Ontario, 2005). Hamilton Harbour's maritime history was chronicled by Ivan S. Brookes, *Hamilton Harbour, 1826-1901* (2001) chapter 1 <http://www.aritimehistoryofthegreatlakes.ca.documentsbrookes/>Nancy Bouchier and Ken Cruikshank examine the social and environmental history of Hamilton Harbour in *The People and the Port: A Social and Environmental History of Hamilton Harbour* (Vancouver and Toronto: UBC Press, 2016). For two recent studies of the St. Lawrence Seaway, see Ronald Stagg, *The Golden Dream: A History of the St. Lawrence Seaway* (Toronto: Dundurn Press, 2010) and Daniel Macfarlane, *Negotiating a River: Canada, the US, and the Creation of the St. Lawrence Seaway* (Vancouver and Toronto: UBC Press, 2014). The reference to the Seaway's length is from p. 17.

[2] Methodologically, Mel Watkins writes, "Innis' staple approach was more technological history writ large than a theory of economic growth in the conventional sense." M.H. Watkins, "A Staple Theory of Economic Growth," in *Approaches to Canadian Economic History*, edited by W.T. Easterbrook and M.H. Watkins (Toronto: McClelland & Stewart, 1967), 50. Stating that the staple thesis cannot be proven right or wrong, H.G.J. Aitken prefers the term 'staples approach,' because it "suggests not a series of testable propositions but a frame of reference, a point of view, a perspective, a way of seeing the data...." H.G.J. Aitken, "Myth and Measurement: The Innis Tradition in Economic History," in *Canadian Economic History: Classic and Contemporary Approaches*, edited by M.H. Watkins and H.M. Grant (Ottawa: Carleton University Press, 1993), 41. On this point, see Robin Neill, *A New Theory of Value: The Canadian Economics of H.A. Innis* (Toronto: University of Toronto Press, 1972), 56.

[3] Harold A. Innis, "The Teaching of Economic History in Canada," in *Essays in Canadian Economic History*, edited by Mary Q. Innis (Toronto: University of Toronto Press, 1956), 11.

> hastened the shift to imports of bulky, low value, and perishable commodities from more adjacent regions....[4]

The nature and timing of British demand for staples, facilitated by the right geographical, technological, and social conditions, explained Canadian economic development.

Innis considered the possibility that colonial agriculture and the flood of cheap staples into Europe from abroad, not European demand, drove economic growth. In his seminal article, "Significant Factors in Canadian Economic Development," however, he rejected this idea by attacking Adam Smith's conclusion that the improvement of the country preceded that of cities. Quoting Smith, Innis wrote: "[T]hrough the greater part of Europe the commerce and manufactures of cities, instead of being the effect, have been the cause and occasion of the improvement and cultivation of the country...."[5] Innis cites Smith to show that cheap water transportation opened North America to European manufactured goods and brought North American staples into the European market. "Cheap water transportation from Europe to North America," he argued, "stimulated commerce and brought 'improvement and cultivation of the country.'"[6]

Technology, especially transportation technology, was central to Innis's vision. It was the medium through which British demand was realized. By 1929, he had worked out a coherent interpretation of Canadian economic development that, as his biographer Alexander John Watson notes, "revolved more around transportation systems than around staples."[7]

There has been some confusion about Innis's interpretation. Douglas McCalla, for example, writes:

> There is, however, a growing body of literature that questions the utility of this type of [staples] model, which in Canada is based particularly on Harold Innis' arguments on staple products and *export-led* growth, in explaining actual economic development in the past in regions such as Upper Canada....[8]

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[4] Harold A. Innis, "The Penetrative Powers of the Price System," *The Canadian Journal of Economics and Political Science* 4:3 (1938), 305-306.

[5] Harold A. Innis, "Significant Factors in Canadian Economic Development," in *Essays in Canadian Economic History*, 201.

[6] *Ibid*., 202.

[7] Alexander John Watson, *Marginal Man: The Dark Vision of Harold Innis* (Toronto: University of Toronto Press, 2006), 149. In 1958, Kenneth Buckley made a similar point. He argued that Innis, focusing on the international economy centred in Europe, thought that, "technology was more fundamental than natural resources and he paid special attention to techniques of transportation and communication." Kenneth Buckley, "The Role of Staple Industries in Canada's Economic Development," *Journal of Economic History* 18:4 (1958), 440.

[8] Emphasis added. To make this point, McCalla states: "As research on similar issues in American history has convincingly demonstrated, interregional and export trades did not typically have the growth-generating effects postulated by staples theory of the Innis-Callendar-North variety; volumes simply were not large enough to account for the economic development that occurred." Douglas McCalla, "The Internal Economy of Upper Canada: New Evidence on Agricultural Marketing Before 1850," in *Historical Essays on Upper Canada: New Perspectives*, edited by J.K. Johnson and Bruce Wilson (Ottawa: Carleton

Here, the crucial distinction is obscured between 'export-led' growth—colonial producers pushing staples into the British market (McCalla's version of Innis)—and 'demand-led' growth—British demand pulling staples into Britain (Innis). McCalla reverses Innis to agree with Smith, and casts Innis as the founder of a theory of export-led growth. Innis, however, explicitly rejected this, a point recognized by his critics, such as Kenneth Buckley.[9] Ironically, Innis would have agreed with McCalla on one important point: Upper Canada's economy before mid-century was not driven by wheat exports.[10] In fact, the lack of significant demand for Upper Canadian wheat flour had a profound impact on the construction of the Burlington Bay Canal.

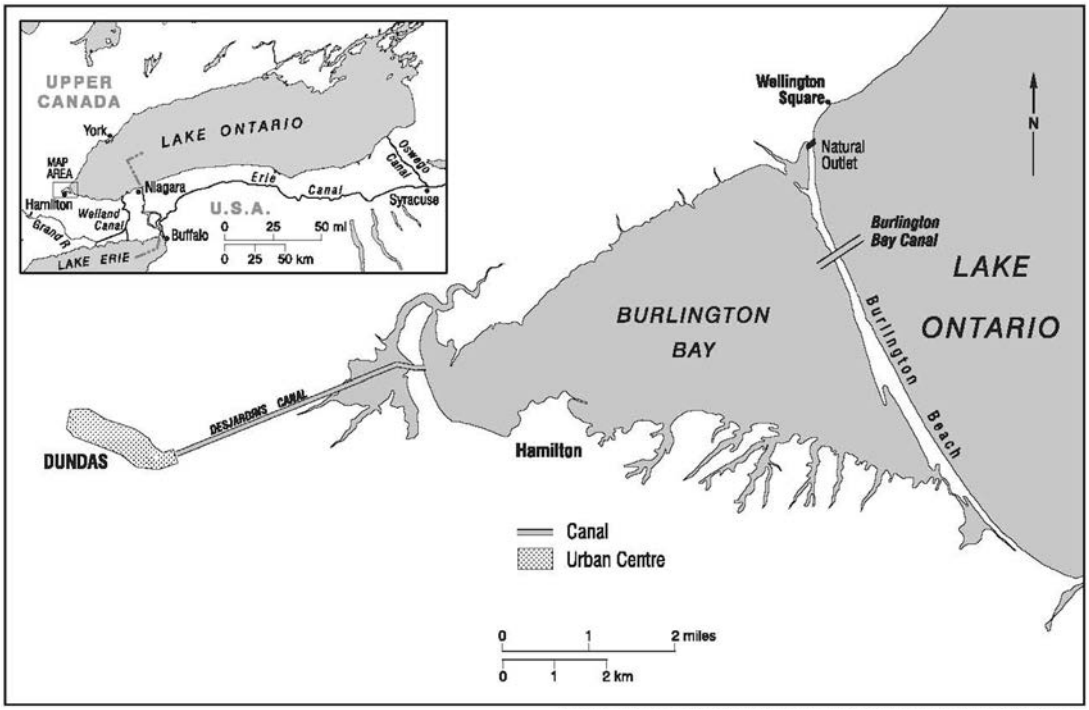
The initiative to build the Burlington Bay Canal coincided with the revival of Upper Canada's grain trade following the 1819-21 depression and the relaxation of the Corn Laws (1822) that granted British provinces some preferential access to the British market. Wheat was Upper Canada's principal and only significant cash crop. In 1823, over 14,000 barrels of flour were shipped from Burlington Beach at the western end of Lake Ontario.[11] More exports were expected as newly-cleared land came under cultivation in the back-country. Located at the head of Lake Ontario on Burlington Bay,

University Press, 1989), 238. (This essay was originally published in *Agricultural History,* 59 [1988], 397-416). McCalla does not cite any of Innis's works in this essay. In his book, *Planting the Province: The Economic History of Upper Canada, 1784-1870* (Toronto: University of Toronto Press, 1993), he continues to refer to American authors and studies to discredit the staples thesis, but Innis's name is not mentioned. See *Ibid.*, 4-5. On the evolution of McCalla's thinking on the role of the wheat and pine staple in Upper Canada, and, especially, his focus on the economy's complexity and variety, see Douglas McCalla, "A World Through Commerce: Explorations in Upper Canada (and Beyond)," *Canadian Historical Review* 97:2 (June 2016), 257-70.

[9] See Buckley, "The Role of Staple Industries in Canada's Economic Development," 440, 442. "While Innis did not subscribe to a staple theory of economic growth," Buckley argued, "he did use the staple approach to correlate a wide range of political and social developments and explain the character of major institutions within Canada. He wrote an economic interpretation of Canadian history." *Ibid.*, 442

[10] For a review of the principal writers, beginning with Harold Innis and W.A. Mackintosh, that promoted the idea that wheat exports to Britain before mid-century drove Upper Canada's economic development, see R. Marvin McInnis, *Perspectives on Ontario Agriculture, 1815-1930* (Gananoque: Langdale Press, 1992), 21-26. McInnis notes, however, that neither Innis nor Mackintosh elaborated on Upper Canadian wheat staple. *Ibid.*, 22. On the impact of Innis and the staples thesis on Canadian and international scholars, see Douglas McCalla, "Making a Country (and an Economy): Economic History in Canada," in *Routledge Handbook of Global Economic History*, edited by Francesco Boldizzoni and Pat Hudson (London: Routledge, 2016), 55-72. Paul Kellogg critiques the staples approach used by left nationalist writers after 1960. See Paul Kellogg, *Escape from the Staple Trap: Canadian Political Economy after Left Nationalism* (Toronto: University of Toronto Press, 2015).

[11] Library and Archives Canada (hereafter LAC), RG 1, E 3, vol. 13, Upper Canada State Papers, Memorandum, unsigned, undated (approximately 1 Dec.1828), 50-56. By 1850, Hamilton, according to John McCallum, "exported more wheat and flour than any other town except Port Dalhousie, located at the mouth of the Welland Canal." John McCallum, *Unequal Beginnings: Agricultural and Economic Development in Quebec and Ontario until 1870* (Toronto: University of Toronto Press, 1980), 61-62.



Burlington Bay canal. Map produced by the GIS and Cartography office, Dept. of Geography, University of Toronto.

Hamilton (scarcely a village in 1823) was ideally situated to conduct a thriving trade with its large and fertile hinterland reaching back to London on the Thames River. It was the gateway to the south-western peninsula.[12] Mill owners and ship owners were eager to exploit this potential. Transportation was central to achieving their ambition.

Before the construction of railways at mid-century, water transportation was the only way to ship bulky, low-value commodities, such as wheat and flour, over long distances in British North America.

[12] John C. Weaver, *Hamilton: An Illustrated History* (Toronto: James Lorimer & Company and the National Museum of Man, 1982), 20. In 1851, surgeon-dentist William Henry Smith wrote that Hamilton was "admirably situated for carrying on a large wholesale trade with the West, being at the head of navigation of Lake Ontario, and in the heart of the best settled portion of the Province, it possesses peculiar advantages for receiving goods, and distributing them through the interior, while its central position makes it the depot of a large extent of grain and other produce." (W.H. Smith, *Canada: Past and Future, Being A Historical, Geographical, Geological and Statistical Account Of Canada West*, vol. I [1851; Belleville: Mika Publishing, 1973], 223). Also see *Hamilton Free Press* 7 July 1831. By the mid-1840s, Hamilton was already the second largest urban area in the province. (McCalla, *Planting the Province*,177). At the beginning of the wheat boom in 1851, wheat production was concentrated in the older settled townships in a narrow band from the mid north shore of Lake Ontario at Port Hope township, west to the north of Toronto and around the head of the lake at Dundas. This area benefited from good soil and proximity to water transportation. McInnis, *Perspectives on Ontario Agriculture*, 39.

Although the Great Lakes and St. Lawrence River flowed over 2,300 miles from the heart of the continent, Niagara Falls and the St. Lawrence rapids blocked ship navigation. Costly transshipments resulted.[13] By the late 1840s, however, the Welland and St. Lawrence canals overcame these barriers. Meanwhile, there was another obstacle to realizing cheap water transportation on the lower Great Lakes for Britain's first inland colony.

Upper Canada had few natural harbours. As late as 1826, with the exceptions of Kingston, York (Toronto) and Niagara (Niagara-on-the-Lake), there were few places on Lakes Erie or Ontario, where a sailing vessel could be loaded directly from land. Elsewhere, produce in heavy barrels was moved by row boats or lighters from the shore, or privately owned wharves to anchored schooners.[14] Moreover, there were few sheltered bays or inlets, such as the Bay of Quinte on Lake Ontario, or Lake Erie's Long Point where ships could ride out a storm, make repairs, or lay up for the winter. Harbours, therefore, were essential.

Between 1823 and 1830, five major government-owned, or government-subsidized harbours were constructed at Cobourg, Port Hope, Burlington, and Port Dalhousie on Lake Ontario, and Port Stanley on Lake Erie. The most controversial of these was located on Burlington Beach. Although a road along the Beach shortened the journey from York to Niagara by fifteen miles, (in 1958 it became the foundation for the Burlington Skyway), the Beach blocked shipping from Lake Ontario into Burlington Bay. In 1828, Basil Hall, a British travel writer and former Royal Navy officer described the Beach as a "natural dam, or breakwater, which lies across the mouth of Burlington Bay, at the extreme western end of Lake Ontario." He observed that the Beach was, "six miles long, nearly straight, and rises about 12 or 15 feet above the level of the lake. It varies from 40 to 100 yards in width, is formed entirely of sand, and covered with oaks."[15] To Hall, it was "the most extraordinary thing of the kind I ever saw." The only water access across the Beach was a natural outlet located about three quarters of a mile from the north shore of the lake and bay. The out-

[13] Shipping costs from Montreal to Prescott, the head of navigation on the St. Lawrence for eastern Lake Ontario, were greater than the cost of shipments from Liverpool to Montreal. Kenneth Norrie, Douglas Owram and J.C. Herbert Emery, *A History of the Canadian Economy* 3rd edition (Toronto: Nelson, 2002), 101.

[14] For a description of this process, see J.A. Bannister, "Some North Shore Ports, Part I," *Inland Seas*, 18:4 (1960), 303. Schooners were the workhorse of lakes Ontario and Erie. These vessels had two masts and were built initially with shallow drafts to cross sandbars at harbour entrances. If the whole foremast was fully rigged, they were sometimes called a brigantine or brig. Don Bamford, *Freshwater Heritage: A History of Sail on the Great Lakes, 1670-1918* (Toronto: Dundurn, 2007), 174-76.

[15] Basil Hall, *Travels in North America, in the Years 1827 and 1828,* 2nd edition (Edinburgh: Cadell, 1830), 134. "The beach," Lady Simcoe wrote in 1795, "is like a park covered with large spreading oaks." *Mrs. Simcoe's Diary*, edited by Mary Qualye Innis (Toronto: Macmillan of Canada, 1965), 182. Similarly, Peter Russell, Upper Canada's first Receiver General, thought that the Beach resembled "a nobleman's deer park." *Colonial Advocate* 11 July 1827.

let, however, was suitable only for shallow draft boats. Cargo, therefore, had to be poled through the outlet, or hauled across the Beach, stored and then transferred to schooners on Lake Ontario.[16] Cutting a channel across the Beach would solve this vexing transportation problem that increased shipping costs and slowed local development. It would transform Burlington Bay into a magnificent fifteen square-mile natural harbour, larger and deeper than York's harbour, and capable of sheltering the entire Royal Navy. The commercial and military advantages were obvious to residents.

The idea was not new. In 1819, a Royal Navy officer had urged the Navy Board to construct a canal large enough for warships. Communications then could be opened to the Grand River and beyond (perhaps by a boat canal) thereby avoiding the risk of transporting stores to the Niagara frontier in wartime. Four years later, Upper Canada's Commission for Internal Navigation, created in 1821, made a similar recommendation. The commissioners engaged civil engineer Samuel Clowes to locate a site for a canal on Burlington Beach, and then survey a canal route between Burlington Bay and the Grand River.[17]

Two merchants, James Crooks and William Chisholm, took the lead to build the Burlington Bay Canal. Born in 1778 in Scotland, Crooks was a War of 1812 veteran, a militia colonel, and a prominent West Flamborough mill and ship owner. He exported flour and potash on Lake Ontario, and staunchly promoted domestic manufacturing and transportation improvements. In 1818, he served as a member of a joint Upper and Lower

[16] Joseph Bouchette, *The British Dominions in North America*, vol. I (1831; New York, AMS Press, 1968), 152. Mill sites at Albion Mills, Ancaster, Dundas, and Crooks Hollow had no direct water link with Lake Ontario. Mill owner Richard Hatt and his brother Samuel, for example, had to move barrels of flour in shallow-draft scows down Spencer Creek to a swamp, known as Cootes Paradise, before entering and crossing Burlington Bay, and then passing through the outlet to the lake side of the Beach, where their cargo was transferred to anchored schooners. (Joan and John Weaver, "Peter Desjardins," *Dictionary of Hamilton Biography,* vol. I [1981], 60). Although the outlet was too small for schooners, in 1813 Commodore Sir James Yeo, pursued by an American squadron, managed to pass through the outlet aided by high waters and a skilled local pilot. (Frank L. Jones, "The Burlington Races," *Wentworth Bygones* 5 [1963], 71). In the same year, however, Royal Navy Lieutenant David Wingfield had considerable difficulty navigating the outlet with his schooner after he had removed its masts, gun and stores. (David Wingfield, *Four Years on the Great Lakes, 1813-1816: The Journal of Lieutenant David Wingfield, Royal Navy*, edited by Don Bamford and Paul Carroll [Toronto: Dundurn, 2009], 73). Shipmasters were not likely to use the outlet, Ivan S. Brookes maintained, because it could be blocked by gravel during easterly gales. Brookes, *Hamilton Harbour, 1826-1901*, chapter 1. Later, the outlet was filled in after the Burlington Bay Canal was built. Marjorie Freeman Campbell, *A Mountain and a City: The Story of Hamilton* (Toronto: McClelland & Stewart, 1966), 62.

[17] Metropolitan Toronto Reference Library, Marilyn and Charles Baillie Special Collections Centre, Baldwin Collection, Upper Canada, Commissioners for Internal Navigation, "First Report of the Commissioners appointed by his Excellency the Lieutenant Governor, in conformity to the provisions of an Act passed in the second year of His Majesty's reign, entitled, 'An Act to make provision for the improvement of the internal navigation of this Province.'" in Reports of the Commissioners for Internal Navigation (Kingston, 1826), 10.

William Chisholm. Courtesy of the Oakville Historical Society.

Canada committee on improving navigation on the St. Lawrence. William Chisholm, ten years Crooks' junior, also a War of 1812 veteran, came from a prominent Scottish loyalist family that, together with the Brant family, controlled the forwarding business at the outlet on Burlington Beach. Chisholm owned a small fleet of schooners, built ships at the Beach, and was involved in the timber trade.[18] For these men and other members of the merchant community at the head of the Lake, the Burlington Bay Canal idea was part of a larger, more ambitious scheme to capture the trade of the western interior. They planned later to join the Desjardins Canal (1826-37) linking Dundas with Burlington Bay, with the Grand River, and then extend the navigation system to the Thames River.[19]

Elected to the House of Assembly in 1820, Crooks and Chisholm gained support for the Burlington Canal. They stressed its military value (an important consideration for Lieutenant-Governor Sir Peregrine Maitland),[20] and promoted the canal as an essential public work that would pay for itself with tolls generated by the trade of an expanding agricultural hinterland. By 1823, there was broad public support in Upper Canada for transportation improvements to counter American canal-building initiatives aimed at acquiring the western grain trade, and to reverse the province's slow economic growth made worse by depression.[21] Canal-building, in particular, generated

[18] David Ouellette, "James Crooks," *Dictionary of Canadian Biography* (hereafter *DCB*) 8 (1985), 185-88; Walter Lewis, "William Chisholm," *Ibid.* 7 (1988), 177-79.

[19] LAC, RG 5, A 1, vol. 67, Civil Secretary's Correspondence, Upper Canada Sundries (hereafter UCS), 35339-43, Robert Barrie to Sir Peregrine Maitland, 15 June 1824. By January 1828, however, these ambitions came sharply into conflict with W.H. Merritt's plans to make the Grand River part of the Welland Canal system. *Gore Gazette* 5 Jan. 1828; 19 Jan. 1828; Guy St- Denis, "An Erie Canal for Western Upper Canada: A Forgotten Episode in Ontario's Transportation Evolution," *Ontario History* 85:3 (1993), 238-39.

[20] See F.M. Quealey, "The Administration of Sir Peregrine Maitland," (Ph.D. diss., University of Toronto, 1968), 280; George K. Raudzens, "The Military Impact on Canadian Canals, 1815-1825," *Canadian Historical Review,* 54:3 (1973), 273-86.

[21] On the drive to develop the province's agricultural resources for British markets by transportation

much popular enthusiasm. As J.P. Merritt, son and biographer of the Welland Canal promoter, William Hamilton Merritt, put it: "a mania for canalling seemed to possess the people."[22] On 19 March 1823, *an Act to provide for constructing a navigable canal between Burlington Bay and lake Ontario,* became law. It authorized the Receiver General to raise £5,000 upon debentures, redeemable in sixteen years, to build a canal forty feet wide and ten feet deep. Five appointed commissioners would manage the project. A schedule of tolls was listed to repay the loan plus interest. Tolls would be collected when the canal opened. Later, the commissioners could set a rate adequate to keep the canal in good repair.[23]

Unfortunately, the canal was obsolete before it was built; it was too small for steamships and warships. The *Frontenac,* Lake Ontario's first steamship, for example, drew 9 feet, 6 inches when fully loaded. Larger than Nelson's *Victory, HMS St. Lawrence,* a 112-gun first-rate ship of the line, drew 20 feet, 6 inches and was 50 feet, 8 inches wide. On 20 May 1823, the *Frontenac*'s owners, and some Kingston residents complained to Maitland that a monopoly was being created at Burlington Beach in favour of schooners, to the exclusion of steamships and warships. In the interest of freer commerce, and naval necessity, they urged that construction be delayed until funds could be voted to build a larger canal.[24]

Not only was the proposed canal too small, it was underfunded. In December, after examining exports and imports from Burlington Beach during 1823, Crooks and Chisholm realized that the projected toll revenue would be insufficient to build and maintain the canal. They petitioned Maitland to increase the loan to £8,000, adding that, for want of a harbour, three ships had been driven ashore at the outlet that year.[25] On 9 January 1824, the Act was amended to enlarge the canal to a width of 72 feet, a depth of 12 feet, and to increase the loan to £8,000, a sum equivalent to thirty-five percent of the province's 1822 total revenue. Receiver General John Dunn was pessimistic about raising the money because of the lengthy time (fourteen years) to redeem the debentures.[26] The gov-

improvements, see Robert Lochiel Fraser III, "Like Eden in Her Summer Dress: Gentry, Economy, and Society; Upper Canada, 1812-1840," (Ph.D. diss., University of Toronto, 1979), chapter 4. Science and technology would help the province achieve this goal. See Lawrence Fallis Jr., "The Idea of Progress in the Province of Canada, 1841-1867," (Ph.D. diss., University of Michigan, 1966), 100-27.

[22] J.P. Merritt, *Biography of the Hon. W.H. Merritt...* (St. Catharines: E.S. Leavenworth, 1875), 81.

[23] Statutes of the Province of Upper Canada, 4 Geo. IV c. 8 (1823).

[24] LAC, UCS, RG 5, A 1, vol. 60, pp. 31854-55, Thomas Markland *et al.* to Maitland, 20 May 1823; *Ibid.*, vol. 63, 33676, Robert Moore to Anon., 26 Nov. 1823; *Ibid.*, 33667, John Macaulay to Anon., 24 March 1824, 33677. David Lyon and Rif Winfield, *The Sail and Steam Navy List: All the Ships of the Royal Navy, 1815-1889* (London: Chatham Publishing, 2004), 85.

[25] LAC, UC, UCS, vol. 75, 40059-90, Enclosure no. 1, James Crooks to Major Hillier, and Enclosure no. 2, Petition from James Crooks and William Chisholm to Sir Peregrine Maitland, 5 Dec. 1825.

[26] Great Britain, Colonial Office Records, CO 42, vol. 370, p. 219. LAC, MG 11, Statement of Income and Expenditure of Upper Canada for 1822 enclosed in Sir Peregrine Maitland to Robert Wilmot

ernment, however, borrowed £24,000, two-thirds for public service and the remainder for the canal. Although the canal promoters had stressed its military importance, and Maitland hoped in vain that the Admiralty would pay for it, the larger canal still would not be big enough to admit the largest warships.[27]

Dissatisfied with the original Act, Maitland waited until 16 April 1824 before he appointed five canal commissioners—Thomas Clark, James Crooks, William Chisholm, Manuel Overfield, and John Wilson. Clark, a wealthy Niagara merchant and member of the Legislative Council was appointed president; Crooks became vice-president, later succeeding Clark as president.[28] The commissioners then engaged Francis Hall, a thirty-two year-old Scottish civil engineer who had immigrated to Upper Canada in 1823 and was supervising the erection of the Brock Monument. Hall was, according to Roberta Styran and Robert Taylor, "the best-educated and most influential of the British-trained civil engineers in British North America in the 1820s and '30s." He had attended Edinburgh University and gained valuable experience on projects such as the Edinburgh and Glasgow Union Canal.[29] His work under Thomas Telford, one of Britain's most celebrated engineers, impressed the commissioners.

Hall estimated that the canal would cost £8,012-7-1, only a few pounds more than the province had just voted. He was contracted to design and superintend the canal's construction by 1 October 1825 for a fee of £400.[30] Three American con-

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Horton, 20 Sept. 1823. Total income is listed as £23,794-4-0-1/4; LAC, UCS, RG 5, A 1, vol. 66, 34656-57, John H. Dunn to Hillier, 12 March 1824. In 1821-22, Upper Canada first experimented with public borrowing by issuing debentures, obtaining £25,000 through the Bank of Upper Canada and the firm of Clark and Street. McCalla, *Planting the Province*, 167.

[27] LAC, MG 11: CO 42, Upper Canada, 1824 Dispatches, vol. no. 373: vol. 2, 151-67, Maitland to Lord Bathurst, 9 Oct. 1824.

[28] *Colonial Advocate* 27 May 1824. The practice of appointing prominent people as commissioners, usually government supporters who would benefit from the public works they supervised, followed British precedent and was common in North America before governments organized departments with professional staffs to plan and construct public works. These commissions formed what James Angus calls a "local public works mini-department." James Angus, *A Respectable Ditch: A History of the Trent-Severn Waterway, 1833-1920* (Kingston and Montreal: McGill-Queen's University Press, 1988), 5.

[29] Roberta M. Styran and Robert R. Taylor, *This Great National Object: Building the Nineteenth-Century Welland Canals* (Montreal and Kingston: McGill-Queen's University Press, 2012), 82. Hall worked for the Welland Canal Company in 1824 and from 1835 to 1837. *Ibid.* For a description of his engineering career, see Mark Andrews, "Francis Benjamin Hall," in *A Biographical Dictionary of Civil Engineers in Great Britain and Ireland* vol. I, edited by A.W. Skempton *et al.* (London: Thomas Telford Publishing on behalf of the Institution of Civil Engineers, 2002), 292. Civil engineer Francis Hall (1792-1862) should not be confused with another Francis Hall (d.1833), author of *Travels in the United States and Canada in 1816 and 1817* (London: Longman, 1818).

[30] LAC UCS RG 6, A 1, vol. 67, Commissioners of the Burlington Bay Canal to Maitland, 14 Oct. 1824; LAC, Upper Canada, Journals of the Legislative Assembly [hereafter UC, JLA], Appendix, Report of the Commissioners of the Burlington Bay Canal, 2 Dec. 1824.

tractors—James Gordon Strowbridge, John W. Hayes, and John McKeen—were hired for £8,500 to build the canal according to Hall's design and deadline. These men had worked on Buffalo's harbour at the western terminus of the Erie Canal. Their contract was "subject always to any diminution or extension of the work proportionally agreeable to it." The commissioners advanced £1,000 upon ample surety for the contractors' expenses, and agreed to pay the balance in monthly installments with the approval of a commissioner and the engineer.[31]

On Hall's recommendation, the commissioners chose a site for the canal a half mile south of the outlet. This location was wider (540 feet) than the rocky and shallow outlet, but Hall thought that excavation would be easier because the Beach consisted mainly of sand, and the canal would require shorter protective piers in the lake and bay. He also may have believed that this site, situated well away from the outlet with its dangerous winds and currents, would give sailing vessels more room to enter the canal safely.[32]

Initially, Hall wanted to build the canal with rows of piles and sheeting piles.[33] But, after the agreement with the contractors was signed, this plan was changed to combine piling and crib work. A retaining wall of alternating squared piles and sheeting piles would secure the sides of the cut through the Beach. Two parallel sets of piers extending into the lake and bay at right angles to the Beach would prevent sand from silting up the channel and its approaches. The piers were a series of thirty-feet long rectangular wooden cribs placed lengthwise, end to end. Each crib was a four-sided frame, open at the top and bottom, made of tightly fitted squared timber, filled with stones and decked over with heavy planks.[34] Resting

[31] LAC, UCS, RG 5, A 1, vol. 68, 36244-47, Agreement Between the Burlington Bay Commissioners, James Crooks, Manuel Overfield, William Chisholm and John Wilson, and the Contractors, James Strobridge [sic], John W. Hayes and John McKeen, 4 Aug. 1824; *Ibid.*, vol. 75, 40075-78, Report of the Burlington Bay Commissioners, 10 Oct. 1825. Changing contract provisions after an agreement was signed was a common practice on New York canals, one that led to frequent disputes. (Daniel Hovey Calhoun, *The American Civil Engineer: Origins and Conflict* [Cambridge: The Technology Press, MIT, 1960], 61). Strowbridge and his partners probably learned of this custom when they worked on the Erie Canal.

[32] LAC, UCS, RG 5, A 1, vol. 67, 36218-47, Commissioners of the Burlington Bay Canal to Sir Peregrine Maitland, 14 Oct. 1828. Another popular site was Brant's Pond, situated on the Beach between the outlet and the north shore. This location was considered advantageous for ships sheltering in a storm, but it was rejected because, like the outlet, it was too rocky to excavate, and the water on the lake and bay sides of the Beach were too shallow. *Ibid.*

[33] LAC, UC, JLA, Appendix, no.19, Memorial of the Burlington Bay Commissioners, 17 Dec. 1827. *The McGraw-Hill Dictionary of Scientific and Technical Terms* 6th ed. (Toronto: McGraw Hill, 2003), defines sheet piling as "closely spaced piles of wood, steel or concrete driven in vertically into the ground to obstruct lateral movement of earth or water...." 1915.

[34] Wood was the universal construction material for building North American harbours. Quebec City was an exception. (T.C. Keefer, "President's Address," *Transactions of the Canadian Society of Civil Engineers*, vol. I [1888], 28). In 1837, David Stevenson, a visiting British civil engineer, wrote that timber was "seldom squared, and never, in any case, protected by paint or coal-tar from the destroying effects of

on the bottom of the lake or bay, the cribs would rise six feet above the water. The piers in Burlington Bay were 810 feet long and 15 feet wide. The north pier in Lake Ontario would run 570 feet; 400 of which was 10 feet wide. The south pier was designed to break the force of the lake's waves. It was 964 feet long and varied in width from 15 to 22 feet towards the pier head, which also would serve as a foundation for a lighthouse. A swivel bridge at the centre of the cut would connect the roadway along the Beach.[35]

From the outset, the contractors had difficulty implementing this plan. Storms from Lake Ontario interrupted the excavation of the cut, which soon filled with sand and water. Attempts to pile the sides of the cut were abandoned, temporarily, because of the difficulty of driving piles through the densely compacted beach sand.[36] A dredging machine was built to facilitate piling by lowering the bottom of the cut. This delayed work by six months,

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the atmosphere. Wood is so plentiful in America, that to repair, or even construct works in which timber is the only material employed, is generally regarded as a very light matter." David Stevenson, *Sketch of the Civil Engineering of North America* 2nd edition. (London: John Weale, 1859), 27. Crib-work, according to Royal Engineer Sir Richard Bonnycastle, referring to Port Credit on Lake Ontario west of Toronto, was "the usual mode of forming piers...." Sir Richard Bonnycastle, *Canada and the Canadians in 1846,* vol. II (London: Henry Colbourn, 1849), 9. Although the Burlington Bay Canal's cribs were made of wood, Hall preferred stone construction. In this respect, he was typical of most British-trained civil engineers. In 1825, for example, he recommended stone piers for Port Dalhousie. More economical sunken wooden cribs were built instead, at both ends of the Welland Canal at Port Dalhousie and Port Colborne. Stryan and Taylor, *This Great National Object*, 216.

[35] *Colonial Advocate* 27 May 1824; LAC, UC, JLA, Appendix, Report of the Commissioners of the Burlington Bay Canal, 2 Dec. 1824. Hall's plan was not the first. On 1 Nov. 1823, civil engineer Samuel Clowes submitted a design for a canal to John Macaulay, president of the Commission for Inland Navigation. Clowes proposed to dig a canal across Brant's Pond using pile, not crib work. He presented four separate estimates varying according to the depth and width of the canal. These ranged from £8,000, for a canal 12 feet deep, 72 feet wide, to £48,000, for a 23 feet deep, 133 feet wide canal. LAC, UCS, RG 5, A 1, vol. 63, 33661-74, Samuel Clowes to John Macaulay, 29 Nov. 1823. Later, Clowes' plan was modified. See: *Ibid.*, vol. 66, 348311-31, Macaulay to Hillier, 27 March 1824.

[36] *Ibid.*, vol. 72, pp. 38305-8, Report of the Burlington Bay Commissioners, 7 May 1825; *Ibid.*, vol. 75, 40059-90, Report of the Burlington Bay Commissioners, 3 Feb. 1825, filed with Crooks to Hillier, 5 Dec. 1825. Pile driving was a slow and difficult task. To prevent a pile from splitting, an iron hoop was placed temporarily over the top of a 30-feet-long, one-foot-thick pile. The point was sharpened and sometimes sheathed with an iron shoe, before a floating pile driver hammered the pile into the bed of the lake or bay. It is not known what kind of pile driver was used at Burlington. It may have been similar to one used after the spring of 1828 during the construction of Oakville's harbour, located ten miles east of Burlington Bay on the north shore of Lake Ontario. Here, a piling hammer, weighing just under a ton was raised by hand with block and tackle, then dropped on a pile. This "pile engine" was used on ice in winter, or mounted on a piling scow in other seasons. (See Hazel C. Mathews, *Oakville and the Sixteenth: The History of an Ontario Port* [Toronto: University of Toronto Press, 1953], 20). A War of 1812 mortar weighing 2,000 pounds was used as a pile hammer to construct Buffalo's harbour. It was raised by a mechanism powered by a blind horse circling a shaft on a floating scow. When the hammer was tripped, it fell on the top of the pile. About 100 strokes were required to drive a single pile. See Judge Samuel Wilkeson, "Recollections of the West and the First Building of the Buffalo Harbor," *Publications of the Buffalo Historical Society* vol. 5, (Buffalo: Buffalo Historical Society, 1902), 193-95, 200.

[37] LAC, UCS, RG 5, A 1, vol. 74, 39570-71, Crooks to Hillier, 24 Oct 1825.

cost £2,000 (a quarter of the canal's budget), and forced the commissioners to give the contractor another year to finish the job.[37] Although cribs could be assembled quickly on land, workmen had to get into the water to place and secure them. This could be done only during a short time in the summer when the water was calm and warm. Loading the cribs with stone caused more delay. Stone could not be obtained near the canal, as expected. Most large stone was gathered six miles away at Stoney Creek. During the winter, when the bay was frozen, stone was hauled over the ice and deposited directly into the cribs. Filling the Lake Ontario cribs was harder and more dangerous because stone could be moved to the cribs only in large open scows during calm weather.[38]

Except for horse-drawn ploughs or scrapers that may have been used initially on the cut, or a horse-powered dredging machine and, perhaps, a pile driver, there was no machinery for digging, gathering and depositing stone, or fabricating and placing cribs. Before canal-building in Canada was revolutionized by steam-power after 1840,[39] fifty workmen at Burlington built the canal by intensive hand labour under dangerous and appalling conditions. Little is known of the men who toiled on the canal for a few shillings a day, or of the families who supported them.[40]

Nevertheless, in spite of their efforts, waves from Lake Ontario damaged the piers. As a result, the commissioners then ordered that the south pier head be converted into a massive wedge-shaped breakwater. Located 500 feet from the end of the south pier in 18 feet of water, on what was mistakenly believed to be a bed of clay, the breakwater consisted of a large centre crib and two 250-feet long, 20-feet wide wings angled at 45 degrees towards the Beach. It was built in the same manner as the piers. High winds and waves, however, made construction more difficult than the piers in the lake

[38] *Ibid.*, vol. 85, 46716-18, John Chisholm to William Chisholm, 29 Sept. 1827; *Colonial Advocate* 1 June 1826; LAC, UCS, RG 5, A 1, vol.75, 40081-and verso, Report by Francis Hall Respecting the Burlington Bay Canal, 2 Dec. 1825 filed with Crooks to Hillier, 5 Dec. 1825.

[39] Ruth Bleasdale, *Rough Work: Labourers on the Public Works of British North America and Canada, 1841-1862* (Toronto: University of Toronto Press, 2018).

[40] Workers probably lived with their families in shanties near the canal. Marjorie Freeman Campbell, however, believes that an "army of labourers" lived in Hamilton, miles away from the work site. (Marjorie Freeman Campbell, *A Mountain and a City: The Story of Hamilton* [Toronto: McCelland & Stewart, 1966], 62). Some men came from Ireland; others may have accompanied the contractors from Buffalo. Canal workers, contractors, engineers and canal promoters moved freely across the border in search of work during this period. (Peter Way, *Common Labour: Workers and the Digging of North American Canals, 1780-1860* [Cambridge: Cambridge University Press, 1993], 12-13). One man from Ireland drowned shortly after he arrived; another lost a leg after it was crushed between a scow and a crib. He subsequently died of his injury and was said to have haunted a tavern near the outlet where he had lain in agony after his accident. On the "Ghost of the Canal," see *Colonial Advocate* 5 Jan. 1826, and Campbell, *A Mountain and a City*, 64-5. Other hardships were suffered. In September 1824, contractor Captain John McKeen, as well as several workers (including, presumably, some of their wives and children), died of typhus. (*Colonial Advocate* 5 Jan. 1825). On the working and living conditions of Rideau Canal workers, during this time, see William N.T. Wiley, "Poverty, Distress, and Disease: Labour and the Construction of the Rideau Canal," *Labour/Le Travailleur* 11 (Spring 1983), 7-29.

and bay. It cost £3,681, nearly half the original canal's estimate. Not discouraged by these developments, Hall confidently reported that, while much had been spent on the canal, "the permanence of the Works, even in their unfinished state, are now placed beyond a doubt...." An extra £1,391-15 was required to secure the works "against all future contingencies."[41] By the summer of 1826, however, storms from Lake Ontario damaged the breakwater. It had to be rebuilt.

At this point, the 180-yard cut across the beach was deep enough for small ships to enter Burlington Bay. An official opening ceremony was set for 1 July 1826. Maitland, his retinue, and a military band was scheduled to sail through the canal aboard Chisholm's schooner, the *General Brock*, at the head of a small flotilla and receive a salute from the militia lining the banks of the cut. Unfortunately, a crosswind grounded the ship as it rounded the breakwater and blocked the canal's entrance. Strowbridge and his men were unable to free the ship. In the excitement, a bandsman fell overboard and drowned. Maitland was forced to finish his procession through the canal aboard a six oared barge.[42]

Although open for navigation, work on the canal was not finished. In the fall of 1826, when most of the canal funds were spent, Hall departed abruptly for Nova Scotia to undertake another abortive canal scheme, the Shubenacadie Canal, to link Halifax with the Bay of Fundy.[43] He claimed later that the commissioners owed him £55 in unpaid professional fees. The commissioners were exasperated. They complained that Hall had spent only one day a month on the site. On 22 February 1827, the government instructed Robert Moore and John MacTaggart to conduct a thorough investigation of the canal.[44]

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[41] LAC, UC, JLA, no. 19, Memorial of the Burlington Bay Commissioners, 17 Dec. 1827; LAC, UCS, RG 5, A 1, vol. 77, 41430-54, Engineer Report, 13 April 1826, contained in Commissioners to Maitland, 13 April 1826.

[42] This account is based on Mary Weeks-Mifflin and Ray Mifflin, *Harbour Lights: The Story of Burlington Bay* (Erin: The Boston Mills Press, 1988), 15. The *Rebecca and Eliza*, commanded by Edward Zealand was the first ship through the canal, having won a race on 4 June for the honour. *Ibid.*, 14.

[43] LAC, UCS, RG 5, A 1, vol. 83, 44840-41, Hall to Maitland, 3 March 1827; *Ibid.*, 83411, Hall to Sir John Colborne, 18 April 1835. Hall was appointed engineer and construction began in July 1827, but he would underestimate costs and the effects of frost. The project soon collapsed for want of funds. It was not completed until 1861. (W.S. MacNutt, *The Atlantic Provinces: The Emergence of Colonial Society, 1712-1857* [Toronto: McClelland & Stewart, 1965], 172-75; Donna Barnett, *River of Dreams: The Saga of the Shubenacadie Canal* [Halifax: Nimbus, 2002], 45-46, 52). In 1905, the state engineer and surveyor of New York, Noble E. Whitford, described the Shubenacadie Canal as a "disastrous failure." *History of the Canal System of the State of New York Together With Brief Histories of the Canals of the United States and Canada* vol. II (Albany: Brandow Printing Company, 1906), 1463.

[44] LAC, UCS, vol. 83, 45441-44, Commissioners of the Burlington Bay Canal to Hillier, 25 April 1827; LAC, UC, JLA, Appendix X, Burlington Bay Canal Instructions, March [21 Feb.] 1827; CO 42, vol. 381, LAC, UC, MG 11, "An Act to provide a further survey of the works done at the Burlington Bay Canal and to afford further aid to the same," 8 Geo. IV c. 19... enclosed in Maitland to Bathurst 31 May 1827. The government approved Hall's claim in April 1835. *Correspondent and Advocate* 16 April 1835.

Moore was a Royal Navy master shipwright based at Kingston. MacTaggart, a talented young Scottish civil engineer, was Colonel John By's principal civilian aid on the Rideau Canal until his dismissal later in December 1829 for intemperance.[45] MacTaggart was not impressed with the Burlington Canal.[46] In their report of 30 March 1827, Moore and MacTaggart documented a series of engineering and construction blunders. They explained that waves had washed fine drift sand from beneath the cribs, causing their stone contents to settle, thereby exposing the wooden frames above the water to the elements. Lake Ontario's "short jumping seas," then battered and broke them spilling their stone contents. Moore and MacTaggart were sharply critical of Strowbridge for filling the cribs with alternate layers of brushwood and beach pebble. They also pointed out that the south pier in Lake Ontario curved in the wrong direction. Had Hall designed it to bend against the waves, the breakwater would have been unnecessary. Moreover, there was no need for a dredging machine because the canal's natural current could have washed the channel free of sand if the bottom was loosened by iron toothed drags. The report concluded with a set of specifications to finish the canal. Moore and MacTaggart strongly recommended that the cribs have bottoms to hold stone and that no brushwood be used to fill them. The work done was valued at £8,800 and a further £4,700 was needed to complete the project.[47]

By June 1827, when the weather most favoured construction, serious differences arose between the commissioners and the contractor, James Strowbridge (his partner, John McKeen, died of typhus fever in September 1824, and the third contractor, John Hayes was

[45] Moore held his post from 1818 to 1834 when the Kingston dock yard was closed. (T.L. Brock, "H.M. Dock Yard, Kingston, Under Commissioner Robert Barrie, 1819-1834," *Historic Kingston* 16 [1968], 10). After his dismissal from the Rideau Canal, MacTaggart returned to Scotland and, before he died at his father's country home aged 31, recorded his experiences in *Three Years in Canada An Account of the actual state of the Country in 1826-7-8* (London: Henry Colbourn, 1829). Edward F. Bush, "The Builders of the Rideau Canal, 1826-1832," *Manuscript Report Number* 185 (Ottawa: Parks Canada, Department of Indian and Northern Affairs, 1976), 95, 101.

[46] Similarly, MacTaggart was unimpressed with the Welland Canal. Compared with the Rideau Canal's solid masonry dams and lock pits, he viewed the Welland Canal's wooden structures as an example of American shoddiness. (MacTaggart, *Three Years in Canada,* vol. II, 153-63). This view of North American engineering was not shared by all visiting British engineers. Recognizing that British and American engineers were guided by the same design principles, David Stevenson argued that, what might at first glance appear temporary and unfinished in American engineering was really, as he observed, "a judicious and ingenious arrangement to suit the circumstances of a new country, of which the climate is severe—a country where stone is scarce and wood is plentiful, and where manual labour is very expensive." Stevenson, *Sketch of the Civil Engineering of North Americ*a, 192.

[47] LAC, UC, JLA, Appendix, Report of Messrs Moore and MacTaggart, 29 March 1827. This report also appears in the *Gore Gazette* 26 May 1827. A shorter version is in MacTaggart's *Three Years in Canada*, 296-300. Chisholm may have taken Moore and MacTaggart's recommendations seriously. He made certain that the cribs forming Oakville's harbour had bottoms. Mathews, *Oakville and the Sixteenth*, 20.

never actively involved). Strowbridge had not been paid since Hall's departure because the law required the approval of an engineer before payments could be authorized. The commissioners hoped that Strowbridge would continue working until another engineer was appointed, and, more importantly, implement Moore and MacTaggart's recommendations. Strowbridge, however, regarded these as "wholly impractical," and not binding on him. He vigorously denied filling the cribs with brushwood,[48] and objected that Moore was not an engineer, as the Act required. Privately, he disparaged Moore and MacTaggart's professional competence, complaining bitterly that they had undervalued the amount of work done. Strowbridge believed that an estimate of £12,131-9-5, made by civil engineer Alfred Barrett at the request of the commissioners in late November, was more accurate.[49] Although Strowbridge thought that this report would authorize payments to him, the commissioners dismissed it as extravagant. On the basis of their personal knowledge of local prices, they reduced the estimate by £4,000 and explained that Barrett was consulted only for their personal information. Without funds, Strowbridge could neither continue working, nor stop construction and pay off the workmen. Nevertheless, during the summer of 1827, construction continued with credit from his friends, and, especially, from Chisholm, whose store at the Beach provided Strowbridge and his men with essential goods at inflated prices.[50]

The commissioners had little sympathy for Strowbridge. In their view, he had not fulfilled his contract on time and he had refused to accept Moore and MacTaggart's plan. On 24 July, at a

[48] It was not uncommon, however, to use brushwood to fill cribs. Harbour crib work on the first Welland Canal at Port Dalhousie and Port Colborne were filled with brush and stone. They were called "brush piers." (Styran and Taylor, *This Great National Object*, 216). Earlier, the harbour pier at Buffalo was filled with brush and stone. Ronald E. Shaw, *Erie Water West: A History of the Erie Canal, 1792-1854* (Lexington: University of Kentucky Press, 1966), 146. Strowbridge simply may have built the best canal he could, utilizing the limited and available materials he had, including brushwood.

[49] LAC, UC, JLA, Appendix, Crooks to Strowbridge, 8 June 1827; *Ibid.*, Commissioners to Strowbridge, 18 June 1827; *Ibid*., Strowbridge to Commissioners, 19 June 1827; *Ibid*., no. 10, Memorial of J.G. Strowbridge, Resident Contractor for the Burlington Bay Canal, to his Excellency the Lt. Governor, 20 Aug. 1827. LAC, UCS, RG 5, A 1, vol. 80, 43606-7, Estimate made by Alfred Barrett of the expenses to complete the Burlington Bay Canal, November 1826. Born in New England, Barrett worked on the Erie Canal before his employment with the Welland Canal Company. Together with David Thomas, these men are believed to have been the first American engineers to practice in British North America. See Larry McNally, "Alfred Barrett," *DCB,* 7 (1988), 49-50.

[50] LAC, UC, JLA, Appendix L, Testimony of Mr. Strowbridge, 3 March 1828; *Ibid.*, Appendix, First Report made by the Burlington Bay Commissioners, 15 Dec. 1826; *Ibid.*, Report of the Burlington Bay Commissioners, no. 8, 2 July 1827; *Ibid*., Burlington Bay Canal, no. 10, Memorial of J. G. Strowbridge, Resident Contractor For The Burlington Bay Canal, to his Excellency the Lt. Governor, 20 Aug. 1827; LAC, UCS, RG 5, A 1, vol. 85, 46716-18, John Chisholm to William Chisholm, 29 Sept. 1827. Earlier, Strowbridge found other ways to secure building materials. He cut timber on the Beach, much to the annoyance of John Chisholm, William Chisholm's older brother, and future toll collector at the canal. See LAC, UCS, vol. 75, 40046-47, John Chisholm to Hillier, 3 Dec. 1825.

meeting held in Chisholm's absence, and against the objections of William Jarvis, another commissioner, they decided to advertize for another contractor to finish the job. They felt that they had no other option. Strowbridge was not informed of this decision. In August, when the commissioners' advertisement appeared in provincial newspapers, his credit was ruined. Desperate, he appealed directly to Maitland in a lengthy memorial, dated 20 August 1827, complaining that the commissioners had not paid him, and that he had suffered great expense from unforeseen problems arising from local conditions. He claimed that the commissioners had arbitrarily changed the terms of his contract, and were using him as a "scapegoat" for their own mistakes. Without naming him, Strowbridge accused Crooks of willfully injuring his reputation and cautioned that, without relief, he and his creditors would suffer ruin. He suggested arbitration by three engineers to resolve the dispute.[51]

The commissioners were indignant. They argued that they had not withheld funds improperly. Rather, they asserted that Strowbridge was overpaid and had used his contract to settle a large debt from the Erie Canal. Although the commissioners did not identify the source of this accusation, they were quite specific about the particulars of the alleged debt: Strowbridge owed one man £600 for stone at Buffalo, making a total debt of from $16,000 to $20,000. The commissioners believed that Strowbridge's creditors had not attempted to collect the debt because of the prospect of being paid out of his fee at Burlington. They maintained that his problems were of his own making. He had underbid his contract and did not supervise construction properly.[52] Privately, Crooks told Maitland's secretary, Major George Hillier, that the "obvious intention of Mr. S. and his advisers is to throw every possible difficulty in the way, and... swallow up the whole grant of £8,000; and, indeed, more, if he can get it, when half the sum is unquestionably sufficient...." Concluding his attack, Crooks asserted that that "the large grant made excites his cupidity, and the satellites with whom he is surrounded, are urging him, eager to participate in a pay... they think within their reach."[53]

Crooks' animosity may have stemmed from a dislike of Americans. The United States Navy seized his schooner, the *Lord Nelson,* on 5 June 1812 just before the outbreak of war, and converted it into a warship. It later sank in a storm. In 1813, during the American occupation of Niagara, troops destroyed his home and business. Crooks was never indemnified fully

[51] LAC, UC, JLA, Appendix, no. 8, Report of the Burlington Bay Commissioners, 2 July 1827; *Ibid.*, Appendix, 27 Feb. 1828. Archives of Ontario, Pamphlet 1827 Memorial Presented to His Excellency The Lt. Governor By James G. Strowbridge (York 1827). Strowbridge probably read the commissioners' advertisement in the *Gore Gazette* on 18 Aug. 1827; *Ibid.*, Memorial of J. G. Strowbridge 20 Aug. 1827.

[52] LAC, UC, JLA, Appendix, no. 19, Memorial of the Burlington Bay Commissioners, 17 Dec. 1827. See also Crooks' testimony, LAC, UC, JLA, Appendix, 5 March 1828.

[53] *Ibid.*, Appendix, Jan. 1828-March 1828, Crooks to Hillier, 19 Dec. 1827.

and did not recover completely from his losses.[54] Not all commissioners, however, disliked Strowbridge. For some time, Crooks and Chisholm had differed over Strowbridge, and a rift developed in the commissioners' ranks. Chisholm, for example, did not believe that Strowbridge was in debt to American creditors. In the fall of 1827, when Chisholm was in Lower Canada, Crooks drafted the commissioners' official response to Strowbridge's memorial. Two commissioners agreed to sign it; two refused. Crooks resigned.

Compounding their problems, the commissioners could not find another contractor to replace Strowbridge. Although several men had viewed the works, no one made an offer to finish the canal because the commissioners did not provide all the necessary information. This baffled Asa Mann, Strowbridge's foreman, who speculated that the commissioners were attempting to further injure Strowbridge's credit. Without an engineer, or a contractor who enjoyed the commissioners' confidence, work on the canal halted as winter approached. This alarmed Maitland who was unhappy with the canal's management, but had refused to intervene, hoping that Strowbridge would continue working. After a storm damaged the canal in early November 1827, Maitland offered whatever funds were needed to secure the works for the winter. The commissioners then engaged John Harris, a marine surveyor and former Royal Navy master shipwright who had been retained briefly in October to value the work.[55] Harris and Strowbridge immediately began to quarrel. Strowbridge wanted to fill and cover the breakwater cribs; Harris insisted on open ones. The commissioners backed Harris. On 27 November, Harris reported that the canal was ready for winter.[56]

Two months later, on 27 January 1828, the storm everyone dreaded struck and swept away the entire breakwater. In March, another storm attacked the piers in Lake Ontario, breaking them up at the shoreline and washing away a large amount of stone from the length of the south pier. The canal lay in ruin.[57]

Three weeks after the breakwater

[54] Ouellette, "James Crooks," 185. It was not until 1930 that Crooks' descendants received compensation for the *Lord Nelson*. Gary M. Gibson, "Justice Delayed is Justice Denied: The Lord Nelson Case," *Ontario History* 108:2 (Autumn 2016), 157-88.

[55] LAC, UC, JLA, Appendix, Crooks to Hillier 18 Dec. 1827; *Ibid.*, Crooks to Hillier, 18 Oct. 1827; LAC, UCS, vol. 86, 46988-90, George Hamilton to Anon., 31 Oct. 1827; LAC, UC, JLA, Appendix A. Mann to Strowbridge, 6 Dec. 1828 [1827]; LAC, UCS, vol. 85, 46716-18, John Chisholm to William Chisholm, 29 Sept. 1827; LAC, UC, JLA, Appendix, Hillier to Crooks, 23 July 1827; *Ibid*., Hillier to Commissioners, 1 Oct. 1827; *Ibid.*, Hillier to Crooks 10 Nov. 1827. LAC, UC, JLA, Appendix L, The Select Committee to Whom was Referred the Petition of James G. Strowbridge and also the Message of His Excellency the Lieutenant Governor Respecting the Canal at Burlington Bay, March 1828.

[56] *Ibid.*, 9, Testimony of Asa Mann, 27 Feb. 1828; LAC, UC, JLA, Appendix, (undated, presented to the Legislative Assembly, 26 Feb. 1830), Report on the Burlington Bay Canal; LAC, UC, JLA, Appendix, Harris to Crooks 27 Nov.1827.

[57] LAC, UC, JLA, Appendix, no. 22, Kerr to Hillier, 28 Jan. 1828; *Ibid.*, no. 23, Kerr to Hillier, 25 Feb. 1828. In his twenty-five years at Burlington Beach, John Chisholm had never seen waves pass over

was destroyed, the Legislative Assembly struck a committee to investigate Strowbridge's complaints. It questioned several witnesses and soon discovered that Strowbridge was widely regarded as an honest man who paid his debts when he had the means. No evidence was presented to substantiate the rumour that Strowbridge owed money in Buffalo. The most dramatic testimony came from John Wilson, Speaker of the Assembly, and one of the original canal commissioners. Appearing at Strowbridge's request, Wilson asserted that the commissioners should not have withheld funds from Strowbridge. It was evident from the start, he declared, that the plan would not work, and that the money granted was insufficient. Wilson accused the commissioners of driving Strowbridge, "to do more than could be done with the means at [his] disposal."[58] The committee recommended arbitration to settle the dispute.

In April, three members of the Legislative Assembly—David O'Reilly, Edward McBride and Allan MacNab—were appointed to value the cost of labour and materials to build the canal.[59] They examined financial statements submitted by the commissioners and Strowbridge, and, on 19 May, read a lengthy statement from William Johnson Kerr on behalf of the commissioners. Kerr was appointed earlier by the commissioners on the recommendation of Moore and MacTaggart to superintend the canal, and act as the commissioners' secretary (thereby drawing two salaries).[60] Better known to history for his involvement in an attempt to assassinate William Lyon Mackenzie in 1832,[61] Kerr was neither an engineer, nor a contractor, but a loyal government supporter and owner of a large property near the canal. Originally an admirer of Strowbridge, Kerr now characterized his workmanship as shoddy and claimed that several of the cribs were "experimental," the contractor being liable to replace them if they failed. As a public work solemnly contracted for in good faith, Kerr opined

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the Beach in the same place during a storm. LAC, UC, JLA, Appendix, The Select Committee, 5 March 1828. A common explanation for the canal's building problems was the Beach's peculiar formation and composition, which caused unforeseen difficulties. Construction, therefore, was of necessity experimental. See, for example, *Gore Balance* 11 Feb. 1830.

[58] *Ibid*., The Select Committee, "The Speaker," [John Wilson], 5 March 1828.

[59] The commissioners choose Daniel O'Reilly to represent them; Strowbridge selected Edward McBride. O'Reilly and McBride named Allan MacNab as the third arbitrator. LAC, UCS, vol. 89, 49172-79, Report of the Burlington Bay Commissioners respecting the outcome of Arbitration between themselves and James G. Strowbridge, 27 May 1828; LAC, RG 1, E 3, vol. 81A, UC State Papers, 165, John Law to Thomas Horner, 19 Feb. 1836; *Gore Balance* 3 Sept. 1830.

[60] See LAC, UCS, vol. 91, 50721, Financial Statement of the Burlington Bay Canal, by W.J. Kerr, 1 Jan. 1829.

[61] A judge reprimanded Kerr and fined him a small sum. (William Kilbourn, *The Firebrand: William Lyon Mackenzie and the Rebellion in Upper Canada* [Toronto: Clarke, Irwin and Company, 1956], 82-3). The *Dictionary of Canadian Biography*, however, describes this incident as an "assault." See [In Collaboration] "William Johnson Kerr," *DCB*, 7 (1988), 466-67. The *Dictionary of Hamilton Biography* has a similar interpretation. Thomas Melville Bailey, editor, "William Johnson Kerr," 1 (1981), 116-17.

that the canal was "the most shameful... piece of work I ever beheld."[62]

The arbitrators finished their investigation on 19 May 1828. They demanded £37-10-0 each from the commissioners for their services, as provided in the Act establishing the arbitration. The commissioners, however, said they would consider this request after they had seen the report. They wanted to know how much money they had to pay Strowbridge. Later that day, after more polite threats and counter threats, the arbitrators simply gave Strowbridge all the funds remaining in the commissioners' hands, £3,234-14-8. They believed Strowbridge deserved £5,591-58-5, but could not award this amount because the law restricted them from giving him more than the commissioners had on hand at the time of the arbitration. The arbitrators were angered that the commissioners had appropriated £800 illegally for canal expenses, effectively placing this sum beyond the arbitration.[63]

On 2 June, at 11:00 o'clock, Strowbridge and many of his creditors gathered at the Court House in Hamilton. They waited two hours for the commissioners to pay the ordered arbitration award. The commissioners never appeared. "I am drained of all my resources," Strowbridge lamented, "and... have not face enough to beg from my friends."[64]

The commissioners, however, believed that the award was not just, and that it would be inappropriate to pay Strowbridge until he surrendered all remaining government equipment used in the canal's construction. During the arbitration on 17 May, they dismissed Strowbridge and seized the dredging machine and piling engine. They recommended that the dispute be investigated by the Legislature, or settled in court. Strowbridge's creditors then harassed him with lawsuits, and during the summer of 1828, he was cast into jail for debt.[65] His family, according to the *Canadian Freeman,* was stripped "of their very beds and thrown into the street, (some of them in a state of sickness)...."[66]

[62] LAC, UCS, vol. 89, 49154-57, Kerr to Burlington Bay Arbitrators, 17 May 1828.

[63] LAC, UC, JLA, Appendix, Award of the Burlington Bay Canal Arbitrators, 19 May 1829, printed with the Report of the Burlington Canal Commissioners, sent to the Assembly, 27 Jan. 1829; LAC, UCS, RG 5, A 1, vol. 89, 49159-64, Minutes of an exchange of information between the Burlington Beach Canal Commissioners and the Arbitrators, 19 May 1828. The Arbitrators eventually settled for £25 each. *The Gore Balance* viewed the clause in the bill restricting the award to funds on hand as a "cunning device" to defeat the purpose of the bill. *Gore Balance* 2 Sept. 1830.

[64] LAC, UC, JLA, Appendix, Strowbridge to Hillier, 6 June 1828, printed with, Report of the Burlington Canal Commissioners, sent to the Assembly, 26 Jan. 1829.

[65] LAC, UCS, vol. 89, 49172-79, Report of the Burlington Bay Commissioners respecting the outcome of Arbitration between themselves and James G. Strowbridge, 27 May 1828; LAC, UC, JLA, Appendix, Testimony of Wm. Chisholm, undated, presented to the Legislative Assembly, 26 Feb. 1830; LAC, UCS, vol. 89, 49278, Strowbridge to Hillier, 19 June 1828; *Ibid.*, vol. 81A, 147-50, Strowbridge to Colborne, 9 March 1830.

[66] *Canadian Freeman* 3 July 1828. Jeffery L. McNairn, "'The common sympathies of our nature,' Moral Sentiments, Emotional Economies, and Imprisonment for Debt in Upper Canada," *Histoire sociale/ Social History* 49:98 (May 2016), 65. Rumours that the commissioners were profiting financially from the

Until December, the commissioners defied the arbitrators' order when Maitland persuaded them to pay Strowbridge, in order to relieve his creditors. Strowbridge received £1,734-14-8. Although the commissioners maintained that Strowbridge was fully compensated, Maitland intervened again in March 1829 and Strowbridge received £1,500 more.[67] This did not satisfy his creditors, and, having twice failed to gain redress through the courts, he was again jailed for debt in January 1830. He petitioned the government for help, but while the elected Legislative Assembly was generally sympathetic, the appointed upper house, the Legislative Council was not.[68] The dispute bogged down into partisan politics. On 9 March 1830, Strowbridge appealed directly to the new lieutenant-governor, Sir John Colborne, who had succeeded Maitland in 1829, praying that he not be abandoned to another imprisonment, adding prophetically, that if he did not receive relief justly due him, he had, he wrote, "no prospect of terminating but by death."[69] In February, upon his release from jail, he returned home only to bury one of his children who had died of an illness.[70]

Strowbridge's involvement in reform politics complicated his claim. In January 1829, he solicited signatures on a petition for the release of journalist and government critic, Francis Collins, who had been jailed for libel.[71] Later, Strowbridge was called before the Assembly to explain his role in the 29 January 1829 Gore District "Outrages," the hanging in effigy of the lieutenant-governor, who had refused to release Collins.[72] The effigy was hung from a tree in front of Strowbridge's house. The government, however, did not consider Strowbridge to be a threat. In 1831, he was granted £2,356, but he was jailed again for debt in 1833. Although Collins secured his release, two days later on 10 March, Strowbridge died of a fe-

canal at the expense of Strowbridge and the public were common. See, for example, *Ibid.*, and Letter to the Editor from "A Creditor," 20 Oct. 1828.

[67] LAC, UCS, vol. 98, 54986-87, J.B. Robinson to Anon., 21 March 1829: opinion re payment of the arbitrations award to James G. Strowbridge, enclosed in J.W. Kerr to Z. Mudge, 21 Jan. 1830; *Ibid.*, William Chisholm to Z. Mudge, 24 March 1829, enclosed in Kerr to Mudge, 21 Jan. 1830; LAC, UC, JLA, Appendix, Report of the Commissioners of the Burlington Bay Canal, 24 Jan. 1829, printed with the Report of the Burlington Bay Commissioners, sent to the Assembly, 27 Jan. 1829.

[68] LAC, UC, UCS, RG 5, A 1, vol. 98, 54964-95, Petition of James G. Strowbridge to Sir John Colborne, 10 April 1829, enclosed in Kerr to Mudge, 21 Jan. 1830.

[69] LAC, RG 1, E 3, vol. 81A, Upper Canada State Papers, 147-50, Petition of James G. Strowbridge to Sir John Colborne, 9 March 1830.

[70] The *Gore Balance* sided with Strowbridge, asserting, that his claims were "just and equitable...." It was, it believed, "the most ruthless injustice" that his rights were denied. *Gore Balance* 18 Feb. 1830.

[71] On the Collins case, see Paul Romney, "Upper Canada in the 1820's: Criminal Prosecution and the Case of Francis Collins," in *Law, Politics and Security Measures, 1608-1837: Canadian State Trials*, vol. 1, edited by Murray Greenwood and Barry Wright (Toronto: Osgoode Society for Canadian Legal History, University of Toronto Press, 1996), 505-21.

[72] For the significance of this incident, see Leo A. Johnson, "The Gore District 'Outrages,' 1826-1829: A Case Study of Violence, Justice, and Political Propaganda," *Ontario History* 83:2 (1991), 109-126.

ver contracted in prison. He was forty-five years old and left a wife and several children. His widow, Nancy, pursued his claim unsuccessfully until 1839.[73]

Meanwhile, work on the canal continued under Kerr. Acting, in effect, as the commissioners' contractor, and, to some extent, their engineer, he worked full-time with twenty-five hands to repair the damage caused by the storms of January and March 1828. The channel was dredged and the piers were rebuilt and extended. During the winter of 1828-29, however, sandbars formed in the canal, blocking shipping. Appealing unsuccessfully to the lieutenant-governor for funds, the commissioners borrowed £650 from the Bank of Upper Canada upon Chisholm's personal guarantee. When the sandbars were removed, the commissioners cautioned that more work, as well as a new bridge was needed. By 1830, four floating bridges, or carriage scows, and four winter bridges had been built at a cost, (including a ferryman's pay), of $1,000. The commissioners, lacking sufficient funds after paying the arbitration award, complained that they had to build another temporary winter bridge, instead of the planned swivel bridge. As a result, during the autumn of 1830, three people drowned attempting to cross the canal after midnight.[74]

Although £20,000 had been spent on the canal by 1830, more would be needed. Local pressure mounted for government action. The *Gore Balance*, for example, warned that without help, the government might lose its entire investment if the elements destroyed the works before they could be finished. After a wide-ranging investigation of the canal's affairs in January 1830, a select committee of the Legislative Assembly recommended more aid; £5,000 was granted against the canal's tolls.[75]

Ships had used the canal since July 1826 but, because construction made navigation difficult, no tolls were collected until 1828. More importantly, Crooks did not want the canal declared open officially for the purpose of toll collection. This cost the province £1,300 in lost revenue, and exasperated Maitland. On 27 March 1828, he appointed a merchant and ship owner, John Chisolm, William Chisolm's older brother, as Customs Collector. The following month, the commissioners published a list of tolls for items not designated in the original Act. Although Crooks and William Chisholm were major users of the canal, and had even warned Maitland in December 1823 that the projected tolls were insufficient, nevertheless, they invoked their statutory powers to change the tolls and

[73] *Canadian Correspondent* 16 March 1833; Patrick Brode, "James Gordon Strobridge (Strowbridge)," *DCB* 6 (1987), 741-42. In 1837, the Assembly passed a bill granting Nancy Strowbridge's claim, but the Legislative Council refused to pass it. J.K. Johnson, *In Duty Bound: Men Women and the State in Upper Canada, 1783-1841* (Montreal and Kingston: McGill-Queen's University Press, 2014), 99.

[74] LAC, UCS, vol. 90, 50145-48, Kerr to Chisholm, 13 Oct. 1828; LAC, UC, JLA, Appendix, Report of the Commissioners of the Burlington Bay Canal, to His Excellency, 31 Dec. 1829.

[75] *Gore Balance* 30 March 1830. LAC, UC, JLA, Appendix, Report on the Burlington Bay Canal, undated, presented to the Legislative Assembly, 26 Feb.1830.

lowered them on flour and wheat, the canal's main exports. The following year, they proposed that the toll be dropped another 15 to 25 percent; flour, in particular, they suggested, should be set at a rate of about half that listed in the 1823 Act. Originally, the Act had stipulated that tolls should pay for the canal's construction, but Chisholm now explained that the commissioners had always believed that tolls should pay only the interest, not the principal of the loans.[76] Later, in September 1841, a select committee of the Legislative Assembly uncovered irregularities in toll collection. Asked about annual receipts, John Chisolm replied that he could not, without a great deal of trouble, produce the information, adding that he did not know the number or size of ships that had passed through the canal. John Davidson replaced Chisholm as Customs Collector.[77]

When the Board of Works of the newly-constituted Province of Canada assumed responsibility for the canal in 1841, the project had cost £31,000,[78] over six times the original estimate. Throughout the 1840s, serious engineering problems persisted, disrupting shipping. In 1843, the Board of Works reported that the canal was in "such a wretched state of dilapidation, as to threaten the stoppage of the navigation...."[79] The government ordered that the canal be widened and deepened to make it more stable. That work was completed in 1844 at great cost. Two years later, Royal Engineer Sir Richard Bonnycastle wrote that the canal had been, "an arduous and very expensive undertaking." Steamboats, he reported, had difficulty navigating the canal in rough weather and much dredging was required.[80] More improvements would follow. Later, on 19 January 1854, Hamiltonians celebrated the opening of the Great Western Railway. A new transportation era had begun. Although railways did not replace steamships immediately on the lower Great Lakes, the following year, more wheat and flour from west

[76] LAC, UCS, RG 5, A 1, vol. 80, 43653-59, Report of the Commissioners for the Burlington Bay Canal, 30 Dec. 1826; *Gore Gazette* 5 April 1828; LAC, UC, JLA, Appendix, New rates of tolls of the Burlington Bay Canal, 16 April 1828 printed with the Report of the Burlington Bay Canal Commissioners, sent to the Assembly, 27 Jan. 1829; LAC, UCS, vol. 88, 48697-98, Kerr to Anon., 16 April 1829; LAC, UC, JLA, Appendix, William Chisholm examined, undated, presented to the Legislature, 26 Feb. 1830.

[77] "Report, the Select Committee appointed into the manner according to which the Customs are collected..., Minutes of Evidence", *Journals of the Legislative Assembly of the Province of Canada*, vol. 1, Appendix (V. V.), 1841; John Chisholm's son John, another son, and his son-in-law were deputy toll collectors at the canal, Hamilton and Wellington Square (Burlington) respectively. William Chisholm was the toll collector at nearby Oakville. *Ibid*. In 1886, the federal government removed the tolls. Bouchier and Cruikshank, *The People and the Bay*, 62.

[78] John P. Heisler, *The Canals of Canada* (Ottawa: Department of Indian Affairs and Northern Development, Canadian Historic Sites, Occasional Papers in Archaeology and History - no. 8 (1973), 97.

[79] "Board of Works Report, Burlington Bay Canal", *Journals of the Legislative Assembly of the Province of Canada* (Kingston: Desbarats & Cary), Appendix (Q) np.

[80] Bonnycastle, *Canada and the Canadians in 1846*, vol. II, 11-12. As late as 1856, sailing vessels had difficulty entering the canal under certain wind conditions. M. Hodder, *The Harbours and Ports of Lake Ontario* (Toronto: Maclean & Co., 1857), 24.

of Hamilton was shipped by the Great Western, than had passed through the Burlington Bay Canal.[81]

Undercapitalized and badly engineered, the Burlington Bay Canal's troubled history reveals much about the society that built it, and underscores the importance of social factors in shaping technological development. In the 1820s and '30s, Upper Canada did not have a professional public works department, or well-financed contracting firms that possessed adequate scientific knowledge of the environment to build essential public works. Instead, partisan politicians with vested interests in the canal placed responsibility for construction in the hands of an engineer who was unfamiliar with North American conditions, while the contractor assumed most of the risk without proper resources. Underbidding by the engineer and the contractor doomed the project.[82] Bitter quarrels resulted. These disputes were quickly politicized. Without strong political leadership, self-interest triumphed over the public interest.[83]

Ultimately, underfunding lay at the root of these problems. Building the Burlington Bay Canal eventually provided cheap water transportation, one of Harold Innis's requirements for economic development. But, during the critical period of the canal's construction in the 1820s and '30s, without significant British demand (Innis's other prerequisite) for Upper Canadian wheat flour, until the late 1840s, on the eve of the railway boom, there was not enough toll revenue generated from agricultural exports to pay for the canal's construction and reconstruction. The canal simply was not viable. It was never self-financing as legislated, and, thus, chronically underfunded.

Although Upper Canada shipped wheat and flour to Lower Canada, the Maritimes, even the West Indies, and, on rare occasions, the United States, in spite of its 1824 tariff, comparatively little grain was exported to Britain before mid-century. British agriculture was highly effective; production more or less kept pace with population growth until the 1840s. By 1851, only one-fifth of British food was imported, although the population had nearly doubled during the Industrial Revolution.[84] Supplemented by

[81] McCalla, *Planting the Province*, 210, 422 n. 32.

[82] "Underbidding," Peter Way explains, "was the main cause of financial problems among contractors...." Way, *Common Labour*, 69. The same would be true later for railway contractors. See Richard White, "Losing Ventures: The Railway Construction Contracts of Frank Shanly, 1860-75," *Canadian Historical Review* 79:2 (1998), 237-60.

[83] Many of these problems were common to Canadian and American canals during this period. For an overview of the difficulties early nineteenth-century Canadian canal-builders experienced, see Stagg, *The Golden Dream*, chapter I.

[84] Charles More, *The Industrial Age: Economy and Society in Britain, 1750-1885* (London and New York: Longmans, 1989), 130; Gregory Clark, "Agriculture and the Industrial Revolution: 1700-1850," in *The British Industrial Revolution: An Economic Perspective*, edited by Joel Mokyr (Boulder: Westview Press, 1993), 230. For an analysis of British wheat production and imports, see Susan Fairlee, "The Corn Laws and British Wheat Production,1829-76," *Economic History Review* 22:1 (1969), 101-109.

continental European imports, especially from Prussia, British North America's primary competitor for grain exports, domestic production met British needs until the late 1840s.[85]

Amendments to the Corn Laws in 1815, 1822, and 1828, granted British North America some preference over foreign competitors under certain conditions. In practice, however, the British market was virtually closed to Upper Canadian farmers until the 1840s.[86] In 1822, 1823, and 1824, imports were banned (or warehoused in bond) under the exclusionary provisions of the Corn Laws. An exemption was granted in 1825 and shipments rose until 1828, before falling sharply. Although exports improved dramatically during the first three years of the 1830s, they fell again by 1834-35.[87] "For most of the decade of the 1830s," Marvin McInnis observes, "Canada was simply out of the export market." Exports rose substantially in the early 1840s, but Upper Canada would not establish a stable British market until late in the decade,[88] when rising British demand and higher prices touched off Canada's first wheat boom.

Moreover, in addition to low British demand and high tariffs, there were other barriers to grain exports. These included: extreme year-to-year volatility in British wheat prices (often lower than the Montreal price);[89] the long credit cycle for Canadian merchants, a minimum of three years from the time goods on credit left Britain until wheat could be shipped to pay for them; and a few poor harvests. High transportation costs were another major impediment. Before the St. Lawrence canals were completed by 1848, Upper Canadian wheat and flour first had to be transshipped over the St. Lawrence rapids to ocean vessels at Montreal, before export to Liverpool. Grinding wheat into flour reduced weight and bulk; by 1840, ninety percent of shipments were flour.[90] Nevertheless, high tariffs, low demand and prices, combined with high transportation costs, often made it unprofitable to export wheat and flour to Britain before mid-century.

By this time, however, conditions changed dramatically and several factors had converged to foster prosperity: tariff

[85] In 1841, Prussian grain accounted for 36.6 percent of all British wheat imports. (Jeffrey C Williamson, "The Impact of the Corn Laws Just Prior to Repeal," *Explorations in Economic History*, 27:2 [1990], 126). Between 1828 and 1838, C.R. Fay calculated that, "the total annual importation of wheat and wheat flour were considerably under one million quarters, [a quarter contains eight bushels] and of that quantity more than three-fourths were derived from Germany and the north of Europe." C.R. Fay, *The Corn Laws and Social England* (Cambridge: Cambridge University Press, 1932), 117.

[86] Douglas McCalla, "Des Pays d'En Haut au Haut-Canada: la formation d'une économie de colonisation" *Histoire, économie et société*, 27:4 (2008), 98.

[87] McCallum, *Unequal Beginnings*, 12-18, 124 Table S.1. Donald Grove Barnes, *A History of the English Corn Laws from 1660-1846* (London: George Routledge & Sons, 1930), 174, 189, 276, 288-89.

[88] McInnis, *Perspectives on Ontario Agriculture*, 35.

[89] *Ibid.*, 26-39.

[90] D.G. Creighton, *The Commercial Empire of the St. Lawrence, 1760-1850* (Toronto: The Ryerson Press, 1937), 243.

reductions in 1842 and 1843 leading to free trade three years later, good weather, and increased settlement and grain production. The American Drawback Acts (1845-46) also boosted exports. They permitted Upper Canadian produce to pass in bond through the Oswego and Erie Canals to New York,[91] by-passing the slower, more expensive St. Lawrence canals. As a result, between 1850 and 1856, John McCallum writes, "net exports of Ontario wheat almost doubled in volume and tripled in value."[92] Upper Canada (or Canada West as it was known after 1841), could boast that it was the bread basket of the British Empire. Unfortunately, by this time, British North American canals were overbuilt. There was not enough British demand to fully utilize the canals built in leaner times.[93]

The Burlington Bay Canal, like other North American transportation schemes, was built ahead of demand in anticipation of growing agricultural trade. Financed on credit, it was a highly speculative venture that collapsed several times because of inadequate funding. Neither merchants, nor politicians, or even the British government, shocked by the cost of the Rideau Canal, would finance it properly.[94] The merchants wanted to lower transportation costs, but were unwilling to risk their cash or credit. Instead, they shifted the expense of canal construction to government through political action. The government, inspired by notions of progress, but lacking enough revenue, borrowed to build the canal, persuaded that tolls would make it self-financing.

Once the canal was open to navigation, however, the same merchants used their statutory authority to lower the tolls mandated to pay for the canal. When faulty design and shoddy construction caused the canal to collapse, the government succumbed to local political pressure from unsecured creditors to borrow more money for canal reconstruction. This pushed the province deeper into debt, while it continued, in effect, to subsidize an unprofitable export trade until the late 1840s. As civil engineer T.C.

[91] The Oswego Canal (1825-29), Janet Larkin writes, was "Upper Canada's gateway to New York." It linked Oswego New York on the south shore of Lake Ontario with the Erie Canal at Syracuse. It was a major Canadian-American trade artery. Janet Larkin, "The Oswego Canal: A Connecting Link Between the United States and Canada, 1819-1837," *Ontario History* 103:1 (Spring 2011), 23-41.

[92] McCallum, *Unequal Beginnings*, 18.

[93] Thomas F. McIlwraith, "Freight Capacity and the Utilization of the Erie and Great Lakes Canals before 1850," *Journal of Economic History* 36:4 (1976), 874-75.

[94] McCalla maintains that there was no shortage of capital in Upper Canada. The province had access to hundreds of thousands of pounds in commercial credit, which it used in the 1830s to finance a steamship fleet and for increasing banking capital. Except for two major public works (presumably the Welland and Cornwall canals), it is reasonable, he believes, to think that, had there been a realistic possibility of a private return on lesser projects (possibly the Burlington Bay Canal), these works could have been financed from within the province, or, by outsiders, such as J.B. Yates, the American who invested in the Welland Canal. Of the projects for which the government had borrowed, in spite of the risk, McCalla speculates that they were, "essentially political and social investments, and those closest to them must have known or strongly suspected that they could not be made to pay an adequate return measured by ordinary private calculations." McCalla, *Planting the Province*, 170.

Keefer later remarked about Canada's canals, this debt was "a charge upon the public purse."[95] Public spending on the Burlington Bay Canal, and, especially, the Welland and St. Lawrence canals, eventually caused serious financial problems for the province. By the depression of 1837, work on major public works projects was practically suspended. During his brief 1838 visit to Upper Canada, Lord Durham, a strong supporter of canals, was dismayed to learn that Upper Canada was, as he reported, "burdened with debt of more than a million of pounds; the whole revenue, which is about £60,000, being hardly adequate to pay the interest."[96] Union with Lower Canada in 1841 would address the problem in the short term; a wider union would be necessary by 1867.

Upper Canada's first government-financed internal improvement, also foreshadowed a pattern of development problems—underfunding, shoddy construction, public debt, and political controversy—that would plague other government-supported projects, particularly the Welland Canal and the Grand Trunk Railway. Meanwhile, William Lyon Mackenzie, who sat on the Legislative Assembly's select committee of 1830 that investigated the Burlington debacle, was forewarned and forearmed when he attacked the Welland Canal's finances. Similarly, decades later, George Brown would criticize the Grand Trunk Railway.

While cheap water transportation and British demand were central to Harold Innis's interpretation of Canadian history**,** he was not a monocausal theorist. His colleague, Irene Spry, recalls that Innis considered many factors in his analysis, including geography, geology, biology, botany, meteorology, human culture, customs, religion, and technology. "In fact," Spry writes, he studied "the entire context of the economic problem."[97] Human culture, especially social values and attitudes were an important part of that context, one that warrants further research to help explain how culture affected technology differently in British North America and the United States. The development of transportation infrastructure, including harbour construction, merits more study.

There was a wide spread concern in early Upper Canada that the province, in spite of its abundant natural resources and agricultural development, was not progressing as rapidly as the republic to the south.[98] Travelers familiar with the United States and British North Ameri-

[95] Thomas Coltrin Keefer, *Canadian Water Ways from the Great Lakes to the Atlantic* (Boston: Damrell & Upham, 1893), 16-17.

[96] Gerald M. Craig, editor, *Lord Durham's Report: An Abridgment of Report on the Affairs of British North America by Lord Durham* (Toronto: McClelland & Stewart, 1963), 104.

[97] Irene M. Spry, "Economic History and Economic Theory: Innis's Insights," in *Harold Innis in the New Century: Reflections and Refractions*, edited by Charles R. Acland and William J. Buxton (Montreal and Kingston: McGill-Queen's University Press, 1999), 106.

[98] The post war depression, Gourlay agitation and the Erie Canal's economic threat, according to Denis McKim, triggered this anxiety. See "Upper Canadian Thermidor: The Family Compact & the Counter-revolutionary Atlantic," *Ontario History* 106:2 (Autumn 2004), 256-57. McCalla argues that Up-

ca also observed significant differences in outlook between the two North American societies. For example, touring North America in 1824 as a young man, E.G. Stanley, a future colonial secretary and prime minister (Lord Derby), compared British North America with the United States, recording in his journal, "the universal energy and activity which pervades the latter, and the general supineness and listlessness in which the former appears to be stuck."[99] In his 1849 pamphlet, *Philosophy of Railroads,* T.C. Keefer, who had worked on both the Erie and Welland Canals, likened British North America to Washington Irving's Sleepy Hollow, advocating railways to foster progress.[100] Years later, German political theorist Frederick Engels had a bleaker view of the somnolent Dominion. Arriving in Montreal from Port Hope, Ontario, in September 1888, he remarked: "It is a strange transition from the States to Canada. First one imagines that one is in Europe again, and then one thinks one is in a positively retrogressing and decaying country. Here one sees how necessary the feverish speculative spirit of the Americans is for the rapid development of a new country.... [I]n ten years this sleepy Canada will be ripe for annexation...."[101]

Compared to similar American harbours, such as the first Buffalo harbour on Lake Erie, completed in the summer of 1821, the construction of the Burlington Bay Canal reveals important cultural differences between American and British North American approaches to building harbours. Both projects were state-sponsored enterprises built by Americans using the same construction techniques and materials. Both were undercapitalized and badly engineered; the waves of Lakes Erie and Ontario smashed the flimsy wooden cribs with equal indifference. But, in one respect, Buffalo's harbour, was relatively more successful. Competing with neighbouring Black Rock to become the western terminus of the Erie Canal, Buffalo's harbour in 1821, although less complex than the Burlington Bay Canal, was completed in only 221 working days at a fraction of Burlington's cost. Led by an energetic merchant and magistrate, Judge Samuel Wilkeson,[102] the harbour was financed initially by Wilkeson and

per Canada's development did not lag behind the United States. The "timing and rate of Upper Canada's expansion," he writes, "were in essential accord with adjacent states, in particular, Ohio, Michigan and Western New York." McCalla, *Planting the Province*, 7.

[99] Quoted in Gerald M. Craig, *Upper Canada: The Formative Years* (Toronto: McClelland & Stewart, 1963), 145.

[100] T.C. Keefer, "Philosophy of Railroads" in *Philosophy of Railroads and other Essays by T.C. Keefer*, edited with an introduction by H.V. Nelles, (Toronto: University of Toronto Press, 1972), 7. The most celebrated literary allusion to American enterprise, contrasted with Canadian lassitude is Thomas Chandler Haliburton's 1836 satirical novel, *The Clockmaker*; or, *The Sayings and Doings of Samuel Slick of Slickville*.

[101] Engels to Sorge, 10 September 1888, printed in Karl Marx and Frederick Engels, *Letters to Americans, 1848-1895: A Selection*, translated by Leonard E. Mins (New York: International Publishers, 1953), 204.

[102] For Wilkeson's biography, see R. Beth Klopott, "Samuel Wilkeson," *American National Biography* 23 (1999), 396. Wilkeson usually is portrayed as an heroic figure. He placed the good of the community

two other local entrepreneurs who risked their money and plunged into the frigid waters of Lake Erie to work from dawn to dusk with their neighbours, many of whom had volunteered their labour.[103] In this way, the Buffalo harbour, like the Erie Canal, was "the perfect democratic artifact,"[104] and, as Ronald E. Shaw notes, it was simultaneously a "symbol of nationalism and a manifestation of republicanism."[105]

The Burlington Bay Canal, by contrast, reflected a more conservative and hierarchical society that did things differently. Unlike Judge Wilkeson, James Crooks never risked his purse, much less worked alongside common navvies. He acted as though the canal was the responsibility of the Crown to be managed by gentlemen no matter what the cost. The result was not only a distinctive national technical style that blended British traditions and American influences,[106] but also construction that was slower and more costly. This conservatism[107] would influence other projects and manifest itself later when Ontario struggled to build an industrial infrastructure.[108]

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ahead of his own interest and overcame difficult natural and man-made obstacles to build the harbour, thereby securing Buffalo's future as the western terminus of the Erie Canal. Mark Goldman attributes his reputation to eulogistic late nineteenth- and early twentieth-century writers, such as J.C. Lord and Alfred Bigalow. (Mark Goldman, *High Hopes: The Rise and Decline of Buffalo* [Albany: State University of New York, 1983], 25). The Wilkeson legend persists: See, for example, Gerald Koeppel, *Bond of Union: Building the Erie Canal and the Rise of the American Empire* (Philadelphia, Da Capo Press, 2009), 10. Wilkeson played a small role in Canadian history. In 1829, he was awarded a contract to build a brush dam on the Welland's Feeder Canal. Styran and Taylor, *This Great National Object*, 101.

[103] In the absence of a modern study, some of the older sources are useful: Wilkeson, "Recollections of the West," 199-209; Thomas W. Symons and John C. Quintuse, "History of the Buffalo Harbor: Its Construction and Improvement During the Nineteenth Century," *Buffalo Historical Society Publications* 5 (1902), 239-86. Also see Katheryne Thomas Whittemore, "Geographic Influences in the Building of Buffalo Harbor" (Ph.D. diss., Clark University, 1936), 169-78.

[104] Page Smith, *The Shaping of America*, vol. 3 (New York: McGraw-Hill, 1980), 773.

[105] Ronald E. Shaw, *Canals for a Nation: The Canal Era in the United States, 1790-1860* (Lexington: The University of Kentucky Press, 1990), 30. For an analysis of the relationship between technology and republicanism, see John F. Kasson, *Civilizing the Machine: Technology and Republican Values in America, 1776-1900* (New York: Grossman Publishers, 1976), 3-51.

[106] On the distinctiveness of Canadian technology, see Bruce Sinclair, "Canadian Technology: British Traditions and American Influences," *Technology and Culture* 20:1 (1979), 108-123.

[107] For an analysis of Canadian conservatism, compared to American liberalism, see Seymour Martin Lipset, *Continental Divide: The Values and Institutions of The United States and Canada* (New York and London: Routledge, 1990). Conservative ideology exerted a strong influence on Upper Canada's development. Denis McKim, for example, argues that the governing elite believed that the province's future lay in agriculture and canal-building, not manufacturing. Denis McKim, "Upper Canadian Thermidor," 256-58.

[108] Contrary to the expectations of James Crooks and other boosters of domestic manufacturing, the Burlington Bay Canal did not create much industry. As late as 1851, manufacturing in Hamilton, as well as most of Canada West, was dominated by artisanal, not industrial production. The census of 1851 reported that there were 282 artisan stores, shops, offices, and manufactures in Hamilton. Over half (52 per cent) had no employees; only 30 had 5 to 10. Michael Katz, *The People of Hamilton, Canada West: Family and Class in a Mid-Nineteenth Century City* (Cambridge: Harvard University Press, 1972), 2.