Kimberly E. Monk, A GREAT LAKES VESSEL TYPE: ARCHAEOLOGICAL AND HISTORICAL EXAMINATION OF THE WELLAND SAILING CANAL SHIP, *SLIGO*, TORONTO, ONTARIO (Under the direction of Dr. Timothy Runyan), Department of History, August 2003.

This thesis identifies and defines a typology for Welland sailing canal ships, the first commercial Great Lakes vessel type. The Welland Canal played a pivotal role in trade between the Great Lakes during the nineteenth century. It also gave rise to a new vessel type, one that would maximize profits for investors. The influences and effects of the canal on ship design are analyzed from the establishment of the first Welland Canal in 1829, and the enlargement and successive opening of the second Welland Canal in 1846. The study concludes in 1882, with the opening of the third Welland Canal.

A principal figure in Canal shipbuilding was Lewis Shickluna, who constructed the *Sligo*, née *Prince of Wales*. The *Sligo* is the primary example of a Welland sailing canal vessel in this study. The sunken vessel was documented using appropriate archaeological methods and employing historical documentation of the vessel and the vessel type. The *Sligo* is contrasted with other sailing canal ships, toward understanding constructional details and modifications. Ultimately these vessels became Great Lakes workhorses and form an important element of maritime history.

A GREAT LAKES VESSEL TYPE: ARCHAEOLOGICAL AND HISTORICAL EXAMINATION OF THE WELLAND SAILING CANAL SHIP, *SLIGO*, TORONTO, ONTARIO

A Thesis

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By

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For my parents

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INTRODUCTION

The Great Lakes became a waterborne commercial highway by the nineteenth century. Necessity, being the mother of all invention, dictated the need to develop transportation modes to address the unique conditions of the region and serve as profitable economic investments.

The physical environment of the Great Lakes placed a number of constraints on navigation and vessel design. The most significant of these were: lack of sea room, the predominance of East –West trade networks, the seasonal nature of shipping in the area, and restrictions on vessel draft and length imposed by the dimensions of the region's canals, rivers, and harbors.[1] Although most shipbuilders faced these challenges when constructing lake vessels, none were more aware than those who were in the business of building sailing canal ships, or sailing canallers. Their ingenuity and drive resulted in the sailing canallers that are the chief focus of this study.

Great Lakes Commerce and Shipping During the Nineteenth Century

Shipyards sprang up along the shores of lakes Michigan, Huron, Erie, and Ontario during the nineteenth century. Many of the builders, having emigrated from Europe, apprenticed with yards that built ocean-going vessels. The economic downturn in Europe during the early nineteenth century pressed shipbuilders, journeymen, and carpenters to establish their own yards in both the United States and the British Crown land of Upper Canada, which became the Canadian province of Ontario in 1867.

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[1] John N. Jackson, *The Welland Canals and Their Communities: Engineering, Industrial and Urban Transformation* (Toronto: University of Toronto Press, 1997), 33.

The opening of the Erie and Lake Champlain canals in the Eastern United States during the early 1820s spurred the invention of vessel forms able to transport both passengers and bulk cargo to previously remote, inaccessible areas. The size limitations of these canals supported the further spatial and temporal evolution of these vessels. As quickly as such evolution occurred, however, extinction could be right behind. Vessels designed to fill particular transportation niches were quickly replaced whenever improved forms appeared.

The nineteenth-century market revolution, which stirred United States transportation growth in the form of railroads and canals, also encouraged United Empire Loyalists in Upper Canada to invest in transportation networks. The prospect of a canal (i.e., the Welland Canal) that would connect Lake Erie to Lake Ontario and therefore bypass the treacherous Niagara rapids, promised considerable opportunities for commerce.

At the time, it was also suggested that such a canal would allow passage of vessels for military purposes. As many British contemporaries noted, the canal could provide a throughway for vessels.[2] As it turned out, however, while small vessels could pass through the various incarnations of the Welland Canal, the passage of large warships was impossible. Additionally, any vessel traversing the canal during wartime would have been highly susceptible to capture or sabotage. Even with the enlargement of the Welland Canal in 1846, the waterway was still unable to support large vessels. Its inadequacies were duly noted, in jest, by an Upper Canada Loyalist:

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[2] The treaty limited British and US naval forces on the Great Lakes and Lake Champlain, following the end of the War of 1812–1814.

> When next our much respected contemporary discusses the probability of war with England and the importance of our lake defenses, we wish it would point out how it proposes to get that seventy-four gun ship from Sacketts Harbor into Lake Erie. Will the *New Orleans* go through the Welland Canal or up Niagara Falls? Perhaps, however, the Post proposes to carry it over land to Buffalo.[3]

Although it could not handle large ships, the first Welland Canal spurred commercial activity and community growth throughout the Great Lakes region, and encouraged activities that supported the new travel networks. The shipbuilding industry, in particular, was crucial to the region's development. Innovations in ship construction set the stage for the expansion and political/commercial recognition of the region's growing population. In fact, it can be safely concluded that the development of new vessel types during the nineteenth century helped to stimulate economic growth on both sides of the Canada–United States border and initiated a revolution in bulk freight shipment that remains vital to this day.

Commercial Vessels on the Great Lakes

Few studies to date have focused on the wide variety of nineteenth-century Great Lakes vessel types.[4] Vessel development on the Lakes developed along two trajectories: sail and steam. Within both types, further specialization was dictated by different cargoes

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[3] *St. Catharines Evening Journal*, 2 January 1862.

[4] There are a variety of site reports indicating shipwrecked-vessels' forms and functions. Examples include C. Patrick Labadie's report, *Submerged Cultural Resources Study: Pictured Rocks National Lakeshore*. Southwest Cultural Resources Center Professional Papers no. 22 (Washington, DC: Government Printing Office, 1989), which addresses vessel forms such as Welland sailing canal ships and scow schooners. For research on Davidson Goliaths and one builder's contribution to this formidable vessel type, see David J. Cooper and John O. Jensen, *Davidson's Goliaths: Underwater Archeological Investigations of the Steamer "Frank O'Connor" and the Schooner-Barge "Pretoria"* (Madison: State Historical Society of Wisconsin, 1995).

carried as well as by natural and forged landscapes. By the 1840s, several hull forms were designed specifically to take advantage of these landscapes.

The period of the first Welland Canal (1829–1845) witnessed a dozen or so hulls built to conform to the route's lock dimensions. Full realization of a hull form expressly suited for transiting this waterway only came about with the opening of the second Welland Canal in 1846. From the 1850s through the 1870s, this hull form evolved to include sailing canal ships, propeller canallers, canal sidewheel steamers, and canal steam barges. The development of the third (1881-1930) and fourth (1931-present) Welland Canals heralded the most recent Great Lakes vessel type, the Laker, a not-so-distant cousin to the original ships that had been built to maximize the second canal's potential.

Scow craft were prevalent from the early 1850s until the end of the nineteenth century, providing a working boat that required limited shipwright experience. Another introduction to the Lakes during the 1850s was the centerboard clipper. It differed greatly from its freshwater cousins of the same period because its commercial success depended on speed rather than maximized space. Other sailing craft included the goliath wooden bulk freighters of the Upper Lakes, built from the 1880s through the first decade of the twentieth century. Consort-barges were either sailing vessels that had been converted to barges or ships built as barges that contained masts; they were usually schooner-rigged.

Steam vessels are generally classified according to propulsion, whether they were sidewheel steamer or steam-driven propeller. Sidewheel steam-driven vessels were employed on the Great Lakes as early as 1816 in both the passenger and package freight trade. Characteristically, they employed two large paddlewheels mounted port and

starboard, with engines and boilers amidships. Most early sidewheelers also carried one to three masts. During the 1850s a few shipbuilders deviated from the typical sidewheel steamer form to construct pollywogs, which boasted narrow paddlewheels that had a large circumference and were situated well aft in order to enable these ships to participate in the canal trade.

Steam-driven propellers, meanwhile, were introduced after 1840. These ships held a niche throughout the nineteenth century, during which time they evolved in size and reflected the navigational and engineering improvements of the post-1850 period. These vessels were configured with two or more decks, allowing for cargo space in the hold and passenger accommodations in enclosed cabins on deck. Steamers without passenger cabins were termed package freighters. The standard arrangement included two decks with side-loading gangways; single- or twin-screw propellers and machinery were mounted aft. During the 1850s, aesthetically extravagant versions of these ships were popularly known as palace steamers. As a result of competition with railroads, steam-driven propellers gradually vanished from the Lakes region, save for a few that operated as tour boats as late as the 1930s.

Bulk-freight steamers were propeller driven and designed for the carriage of bulk cargoes. The first bulk freighters were built around 1865 to carry lumber, but the basic design was adapted for coarse freight in 1869. The hybrid form that resulted is entirely unique to the Great Lakes and remains to this day a cost-effective system of transporting the agricultural and mined commodities of the Upper Lakes to the lower Lakes markets. During the second half of the nineteenth century this vessel type evolved to include

examples of steamers and steam barges (1860s–1870s) and specialized types such as whalebacks (1880s–1890s). Steamers were generally double-decked vessels, with their machinery mounted in the stern and a small raised forecastle at the bow; they also usually carried auxiliary masts. Steam barges were small, single-decked propeller craft containing powerful engines and small cabins at the stern. They also had raised poop decks. On the early steam barges the pilothouse sat aft; it was placed on a raised forecastle with a well-deck between bow and stern after 1880. Steam barges were often seen towing two or more schooner barges, while also carrying modest cargoes of their own.

Anatomy of Chapters

This study identifies and defines the historical provenience of Welland sailing canal ships over the course of five chapters. Chapter 1 focuses on shipbuilding on the Welland Canal from 1829 to 1881. It emphasizes the development and decline of wooden shipbuilding through documentation of the shipbuilders, their yards, and their ships. In addition to focusing closely on the St. Catharines, Ontario, shipbuilder Lewis Shickluna, this chapter also explores the interrelationships between shipbuilding and the region's economic infrastructure. Chapter 2 classifies and analyzes the sailing canal vessel type. Emphasis is placed on identifying key characteristics, and attention is given to its temporal and spatial construction. Chapter 3 provides a history of the *Sligo* (née *Prince of Wales*), a sailing canaller built by Lewis Shickluna. This descriptive chronology presents the ship's career as it was affected by the people, places, and economy that shaped the

Great Lakes region. Chapter 4 focuses on the archaeological fieldwork conducted on the *Sligo*. Field investigations of the *Sligo* are compared with those on the Welland sailing canal ships *Bermuda* and *China*. Chapter 5 analyzes the results of the archeological and historical evidence, suggesting the importance of delineating vessel design analysis spatially, temporally, and individually. It concludes by emphasizing the contribution this research makes to our understanding of the factors that affected the economic and social development of the Great Lakes region.

Although this study focuses primarily on one Great Lakes vessel type, the intention is not to diminish the many other significant forms that plied North America's inland waterways. Each vessel type played a vital role in Great Lakes economic and social history, and therefore each type deserves recognition for its impact on the region's commerce and life. It is through individual ship studies such as this one that we may better comprehend the circumstances that initiated form design and innovation as well as the consequences of those developments.

CHAPTER 1
SHIPBUILDING ON THE WELLAND CANAL, 1829–1881

The economic development of the Great Lakes region reached unprecedented levels with the establishment of canal systems. The Welland Canal, which was first opened in 1829, played a particularly important social and economic role for the United States and Canada during the nineteenth century, controlling all trade between the Upper and Lower Lakes. As a result of this canal, enterprising individuals took advantage of new economic opportunities.

In ports located near the Welland Canal, a great shipbuilding industry flourished and declined over the course of the nineteenth century, its growth frequently curbed by depressions, yet also spurred by intermittent booms. The history of the Welland area's shipbuilding industry is typical of many other places in Eastern Canada, Great Britain, and the United States where shipyards sprang up to meet the heavy, though erratic, nineteenth-century demand for tonnage. True to the law of supply and demand, when steel-built vessels became economically as well as physically superior, the market for new wooden ships disappeared and the yards closed.

This chapter explores the development of wooden shipbuilding in the Welland Canal area, and addresses the importance of associated shipyards to the larger context of Western maritime history. It begins with a discussion of the purpose and development of the first Welland Canal, and then examines the development of various markets and resources associated with Great Lakes shipping during the nineteenth century. The chapter concludes with an extended analysis of shipbuilding along the Welland Canal,

and features a close scrutiny of the five major players in the region's emergence as a North American shipbuilding hub.

The First Welland Canal: Purpose and Development

The War of 1812 demonstrated to British-Canadian authorities the strategic requirement for a canal across the Niagara Peninsula. The laborious transport overland of military supplies to the Detroit frontier, as well as the maintenance of separate fleets on Lakes Ontario and Erie, had emphasized the need. At the same time, events had shown that naval supremacy on the Great Lakes was indispensable to military success on land.[5] Interest in carving a canal across the Niagara peninsula was not confined to imperial strategists, however; agriculturalists and merchants in Upper and Lower Canada also advocated for its construction. Indeed, interest in building a canal, although primarily claimed to be military, was most certainly oriented more toward mills and principal import and export markets than for use as a national route of communication and military transport.[6] Lucrative high-volume, low-value bulk goods markets would, in fact, come to be the peninsular canal's true *raison d'être*: economic development.

During the Parliamentary session of 1818, a joint resolution by the two Canadian Houses of Assembly declared that the improvement of navigation on the St. Lawrence River to and from Montreal was "essential to the interests of each province in a

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[5] William Hamilton Merritt, *Brief Review of the Origin, Progress, Present State and Future Prospects of the Welland Canal* (St. Catharines, 1852), 15.
[6] John N. Jackson, *St. Catharines, Ontario: Its Early Years* (Belleville, ON: Mike Publishing, 1976), 269.

commercial and to our parent country in a political view."[7] Within a week of the presentation of this report, the Assembly of Upper Canada received a petition from the inhabitants of the war-ravaged District of Niagara containing a plan to connect Lakes Erie and Ontario by a canal.[8]

By 1823, Upper Canada faced the prospect of an American canal between Lakes Erie and Ontario. Many people in the colony therefore felt an increased urgency to construct a Canadian canal. Instead of being undertaken as a government project, a joint stock company (the Welland Canal Company) was formed in 1824 and ground was broken the same year.

The company's original plan was to build a canal four feet deep from the Welland River to Lake Ontario, suitable only for transporting boats less than 40 tons burden.[9] No sooner had construction commenced than both shareholders and colonial authorities began to pressure the company to enlarge the proposed dimensions. The former urged the company to keep in mind schooners as well as boat navigation in order to render the stock more valuable. The latter were concerned that a four-foot canal would be unable to accommodate gunboats and would not permit the movement of naval vessels from one lake to the other.[10]

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[7] Merritt, *Brief Review, 37.*
[8] *Colonial Advocate*, No.6, Published September 27th, 1824, Containing an essay on canals and inland navigation, and the Reports to the President and Directors of the Welland Canal Company, of Messrs. Francis Hall, James Clowes, and Nathan Roberts, engineers, employed to survey a line of canal to connect Lakes Erie and Ontario. *(Queenston, ON: 1824), 13.*
[9] Welland Canal Company. *Minutes of the Welland Canal Company*, 35.
[10] Welland Canal Company. *Annual Report of the Board of Directors of the Welland Canal Company*, 54.

Overwhelmed by external pressure, the company agreed to enlarge the canal. Amid growing debt and deficient wooden lock construction, the first Welland Canal was partially opened in December 1829, with all 40 locks accessible by 1833.

Establishing Principal Markets

The promise of agricultural land was the greatest attraction to immigrants to the Great Lakes region in the nineteenth century. By the mid-1800s, most of the areas where farming was possible had been settled, and population throughout the region had swelled tremendously. There were about 400,000 people in Michigan, 300,000 in Wisconsin, and almost half a million in Upper Canada.

The Welland Canal led to broader commodity export opportunities, allowing farmers to expand their operations beyond a subsistence level. Wheat and corn were the first commodities to be packed in barrels and shipped abroad. Grist mills, one of the region's first industries, processed grains for overseas markets and were built on the tributaries flowing into the Great Lakes. As the population grew, so did the need for construction material such as timber. This demand continued to increase through the turn of the twentieth century, and eventually rivaled the grain market. The balance of bulk freight was divided among oil, iron ore, coal, and limestone.

The Welland Canal was well positioned to take advantage of the Great Lakes' bountiful natural resources, especially because freight rates through the waterway were cheaper than those charged by the railroad. To an extent, the railway lines acted as feeders to the canal, making it more convenient for inland producers to use the route to

ship their goods east. Although there were other inherent barriers to navigation, including shallow harbors and the narrow and constantly shifting St. Clair Flats, the Welland Canal became a formidable waterborne highway and its bulk cargoes a lucrative business.

Wheat Kings

Agriculture advanced on a broad scale behind wheat-producing frontiers in Canada and the United States. During the 1830s and 1840s, Chicago, with its prime Midwest location on Lake Michigan, became a natural hub for the exchange of grain. There was, however, no organized exchange system, and grain farmers were forced to go from merchant to merchant looking for a buyer. Often they could not find buyers and abandoned their produce in Lake Michigan. Grain prices were usually low after the fall harvest and much higher in April, after winter supplies had run low. By 1848 it was clear that there were problems matching the supply and demand transportation services for agricultural products. The time was ripe for the development of a futures market to stabilize prices.

Eighty-two Chicago merchants founded the Chicago Board of Trade in 1848. The organizers realized that natural resources were vital to the economy. The Board assisted in the development of communications and transportation links to create opportunities for businesses and communities, to expand and diversify their economies. By 1860, the Great Lakes grain trade had assumed immense proportions, with an increase from 30,000 to 50,000 bushels per vessel shipment. Although grain exporting remained strong at United

States ports such as Chicago and Milwaukee, competition with their northern neighbors was intensifying.

Canadian wheat export was based at Fort William, Ontario (later renamed Port Arthur) on the shores of Lake Superior. This town's history was irretrievably changed in the 1870s and 1880s with the coming of the transcontinental railway. Within a very short time, strengthening links between Fort William and Canada's rich agricultural Western provinces made this location the principal port for Canada's grain shipments to the world. By the early 1900s, Port Arthur ranked as the world's number-one grain handling port.

Wheat export was managed by two consortiums in northern Ontario. The Port Arthur Board of Trade was founded on 21 April 1885 in order to nurture a healthy business climate and to develop local industries in transportation, harbor construction, mining, forestry, the grain trade, and shipping. The Fort William Board of Trade possibly grew out of the Kaministiquia Club that was formed in 1879 to look after Fort William's business interests which at the time were threatened by stakeholders from Prince Arthur's Landing, who wanted to gain control of the entire region. These two business groups oversaw the early years of grain shipment eastward from the Canadian Prairies to forwarding ports such as Kingston, Ontario, or directly to growing metropolitan areas such as Toronto.

Timber Barons

In the early decades of the nineteenth century, the Great Lakes and their tributary waterways flowed through areas densely covered with virgin timber. Timber became a

primary resource for both regional and national building materials, industry, and fuel. Timber harvesting began along the shores of the southernmost Lakes – Ontario, Erie, and Michigan. Following the depletion of those reserves, lumber was harvested in the North American interior and shipped from or processed in ports such as Alpena, Bay City, and Saginaw in Michigan, and Southampton, Wallaceburg, Chatham, as well as a number of ports on Georgian Bay in Ontario.[11] This rough-cut and processed lumber was then transported via lake vessels to transshipment hubs such as Oswego, New York, and Kingston.

The British timber market was the main customer of the early Canadian merchants. By the 1840s, cities such as Cleveland, Buffalo, Toronto, Milwaukee, Chicago, and Detroit also imported wood products for both local use and for transshipment to the East and West. This process was accelerated by the great Chicago fire of 1871 and the resulting need to rebuild one of America's leading cities.[12]

Ontario's land use objectives were similar to those of the United States in that both focused on converting publicly owned forest land to privately owned agricultural land, while encouraging settlement.[13] Land clearing was initially stimulated by the closing of the Baltic forests during the Napoleonic Wars (1800–1815), and by British demands placed on Upper Canada's natural resources. This demand continued until the

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[11] The story of one company's experience in timber shipment is offered by James T. Angus, *A Deo Victoria: The Story Of the Georgian Bay Lumber Company, 1871-1942* (Orillia: Severn Publications Limited, 1994). It is interesting to note that the flagship of this company's fleet was the Welland sailing canal ship *Thomas C. Clark Street*, an 1869 product of the Shickluna shipyard.

[12] Eileen Reid Marcil, *The Charley-Man: A History of Wooden Shipbuilding at Quebec, 1763–1893* (Kingston, ON: Quarry Press, 1995), 219.

[13] R. J. Burgar, "Forest Land-Use Evolution in Ontario's Upper Great Lakes Basin," in *The Great Lakes Forest: An Environmental and Social History* (Minneapolis: University of Minnesota Press, 1983), 179.

mid 1850s when, after the Crimean War, Britain directed its attention to European timber supplies. Britain had also by this time begun to focus on iron as a construction material for ships. A new market in the expanding U.S. Midwest arose in its place, with a demand for Ontario's white pine, oak, walnut, and black cherry.[14]

Nineteenth-century timber exports to Britain and the United States were important for the growth of the Upper Canadian economy. They earned foreign exchange for the colony in the same order of magnitude as any other single export, including wheat and flour. Timber exports also provided early cash for settlers in those parts of Upper Canada that eventually turned to full-time, mixed farming. In turn, the Canadian forests contributed to the prosperity of British timber importers and United States lumbermen.

Liquid Gold

The oil industry in Canada developed in tandem with a similar enterprise in the United States. This industry experienced its humble origins in Southwestern Ontario as early as 1850 and in Pennsylvania by 1860. Various well-financed local Ontario merchants and producers began to send cargoes of oil to Great Britain. Barrels of oil were floated down the Sydenham River toward the St. Clair River and loaded onto ships such as the barkentine *Prince of Wales*, which carried 3,000 barrels. In all, seventeen ships laden with oil left Montreal during the shipping season of 1862, fourteen bound for Britain and one each to Germany, British Guiana, and Australia. Unfortunately, not all the oil sent abroad was properly deodorized, so that the quality of the product was not

[14] *Ibid.*, 180.

uniformly attractive to foreign customers. Continued poor quality effectively ruined the Canadian export market for oil by 1864.[15] Thereafter, Canadian oil production and shipment were largely focused on domestic markets.

Mining the Earth

By sheer chance, drilling for oil in New York and Pennsylvania uncovered significant deposits of salt. United States commercial interests became heavily involved in salt extraction. The major export markets for salt were in Milwaukee and Chicago. By the early 1800s, salt from Syracuse was being shipped through Oswego to the Midwest. Oswego's decline from a bustling port began in the 1870s when salt fields were discovered in the Midwest and shipments of salt from Syracuse were no longer needed there.

The opening of the Soo Canal in 1855 stimulated the transport of goods from Lake Superior to the Lower Lakes. In the United States, ore was carried from mines near Lake Superior to mills at the south end of Lake Michigan and at Detroit, Cleveland, and Lorain, Ohio in the Lake Erie basin. In Canada, ore from the Upper Lakes region was processed in Ontario mills at Sault Ste. Marie, Hamilton, and Nanticoke. Ships such as the Welland sailing canal schooner *Bermuda* were employed in ore carriage during the late 1860s from ports such as Marquette, Michigan.

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[15] Edward Phelps, "Foundations of the Canadian Oil Industry, 1850-1866," in *Profiles of a Province*, ed. Edith G. Firth (Toronto: Ontario Historical Society, 1967), 163.

In addition to the iron industry, during the late nineteenth and early twentieth centuries great quantities of coal and limestone were carried by ship from mines and quarries to mills along Lakes Erie and Ontario. The increasing demand for materials to construct highways, bridges, and other major projects stimulated these markets, a situation that continues to this day.

Shipbuilding Along the Welland Canal

The value of the first Welland Canal to economic enterprise was fully realized by 1841, when construction of the second Welland Canal began. With only 27 locks to navigate and the locks themselves constructed of stone and entailing a significant increase in dimension, shipbuilders and ship owners were undoubtedly eager to profit from this new engineering feat. With the opening of this improved waterway in 1846, shipbuilding along the Welland Canal flourished; but was most prominent at Port Dalhousie, Port Robinson, and St. Catharines. The redirection of the Canal transformed these places from obscure villages to important inland ports. Certainly, the combination of navigable water, available timber, and a skilled workforce provided a suitable base for shipbuilding. Additional smaller shipyards also sprang up at the smaller Niagara Peninsula communities of Welland, Port Colborne, Stromness, and Dunville.

Major shipbuilding activities began when Russell Armington, a master builder, was persuaded by William Hamilton Merritt to enter into the business of repairing and building ships. Three schooners were built on Twelve Mile Creek below the village of St. Catharines. The first, with the appropriate (but anticipatory) name of *Welland Canal*,

made its maiden voyage in 1827, when it carried a thousand barrels of flour to Prescott, Ontario.[16] The captain and part owner, Job Northrup, who had established a forwarding business, superintended the construction of the vessel. The following year consideration was given to constructing a packet boat that would run between Twelve Mile Creek

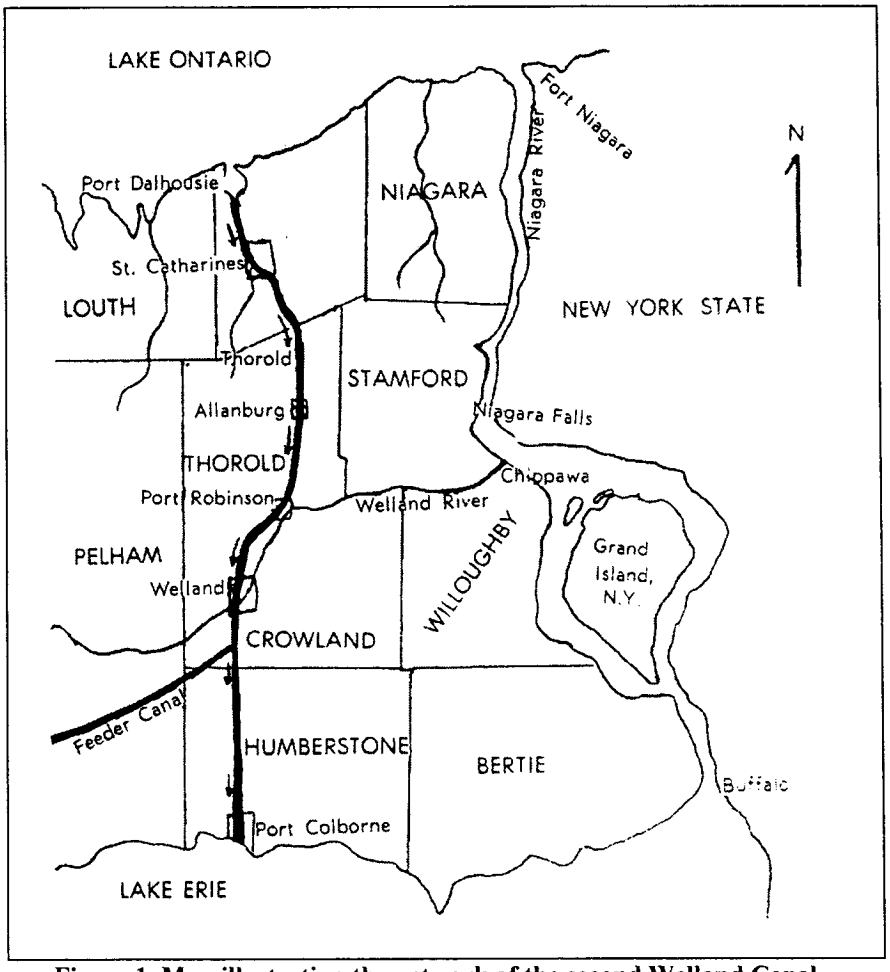

Figure 1. Map illustrating the network of the second Welland Canal. (Credit: Brock University.)

and Port Dalhousie. A further significant impetus to shipbuilding occurred in 1830, when the Welland Canal Company authorized the construction of a dry dock in the valley

[16] Bruce Parker, "Shipbuilding in the Niagara Peninsula: A Study of Nineteenth-Century Enterprise," *Inland Seas* 36, no.3 (1980): 43.

below St. Paul Street. Armington launched a schooner with the now familiar name of *W. H. Merritt* in 1832, and two more schooners were launched in 1834. Although primarily a repair yard, at least four other schooners were built at Twelve Mile Creek.[17] Armington's death in 1836, however, was merely the end of one small chapter in Welland Canal shipbuilding. By 1841, capitalization of this lucrative resource was well underway.

The "Big Five"

The majority of hulls produced along the Welland Canal during the period between 1836 and 1881 were manufactured by five shipbuilding partnerships and individuals. The Abbeys, the Muirs, Donaldson and Andrews, Melancthon Simpson, and Lewis Shickluna served the growing region and played a vital role in years leading up to Canadian Confederation (1867). Most importantly, construction of canallers, which were built to maximize cargo-carrying space within the confines of the second Welland Canal, were the tool used to capitalize on this striving economy.

In the middle of the century, the *Niagara Mail* (19 April 1854) boasted of the area's shipping resources:

> The docking privileges afforded by the Welland Canal are unsurpassed in the county and we hail, with pleasure, every attempt made by deserving mechanics to avail themselves there from. Capital, inexhaustible resources and indomitable perseverance must make this Canada a great place.

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[17] Peter D. A. Warwick, "The Shickluna Story," *The Canadian Geographical Journal* (June/July, 1978): 33.

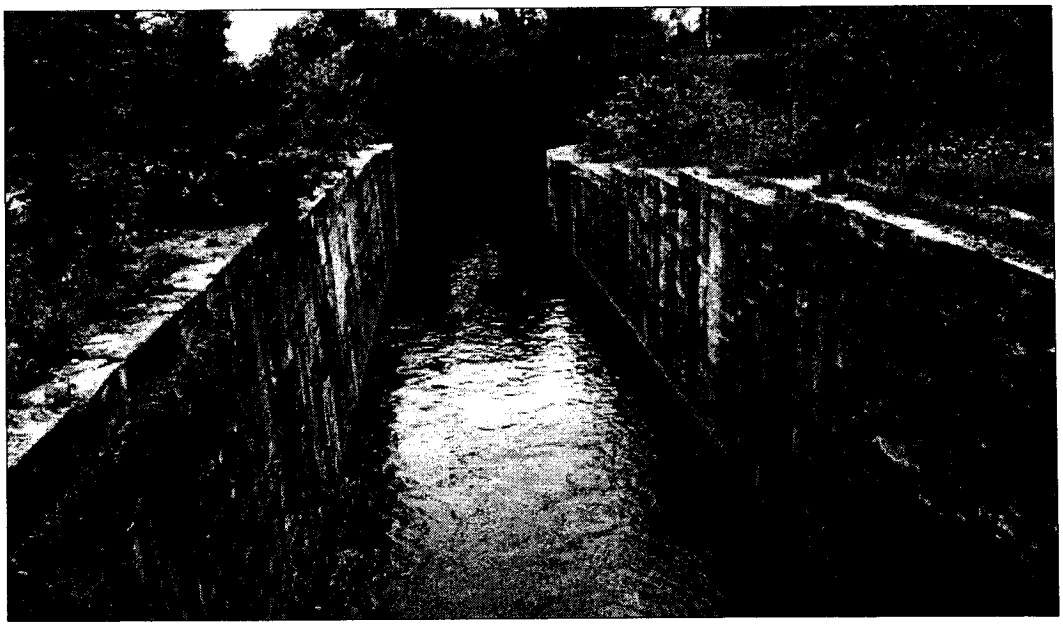

Figure 2. Lock 8: A typical lock of the second Welland Canal.

As this journalistic account reveals, the Welland Canal had become a major center for shipbuilding on the Great Lakes, and as its vessels fit the size of the locks, they had the advantage of being able to carry maximum cargoes through the waterway. These vessels also served to advertise the canal in the ports around the Lakes and influenced the design and construction of ships that now had to be built to meet the canal's lock dimensions.

But, as shipping demands evolved, so did the surrounding landscape. By 1 May 1875, most of the contracts had been let for the construction of the third Welland Canal. This project spelled out the final chapter of the ports along the waterway; once the second Welland Canal was abandoned, slow decay set in. The closing down of these five shipyards signaled the end of a great shipbuilding era.

The Abbeys: Men of Skill and Integrity

The Abbey name became synonymous with shipbuilding beginning in 1843. The Abbey family were prolific shipbuilders along the Welland Canal, at Port Dalhousie, Port Robinson, and Port Colborne. The first family member to stake a claim in the region was Robert M. Abbey, who between 1836 and 1857 built a number of schooners, including the *Scotia*, at Port Dalhousie.

The most noted builders in the Abbey clan were undoubtedly John P. and James S. Abbey. They had learned their trade as ship's carpenters at Lewis Shickluna's yard, and opened their own shipyard in 1853 at Port Robinson. Between 1853 and 1874, John P. and James S. Abbey were responsible for building numerous sailing ships, steamships, barges, and scows. The shipyard was located on the north side of the canal cut, south of Lock 26. The schooners *John Young*, *Antelope*, *Perseverance*, and *Elk* were products of the yard.

As early as 1854, Kingston's *Daily News* (14 September) reported on the enterprising Abbey shipyard:

> the proximity of their yard and dry dock to the Welland Canal rendered it very convenient for vessels requiring repairs to take advantage of their skill in such matters. We are happy to learn that the Messrs. Abbey have always as much work on hand as they can attend to, and that their business is constantly increasing, which is always the result where men of skill and integrity have charge of an establishment.

The barkentine *E. S. Adams* was also a product of the Abbey's yard in 1857. She participated in direct trade to London, England, in 1858 with a cargo of walnut timber, having made the Atlantic crossing in a speedy 26 days. Kingston's *Daily News* (31 August 1857) had the following to say about this ship:

> Of the excellence of the workmanship, and of the materials of which she is built, it is unnecessary for us to say anything, as the testimony of several gentlemen connected with the marine merchant service, given at the dinner to the Messrs. Abbey the same evening, is sufficient to show that she is not inferior to any vessel on the inland waters of North America. On the water she appears a most beautiful model.

In the same article, the *Daily News* commented on the impressive growth and size of the Abbey's shipbuilding enterprise:

> By perseverance, sobriety, and honest industry, they attained the enviable position they now hold among the first shipbuilders in Upper Canada. They recently built a dry dock at an expense of about $10,000, and so rapidly is their business increasing, that they begin to feel the want of another. They have now in their employ from seventy to eighty men, and yet they have more work than they can readily manage to perform. On the day the E.S. Adams was launched, there were no fewer than four schooners and five or six scows lying in port waiting for repairs.

On 28 March 1861, however, trouble ensued at the Abbey shipyard, when ship carpenters and caulkers struck for higher wages.[18] By June the workers had organized themselves into the Welland Canal Ship Carpenters and Caulkers Union; they intended to close all the shipyards along the Canal unless their demands were met. The Abbey brothers, along with Donaldson and Andrews at Port Dalhousie, discharged every union man and declared they would not employ anyone belonging to the union. On 16 June, the Abbeys' joiner shop, which stored some lumber, two buggies, and nine chests of tools belonging to the joiners, were set fire to and completely destroyed.[19] The Shickluna shipyard soon began to discharge union workers, as did several other yards. Toward the

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[18] Ronald M. Findlay, "Lewis Shickluna: Shipbuilding and Repair, St. Catharines, Ontario," *Inland Seas* 51, no. 3 (1995): 67.
[19] *St. Catharines Journal*, 20 June 1861.

end of the summer, activities at the shipyards returned to normal since the union realized it could not compete with the unity of these primary shipyards.[20]

The premature death of James Easton Abbey in June 1863 saw John P. Abbey take over the business. The schooner *Guelph* and the steamer *City of St. Catharines*, both built in 1874, were the last of the large ships built at the Abbey shipyard. The rerouting of the second Welland Canal stimulated John P. Abbey to leave Port Robinson in October 1876; he died at Toronto in December 1877.

Alexander Abbey built a number of vessels at Port Dalhousie, Port Robinson, and Port Colborne between 1872 and 1911. These included the schooner *Minnie*, the propellers *Louisa* and *Ada Alice*, and the barge *Centennial*. His death in December 1896, marked the end of the Abbey Yard's prominence.

The Muirs: Mariners, Merchants, and Master Shipbuilders

Alexander Muir established a ship repair business at Port Dalhousie in 1853. He was soon joined by his four brothers, who assisted in the business using a floating dry dock. In 1866, the Muirs established a permanent dry dock south of Lock 1 along the Welland Canal at Port Dalhousie. The Muir yard became renowned throughout the Great Lakes region for their ability to accept goliath steamers into the repair facility. The steamer *Chicora* was one such example, in need of refitting in September 1871.

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[20] Findlay, "Lewis Shickluna," 69.

Beyond their ship repair business at Port Dalhousie, the Muirs produced almost a dozen sailing ships, many of these constructed as timber droughters. This term applied to those ships that were in the lumber trade and fitted with ports or doors in their sterns for the purpose of loading long pieces of timber.[21] The Muirs built the schooners *Ayr, Arctic*, *Antelope*, *Albatross*, *Asia*, *Alexander*, and *Ark*. They also experimented with steam power, and constructed the steamship *Albion* in 1875. After 1875, their dry dock was booked solidly for repair work. The Muir Brothers Dry Docks were bought by the Port Weller Dry Docks in 1954, ending the family's affiliation with the Welland Canal.

The Muir name was familiar at Port Huron, Michigan. In fact, Michigan's first dry dock was constructed by Archibald Muir & Co. in 1866 at a cost of $80,000. The Muir & Livingston shipyard and dry dock launched the schooner *James Couch* (later *Tasmania*) in 1871. At 221 feet, she was the largest sailing schooner on the lakes when built. The propellers *Vanderbilt* and *Montana* were two other products of this yard, which produced a number of Welland sailing canallers.

Donaldson and Andrews: Mobility and Misfortune

The association between Donaldson and Andrews began in 1856, although their association as independents in shipbuilding and ship ownership appears to have begun shortly before. Andrews, for example, had served as Lewis Shickluna's foreman from 1854 to 1856. As a result of a business transaction gone sour, Shickluna decided to sell his shipyard and dry dock in 1856, Donaldson and Andrews purchased the auctioned

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[21] J. B. Mansfield, *History of the Great Lakes*. 2 vols. (Chicago: J. H. Beers & Co., 1899), 237.

properties on 15 October for $15,000.[22] One remarkable hull was launched from the shipyard, the barkentine *R. H. Rae*, cited by the *St. Catharines Journal* (8 October 1857) as: "one of the most beautiful ... and most sea-worthy barques [*sic*] ever set afloat. As a piece of naval architecture, she is pronounced second to none on the Lakes, either for beauty, durability, or speed." The *R. H. Rae* sank during her first full season of operation about two miles south of Point Traverse, Ontario. A further blow to the shipbuilders was that they were unable to make the necessary payment for the shipyard and, as a result, Shickluna repossessed the property on 14 December 1857.

The partners reestablished themselves at Port Dalhousie by 1859 and went on to construct and repair ships through 1866. Work took place on the east side of Port Dalhousie harbor, and included the schooner *Prince Alfred* in 1863, followed by the propeller *Silver Spray* in 1864, the barkentine *Cecilia* in 1865, and the schooner *John Breden* in 1866. It appears that Donaldson retired at this point, and that S. J. Andrews went into business with his sons. Between 1867 and 1874 Andrews launched nearly 20 hulls from this yard, including the schooners *Victor, Jessie H. Breck*, and *E. H. Rutherford,* the bark *Bismark*, the propeller *Alma Munro,* the steam barge *Dromedary*, and the tug *James Norris*.[23] Andrews continued this operation until 1874 when construction of the third Welland Canal forced the closing of the shipyard. The Andrews name continued to be associated with shipbuilding and repair at Port Robinson in 1877, but by 1896 it had vanished.

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[22] *Evening Journal* (Toronto), 15 October 1856.
[23] Parker, "Shipbuilding," 48.

Melancthon Simpson: The Ubiquitous Architect of Progress and Productivity

Melancthon Simpson built his first-known ship, the schooner *Catherine*, at Oakville in 1851. In about 1860 he moved to Port Dalhousie and served as foreman in the shipyard and dry dock of Donaldson and Andrews. By 1863, Simpson had established his own shipyard near Lock 5. Stationed at his St. Catharines shipyard near Wellington Square for almost fifteen years, he built every kind of craft conceivable, from barges, tugs, and sailing ships, to larger steamboats and propellers. It has been estimated that Simpson constructed a total of 55 vessels between the years 1851 and 1889. Among them were the schooners *Azov* and *Ellen M. Baxter* and the steamer *Lake Michigan.*[24] The most famous of Simpson's St. Catharines hulls were the *Persia* and the *Asia*. The former was known for its record of long service; the latter for the abrupt end it met when it sank with more than 100 lives lost on Georgian Bay in 1882.

Simpson's most spectacular undertakings along the canal were on the banks of the cut leading to the Welland River (Chippawa Creek), just east of the lock at Port Robinson. Here, in 1871, he built two paddlewheel steamers for Upper Lakes service. They were the *Manitoba*, measuring 173 feet (52.7 m) in length, and the *Cumberland*, measuring 205 feet (62.5 m) in length. Because these steamers were too large to transit the canal to Lake Erie, they were towed via the Welland River to Chippawa and from there up the Niagara River to the lake.[25]

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[24] The steamer *Lake Michigan* later served in the same fleet with the schooner-barge *Sligo*, owned by Point Anne Quarries, hauling limestone between the Bay of Quinte, Toronto, and Hamilton.
[25] Mansfield, "*History*," 236.

Simpson's abilities were known throughout the Great Lakes region. For example, the *Oswego Palladium* (20 August 1875) recorded the following regarding the steamer *Oswego Belle*: "Melancthon Simpson, a man who has no superior in Canada as a shipbuilder, has on the stocks one of the handsomest modeled screw steamers." A few months later, the same paper (22 November 1875), also noted that the steamer "is as handsome a piece of marine architecture as Canada has ever given to the inland unsalted seas."

Simpson built his last ship at St. Catharines in 1877, before moving to Hamilton and then to Toronto, where he continued to build steamers, propellers, and tugs. One of his last hulls was built at Gravenhurst, Ontario. This Simpson legacy, which still floats today on Ontario's Lake Muskoka, is the steamer *Nippissing II*, later renamed the *Segwun*. She is a testimony to the traditions and craftsmanship that were trademarks of this great shipbuilder who died in 1899.

Lewis Shickluna: St. Catharines Union Jack Boss Boatbuilder

Among these great shipbuilders, Lewis Shickluna serves as the most distinctive: in quality, quantity, and resilience. These qualities led him to build an unparalleled shipbuilding reputation, well known nationally and internationally. Shickluna was a respected and tenacious individual who will survive in history as one of Canada's greatest entrepreneurs.

Lewis Augustine Saviour Michael Scicluna,[26] son of Joseph Scicluna and Terese Farrugia, was born on 16 June 1808, in Senglea, Malta. Lewis' family was upper middle class, even moderately wealthy considering the impoverished state of Malta at the time. His father and grandfather were skilled shipwrights who ran their own small shipyard and who were eventually contracted to serve the British Royal Navy dockyards in Vittoriosa and Senglea.[27] At the tender age of 7, Lewis began to assist his father and grandfather at the shipyard, learning both the craft and the business.

Following the War of 1812, Malta experienced a depression that significantly suppressed economic activity, in particular, shipbuilding. At the age of 16, Shickluna decided to venture to where opportunities existed, sailing to New York City in 1824. Undoubtedly the most celebrated news upon arriving in the United States was the completion of the longest canal in the world, the Erie Canal, in upstate New York. Although Shickluna's exact whereabouts during the next four years are undocumented, it is plausible that he began to work his way along the Erie Canal, destined for Western New York. As early as 1828, Shickluna was serving as a ship's carpenter at Youngstown, having participated in the construction of several vessels, including the *R. H. Boughton*.[28]

Completing his apprenticeship as a ship's carpenter in 1829, Shickluna traveled to Quebec where he worked as a seaman and carpenter on timber and grain ships. While in Quebec, Shickluna was contracted to assist with building the *Royal William*, launched at

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[26] Shickluna anglicized his name to its current spelling upon arrival in Ontario.
[27] Donald C. Holmes, "Louis Shickluna and His Posterity," *Maltese Forum* 6, no. 1. (1980): 17.
[28] The *Boughton* was the second vessel to transit the first Welland Canal, making the first passage up from Lake Ontario to Lake Erie on November 27–29, 1829, following the Canadian *Annie and Jane*.

Quebec on 29 April 1831.[29] Shickluna next went to work briefly in Oakville, Ontario, where in 1832 he helped build the 350-ton steamer *Constitution*, later renamed the *Transit*. He next worked at dock building at Niagara, and then at Youngstown, where for two years he studied marine drafting and naval architecture under H. H. Smith.[30]

The ship's carpenter had become a master shipwright by 1836, and was ready to strike out as a shipbuilder. At this time, Shickluna started building on his own account. A posthumous record indicates that Shickluna described his beginnings as a shipbuilder at Niagara in the following way: "I buy a bag of flour and half a pig, and then I go to work and build a little yawl boat and sell it."[31]

The 26 October 1837 edition of the *St. Catharines Journal* announced that at 10:00 a.m. on Tuesday, 21 November, the shipyard and effects of Russell Armington, deceased, would be sold at public auction. These effects included a cow, a one-horse wagon and harness, office furniture, a quantity of lumber, bolt iron, cordage, spikes, oakum, a crosscut and two pit saws, and a variety of shipwright tools.[32] At the request of Henry Mittleberger, Shickluna traveled to St. Catharines and leased the shipyard from William Hamilton Merritt for $15 a year. After reorganizing and provisioning the yard to his satisfaction, he placed the following advertisement in the 28 June 1838 edition of the *St. Catharines Journal*:

Shipwright Business

> The subscriber begs to acquaint the owners of schooners or other water craft that are in the habit of passing through the Welland Canal that he has taken the

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[29] In 1833 the *Royal William* became the first Canadian steam-powered vessel to cross the Atlantic.
[30] Warwick, "The Shickluna Story," 35.
[31] C. H. J. Snider, "Schooner Days," *Evening Telegram* (Toronto), 9 August 1947.
[32] *St. Catharines Journal*, 21 November 1837.

Shipyard at St. Catharines formerly occupied by the Late Russell Armington and where he intends following the business of Building and Repairing, in all its branches, at the most moderate terms. He will also keep constantly on handspikes, oars, etc., ready made, for sale. From his being well supplied with Spars and Timber at all times suitable for the business, and having in his employ a number of good workmen, jobs will be done with the utmost dispatch. Reference as to the character and abilities to Wm. Hamilton Merritt or H. Mittelberger, Esqrs. St. Catharines, or Mr. H. H. Smith, Youngstown.

Lewis Shickluna
St. Catharines, June 27, 1838

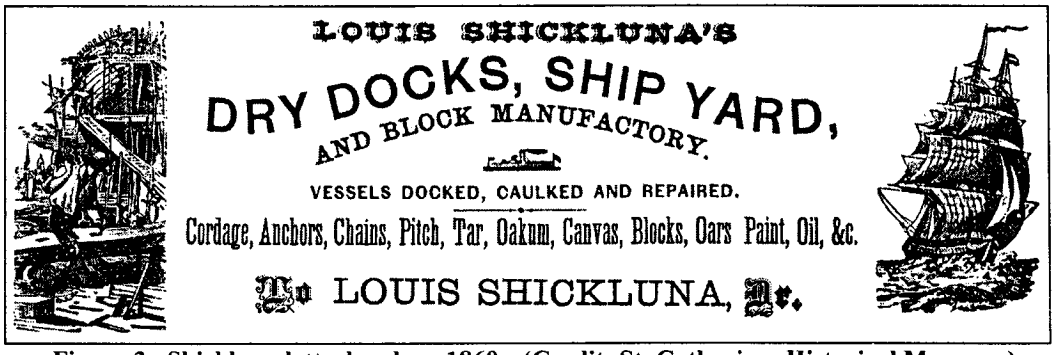

Figure 3. Shickluna letterhead ca. 1860s. (Credit: St. Catharines Historical Museum.)

Shickluna's shipyard was now established, and no sooner had the advertisement been placed than Shickluna was actively repairing a variety of ships. His first repair job was, more than appropriately, the Armington-built schooner *Welland Canal*. By 1841, Shickluna was building on speculation as well as to order. His first two launches out of the St. Catharines shipyard were the ice-breaking paddlewheel steamer *Chief Justice Robinson* and the schooner *Merchant Miller.*

By 1846 Shickluna had leased the dry dock by Lock 3 in order to offset the space needed to accommodate repairs, while his St. Catharines shipyard was purely directed toward building contracts. With the opening of the second Welland Canal that same year, Shickluna was likely bracing for the demand at his strategically placed shipyard. The shipyard advertised for shipwrights and ship's carpenters, at 13 to 14 shillings, New York

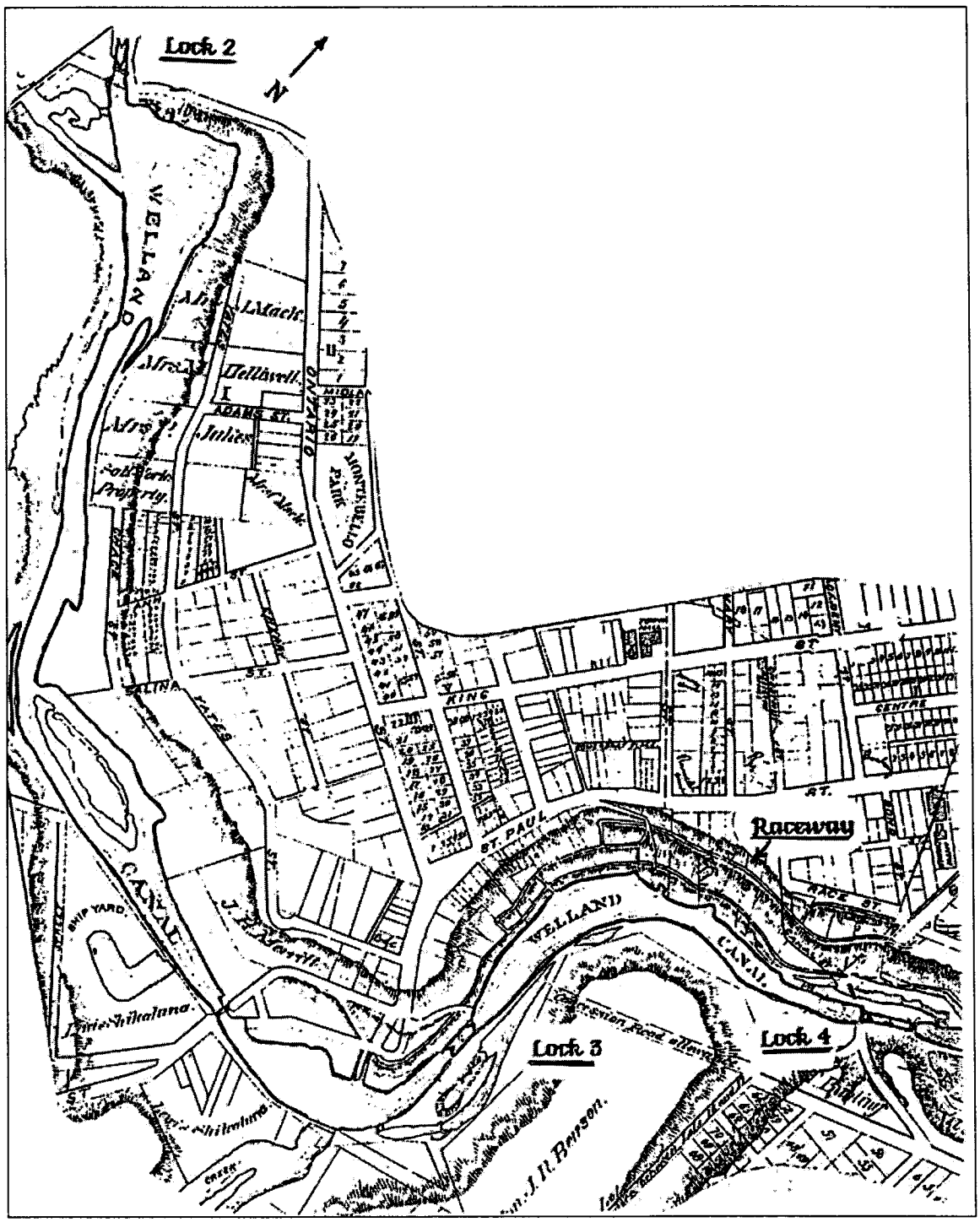

Figure 4. Map illustrating location of Shickluna Shipyard, in relation to second Welland Canal locks. (Credit: Brock University – Special Collections.)

currency, per day.[33] Building and repairing all vessels required Shickluna to hire as many as 300 men, with constant employment guaranteed, and at times he still had to turn away prospective contracts. Many of the jobs were rush orders or repairs and had to be done at night. In these cases, men received double time for night work, and some enterprising laborers were known to make fourteen days' pay out of a week.[34] It was recorded that Shickluna lamented over the shortage of ship's carpenters, which was slowing down his work. This want of skilled laborers continued throughout the period of the second Welland Canal, and advertisements were consistently placed in St. Catharines' newspapers soliciting workers.

On 12 April 1847 Shickluna launched two vessels, the three-masted schooner *New Brunswick,* for N. Merritt, and the two-masted *Welland,* for Benson and Merritt. The *New Brunswick* would later make history as the first vessel to participate in direct trade between Chicago and Liverpool. In June 1850, due to increased business, Shickluna opened a dry dock beside Lock 3 of the second Welland Canal. By the mid-1850s, Shickluna built approximately five vessels a year, in addition to completing numerous repair and building jobs.

On 27 March 1851, the *St. Catharines Journal* greeted spring with the following dispatch:

> We are pleased to see indications of prosperity evidinced in our Town by new buildings, foundries, increased trade, and last, but not least, the stir and bustle always to be seen and heard at the shipyard of our worthy citizen, Lewis Shickluna. We are pleased to see on the stocks, two new vessels, a schooner of 250 tons and a propeller of 400 tons burden. We have been highly pleased also to

[33] Shickluna Family Papers, September 1841.
[34] Shickluna Family Papers, March 1845.

> find that a double dry dock has been made by Shickluna, which will facilitate repairs considerably.

Befitting his status as a major economic player in the city, in 1851 and 1852 Shickluna served on the St. Catharines town council. Samuel G. Montgomery, one-time editor of the *St. Catharines Journal*, observed on many occasions that "if Lewis Shickluna said a thing, it must be so."[35] Shickluna could neither read nor write and spoke with broken English throughout his life. That most of his contracts were sealed by no more formality than a handshake is evidence of the high esteem in which his word was held by fellow citizens of St. Catharines.

The *Niagara Mail* noted on 20 July 1853 that Shickluna had leased the Niagara Dockyard. It was at this yard that Shickluna built three first-class steamers, two for the Great Western Rail Road and one to run in connection with the Niagara and Northern Railroad. The launch of one of these steamers – the *Zimmerman* – was recorded by the *Niagara Mail* (10 May 1854): "This large and beautiful steamer, built for the Erie & Ontario Railway, was launched on Saturday, 6 May. She was named in honour of Samuel Zimmerman and was christened by Miss Louisa Dickson. Mr. Shickluna, her skillful builder has done himself credit by this boat."

By 1856 it was estimated that Shickluna had produced twenty-four vessels over a fourteen-year period, including six that were propelled by steam and four three-masted schooners. This figure was out of some 268 steamers, propellers, and schooners then sailing on the Great Lakes, and it excluded those that Shickluna had overhauled or

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[35] *St.Catharines Journal*, 8 September 1860; 2 June 1862.

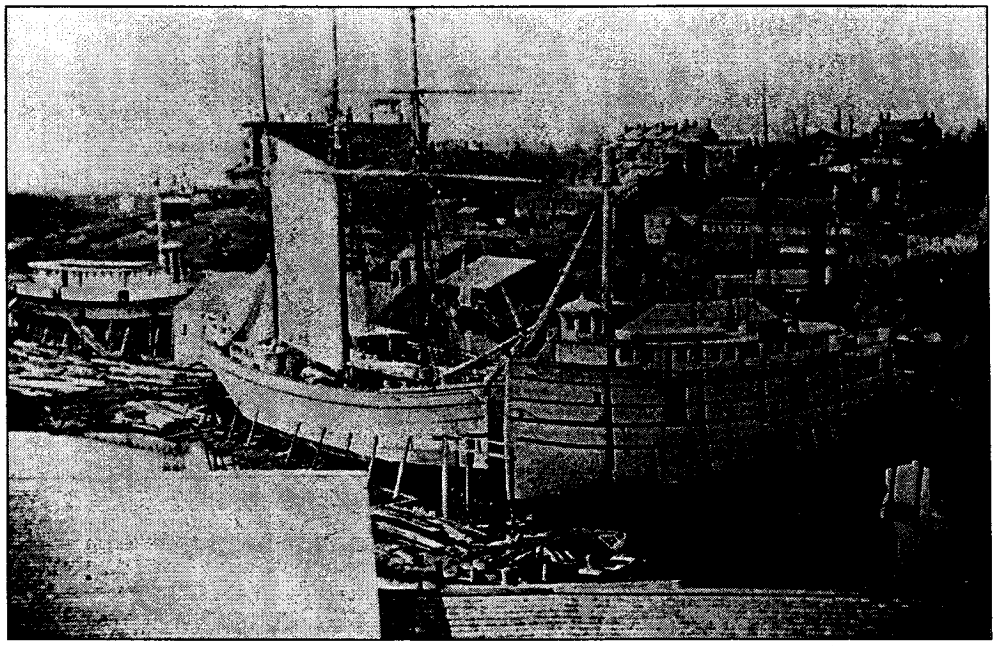

Figure 5. Shickluna Shipyard c. 1863: Photographed are the propeller *Her Majesty*, sailing canaller *Pride of America*, and propeller canaller *America*. (Credit: Historical Collections of the Great Lakes.)

rebuilt. Shickluna's output was greater than at rival places such as Niagara, Kingston, or Montreal, with their more celebrated facilities.

It is apparent that Shickluna's financial difficulties were not well known, and many people must have been surprised by the announcement in 1856 that he intended to retire. Two flour millers, James Ranney of St. Catharines and William Chrisholm of Burlington, Ontario, had schooners built by Shickluna.[36] While the millers did not have the requisite money or bank credit to get a loan to have the schooners built, Shickluna had sufficient credit and endorsed notes for large sums. When the millers were unable to repay the loan, Shickluna decided to retire. He sold the shipyard and dry dock on 15 October 1856, for $15,000 to Donaldson and Andrews.[37] As noted earlier they were unable to make payment and, as a result, Shickluna repossessed the property on 14

[36] Shickluna Family Papers, September 1855.
[37] *Evening Journal* (Toronto), 15 October 1856.

December 1857. Despite his financial difficulties, Shickluna reduced his liabilities with the Bank of Upper Canada from $80,000 to $47,000, while still retaining the shipyard.[38] It is some indication of the shipyard's profitability that he could repay the bank $33,000 solely from the profits of his business during one of the worst depressions of the nineteenth century.

Evidence of the speed with which Shickluna could repair a ship appeared in the *St. Catharines Journal* on 26 August 1858. The schooner *W. F. Allen* of Cleveland was in need of a new mast and had docked at the yard that morning. Rigging, ratlines, and all were taken down, the old mast was taken out, and a new one was fitted and rigged. By evening the ship was again seaworthy. The newspaper claimed this was the quickest remasting ever performed by any shipyard in the world, and Shickluna offered $1,000 to anyone who could perform the job faster.

St. Catharines' proximity to the United States border certainly offered employment benefits to Shickluna. The underground railway used byAmerican blacks to reach freedom in Canada, terminated at crossing points near both Detroit and Niagara. Drawing on this available labor pool, Shickluna was widely noted for employing highly skilled black ship's carpenters at fully competitive wages.

Ship launchings along the Welland Canal were generally well attended, but at Shickluna's shipyard they were often celebrated and imposing affairs. One example was the launch of the propeller *Her Majesty.* This was the first propeller built on Lake Ontario, specifically for the St. Lawrence River trade. The reception took place at the

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[38] Shickluna Family Papers, August 1858.

Figure 6. Advertisement for ship launching at the Shickluna Shipyard. (Credit: St. Catharines Historical Musuem.)

prestigious Welland House and included many guests from Toronto, including the mayor of that city.[39]

Suffering from severe rheumatoid arthritis as well as failing health, in 1871 Shickluna arranged to return to Malta to visit his family and, by some accounts, to leave a financial legacy for future generations. His departure was duly recorded and even though he intended a brief two-month overseas trip, the citizens of St. Catharines wished him well and thanked him for all he had contributed to the city.

The universally high public esteem in which Lewis Shickluna was held is reflected in a testimonial scroll, signed by 97 prominent individual and corporate citizens of St. Catharines. It was presented to him, with an elegant gold watch and chain, on 16

[39] *Daily News*, (Kingston), 7 Nov 1863.

May 1871, just before his departure to Malta. This citation, still in the possession of his descendents, includes these words:

> When we call to mind the circumstances under which you commenced your career as a shipbuilder in this place, and the rapid advancement of the highly prosperous and remunerative business you have established, we feel a just pride in the fact that one of the townsmen should have attained to the first place amongst the marine architects of the Dominion, a position the more honorable because Canada can boast of possessing several of the best shipwrights on the American continent. In the journey you are about to undertake to the land of your nativity, we wish you a pleasant voyage, feeling assured that your visit and your renewed intercourse with your kindred and friends will contribute much to the pleasure you will enjoy during your absence. And when you return to the home of your adoption, rely upon it that you will receive the hearty greeting of many warm friends, who will gladly welcome you back to the shores of Canada.[40]

Additional details of the event were reported by the Toronto Evening Journal:

> *Presentation to Lewis Shickluna, Esq., A Well Deserved Tribute*
> Last Tuesday at 4 p.m., the numerous friends of Mr. Lewis Shickluna testified their appreciation of his worth as a man and a citizen by assembling together at the Welland House in large numbers to present him with a valuable gold chronometer, massive gold guard chain and diamond ring specially procured by Messers Douglas and McMullin for the committee having the matter in charge. The affair was admirably managed throughout, from its inception to its close, and we venture to say that all of the happy gatherings that the Saints have had in the last quarter of a century, none of them afforded more real pleasure than that under notice. The formal proceedings were commenced by Hon. James R. Benson, reading an address which had been engraved on parchment by Mr. H.P. Gibson, with the names of the donors attached.[41]

On 18 May 1871, Shickluna departed for Malta; he returned to Canada on 27 July the same year.

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[40] Shickluna Family Papers, 16 May 1871.
[41] *Evening Journal* (Toronto), 18 May 1871

The prosperity of St. Catharines itself was closely linked with that of Shickluna's yard.[42] At its peak in 1871 the yard stretched more than half a mile along the Welland Canal. It consisted of two blacksmith's shops, a planing mill, a joiner's shop, rigging loft, two storehouses, a spar yard, lumberyard, offices, and a small boat factory. Shickluna reached the highest peak in the evolution of the wooden sailing vessel in the last decade of his life, between 1870 and 1880. A tribute from a contemporary has this to say of Shickluna's contributions to the city and to ship development:

> That Mr. Shickluna has given our town a hoist ahead, a larboard luff ,and filled her sails of late all freely will admit; and that he is one of our sheet-anchors, mainstays, top-gallant fellows, flying pennants, keelcutters, wave clippers, storm-riders, floating palace builders and Union-jacks, all will equally as soon agree.... So Lewis Shickluna is the Great Maltesian-born Canadian Shipbuilder and St. Catharines Union Jack Boss Boat Builder, which beats their star-spangled banners and French egos all hollow, and knocks them into a cocked hat.

Shickluna died on 24 April 1880. The completion of the third, rerouted, and much larger Welland Canal in 1881, reduced demand at the Shickluna shipyard. The yard was not on the route of the third Welland Canal, and moreover the site was land-locked between the old and smaller Locks 2 and 3, where it was not possible to build vessels large enough to be competitive in the new and enlarged waterway.

Joseph Shickluna, who took charge of the shipyard between 1880 and 1892, constructed an additional eight vessels, including steam barges, tugs, and propellers. Work was largely reduced to ship repair. Shipyard receipts still in the family's possession

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[42] Holmes, "Louis Shickluna," 80.

THE CITIZENS OF ST. CATHARINES

—TO—

LOUIS SHICKLUNA, Esq.

May 16, 1871

L. Shickluna, Esquire,

DEAR SIR,—

We, as Citizens of St. Catharines, with the prosperity of which you have been so long identified, desire to present you with the accompanying gift as an evidence of the esteem in which you are held among us. We have great pleasure in Congratulating you on the well merited Success that has followed your diligent efforts in attaining a competency for yourself and contributing to the material advancement of our Town. This gift but feebly expresses the estimation in which you are held by your fellow townsmen, who are not unmindful of the many benefits you have, through your exertions, conferred upon us during the last thirty years. When we call to mind the circumstances under which you commenced your career as a Ship Builder in this place and the rapid advancement of the highly prosperous and remunerative business you have established, we feel a just pride in the fact that one of our Townsmen should have attained to the First Place amongst the Marine Architects of the Dominion,—a position the more honorable because Canada can boast of possessing several of the best Shipwrights on the American Continent. In the journey you are about to undertake to the Land of your Nativity, we wish you a pleasant voyage, feeling assured that your visit and your renewed intercourse with your kindred and friends will contribute much to the pleasures you will enjoy during your absence. And when you Return to the Home of your Adoption, rely upon it that you will receive the Hearty Greetings of many warm friends, who will gladly Welcome you back to the Shores of Canada. Again, we wish you a Prosperous Voyage, a Happy Visit, and a Safe Return.

Thos. R. Merritt,
Sylvester Neelon,
James Norris,
S. D. Woodruff,
Patrick Larkin,
Robert Fowlie,
J. P. Merritt,
Geo. R. Benson,
Jas. Lamb.
Wm. Boles,
R. Fitzgerald,
Henry Brownlee,
Edwin Goodman,
James Seymour,
T. Henley,
George Riley,
J. C. Graham,
H. H. Collier,
J. A. Woodruff,
James Murray,
Burrow, Chatfield & Co.
James A Miller,
W. B. Benton,
Henry Carlisle,
Douglas & McMullin.

J. B. Gillespie,
R. Woodruff & Co.
J. G. Currie,
D. Curtiss Haynes,
Holmes & Greenwood,
Thos. Adams.
John Berryman,
W. J. & J. McCalla,
Robert Struthers,
P. B. Owens,
John Junkin,
Henry Mittleberger,
Lucius S. Gills,
George N. Gill
McKinley & Co.
Thomas Burns,
Francis Stinson,
D. McGuire,
W. L. Copeland,
George Wood,
John M. Lawder,
Calvin Brown,
C. M. Arnold.
P. McCarthy,
J. B. Fomer.

W. H. McClive,
A. Jeffrey,
Jno. Lepper & Co.,
Wilson Bros.
McIntyre & Son,
E. McArdle,
W. A. Mittleberger,
Jas. Lawrie,
Jas. Orr,
Geo. P. M. Ball,
Robt. Parrson,
Joseph Smith,
George Smith,
Rykert & Gilleland,
John S. Thomson,
W. Jeffrey,
W. Andrews,
T. L. Helliwell,
John Battle,
J. Mills, jr.
W. Barr,
A. Mitchell,
Mathew Battle,
A. Davis,
K. Houghton.

...ames McNeil,
...m. Barbara.
...ale, Dun & ...
...ald Currie
...A. Hutchison,
...ames McCourt,
...obert Lawrie,
Jas. Dougan,
J. ...iordon,
...homas D. Mahon,
E. Rogers,
T. & F. L. Mack,
R. A. Clark,
Bernard King,
J. H. Horne,
Charles Norton,
Jacob Heiner,
J. A. Goodman,
D. D. Moore,
W. A. Chisholm,
...I. Benson
Thos. Clark.

Figure 7. Scroll dedicated to Lewis Shickluna, 16 May 1871. (Credit: St. Catharines Historical Musuem.)

reveal that by 1885 Joseph Shickluna had been reduced to selling $20 orders of chain and timbers to the Department of Railways and Canals.[43]

Joseph Shickluna closed his books for the last time in 1892, leasing the premises to the Lewis Shickluna yard's former foreman Patrick Dixon and his eldest son Harry. The Dixons constructed a half-dozen tugs and repaired the aging fleet of canallers still utilizing the second Welland Canal. Tugs had come into great prominence on the third Canal because they replaced the teams of horses formerly used to tow vessels through the waterway. This was also a period of major construction on the Canal and tugs were used on the various sites to move contractors' scows, dredges, and floating equipment.[44] Harry J. Dixon and Company abandoned the yard in 1894, where the hull of the *Sir Charles Napier*[45] lay submerged until the site was filled in, along with the old dry dock, in 1955.[46]

Shickluna infused nearly $200 million dollars into the Canadian economy and into a community that, at the time of his death, boasted fewer than 15,000 individuals. Accounts vary on the number of ships Shickluna actually produced. Evidence exists for over 150 vessels built from scratch. It is safe to say that Shickluna was a pioneer in the development of the Great Lakes shipbuilding industry and can be considered one of Canada's greatest entrepreneurs. His successful management of business operations, in addition to his unique style of ship construction, led him to establish a monopoly on shipbuilding throughout the Welland Canal region. The career of Lewis Shickluna

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[43] Shickluna Family Papers, August 1885.
[44] John N. Jackson, *The Welland Canals and Their Communities: Engineering, Industrial and Urban Transformation* (Toronto: University of Toronto Press, 1997), 247.
[45] This vessel will be studied in conjunction with the excavaton of the Shickluna Shipyard, beginning 2003.
[46] Warwick, "The Shickluna Story," 39; Correspondance with the author and Frank Hawley, dated 20 May 2003.

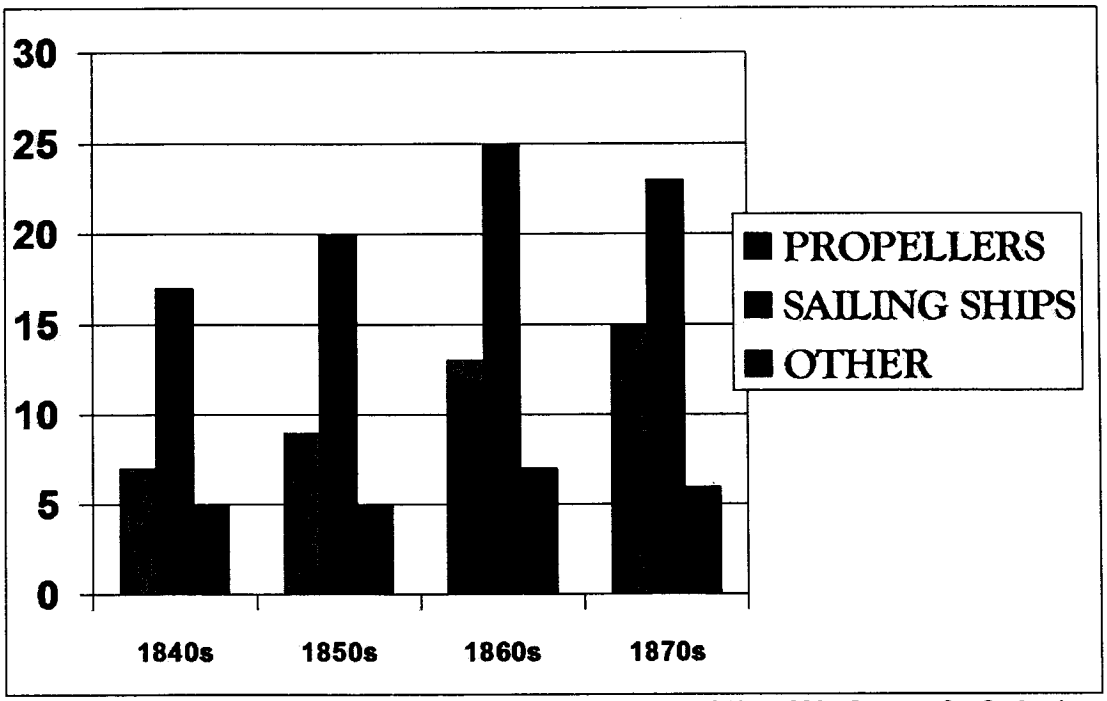

Figure 8. Total output of ships from the Shickluna Shipyard, 1840 – 1880. (Source: St. Catharines Historical Museum – Shickluna Files.)

provides a significant example of Canadian enterprise that contributed to the economic development of the Great Lakes region

Development and Decline

Largely through advances made at the Shickluna yard, shipbuilding and vessel repair remained a predominant activity in the Welland Canal area. The main technological transitions to be weathered included the fact that steam tugs, propellers, barges, and scows were now in regular use on the canal. Success in shipping, lumbering, and the grain trade provided the capital to undertake even more industrial diversification, primarily in the area of shipbuilding and repair. The principal changes were from sail to steam, from wooden to metal hulls, and from small-to larger-sized vessels.

Since the first sailing canal schooner the *Welland Canal* was launched in 1828, more than 300 hulls of various descriptions were produced at the shipyards along the changing waterway. None of the shipbuilders on the early canals survived the transition from wooden ships to those made of iron and steel. By 1932, with the opening of the present Welland Canal, the once prominent area shipyards had, one by one, discontinued operation. Upon reflection, it is clear that the impact of the Welland Canal was both positive and negative. It favored the development of many new industries, but debilitated others. Fundamentally, though, during the era of the first and second Welland Canals a powerful new economic base was created across the Niagara Peninsula,

CHAPTER 2
VESSEL TYPE: WELLAND SAILING CANAL SHIPS

The dimensions of the first Welland Canal throttled the profits of area merchants and shipbuilders. The announcement that the canal would undergo expansion, however, most likely encouraged their hopes. It is clear that the development of a new breed of vessels that would ply Eastern North America's inland waterways was expected as early as 1841.

Shipbuilders recognized that they would need to develop a form that could take advantage of an enlarged waterway and still remain efficient and seaworthy. These considerations as well as geographical challenges and the desire to secure economic dominance commanded the invention of the first commercial Great Lakes vessel type: Welland sailing canal ships (i.e., "sailing canallers). This chapter examines the terminology, classification, and salient characteristics of this vessel type and its development, deployment, and eventual extinction.

Sailing Canallers

The terms Welland sailing canal ship and sailing canaller specifically describe Great Lakes sailing vessels that were built to maximize cargo space when traveling through the locks of the second Welland Canal. The heyday of this vessel type lasted from 1846 (the year the second canal opened) through 1880. The form is identified in the annals of Great Lakes history as canalers (*sic*) and canal schooners; however, neither of these words best describes it. The term canallers was loosely applied to all canal craft, whether driven by sail or propeller. "Old Canaller" conventionally signifies a vessel built

to the dimensions of the second Welland Canal. The later form, "propeller canallers," is beyond the scope of this study, but it should be noted that this vessel type incorporated the same design attributes as its sail-driven cousins. Examination of the similarities and differences between sailing and propeller canallers is well warranted, and would enhance understanding of their relative attributes and histories.

The creation of the early canals in the Eastern United States introduced the basic terminology that would be used for many generations to identify the types of vessels that plied North American canals. Looking to this period, there appear two points of origin and a possibility for confusion when assessing Welland sailing canal ships. The opening of the Erie Canal in 1825 contributed to the development of a type of craft that could serve the East–West waterway networks stretching from the Midwest to the Hudson River. These shallow-draft vessels (often likened to barges) were called canal boats; while they occasionally boasted a sail, they were not constructed for open-lake shipping. These vessels rarely exceeded 100 tons and their length from stem to stern was at most 60 feet. Because contemporary authors sometimes labeled these canal boats as canallers, caution must be taken when attempting to distinguish the historical development of sailing canallers.

Another important precursor that is even more closely associated with Welland sailing canal ships, is the Lake Champlain sailing canal boat. These vessels were engaged and built for a similar economic purpose: bulk cargo carriage. Their evolution,

development, and decline closely resemble those aspects of Great Lakes sailing canallers.[47]

The most extensive and familiar description of sailing canallers is found in John Brandt Mansfield's *History of the Great Lakes*. Mansfield observes that:

> Canal schooners, so-called because they were built light of draft to permit passage through the Welland Canal, have been rapidly passing away during the past several years, and the extinction of this type of vessel will decrease the relative importance of Lake Ontario navigation until a larger passage way is provided.[48]

The author also cites London's *Nautical Magazine*, which described the transition from sail to steam, especially as it applied to navigation through the Welland Canal:

> The type of vessels originally used for freighting throughout the lake system was a three-masted schooner carrying fore-and-aft sails-rarely a foretopsail and topgallant sail-limited in draft to the depths of the old canals, 9 feet, but borrowing improved beating power by the use of a centerboard. Keenness of competition soon taught the lesson that the larger vessel was the cheaper carrier; and from that conclusion an abandonment of the Welland Canal route, and the selection of ports on Lake Erie which would permit the use of vessels larger than the docks would accommodate as eastern termini of the Great Lakes freight traffic, was a logical step.

Moderate and Extreme Sailing Canallers

The evolution of the sailing canaller did not culminate, in a single form. Rather, this vessel type evolved into two distinct forms: "moderate" and "extreme". Moderate and extreme sailing canallers were distinguished from other commercial sailing vessels according to beam and depth, rather than length. As will be discussed later, sailing

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[47] Examination of this vessel type has been undertaken by the Lake Champlain Maritime Museum in conjunction with Texas A&M University. See Joseph Robert Cozzi, "The Lake Champlain Sailing Canal Boat," (Ph.D. diss., Texas A&M University, 2000).

[48] J. B. Mansfield, *History of the Great Lakes*, 2d ed., 2 vols. (Cleveland: Freshwater Press, 1972), Vol. I, 393.

canallers were also frequently recognized by specific areas and purposes of employment.[49]

Moderate sailing canaller design appears to have been the initial form this type of craft took. Builders apparently erred on the side of caution, checking to see whether ship captains would be able to successfully negotiate the canals and inland waterways with such a bulky vessel. For example, the barkentine *Malta* was built in 1853 and measured 137.6 feet (41.9 m) in length, 23.6 feet (7.2 m) in beam, and drew 9 feet (2.7 m) of water. The *Malta* could only carry 18,000 bushels in the Welland Canal, though her capacity was 22,000.

Other shipbuilders were engaged in building extreme sailing canallers. The earliest recorded extreme sailing canaller was the *Oliver Culver* built by H & D Rogers in 1855 on the Genesee River, near Rochester, New York. This behemoth measured 145 feet (44.2 m) in length, 26 feet (7.9 m) in beam, and drew 10 feet (3 m), with 450 tons capacity. Oswego builder George Goble, meanwhile, consistently produced vessels of maximum proportion and capacity for the locks of the second Welland Canal. The *Bermuda*, built in 1860, measured 136 feet (41.5 m) in length, 26.3 feet (8 m) in beam, and drew 10 feet (3 m) of water. She had a carrying capacity of 24,000 bushels, and 18,000 or 19,000 through the canal.[50]

Extreme sailing canallers were not without their challenges. Old canal sailors told of the vessels getting stuck in the Welland locks when the towing rope jammed between

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[49] It should be noted that archival records rarely refer to an extreme sailing canaller versus a moderate sailing canaller, or specialty forms such as a timber droughter vs. a lumber hooker. I employ these terms in the interest of clarity.

[50] *Oswego Palladium*, 21 August 1871.

the vessel and the lock wall. As the cutwater became more plumb, and the hulls grew to be very close to the lock size, the yawl boat astern would be taken in and the davits folded inward on hinges.

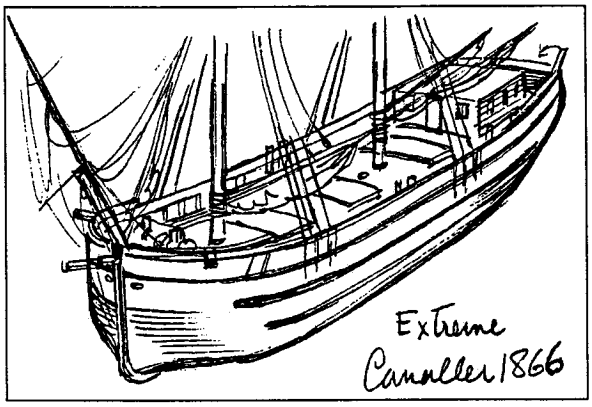

Figure 9: Extreme Canaller as Portrayed by Loudon Wilson, p. 29.

Specialized Canallers

Although many sailing canallers were built for use in any of the inter-lakes trades, there were also three purpose-specific forms: timber droughters, lumber hookers, and grain and ore carriers. Timber droughters boasted four big square timber ports; two being aft on either side of the sternpost, and another two forward in the bow. To accommodate the lengthy cargo, droughters had on-deck cabins that were flush and as small as possible. On lumber hookers, cargo was loaded on deck. Their cabins were high so that the wheelman could have physical advantage over the load. The afterdeck was raised to the height of the main sail and rose out of the deck flush with the main deck, with room under the afterdeck for bunks on each side. Finally, grain and ore carriers possessed low

cabins, and their main hatches were usually laid athwartship to facilitate loading and unloading around the centerboard trunk.[51]

Sailing Canaller Characteristics

Crystallization of a hull form that embodied both capacity and seaworthiness was nurtured during the 1840s and 1850s. The engineering of an economically successful hull form for Great Lakes sailing vessels was firmly established by the 1860s. Accounts describing the appearance of sailing canallers vary. A report of the launching of the schooner *Groton* at the A.H. Muir shipyard at Port Huron, Michigan, reveals one author's perception: "Substantially constructed but possessing no beauty whatsoever, her owners having aimed at a great capacity upon a light draught without regard to symmetrical proportion."[52] Through improvements based on trial and error, shipbuilders developed the vessel type both in terms of hull form and rigging. With a rumored fleet of approximately 500 vessels, built during the second Welland Canal, sailing canallers encompassed the greatest diversity in terms of location, and yet an extreme conformity in hull design and rigging.

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[51] Garth Wilson, *A History of Shipbuilding and Naval Architecture in Canada*, Transformation Series 4 (Ottawa, ON: National Museum of Science and Technology, 1994), 149.
[52] *Daily National Pilot* (Buffalo), 3 June 1868.

Hull Design[53]

During the era of the second Welland Canal, the drive to maximize cargo space was largely accomplished through modifications to hull design. The bluff, full-bodied form of canal ships, with their flat bottoms and vertical sides, gave them a shoebox-like shape. By the 1850s, bottoms had become flatter and bilges harder, while a straight stem took the place of a finely curved cutwater.[54] The majority of Welland sailing canal ships also generally boasted square transoms and heavy counters.

Rigging

Most Great Lakes sailing ships had tall masts. The reduced strength of prevailing winds on the Lakes (as opposed to on the open sea) did not influence the rigging of lake ships. The preferred rigging was the fore-and-aft schooner style because gear could be stowed while the gaffs and booms were swung clear of the decks to facilitate loading and unloading; these features kept the deck free of obstructions and simplified the rigging network.[55] Shipbuilders such as Lewis Shickluna, however, continued to employ the occasional barkentine and brigantine rigging to sailing canaller as late as the mid-1870s.

A more specific difference between sailing canaller rigging and that found on Upper Lakes vessels is evident in the cut of the gaff sails. Sailing canallers' gaff sails had

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[53] The study of hull design was an objective of the Great Lakes Historic Ships Research Project. In this project, Garth Wilson studied developments in the hull forms of wooden commercial vessels on the Great Lakes in the nineteenth century. Utilizing surviving half models and the CAD software program Fast Yacht, Wilson was able to generate hull plans and therefore hydrostatics of various vessel hull forms, including seven sailing canallers. A future report by the Great Lakes Institute for Marine Research will focus on the results tabulated from this work, with the addition of lines lifted from various Canal-ship sites, with the aim of generating a more analytical study of sailing canaller hull design.

[54] John N. Jackson, *St. Catharines, Ontario: Its Early Years* (Belleville, ON: Mika Publishing, 1976), 218.

[55] Loudon G. Wilson, *The Loudon Wilson Collection: Great Lakes Sail* (Historical Collections of the Great Lakes: Bowling Green State University), 26.

a short luff and low peak, as compared with other schooners; this necessitated a longer gaff. Wilson suggests that sailing canallers usually had less rake to their masts. He argues that this is partly what gave the timber droughter type a short, boxy appearance, its most visible characteristic.[56]

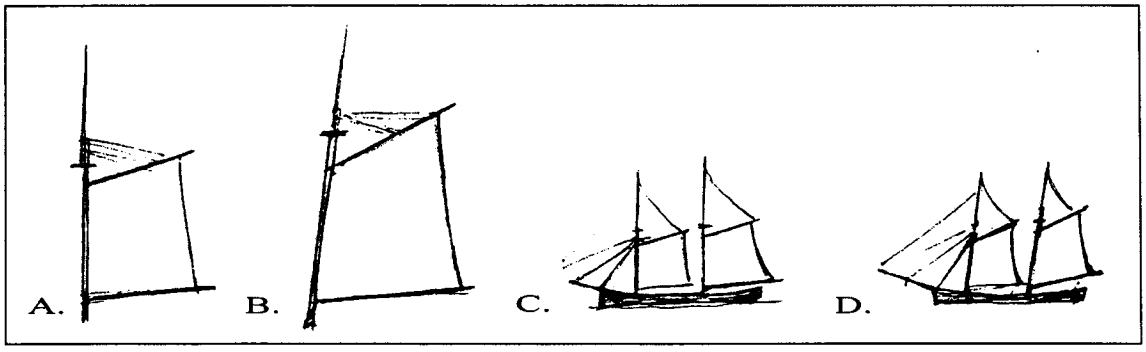

Figure 10: Loudon Wilson representation of regular versus canaller-type sail: a) canaller sail b) regular sail c) canaller rig d) regular rig, p. 41.

A serious problem with the early sailing canallers involved manipulating the bowsprit and jib boom over lock gates. The solution was the hoisting jib boom, also referred to as a cock-billed jib boom. Little has been written on this forward rigging as it appeared on sailing canallers. A brief account in Wilson refers to the Goble-built *Knight Templar*, based on descriptions provided to Wilson by Captain John Thurston.[57] This description suggests that the bows were opened with lifting bowsprit and jib boom, while the sketch image indicates that the bowsprit was secured to the pawl post, just forward of the ship's windlass.

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[56] *Ibid.*, Communication between Captain Corus of Manitowoc, Wisconsin, and Loudon Wilson, 41.
[57] Wilson, 166. John Thurston was Master of the *Knight Templar* at 19 years of age.

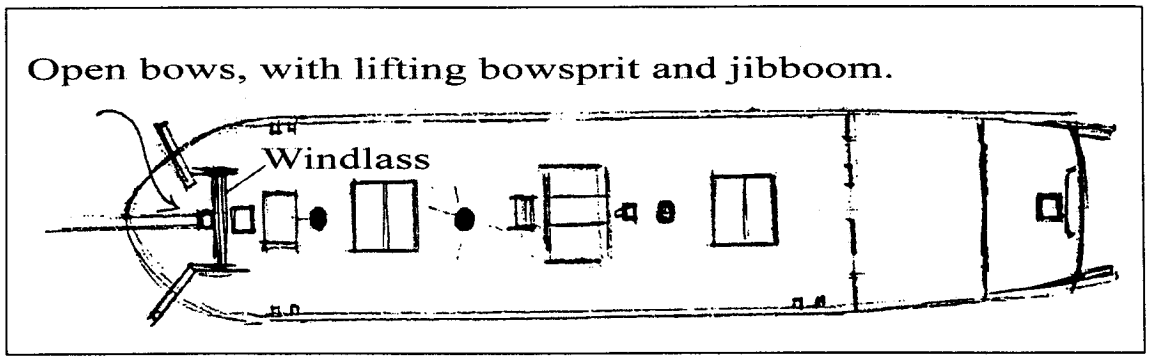

Figure 11: Loudon Wilson Illustration of a Hoisting Jibboom, p. 166.

Davits

Davits secured a boat to the taffrail, where a wood fender or pad was placed to protect a ship's transom. On sailing canallers, they were set to be aligned toward outboard and included a hinge to allow the mechanism to flip inboard when passing through the tight-fitting canal locks. This type of davit lasted throughout the era of the sailing canallers.[58]

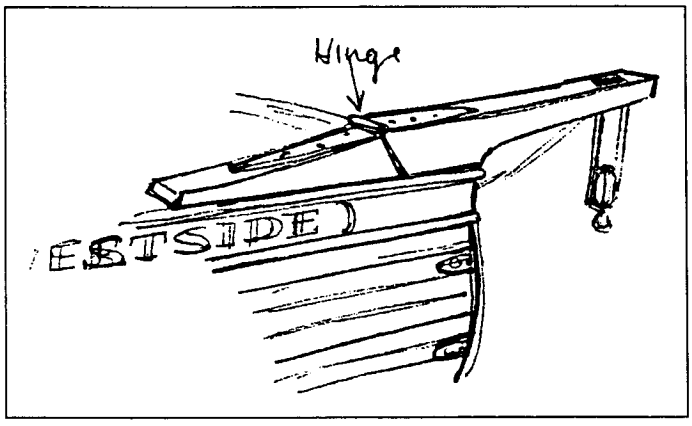

Figure 12: Loudon Wilson illustration depicting davit, typical of a sailing canaller, p. 130.

[58] *Ibid.*, 130.

Development of Sailing Canallers

The opening of the first Welland Canal in 1829 invited new opportunities for shipbuilding, but, few steps were taken to develop a fleet that could best serve the growing region. Shipbuilders faced the inherent problems with the first canal and difficulties determining what type of vessel would best fit the forged landscape. They refined their construction methods to take advantage of lock space, developing what may be considered as a proto-Welland Canal ship or transition-era vessel. Although vessels employing full Canal dimensions were rare, the development of sailing canaller characteristics was certainly underway.

The first recorded official suggestion that a new class of vessel should be built for transit of the Welland Canal was made in 1830:

> ...as no preparation has been made for building boats, and as so few of the vessels owned on the Canadian side of the Upper Lake are adapted for the double voyage, it would have been impossible to have conveyed the whole quantity of produce with the present means of transportation. The Directors have now made arrangements to remedy this inconvenience ... they are building large covered boats that will carry 600 or 700 barrels of flour.[59]

In 1834, Captain August Pickering built a schooner at Sackett's Harbor and named her the *Illinois*. This vessel measured 80 feet (24.4 m) in length, 20 feet (6.1 m) in beam, with an 8 foot (2.4 m) depth of hold, and was as large a ship as could go through the first Welland Canal. The *Illinois* sailed from Sackett's Harbor on 12 May 1834, carrying 104 passengers and a cargo of household goods and farming implements. Arriving in Chicago on 14 June, she crossed the bar at the mouth of the river after unloading. Pickering also built another Welland Canal-sized vessel, the schooner

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[59] Jackson, "*St. Catharines*," 217–218.

Niagara, but she was one inch too wide for the Canal. The *Niagara* was to be cut down but, while waiting for this to happen, Pickering passed away. Another early vessel that employed sailing canaller characteristics was the schooner *St. Clair*, built by Sam Ward at Ward's Landing, Ontario in 1835.[60] This vessel used a drop keel, and was employed specifically for bulk freight forwarding. In total, a dozen vessels that possessed sailing canaller characteristics were launched during the 1830s, but shipbuilding remained a limited activity and the first Welland Canal a dubious investment.

By the 1840s shipbuilders had become more comfortable with the dimensions of the Canal and had moved toward creating a more economically viable vessel. On 18 August 1841, Lewis Shickluna launched the *Merchant Miller*, which was at the time believed by many to be the largest vessel built for the Welland Canal trade.[61] The ship was schooner rigged, and carried 110 tons. Three months later at Oswego, New York, Sylvester Doolittle launched the sloop-rigged *Vandalia*, which became the first successful propeller canaller. This twin-screw vessel embodied characteristics of sailing canallers, with a length of 91 feet (27.7 m), a beam of 21 feet (6.40 m), and a depth of 8 feet, 3 inches (2.53 m), she carried 141 tons. The form was boxy, but her bow still retained a sharp cutwater, with a reasonable degree of deadrise.

The same year the *Merchant Miller* and the *Vandalia* were launched, affirmation of the enlargement of the Welland Canal spread like wildfire. The dimensions of the new canal were in existence by 1842. Builders were, however, continuing to strive to the dimensions of the first Canal, exemplified through a significant increase in tonnage

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[60] Wilson, *Great Lakes Sail*, 72.
[61] *St. Catharines Journal*, 19 August 1841.

passing through the Canal by 1845.[62] By this time, centerboard use was standard, and schooner rigs predominant. Shipbuilders were at a transition point, ready to develop the full-bodied hull form, of the canallers.

Initiatives to construct vessels that would fit the second Welland Canal was apparent as early as 1845. Two lake brigantines were launched from the Calvin, Cook, & Company Shipyard at Garden Island near Kingston, Ontario in August 1845. The *Quebec*[63] and *Liverpool*[64] became the pioneers of a new class of vessel built to supersede their antiquated predecessors.[65] Both ships were intended for the Lake Erie timber trade.

Efforts to take advantage of the improved canal were underway in its immediate vicinity. On 24 July 1845, the *St. Catharines Journal* reported an important local shipbuilding development:

> The shipyard in this place exhibits quite a bustling appearance, and the skill and the business habits of its proprietor, Mr. Lewis Shickluna, secures a good share of orders from distant places. The keel is now laid for a brig, ordered by a gentleman in Hamilton. The dimensions will be 110 ft. keel, 120 ft. on deck, 25 ft. 6 in. beam and 11 ft. depth of hold. Burthen is to exceed 350 tons, and she is to carry over 2,000 barrels under the hatches. She is to be ready next spring.

With the opening of the second Welland Canal is 1846, "a large and noble-looking class of vessels and propellers was born" to meet the requirements of this forged waterway.[66] By the end of the 1840s, these forerunners of Welland sailing canal ships were striving to attain dominance of bulk freight carriage. It had become apparent that in

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[62] Mansfield, "*History of the Great Lakes*," 44.
[63] The brigantine *Quebec* was launched from Wolfe Island, Ontario. She was commanded by her owner, Captain William Donaldson.
[64] The brigantine *Liverpool* experienced a troubled launch from Wolfe Island – having caught on a small rise in the ways, she had to be pushed in.
[65] *Daily National Pilot* (Buffalo), 16 August 1845.
[66] Jackson, "*St. Catharines*," 216.

order to maintain trade through the Welland Canal, merchants and ship owners would benefit from maintaining fleets that could navigate the canal locks and the region's shallow harbors. To this end, sailing canallers became more that just another form of ship. They constituted an industry that would characterize bulk trade and commerce for the next 30 years.

The Business of Building Sailing Canallers

Sailing canaller shipbuilding evolved rapidly during the 1850s, and was partly responsible for the speedy establishment of shipyards along the shores of Lakes Ontario, Erie, Huron, and Michigan. Although sailing canallers were only one type of vessel launched at these shipyards, the demand for them is evident in the fact that most shipyards had at one time or another built a Welland sailing canal ship. By the mid-1860s, the majority of vessels on the Lakes were sailing canallers capable of carrying 500 tons of ore or 16,000 bushels of grain, which was equal to the capacity of two Erie Canal barges. A preliminary list of shipbuilders and their ships (see Appendix G) illustrates the spatial and temporal distribution of their construction. This list likely comprises a little over half of all the Welland sailing canal ships built during the second Welland Canal era.

Canadian interest in the Welland Canal is evident in Canadian shipbuilders' dedication to sailing canaller construction. The main sites of sailing canaller shipbuilding were Kingston, Ontario, and the many shipyards that lined the banks of the second Welland Canal. The most prolific sailing canaller builder on either side of the Lakes was Lewis Shickluna, based at St. Catharines, Ontario. Credited with the construction of at least 40 Welland sailing canal ships, the Shickluna yard maintained a consistent record of

production from 1846 through 1879. Other prominent builders include the Abbey's at Port Robinson, Ontario, Henry Rooney at Garden Island (Kingston), Melancthon Simpson, and Alexander Muir. These last two Great Lakes shipbuilding moguls did not confine their work to single locations.

If St. Catharines was the epicenter of the Canadian sailing canallers, then Oswego, New York, served as its most formidable rival. The most notable of Oswego's sailing canaller builders was George Goble. An Irish emigrant, Goble arrived at Oswego in 1837, serving first as a ship's carpenter before going into business for himself. Between 1856 and 1891, Goble built 34 large schooners, tugs, and yachts. The fact that 26 of the hulls launched from his yard at the foot of West Fourth Street between 1856 and 1879 were sailing canallers attests to Goble's investment in the forwarding business and, moreover, his adherence to a maximum canal tonnage throughout this period. Other notable sailing canaller builders in New York State included Andrew Miller, also located at Oswego, and Asa Wilcox, at Three Mile Bay, New York, the easternmost point of Lake Ontario.

New York State shipbuilders were as vested in building sailing canallers as their Canadian counterparts. Like George Goble, they were particularly focused on freight forwarding, which in turn fueled their interest in building ships to maximize the potential of the second Welland Canal. Additionally, Oswego was a major port for the export of salt, offering her ships return cargos for delivery to the timber and wheat ports on the western Great Lakes. This provided a double benefit to ship owners and increased the opportunities for shipbuilders to also profit.

The construction of sailing canallers in Ohio was also a serious undertaking. Cleveland appears to have most heavily invested in canaller construction. In particular, the shipyards of Quayle and Martin, Laffrinier and Stevenson, and Roderick Calkins witnessed a fair amount of activity throughout the 1850s and 1860s. The reduced construction of sailing canallers during the 1870s supports the contention that builders had begun to lose interest in freight forwarding, realizing instead the advantages of building larger ships and terminating cargo at Buffalo for forwarding by rail or Erie Canal barge.

Michigan shipbuilding provides an interesting relationship between dominant sailing canaller shipbuilders. The majority of sailing canallers were launched within a 60-mile radius around the ports of Trenton, Detroit, Marine City, and Port Huron. Most prolific among these ports were the shipyards of Turner, Campbell, Arnold, and Muir. Certainly, these builders were encouraged to manufacture larger ships as a result of their close proximity to the major timber ports at Saginaw Bay. The height of sailing canaller shipbuilding in Michigan occurred late, in comparison with the shipyards along the Lower Lakes. The heaviest output was during the 1860s and 1870s as a result of expanding timber markets.

As shipyards developed westward and builders there focused more on inter-lakes bulk shipping, the demand for canal-sized ships diminished. The Wisconsin ports of Milwaukee and Manitowoc experienced the most sailing canaller building activity, particularly at the yards of Wolf and Davidson, and Rand and Burger. James Davidson, noted for his later Goliath wooden bulk freight ships, was another sailing canaller builder

who was not attached to one area. He began building sailing canallers at Buffalo with Bidwell and Banta, later moved to Ohio with the Bailey Brothers, and then to Marine City and Bay City, Michigan. For Davidson, building these schooners represented a considerable investment in time and money, but the risk was low and short term. During the early 1870s, demand was steady for sailing canallers valued at $20,000.[67]

Records of only four sailing canallers built in Illinois have been found. Although it is likely other sailing canallers were built at or near the port of Chicago, this rapidly growing Midwest port city was more heavily invested in the business of exporting agricultural product than in shipbuilding. Also, the Great Chicago fire of 1871 would have diminished shipbuilding activity at the port while timber was dedicated to rebuilding the city.

Direct Trade

The crossing of lake ships to the ocean occurred as early as the 1840s when the brigantine *Pacific* of Toronto sailed to Liverpool with a cargo of wheat. However, the development of Welland sailing canal ships significantly expanded trade from ports west of the Welland Canal and, in turn, instigated a prosperous new commercial network.

This development of trade between the Lakes and overseas ports flourished with the completion of the second Welland Canal. Beginning as early as 1847 with the Shickluna-built *New Brunswick*, vessels traversed the Lake system from ports on Lakes

[67] Board of Lake Underwriters, Lake Vessel Register; John O. Jensen, "Oak Trees and Balance Sheets: James Davidson, Great Lakes Shipbuilder and Entrepreneur," *American Neptune* 54 (1994): 103–104.

Michigan, Huron, and Erie to European ports such as Liverpool, London, and Cork.[68] Some sailing canallers, such as the schooner *City of Green Bay* and the bark *Canada*, voyaged as far as South America and South Africa.

A second trade stimulus attributable to the opening of the second Welland Canal was a quest to find new and more profitable markets. The financial panic of 1857, as a result of the Gold Rush recession, left hundreds of vessels idle. This drove many ship owners to salt water due to the lack of trade, and some went into coasting trades never to return to the Lakes.[69] By the early 1860s, branches of British manufacturing houses were established at the port of Chicago for the purpose of transacting regular business between England and North America via the Welland Canal. The majority of direct trade had been diverted by 1865, at which time demand was rekindled within the Great Lakes.

Towing and Canalling

Transit through the second Welland Canal was a time-consuming and occasionally dangerous endeavor. Forty-eight hours was considered a fair passage and sometimes the trip would take as long as a week.[70] Preparing a vessel for transit through the Canal required jib booms to be run in and topped up, yards to be cockbilled (meaning

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[68] For a detailed discussion of the trade between the Great Lakes and Europe see H.A. Musham, "Ships That Went Down to the Seas," *Inland Seas* vol. 1 no. 4 (1945): 2-13 and vol. 2. no. 1 (1946): 17-27. An additional article of interest authored by George V. Brown "Early Great Lakes Trade with Europe, 1847-63," *Inland Seas* vol. 17 no. 1 (1961): 4-9. Of particular interest will be the discussion of direct trade from Georgian Bay to Montreal, utilizing the Ottawa River, and the discussion of ready sale at the destined European port. Note: The listing of ships engaged in direct trade, found on p. 9, is inaccurate since a number of additional vessels have been located through this sailing canal ship study.

[69] Wilson, *Great Lakes Sail*, 106.

[70] Extracts from the Log Schooner *Augusta* April to November Captain S.G. Gibbs, Master Sailing Season of 1856.

they would be juxtaposed at an angle), yawl boats to be brought aboard, and taffrail davits and catheads to be capsized.

Passage through the canal, although vastly improved, remained a challenge even when weather conditions were agreeable. A ship might, for instance, "take charge" when traversing a bend in the canal. This occurred when the weight of the ship, pushed by winds, generated enough force to pull the three teams and the horse-boys into the canal. To avoid this debacle, sailing canallers were often moored to the bank to ride out a gale.

The cost of towing through the second Welland Canal averaged between $12 and $30.[71] In addition, freight rates were charged for passage through the Canal. A 383-ton vessel such as the *Prince of Wales*[72], with no cargo, would have been required to pay about $9.58 in transit costs. When loaded with 436 tons of corn, she would have been charged $84.20, plus transit costs. Alternatively, a cargo of 240 tons of timber would have cost $36, plus transit costs.

Captains often waited for the best possible commodity rates before securing and loading cargos. One of the principal sources of information on rates was the Chicago Board of Trade. The Oswego schooner *Augusta* delayed loading her cargo for two days, at which point an increase in the price for corn from 6½ cents to 7 cents per bushel augmented the shipment's gross profit for 16,010 bushels from $1,040.65 to $1,120.70, thereby garnering an additional profit of $80.05.

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[71] Extract of transcription from the logbook of the bark *Mary Battle*, 1872–1876.
[72] *Welland Canal Register*, 1866–1867.

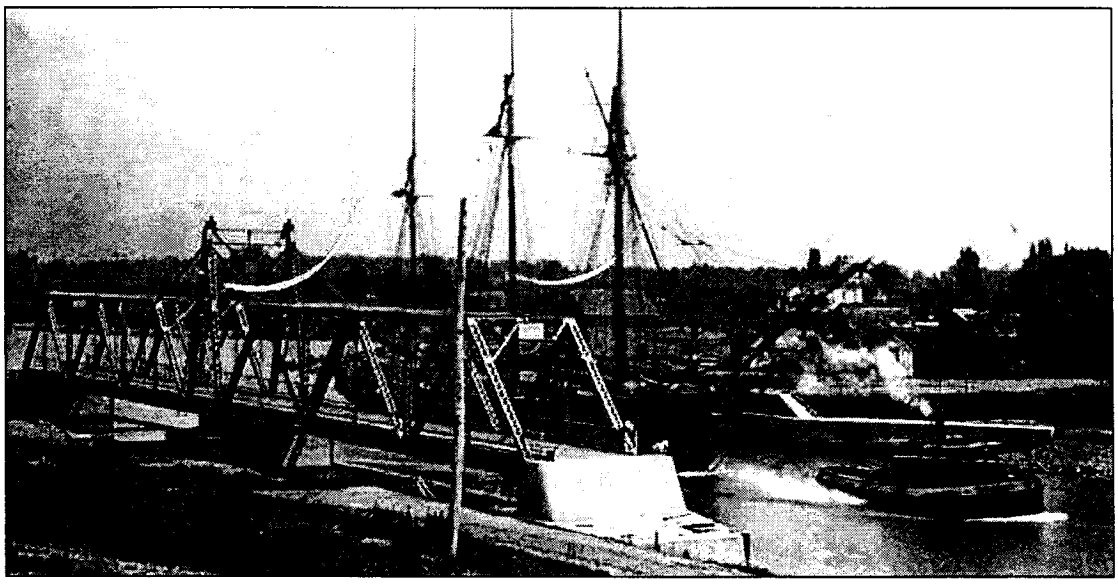

Figure 13: Sailing Canaller under tow through Welland Canal Lock at Port Robinson, Ontario. (Credit: John Burtniak Collection.)

Given such market fluctuations, it is understandable why shipbuilders strived to keep apprised of every fluctuation of the depth of the canal. The difference between a freight of 16,000 and 22,000 bushels established the differences in profits for an owner. When the Welland Canal was deepened in 1873, the Shickluna-built sailing canaller *Malta* was able to increase its cargo from 18,000 to 22,000 bushels. Based on freight rates for a particular cargo, this added capacity could swiftly advance the net profit for a ship's owner.

Even beyond the Canal, captains who transited from Lake Ontario to ports on the Upper Lakes constantly dodged risks to their vessels. Of particular expense and danger were transits through the Detroit River and the St. Clair Flats. To traverse the Detroit River and St. Clair Flats usually required two or three tows by tugboats. Ships were at the mercy of a tugboat captain and able vessels were ancillary to vessels caught on the Flats.

Ship captains would first have to signal a tow and then negotiate a price for towing. A typical combined cost for towing between Detroit and Port Huron was between $55 and $65 for a canal-sized ship.

In considering canalling on an annual basis, a one-way trip from Oswego to Chicago averaged about 14 days.[73] A one-way trip from Kingston to Bay City, Michigan, averaged about eight days.[74] Canallers averaged five to eight roundtrips per season, with most seasons based on an April-through-November navigation period. Risk was inherent not only financially, but also in terms of human life. Despite the risks, hundreds of mariners and ships reunited each season and locked their sailing canallers through, destined to attain large cargoes and even larger profits.

Vessel Mortality

Chicago's *Inter-Ocean* newspaper pronounced sailing canallers unsafe in the 1870s. Public opinion at that time remained supportive of the vessel type. But the records indicate that of all the vessels both sail and steam that foundered with all hands, more than 90 percent were sailing canallers.[75] Critics of the vessel's abilities claimed that foundering with all hands was a common occurrence. Cabin arrangement was one of the reasons for the significant loss of life. In heavy seas, sailing canallers that had cabins

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[73] Extracts from the Log Schooner *Augusta* April to November Captain S.G. Gibbs, Master Sailing Season of 1856. *Inland Seas*.
[74] Extract of transcription from the logbook of the bark *Mary Battle*, 1872–1876.
[75] *Chicago Inter-Ocean*, 9 November 1877.

below deck were most severely affected. Critics claimed that cabins should be placed above deck to reduce the death toll if a vessel were caught in treacherous weather.[76]

While an analysis of propeller canallers is beyond the scope of the present study, a brief mention of their foundering history in conjunction with their sailing brethren is useful. Canada, in particular, was credited with a high fatality record during the late 1870s, at which time a great number of both Welland sailing canal ships and propeller canallers foundered. The foundering of the propeller canaller *Asia*, built by Melancthon Simpson at St. Catharines, initiated an investigation into canaller construction. Investigators established that the problem was not, in fact, that propeller canallers were not as strong and staunch as other Lake craft. Captain Warren, United States government inspector of hulls in Chicago, attested that the reason for canal craft mortality was their box builds: "They are flat on the bottom and have box ends. When they get into the trough of the sea it is all over with them."[77] With regard to Simpson's *Asia*, Captain John Ilea claimed that: "She was in the local trade, and probably had package freight on deck and but little freight in the hold, and, with the passengers in the cabin, she was top-heavy, and easily fell prey to such a storm."[78]

The foundering of Shickluna's sailing canaller *Magellan* sparked revealing correspondence between two Lake captains deliberating on the possible cause for the ship's fate. The first suggestion, offered by "Careful Skipper," was that the vessel's loss was caused by the shifting of her cargo. The surface of cargo, in particular corn, he noted,

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[76] *Ibid.*, 9 November 1877.
[77] *Duluth Tribune*, 22 September 1882.
[78] *Ibid.*, 22 September 1882.

will slide when raised to a certain incline, assisted by the other motion and jar of the vessel. When cargo starts running to leeward, he went on to say, there is no help for it except to take in sail or change the position of the vessel immediately. The Careful Skipper asserted that although canal vessels have a high foundering rate, careen easily, and will not stand up straight with all sails in a gale, they are lively and "limber" in carrying sail and are the best seagoing vessels on the Lakes.[79]

A rebuttal to Careful Skipper's endorsement was offered by "Jack", who contested the conventional list of good seagoing qualities and suggested an alternative explanation. Jack supported the argument that few vessels leave port with grain cargoes in seagoing condition. He suggested this deplorable state arises because there are no shifting planks in the hatches, and because the shifting boards placed on stanchions are generally not continued all the way forward and aft in order to completely stop grain from sliding to leeward. Besides preventing the cargo from shifting, Jack claimed that water under the ceiling should be confined as much as possible from running down into the lee bilge. Vessels that are crank (such as canallers) become doubly susceptible to this running of the water to leeward, which makes them lie down farther and tends to increase the slippage of cargo. Jack also saw overloading as another cause of shifting cargo. The forms of canal vessels, he argued, do not favor deep loading, but incline more to crankness in proportion as they are overloaded.[80] He concluded his rebuttal with the decree that "canal vessels are not the best seagoing vessels on the lakes."

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[79] *Chicago Inter-Ocean*, 12 December 1877.
[80] *Ibid.*, 17 December 1877.

In his *History of the Great Lakes,* Mansfield also contends that overloading was the chief cause of vessel foundering.[81] If one accepts this claim, then sailing canaller mortality may be attributed to the merchants and ship owners who pressed vessels' capacities in order to realize a higher monetary return on freight. When sailing canallers could only carry cargo to a 14-foot (4.27 m) draft, they were safe. When channels were deepened, increase of freight tonnage was matched by an increase in the loss of sailing canallers.

Demise of Sailing Canallers

The pressure to compete with railroads and larger Upper Lakes ships contributed both to the sailing canaller's domination during the era of the second Welland Canal and to its eventual demise after the development of the third Welland Canal. Although some builders continued to construct vessels to fit the locks of the third Canal, the heyday of the true sailing canaller was effectively over.[82]

As early as the 1850s, many people realized the second Welland Canal was insufficient in size. Construction of the third Welland Canal that would admit vessels 270 feet (82.3 m) in length and 45 feet (13.7 m) in beam, began during the mid 1870s. This version of the canal was officially opened to a depth of 12 feet (3.66 m) in 1882, and further deepened to a depth of 14 feet (4.27 m) in 1884. The third Canal immediately changed the nature of the sailing canallers' employment. Beginning in the late 1870s, a

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[81] Mansfield, "*History of the Great Lakes*," 393.
[82] The four-masted *John C. Fitzpatrick* was built at West Bay City, Michigan, in 1892. She was the maximum-sized vessel capable of transiting the third Welland Canal.

lumber boom occurred in Michigan, and lumberman brought up old sailing canallers for the trade.[83] While some remained under full sail, many of the ships were converted into tow barges; at the same time, many of their propeller cousins were transformed into steam barges. As early as 1869, St. Catharines merchant James Norris contracted the Shickluna-built propeller canaller *Samson* to tow three schooners from St. Catharines to load cargo at Chicago and to unload it back at St. Catharines. The tug was fueled from the schooner's deck loads. The lengthy towline of canallers would become known as the "death knoll of the schooner."

Maintenance of the old wooden sailing canaller fleet became more challenging after the turn of the century because of the lack of craftsmen trained in traditional skills. This problem was largely due to the conversion of shipyards and dry-docks to service iron hulls. Winches powered by donkey engines assisted in lengthening the careers of sailing canallers by increasing the effectiveness of the relatively small crew.

Turning schooners into tow barges was considered a smart move by owners because it helped to save money by reduceing the number of sailors needed. These capitalists attempted to beat the unions and sailors' organizations that demanded better wages and improved living conditions. The new scale did not at first include barges and steamers. Sailors were hired for 25 cents less per day when just steering and pumping (and no climbing or rigging) were involved.

Sailing canallers remained employed in carrying low-value bulk cargoes through the early years of the twentieth century, even though the craft had outlived its original

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[83] George A. Waterbury, "The Wood Burners," *Inland Seas* 45, no. 4 (1989): 307-310.

function. With markets changing to meet consumer demands, many of these vessels were placed into trade networks that focused on two or three ports on only one lake. For example, by the 1900s, certain Lake Ontario ports had become established in coal and stone export. Oswego and Charlotte, New York, serviced the growing demand for coal at Canadian ports, while stone quarries in eastern Ontario were in demand to meet the needs of city development in south-central Ontario.

By 1928, the Lake Ontario fleet of sailing canallers, which had once numbered several hundred, had dwindled to two.[84] The *Julia B. Merrill* and the *Lyman M. Davis* would both later meet their fate in a rather unceremonious public spectacle near Sunnyside Park in Toronto.[85] On 11 July 1933, Lake Ontario reaped the last harvest of her glorious days of sail, as the *Lyman M. Davis*, engulfed in flames, slipped below her murky depths.

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[84] *Oswego Palladium Times*, 19 October 1927.

[85] Both the *Julia B. Merrill* and the *Lyman M. Davis* were bought by the Canadian National Exhibition in Toronto, so that they could be used as spectacles to lift the spirits of residents who were suffering through the Great Depression.

CHAPTER 3
VESSEL HISTORY: THE *SLIGO*

This chapter traces the evolution of the *Sligo*, a Welland sailing canal ship. The *Sligo*'s career, including the structural changes that were made to her in response to industrial development, exemplifies the fact that canallers were built as Great Lakes' workhorses that could be adapted to meet the needs of a growing nation. The markets for which the *Sligo* was employed changed during the latter half of the nineteenth century prompting the owners to modify the vessel to meet new requirements.

The *Sligo* was built in 1860 as the barkentine, *Prince of Wales*, at the Shickluna shipyards in St. Catharines, Ontario. Her purpose was to serve both oceanic and Great Lakes trade. She was rebuilt and rerigged as a schooner by Shickluna in 1874, and renamed *Sligo*, for employment exclusively in the Great Lakes. The *Sligo* was cut down in 1908 at the John Simpson shipyard in Oakville, Ontario for use as a tow barge when the costs of sailing and manning ships outweighed the costs of operating steam tugs. The ship's career ended in 1918 when she foundered at Humber Bay, near Toronto.

The Barkentine *Prince of Wales*, 1860–73

The Shickluna shipyard neared its zenith by the spring of 1860. After twenty-two years experience in the St. Catharines yard, Lewis Shickluna was a leader in the Canadian shipbuilding community, his service in constant demand. Among those who made significant investments in Shickluna's shipyard were the St. Catharines-based business owners, James Norris and Sylvester Neelon. The partnership between Norris and Neelon

began in the 1850s and lasted over twenty years.[86] Both men had extensive shipping interests and, by the mid-1870s, they owned two of the top three manufacturing industries in St. Catharines, with a gross income of between $150,000 to $300,000 in both milling and shipping.

By 1860, Shickluna had built and launched a total of twelve canal ships that fit the locks of the second Welland Canal (see appendix G). In March of 1860, Shickluna began building a new vessel that was destined to become the barkentine *Prince of Wales*. With the constant employment of up to 300 workers at his shipyard, it is no surprise that the vessel's keel and frame were completed by May of that year. The vessel was put up for sale by Shickluna that same month and was quickly purchased by Norris and Neelon.

James Norris and Sylvester Neelon were certainly familiar with Shickluna's craftsmanship and reliability, based on their earlier purchase of the canal schooners *St. Andrew* and *Louisa*. They expected the new barkentine would enable them to capitalize on the high returns possible from the United States wheat markets. The ship would allow them to reduce the British tariffs placed on United States staples by enabling them to process the goods at their own Welland Canal mills and then send the bulk cargo to Kingston for forwarding to Quebec, the Maritime provinces, and overseas.

On 13 May 1860, Shickluna met with Norris and Neelon to define the terms of their shipping venture, particularly the final construction specifications and materials

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[86]Norris and Neelon's first shipping venture appears to have occurred at the Abbey brother's shipyard of Port Robinson in 1854, with the construction of the *Sir Charles Napier* (Thomas Register of 1864). Their activities extended across different communities at the northern end of the second Welland Canal. Neelon established the Lincoln Paper Mills at Merritton, and also operated a prosperous shipping business and flourmills.

needed to produce the new vessel. Two days later, on 15 May, the three parties signed the necessary memorandum of agreement that confirmed the release of money for materials and compensation for the yard owner and workers, and ensured that the vessel would be built to the buyers' specifications. Shickluna received a payment of $11,000.[87]

Construction of the vessel continued until September 1860. The ship was launched during the first week of September and christened the *Prince of Wales*. The *St. Catharines Journal* of 20 September 1860, included the following mention of the vessel:

> The shipbuilding arch erected by Mr. Shickluna, near his dock was considered by nearly all to be the best and most handsome arch in town. It was beautiful. Two ship masts 45 feet long were hoisted and secured in the center by ropes, having rope guys running out to different stakes drove in the ground, and all beautifully decorated. In the apex was a large yawl boat: beneath this was a model of the schooner (*sic*) *Prince of Wales*, recently launched from Mr. Shicklunas shipyard for Messrs. Norris and Neelon.

Shickluna's newest vessel was named in honor of Prince Albert Edward, the heir to the British throne who toured North America during September and October. Some scholars have suggested that Edward christened the vessel at the Shickluna shipyards while visiting St. Catharines. This supposition appears to be unfounded, given that Edward did not visit the city until late in September.

The *Prince of Wales* was a solid product of Ontario shipbuilding. In Great Lakes nomenclature, the *Prince of Wales* was considered a "barkentine." She was fitted with two complete suits of sails and built with a hold that was two feet deeper than those of

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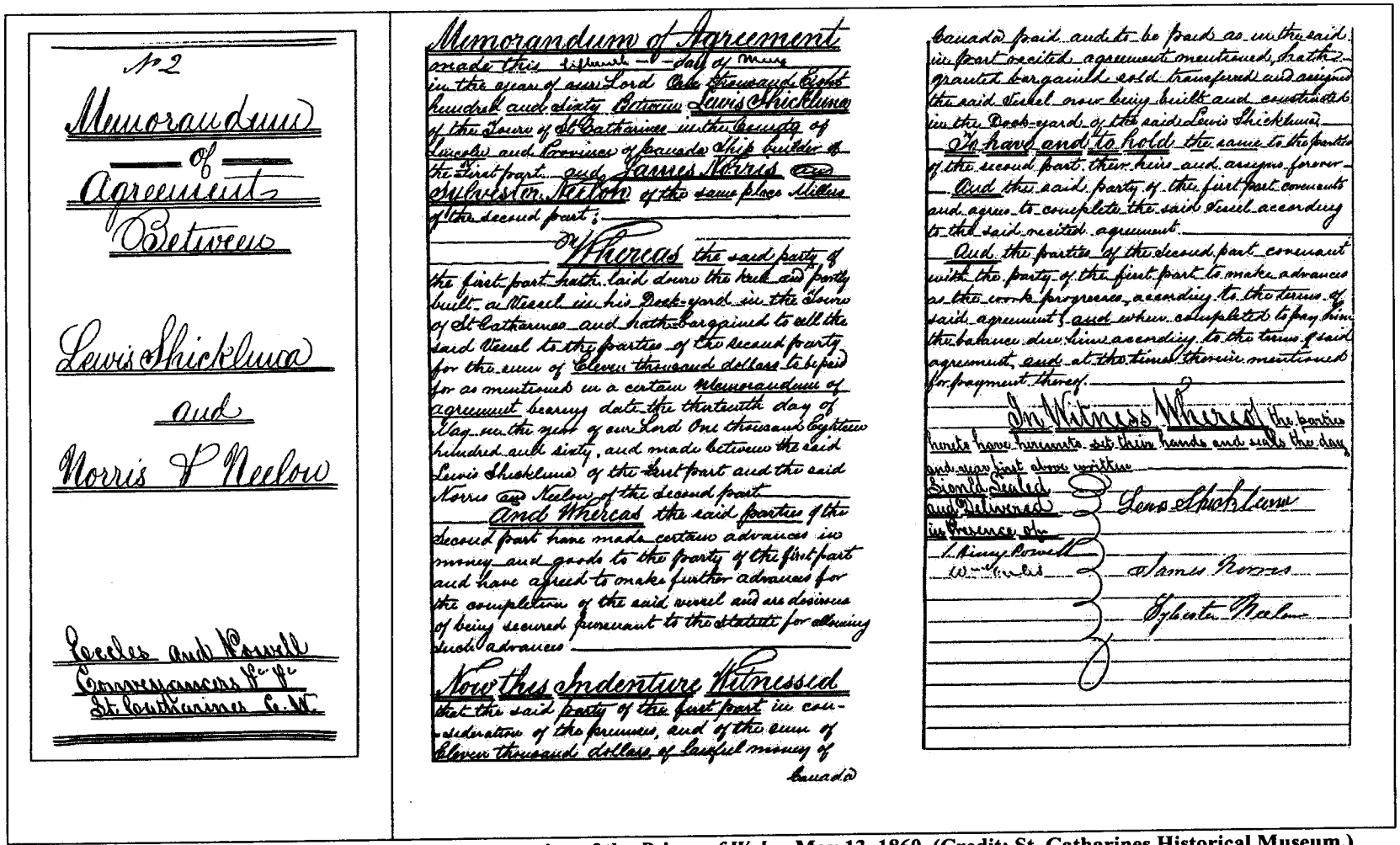
[87] Memorandum of Agreement Between Lewis Shickluna and Norris and Neelon for the Construction of a Vessel, (*St. Catharines Historical Museum – Shickluna Files*),13 May 1860.



№2

Memorandum of Agreement Between

Lewis Shicklima and Norris P Neelon

Leeches and Powell Conveyancers &c. &c. St. Catharines C. W.

Memorandum of Agreement made this [illegible] day of [illegible] in the year of our Lord One thousand Eight hundred and sixty Between Lewis Shicklima of the Town of St Catharines in the County of Lincoln and Province of Canada Ship builder of the first part and James Norris and Sylvester Neelon of the same place Millers of the second part;

Whereas the said party of the first part hath laid down the keel and partly built a Vessel in his Dock-yard in the Town of St Catharines and hath bargained to sell the said Vessel to the parties of the second party for the sum of Eleven thousand dollars to be paid for as mentioned in a certain Memorandum of agreement bearing date the thirteenth day of May in the year of our Lord One thousand Eighteen hundred and sixty, and made between the said Lewis Shicklima of the first part and the said Norris and Neelon of the second part

And Whereas the said parties of the second part have made certain advances in money and goods to the party of the first part and have agreed to make further advances for the completion of the said vessel and are desirous of being secured pursuant to the Statute for allowing such advances

Now this Indenture Witnessed that the said party of the first part in consideration of the premises, and of the sum of Eleven thousand dollars of lawful money of Canada paid and to be paid as in the said in part recited agreement mentioned, hath granted bargained sold transferred and assigned the said Vessel now being built and constructed in the Dock-yard of the said Lewis Shicklima

To have and to Hold the same to the parties of the second part their heirs and assigns forever

And the said party of the first part covenants and agrees to complete the said Vessel according to the said recited agreement

And the parties of the second part covenant with the party of the first part to make advances as the work progresses according to the terms of said agreement and when completed to pay him the balance due him according to the terms of said agreement and at the time therein mentioned for payment thereof

In Witness Whereof the parties hereto have hereunto set their hands and seals the day and year first above written

Signed Sealed and Delivered in Presence of

L Kinny Powell

Wm Reid

Lewis Shicklima

James Norris

Sylvester Neelon

Canada

Figure 14. Memorandum of agreement for the construction of the *Prince of Wales*, May 13, 1860. (Credit: St. Catharines Historical Museum.)

No 2

Memorandum

OF

Agreement

Between

Lewis Shickluna

and

Norris & Neelon

Eccles and Powell

Conveyancers &c &c

ST. CATHARINES C.W.

Memorandum of Agreement

made this fifteenth day of May in the year of our Lord One thousand Eight hundred and sixty Between Lewis Shickluna of the Town of St. Catharines in the County of Lincoln and Province of Canada Ship builder of the First Part: and James Norris and Sylvester Neelon of the same place, Millers of the second part;

Whereas the said party of the first part hath laid down the keel and partly built a vessel in his dockyard in the Town of St. Catharines and hath bargained to sell the said vessel to the parties of the second party for the sum of Eleven thousand dollars to be paid for as mentioned in a certain Memorandum of agreement bearing date the thirteenth of May in the year of our Lord One thousand Eighteen hundred and sixty, and made between the said Lewis Shickluna of the first part and the said Norris and Neelon of the second part

and Whereas the said parties of the second part have made certain advances in money and goods to the party of the first part and have agreed to make further advances for the completion of the said vessel and are desirous of being secured pursuant to the statute for allowing such advances.

Now this Indenture Witnessed that the said party of the first part in con-=sideration of the premises and of the sum of Eleven thousand dollars of lawful money of Canada

Canada paid and to be paid as in the said in part recited agreement mentioned, hath granted bargained sold transferred and assigned the said vessel now being built and constructed in the Dock-yard of the said Lewis Shickluna,

To have and to hold the same to the parties of the second part their heirs and assigns forever.

and the said party of the first party covenants and agrees to complete the said vessel according to the said recited agreement

and the parties of the second part covenant with the party of the first part to make advances as the work progresses, according to the terms of said agreement, and when completed to pay him the balance due him according to the terms of said agreement, and at the times therein mentioned for payment thereof.

In Witness Whereof the parties hereto have hereunto set their hands and seals the day and year first above written.

Signed, Sealed and Delivered in Presence of
I. Henry Powell
W^m Eccles

Lewis Shickluna

James Norris

Sylvester Neelon

Figure 15. Transcription of memorandum of agreement.

Figure 16. ***Prince of Wales*** **ca. 1860, Shickluna Shipyard, St. Catharines, Ontario. (Credit: Historical Collections of the Great Lakes.)**

ordinary canal-sized vessels. The *Prince of Wales* was square-rigged forward and her main mast and mizzen were fore and aft rigged; her standing rigging was hemp. Although wire rigging and double topsails were coming into widespread use, she carried a traditional single topsail with three reefs, and all of her rigging was rope. The ship had five thick rope shrouds on either side of her foremast, besides rope backstays and headstays, which were tarred to protect them from weather. Painted black, the *Prince of*

Wales registered 509 tons but could carry a thousand tons.[88] When launched, she had an insurable value of $20,000.[89]

Lewis Shickluna declared the *Prince of Wales* to be the best of the ships he had built.[90] This declaration is supported by other accounts other accounts praising the *Prince of Wales* to be the very best.[91] Sometimes the strength and durability of canal vessels were sacrificed insofar as their construction, for the sake of saving money. The *Prince of Wales* was not constructed this way. She was heavily built in order to straddle both the oceanic and inter-lake markets. She was able to carry only about 75 percent of the load of vessels of the same dimensions. The *Prince of Wales* was such a well-built vessel that Norris and Neelon contracted Shickluna to build the bark *Canada*, to similar specifications. She was launched on 3 June 1861.[92]

The *Prince of Wales*' career as a Welland sailing canal ship began on 13 September 1860, with her first passage through the locks of the second Welland Canal. At the helm was John C. Graham, who first captained a ship in 1848 and owned his first vessel in 1853.[93] She was bound for Chicago from St. Catharines. Most likely, that autumn she participated in trade on the western end of the Great Lakes and wintered in Chicago. The ship's first full season began in May 1861, when she left Chicago for

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[88] "Mighty Maltese of Shipman's Corner." *Toronto Evening Telegram,* 16 August, 1947.
[89] Thomas, Robert, *Register of the Ships of The lakes and River St. Lawrence*, (Buffalo: Wheeler, Matthews & Warren, 1864), 110.
[90] "The Pickled Prince." *Toronto Evening Telegram,* 30 December, 1944.
[91] Just as Good as New Schooner *Sligo*, Formerly *Prince of Wales*, Still Afloat. *Hamilton Herald*, 18 September, 1901.
[92] *St. Catharines Constitutional*, 6 June 1861
93 Graham was born in Scotland in 1823. At age six he emigrated with his family to Glencoe, Ontario. Graham became a mariner when he was sixteen years old, and moved to St. Catharines in 1848.

Kingston, Ontario, carrying a cargo of wheat. Unfortunately, the *Prince of Wales* ran aground on the St. Clair Flats and suffered a damaged rudder, repaired for $50.[94]

Throughout the summer months of June, July, and August 1861, the *Prince of Wales* was employed in the timber trade between the ports of Saugeen and Kingston, Ontario. Unfortunately, Welland Canal shipping records do not exist between August and December. The last cargo of the season, however, supports a reflection on Norris and Neelon's shipping and milling activities. The *Prince of Wales* is recorded as having carried flour from St. Catharines to Cape Vincent. This suggests that an earlier cargo of wheat shipped from Chicago or Milwaukee to St. Catharines was processed at mills in St. Catharines offering Norris and Neelon reduced tariffs for their cargo passage through the Welland Canal. Given her early whereabouts the following spring, the *Prince of Wales* presumably wintered in Kingston.

The 1862 season began early for the *Prince of Wales*. On 22 March 1862, Kingston's *Daily British Whig* recorded that the vessel was under repair at the Ault Shipyard in Portsmouth, Ontario: "the schooner (*sic*) *Prince of Wales* (belonging to St. Catharine's) ... is undergoing a large amount of repairs, for though a new vessel, she requires caulking, painting, &c., and, in Mr. Ault's hands, will look, when finished, as though she was just built." After the repairs were completed, the ship departed light for Sarnia, Ontario.

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94 List of Marine Disasters for 1861. *Buffalo Commercial Advertiser*, 22 January, 1862.

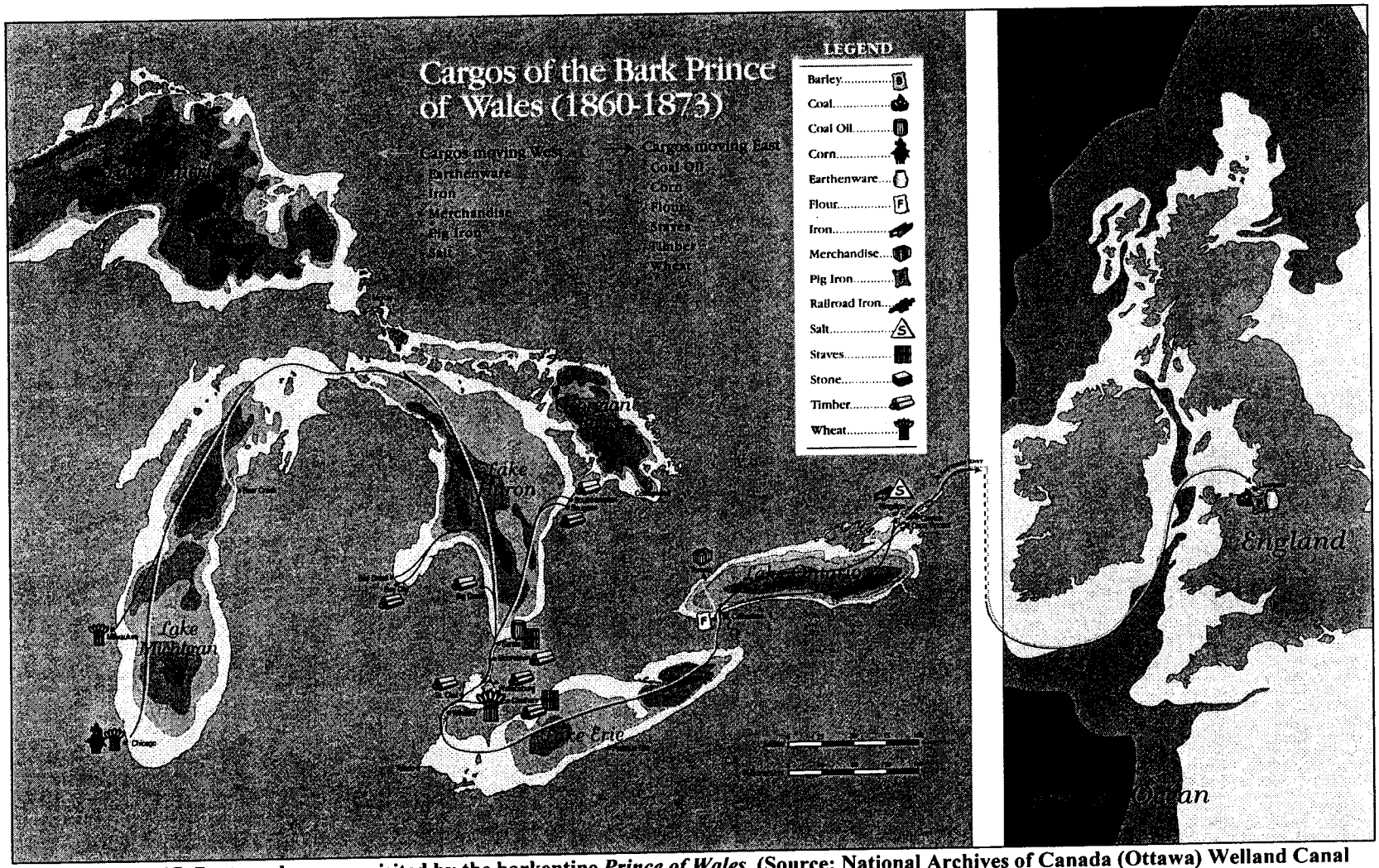

Figure 17. Ports and cargoes visited by the barkentine *Prince of Wales*. (Source: National Archives of Canada (Ottawa) Welland Canal Registers 1854–1867: RG43-C-VI-2-k), see Appendix E. (Map by Andrew Hibbert.)

In 1862 Norris and Neelon decided to use the *Prince of Wales* in an experiment in direct shipping from Canada to Europe. Direct trade was relatively new, particularly from ports west of the Welland Canal. The *New Brunswick*, a canal ship built in 1847 by Lewis Shickluna, had been the first vessel used in direct trade from Chicago to Liverpool. The *Sarnia Observer* printed the following notice on Friday, 2 May 1862:

> We have now lying at the C.W. Railway Dock a large three master, the *Prince of Wales*, of St. Catharines taking on a cargo of oil to be taken hence, direct to Liverpool; so that the experiment of shipment, direct, will soon be put to the test, and we hope with favorable success. The *Prince of Wales* will carry about 3, 000 barrels, upwards of which she will take on board here, and the balance at Mooretown, at which place Mr. Bush, the owner has about 800 barrels.

The replacement of whale oil and candles with petroleum to heat and light English homes opened a new market for Canadian merchants involved in exporting natural resources. A thriving petroleum trade developed between the Sarnia area and England, even before Imperial Oil established Sarnia as a gasoline production center.[95] The *Prince of Wales*'s 1862 cargo may have been the first such direct petroleum shipment.[96]

Under command of Captain Graham, the *Prince of Wales* cleared the St. Lawrence River and then Newfoundland. The crossing was reported to have been rough, with the heavy seas and angle of heel placing an exorbitant amount of pressure on the lower tiers of barrels in her hold. Over 500 barrels of the oil, or "liquid gold," leaked out during her voyage. By the time the *Prince of Wales* arrived in Liverpool, her timbers were thoroughly soaked in oil from stem to stern. In England the crew attempted to sand

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95 Gasoline was at this time a waste by-product of the process used to refine coal oil from crude petroleum. Most of it simply flowed into the river.

96 Edward Phelps, Foundations of the Canadian Oil Industry, 1850-1866 in *Profiles of a Province*, Ontario Historical Society (Toronto, 1967), p. 163.

and scrub her hold to remove the reek of petroleum, but to no avail. Later, among the shipbuilding community, the ship's saturation by oil to a depth of three or four feet was reputed to be the reason for her longevity.

A newspaper account claimed that the *Prince of Wales* departed Liverpool for Cape Town, South Africa.[97] While no evidence documenting this voyage has been located, it was not unheard of that a Great Lakes vessel would travel this immense distance. For instance, on 13 May 1865, the Great Lakes brigantine *Sea Gull* sailed from Toronto to Port Natal, South Africa with a cargo of oak lumber.[98]

The only English return cargo Captain Graham could locate for the *Prince of Wales* was earthenware, pig iron, and coal. Stopping off in Toronto at the foot of Yonge Street on her return trip, Captain Graham claimed to have made the round trip without losing a rope on lake or ocean. She reached St. Catharines on 17 September 1862 and presumably wintered there.

From late April through August 1863, the *Prince of Wales* made a minimum of ten transits through the Welland Canal, traveling between Kingston and the timber towns of Wallaceburg, Saugram, and Southampton. The owners relied on a high return for a single bulk cargo shipment; because few return cargos were available. For the entire 1863 season, the *Prince of Wales* was able to locate only one return cargo - a half ton of iron carried from Kingston to Saugeen.

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[97] *Collingwood Enterprise Messenger,* 1932.
[98] *Detroit Free Press* 1865, 1867.

The *Prince of Wales* continued to be employed in the timber trade between Kingston, Wallaceburg, and Saugeen during 1864. Thomas register of 1864 lists Norris and Neelon as owners of the *Prince of Wales*. By late September she was bound for Chicago to participate in trade on the western Great Lakes for the remainder of the season. The ship most likely wintered in the Upper lakes, where she was positioned to transport cargo from Lake Huron's timber resources in the early spring.

The *Prince of Wales* resumed her employment in the timber trade between Kingston, Wallaceburg, Mooretown, Saugeen, and Bear Creek. This activity lasted until September 1865 when, quite uncharacteristically, she began transporting a wider variety of cargoes, including a significant return tonnage from Kingston. Records indicate that the *Prince of Wales* carried timber and staves to Clayton, New York, from Chatham, Ontario. She traveled to Kingston, and loaded a cargo of salt bound for Chicago. She loaded a cargo of wheat in Chicago, the first since the oil had soaked her hold.[99] After having the *Prince of Wales* thoroughly whitewashed, Norris and Neelon bought a cargo of wheat and, on arrival in Kingston, all but twenty bushels were found in the best of condition.[100] The *Prince of Wales* was again able to locate a return cargo of salt and set course for Chicago, where she wintered.

The *Prince of Wales*'s circuitous trade had developed a focus on the ports of Kingston, Chicago, and Milwaukee. Consequently, during the first trips of the 1866

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99 Captain Graham had encountered a common prejudice – vessels that carried caustic substances such as coal oil were blackballed as "coil oil can for a bushel measure" (*Collingwood Enterprise Messenger* 1932: 12), and rarely used to transport perishable cargoes. It was believed that oil that had impregnated a ship's ceiling planking could taint grain or flour. This was, of course, long before the days of sanitary modern tankers with oil-proof compartments.

100 *Collingwood Enterprise Messenger,* 1906.

season she more than likely remained engaged in the trades on the western and upper Great Lakes. The barkentine's first transit of the Welland Canal for the season occurred on 11 July, when she was bound from Chicago for Kingston carrying wheat. On the return trip from Kingston she was able to locate and load a cargo of salt, bound for Chicago. Although focused mainly on wheat export, she carried corn from Chicago to Kingston in late August and another cargo of corn from Chicago to Toronto in December. This was her final cargo of the season, and found her wintering at Toronto. The 1866 register lists the *Prince of Wales* as 507 tons; she remained classed as A1 and valued at $13,500.[101]

In late April 1867 the *Prince of Wales* carried merchandise upbound from Toronto to supply resident in Bear Creek. From May through October, she resumed her employment with the timber ports of Wallaceburg, Bear Creek, St. Clair, and Chatham, ultimately forwarding her timber cargoes through Kingston, Ontario, or Clayton, New York. Returning to the western Great Lakes in October 1867, she carried wheat bound from Milwaukee to Kingston. In November she returned to Chicago, where she wintered.

Few records exist for the *Prince of Wales*'s employment after 1867. This is due, primarily to a gap in the Welland Canal registers. There are no available register books for vessel passages between 1868 and 1874. Newspaper accounts, marine casualty reports, and individual port logs from this period are the only available records of the activities of the *Prince of Wales* and other ships that transported bulk cargoes to and from the Lake Ontario forwarding ports. The 1869 Association of Canadian Lake Underwriters

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[101] ACLU Register, 1866.

register lists the *Prince of Wales* at 507 tons, classed as A2, valued at $12,000, and owned by John Graham.

Newspaper accounts illustrating the movement of the *Prince of Wales* records her traveling light from Kingston to Chicago on 11 September 1871.[102] She apparently wintered at Port Colborne.[103] The *Prince of Wales*'s final registration for the year 1871 records her at 383 tons (new tonnage) and owned by Graham and Campbell. She was valued at $14, 000 and classed as A2.[104]

On 1 September 1872, while bound from Oswego to Toronto, the *Prince of Wales* was stranded about six miles below Port Dalhousie on the western end of Lake Ontario. She was a partial loss, with a cost estimated at $4,000, but no lives lost.[105] The *Prince of Wales* again ran aground at the same time and place in December.[106]

The final newspaper account of the *Prince of Wales* indicates that in July 1873, she and the schooner *Morning Star* collided off Nine Mile Point, Lake Ontario. The *Morning Star* incurred $300 in damages; the *Prince of Wales* was not damaged.[107] The final registration for the *Prince of Wales* was entered at the end of 1873, at which point she measured 407 tons. Owned by Graham and Company, and valued at $12,000 Canadian, she is classed as a B1.[108]

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[102] *Detroit Free Press*, 12 September 1871.
[103] *Detroit Free Press*, 22 December 1871.
[104] CLVB 1871.
[105] SWC 1872; DMF Papers 1873.
[106] Marine Statistics Disasters to Shipping on the Lakes in 1872. *Detroit Free Press*, 14 December 1872.
[107] Marine Casualties of 1873. *Detroit Free Press*, 9 December 1873.
[108] NBLU Register 1873; ACLU Register 1873.

Cargo	Frequency	Percent
Timber	22	34.4
Wheat	5	7.8
Salt	3	4.7

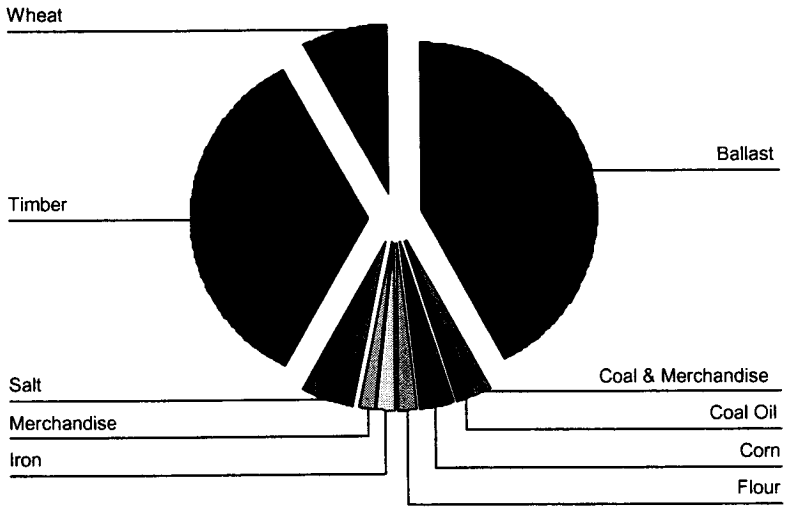

Figure 18. Cargoes carried by the barkentine *Prince of Wales*. (Source: National Archives of Canada (Ottawa) Welland Canal Registers 1854–1867: RG43-C-VI-2-k), see Appendix E.

The Three-and-Aft Schooner *Sligo*, 1874–1908

The Toronto *Globe* reported on 6 April 1874, that the barkentine *Prince of Wales* of St. Catharines had been changed into a fore-and-after and named *Sligo*. After fourteen years it was thought advisable to rebuild the *Prince of Wales*. During a survey her timbers were found to be in excellent shape and, in order to reduce crew costs, her rig was changed from a heavily-sparred barkentine to a three-and-aft schooner. Cut down to Welland Canal depth, the ship's new registered dimensions were 138 feet (42.1 m) in

length, 23 feet (7.01 m) in beam, 11 feet, 8 inches (3.60 m) in depth and 335 tons.[109] Her new name, *Sligo*, was painted over the old one, and the entire vessel was painted white.

Registered on 11 April 1874, and survey approved on 22 April 1875, the schooner *Sligo*'s official number was 72711. Her subscribing owners were John C. Graham, of St. Catharines, owning 32 shares, George Campbell, mariner, of St. Catharines, owning 32 shares; the Canadian Bank of Commerce held the mortgage.[110]

It was Captain Graham who renamed the vessel *Sligo*. The name is not all that surprising, given the substantial Irish presence along the Welland Canal. Sligo was one of the principal ports of emigration in Western Ireland. Canadian immigration records show that between 1847 and 1850, 17,943 people sailed from Sligo to Canada in an effort to escape the Irish penal codes.

Captain Michael Kerwin was placed by Captain Graham in charge of the *Sligo*. Graham instructed Kerwin that he would be beat if he took the "whiskers out of the vessel." The *Sligo* was launched in late April 1874 and, based on later register entries, probably re-engaged in the timber trade.

The first transit record available for the *Sligo* reveals her upward bound from McKay to Bay Creek, and light, in July 1875. Her cargoes during the 1875 season consisted largely of timber exported from Bay City, Chatham, and Big Creek and forwarded to Kingston, Pt. Metcalf, and Pt. Inecraft. She managed one return

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[109] List of vessels on the registry books of the Dominion of Canada for the year 1874.
[110] Port of St. Catharines Shipping Register Folio 26 Registrar's Notes: Transferred to Folio 2, New Book, *Shipping Act*, 1854 & *Provincial Act* 36 Victoria, Cap. 128.

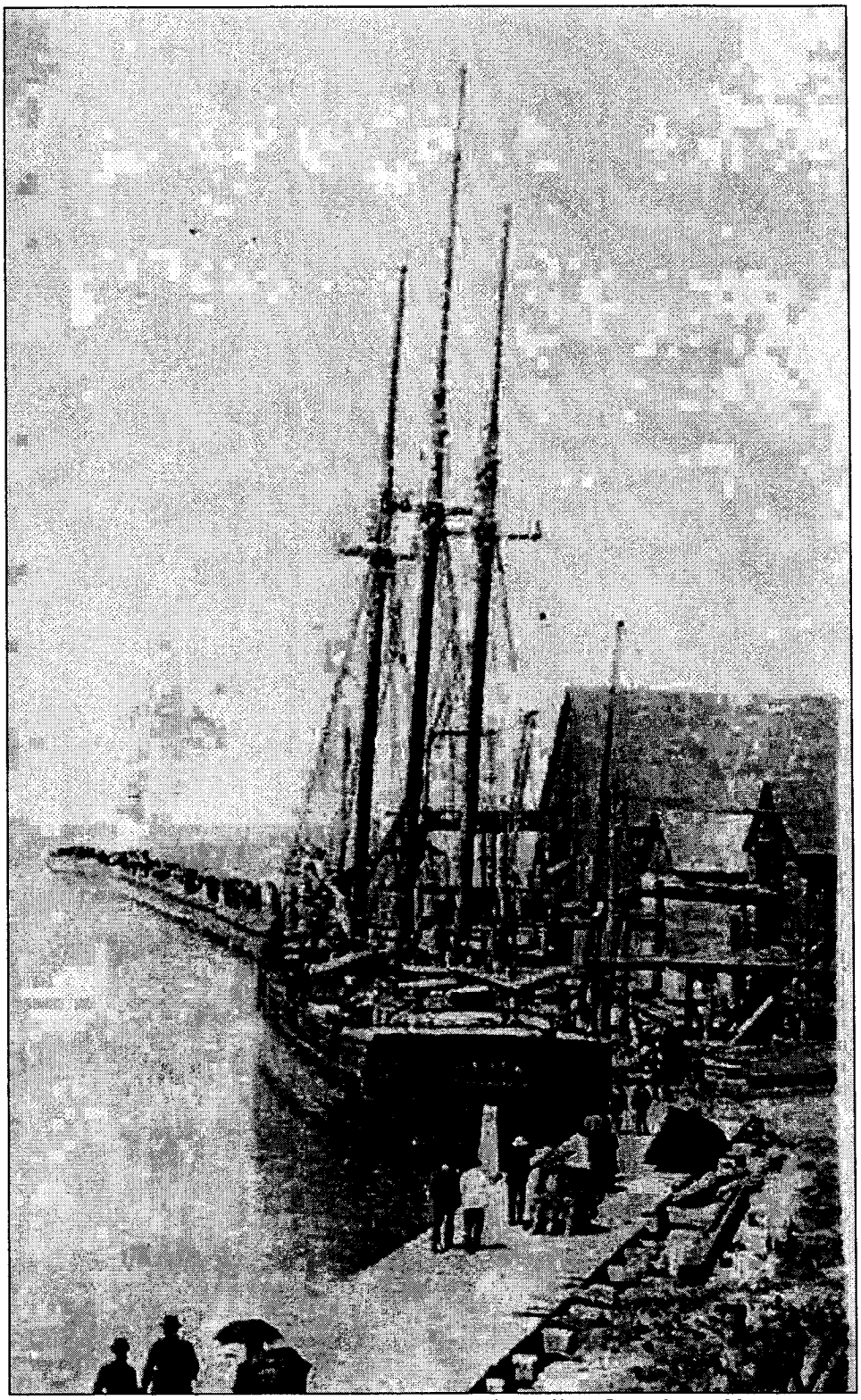

Figure 19. Schooner *Sligo* docked at Kincardine, Ontario c. 1885. (Credit: Southampton Museum.)

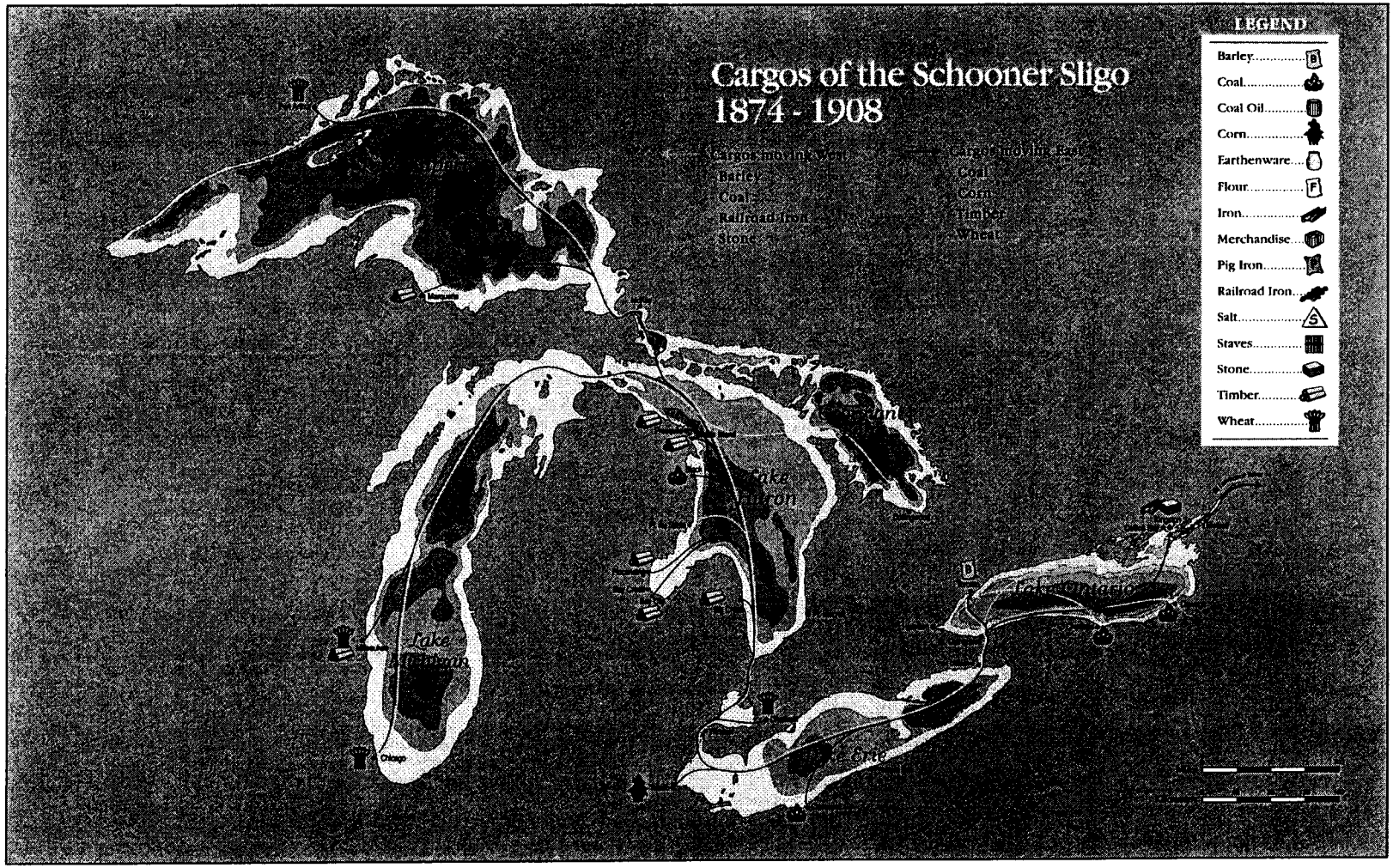

Figure 20: Ports and cargoes visited by the schooner *Sligo* (source: National Archives of Canada (Ottawa) Welland Canal Registers 1875-1893; 1904–1908; Vols. 2403, 2404), see Appendix E. (Map by Andrew Hibbert.)

cargo in early September, consisting of railroad iron bound for Windsor. Later transshiped to northern Lake Superior, this was one of the first cargoes of iron rails used in the construction of the Algoma Central Railway in Northern Ontario. The *Sligo* wintered somewhere along Lake Erie. During May through August 1876 the *Sligo* continued to be employed in the timber trade between the Pt. Metcalfe and Pt. Colbourne, before turning to the coal trade between Toronto and ports in Ohio. The last existing record finds her carrying barley between Toronto and Toledo. The 1876 list classes *Sligo* as A2 with a value of $13,000.[111]

The *Sligo* carried a variety of cargo during the 1877 season. She carried timber, wheat, coal, and stone from Kingston, Marquette, Oswego, Milwaukee, and Chatham to the Canadian ports of Pt. Metcalfe, Pt. Arthur, Kingston, Pt. Colbourne, and Toronto. The Toronto *Globe* reported that on 24 October 1877, the schooner *Sligo*, enroute from Port Colbourne through the Welland Canal, was leaking and had to go to Port Robinson dry dock for repairs. The *Sligo* wintered in Toronto, pre-positioned for the following season.

John Ross, a Montreal railway contractor, chartered the *Sligo* in 1878. He intended that the *Sligo* would carry a variety of machinery to Port Arthur for the building of a hundred-mile section of the Canadian Pacific Railway west from Nipigon. The Sylvester Brother's Wharf, located at the foot of Church Street, in Toronto, had the biggest derrick on Lake Ontario. There, the crew loaded a donkey engine on deck and 250 tons of iron rails, black powder, picks, shovels, hexagonal steel bars for drills, wheelbarrows, and sledges, along with hay, oats, and cattle feed for the horses and oxen.

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[111] ALU Class List of Vessels 1876.

During the summer of 1878 the *Sligo* began carrying timber between Marquette and Pt. Metcalfe, and corn between Toledo and Kingston. By October 1878, she had carried 22,000 bushels of oats to Collingwood from Chicago.[112] While returning to Chicago from Collingwood on October 25, 1878, the *Sligo* stranded on Lake Michigan at St. Helena Island, U.S.A., owing to stress of weather; damage was minor.[113]

The *Sligo* was employed in the wheat trade between Milwaukee, Chicago, and Kingston during the summer months of 1879. In addition to wheat, the *Sligo* also carried corn cargo during the 1879 season, from Chicago to Collingwood.[114] The *Chicago Tribune* reported that the *Sligo* wintered in Chicago.[115]

On 30 May 1880, the *Sligo* was stranded on Georgian Bay at Cockburn Island in a fog while bound from Parry Harbor to Fort William (later Port Arthur). The schooner was classed as a total wreck with an estimated loss of $8,000, and a loss of $890 on her cargo.[116] Salvors managed to save the vessel, and after a rebuild, the *Sligo* was placed back in service.

In September 1883, the *Sligo* carried the first ever grain cargo, out of Fort William – 17,000 bushels. This historic cargo was the first of many wheat shipments from the Canadian West, and presents a milestone in prairie economic development. At this time, Fort William was a Hudson Bay post and did not have any grain elevators. The

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[112] *Meadford Monitor*, October 1878.
[113] Statement of Wreck and Casualty for 1878, Dept. of Marine and Fisheries. *Sessional Papers* 1879.
[114] *Meadford Monitor*, October 1879.
[115] *Detroit Post*, 18 December 1879.
[116] Statement of Wreck and Casualty for 1880, Dept. of Marine and Fisheries. *Sessional Papers* 1881.

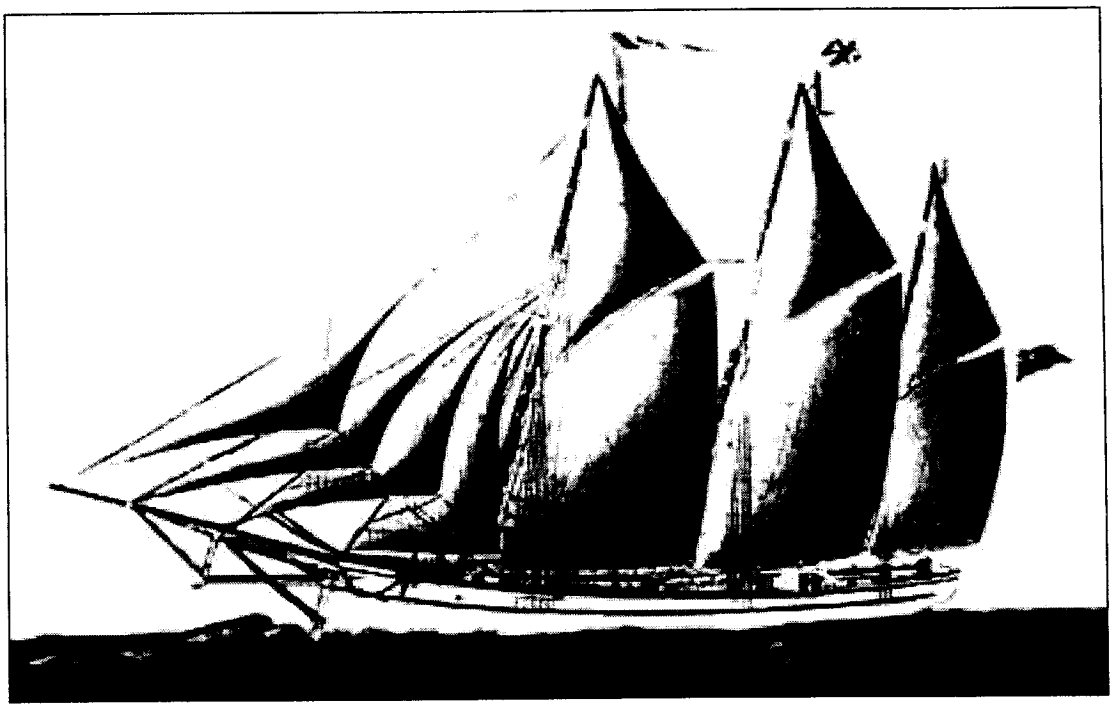

Figure 21. Schooner *Sligo*, painting by Gibbons ca. 1890. (Credit: Ontario Archives.)

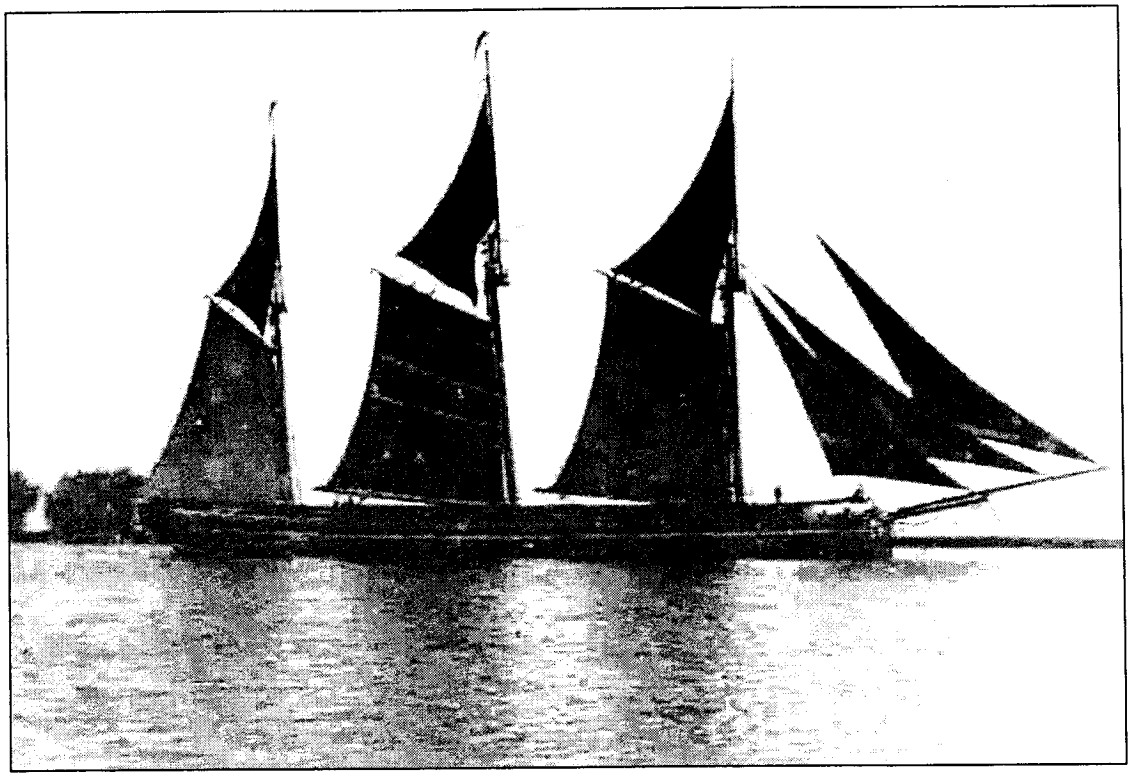

Figure 22. Schooner *Sligo* under sail on Lake Huron ca. 1880. (Credit: Dossin Museum.)

wheat was shoveled out of railroad boxcars into pushcarts, wheeled over the *Sligo*'s rail, and poured through her hatches. In addition to this grain export, between 1882 and 1886 the *Sligo* carried materials for construction of the Canadian Pacific Railway along the north shore of Lake Superior. The following report from the Detroit Free Press (8 October 1883) helps illuminate the *Sligo*'s activities:

A Novel Cargo on the Schooner *Sligo*

The schooner *Sligo* was loading yesterday at Armour's warehouses [in Chicago] with a complete cargo of provisions for Duluth. It was brought for the supply of the Canada Pacific Railway. It includes everything manufactured from both the hog and the bullock - all of the leading cuts of sides, shoulders, hams, salted and pickled pork in barrels, lard in tierces, brawn, mess beef, canned beef, beef hams, sausages, etc.[117] It is worthy of remark that a year ago yesterday a large lot was shipped to the same region. The prices charged for sides from the hog being then very nearly three times the price charged on the present cargo. Middles were then charged at 16 cents a pound. The price yesterday was but a shade over 6 cents. This is believed to be the first cargo ever shipped from one house comprising a complete assortment of all the food products manufactured from the hog and ox. The same house also sold 250,000 pounds of long clear middles to go to Baltimore, which is also believed to be a unique shipment.

George A. Graham, the son of Captain John C. Graham, was her managing owner during this period.

The rest of the *Sligo*'s history to 1908 is fairly uneventful and can be succinctly set down in rapid chronological fashion. In the autumn of 1883, after having been reported missing, the *Sligo* arrived in Chicago "minus some canvas, but otherwise sound and her crew all well."[118] In 1884, she was recorded at 399 tons and owned by G.A. Graham et al.[119] Two years later, the *Sligo* was registered at 284 tons, and measured 137 feet (41.8

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[117] "Tierces" are half barrels and "brawn" is a pork product similar to headcheese.
[118] *Marine Record*, 29 November 1883.
[119] Directory of Marine Interests of the Great Lakes R.L. Polk and Co., 1884.

m) in length, 23 feet (7.01 m) in beam, and 11 feet, 8 inches (3.60 m) depth of hold. Her owner was George A. Graham of Port Arthur, Ontario.[120]

Moving ahead into the last decade of the nineteenth century, the *Marine Record* (25 April 1895) states "The little Canadian canaller *Sligo*, which laid up at Sandwich last winter, has been given a good overhauling. It is said she cleared $1,800 for her owners last season." The next year, the *Meaford Monitor* (6 November 1896) reported that the *Sligo* brought in a cargo of salt for a William Cook. By 1898 the *Sligo* had changed hands and was now owned by R. Thompson of Hamilton.[121]

During the late 1890s, Captain Neil McKenzie was in charge of the schooner. Captain Archie McInnes, also of Tiverton, succeeded Captain McKenzie and later served on the *Juno* with the *Sligo* as consort.[122] In 1895, a rather unique account describes an experience by the crew aboard the *Sligo*. While at the dock in Port Elgin, Ontario, crew members aboard the *Sligo* sighted a boat in distress. A recreational sailboat was in trouble because of high winds. The boat's main sail shredded, and the vessel nearly swamped. Two crew members were projected and clinged to the boat as the river became rougher; and while the prospect of survival decreased for the sailors. The *Sligo*'s yawl boat was launched, and after a difficult time, succeeded in rescuing the young men from their perilous position. As the *Port Elgin Times* reported: "Capt. McKenzie and his bold crew of hardy Scothmen (*sic*) from Tiverton, Ont. said never a word of their brave deed

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[120] List of vessels on the registry books of the Dominion of Canada on December 31, 1886.
[121] List of vessels on the registry books of the Dominion of Canada on December 31, 1898.
[122] As a point of interest, the *Juno* was wrecked off the Scarborough Bluffs, five miles east of Toronto. It has been the focus of archaeological investigation by the heritage organization Save Ontario Shipwrecks.

and are now up the lakes for another cargo. Their reward was the heartfelt thanks of the rescued ones but they have the satisfaction that comes from doing a noble action."[123]

In 1900, the *Sligo* changed hands and became the property of William J. Pulling of Windsor, Ontario.[124] In 1902 she was owned by Archibald McInnes, also of Windsor, Ontario.

Cargo	Frequency	Percent
Coal	12	26.1
Timber	10	21.7
Wheat	4	8.7

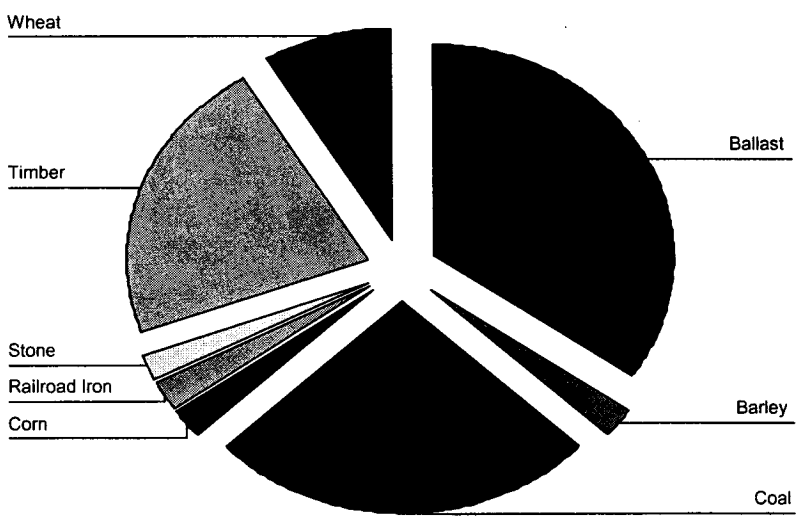

Figure 23. Cargoes carried by the schooner *Sligo,* 1974 – 1908. (Source: National Archives of Canada (Ottawa) Welland Canal Registers 1875-1893; 1904–1908; Vols. 2403, 2404), see Appendix E.

[123] *Sligo* - Saved Their Lives. *Port Elgin Times*, 23 May, 1894.
[124] *Great Lakes Marine Register*, 1900.

The Schooner-Barge *Sligo*, 1909–18

A fond and rather optimistic account of the *Sligo* appeared in the pages of the *Collingwood Enterprise Messenger* on 22 March 1906. The venerable old boat, the author observed, represents "a class of craft now almost extinct, no vessel of this class having been built for 25 years. But the *Sligo* is still in existence, good for another forty years, a gallant old vessel." The interests of men and the hand of fate, however, had other plans.

Like many another tall schooner the *Sligo* was turned into a towbarge in 1909 because it was cheaper to buy coal for a tug to tow her than to pay sailors to sail her. It has been suggested that this conversion occurred at the John Simpson shipyard in Oakville, Ontario.[125] C.H.J. Snider, who sailed past the *Sligo* in 1908 aboard the schooner *Albacore*, evocatively describes her appearance by this period: "... a tow barge, which had been doing nothing for some years; a white painted, straight sided, round nosed thing, with a weary expression in her goggle eyed hawse-pipes. Old Canaller was written all over her, in her shape, and the scoring of her oaken sides by years of grinding lock walls."[126] The *Sligo's* schooner foremast had been left in her, and she had either a foresail rigged on it or a cargo boom. To facilitate the loading and unloading of the crushed stone, the schooner-barge's hatches were widened from covering-board to covering-board. Snider suggested that this was "like cutting her backbone through – She

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[125] No reference to such changes at that facility have been located.

[126] *Collingwood Enterprise Messenger,* 6 October 1932. Snider based most of his stories on interviews with Captain George Graham and Nosey O'Brien, the nestor of the Toronto waterfront. He supplemented these interviews with research in the Dominion and local registers.

Figure 24. Schooner-barge *Sligo* docked at the Bathurst St. Wharf, Toronto, ca. 1915. (Credit: Ontario Archives.)

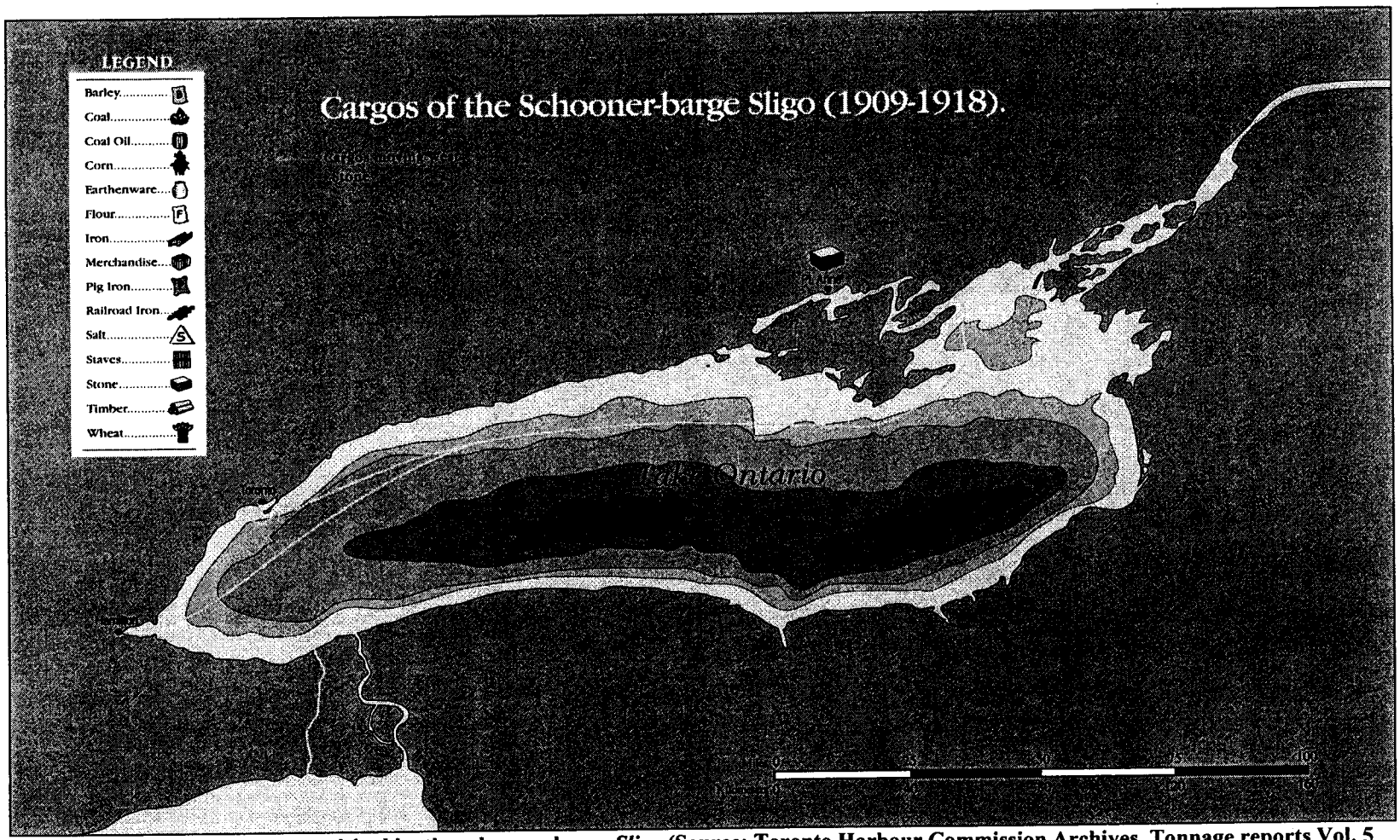

Figure 25. Ports and cargoes visited by the schooner-barge *Sligo* (Source: Toronto Harbour Commission Archives, Tonnage reports Vol. 5 1902–09: RG2/6, Vol. 6; 1910–19: RG2/6, Vol. 7), see Appendix E. (Map by Andrew Hibbert.)

wriggled in a seaway like a rattlesnake with colic." It may be surmised that these renovations contributed to her foundering.

In 1909 M.J. Haney and Miller, contractors for the waterworks at Toronto Bay, purchased the recently revamped schooner-barge *Sligo*. Registered at Toronto on 26 July 1909, she was employed for both the stone and coal bulk freight trades. Haney and Miller employed her to carry crushed stone from the Point Anne Quarries (near Belleville on the Bay of Quinte) to Toronto and Hamilton. [127] This material was used to make concrete for the construction of Highway 2 which stretches along the coastline of Lake Ontario.

From 1909 through 1914, the *Sligo* maintained a consistent employment record. At some point during 1913, Adamsons Elevator at the foot of West Market Street in Toronto collapsed while full of stone. The *Sligo* was moored alongside the elevator and bore the main brunt of the collapse. The durable old schooner-barge seemed none the worse for this mishap and carried on hauling stone.

The *Sligo* left Point Anne on 2 September 1918. In the early morning hours of 5 September, she was laden with 500 tons of stone cargo and bound for Toronto; the steam barge *City of New York* was towing her. The steam barge's master, Captain Quinn, found that there was seven feet of water in the hold of the vessel. Added to that, the steam barge's pressure was steadily decreasing, making it

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[127] The *Sligo* was not the only vessel employed by Point Anne Quarries for the crushed stone trade. Between 1909 and 1925, the company's fleet numbered eleven vessels (including the *Sligo*) that carried aggregate by-products to Toronto and other ports along Lake Ontario. A brief discussion of the company and ships employed was published in the *Scanner*, the monthly news bulletin of the Toronto Marine Historical Society Vol. 5, No. 7 (1973).

impossible to tow the *Sligo* any further.[128] Forced to run into port, Captain Quinn sent for the tug *Geary*, to rescue the crew of the barge. The hawser eventually parted and left the *Sligo* at the mercy of heavy swells. Captain James Smith and the *Sligo*'s crew attempted to keep the ship afloat using the two siphons and one pump that were aboard. Their efforts were to no avail because the siphons failed to channel the water quickly enough and one pump eventually clogged.[129] The *Sligo* was leaking badly with waves breaking over her sides when the towline parted. Coming around to make the western entrance to Toronto harbor, the ship foundered at 3 a.m. in 70 feet of water off the west end of Toronto Island near Sunnyside. Reports indicate that the rain that day totaled 1.84 inches driven by a strong eastward wind.[130] Her crew made it safely to shore in the yawl boat, the *Geary* having arrived after the barge foundered. At the time of her loss, the *Sligo* was valued at $6,000, and her cargo pegged at $787.5.[131]

The career of the *Sligo* provides a view of the economic landscape of the Great Lakes region. But studies of this kind must not be read in a vacuum. Ships are not autonomous, rather, they are intricately connected to economic networks and circumstances that determine their careers. Nineteenth-century shipbuilding was a vehicle for, but not the essence of, the region's mercantile economy. The *Sligo* was one of these vehicles; a representative product of the era's industrial development and a typical workhorse of the U.S. and Canadian Great Lakes.

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[128] "Five Row to Safety When Barge Founders," *Toronto Daily Star*, 5 September, 1918.
[129] "Braved Ocean, Sank in Bay," *Toronto Evening Telegram*, 5 September, 1918.
[130] Environment Canada Abstract of Observations Made at Toronto, Month of September. Department of the Environment Archives, Ottawa, Ontario, 1918.
[131] Department of Transportation Marine Casualty List for 1918.

CHAPTER 4
FIELD INVESTIGATION

The Great Lakes contain over 6,000 shipwrecks, ranging in date from the seventeenth through the twentieth centuries. The preservative qualities of these cold, freshwater lakes present an opportunity for archaeological research almost unparalleled anywhere else in the world. Only recently have archaeologists begun to survey and inventory the extensive material culture submerged throughout this region. The majority of field studies conducted in the Great Lakes have, to date, focused on individual shipwrecks. Relatively few attempts have been made to address similarities between vessel types or to study the craft of a particular Great Lakes builder.[132] The field investigation described in this chapter addressed both issues by focusing on the intrinsic characteristics of Welland sailing canal ships. With over 100 known canaller underwater site locations across the Great Lakes, there are significant opportunities to study canaller design and development.

Three canaller sites are presented in detail in this chapter: the schooner-barge *Sligo* (this site receives the most scrutiny), the schooner *Bermuda*, and the schooner *China*. These sites were chosen for specific reasons. The *Sligo* provides an opportunity to study the full metamorphosis of a sailing canaller and clearly demonstrates the various ways in which the vessel type could be modified to meet changing economic demands.

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[132] See David Cooper, "Synthesizing the Archaeological and Historical Record of Great Lakes Maritime Transportation," *Underwater Archaeology*, edited by Sheli O. Smith, (Kansas City, MO: Society for Historical Archaeology, 1993); Patrick Labadie, *Submerged Cultural Resources Study: Picture Rocks National Lakeshore*, Southwest Cultural Resources Center Professional Papers, no. 22 (Washington, DC: Government Printing Office, 1989).

She also represents a product of the most prolific builder of Welland sailing canal ships, Lewis Shickluna. The *Bermuda*, constructed by George Goble in 1860, presents a contemporaneous model useful for comparitive purposes. She also offers an opportunity to study an intact canaller in its original form and presents an American example of these workhorses. Finally, the *China* provides a more disarticulated view of a sailing canal ship's features. She serves as a regional comparator; a product of Welland Canal shipbuilding in 1863 and later rebuilt by Shickluna. Although a larger archaeological database would enhance this study, the examples documented here highlight significant characteristics and developments that provide a better understanding of Welland sailing canal ship construction.

The Schooner-Barge *Sligo*

Discovery and Initial Site Survey

On 1 June 1979, a group of Toronto-area divers led by Don McIntyre were conducting remote sensing operations in Humber Bay, Lake Ontario.[133] The team followed lake depth profiles and discovered a potential shipwreck and marked the target for a return dive. The following day a team of three divers (Harold Riley, Don McIntyre, and his son Peter McIntyre) entered the murky Lake Ontario waters and proceeded to search for the target. With visibility ranging between 4 feet (1.2 m) and 6 feet (1.8 m), the three divers swam lanes across the lake floor, until they located their target at a depth of 65 feet (19.8 m). A large wooden vessel lay uncovered from the port side and discovered

[133] Correspondance with author, Don McIntyre, 26 February 2003.

amidships.

Over the next few weeks, basic measurements were taken, preliminary site drawings were made, and diagnostic artifacts recovered from the site were analyzed to assist in the identification of this sunken ship. With length and beam measurements, a sample of the limestone cargo, and samples of ceramic and glass artifacts located on site, McIntyre searched the Toronto archives to determine the names of the ships known to have sunk in the Toronto area. Ironically, the ship's identity was discovered on 5 September 1987; 69 years to the day after the vessel sank. A newspaper account found by McIntyre at the Toronto Metropolitan Reference Library enabled him to identify the wreck as the remains of the schooner-barge *Sligo*, which had sunk on 5 September 1918, at Humber Bay.

The survey team attempted to keep the vessel's location quiet for fear of pillage by salvors. As early as 1980, the team noted artifact movement and disappearance from the site. Realizing others had found the wreck, the site was opened up to the dive community in 1983 and stewarded by the recently formed heritage organization Save Ontario Shipwrecks (SOS). During the mid-1980s, members of SOS under the direction of Tutty Lee conducted preliminary surveys of the *Sligo* wreck site. In April 1997, preliminary surveys of the site were resumed by SOS Toronto chapter president Kimberly Monk, to determine the site's significance and feasibility for long-term study. A report submitted to the Ontario Ministry of Culture by Monk, in fulfillment of archaeological license 97-078, proposed long-term monitoring of the *Sligo* in addition to a thorough

investigation of the hull structure.[134]

2001 Field Investigations

Field investigations of the *Sligo* took place between the 23 June and 14 July 2001, under Ontario license 2001-131. A Canada–U.S. research team participated in the Phase-II predisturbance archaeological survey that focused on developing a wreck site photomosaic, taking scantling measurements, and collecting wood and cargo samples in order to ultimately create a three-dimensional view of canaller attributes. Diving operations were conducted from the Boulevard Club's 30-foot (9.1 m) work vessel, the *Sharon III.*

The *Sligo* wreck lies 1.2 miles (2 km) south of Toronto harbor, in Humber Bay, at a depth of 65 feet (21.3 m).[135] The lake floor at the *Sligo* site is relatively flat, with the bottom comprised of flour-like silt. Beyond the limitations imposed by the site's depth, frigid lake temperatures restricted activities to two 30-minute dives per day. Average lake temperatures hovered around 37 degrees Fahrenheit (2.8 C); these conditions constricted dexterity and made even drysuits ineffective against the cold.

Heavy boating traffic was another prevalent problem associated with conducting investigations in such close proximity to the Port of Toronto. Curious recreational

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[134] Kimberly E. Monk, "A Preliminary Investigation of the Sunken Schooner-Barge Sligo," Report on file with the Marine Heritage Unit of the Government of Canada Ministry of Citizenship, Culture and Recreation (Ottawa, 2001).

[135] Although *Sligo* is purported to have sunk to a depth of 70 feet, a decrease in lake levels is the likely cause for this 5-foot depth discrepancy.

Figure 26: Location map of the *Sligo* . (Map by Andrew Hibbert.)

boaters, unfamiliar with either the Diver Down or Alpha flags, posed a risk to divers as they steered close to the *Sharon III* in order to question the boat's moored position. Surface support team members managed to maintain project safety with the use of a blow horn to ward off boaters.

The Great Lakes possess the preservative qualities of a freshwater environment, providing researchers with submerged cultural resources in an excellent state of preservation. The Great Lakes have been plagued in the past by poor visibility, but the otherwise-problematic introduction of the zebra mussel to the Great Lakes has served to assist researchers in documenting historic ships. Zebra mussels serve as filter feeders: each mussel is capable of filtering 33 ounces (1 liter) of water per day. The presence of zebra mussels at the *Sligo* site provided increased visibility during the 2001 field investigations. Visibility ranged between 15 feet (4.6 m) and 50 feet (15.2 m), enabling photo documentation of the site. On the negative side, the layering of the zebra mussel population on the site prevented researchers from creating a detailed site map as originally planned. Additionally, scantling measurements were inhibited by the layered mussel infestation.

Damage to the *Sligo*'s structure includes a 5-foot (1.5 m) by 5-foot (1.5 m) hull breach along her port side bow. Her upper rails are disarticulated from the hull and rest along both the port and starboard sections of the vessel. General measurements of the *Sligo* found the vessel to be 141.5 feet (43.1m) from stem to stern. Both stem and stern were found to stand 11.5 feet (3.5 m) in height above the lake floor. Divers during their visual survey noted that the *Sligo's* anchor, windlass, and donkey boiler lay among the

broken-up forward deck planks. The forward bulkhead could be penetrated for the purpose of recording the forward hull lines and thereby gaining a better understanding of Great Lakes bluff bow construction as employed on sailing canal ships. The rudder lies disarticulated at an approximately 90 degree angle toward the starboard side of the vessel, half buried but in excellent condition. Close examination of the rudder revealed a layer of copper sheathing on the middle section of the rudder assembly. Copper sheathing was also located on disarticulated hull planks lying beside the forward hull structure.

Sediment, Wood, and Cargo Sample Collection

As part of a long-term study of the vessel, lake sediment samples were taken from positions at the north and south datum of the site. High pollution levels are a constant concern to swimmers frequenting Toronto-area waters. Certainly, this concern exists for both divers and the wreck, even with zebra mussel filtration. Spring runoff from Humber Bay into Lake Ontario, where waste floods into the lake, is one of the main concerns for diver safety, particularly if lake water is ingested. Ian Brindle of the Department of Earth Sciences, Brock University, St. Catharines, Ontario, performed a general scan for contaminants, in which nothing notable was found.[136]

Lee Newsom of the Center for Archaeological Investigations, Southern Illinois University, Carbondale, Illinois, analyzed twenty-three wood samples.[137] The results of this analysis suggest three main wood types employed on this Canadian-built wooden bulk freighter. Samples removed from the *Sligo's* hull structure, rudder, windlass, and

[136] See Appendix C for Lake Sediment Report.
[137] See Appendix A for Wood Sample Report.

anchor stock show that white oak was employed as the main construction wood. White pine was used for the construction of the *Sligo's* mast and mast partners. Sample analysis indicates wood from the pine family (including spruce, tamarack, and larch) was utilized to fashion railings, knees, and hatch comings.

Additional analysis of the *Sligo*'s limestone cargo was undertaken by Howard Melville of the Department of Earth Sciences, Brock University.[138] Two cargo samples were identified and suggest mining from two stratigraphic levels.[139] Sample 14, recovered from cargo hold 4, was extracted from Paleozoic geology of the Belleville-Wellington area and is a medium-to-dark-gray lithographic (fine-grained) limestone. Sample 23, recovered from cargo hold 3, was extracted from the Bobcaygeon formation, lower member, unit 4a, on the same map (Appendix C). It is a fine-to-medium-grained calcarenite with stylolites[140] across the sample.

Photomosaic

The *Sligo* photomosaic was the result of piecing together 165 different photographs of the wreck. The composite image represents a significant contribution to understanding the wreck formation process and offers visual access to non-divers. Based on structure and debris field measurements, researchers planned to conduct photomosaic

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[138] See Appendix C for Limestone Cargo Report.

[139] Both samples are sedimentary rock, deposited in warm tropical seas during the Paleozoic era (540–250 million years ago). The Ordovician was a period during the Paleozoic lasting from 500–440 million years ago. The Gull River formation and the Bobcaygeon formation were both deposited during the middle of the Ordovician. Sedimentary rocks are deposited in layers, with the oldest being deposited first and on the bottom of the sequence. In this case, the Gull River is immediately below the Bobcaygeon and both would appear as layers within the quarry. See Appendix C for a map of quarry, including geologic survey map.

[140] Stylolites are the suture-like black lines running across the middle of the sample.

recording runs over eight lanes, while ensuring a 40 percent overlap. Hovering at a constant depth of 50 feet (15.2 m), with visibility at 40 feet (12.2 m), videographer Doug Arnberg and dive officer Eric Van Velzen, who paced Arnberg's lane swims, shot 40 minutes of video from which the photomosaic would be constructed. Kimberly Monk then captured individual still images from the video. Serena Oyama, an SOS Toronto member, then composed the mosaic. The composite picture was produced after 36 hours at a computer terminal matching the images from the original underwater video. Oyama was able to systematically compose the images based on measurements and perspectives, including the video footage that had been amassed. Her basic technique was to import each image into a PhotoShop file and alter the perspective by stretching the frame of each one. Each image was then matched, like a puzzle piece, into the photomosaic. Once all of the individual images were fitted together, the rough edges between each one were smoothed out and the color was balanced. Finally, the rest of the frame was filled in. The result: a visual portrait of a 140-year-old shipwreck.

Photographic and Video Database

One of the most valuable aspects of photo documentation of a shipwreck is the ability to monitor the state of preservation. Preminary investigation in 1997 and the 2001 field investigations captured 120 images, in addition to plan view and profile video footage. As part of the 1997 field survey, photographs taken by Mike Williams offered researchers a glimpse of the *Sligo* site before zebra mussel infestation. By comparing the

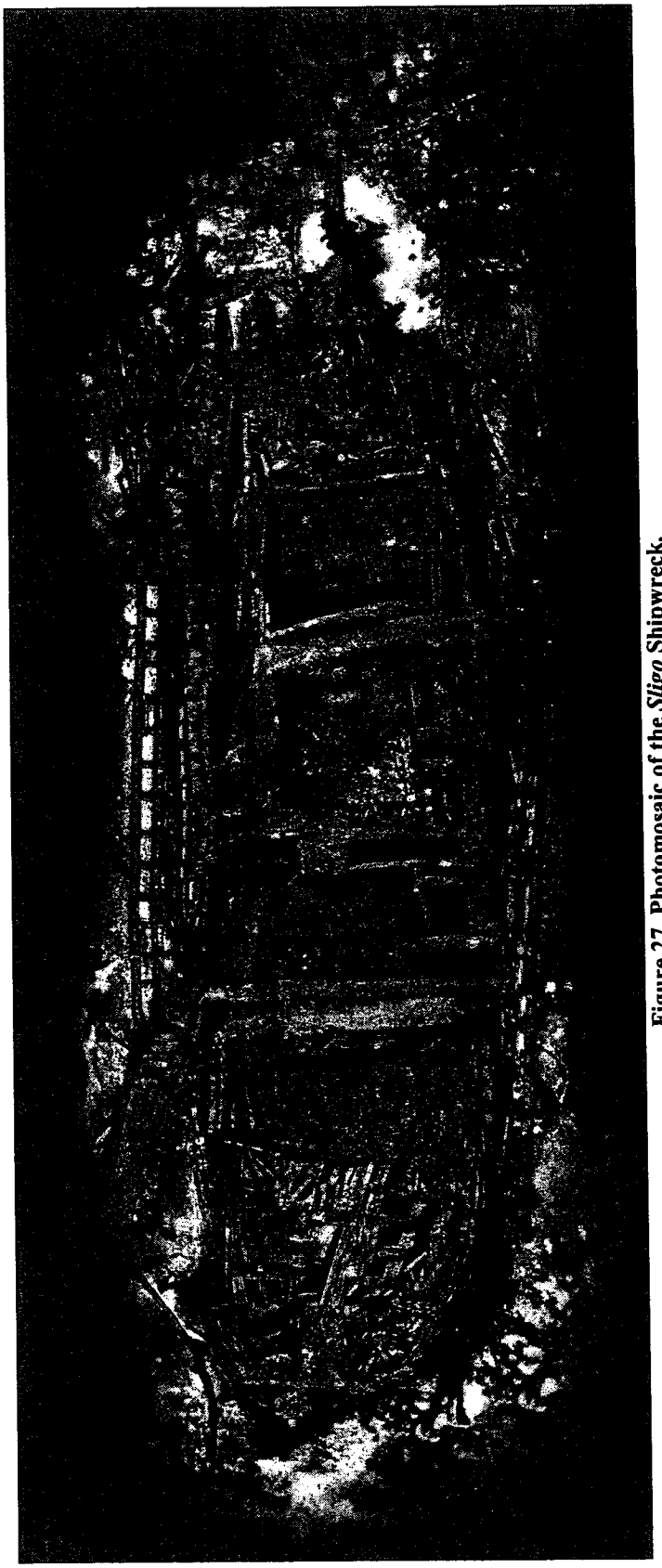

Figure 27. Photomosaic of the *Sligo* Shipwreck.

1997 and 2001 images (captured by Tom Wilson and Doug Arnberg), researchers have been able to further identify minute details that may have otherwise been missed due to the intensive layering of mussels.

Four historical photographs of the *Sligo* are known to exist. These photographs have also been immensely helpful in understanding the metamorphosis of the *Sligo* by providing reliable evidence of modifications to her salient characteristics over a 58-year period. Because the archaeological record is skewed toward the state of a vessel in a single form, these photographs complement newspaper and underwriters' accounts of the *Sligo* during her lifespan.

One of the vessel's most interesting characteristics, noted by comparing photographs of the three phases of her metamorphosis, is the addition of a raised forecastle during the vessel's incarnation as the schooner *Sligo* (1874–1908). The forecastle, under which her windlass is housed, is visible on a photograph of the *Sligo* docked at Kincardine, Ontario, circa 1885. In this photograph the vessel's name is conveniently and prominently displayed on her transom.

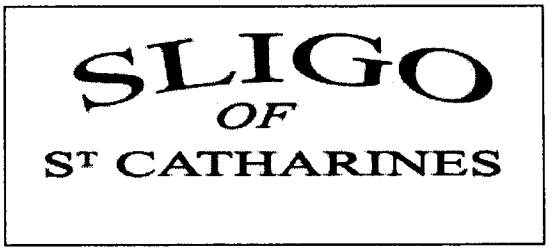

Figure 28. Depiction of nameplate on the schooner *Sligo*, c. 1885.

A consistent feature among all four historical photographs is the placement of the aft deck cabin. In the circa 1885 photograph of the schooner *Sligo* the aft cabin appears to have lost its bowed roof and, in fact, appears to be smaller in size than in previous

images. The cabin was probably reduced in size to make room for larger cargo hatches and because of the smaller crew required to maintain a single-masted tow barge.

Hull Remains

The hull of the *Sligo* is still intact although there is an extensive debris field. When the *Sligo* foundered, the weight of her cargo and the additional water weight likely placed immense pressure abaft, forcing the vessel to sink stern first. This would account for the high concentration of limestone in the aft cargo holds beneath the two hatches. The deck cabin, likely built of pine, would have quickly broken apart. The first section to have met the lake floor would have been the sternpost and ship's transom; this is also where the impact would have been most intense. The impact undoubtedly loosened the wheel box, tearing the steering assembly from the ship. The rudder stock appears to have snapped off to starboard, remaining in remarkably intact condition when compared with the stern assembly. Certainly, both the impact and the shifting of the limestone cargo would have caused considerable stress on several areas of the vessel. Covering boards constructed of softwood lumber such as pine, for example, would have been employed to cover cargo hatches and they occupied over 50 percent of the vessel's deck. This feature explains why the majority of the deck aft of the forward mast hole is missing.

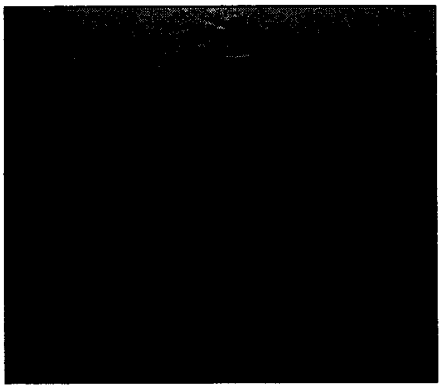

Figure 29. *Sligo* Bow Assembly.

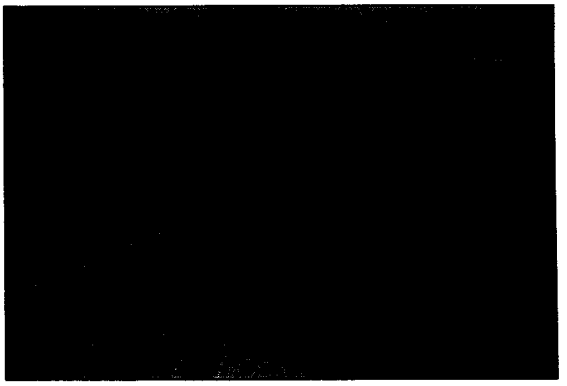

Figure 30. *Sligo* Stern Assembly.

There is one other factor affecting the vessel's site formation. The western entrance to the Toronto harbor has long served as a mooring area for modern freighters while they await clearance to enter the port. As a result of anchors, a 10-foot (3.0 m) section of starboard railing at the *Sligo*'s bow has been broken off. In addition, the wreck has suffered a 5-foot (1.5 m) by 5-foot (1.5 m) hull breach on her port bow.

As was typical with other wooden sailing craft of the period, the *Sligo* employed wooden knees. The first type noted on the site are hanging knees, which are vertical wooden brackets used to support deck beams. Lodging knees, which were also fairly common on Great Lakes ships, are placed horizontally and helped to reinforce the *Sligo*'s longitudinal and athwartship timbers and planks. Beyond the employment of hanging and standing knees aboard the *Sligo*, evidence of iron knees was also recorded. Only two examples were located, however, due to the wreck's fragmentary condition and the inaccessibility of certain areas. Both of these iron hanging knees were located between cargo hatches two and three, supporting a deck beam that runs athwartships. Both knees are 3 feet, 2 inches (97.5 cm) high, and their molded and sided dimensions measure 3.5

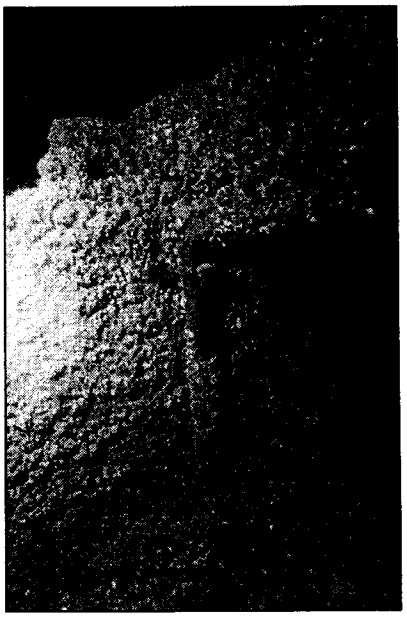

Figure 31. View to starboard of iron knee employed on *Sligo*.

inches (8.9 cm) by 1.3 inches (3.2 cm). Knees are affixed to the ceiling planking, frames, and beams, with square, 1-inch (2.5 cm) by 1-inch (2.5 cm) iron bolts.

Iron structural elements were used in the construction of Great Lakes sailing vessels as early as 1869; suggesting that *Sligo*'s knees were added during her 1874 rebuilding. The Pilot Island wreck site of the *Nichols* in Door County, Wisconsin, offers another example of an iron knee. In that case the knee was fastened over deck clamps that are joined with square-keyed scarfs. This elaborate reinforcement technique is alleged to be 25 % stronger than a plain scarf joint.[141] The iron knees and keyed scarfs were two refinements in later nineteenth-century vessel reinforcement that contributed to extending the life of bulk-cargo carriers. Although no keyed scarfs were located on the *Sligo* site, it is possible that this feature has been hidden by zebra mussel growth.

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[141] David J. Cooper, *Survey of Submerged Cultural Resources in Northern Door County: 1988 Field Season Report* (Madison, WI: State Historical Society of Wisconsin, 1989).

The *Sligo* possessed four cargo hatches during her final form as a schooner-barge. The hatches measure as follows: (1) 14 feet, 4 inches (4.4 m) by 15 feet, 9 inches (4.8 m); (2) 15 feet, 8 inches (4.8 m) by 15 feet, 9 inches (4.8 m); (3) 15 feet, 8 inches (4.8 m) by 15 feet, 9 inches (4.8 m); and (4) 15 feet, 8 inches (4.8 m) by 15 feet, 9 inches (4.8 m). A final notation in *Green's Marine Directory* alludes to another hatch as 15 feet, 3 inches (4.7 m) by 15 feet, 9 inches (4.8 m).[142] This additional hatch notation may identify the space allocated for the aft deck cabin. The fragmentary condition of the stern area did not enable a thorough study of any remaining structure. The contemporary measurements conform to results from the survey, suggesting the smaller cargo hatch was forward of the centerboard while the remaining three hatches aligned in sequence abaft of the centerboard.

The two forward cargo compartments each have complete hatch coamings; the molded and sided dimensions measure 2 feet, 2 inches (66.0 cm) by 1 foot, 10 inches (55.8 cm). The final two cargo compartments are each missing one side of their hatch coaming, but for those coamings that do remain, molded and sided dimensions measure 1 foot, 7 inches (48.2 cm) by 2 feet, 3 inches (68.5 cm). Cargo hatch three lacks its starboard side coaming, and cargo hatch four is also without a coaming for the port side. Inspection of the cargo hatch assembly indicates that the forward starboard corner of the fourth cargo hatch is affixed with iron bands, probably to repair a break in the area while also reinforcing the hatch.

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[142] Fred W. Green, *Green's Marine Directory of the Great Lakes* (Cleveland, 1916), 154.

Centerboard

To navigate the shallow harbors and Welland Canal locks, the *Prince of Wales/Sligo* was fitted with a centerboard. The size of a centerboard box was generally proportional to a vessel's size. In the case of canallers, a standard-sized centerboard trunk for a 140-foot (42.7 m) vessel would typically have measured approximately 26 feet (7.9 m) lengthwise.[143] Investigation of the *Sligo's* centerline centerboard trunk, however, reveals a deviation from this standard size: it is much smaller. The centerboard was largely removed when the *Sligo* was converted to a tow barge, with the 6-foot section representing a portion of the original centerboard structure. In all likelihood, this adapted form was employed to save cargo space and because as a vessel that was towed the *Sligo* would not have required the lateral resistance needed by a fully rigged sailing ship. The *Sligo*'s centerboard trunk is 6 feet (1.8 m) in length and 5.5 feet (1.7 m) in height, and consists of six planks per side. The trunk components are 6 inches (15.2 cm) thick on the starboard side and 9 inches (22.8 cm) thick on the port side. The centerboard itself is 4 inches (10.1 cm) thick.

The centerboard pivots on a bolt located 3 feet (91.4 cm) from the forward end of the trunk and 3 feet, 6 inches (1.1 m) beneath the deck planking. The centerboard trunk begins aft of the first cargo hatch. It is visible through the next hatch aft, but is divided by the second cargo hatch by three planks lying horizontally side by side and running athwartship.

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[143] Henry N. Barkhausen, *Focusing on the Centerboard* (Manitowoc, Wisconsin: Manitowoc Maritime Museum, 1990).

Figure 32. View aft toward port of *Sligo*'s adapted centerboard trunk.

Ship's Equipment

The ship's windlass was operated using a ratchet. This mechanism employed windlass bars inserted in the sockets on the axle of the windlass to be raised and lowered to haul in chain, cables, or rope. A pawl post was positioned forward of the windlass and the teeth of the pawl rim prevented back slipping by locking the barrel in one direction.

On the *Sligo*, the centerline of the windlass axle is 4 feet, 3 inches (1.3 m) abaft the forward face of the stem. The axle is attached to the bitts by cheeks; however, the entire assembly has broken off its mount and rests directly on the deck. The anchor chain was stowed in the bow compartment and passed up to the deck through two hawse pipes. A pair of lead hawse pipes in the bulwarks, on either side of the stem, led the chain off the deck. The anchor chain, still affixed through the anchor ring, is made up of standard studded links, each 2.3 inches (5.7 cm) thick.

The iron anchor on the *Sligo's* port bow is of the admiralty pattern. Its shank is 7 feet, 1 inch (2.2 m) long, and is 6 inches (15.2 cm) thick. The stock is 10 feet, 7 inches

(3.3 m) long and round in section – a distinctive characteristic of Great Lakes vessels. The anchor measures 6 feet, 4 inches (1.9 m) from bill to bill. The flukes of the anchor differ in size from the left to right. The left fluke is 2 feet, 10 inches (86.3 cm) in length and the right fluke a length of 2 feet, 2 inches (66.0 cm). The anchor has a ring that connects to the shank. The ring is 3 inches (7.6 cm) thick and has an outer diameter of 1 foot, 5 inches (43.0 cm); it is shackled to the anchor chain.

Schooners were modernized by the addition of an "iron deckhand," a donkey boiler and steam winch; these were designed to take over the heavy work formerly done with a capstan. For example, the sailing canaller *Gulnare*, built by John Abbey at Port Robinson, Ontario, in 1873, boasted a donkey boiler and steam winch by 1881.[144]

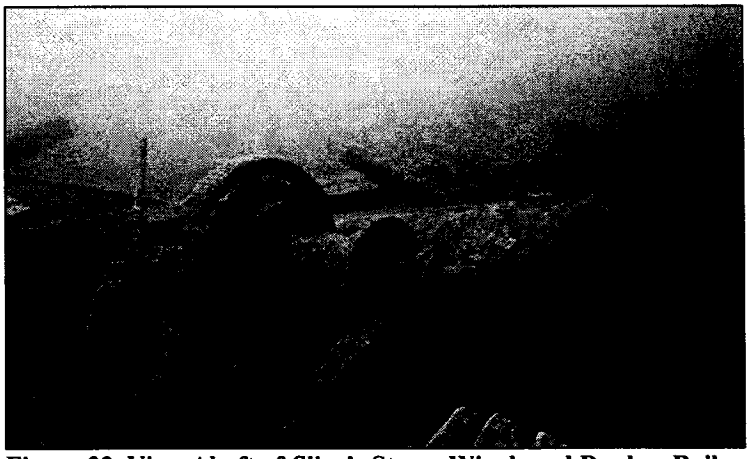

Figure 33. View Abaft of *Sligo*'s Steam Winch and Donkey Boiler.

The *Sligo*'s donkey boiler is lying on its side on the forward deck toward starboard. The boiler is 7 feet, 10 inches (2.4 m) long and 3 feet, 11 inches (1.2 m) wide. Both the top and bottom faces of the cylinder have a diameter of 3 feet, 5 inches (1.0 m).

[144] This particular piece of equipment was built by Messrs. Copp Bros. & Barry, located in Northey's old works at King William and Wellington Streets in Hamilton, Ontario. Thursday, 28 April, 1881. Ivan S. Brookes, *Hamilton Harbour 1826–1901.* A Transcription for the Maritime History of the Great Lakes by Walter Lewis (Halton Hills, ON: Maritime History of the Great Lakes, 2001).

The boiler is missing the steam exhaust funnel. The gauge glass to view water levels remains intact and is 1 foot (30.5 cm) long and 0.5 inches (1.3) thick.

Rigging Elements

A chainplate located on the forward deck, port side, is part of the lower rigging of the *Sligo's* single mast. The chainplate is constructed of iron and originally attached to the standing rigging assembly to the ship's side. The total length of the *Sligo's* chainplate is 5 feet, 6 inches (1.7 m). At one end is a flat-faced rectangular plate that was fastened to the ship's side. It measures 1 foot, 3 inches (38.1 cm) in length and 3 inches (7.6 cm) in width. A ring, originally cloaked around a dead eye, is 1 inch (2.5 cm) thick and measures 4 inches (10.2 cm) by 6 inches (15.2 cm) in diameter. These two ends are connected by a 1-inch-thick (2.5 cm) iron stock.

Additional elements that served to support the rigging structure include the forward mast hole and wire rope. The mast partners outlining the forward mast hole lie on the forward deck just forward of the first cargo hatch. The diameter of the mast hole is 1 foot, 1.3 inches (33.7 cm). The thickness of the mast partners is 3 inches (7.6 cm). A section of wire rope, a remnant of the standing rigging, lies to port on the lake bottom, abaft the bow.

Steering Mechanisms

The use of rope in tiller-wheel mechanisms was a serious difficulty in navigating early ships because the linear pull of the rope was incompatible with the arc of the tiller,

causing the rope to stretch and the vessel to become unmanueverable. The invention of worm steering gears during the nineteenth century solved the problem of rudder jams by eliminating wheel ropes altogether. The worm-gear, which became common after 1850, revolutionized steering because the wheel turns the gears to swing a double-headed tiller. The works were commonly housed in a wooden box, either raised on legs or flush with the deck. *Sligo* has a worm-gear wheel of this type.

The *Sligo* wheel has a total outer diameter of 4 feet, 11.5 inches (1.5 m). The wheel has eight handles, all of which measure 5.5 inches (14.0 cm) in length and 1.3 inches (3.2 cm) in width; each one is topped with a brass cap. The wheel hub's outer diameter is 5 inches (12.7 cm), its thickness is 4 inches (10.2 cm), and the hexagonal nut measures 1.8 inches (4.4 cm) by 1 inch (2.5 cm). The wheel is 3 inches (7.6 cm) thick. The distance between spokes at the wheel is 14 inches (35.6 cm), and the length of the spokes within the interior is 18 inches (45.7 cm).

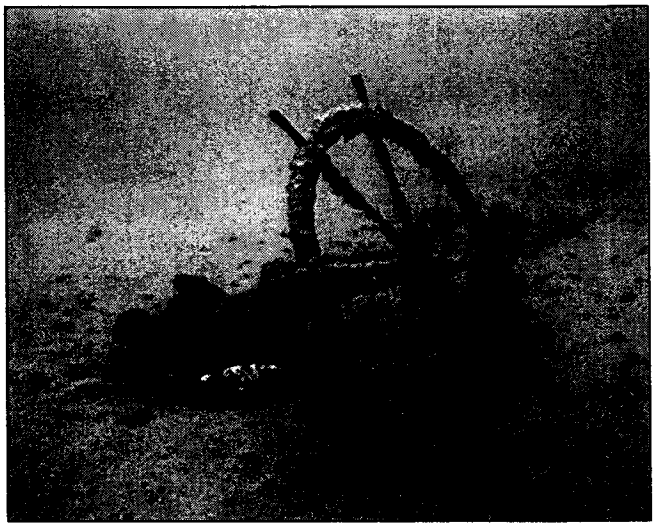

Figure 34. View of the *Sligo* Wheel and Steering Assembly.

Although the rudderhead and standard, as well as the wooden gear box, likely broke away from the steering assembly when the ship foundered and the entire steering apparatus fell aft of the ship, the remaining apparatus is intact and attached to the wheel. This includes the spindle connected to the wheel; it measures 20 inches (50.8 cm) in length and is 2.5 inches (6.4 cm) in diameter. The crosshead is 13 inches (33 cm) long and 1 inch (2.5 cm) wide; it is fixed with two hexagonal nuts and both are 2 inches (5.1 cm) in diameter. Two guide rods, each 2.5 inches (6.35 cm) thick, are connected to the cross head; each one measures 16 inches (40.6 cm) in length, with a space of 9.3 inches (23.5 cm) between the two rods. The spindle, arms, and cross heads are fastened to the yoke by two bolts. Based on Amos's study of rudders, the steering assembly corresponds to the Reed patent steerer of 1855, which was used on the majority of Great Lakes ships.[145]

The *Sligo*'s rudder dismounted from the ship's stern post and lies perpendicular to the vessel abaft the stern toward starboard. The rudder is triangular in form and closely resembles other nineteenth-century rudders of Canadian origin. The rudder stock is in two sections, with a gap of 5 inches (12.7 cm) between sections. The stock measures a total length of 19 feet, 2 inches (5.8 m). The upper piece measures 10 feet, 8 inches (3.3 m) in length; the bottom piece is 8 feet, 6 inches (2.6 m) long. The sided and molded dimension for both sections is 10 inches (25.4 cm) by 11 inches (27.9 cm).

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[145] Arthur Amos, *Rudders: A Comparison Study* (Ontario Marine Heritage Committee, Midland Printers, Midland, 1993).

The Schooner *Bermuda*

The schooner *Bermuda* provides another excellent opportunity to examine the attributes of nineteenth-century sailing canal ships that plied the Great Lakes waterways. For the purposes of this research project, a comparison of the *Sligo* and the *Bermuda* is especially revealing because both ships were built in 1860. The builders of both vessels were experienced in the construction of Welland sailing canal ships.

Vessel History

Launched from the Goble Shipyard located at Oswego, New York, in April 1860, the schooner *Bermuda* was 143 feet (43.6 m) long, with a 136-foot (41.5 m) keel, 26.3-foot (8.0 m) breadth of beam, and a depth of hold that was 11 feet, 9 inches (3.6 m). A contemporary journalist from Oswego, New York, wrote: "The vessel is of the large class, is thoroughly and perfectly built in every respect, and sits upon the water with remarkable buoyancy and beauty."[146] Another journalist also spoke highly of the ship's appearance: "the vessel is a fine specimen of marine architecture, and does high credit to Mr. Goble as a skillful builder."[147]

The *Bermuda* was initially owned by Thomas S. Mott, an Oswego businessman, and commanded by Captain A. Stowell. Mott immediately placed her in the Upper Lakes trade. In 1863, she was sold to William Stewart of Detroit, Michigan. She spent her early career as a grain carrier between Chicago, Milwaukee, and Oswego, and her employment

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[146] *Oswego Palladium*, 13 April 1860.
[147] *Oswego Daily Commercial Times*, 13 April 1860.

by 1865 consisted largely of coal and ore carriage between Oswego, Detroit, Chicago, and the mineral mines along the southern shores of Lake Superior.

The *Bermuda* received recognition for a quick passage during the 1866 season. Under the command of Captain McDonald, she traveled from Detroit to Port Colborne, and then on to Port Huron, in just four days.[148] On 14 September 1866, she broke her rudder near Clay Banks on Lake Erie, and the *Bermuda* was towed by the steamer *Magnet* to Cleveland for repairs.[149] While downbound from Marquette, Michigan carrying iron ore, in October 1870, the *Bermuda* foundered off the east end of Grand Island. She was raised in 1881, and a few days later, subsequently foundered again at her present location in Murray Bay, Michigan in Lake Superior.

Discovery and Early Site Investigation

The wreck of the *Bermuda* was familiar to Munising residents for many years and became a popular scuba diving site as early as the 1950s. The site's relatively shallow location made it vulnerable to artifact removal and salvage. The ship's identity, however, remained a mystery until Patrick Labadie confirmed her identity through historical records during a 1987 study of Pictured Rocks National Lakeshore sponsored by the US National Parks Service.[150] This preliminary study specified the site's value for documentation due to its quality of preservation, and as a fine example of a sailing canaller.

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[148] *Detroit Free Press*, 24 December 1865.
[149] *Detroit Free Press*, 8, 19 December 1866.
[150] Labadie, "*Pictured Rocks*," 35-43.

The *Bermuda* shipwreck site (20US47) is located in Murray Bay at Grand Island, 2 miles (3.2 km) north of Munising. The 2002 *Bermuda* Shipwreck Survey, conducted under Michigan permit 02-17-0002, was undertaken over a two-week period in September 2002. The investigations focused on producing a photomosaic of the site, recording structural information, conducting wood sample and cargo analysis, and creating a virtual tour of the shipwreck; the recovery of wood samples was especially vital to the research, for it enabled identification of the ship's component timbers. Samples of the ore cargo were also removed to determine the specific quarry source. Conditions on the site proved favorable for the project, with visibility ranging between 30-35 feet (9.1-10.7 m), and water temperatures hovering at 60 degrees Fahrenheit (15.6 C).

The dive crew was surprised by the remarkable state of preservation of this nearly intact example of a Welland sailing canal ship. A minimal degree of damage was noted on the deck amidships and along the transom towards port. The *Bermuda*'s masts lie broken in half and oriented perpendicular to and along her port side. Additionally, interior damage was noted on stanchions that originally aided in supporting vessel superstructure.

Fortunately, the wreck was sheltered within the unique confines of Murray Bay, where it has received very little wave action and there is relatively little turbidity that might have caused erosion. Zebra mussels require calcium-rich environments to build their shells and the area's ecosystem has created a calcium-deficient environment that protects shipwrecks from infestation. Construction details are much easier to record than

at sites infested with zebra mussels. As a result of these fortuitous natural conditions, the *Bermuda* is in nearly pristine condition.

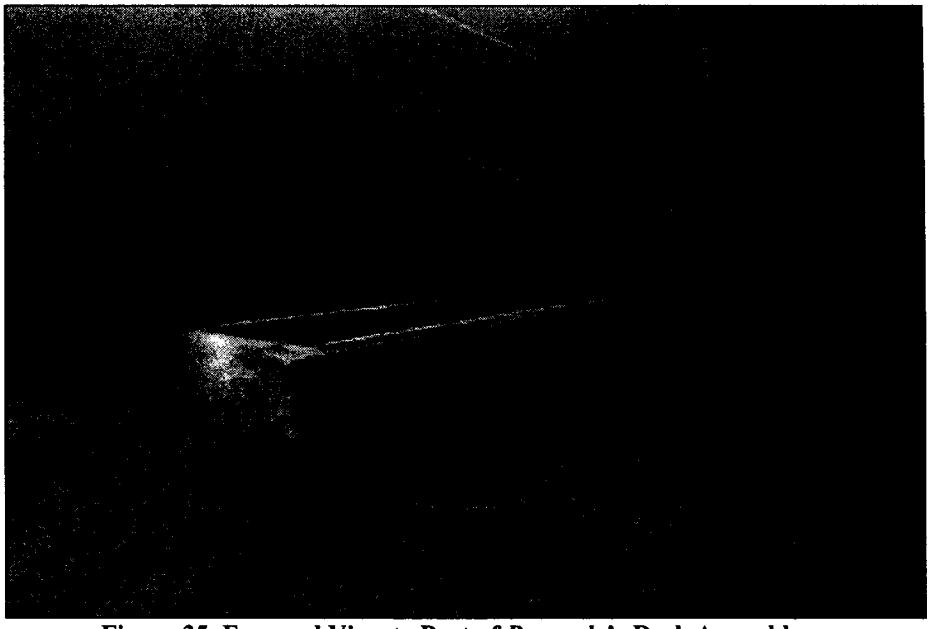

Figure 35. Forward View to Port of *Bermuda*'s Deck Assembly.

Hull Remains

The *Bermuda* sank quickly while loaded with a heavy ore cargo. The ship rests on an even keel, with a small accumulation of silt and sand on her decks and in her hold. She measures 138 feet, 6 inches (42.2 m), from stem to stern, with a beam that is 26 feet, 3 inches (8.0 m) long.

Wood Sample Collection

Wood samples retrieved from the *Bermuda* site retain some similarities and some differences to the *Sligo* site.[151] The main structural timbers were constructed of white

[151] See Appendix B for *Bermuda* wood sample report.

oak and support timbers constructed of white pine. Red oak as employed on the transom is a deviation in materials employed, and may suggest a depletion of available white oak supplies or a preference for this wood type. Another feature in contrast is the rudder which is composed of both white oak and white pine.

Keel and Posts

Although largely obstructed by sediment, the *Bermuda's* keel was examined at the stern. These investigations revealed a keel fashioned from white oak, with a sided dimension of 13.3 inches (33.8 cm) and a molded dimension of 10.1 inches (25.7 cm). Because this type of craft was characterized as flat bottomed, the keel would have served a more structural function rather than providing lateral resistance.

Because the entire length of the keel was inaccessible, details of the rabbet are unavailable. Further investigation would also be required to determine details about the keel such as the number of timbers employed and joinery. Additional research might also reveal how it was fashioned amidships, allowing for a centerboard to pass through and extend for lateral resistance while underway.The *Bermuda*'s stem stands 17 feet, 3 inches (5.3 m) from lake floor to a point just below the caprail. Its sided dimension is 13.3 inches (33.8 cm) and its molded dimension is 13.1 inches (33.3 cm). Inspection of the stem revealed draught numbers carved into its starboard side.

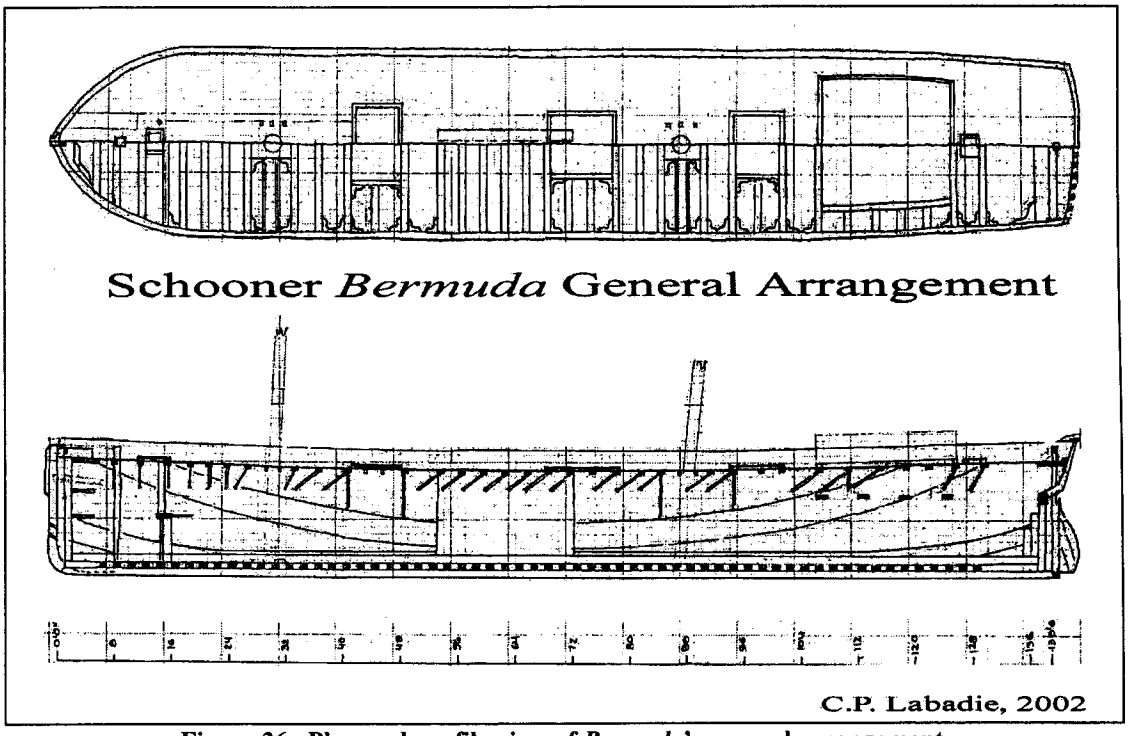

Figure 36. Plan and profile view of *Bermuda*'s general arrangement.

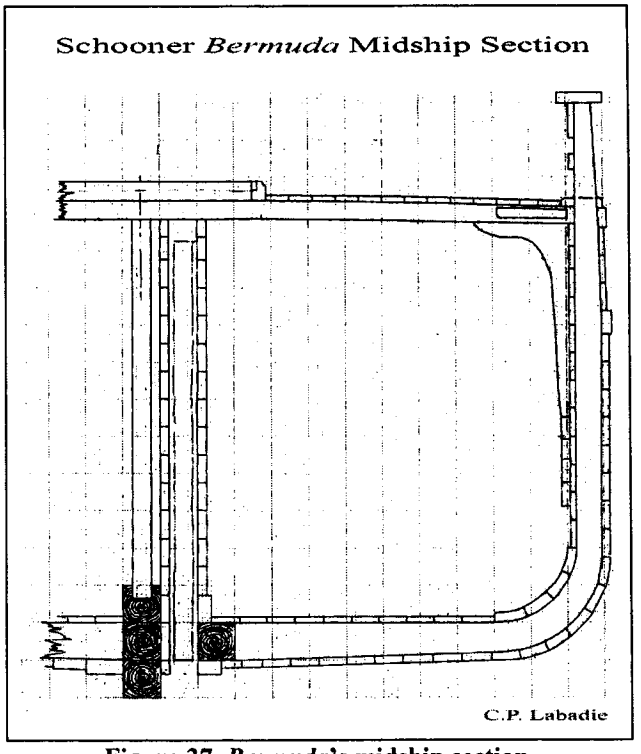

Figure 37. *Bermuda*'s midship section.

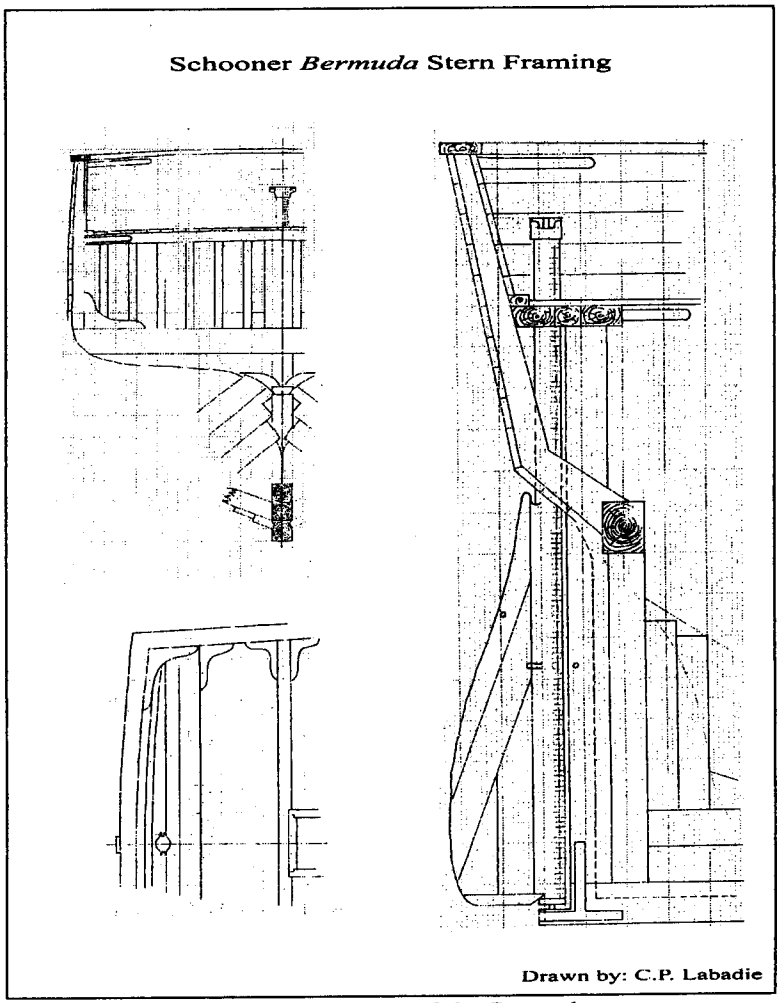

Figure 38. Stern framing of the *Bermuda*.

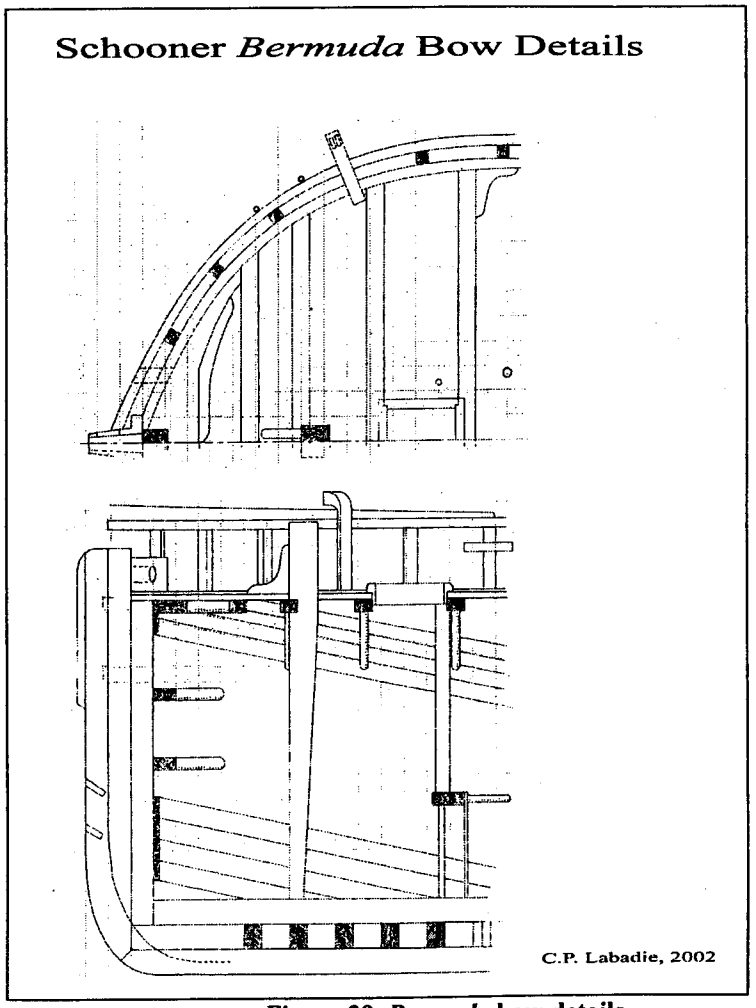

Figure 39. *Bermuda* bow details.

Two breast hooks secured the stem and apron to the sides of the vessel. The top breast hook is located 3 feet, 6 inches (1.1 m) below the deck. The second is located 2 feet, 3 inches (70.1 cm) below the first breast hook, and 5 feet, 3 inches (1.6 m) above the keelson. Each breast hook measures 3 feet, 2 inches (96.5 cm) and appears to have been fastened to the apron and ceiling planking with iron bolts. Additionally, each breast hook appears to comprise three component pieces (a knee plus two independent timbers flanking the knee) joined at the ends to the apron.

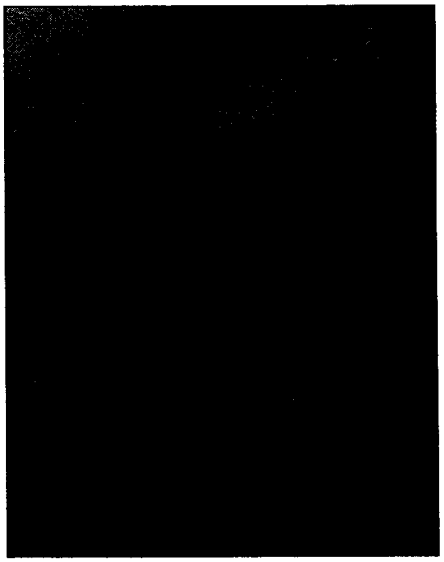

Figure 40. Forward view of *Bermuda*'s breast hooks.

The *Bermuda*'s planking is of the fore-and-aft variety, with thicker planking toward the bilge to strengthen the vessel for transporting cargo. The majority of planking was 10 inches wide (25.4 cm) and 4 inches (10.2 cm) thick, with an increase to 10.4 inches wide (26.4 cm) and 5 inches thick (12.7 cm) in the bilges.

The *Bermuda*'s deck was supported by three different types of knees: hanging, lodging, and dagger. As seen on the *Sligo*, hanging and lodging knees were commonly

associated with most contemporaneous sailing craft on the Great Lakes. One deviation aboard the *Bermuda*, however, concerns the employment of dagger knees. These are not as common as the two other types of knees, but serve the same purpose. This type of knee is angled or canted and provides additional deck support by spreading the strain over two or more frames.

Hogging Arch

Inverted wooden arches begin just below the forward deck, 6 feet (1.8 m) aft of the stem. Composed of planks, the arches are laid on top of the ship's side, fastened to the ceiling, while running down toward the bilge amidships and then back up to the deck at the stern, 9 feet (2.7 m) forward of the sternpost. These hogging arches, which run the length of the ship, helped prevent the ship's ends from flexing or sagging at the stem or stern.

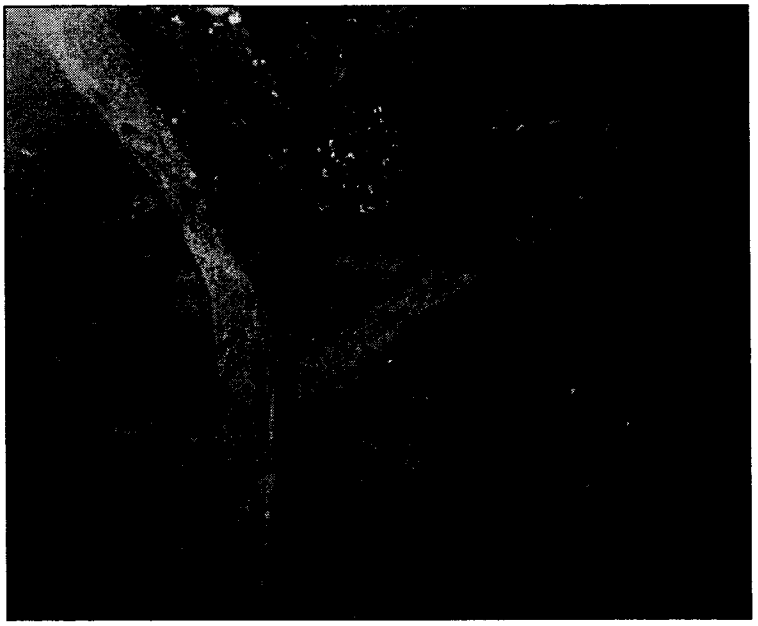

Figure 41. Port view of hanging, lodging, and dagger knees as employed on the *Bermuda*.

Centerboard

The *Bermuda* possesses a standard centerline centerboard trunk. The centerboard trunk is 26 feet, 4 inches (8 m) long and 10 feet, 2 inches (3.1 m) high; it consists of 11 planks per side. The trunk components are 5.3 inches (13.5 cm) thick on the starboard side and 5.1 inches (13 cm) thick on the port side. The centerboard itself has a thickness of 7 inches (17.8 cm).

Rigging Elements

The *Bermuda* was rigged as a two-masted fore-and-aft schooner. The vessel's mast partners, which outline a forward mast hole, remain intact. The diameter of the forward mast hole is 2 feet, 11 inches (88.9 cm), and is located 30 feet (9.1 m) aft of the stem. Mortises in the deck suggest iron fittings and, based on their position, likely padeyes. Padeyes were common fairleads used to guide ropes and tie them down. The three padeyes line each side of the mast hole and measure 4 inches (10.2 cm) by 3 inches (7.6 cm), with a center diameter of 1.5 inches (3.8 cm) and a depth of 0.5 inches (1.3 cm).

Steering Assembly

The *Bermuda* rudder appears to be a standardized rounded form associated with American shipbuilding practice on the Lakes.[152] The rounded form is made up of 5 pieces. The backpiece contains a 1-inch (2.5 cm) in diameter hole. This hole likely accepted a retaining chain, in case the rudder was unshipped. The steering assembly

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[152] Amos, "*Rudders,*" 47.

suggests a Jesse Reed patented steerer from 1855, the same patent as was used on the *Sligo*.

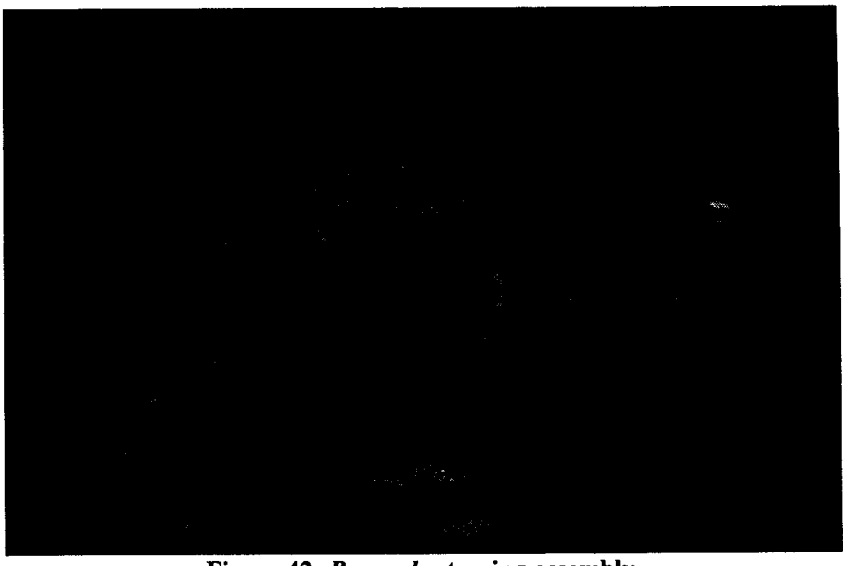

Figure 42: *Bermuda* steering assembly.

Cabin Arrangement

Generally speaking, sailing canallers were fitted with an aft deck cabin that housed the captain, two mates, and the cook. Additional crew lived in the forecastle, sleeping in bunks situated on narrow shelves at either side of the bulkhead. The *Bermuda* was built with this arrangement, including wooden shelves located below the forward hatch aft of the bulkhead.

Shifting Boards

The *Bermuda* has two shifting boards located just forward of the aft cabin. These consist of vertical boards fastened to the ceiling planking on either side of the aft cargo hatch, just below the deck. As mentioned in chapter 2, the movement of cargo

contributed to the imbalance of canallers and was a factor in their loss at sea. The Board of Lake Underwriters stated in its 1866 rules that a vessel is not really seaworthy without shifting boards.[153]

The Schooner *China*

Vessel History

Built in 1863 by John and James Abbey at Port Robinson, Ontario, the *China* was a two-masted sailing canal ship. It originally boasted a length of 125 feet (38.1 m), a beam of 26 feet (7.9 m), and a depth of 11 feet (3.4 m). The schooner grossed 249 tons when it was launched. Accorded an A rating, she was valued at $13,000 US.[154] The *China* served the bulk forwarding trade between the Upper and Lower Lakes under the ownership of Edward Browne of Hamilton, Ontario. According to the Welland Canal Registers, it appears that the *China* was largely engaged in transporting lumber or square timber between ports on Lake Huron and Georgian Bay to the forwarding port of Kingston, Ontario.

During the winter of 1864–65, the *China* was lengthened to 137 feet (41.8 m) at the Shickluna Shipyards in St. Catharines, Ontario. She emerged as a 314-ton vessel, classed as A1 with a value of $14,000 US.[155] Prior to this rebuilding she had a scroll stem. By 1869 the vessel had fallen to an A2 rating, with an approximate value of

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[153] Board of Lake Underwriters, *Rules Relative to the Construction of Lake Sail and Steam Vessels* (Buffalo, Printing House of Matthews and Warren, 1866), 11.
[154] Robert Thomas, *Register of the Ships of the Lakes and River St. Lawrence* (Buffalo: Wheeler, Matthews & Warren, 1864), 23.
[155] Association of Canadian Lake Underwriters, *Lake Vessel Register for 1865* (Toronto: W. C. Chewett & Co., 1866), 14.

$12,000 US.[156] In 1870 she received new decks, increasing her value to $14,000 US.[157] By 1872 the *China*'s ownership had changed to D. C. Thompson of Quebec City, and she had tumbled to a B1 rating, with an approximate value of $9,500 US.[158] The *China* continued to carry bulk cargoes, and was recorded as receiving various repairs in 1882 at Wiarton and Garden Island, Ontario, and at Lackawanna, New York. Her final owner was Michael Ryan who, like Thompson, hailed from Quebec City.[159]

On 20 November 1883, the *China* was bound for Parry Sound, Ontario, to collect a load of lumber. Downbound to Georgian Bay, and without cargo, she was caught in bad weather and struck what is now called China Reef. The crew made it to shore safely. Attempts were made to salvage the schooner, but these proved unsuccessful. The ship was stripped and left to break up in the shallows between China Cove and Wreck Point on Lake Huron.

Discovery and Early Site Investigations

Preliminary investigations of the *China* began on 3 November 2002, under Parks Canada permit 2002-016, for the purpose of determining the extent of the site's remains. Because of its fragmentary nature, the site was rarely visited by divers; therefore, relocating the shipwreck was determined to be a primary objective.

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[156] Association of Canadian Lake Underwriters, *Lake Vessel Register for 1868* (Toronto: W. C. Chewett & Co., 1869), 7.
[157] *Classification of Lake Vessels and Barges: Adopted by a Board of Marine Inspectors, April 1, 1871* (Buffalo: Warren, Johnson & Co., 1871), 23.
[158] Association of Canadian Lake Underwriters, *Lake Vessel Register for 1872* (Toronto: Copp, Clark & Co., 1873), 8.
[159] *Directory of the Marine Interests of the Great Lakes, Comprising a Complete List of All Vessels Navigating the Lakes* (Detroit: R. L. Polk & Co., 1884), 36.

Patrick Folkes, a member of the Ontario Marine Heritage Committee, loaned an aerial image of the *China* site to the research team. Based on the site's position relative to the shoreline, the group took into consideration the change in lake levels that have significantly lowered over the past few years. The team began with surface sweeps of the shoreline until wreckage was sighted. The debris field covered a quarter square-mile area (402.3 m), and eventually led the team to the wreck.

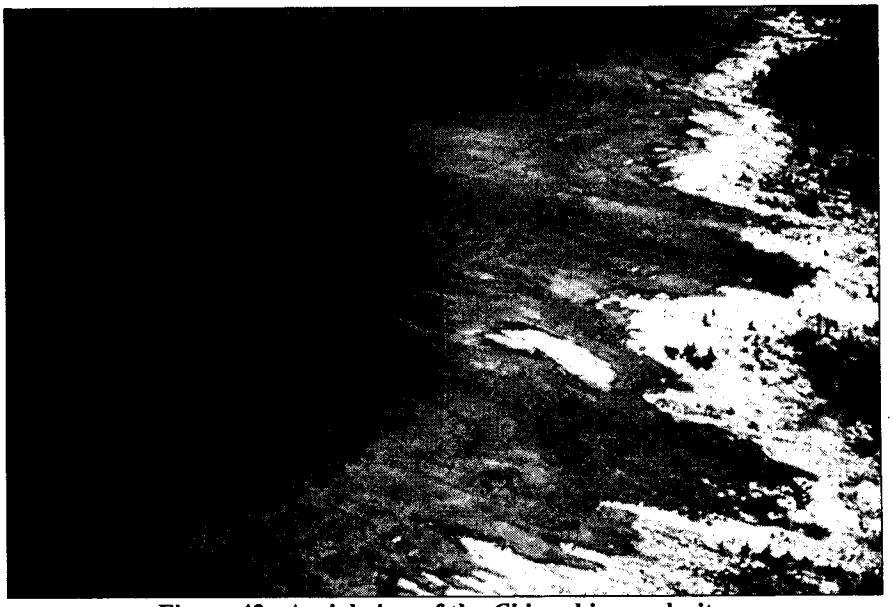

Figure 43. Aerial view of the *China* shipwreck site.

The *China* was found at a depth of 8 feet (2.4 m), with 50 feet (15.2 m) of visibility and water temperature of 44 degrees Fahrenheit (6.7 C). Because dive time at the site was limited, emphasis was placed on photography, taking a few scantling measurements, and site observation.

Hull Remains

The *China* site consists of a port-side section of hull, which includes the keelson, centerboard trunk, frames, ceiling, and outer hull planking. This entire hull section totals 70 feet (21.3 m) in length and 15 feet (4.6 m) in width.The keelson is 2 feet, 1.3 inches (64.2 cm) sided and 1 foot, 11.5 inches (59.6 cm) molded. Mortises cut into the keelson are visible from starboard due to the absence of frames. Framing is more evident from the port side and indicates double framing with an average sided frame measurement of 5.3 inches (13.3 cm) and an average molded frame measurement of 10.1 inches (25.7 cm). The frames lie on 2-foot (61 cm) centers.

The majority of the *China*'s ceiling is missing and the remaining planking is of the fore-and-aft variety. The ceiling averages 10.1 inches (25.7 cm) wide and 3.1 inches (2.9 cm) thick. The outer hull planking is fairly complete. Planking up to the turn of the bilge is 16 inches (40.6 cm) wide, and averages 1.9 inches (4.8 cm) thick. At the turn of the bilge the planks are thicker but narrower, averaging 8.5 inches (21.6 cm) wide and 3.1 inches (7.9 cm) thick. The centerboard trunk has a total length of 25 feet 3 inches (7.7 m), with evidence of the centerboard still within the trunk.

The rudder, located 200 feet (61.0 m) from the main hull, was examined in 1985 by Arthur Amos.[160] The rudder is similar in style to that of the *Sligo*, following what appears to be a Canadian taste for triangular form (see Figure 48). According to a November 1879 newspaper transcript, the *China*'s original rudder was lost off Lion's Head, near Wiarton,

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[160] Amos, *Rudders,* 12-14.

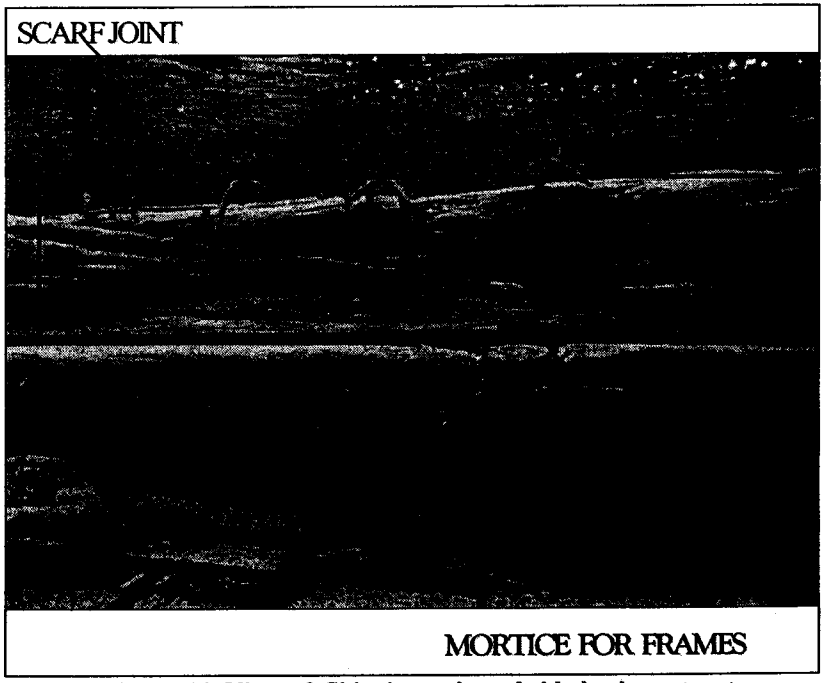

Figure 44. View of *China*'s starboard side keelson structure.

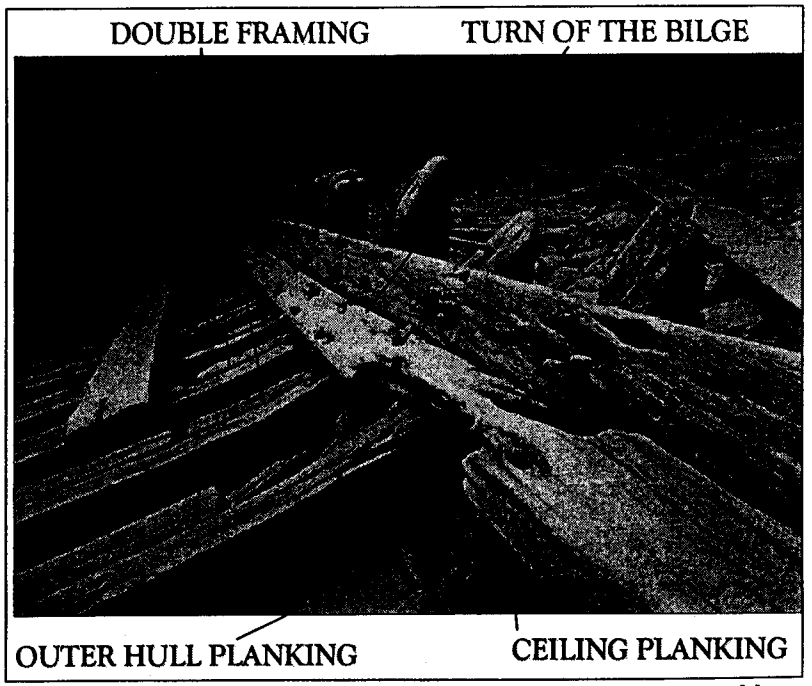

Figure 45. View abaft toward port of *China*'s frame assembly and ceiling planking.

Ontario.[161] The rudder currently associated with the wreck suggests that repairs and the new rudder may have been furnished by Melancthon Simpson, an Owen Sound shipbuilder who, like the Abbeys and Shickluna, hailed from the Welland Canal (see chapter 1). As a major builder of canal-sized vessels, Simpson would undoubtedly have been able to provide a speedy turnaround for the repair and fitting of the *China*.[162]

A 1991 Parks Canada publication, authored by Jim Ringer and Patrick Folkes, suggested the need for a site map of the *China* and a more thorough underwater search.[163] Our limited time on site concurred with this recommendation, and plans are underway to pursue a more in-depth survey of the site in 2003. The investigations of the *China* will not only provide valuable information about the construction of Welland sailing canal ships, but will serve as comparator to planned investigations of another hull built by John and James Abbey in 1854, the *Sir Charles Napier*.

Archaeology has provided a unique opportunity to study the features of sailing canallers. Investigations of the *Sligo*, *Bermuda*, and *China* shipwrecks have offered a cross-section of features employed on these vessels. The careers of these ships were different although they were built for the same markets and to the same specifications. Archival sources provide some information on construction of canal ships but are not exhaustive in architectural schematics and design details. The adaptation to Welland sailing canal ships, as a result of changing economic times, remains best examined through physical study.

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[161] *Echo* (Wiarton), 7 November 1879.
[162] See Chapter 1: Welland Canal Shipbuilding, for further information regarding Melancthon Simpson.
[163] R. James Ringer and Patrick Folkes, *A Marine Archaeological Survey of Fathom Five National Marine Park* (Ottawa: National Historic Parks and Sites Branch, Environment Canada, Parks Service, 1991), 57-64.

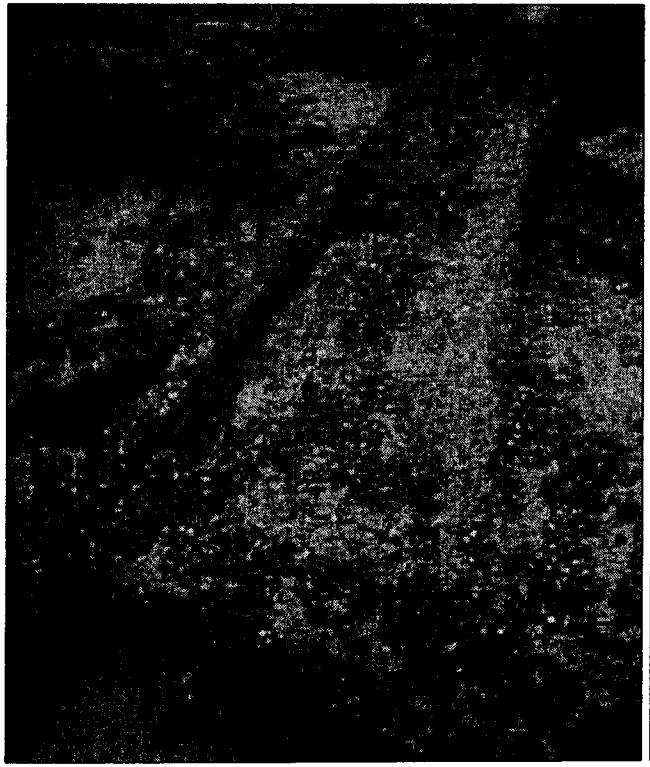

Figure 46: Rudder from schooner-barge *Sligo.*

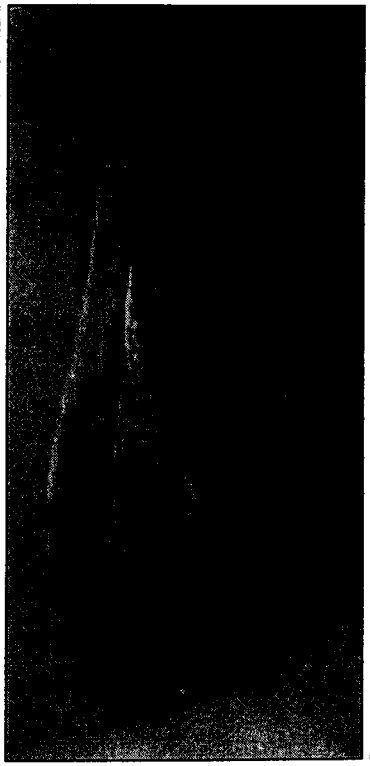

Figure 47. Rudder from schooner *Bermuda*

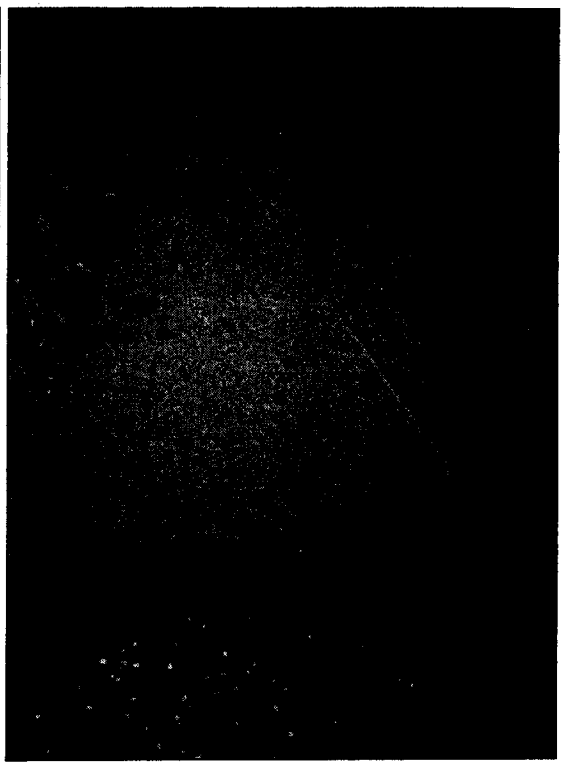

Figure 48. Rudder from schooner *China*

CHAPTER 5
CONCLUSIONS

Shipbuilding within the Great Lakes region transformed dramatically over the course of the nineteenth century. Of particular interest for this study has been the specific adaptation of material resources and construction methods to design and construct ships capable of fitting the successive incarnations of the Welland Canal. Through a combination of technical and commercial ingenuity, shipbuilders such as Lewis Shickluna were able to create and maintain fleets that dominated commercial traffic on North America's inland seas. Their legacy continues to be felt throughout the region's shipbuilding and waterborne transport industries.

The major catalysts of shipbuilding innovation were demographic, economic, and technological. Increased immigration to Canada and the United States, for example, raised the demand for the continent's natural resources; shipbuilders responded by fashioning vessel types that could accommodate larger cargoes of forest products and mineral wealth. Similarly, a combination of advances in navigation, metallurgy, and steam technology, coupled with the growth of international shipping networks, gave rise to a new generation of ships. It also signalled the demise of wooden hulls and the ascendance of iron and steel.

Throughout the Great Lakes region, shipyards sprang up in response to the heavy, though erratic, demand for tonnage. Shipbuilders ingeniously adapted to the area's physical challenges. In the case of the Welland Canal, for example, they created a specialized form of wooden craft – sailing canallers. This remarkably successful vessel

type filled a vital commercial niche by serving the forwarding and bulk freight trade networks that were linked by the waterway.

Shipbuilders who located their yards along the Canal were especially well positioned to reap full advantage of any enhancements of this transportation corridor. In relatively little time they could modify their vessels to maximize new shipping opportunities. True to the law of supply and demand, however, when iron and then steel vessels became economically as well as physically superior, the market for new wooden ships disappeared and the shipyards closed.

Although the construction of sailing canallers ceased with the establishment of the third Welland Canal, many of the existing ships continued to live on. Their survival was made possible because the Great Lakes region included varying navigational conditions, many different types of commodities for carriage, and a continuing (albeit diminished) need for sailing canallers' services.[164] As this study has shown, the continued use of these ships depended on significant design modifications.

Welland sailing canallers provide opportunities to study adaptations of vessel design for the purpose of maximizing returns on cargo. Although this vessel type was not the only form employed for cargo carriage on the Great Lakes, the great numbers produced and the many locations at which they were manufactured underscore their centrality. It is not an exaggeration to claim that the sailing canaller was the single most important vessel type plying North America's inland seas during the nineteenth century.

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[164] Jerome K. Laurent, "Trade, Transport, and Technology: The American Great Lakes, 1866–1910," *Journal of Transport History*, 4 (1983), 16.

Their impact on commercial, technological, and economic development warrants the examination of individual vessels as a means to better comprehend them.

The history of the *Sligo* (née *Prince of Wales*) documented in this study provides an opportunity to explore the career of a sailing canaller as it evolved over six decades. As markets changed and technology developed, the *Sligo* was adapted to meet the needs of a growing region. Through the histories of individual ships such as the *Sligo*, we may understand the forces that determined the fate of sailing canallers.

Archaeological field investigations have provided information on sailing canallers' unrecorded in the historical literature. Underwater surveys of the *Sligo* support the contention that tracing architectural traits offers opportunities to understand the ways in which shipbuilding dexterously adapted to new economic demands. A feature such as an adapted centerboard for use during the *Sligo*'s phase as a tow barge, for instance, represents a previously undocumented commercial modification. Similarly, the employment of iron knees provides an explanation of how these workhorses maintained their employment carrying bulk cargoes well beyond their expected lifespans. Archaeological inquiries enhance our understanding of commercial vessel construction and serve as a model according to which further studies may expand on the conclusions presented here. The investigations of centerboard employment, shifting boards, steering mechanisms, deck arrangement, and scantlings have permitted a broader understanding of canaller features but would benefit from further detailed study.

In addition to enhancing our knowledge of sailing canallers, this study has established the architectural differences between extreme and moderate forms, as well as

the modifications in deck arrangement and other characteristics that led to timber droughters, lumber hookers, and grain and ore carriers. Because the written records of these derivations of the sailing canaller form are scant, archaeology is the best mode for study and understanding of specialized adaptations of this vessel type.

It is only by documenting these wooden workhorses in their totality can we appreciate the complexity of their careers and their contributions to maritime history. Technology may have rung the death knoll for sailing canallers, but historical and archaeological research can ensure their immortality within the annals of Great Lakes studies.

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APPENDIX A: WOOD SAMPLE ANALYSIS, *SLIGO* SHIPWRECK

SIU
SOUTHERN ILLINOIS UNIVERSITY
CARBONDALE

11 December 2001

Ms. Kimberly Monk
Program in Maritime Studies
East Carolina University
Greenville, NC 27858

Dear Kimberly:

I have completed analysis of the wood hull samples recovered from the Sligo shipwreck. The wood taxa represent both hardwoods (angiosperms) and softwoods (conifers), including one type of oak and at least two genera of conifers. The individual samples and identifications are attached. Species belonging to the oak and pine genera are not separable to the level of individual species based exclusively upon wood anatomy, hence, the samples were classified according to recognized wood anatomical groups. Nevertheless, white oak (*Quercus alba*) and white pine (*Pinus strobus*), as the most likely identifications for the oak and pine woods present, are species native to eastern North America and with long histories of use in ship construction. Species of spruce (*Picea* sp.) and larch (*Larix* sp.) span the entire northern temperate zone; in lieu of additional samples and anatomical detail, it is not possible to further resolve these identifications to individual species or wood anatomical groups.

Please let me know if you have any questions or I may provide any additional information concerning the wood identifications.

Sincerely,

Lee Newsom
Associate Professor

Center for Archaeological Investigations, Faner 3479, Mailcode 4527, Carbondale, Illinois 62901-4527
618/453-5031, Fax: 618/453-3253

SLIGO SHIPWRECK HULL SAMPLES (2001 Sligo Shipwreck Survey, Toronto, Ontario).

1 Stempost: hardwood, cf. *Quercus* sp., possibly white oak wood group (cf. *Q. alba*, white oak of eastern North America).
2 Deadwood (stem): (no identification, sample insufficient of anatomical detail).
4 Forward deck: (no identification, sample insufficient of anatomical detail).
5 Anchor stock: hardwood, cf. *Quercus* sp., oak.
6 Windlass: hardwood, not further identified due to deteriorated cell structure.
7 Forward mast partner: *Pinus* sp., *strobus* anatomical group (white pine wood group; very likely *P. strobus*, white pine of eastern North America).
8 Centerboard: (no identification, sample insufficient of anatomical detail).
9 Centerboard trunk: *Quercus* sp., white oak wood anatomcial group (especially *Q. alba*).
10 Ceiling forward: (no identification, sample insufficient of anatomical detail).
11 Deck beam (amidship): *Quercus* sp., white oak wood anatomical group (especially *Q. alba*).
12 Hatch coming (amidship): Pinaceae, pine family, either the genus *Picea* sp. (spruce) or *Larix* sp. (tamarack, larch).
(tamarack, larch).
13 Top timber (amidship): hardwood, cf. *Quercus* sp., oak.
15 Futtock (amidship): hardwood, unidentified due to condition, but likely oak, *Quercus* sp.
16 Wale (amidship): softwood (conifer), unidentified due to condition/size.
17 Inner plank (amidship): hardwood, unidentified due to condition/size.
18 Bottom plank (amidship): hardwood, unidentified due to condition/size.
20 Transom: hardwood, cf. *Quercus* sp. (very likely white oak anatomical group).
21 Sternpost: *Quercus* sp., white oak wood anatomical group (especially *Q. alba*).
22 Rudder brace: *Quercus* sp., white oak wood anatomical group (especially *Q. alba*).
23 Rudder: *Quercus* sp., white oak wood anatomical group (especially *Q. alba*).
24 Deadwood (stern): hardwood, unidentified due to condition/size.
25 Forward rail stanchion: (no identification, sample insufficient of anatomical detail).
26 Forward railing: Pinaceae, pine family, either the genus *Picea* sp. (spruce) or *Larix* sp. (tamarack, larch).

APPENDIX B: WOOD SAMPLE ANALYSIS, *BERMUDA* SHIPWRECK

PENNSTATE

Department of Anthropology
College of the Liberal Arts

The Pennsylvania State University
409 Carpenter Building
University Park, PA 16802-3404

(814) 865-2509
Fax: (814) 863-1474
Website: http://anthro.psu.edu/

7 July 2003

Ms. Kimberly E. Monk
68 Sylvan Valleyway
Toronto, Ontario M5M 4M3

Dear Kimberly:

This is to report my analysis and identification of the wood specimens from your Bermuda shipwreck. All together 15 samples were analyzed resulting in the identification of two wood genera: pine (*Pinus* sp.) and oak (*Quercus* sp.). Furthermore, because preservation of the cell structure in individual samples is very good, it was possible to assign each wood specimen to a particular taxonomic subgroup within the two genera as they occur among the samples. To clarify, species level identification for pines and oaks (for that matter, most wood taxa) is not generally possible based exclusively on wood anatomy. However, where preservation is sufficient, detailed microscopic examination will usually permit a given specimen to be classified to a particular wood anatomical group within the genus, e.g., pine, which may be associated with a geographic range. In the case of pines there exists the potential to refine wood identifications to one of seven wood anatomical groups, again, depending on the condition of the cell structure. Similarly, oaks can be classified according to three wood-anatomical groups.

I was able to refine the wood identifications for your samples according to these additional levels of taxonomic resolution, specifically in this case, the *strobus* anatomical group of pines and the white anatomical group of oaks. *Strobus* pines are among the "white" or "soft" (subgenus *Haploxylon*) pines, and include white pine (*P. strobus*) of eastern North America as well as a few other old and new world species. Your specimens anatomically conform very closely to American *P. strobus*. In each case where it was possible to discern subgroup, the oak among the Bermuda samples was assigned to the white oak anatomical group. This designation pertains primarily to American species, although there are some European oaks with very similar anatomical structure. The oak present among your specimens is a very strong match with the eastern North American white oak, *Quercus alba*. The individual samples and identifications are attached. Please let me know if you have any questions or I may provide additional information.

Sincerely,

Lee Newsom

Lee Newsom
Associate Professor

Bermuda shipwreck identifications (Kimberly E. Monk, ECU), Lee Newsom, July 2003

#03	stem	*Pinus* sp., *strobus* anatomical group (white pine).
#06	main rail	*Quercus* sp., white oak anatomical group.
#15	mast partners	*Quercus* sp., white oak anatomical group.
#16	deck planking	*Pinus* sp., *stobus* anatomical group (white pine).
#17	deck beam	*Quercus* sp., white oak anatomical group.
#18	centerboard trunk	*Quercus* sp., probably white oak anatomical group, growth increments in specimen very narrow.
#19	hatch coming	*Quercus* sp., white oak anatomical group.
#20	deadwood	*Quercus* sp., white oak anatomical group.
#23	shifting board	*Pinus* sp., *strobus* anatomical group (white pine).
#26	keelson	*Quercus* sp., white oak anatomical group.
#27	ceiling	*Quercus* sp., white oak anatomical group.
#28	transom	*Quercus* sp., white or red oak anatomical group.
#30	sternposts	*Quercus* sp., white oak anatomical group.
#32	rudder outside/top	*Quercus* sp., probably the white oak anatomical group.
#33	rudder inside/base	*Pinus* sp., probably *strobus* anatomical group (white pine).

APPENDIX C: CARGO SAMPLE ANALYSIS, *SLIGO* SHIPWRECK

Brock University

Department of Earth Sciences
St. Catharines, Ontario Canada L2S 3A1
Telephone (905) 688-5550 Ext. 3526
Fax (905) 682-9020

Feb. 26,2002.

Hello Kimberly,

We have finally completed all of the analyses on your samples from the Sligo wreck in the Toronto Harbour.

Chemical Analysis of the lake sediments:
The work was performed by Professor Ian Brindle, Chemistry Dept., Brock University. He did a general scan for contaminants usually associated with coal tar. This included looking for the presence of PAH's (Polynuclear Aromatic Hydrocarbons) as well as Sulphur containing Polyaromatics.
Nothing notable was found. Which is probably good news from a pollution stand point.

Geological Report on the cargo:
This part of the project was performed by Howard Melville, Earth Sciences Dept., Brock University.
The samples are Sedimentary rock deposited in warm tropical seas during the Ordovician period of the Paleozoic era. The Paleozoic extended from 540-250 million yrs ago. The Ordovician was a portion of the Paleozoic and lasted from 500-440 million yrs ago.
The Gull River formation and the Bobcaygeon formation were both deposited during the Middle of the Ordovician. In this case the Gull River formation is immediately below the Bobcaygeon and both would appear as layers within the quarry. The list of rock types on the side of the map I sent you is always placed in stratigraphic sequence with the oldest being on the bottom and the youngest at the top.

Sample 14, Hold #4
Comes from the Gull River Formation, unit 3 on the map.
It is a medium to dark grey lithographic (finegrained) limestone.

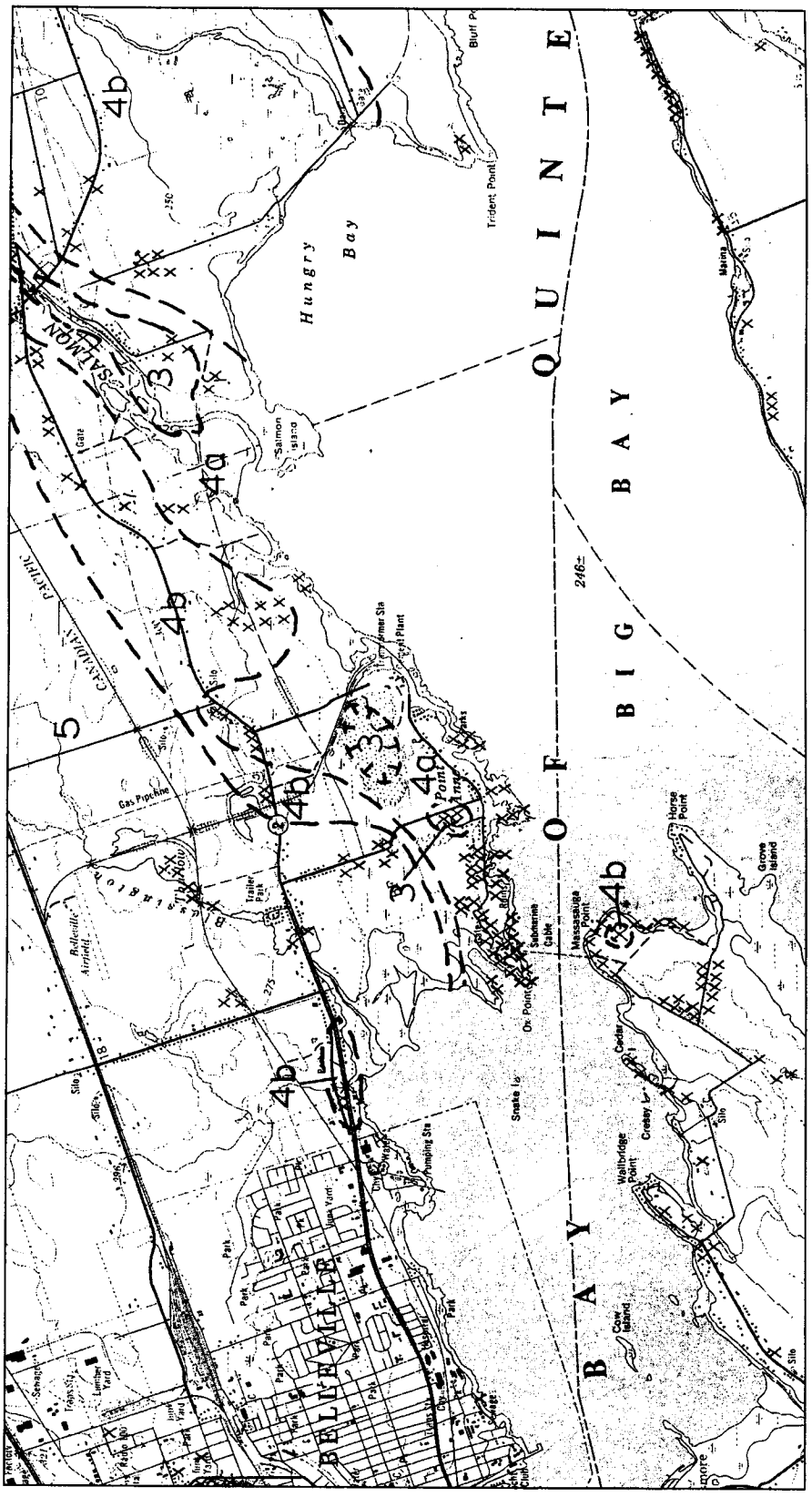
Sample 23, Hold #3
Comes from the Bobcaygeon Formation, lower member, unit 4a on the map.
Stratigraphically it would be just above the Gull River sample at the quarry.
It is a fine to medium grained calcarenite with stylolites across the middle of the sample.

Thank you for your patience in waiting for this report and it has been a pleasure working with you.

Sincerely, Howard Melville

Howard Melville
Ian Brindle

and Ian Brindle


QUINTE
BAY OF
BIG BAY
Hungry Bay
BELLEVILLE
Trident Point
Salmon Island
Gas Pipeline
Trailer Park
Bellville Airfield
Ox Point
Snake Is
Massassaga Point
Horse Point
Grove Island
Cedar Island
Waltbridge Point
Creasy Is
Marina
Pumping Sta
Park
4b
5

LEGEND

PALEOZOIC

MIDDLE ORDOVICIAN

6b	Lindsay Formation (upper member): nodular limestone and shale.
6a	Lindsay Formation (lower member): crystalline limestone with shaly partings.
5	Verulam Formation: interbedded limestone and shale.
4b	Bobcaygeon Formation (upper member): crystalline and bioclastic limestone.
4a	Bobcaygeon Formation (lower member): crystalline limestone and calcarenite.
3	Gull River Formation: lithographic to sublithographic limestone.
2	*Shadow Lake Formation: arkosic sandstone, siltstone, and shale.

? CAMBRIAN

1	*Potsdam Formation: evenly textured sandstone.

UNCONFORMITY

PRECAMBRIAN

Pe	Undifferentiated Precambrian Rocks

*Not present in Kaladar-Tweed map-area.

SYMBOLS

- Bedrock Outcrop
- Geological Boundary, observed
- Geological Boundary, approximate
- Geological Boundary, position interpreted
- Fault, observed
- Fault, approximate
- Fault, position interpreted
- Quarry

APPENDIX D: SHIPPING CASUALTY REPORT FOR THE *SLIGO*, LLOYD'S OF LONDON, 1918.

Wr. 1 (*d*).

SHIPPING CASUALTIES.

Return for Wreck Register, 19*18*

FOUNDERINGS

(Abroad).

No. *4*

SHIP.

Name and nationality. 1.	Port of registry and official number. 2.	Steam or sailing. 3.	No. Register tonnage. 4.	Iron, steel or wood. 5.	Rig. 6.	Age (years). 7.	Nature of employment. 8.
"Sligo" British	Toronto [illegible] 1909	Sailing	284	Wood	[illegible]	44	Stone Coal

Name of master and No. of his certificate. 9.	No. of crew at commencement of voyage including master and officers. 10.	No. of crew available at time of casualty. 11.	No. of passengers (if any) and all others not included in col. 10. 12.	Name of pilot (if any). 13.	By whom insured. 14.	Description and weight of cargo. 15.
James Smith	5	5	None	None	✓	500 Tons Stone

Port sailed from at commencement of voyage and date of sailing. 16.	Port last called from and date of sailing. 17.	Port bound to. 18.	Amount of insurance: On vessel. 19.	On freight. 20.	On cargo. 21.	Name and address of owners. 22.
Point Anne Ont Sept 7-18		Hamilton	None	None	$ 562.50	Point Anne Quarries Ltd Toronto

Lloyd 9.10.18 N.T.

CASUALTY.

Where casualty happened: Exact spot. 23.	Name of country or sea. 24.	Date and hour. 25.	State of tide. 26.	State of weather and atmosphere. 27.	Direction and force of wind. 28.	State of sea and in what direction heaving. 29.	Result of casualty: Total loss — Ship. Value, if known. 30.	Partial loss — Ship. Cargo. 31.	No. of lives lost. 32.	No. of lives saved and by what means. 33.
Off West End Toronto Island	Lake Ontario	3 am Sept 8	✓	Rain [illegible]	[illegible] East		Total [illegible] Value [illegible]		None	Ashore in yawl boat

If salvage services were attempted, state by whom. 34.	Brief account of casualty with remarks as to cause, and whether it could have been avoided. 35.
None	Towing behind City of New York and tow line parted.

These columns (36 and 37) will be filled up at the Board of Trade.

Cause of casualty. 36.	Circumstances attending the casualty. 37.

Particulars of vessel.

38. What was vessel's draught of water forward? *11*
39. Do. do. do. aft? *11 6*
40. No. of compasses. Were they in good order?
41. Had she boats to carry all persons on board? *Yes*
42. Were they of any use in this case? *Yes*
43. Were the life saving appliances on board in accordance with the statutory requirements? *Yes*
44. Number of watertight compartments? *No*
45. Did they prove of use in this case? ✓
46. No. and condition of pumps at the commencement of the voyage. *two syphons & one pump.*
47. How many and which had become useless before foundering? *Pump clogged & syphons not [illegible]*
48. Was vessel well found in masts, rigging, sails, general equipment, &c.? *No mast no sail.*
49. Had engines broken down or become useless before foundering? ✓
50. Date and hour of springing leak or shipping first sea? ✓

Particulars of cargo.

51. Had vessel a deck load? *No*
52. If of wood, was it in accordance with the statutory requirements?
53. Was she overladen? *No*
54. How was cargo stowed?
55. If vessel had a grain cargo, was it stowed in accordance with the statutory requirements?
56. If a coal cargo, how was the hold ventilated?

Particulars of voyage.

57. Course steering when vessel foundered. *Coming [illegible] around to make*
58. Circumstances of the voyage immediately preceding the foundering. *Western entrance to Toronto Harbour.*
59. Details of measures taken to prevent the foundering. *Vessel leaking badly and waves going over before line parted*

60. Source from which this information has been obtained. *Capt Jas Smith – Sligo; Capt Quinn City of New York*

Dated at *Toronto* this *6* day of *Sept* 1918.

The Assistant Secretary,
Marine Department,
Board of Trade,
London.

(Signed) *J. A. McStewart*

(Title) *Manager Point Anne Quarries Toronto, Ont*

General rules.

Every casualty to a British ship by foundering abroad, or to a British or a Foreign ship by foundering on or near the coasts, or in a river or harbour, of a British possession abroad, should be reported on this form.

When a statement on form Inq. 1 in respect of a foundering abroad is sent to the Board of Trade, it must be accompanied by a form Wr. 1 (*d*).

In the absence of special circumstances no covering letter is required with this report.

WIND SCALE FOR SAILING SHIPS.

Numbers to denote force of wind.	Description of wind.	Mode of estimating force of wind on board sailing ships.	Probable hourly velocity of the wind in statute miles per hour.	Probable equivalent force pressure in pounds upon a circular disc one square foot in area.
0	Calm	—	Under 2	Less than [illegible]
1, 2, 3	Light breeze	Sufficient wind for working ship.	2 to 12 inclusive, average about 8	Between [illegible] and [illegible]
4, 5	Moderate breeze	Force most advantageous for sailing with leading wind and all sail drawing.	13 to 23 " " 17	" [illegible] " [illegible]
6, 7	Strong wind	Reduction of sail becomes necessary even with leading wind.	24 to 37 " " 30	" [illegible] " [illegible]
8, 9	Gale force	Considerable reduction of sail necessary even with wind quartering.	38 to 55 " " 45	" [illegible] " [illegible]
10, 11	Storm force	Close reefed sail running, or hove to under storm sail.	56 to 75 " " 65	" [illegible] " [illegible]
12	Hurricane	[illegible]	Above 75	[illegible]

[illegible]

Source: Lloyd's of London. *Shipping Casualty. Return for Wreck Register, 1918.*

APPENDIX E: VESSEL MOVEMENT AND CARGO DESCRIPTION (1860-1918)

Year	Month	Day	From	Destination	Cargo	Vessel Tonnage	Cargo Tonnage
1860	September	13	St. Catharines	Chicago	Ballast	341	0
1861	May	24	Chicago	Kingston	Wheat	341	442
1861	June	5	Kingston	Saugeen	Ballast	341	0
1861	June	29	Saugeen	Kingston	Timber	341	280
1861	July	9	Kingston	Saugeen	Ballast	341	0
1861	July	31	Saugeen	Kingston	Timber	341	280
1861	August	7	Kingston	Saugeen	Ballast	341	0
1861	December	9	St. Catharines	Cape Vincent	Flour	341	104
1862	April	21	Kingston	Chicago	Ballast	341	0
1862	May	13	Sarnia	Liverpool	Coal Oil; Staves	383	530
1862	September	17	Liverpool	St. Catharines	Coal; Pig Iron; Earthenware	383	263
1863	April	27	Wallaceburg	Kingston	Timber	383	240
1863	May	4	Kingston	Wallaceburg	Ballast	383	0
1863	May	21	Southampton	Kingston	Timber	383	360
1863	May	30	Kingston	Saugram	Ballast	383	0
1863	June	19	Southampton	Kingston	Timber	383	240
1863	June	26	Kingston	Saugram	Ballast	383	0
1863	July	17	Southampton	Kingston	Timber	383	240
1863	July	25	Kingston	Saugram	Ballast	383	0
1863	August	14	Saugram	Kingston	Timber	383	260
1863	August	29	Kingston	Saugram	Iron	383	0
1864	May	2	Wallaceburg	Kingston	Timber	383	0.5
1864	May	11	Kingston	Wallaceburg	Ballast	383	0
1864	June	4	Kingston	Saugram	Ballast	383	0
1864	June	25	Saugram	Kingston	Timber	383	240
1864	July	4	Kingston	Saugram	Ballast	383	0
1864	July	21	Saugram	Kingston	Timber	383	240
1864	August	1	Kingston	Saugram	Ballast	383	0
1864	August	22	Saugram	Kingston	Timber	383	260
1864	September	1	Kingston	Saugram	Ballast	383	0
1864	September	15	Saugram	Kingston	Timber	383	260
1864	September	22	Kingston	Chicago	Ballast	383	0
1865	May	9	Wallaceburg	Kingston	Timber	383	240
1865	May	18	Kingston	Wallaceburg	Ballast	383	0
1865	June	1	Mooretown	Kingston	Timber	383	250
1865	June	10	Kingston	Wallaceburg	Ballast	383	0
1865	June	22	Saugram	Kingston	Timber	383	290
1865	July	1	Kingston	Saugram	Ballast	383	0
1865	July	14	Wallaceburg	Kingston	Timber	383	240
1865	July	22	Kingston	Bear Creek	Ballast	383	0
1865	August	11	Wallaceburg	Kingston	Timber	383	260
1865	August	21	Kingston	Saugram	Ballast	383	0
1865	September	18	Kingston	Chicago	Salt	383	358
1865	October	19	Milwaukee	Kingston	Wheat	383	444
1865	October	28	Kingston	Chicago	Salt	383	380
1866	July	11	Chicago	Kingston	Wheat	383	604
1866	July	19	Kingston	Chicago	Ballast	383	0
1866	August	28	Chicago	Kingston	Corn	383	436
1866	September	5	Kingston	Chicago	Salt	383	322

1866	October	16	Milwaukee	Kingston	Wheat	383	422
1866	October	26	Kingston	Chicago	Ballast	383	0
1866	December	5	Chicago	Toronto	Corn	383	439
1867	April	23	Toronto	Bear Creek	Merchandise	383	1
1867	May	8	Wallaceburg	Clayton	Timber	383	240
1867	May	13	Clayton	Wallaceburg	Ballast	383	0
1867	June	1	St. Clair	Kingston	Timber	383	240
1867	June	8	Clayton	Bear Creek	Ballast	383	0
1867	June	27	Chatham	Clayton	Timber	383	240
1867	July	5	Kingston	Bear Creek	Ballast	383	0
1867	July	24	Chatham	Kingston	Timber	383	240
1867	September	2	Kingston	Toledo	Ballast	383	0
1867	October	19	Milwaukee	Kingston	Wheat	383	458
1867	October	29	Kingston	Chicago	Ballast	383	0
1875	July	3	McKay	Bay Creek	Ballast	335	0
1875	July	23	Big Creek	Pt. Inecraft	Timber	335	n/a
1875	July	30	Kingston	Pt. Colbourne	Ballast	335	0
1875	August	23	Bay City	Pt. Metcalfe	Timber	335	n/a
1875	September	4	Kingston	Windsor	Railroad Iron	335	n/a
1875	October	1	Chatham	Kingston	Timber	335	n/a
1875	October	11	Kingston	Windsor	Ballast	335	0
1876	May	11	Middle Island	Pt. Metcalfe	Timber	335	240
1876	May	17	Pt. Metcalfe	Pt. Colbourne	Ballast	335	0
1876	June	7	Presquile	Pt. Metcalfe	Timber	335	240
1876	July	3	Presquile	Pt. Metcalfe	Timber	335	240
1876	July	15	Collins Bay	Pt. Colbourne	Ballast	335	0
1876	August	30	Pinconning	Pt. Metcalfe	Timber	335	240
1876	September	5	Pt. Metcalfe	Pt. Colbourne	Ballast	335	0
1876	September	16	Black River	Toronto	Coal	335	460
1876	September	20	Toronto	Pt. Colbourne	Ballast	335	0
1876	September	27	Cleveland	Toronto	Coal	335	448
1876	October	7	Toronto	Toledo	Barley	335	n/a
1877	June	1	Kingston	Pinconning	Ballast	335	0
1877	July	19	Marquette	Pt. Metcalfe	Timber	335	260
1877	July	30	Oswego	Pt. Arthur	Coal	335	n/a
1877	September	21	Milwaukee	Kingston	Timber	335	417
1877	November	7	Chatham	Kingston	Wheat	335	308
1877	November	16	Kingston	Pt. Colbourne	Stone	335	n/a
1877	December	1	Cleveland	Toronto	Coal	335	436
1878	June	20	Kingston	Marquette	Ballast	335	0
1878	July	19	Marquette	Pt. Metcalfe	Timber	335	200
1878	July	27	Kingston	Chicago	Ballast	335	0
1878	August	14	Toledo	Kingston	Corn	335	420
1879	June	13	Milwaukee	Kingston	Wheat	335	448
1879	June	24	Kingston	Chicago	Ballast	335	0
1879	August	11	Kingston	Chicago	Ballast	335	0
1882	June	10	Kingston	Pt. Au Sable	Ballast	335	0
1882	October	3	Kingston	Pt. Colbourne	Ballast	335	0
1885	July	14	Pt. Arthur	Kingston	Wheat	284	583
1887	June	2	Kingston	Pt. Colbourne	Ballast	284	0
1887	July	5	Chicago	Kingston	Wheat	284	600
1888	August	4	Oswego	Toronto	Coal	284	571
1889	October	21	Charlotte	Toronto	Coal	284	577

1889	November	11	Charlotte	Toronto	Coal	284	576
1890	April	28	Charlotte	Toronto	Ballast	284	0
1903	June	27	Oswego	Toronto	Coal	284	548
1908	October	23	Oswego	Toronto	Coal	284	490
1908	October	27	Oswego	Toronto	Coal	284	490
1908	November	16	Oswego	Toronto	Coal	284	543
1908	November	26	Oswego	Toronto	Coal	284	543
1909	July	5	Pt. Anne	Toronto	Stone	284	n/a
1909	July	8	Pt. Anne	Toronto	Stone	284	n/a
1909	July	19	Pt. Anne	Toronto	Stone	284	n/a
1909	July	20	Pt. Anne	Toronto	Stone	284	47
1909	July	30	Pt. Anne	Toronto	Stone	284	n/a
1909	August	23	Pt. Anne	Toronto	Stone	284	n/a
1909	September	30	Pt. Anne	Toronto	Stone	284	465
1909	October	9	Pt. Anne	Toronto	Stone	284	158
1909	November	24	Pt. Anne	Toronto	Stone	284	n/a
1910	April	6	Pt. Anne	Toronto	Stone	284	500
1910	April	29	Pt. Anne	Toronto	Stone	284	500
1910	May	5	Pt. Anne	Toronto	Stone	284	201
1910	May	16	Pt. Anne	Toronto	Stone	284	188
1910	May	23	Pt. Anne	Toronto	Stone	284	450
1910	May	26	Pt. Anne	Toronto	Stone	284	500
1910	May	31	Pt. Anne	Toronto	Stone	284	450
1910	June	2	Pt. Anne	Toronto	Stone	284	n/a
1910	June	4	Pt. Anne	Toronto	Stone	284	188
1910	June	7	Pt. Anne	Toronto	Stone	284	n/a
1910	June	13	Pt. Anne	Toronto	Stone	284	n/a
1910	July	2	Pt. Anne	Toronto	Stone	284	n/a
1910	July	4	Pt. Anne	Toronto	Stone	284	450
1910	July	7	Pt. Anne	Toronto	Stone	284	180
1910	July	8	Pt. Anne	Toronto	Stone	284	450
1910	July	14	Pt. Anne	Toronto	Stone	284	n/a
1910	August	11	Pt. Anne	Toronto	Stone	284	90
1910	August	12	Pt. Anne	Toronto	Stone	284	n/a
1910	August	16	Pt. Anne	Toronto	Stone	284	n/a
1910	September	1	Pt. Anne	Toronto	Stone	284	n/a
1910	September	8	Pt. Anne	Toronto	Stone	284	n/a
1910	September	10	Pt. Anne	Toronto	Stone	284	90
1910	September	22	Pt. Anne	Toronto	Stone	284	n/a
1910	October	10	Pt. Anne	Toronto	Stone	284	180
1910	October	14	Pt. Anne	Toronto	Stone	284	n/a
1910	October	17	Pt. Anne	Toronto	Stone	284	n/a
1910	November	1	Pt. Anne	Toronto	Stone	284	450
1910	November	9	Pt. Anne	Toronto	Stone	284	90
1910	November	11	Pt. Anne	Toronto	Stone	284	n/a
1910	November	28	Pt. Anne	Toronto	Stone	284	n/a
1910	December	6	Pt. Anne	Toronto	Stone	284	75
1911	May	1	Pt. Anne	Toronto	Stone	284	n/a
1911	May	10	Pt. Anne	Toronto	Stone	284	n/a
1911	May	19	Pt. Anne	Toronto	Stone	284	n/a
1911	June	1	Pt. Anne	Toronto	Stone	284	n/a
1911	June	13	Pt. Anne	Toronto	Stone	284	160
1911	Jun	16	Pt. Anne	Toronto	Stone	284	160

1911	Jun	23	Pt. Anne	Toronto	Stone	284	160
1911	July	7	Pt. Anne	Toronto	Stone	284	160
1911	July	12	Pt. Anne	Toronto	Stone	284	400
1911	July	15	Pt. Anne	Toronto	Stone	284	400
1911	July	27	Pt. Anne	Toronto	Stone	284	400
1911	August	5	Pt. Anne	Toronto	Stone	284	n/a
1911	August	10	Pt. Anne	Toronto	Stone	284	120
1911	August	24	Pt. Anne	Toronto	Stone	284	n/a
1911	September	13	Pt. Anne	Toronto	Stone	284	120
1911	September	18	Pt. Anne	Toronto	Stone	284	400
1911	October	2	Pt. Anne	Toronto	Stone	284	n/a
1911	October	4	Pt. Anne	Toronto	Stone	284	n/a
1911	October	9	Pt. Anne	Toronto	Stone	284	400
1911	October	11	Pt. Anne	Toronto	Stone	284	80
1911	October	13	Pt. Anne	Toronto	Stone	284	n/a
1911	October	20	Pt. Anne	Toronto	Stone	284	n/a
1911	October	31	Pt. Anne	Toronto	Stone	284	n/a
1911	November	6	Pt. Anne	Toronto	Stone	284	n/a
1911	November	7	Pt. Anne	Toronto	Stone	284	n/a
1911	November	8	Pt. Anne	Toronto	Stone	284	160
1911	December	1	Pt. Anne	Toronto	Stone	284	40
1912	May	13	Pt. Anne	Toronto	Stone	284	400
1912	May	25	Pt. Anne	Toronto	Stone	284	400
1912	May	27	Pt. Anne	Toronto	Stone	284	400
1912	June	4	Pt. Anne	Toronto	Stone	284	80
1912	June	5	Pt. Anne	Toronto	Stone	284	400
1912	June	14	Pt. Anne	Toronto	Stone	284	400
1912	June	26	Pt. Anne	Toronto	Stone	284	400
1912	July	10	Pt. Anne	Toronto	Stone	284	80
1912	July	11	Pt. Anne	Toronto	Stone	284	400
1912	July	16	Pt. Anne	Toronto	Stone	284	n/a
1912	July	22	Pt. Anne	Toronto	Stone	284	400
1912	July	31	Pt. Anne	Toronto	Stone	284	400
1912	August	2	Pt. Anne	Toronto	Stone	284	400
1912	August	10	Pt. Anne	Toronto	Stone	284	160
1912	August	12	Pt. Anne	Toronto	Stone	284	400
1912	August	24	Pt. Anne	Toronto	Stone	284	400
1912	August	31	Pt. Anne	Toronto	Stone	284	400
1912	September	3	Pt. Anne	Toronto	Stone	284	n/a
1912	September	11	Pt. Anne	Toronto	Stone	284	400
1912	September	16	Pt. Anne	Toronto	Stone	284	120
1912	September	20	Pt. Anne	Toronto	Stone	284	400
1912	September	21	Pt. Anne	Toronto	Stone	284	n/a
1912	September	27	Pt. Anne	Toronto	Stone	284	400
1912	October	14	Pt. Anne	Toronto	Stone	284	400
1912	October	24	Pt. Anne	Toronto	Stone	284	400
1912	November	7	Pt. Anne	Toronto	Stone	284	n/a
1912	November	11	Pt. Anne	Toronto	Stone	284	400
1912	November	18	Pt. Anne	Toronto	Stone	284	400
1913	April	7	Pt. Anne	Toronto	Stone	284	450
1913	April	16	Pt. Anne	Toronto	Stone	284	450
1913	April	21	Pt. Anne	Toronto	Stone	284	500
1913	May	5	Pt. Anne	Toronto	Stone	284	450

1913	May	14	Pt. Anne	Toronto	Stone	284	450
1913	May	17	Pt. Anne	Toronto	Stone	284	375
1913	May	27	Pt. Anne	Toronto	Stone	284	450
1913	June	1	Pt. Anne	Toronto	Stone	284	450
1913	June	3	Pt. Anne	Toronto	Stone	284	450
1913	June	14	Pt. Anne	Toronto	Stone	284	450
1913	June	16	Pt. Anne	Toronto	Stone	284	450
1913	June	17	Pt. Anne	Toronto	Stone	284	n/a
1913	June	19	Pt. Anne	Toronto	Stone	284	450
1913	June	23	Pt. Anne	Toronto	Stone	284	450
1913	June	28	Pt. Anne	Toronto	Stone	284	450
1913	July	7	Pt. Anne	Toronto	Stone	284	450
1913	July	14	Pt. Anne	Toronto	Stone	284	450
1913	July	16	Pt. Anne	Toronto	Stone	284	450
1913	August	5	Pt. Anne	Toronto	Stone	284	425
1913	August	11	Pt. Anne	Toronto	Stone	284	400
1913	August	15	Pt. Anne	Toronto	Stone	284	450
1913	August	20	Pt. Anne	Toronto	Stone	284	475
1913	August	30	Pt. Anne	Toronto	Stone	284	475
1913	September	11	Pt. Anne	Toronto	Stone	284	425
1913	September	23	Pt. Anne	Toronto	Stone	284	450
1913	October	4	Pt. Anne	Toronto	Stone	284	425
1913	October	20	Pt. Anne	Toronto	Stone	284	n/a
1914	June	4	Pt. Anne	Toronto	Stone	284	400
1914	June	18	Pt. Anne	Toronto	Stone	284	400
1914	July	10	Pt. Anne	Toronto	Stone	284	400
1914	September	10	Pt. Anne	Toronto	Stone	284	350
1914	September	30	Pt. Anne	Toronto	Stone	284	400
1914	October	19	Pt. Anne	Toronto	Stone	284	400
1918	July	5	Pt. Anne	Toronto	Stone	284	n/a
1918	July	31	Pt. Anne	Toronto	Stone	284	n/a
1918	August	12	Pt. Anne	Toronto	Stone	284	n/a
1918	August	15	Pt. Anne	Toronto	Stone	284	n/a
1918	August	25	Pt. Anne	Toronto	Stone	284	n/a
1918	September	4	Pt. Anne	Toronto	Stone	284	500

Source: National Archives of Canada (Ottawa) Welland Canal Registers 1854–1867: RG43-C-VI-2-k); 1875-1893; 1904–1908; Vols. 2403, 2404; Toronto Harbour Commission Archives, Tonnage reports Vol. 5: 1902–09: RG2/6, Vol. 6; 1910–19: RG2/6, Vol. 7.

APPENDIX F: MASTERS, OWNERS, TONNAGE, CLASS AND VALUE (1860-1918).

Year	Masters	Port of Hail	Owner	Port of Hail	Tonnage	Class	Value
1860	John C. Graham	St. Catharines	James Norris & Sylvester Neelon	St. Catharines	507	A1	20, 000
1861	John C. Graham	St. Catharines	James Norris & Sylvester Neelon	St. Catharines	507	A1	20, 000
1862	John C. Graham	St. Catharines	James Norris & Sylvester Neelon	St. Catharines	507	A1	20, 000
1863	John C. Graham	St. Catharines	James Norris & Sylvester Neelon	St. Catharines	507	A1	20, 000
1864	John C. Graham	St. Catharines	James Norris & Sylvester Neelon	St. Catharines	507	A1	20, 000
1865	John C. Graham	St. Catharines	James Norris & Sylvester Neelon	St. Catharines	507	A1	20, 000
1866	John C. Graham	St. Catharines	John C. Graham	St. Catharines	507	A1	13, 500
1867	John C. Graham	St. Catharines	John C. Graham	St. Catharines	507	A1	13, 500
1868	John C. Graham	St. Catharines	John C. Graham	St. Catharines	507	A1	13, 500
1869	John C. Graham	St. Catharines	John C. Graham	St. Catharines	507	A2	12, 000
1870	John C. Graham	St. Catharines	John C. Graham	St. Catharines	507	A2	12, 000
1871	John C. Graham	St. Catharines	John C. Graham & Campbell	St. Catharines	383	A2	14, 000
1872	John C. Graham	St. Catharines	John C. Graham & Campbell	St. Catharines	383	A2	14, 000
1873	John C. Graham	St. Catharines	John C. Graham	St. Catharines	383	B1	12, 000
1874	Michael Kerwin	St. Catharines	John C. Graham & Campbell	St. Catharines	335	A2	13, 000
1875	Michael Kerwin	St. Catharines	John C. Graham & Campbell	St. Catharines	335	A2	13, 000
1876	T. Daley	St. Catharines	John C. Graham & Campbell	St. Catharines	335	A2	13, 000
1877	T. Daley	St. Catharines	John C. Graham & Campbell	St. Catharines	335	A2	13, 000
1878	John Ross	Montreal	John C. Graham & Campbell	St. Catharines	335	A2	10, 000
1879	John Ross	Montreal	John C. Graham & Campbell	St. Catharines	335	A2	10, 000
1880	John Ross	Montreal	John C. Graham & Campbell	St. Catharines	335	A2	10, 000
1881	John Ross	Montreal	John C. Graham & Campbell	St. Catharines	335	A2	10, 000
1882	H. Jeffery	St. Catharines	John C. Graham & Campbell	St. Catharines	335	A2	10, 000
1883	George A. Graham	Port Arthur	George A. Graham et al.	Port Arthur	335	A2	10, 000
1884	George A. Graham	Port Arthur	George A. Graham et al.	Port Arthur	335	A2	10, 000
1885	J.W. Green	St. Catharines	George A. Graham et al.	Port Arthur	335	A2	10, 000
1886	J.W. Green	St. Catharines	George A. Graham et al.	Port Arthur	284	B1	10, 000
1887	Pat Kerwin	St. Catharines	George A. Graham et al.	Port Arthur	284	B1	10, 000
1888	Pat Kerwin	St. Catharines	George A. Graham et al.	Port Arthur	284	B1	10, 000
1889	P. Kenney	St. Catharines	George A. Graham et al.	Port Arthur	284	B1	10, 000
1890	P. Kenney	St. Catharines	George A. Graham et al.	Port Arthur	284	B1	10, 000
1891	P. Kenney	St. Catharines	George A. Graham et al.	Port Arthur	284	B1	10, 000
1892	P. Kenney	St. Catharines	George A. Graham et al.	Port Arthur	284	B1	10, 000

1893	P. Kenney	St. Catharines	George A. Graham et al.	Port Arthur	284	B1	10, 000
1894	P. Kenney	St. Catharines	George A. Graham et al.	Port Arthur	284	B1	10, 000
1895	Neil McKenzie	St. Catharines	George A. Graham et al.	Port Arthur	284	B1	10, 000
1896	Neil McKenzie	St. Catharines	George A. Graham et al.	Port Arthur	284	B1	10, 000
1897	Neil McKenzie	St. Catharines	George A. Graham et al.	Port Arthur	284	B1	10, 000
1898	Neil McKenzie	St. Catharines	R. Thompson	Hamilton	284	B1	10, 000
1899	Neil McKenzie	St. Catharines	R. Thompson	Hamilton	284	B1	10, 000
1900	Archie McInnes	Tiverton	William J. Pulling	Windsor	284	B1	10, 000
1901	Archie McInnes	Tiverton	William J. Pulling	Windsor	284	B1	10, 000
1902	Archie McInnes	Tiverton	Archibald McInnes	Tiverton	284	B1	10, 000
1903	Archie McInnes	Tiverton	Archibald McInnes	Tiverton	284	B1	10, 000
1904	Archie McInnes	Tiverton	Archibald McInnes	Tiverton	284	B1	10, 000
1905	Archie McInnes	Tiverton	Archibald McInnes	Tiverton	284	B1	10, 000
1906	Archie McInnes	Tiverton	Archibald McInnes	Tiverton	284	B1	10, 000
1907	Archie McInnes	Tiverton	Archibald McInnes	Tiverton	284	B1	10, 000
1908	Archie McInnes	Tiverton	Archibald McInnes	Tiverton	284	B1	10, 000
1909	McVickers	Toronto	Haney & Miller	Toronto	284	B1	6, 000
1910	H. Miller	Toronto	Haney & Miller	Toronto	284	B1	6, 000
1911	H. Miller	Toronto	Haney & Miller	Toronto	284	B1	6, 000
1912	H. Miller	Toronto	Haney & Miller	Toronto	284	B1	6, 000
1913	H. Miller	Toronto	Haney & Miller	Toronto	284	B1	6, 000
1914	H. Miller	Toronto	Haney & Miller	Toronto	284	B1	6, 000
1915	H. Miller	Toronto	Haney & Miller	Toronto	284	B1	6, 000
1916	H. Miller	Toronto	Haney & Miller	Toronto	284	B1	6, 000
1917	James Smith	Deseronto	Haney & Miller	Toronto	284	B1	6, 000
1918	James Smith	Deseronto	Haney & Miller	Toronto	284	B1	6, 000

Source: Association of Canadian Lake Underwriters. ***Lake Vessel Registers*****; *Directory of the Marine Interests of the Great Lakes, Comprising a Complete List of All Vessels Navigating the Lakes*; *Dominion of Canada Vessel Register: List of Vessels on the Registry Books*; *Great Lakes Marine Register*; Inland Lloyd's.** ***Register of British Shipping on Inland Waters. Register of the Ships of the Lakes and River St. Lawrence.***

APPENDIX G: PARTIAL LIST OF WELLAND SAILING CANAL SHIPS

Builder	City	Province/State	Country	Ship Name	Built	Length	Beam	Depth	Tonnage	Masts	Rig
Lewis Shickluna	St. Catharines	Ontario	Canada	Breeze	1846	120	26	11	360	2	Brig
Lewis Shickluna	St. Catharines	Ontario	Canada	New Brunswick	1847	129	23	11	296	3	Schooner
Lewis Shickluna	St. Catharines	Ontario	Canada	L. Shickluna	1847	119	21	9	201	2	Schooner
Lewis Shickluna	St. Catharines	Ontario	Canada	Lafayette Cook	1851	121	22	10	291	3	Brig
Lewis Shickluna	St. Catharines	Ontario	Canada	Malta	1853	138	24	8	198	3	Schooner
Lewis Shickluna	St. Catharines	Ontario	Canada	Gibraltar	1854	138	26	11	320	3	Bark
Lewis Shickluna	St. Catharines	Ontario	Canada	Mary Ann	1855	130	23	10	270	3	Schooner
Lewis Shickluna	St. Catharines	Ontario	Canada	Teresa	1855	128	23	10	250	3	Schooner
Lewis Shickluna	St. Catharines	Ontario	Canada	Louisa	1856	129	23	10	233	3	Bark
Lewis Shickluna	St. Catharines	Ontario	Canada	Saint Andrews	1856	116	23	11	202	3	Schooner
Lewis Shickluna	St. Catharines	Ontario	Canada	Sir Edmund W. Head	1856	131	25	11	338	3	Schooner
Lewis Shickluna	St. Catharines	Ontario	Canada	Pride of Canada	1859	136	26	11	336	3	Bark
Lewis Shickluna	St. Catharines	Ontario	Canada	Prince of Wales	1860	137	23	12	305	3	Bark
Lewis Shickluna	St. Catharines	Ontario	Canada	Canada	1861	143	26	12	399	3	Bark
Lewis Shickluna	St. Catharines	Ontario	Canada	Cambria	1862	141	26	12	344	3	Schooner
Lewis Shickluna	St. Catharines	Ontario	Canada	Empire State	1862	132	30	12	318	3	Schooner
Lewis Shickluna	St. Catharines	Ontario	Canada	Mary Jane	1862	142	26	12	345	3	Bark
Lewis Shickluna	St. Catharines	Ontario	Canada	S.D. Woodruff	1862	134	26	12	340	3	Bark

Lewis Shickluna	St. Catharines	Ontario	Canada	Pride of America	1863	134	23	12	296	3	Bark
Lewis Shickluna	St. Catharines	Ontario	Canada	Valetta	1864	137	26	12	407	3	Bark
Lewis Shickluna	St. Catharines	Ontario	Canada	Clyde	1864	136	24	12	293	3	Schooner
Lewis Shickluna	St. Catharines	Ontario	Canada	Mary Merritt	1865	138	26	12	340	3	Bark
Lewis Shickluna	St. Catharines	Ontario	Canada	Bessie Barwick	1866	135	26	11	296	3	Schooner
Lewis Shickluna	St. Catharines	Ontario	Canada	Jane C. Woodruff	1866	139	26	11	228	3	Schooner
Lewis Shickluna	St. Catharines	Ontario	Canada	Fanny Campbell	1868	138	26	11	310	3	Bark
Lewis Shickluna	St. Catharines	Ontario	Canada	Thomas Clark Street	1869	138	26	12	360	3	Bark
Lewis Shickluna	St. Catharines	Ontario	Canada	J.G. McGrath	1870	124	26	12	219	2	Schooner
Lewis Shickluna	St. Catharines	Ontario	Canada	Jennie C. Graham	1871	144	27	12	450	3	Bark
Lewis Shickluna	St. Catharines	Ontario	Canada	Augusta	1872	135	26	12	343	3	Bark
Lewis Shickluna	St. Catharines	Ontario	Canada	Detroit	1872	143	26	12	316	3	Schooner
Lewis Shickluna	St. Catharines	Ontario	Canada	Mary Battle	1872	139	26	11	316	3	Bark
Lewis Shickluna	St. Catharines	Ontario	Canada	James R. Benson	1873	139	25	11	344	3	Schooner
Lewis Shickluna	St. Catharines	Ontario	Canada	Magellan	1873	142	26	12	370	3	Bark
Lewis Shickluna	St. Catharines	Ontario	Canada	Manzanilla	1873	134	26	12	340	3	Bark
Lewis Shickluna	St. Catharines	Ontario	Canada	Sovereign	1873	140	24	12	400	3	Bark
Lewis Shickluna	St. Catharines	Ontario	Canada	Elgin	1874	139	26	12	330	3	Bark
Lewis Shickluna	St. Catharines	Ontario	Canada	Guelph	1874	128	25	11	280	3	Schooner
Lewis Shickluna	St. Catharines	Ontario	Canada	Sylvester Neelon	1874	131	26	12	291	3	Schooner
Lewis Shickluna	St. Catharines	Ontario	Canada	Sir C.T. Van Straubenzie	1875	128	26	12	317	3	Schooner
Lewis Shickluna	St. Catharines	Ontario	Canada	Saint Louis	1877	128	26	12	314	3	Bark
Calvin, Cook, & Company	Garden Island	Ontario	Canada	Quebec	1845	114	26	10	280	2	Brig

Calvin, Cook, & Company	Garden Island	Ontario	Canada	Liverpool	1845	118	26	10	350	2	Brig
John Oades	Pt. Metcalf	Ontario	Canada	Manchester	1847	128	24	9	254	2	Brig
George Thurston	Kingston	Ontario	Canada	Arabia	1852	132	26	12	309	3	Bark
George Nelson Ault	Portsmouth	Ontario	Canada	Queen of the Lakes	1853	133	22	11	344	3	Schooner
J & J Abbey	Pt. Robinson	Ontario	Canada	Sir Charles Napier	1854	135	25	10	320	3	Brig
Alexander Muir	Pt. Dalhousie	Ontario	Canada	Ayr	1855	137	25	10	394	2	Schooner
J. White	Hamilton	Ontario	Canada	Andrew Stevens	1855	141	26	12	417	3	Bark
George Thurston	Kingston	Ontario	Canada	Orkney Lass	1856	122	24	11	282	2	Brig
Donaldson & Andrews	St. Catharines	Ontario	Canada	R.H. Rae	1857	136	23	11	344	3	Bark
J & J Abbey	Port Robinson	Ontario	Canada	E.S. Adams	1857	135	26	12	341	3	Bark
George Thurston	Kingston	Ontario	Canada	George Thurston	1857	135	26	12	307	3	Bark
Henry Rooney	Garden Island	Ontario	Canada	Southampton	1861	135	24	12	345	3	Schooner
Marlton	Goderich	Ontario	Canada	Maitland	1861	137	25	13	253	3	Bark
John Oades	Wolfe Island	Ontario	Canada	General Burnside	1862	138	25	11	308	3	Schooner
J & J Abbey	Port Robinson	Ontario	Canada	China	1863	125	26	11	249	2	Schooner
Melancthon Simpson	St. Catharines	Ontario	Canada	Jessie Drummond	1864	135	23	12	292	3	Bark
Donaldson & Andrews	Port Dalhousie	Ontario	Canada	Cecelia	1865	136	24	11	351	3	Schooner
Henry Rooney	Garden Island	Ontario	Canada	Henry Rooney	1868	136	25	11	295	2	Brig
W.H. Andrews & Son	Pt. Dalhousie	Ontario	Canada	E.H. Rutherford	1869	134	22	11	286	2	Schooner
Henry Rooney	Garden Island	Ontario	Canada	Onondaga	1870	137	26	12	320	3	Schooner
Henry Rooney	Garden Island	Ontario	Canada	Sweden	1870	136	26	12	354	3	Bark
Melancthon Simpson	St. Catharines	Ontario	Canada	Dundee	1870	126	24	10	262	3	Schooner
W. Chisholm	Oakville	Ontario	Canada	Victoria	1871	125	24	10	238	2	Schooner

Alexander Muir	Pt. Dalhousie	Ontario	Canada	Albatross	1871	137	26	12	317	3	Schooner
Alexander Muir	Pt. Dalhousie	Ontario	Canada	Albacore	1872	137	26	11	327	2	Schooner
Lemuel McDermand	Pt. Burwell	Ontario	Canada	Lady Dufferin	1872	135	24	11	356	3	Schooner
Lemuel McDermand	Pt. Burwell	Ontario	Canada	Edward Blake	1872	136	24	12	360	3	Bark
George Hardison	Pt. Colbourne	Ontario	Canada	Emerald	1872	139	29	12	343	3	Schooner
J & J Abbey	Pt. Robinson	Ontario	Canada	Lisgar	1872	139	26	11	360	2	Schooner
J & J Abbey	Pt. Robinson	Ontario	Canada	Gleniffer	1873	135	26	12	328	2	Schooner
S. Andrews & Son	Pt. Dalhousie	Ontario	Canada	George Mortimer Neelon	1873	139	26	12	334	3	Schooner
William Youelle & Co.	Pt. Burwell	Ontario	Canada	Lady Macdonald	1873	137	26	9	410	3	Schooner
H. Jenking	Walkerville	Ontario	Canada	Laura	1873	140	23	12	348	3	Schooner
Beaupre	Millhaven	Ontario	Canada	Oliver Mowat	1873	131	26	10	347	3	Schooner
Henry Rooney	Garden Island	Ontario	Canada	Siberia	1874	136	25	12	360	3	Schooner
Melancthon Simpson	St. Catharines	Ontario	Canada	Shandon	1874	140	24	12	350	3	Bark
J & J Abbey	Port Robinson	Ontario	Canada	Grantham	1874	140	23	11	384	3	Schooner
S.D. Andrews	Pt. Dalhousie	Ontario	Canada	T.R. Merritt	1874	138	26	12	374	3	Schooner
J. Willard	Welland	Ontario	Canada	Richard Morwood	1874	138	26	11	350	3	Schooner
W. Yewell	Pt. Burwell	Ontario	Canada	Mary Ann Lydon	1874	121	26	10	245	2	Schooner
G. Pontine	Pt. Burwell	Ontario	Canada	Lilly Hamilton	1874	137	26	11	321	3	Schooner
Henry Rooney	Garden Island	Ontario	Canada	Bavaria	1878	145	26	13	376	3	Schooner
George Goble	Oswego	New York	United States	Titan	1856	132	26	12	434	3	Schooner
George Goble	Oswego	New York	United States	William Sanderson	1857	136	26	12	412	3	Schooner
George Goble	Oswego	New York	United States	Bermuda	1860	136	26	12	400	2	Schooner
George Goble	Oswego	New York	United States	W.I. Preston	1861	136	25	11	279	2	Schooner

George Goble	Oswego	New York	United States	George Goble	1862	137	26	12	319	2	Schooner
George Goble	Oswego	New York	United States	Senator Blood	1863	125	26	10	350	3	Schooner
George Goble	Oswego	New York	United States	Montauk	1864	136	27	12	310	3	Schooner
George Goble	Oswego	New York	United States	Bahama	1864	136	26	13	333	3	Schooner
George Goble	Oswego	New York	United States	Knight Templar	1865	136	26	12	290	2	Schooner
George Goble	Oswego	New York	United States	Olive Branch	1866	110	25	8	325	2	Schooner
George Goble	Oswego	New York	United States	George C. Finney	1867	130	26	10	301	3	Schooner
George Goble	Oswego	New York	United States	Jamaica	1867	139	20	11	318	3	Schooner
George Goble	Oswego	New York	United States	Nevada	1867	136	26	11	318	3	Schooner
George Goble	Oswego	New York	United States	Florida	1868	142	26	11	299	3	Schooner
George Goble	Oswego	New York	United States	Guiding Star	1869	139	26	11	324	3	Schooner
George Goble	Oswego	New York	United States	John T. Mott	1869	142	26	12	319	3	Schooner
George Goble	Oswego	New York	United States	Madeira	1871	143	27	11	320	3	Schooner
George Goble	Oswego	New York	United States	West Side	1871	138	26	12	324	2	Schooner
George Goble	Oswego	New York	United States	Nassau	1872	137	25	11	303	3	Schooner
George Goble	Oswego	New York	United States	Daniel Lyons	1873	143	26	11	318	3	Bark
George Goble	Oswego	New York	United States	Atlanta	1873	143	26	11	318	3	Bark
George Goble	Oswego	New York	United States	Sam Cook	1873	144	26	11	318	2	Schooner
George Goble	Oswego	New York	United States	M.J. Cummings	1873	143	25	12	325	3	Schooner
George Goble	Oswego	New York	United States	J. Maria Scott	1874	142	26	12	348	3	Schooner
George Goble	Oswego	New York	United States	Bolivia	1874	143	26	12	360	3	Schooner
George Goble	Oswego	New York	United States	Leadville	1879	136	26	12	345	3	Schooner
Jacob & Banta	Buffalo	New York	United States	H.B. Bishop	1847	122	25	10	263	3	Schooner

Andrew Miller	Oswego	New York	United States	Belle Sheridan	1852	123	23	10	265	2	Schooner
G. S. Weeks	Oswego	New York	United States	Indiana	1852	142	25	11	261	3	Bark
Baker & Co.	Oswego	New York	United States	Danube	1853	134	25	12	278	3	Bark
Unknown	Buffalo	New York	United States	Emily A. Rodofson	1854	138	26	10	385	3	Bark
Unknown	Sackett's Harbor	New York	United States	Sonora	1854	135	25	11	368	3	Bark
John Oades	Clayton	New York	United States	Republic	1854	139	26	11	314	3	Schooner
Asa Wilcox	Three Mile Bay	New York	United States	Colonel Camp	1854	137	26	10	350	3	Bark
George R. Rogers	Oswego	New York	United States	Young America	1854	124	25	10	243	2	Schooner
James Navagh	Oswego	New York	United States	Augusta	1855	128	26	11	333	2	Schooner
Asa Wilcox	Three Mile Bay	New York	United States	George Steele	1855	137	26	10	271	2	Schooner
Bidwell & Banta	Buffalo	New York	United States	Ostrich	1856	140	26	11	279	2	Schooner
Bidwell & Banta	Buffalo	New York	United States	C.N. Johnson	1856	138	26	11	288	3	Schooner
Bidwell & Banta	Buffalo	New York	United States	Andrew J. Rich	1856	138	26	11	374	3	Schooner
S.C. Jones	Buffalo	New York	United States	Athenian	1856	136	26	11	283	3	Schooner
S. Johnson	Clayton	New York	United States	Eagle Wing	1856	133	25	11	362	2	Schooner
A. Miller	Oswego	New York	United States	Algerine	1856	136	26	10	300	2	Schooner
George R. Rogers	Oswego	New York	United States	E. W. Cross	1856	132	26	12	434	3	Brig
George R. Rogers	Oswego	New York	United States	Dreadnaught	1856	132	26	12	434	2	Schooner
James Baker	Oswego	New York	United States	Minnehaha	1857	125	25	10	172	2	Schooner
Stevens	Irving	New York	United States	Jupiter	1857	138	26	10	253	2	Schooner
Asa Wilcox	Three Mile Bay	New York	United States	Dane	1857	137	26	11	374	2	Schooner
Asa Wilcox	Three Mile Bay	New York	United States	J.B. Penfield	1861	136	26	10	292	2	Schooner
Asa Wilcox	Three Mile Bay	New York	United States	Henry W. Hoag	1862	138	26	12	389	2	Schooner

Andrew Miller	Oswego	New York	United States	Russia	1862	137	26	11	305	2	Schooner
John Oades	Clayton	New York	United States	Adirondack	1862	139	26	9	300	2	Schooner
John Kelderhouse	Buffalo	New York	United States	J. Hazard Hartzel	1863	130	25	10	329	2	Schooner
William Crosthwaite	Buffalo	New York	United States	Jennie and Anne	1863	137	26	12	255	2	Schooner
John Oades	Clayton	New York	United States	M.F. Merrick	1863	137	25	11	295	3	Schooner
John Oades	Clayton	New York	United States	Montana	1864	138	26	11	301	3	Schooner
Pierson	Ogdensburg	New York	United States	South West	1866	137	26	11	292	3	Schooner
S. Johnson	Clayton	New York	United States	Montgomery	1866	136	26	12	299	3	Bark
G. Johnson	Clayton	New York	United States	Mont Blanc	1867	138	26	11	289	3	Schooner
Asa Wilcox	Three Mile Bay	New York	United States	J.E. Gilmore	1867	138	25	11	292	2	Schooner
James Navagh	Oswego	New York	United States	Cossack	1867	137	25	11	319	2	Schooner
Read	Hudson	New York	United States	C. G. Mixer	1867	130	26	11	294	3	Schooner
J. Martel	Tonawanda	New York	United States	Kate Kelly	1867	126	26	10	257	3	Schooner
Field	Sackett's Harbor	New York	United States	Elvina	1868	138	26	11	297	2	Schooner
Diodat Rogers	Sodus	New York	United States	Charger	1868	136	25	10	277	2	Schooner
L. Reed	Henderson	New York	United States	Phoenix	1868	121	26	9	212	3	Schooner
Andrew Miller & Co.	Oswego	New York	United States	Havana	1871	135	25	10	306	3	Schooner
Andrew Miller & Co.	Oswego	New York	United States	Gilbert Mollison	1871	137	26	11	316	2	Schooner
Andrew Miller	Youngstown	New York	United States	Cheeney Ames	1873	136	26	11	298	2	Schooner
P. Lummeree	Oswego	New York	United States	George B. Sloan	1873	138	26	11	314	3	Schooner
Parsons and Humble	Tonawanda	New York	United States	W.H. Rounds	1875	138	26	11	309	3	Schooner
Andrew Miller	Oswego	New York	United States	Riverside	1880	137	26	11	314	2	Schooner
James Averill	Chicago	Illinois	United States	S.F. Gale	1847	123	24	10	266	2	Brig

Miller Brothers	Chicago	Illinois	United States	Lincoln Dall	1869	116	25	9	206	2	Schooner
Miller Brothers	Chicago	Illinois	United States	Iver Lawson	1869	118	26	9	170	2	Schooner
S. Kempton	Chicago	Illinois	United States	Lomie A. Burton	1873	128	26	10	203	3	Schooner
James Averill	Milwaukee	Wisconsin	United States	Utica	1846	131	26	11	334	3	Bark
James Averill	Milwaukee	Wisconsin	United States	Nucleus	1848	140	25	10	329	3	Bark
G.L. Rand	Manitowoc	Wisconsin	United States	Nabob	1862	138	27	12	310	3	Schooner
John Gregory	Green Bay	Wisconsin	United States	Libbie Nau	1867	129	26	10	232	2	Schooner
Jasper Hanson	Manitowoc	Wisconsin	United States	Louisa McDonald	1869	123	26	8	192	3	Schooner
Fred Hamilton	Sheboygan	Wisconsin	United States	Evening Star	1869	126	25	9	214	3	Schooner
Fred Hamilton	Sheboygan	Wisconsin	United States	City of Sheboygan	1871	135	26	10	261	3	Schooner
Henry B. Burger	Manitowoc	Wisconsin	United States	City of Manitowoc	1872	130	26	10	311	3	Schooner
Wolf & Davidson	Milwaukee	Wisconsin	United States	Penokee	1872	139	26	11	332	3	Schooner
Peter Larson	Manitowoc	Wisconsin	United States	Charles Luling	1873	123	26	9	223	2	Schooner
A. Gibson	Winnecone	Wisconsin	United States	Reuben Doud	1873	137	26	11	352	3	Schooner
William Johnson	Sheboygan	Wisconsin	United States	Arendal	1873	124	25	9	210	3	Schooner
Wolf & Davidson	Milwaukee	Wisconsin	United States	George G. Houghton	1873	137	26	12	332	3	Schooner
Milwaukee Ship Yard Co.	Milwaukee	Wisconsin	United States	Myosotis	1874	137	26	11	333	3	Schooner
S. Anderson	Green Bay	Wisconsin	United States	S. Anderson	1874	141	25	10	282	3	Schooner
Wolf & Davidson	Milwaukee	Wisconsin	United States	Lem Ellsworth	1874	138	26	11	342	3	Schooner
Rand & Burger	Manitowoc	Wisconsin	United States	Lottie Cooper	1876	131	27	9	266	3	Schooner
Rand & Burger	Manitowoc	Wisconsin	United States	John V. Jones	1876	125	27	9	201	2	Schooner
D.H. Corbin	Grand Rapids	Michigan	United States	E.B. Morgan	1847	143	24	10	310	3	Bark
J.L. Woolverton	Detroit	Michigan	United States	Fortune	1853	139	26	9	372	2	Schooner

Gordon Campbell	Detroit	Michigan	United States	Sardinia	1860	137	26	9	384	3	Schooner
McDole & Lester	Marine City	Michigan	United States	E. Kanter	1862	133	27	11	272	3	Schooner
Linn & Craig	Detroit	Michigan	United States	Mojave	1863	137	26	12	400	3	Bark
Stewart McDonald	Gibraltar	Michigan	United States	Jane Ralston	1866	137	26	11	261	3	Schooner
Alexander Muir	Pt. Huron	Michigan	United States	David A. Wells	1866	134	26	12	310	2	Schooner
Stupinski	Detroit	Michigan	United States	John Miner	1866	134	26	10	273	3	Bark
J. P. Arnold	Pt. Huron	Michigan	United States	Mary A. Daryaw	1866	124	27	8	195	2	Schooner
Simon Langell	St. Clair	Michigan	United States	Amoskeag	1867	135	26	10	244	3	Schooner
Arnold	Marine City	Michigan	United States	Keepsake	1867	133	27	11	287	3	Schooner
J. M. Jones	Detroit	Michigan	United States	Marquette	1869	139	26	11	323	3	Schooner
Alexander Muir	Pt. Huron	Michigan	United States	William G. Keith	1869	124	26	9	211	3	Schooner
Morley	Marine City	Michigan	United States	Charles H. Johnson	1870	137	26	12	332	3	Schooner
Campbell & Owen	Detroit	Michigan	United States	Monticello	1870	138	26	11	316	2	Schooner
Campbell & Owen	Detroit	Michigan	United States	Reindeer	1870	134	26	12	306	3	Schooner
T. Arnold	Pt. Huron	Michigan	United States	E. Fitzgerald	1870	135	26	11	298	3	Schooner
James Davidson	Wenona	Michigan	United States	E.M. Davidson	1871	138	26	11	280	3	Schooner
A. Turner	Trenton	Michigan	United States	Alert	1871	143	28	8	360	2	Schooner
Fitzgerald & Leighton	Algonac	Michigan	United States	J.A. Smith	1871	138	26	10	255	2	Schooner
F. A. Carpenter	Wenona	Michigan	United States	Julia B. Merrill	1872	125	26	9	200	3	Schooner
James Navagh	Algonac	Michigan	United States	John R. Noyes	1872	137	25	12	334	2	Schooner
J. P. Arnold	Muskegon	Michigan	United States	Lyman M. Davis	1873	123	27	8	225	2	Schooner
W. Brown	Algonac	Michigan	United States	Issac G. Jenkins	1873	137	26	12	327	3	Schooner
Alexander Muir	Pt. Huron	Michigan	United States	Pulaski	1873	136	26	11	349	3	Schooner

John Oades	Detroit	Michigan	United States	Mineral State	1873	137	26	12	295	3	Schooner
Jacobson & Co.	Allegan	Michigan	United States	E.J. McVea	1873	140	26	10	291	3	Schooner
G. King	Marine City	Michigan	United States	Charles H. Weeks	1873	134	26	11	324	2	Schooner
J. Rice	Marine City	Michigan	United States	Charles Spademan	1873	134	26	11	307	3	Schooner
A. A. Turner	Trenton	Michigan	United States	A.C. Keating	1874	138	26	11	326	3	Schooner
James Navagh	Algonac	Michigan	United States	Oliver Mitchell	1874	137	26	11	320	2	Schooner
James Navagh	Algonac	Michigan	United States	Bell Mitchell	1874	137	26	11	320	3	Schooner
John B. Martel	Saugatuck	Michigan	United States	George M. Case	1874	137	26	12	361	3	Schooner
A. A. Turner	Trenton	Michigan	United States	Monguagon	1874	137	26	11	301	3	Schooner
A. A. Turner	Trenton	Michigan	United States	Wayne	1875	142	26	12	322	3	Schooner
A. J. Footlander	Muskegon	Michigan	United States	George A. Marsh	1882	135	27	9	243	3	Schooner
Jamieson	Maumee	Ohio	United States	Alvin Bronson	1849	119	25	8	192	2	Schooner
Jones W & G & W	Lorain	Ohio	United States	Hency C. Winslow	1853	136	25	8	362	3	Schooner
William Jones	Lorain	Ohio	United States	William F. Allen Jr.	1853	137	25	8	385	3	Schooner
Harvey Stevens	Cleveland	Ohio	United States	Lady of the Lake	1853	139	23	11	317	2	Schooner
Roderick Calkins	Ohio City	Ohio	United States	North Star	1853	138	26	11	357	3	Bark
Roderick Calkins	Ohio City	Ohio	United States	Ilinois	1853	139	26	12	351	3	Bark
Ira Laffrinier	Ohio City	Ohio	United States	Chieftain	1853	140	25	11	375	3	Bark
Laffrinier & Stevenson	Cleveland	Ohio	United States	Samuel Robinson	1853	127	26	12	235	2	Schooner
Peck & Masters	Cleveland	Ohio	United States	Ocean Wave	1853	129	25	10	214	3	Schooner
Laffrinier & Stevenson	Ohio City	Ohio	United States	William Sturges	1853	140	25	8	364	2	Schooner
Stephens & Presley	Ohio City	Ohio	United States	Black Hawk	1854	138	26	8	385	2	Brig
Quayle & Warten	Ohio City	Ohio	United States	John G. Deshler	1854	138	26	8	374	2	Brig

Evaline Bates	Milan	Ohio	United States	Live Yankee	1854	139	24	10	260	2	Schooner
Cherry	Huron	Ohio	United States	International	1854	139	26	12	389	2	Schooner
Roderick Calkins	Cleveland	Ohio	United States	Phalarope	1854	136	25	11	371	2	Schooner
Roderick Calkins	Cleveland	Ohio	United States	William Case	1855	139	26	11	378	2	Schooner
Quayle & Martin	Cleveland	Ohio	United States	Yorktown	1855	136	26	12	372	2	Schooner
Stephens & Presley	Cleveland	Ohio	United States	Cuyahoga	1855	121	26	11	323	2	Brig
Laffrinier & Stevenson	Cleveland	Ohio	United States	Lark	1855	138	26	11	368	2	Schooner
G. W. Jones	Cleveland	Ohio	United States	Gertrude	1855	137	26	8	370	2	Schooner
Joel Norton	Fairport	Ohio	United States	Matt Root	1855	137	26	12	450	2	Schooner
Issac W. Nicholas	Vermillion	Ohio	United States	Wellington	1855	128	24	10	225	2	Schooner
Roderick Calkins	Cleveland	Ohio	United States	Kate Richmond	1855	127	26	11	240	2	Schooner
Quayle & Martin	Cleveland	Ohio	United States	John F. Warner	1855	127	26	11	341	2	Schooner
William Jones	Lorain	Ohio	United States	Kyle Spangler	1856	131	26	11	350	2	Schooner
D. Fox	Lorain	Ohio	United States	Resolute	1856	125	26	11	281	2	Schooner
Cheney	Vermillion	Ohio	United States	F. T. Barney	1856	131	25	11	354	2	Schooner
Issac W. Nicholas	Vermillion	Ohio	United States	New London	1856	129	26	11	339	2	Schooner
Henry Kelley	Milan	Ohio	United States	Surprise	1856	121	25	11	299	3	Schooner
Evaline Bates	Milan	Ohio	United States	Cuba	1856	127	25	11	295	2	Schooner
Stephens & Presley	Cleveland	Ohio	United States	Miami	1856	137	26	10	248	2	Schooner
Peck & Masters	Cleveland	Ohio	United States	Midnight	1856	136	26	11	382	3	Schooner
Quayle & Martin	Cleveland	Ohio	United States	Dean Richmond	1856	135	26	12	380	2	Schooner
Quayle & Martin	Cleveland	Ohio	United States	Star of Hope	1856	136	26	12	276	2	Schooner
Gilmore	Perrysburg	Ohio	United States	Maize	1856	136	26	11	356	2	Schooner

Merry & Gay	Milan	Ohio	United States	Oriole	1857	141	26	12	323	3	Schooner
Issac W. Nicholas	Vermillion	Ohio	United States	Exchange	1857	138	26	12	292	2	Schooner
Jones & Bissett	Cleveland	Ohio	United States	Tracy J. Bronson	1857	138	26	11	381	2	Schooner
Issac W. Nicholas	Vermillion	Ohio	United States	S. H. Kimball	1861	138	26	12	318	3	Schooner
Henry Kelley	Milan	Ohio	United States	Milan	1861	121	25	10	277	2	Schooner
Henry Kelley	Milan	Ohio	United States	Jura	1862	129	25	10	310	2	Schooner
William Shupe	Madison	Ohio	United States	G. G. Cooper	1862	139	26	12	401	2	Schooner
Bailey Brothers	Madison	Ohio	United States	Alida Jane Rogers	1862	138	26	12	340	3	Schooner
Bailey Brothers	Milan	Ohio	United States	William Shupe	1862	129	25	10	240	2	Schooner
Roderick Calkins & Blaisedell	Cleveland	Ohio	United States	Charles A. King	1863	140	26	12	316	3	Schooner
Quayle & Martin	Cleveland	Ohio	United States	St. Lawrence	1863	137	26	12	281	2	Schooner
William Shupe	Milan	Ohio	United States	Atmosphere	1863	135	25	11	275	3	Schooner
George R. Rogers	Toledo	Ohio	United States	A. Boody	1863	137	25	11	287	3	Schooner
William A. Jones	Lorain	Ohio	United States	Minerva	1863	126	26	10	293	3	Schooner
William Shupe	Milan	Ohio	United States	Amaranth	1864	135	25	11	330	2	Schooner
William A. Jones	Lorain	Ohio	United States	H.G. Cleveland	1867	137	26	10	264	3	Schooner
Quayle & Martin	Cleveland	Ohio	United States	Wavertree	1867	128	26	11	343	2	Schooner
Shephard B. Grover	Vermillion	Ohio	United States	Anna P. Grover	1868	137	26	10	247	2	Schooner
Keith, C.	Cleveland	Ohio	United States	John S. Richards	1869	138	26	11	273	3	Schooner
James Davidson	Toledo	Ohio	United States	Laura Belle	1870	138	26	11	269	3	Schooner
Bailey Brothers	Toledo	Ohio	United States	George W. Davis	1872	136	26	11	299	3	Schooner
Bailey Brothers	Toledo	Ohio	United States	John Wesley	1872	135	26	12	301	2	Schooner
Bailey Brothers	Toledo		United States	P.B. Locke	1873	136	26	11	285	3	Schooner

Dave F. Edwards	Toledo	Ohio	United States	St. Peter	1873	136	26	12	290	3	Schooner
Bailey Brothers	Toledo	Ohio	United States	Abbie L. Andrews	1873	136	26	10	278	3	Schooner
John Duff	Pt. Clinton	Ohio	United States	C.B. Benson	1873	136	26	12	298	3	Schooner

Source: Association of Canadian Lake Underwriters. ***Lake Vessel Registers; Blue Book of American Shipping: Marine and Naval Directory of the United States; Classification of Lake Vessels and Barges; Directory of the Marine Interests of the Great Lakes, Comprising a Complete List of All Vessels Navigating the Lakes; Dominion of Canada Vessel Register: List of Vessels on the Registry Books; Great Lakes Marine Register; Register of British Shipping on Inland Waters. Vessel Classification of Canadian Hulls; Marine Record;*** **National Board of Lake Underwriters.** ***Lake Vessel Register; Register o the Ships of the Lakes and River St. Lawrence.***

APPENDIX H: CORRESPONDANCE BETWEEN POINT ANNE QUARRIES AND THE TORONTO DEPUTY HARBOUR MASTER REGARDING *SLIGO* AS A NAVIGATION HAZARD.

M. J. HANEY
PRESIDENT

J. F. M. STEWART
MANAGER

A. M. HARNWELL
SECRETARY-TREASURER

VESSELS
LAKE MICHIGAN
JOHN ROLPH
SOPHIA MINCH
D. F. DOBBINS
SLIGO

Point Anne Quarries Limited

A. G. BENNETT
SUPERINTENDENT
POINT ANNE

F. W. THOMPSON
SUPERINTENDENT
JARVIS STREET

QUARRIES—POINT ANNE, ONTARIO—PHONE BELLEVILLE 457
STORAGE SHED—FOOT OF JARVIS STREET, TORONTO—PHONE MAIN 1976
HEAD OFFICE—McKINNON BUILDING, TORONTO—PHONE MAIN 2793

Toronto Sept. 12, 1918.

Mr. John Allen,

Deputy Harbor Master,

Toronto.

Dear Sir:-

With reference to your telephone conversation to-day might say that we have pulled the spar out of the Barge "SLIGO" and she is no more a menace to navigation. In sounding we find she is in 70 feet of water, which leaves 56 feet of water over her decks.

Yours very truly,

FWT/M.

F. W. Thompson
per M.

MARINE SUPT.

Credit: Toronto Harbour Commission Archives.