

# Sloop Island Canal Boat: A Preliminary Report on the Phase III Study of an Early-Twentieth-Century Canal Boat Wreck

by Scott A. McLaughlin and Adam I. Kane

## Abstract

This paper presents the preliminary results of the Lake Champlain Maritime Museum's (LCMM) Phase III archaeological study of a late-19th-/early-20th-century canal boat sunk in Lake Champlain. The project was undertaken as an "off-site" archaeological study for the Pine Street Canal Superfund Site in order to comply with Section 106 of the National Historic Preservation Act. The Pine Street Canal in Burlington, Vt., contains five canal boats eligible for listing in the National Register of Historic Places. The canal boats' location inside a superfund site made their study impractical, and the environmental remedy for the site would adversely affect the five boats. This off-site mitigation on the Sloop Island Canal Boat (VT-CH-843) was undertaken during 2002 and 2003 as an alternative to studying the boats within the canal proper. The study focused on documenting the canal boat's construction and recovering the artifact collection from the vessel's cabin. Archaeological evidence indicates that the Sloop Island vessel was built between 1873 and 1915, and sank after 1925. Based on the cabin's complete artifact collection, the sinking appears to have been sudden, leaving the resident family little time to remove personal possessions. Historical research has yet to reveal the name of the vessel or the exact circumstances of its loss.

## Introduction

The year is 1925, and this night a winding tow of canal boats is plodding north along Lake Champlain toward Burlington. Canal boats have been a constant sight on the lake now for over 100 years, but the advent of truck transportation and improvements to the rail system have ensured that their days are waning.

On this night Lake Champlain claimed one of only a handful of canal boats still able to eke out an economic existence on the Northern Waterway between New York City and Montreal. This boat was in a tow of canal boats two abreast that stretched nearly a mile in length, all being pulled by a tugboat 100 feet ahead (Figure 1). From the vantage point of the rearmost boats, the tow looked like some strange gigantic water serpent with a smoking head, wriggling along the lake. The ill-fated boat was old – at least 10 years old – and it was a constant struggle for the family aboard to keep their home and livelihood afloat. All wooden boats leak, but the age of this boat combined with its heavy load of coal made working the pumps a chore necessary several times a day. Four bilge pumps, two in the bow and two in the stern, kept

too much water from accumulating in the hold. On this night, the chore at the pumps turned into a desperate race against the lake. We do not know exactly why the boat began to take on water – perhaps a bottom plank sprung – but the water came, and fast. The family, consisting of the father, pregnant mother and one child, was asleep in the cabin unaware that anything was amiss. Suddenly a neighbor yelled that their boat was sinking and everyone jumped out of bed. The father grabbed the toddler and rushed onto deck to see if his boat could be saved. The mother may have had a few moments in the cabin to grab her most precious possessions, but in the confusion much had to be left – furniture, clothes, tools, beds, food, dishes, utensils – little of it could be salvaged in time.

The boat was tied into the tow by cables attached to three cleats on its port (left looking forward) side. With three swift axe blows the cables were cut, and the boat was given to the lake. The family, now on the deck of the adjacent boat, looked on as their home disappeared from view. The descent to the bottom of the lake 90 feet below likely took less than 30 seconds. The bow hit the clay bottom first with the impact buckling the old hull. The cabin roof was ripped off as trapped air pushed toward the surface. The roof settled to the bottom just to the boat's port side. Some personal possessions floated back to the surface, but most stayed in the now disheveled

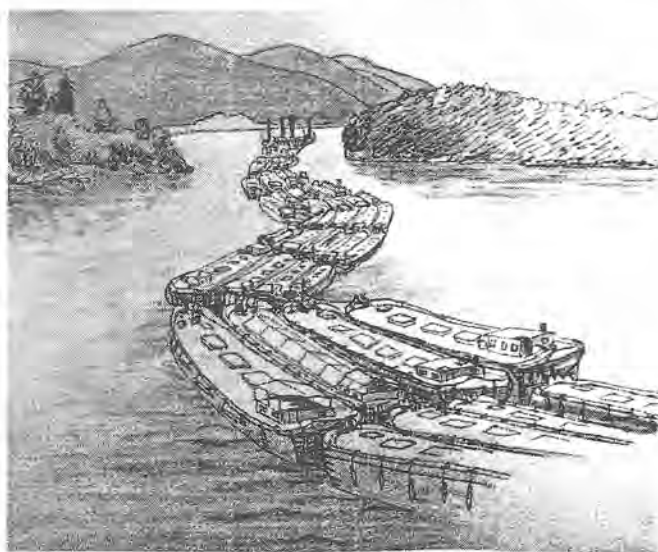


Figure 1. Canal boats towed by a side wheel steamer, 1895, drawn by Augusta W. Brown (courtesy of the New York State Museum).



Figure 2. Map of Lake Champlain showing the location of Sloop Island Canal Boat and the Pine Street Canal.

cabin. Back on the tow, many of the canalers had seen this happen before. It was a catastrophic event to the now homeless family, but the loss of an old canal boat carrying only coal was hardly newsworthy. Reports of the incident never made it to the local media and soon knowledge of the incident resided only in the minds of the few witnesses.

### Project Background

This vessel, known by researchers as the Sloop Island Canal Boat (VT-CH-843), was the focus of a Phase III mitigation undertaken by the Lake Champlain Maritime Museum

(LCMM) during 2002 and 2003. Although the results presented in this article are preliminary, LCMM researchers believe that this is one of the most in-depth archaeological investigations of a canal boat ever undertaken.

Eighty-odd years after the sinking, the event's physical remains were found by the Lake Champlain Maritime Museum during its systematic underwater remote sensing project, known as the Lake Champlain Underwater Cultural Resources Survey (Lake Survey). The 1998 sonar records clearly showed a canal boat sitting upright on the lake bottom near Sloop Island in Charlotte, Vermont (Figure 2). The vessel was given the designation "Wreck Z," as it was the 26<sup>th</sup> shipwreck located during the Lake Survey. Several weeks after its initial discovery archaeological divers inspected the site. Although often over used, the descriptor "time capsule" seemed quite appropriate for this wreck. The boat's intact nature and its sheer scale were immediately apparent to LCMM archaeologists. At 97 feet long, 17 feet 10 inches wide and 10 feet high, it was an impressive wooden structure on an otherwise featureless lake bottom. Based on these dimensions the Sloop Island vessel was built after 1873, often canal boats of this type continued to operate on Lake Champlain into the 1930s. Although the wreck's structure interested LCMM researchers, the contents of the cabin were identified as the site's most important feature. The cabin had the appearance of a jumbled mess with hundreds of disarticulated timbers strewn above artifacts on the cabin floor. Closer examination, however, showed that there was still considerable spatial integrity in the positioning of the numerous visible artifacts. In 1998, LCMM archaeologists recorded the site with underwater photographs, video, and a few key measurements. The wreck was then left as it was found. After its 1998 discovery there were no plans to conduct further documentation of the site (Sabick, Lessmann, and McLaughlin 2000:130-133).

At the same time that LCMM researchers were conducting the Lake Survey, a contentious environmental problem was being resolved in Burlington, Vermont. A small canal was excavated during the 1860s just south of the current location of the Burlington Wastewater Treatment Facility (Figure 3). As Burlington's waterfront boomed with the shipment of millions of board feet of lumber, the Pine Street Barge Canal, (as the small canal came to be known) was excavated to facilitate loading and unloading of canal boats. In the 1890s, Burlington's lumber industry collapsed, and other industries moved into the facilities around the Pine Street canal. For example, a coal gasification plant, which produced manufactured gas from coal and oil, was established next to the canal in 1895. In the process of creating manufactured gas, locally abundant wood chips were used as a filter. Waste products from this process included coal tar, fuel oil, tar-saturated wood chips, cinders, cyanide, and metals. These wastes were disposed of in the wetlands around the canal, leaving a legacy of contamination.

In 1983, the Pine Street Canal was placed on the National Priorities List as a "Superfund Site" by the Environmental Protection Agency. The descendant companies of those that

worked along the canal and the current landowners were charged with cleaning up the site. As part of this process, an archaeological study was conducted in the canal, which located five canal boats abandoned in it probably during the 1930s (Cohn 1996) (Figure 4). In 2001, an Historic Resources Study of the Pine Street Canal Superfund Site determined that the five canal boat wrecks were eligible for the National Register of Historic Places (McVarish, Klein and Cox 2001). The Vermont Division for Historic Preservation determined that the environmental remediation in the canal would adversely affect the canal boats. Regulators and the potentially responsible parties were left in a quandary about how to conduct an economically feasible archaeological study of these contaminated vessels in compliance with Section 106 of the National Historic Preservation Act. The answer lay on the bottom of the lake some 12 miles south of the Pine Street Canal through "off site" mitigation. The Sloop Island Canal Boat was of the same vintage as those in the Pine Street Canal. However, unlike the canal boats abandoned in the Pine Street Canal, the Sloop Island Canal Boat contained all of the arti-

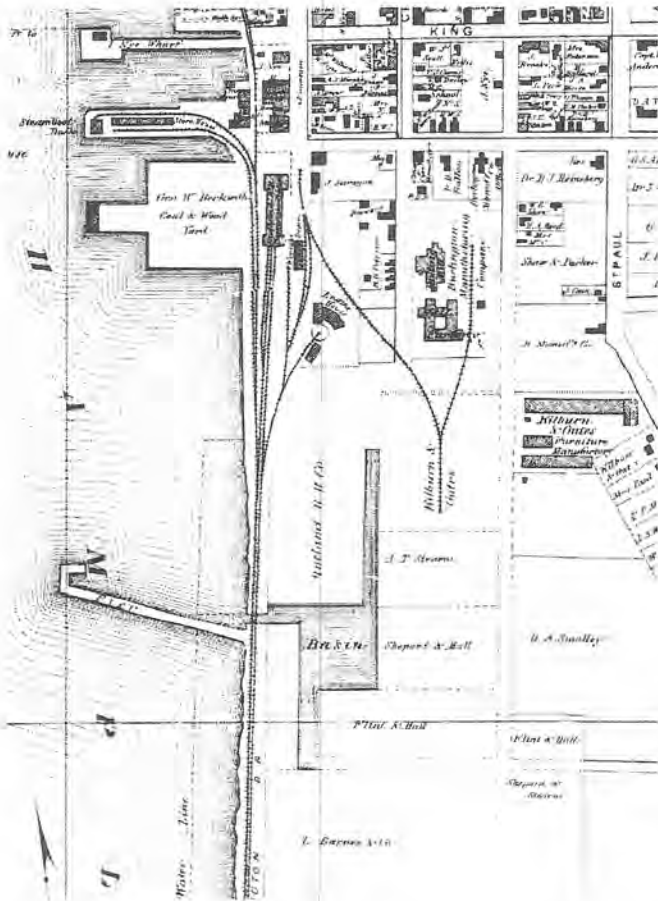


Figure 3. 1859 map of Burlington, Vermont, showing the Pine Street Barge Canal, labeled as "Basin" (from Beers, Ellis, and Soule 1869:23).

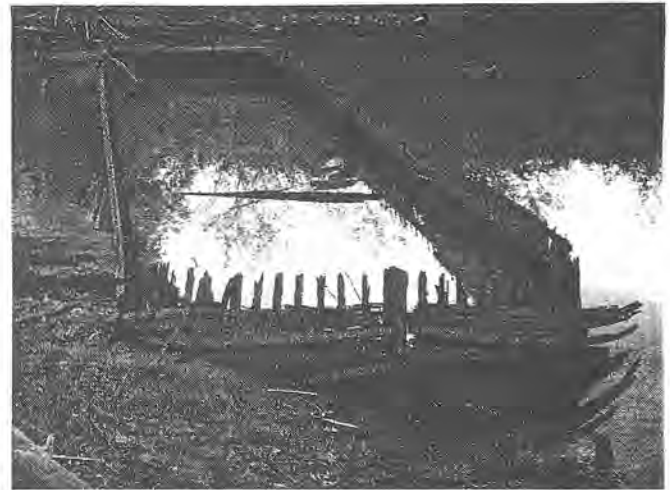


Figure 4. Photograph of one of the five canal boats sunk in the Pine Street Canal (photo by Adam Kane).

facts left onboard when it sank. The study of that artifact collection would be of great value in understanding early twentieth-century canal boat culture. Another important factor in conducting an off-site mitigation was the probable cost. Investigating the Sloop Island Canal Boat in the clean, clear water of the broad lake would cost only a fraction of a comparable Phase III project to study the canal boats in the hazmat conditions of the Pine Street Canal. A Memorandum of Agreement and the Scope-of-Work were signed in June 2002, and the Sloop Island Canal Boat Project was formally launched the following month.

The archaeological study was conducted during two field seasons, with 10 weeks of fieldwork and approximately 400 dives. The number of archaeologists working on the site per day ranged between four and seven. The site lies in 85 feet of water; and water temperatures during the fieldwork varied widely between 40 and 60°F. Although the depth of the site limited the amount of ambient light, the visibility when aided by underwater lights was generally good, ranging from 10 to 25 feet. The breathing gas used for the project was NITROX 36, an enriched air blend with 36% oxygen (normal atmospheric air has 21% oxygen). This gas mixture allowed for longer dive times and shorter surface intervals between dives due to its reduced nitrogen content and the resulting decrease in nitrogen absorbed into the diver's body tissues. Each archaeologist conducted two dives per day; the first dive was 30 minutes and the second was 25 minutes.

## Canal History

The Sloop Island Canal Boat represents one of the last generations of canal boats on Lake Champlain. With the 1823 opening of the Champlain Canal, the region's canal era began roughly 100 years before the sinking of the Sloop Island Canal



Boat. The canal's effect on the economic prosperity of the Champlain Valley was enormous. Bulky raw materials, which were formerly too costly to ship overland, could now be transported to markets along the Hudson River and beyond. Lake Champlain's enhanced importance as a commercial waterway spurred an economic boom in towns along its shores.

The Champlain Canal was expanded three times during the nineteenth and early twentieth centuries. Each expansion gave rise to a new larger class of canal boats. Calls for the first expansion of the Champlain Canal began only a few years after its opening in 1823. Between 1835 and 1862, New York State slowly replaced the locks of the Champlain Canal and enlarged the canal "prism," or cross-section. As a result, the size of canal boats was increased from 79 feet in length and 13 feet in beam to 87 feet in length and 14 feet in beam. Although the enlargement was considered an improvement, it was still inadequate to transport the volume of freight that could be carried between Montreal and New York City, a route known as the Northern Waterway.

The Champlain Canal's second enlargement began after a flurry of suggestions by politicians, boatmen, and shippers, all urging New York State to build the Champlain Canal to at least the dimensions of the Erie Canal. Some even encouraged an expansion sufficient to handle sea-going vessels. In 1864, New York resolved to enlarge the Champlain Canal to the same dimensions as the Erie Canal. The new locks, completed in 1873, measured at least 110 feet long and 18 feet wide. The enlargement of the canal prism, however, was not completed until 1877 with the dimensions of at least 65 feet at the water's surface and containing a minimum water depth of 6 feet. This fell short of the Erie Canal's dimensions by 5 feet in width and 1 foot in depth. Canal boats now averaged 97 feet long and 17½ feet wide; the Sloop Island Canal Boat belongs to this class (Figure 5).



Figure 5. Canal boats docked at Whitehall, New York, on Lake Champlain, circa 1910s (courtesy of the New York State Archives).

Despite continuous outcries by the public about the inadequacies of the Champlain Canal, New York State refused to authorize another expansion. However, in the 1890s the State relented and began a deliberately slow effort of enlarging both the Champlain and Erie Canals. The dimensions of Lake Champlain's canal boats, however, essentially remained the same from 1873 until 1915. After numerous studies and political battles with railroad supporters, New York State finally put energy and funds into establishing the New York State Barge Canal System in 1903. The Champlain Barge Canal was opened in 1915, with concrete locks accommodating vessels 300 feet long by 43.5 feet wide and drafting less than 12 feet of water. Bridges and overhead power and telephone lines limited the vessels to a height of less than 15.5 feet at normal water levels (Larkin 1999:82).

Despite the large lock size on the Champlain Barge Canal, a canal boat's size was severely limited by the old locks on the Chambly Canal, which bypassed a series of rapids on the Richelieu River, connecting Lake Champlain to the St. Lawrence River. Most traffic through the Champlain Canal was through-traffic to and from Canada, which required the use of the Chambly Canal. The Chambly Canal locks could accommodate a boat up to 108 feet long, 22.5 feet wide, and almost any height due to the use of only swing bridges over the canal. The Chambly Canal had a depth of 7.5 feet and allowed vessels to draft 6.5 feet (Godfrey 1973:28).

By 1905, the year construction began on the Champlain Barge Canal, the Northern Waterway had become comparatively unimportant from a commercial standpoint, especially when considering the freight carried by New York State's railroads. Improvements in the efficiency and quantity of freight carried by the railroads and the discovery of cheaper sources of timber, minerals, and agricultural products in mid-western regions reduced the economic vitality of the canal. In 1890, the volume of commerce on the Champlain Canal reached a peak of 1.5 million tons. By 1907, however, it had dropped to less than half that amount. Part of the change resulted from the gradual reduction of trade through New York Harbor. Iron ore traffic had ceased and the lumber and coal trades had moved much of their business, like iron mining, to the rail systems. In spite of the railroads, some canalers continued to work the Northern Waterway. Canal boats carried pulpwood for the region's paper mills and coal to ports along Lake Champlain and to Canada (Bellico 2001:249).

With the opening of the Champlain Barge Canal in the spring of 1915, the old Champlain canal boats, like the Sloop Island Canal Boat, were no longer economical. Soon, several new boat designs appeared that used the larger locks more effectively. However, the old Champlain canal boats remained in use alongside these new vessels until the late 1930s. By 1940, most shippers had abandoned the old wooden craft in favor of steel barges, which had larger capacities, a longer lifespan, and no necessary crew (McHugh 1981:13).

### Operating a Canal Boat

The opening of the Champlain Barge Canal in 1915 marked the end of the century-old custom of animal towage on New York State's canals (O'Malley 1991:23). Small tugs were first introduced on the Champlain Canal as the towpaths were destroyed during the construction of the Champlain Barge Canal. The tugs on the completed Champlain Barge Canal were much larger than on the earlier Champlain Canal, allowing them to pull a far greater number of canal boats. The normal tow for a tug in the Champlain Canal was four boats; on the Barge Canal, they towed as many as ten (Godfrey 1994:93-94).

The boatman had to work hard when towing in the old Champlain Canal. The hours were long and chances to sleep were short and unpredictable. The larger Champlain Barge Canal caused a reduction in the amount of work required of a boatman. Given the broader width of the Barge Canal, a line was placed on each bow corner of the head boat in a tow and none of the boatmen had to steer. The boatman's only work when transiting the canal was putting out a snubbing line at each lock to hold their boat in place. No matter what the period, life was much more peaceful and relaxing for the canal boatmen while being towed on the rivers or lakes by a tug (Godfrey 1994:87, 97-98) (Figure 6).

Most canal boat captains owned their own boats. They went where the railroads did not and where profits were small, picking up cargo wherever they could. Going north the canal boats generally carried coal or manufactured goods and returning they transported lumber, hay, pulpwood, or paper. On the last trip down to New York City each year, the canal boats usually carried a load of potatoes consigned to some commission merchant. The potatoes were covered by straw to keep them from freezing and were sold by the boatmen in small lots to the city peddlers during the winter (Gleason 1922:24).

After the opening of the Champlain Barge Canal, most boatmen operated two canal boats in tandem in order to maximize the profitability of their efforts. This operating technique was exemplified in the first quarter of the twentieth century by the Archambault family of Whitehall, New York. Cora Archambault, born in 1904 to this canal boat family, has generously shared her experiences growing up on the canal. Each Archambault boat carried a cargo, but one vessel served as the quarters for the parents and young children and was where most of the family's belongings were stored and meals were served. The second vessel served as the sleeping quarters for the older children. "We could play in that cabin and do whatever we wanted. You know, make as much noise or wrestle or whatever kids do." Cora's play cabin was sparingly furnished with no curtains in the windows. "We had a table there and we used to tip that table upside down and pretend that was our boat, you know. And we had chairs and the beds and a stove, same as the other cabin, only there wasn't any rug on the floor or anything like that" ( Archambault, Cohn, and

Vincent 2000:11-12; Archambault, Noordsey, and Garrison 1997:9-10).

The canal boat owner-operator faced particular difficulties during the 1920s and 1930s. Lack of capital made it difficult to repair even minor problems with his boat, surmount trade depressions, and/or survive after bad weather had limited shipping. After the completion of the New York State Barge Canal System, many Champlain Valley canalers became tied to their vessels year round, having sold or lost their homes on land. Owner-operators lived in a perpetually precarious situation. They were usually restricted to the least profitable of all cargoes because of the small size of operation and their higher costs. They often had to rely upon being hired by larger carriers and they were first to be cast off in times of little business. Owner-operators had to supplement their income from freight with small-scale entrepreneurial activities such as selling goods that they purchased, produced, or smuggled. Some boatmen did odd jobs for other canal boat operators. During the late 1920s, transportation companies bought or forced out owner-operators to eliminate competition. Smaller canal boat operations were forced to sell their vessels or become subcontractors to the transportation lines. The larger carriers eventually won out in the 1930s and many of the former canal boat owners became employees of these companies (Bellico 1992:245-246).

### Life Aboard a Canal Boat

The life of a canal boat family was one of a curious blend of domestic and nomadic existence. Unlike seafaring men, the captains of canal boats found it advantageous to take their wives and children with them, despite the hardships (Figure 7). The canalers consisted of family members ranging from infants to grandparents (Johnson 1898:314). Most of Lake Champlain's canalers during the early twentieth century were of French Canadian birth (Gleason 1922:18). People made their home as well as their living on the canal. The wife of a

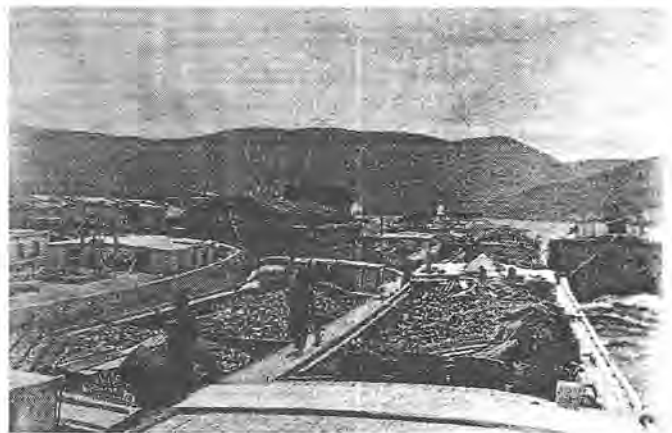


Figure 6. 1895 Howard Pyle photograph of a canal boat tow on the Hudson River (courtesy of the Fort Ticonderoga Museum).

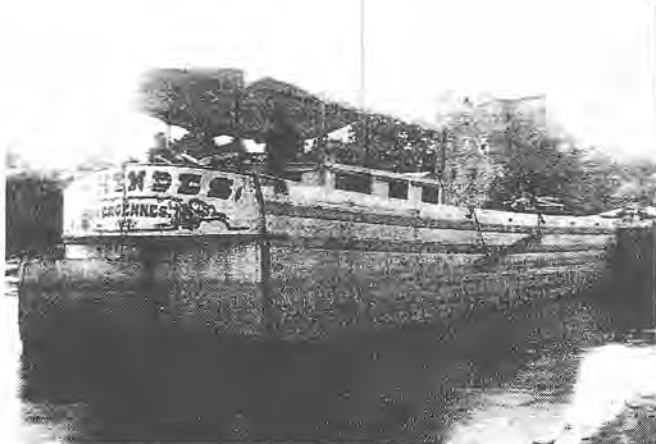


Figure 7. Canal boat J.G. Hindes at the National Horse Nail Company in Vergennes, Vermont, circa 1890s (LCMM Collection).

canal boat captain cooked, cleaned, and cared for many of the family's needs. They also served as a deckhand when the need arose. Children were expected to help by doing chores around the boat and stay out of the way when necessary. The youngest children were tied to a short rope so that if they fell overboard, they could be rescued quickly. By the time children were twelve years old, they were expected to become part of the boat's crew (Stack and Wilson 1993:7).

Out of a boat's wages, a captain had to employ a crew, unless his family acted in that capacity; child labor was profitable and practically indispensable. He also had to finance minor boat repairs and equipment, which appreciably reduced his net income. The northern boatmen had large families and their cabins were usually packed to capacity with children (Gleason 1922:18). Without the help of his wife and children, a captain's income would have been meager. After the opening of the Champlain Barge Canal one man and a boy were considered sufficient crew for two boats in tandem (Anonymous 1923:103). A canal boat owner-operator had to be a *jack of all trades* in order to make a success of canal boating. Minor repairs, caulking the vessel's sides, and painting were all handled by the captain, who had to constantly juggle family life and work (Godfrey 1994:94).

Long hours by boatmen and their families were not uncommon. Crowded, overheated, unsanitary living quarters, lack of a regular supply of milk, interrupted schooling, poor and uncertain facilities for medical care, and restricted recreational opportunities were objections cited by child rights advocates in the early 1920s in attempts to have children removed from canal boats (Albrecht 1918:801; Anonymous 1923:103). Unsuccessful attempts were made both in 1920 and 1921 to secure legislation forbidding the presence of women and children on canal boats. However, by 1920, a number of transportation companies on New York State's canals forbid employees to have women and children with them on the canal

boats (Springer and Hahn 1977:38). Yet many people preferred to hire married captains on the grounds that they were steadier than single men and that the family on board raised the moral tone of the canals (Anonymous 1923:103).

In winter, the canalers could layover in their hometown or anywhere along the Northern Waterway and pay no property taxes. By the early twentieth century, most northern canalers spent the winter in New York Harbor at one of the many places where the canal boats congregated, including Atlantic Basin, Erie Basin, or the Morris Canal Basin. This was when children were sent to school. Whole communities of canalers throughout the country existed there and soon everyone knew their neighbors. The canalers went sightseeing, repaired their boats, and held parties (Godfrey 1994:87).

#### Accommodations on Board

Depending upon the size of the family and the cabin's accommodations, the canal boat could be a snug, homey, comfortable place of refuge (Figure 8). The canal boats varied greatly in the amount of comfort and living conditions. Despite the differences in furnishings and size, apparently all northern canal boat cabins were laid out the same way (Godfrey 1965:1). The cabins on these boats were located at the stern and usually had 12 by 14 feet or 10 by 12 feet of open space. The size of the open space of the cabin could be seen by the size of the cabin trunk, which projected above the deck. The cabin ceiling barely missed one's head and the sides of the cabin were honey-combed with cupboards, shelves and drawers. This storage inside the cabin extended out under the walkways along the sides of the cabin trunk. The floor was covered with oilcloth or linoleum, and the whole place was typically neat and orderly. The table filled the middle of the cabin and most of the chairs were nothing but backless camp-



Figure 8. Cabin interior of canal boat Bertie Harris with George H. Weightman and his mother, circa 1898 (private collection).



stools that could be closed up and tucked away when not in use (Godfrey 1994:84; Johnson 1898:311).

The best cabins had three compartments: one large enough to accommodate a double bed or bunk, another containing the cook stove and a cupboard partitioned off with sliding doors, while the main cabin was utilized as a living room and additional sleeping space. Here was a folding table, which could be opened at mealtime. Sometimes the table would be hinged to the forward bulkhead so it could be folded up against the wall when not in use, thus allowing more space. The partitions of the sleeping area by curtains insured some privacy, which was entirely lacking in more simply constructed cabins. No toilet facilities were provided on the older canal boats, but some of the newer vessels built for the Champlain Barge Canal did provide them (Godfrey 1994:84; Springer and Hahn 1977:33).

Two windows placed on each side and on the forward end of the cabin was most common. Entrance to the cabin was by way of a small door usually on the port side of the after end of the cabin trunk. A hatch cut into the cabin roof at this point and fitted with a sliding hatch cover allowed people to enter the cabin down a steep short set of stairs. The windows and wooden shutters slid aside when not in use. These shutters protected the windows from damage and the cabin's occupants from prying eyes. The shutters also permitted ventilation in the cabin during rainstorms and periods of rough water (Godfrey 1994:84). Screening was placed over the window openings in the heat of the summer, but flies were a frequent problem in the cabin.

Heat for cooking and comfort came from a coal and wood-burning stove. In hot weather, many canalers used a small portable kerosene or wood-burning stove on deck for cooking their meals. Cora Archambault's mother used a small portable kerosene stove to cook their meals, which she placed on top of the cook stove (Archambault and Vincent 2000:16). The cabin roof was pierced by two holes: one for a chimney pipe from the cook stove and the second for what was called a ventilator, which consisted of an iron cover. Cora Archambault remembers, "When we were up on the cabin [roof], sometimes you could take that [the ventilator] off and look down and see what my mother was cooking or talk to her..." (Archambault and Vincent 2000:7).

An awning frame was placed above the cabin roof on which a canvas tarp was stretched to keep the cabin cooler (Figure 9). This provided a place to sling a hammock for sleeping and places for rocking chairs in which to rest, read, do handiwork, or gossip with the neighbors in the tow. Decks of canal boats made for a restricted and dangerous place to play, so the cabin roof also became a playground for the canal family. Toddlers were hitched into a leather harness and connected to a rope that allowed them the freedom to run around the cabin roof, but not fall off into the water (Godfrey 1994:87; Springer and Hahn 1977:36).

Sleeping accommodations were in many cases inadequate on the canal boats because there were not enough beds. During

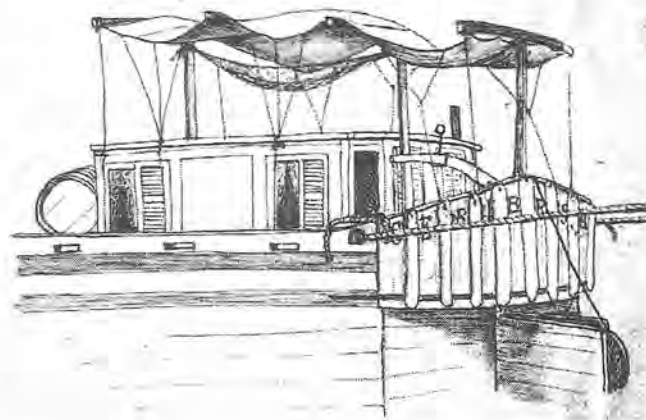


Figure 9. Stern of canal boat *George Brush*, 1895, drawn by *Augusta W. Brown* (courtesy of the New York State Museum).

the extreme hot weather, when individuals could lie out on the deck under an awning, the lack of bunks was not much of a problem, but for families that remained on the boats throughout the winter, the crowded conditions were serious (Springer and Hahn 1977:34).

Occasionally a couple of bunks would be installed in the forecabin or forward locker under the bow deck. This would be used by older boys in a large family or, if the family had young children, the forward bunks might be used by a hired deckhand (Godfrey 1994:84). According to Cora, the forecabin was the men's "domain" and was where the ropes and other equipment were kept for boating (Archambault, Noordsey, and Garrison 1997:7). "That's [also] where they [men] went to use their slop bucket, down there. They didn't use the cabin" (Archambault and Vincent 2000:7).

Aboard the Archambault's main boat, Cora recalls it was "comfortable and cozy" with linoleum and throw rugs on the cabin floor and curtains and potted geraniums in the windows. "And the main cabin, there was a table with a lamp hung" overhead. Set around the cabin's square table were six chairs, one rocking chair, and a sewing machine (Archambault, Noordsey, and Garrison 1997:6, 8, 17; Archambault and Vincent 2000). Kerosene was used for all lamps, lanterns, and navigation lights. All of the canal boatmen used oil lamps to provide light within the cabins (Godfrey 1994:87).

### Archaeological Results

#### Cabin Investigations

The cabin trunk, cabin roof, and "booby" hatch cover of the Sloop Island Canal Boat were ripped off at the time of the vessel's sinking. Work in the cabin and booby (the sternmost hatch) was made easier without these overhead obstructions. However, documentation was complicated by the large number of jumbled timbers from the floor, ceiling, and bulk-

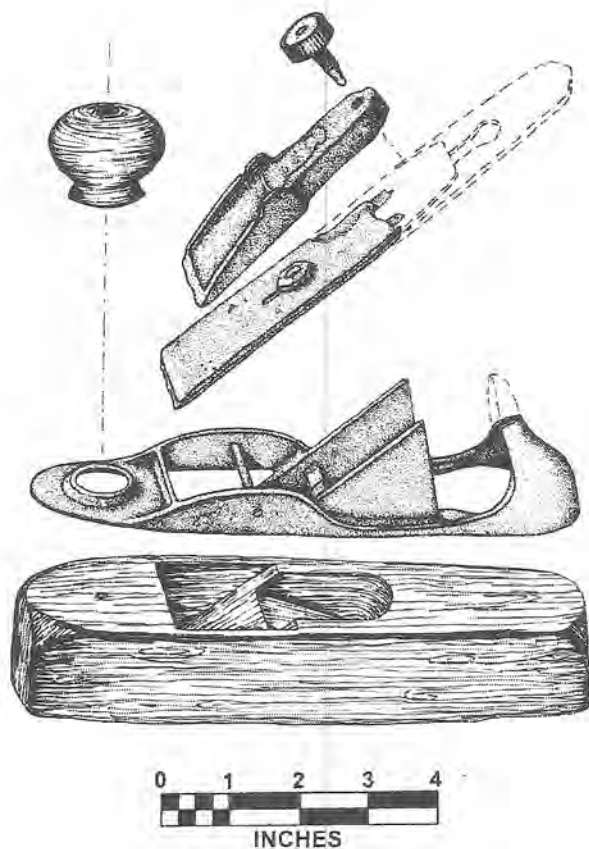


Figure 10. *Liberty Bell Plane (1886-1918) made by Stanley Rule & Level Company was found in a chest of drawers within the cabin of the Sloop Island vessel (LCMM Collection; drawn by Gordon Cawood and Adam Loven).*

head planks, and fragments of the cabin trunk and cabin furniture. The fasteners that once held the wooden elements of the cabin and booby in place had long since rusted away, allowing the timbers to collapse into the vessel. Through careful documentation, we hope the original location of many of the timbers can be identified, permitting the reconstruction of the original layout of the cabin and booby. Layer by layer the timbers and artifacts were removed and video and photographs were used to record the process. All artifacts from the cabin and booby were recovered and brought to the LCMM's conservation facility for stabilization and documentation.

Descriptions of the typical Champlain Canal boat cabin previously discussed are nearly identical to that discovered on the Sloop Island Canal Boat. Although the video footage, still images, and sketches of the cabin and booby and the artifacts and their distribution are still being analyzed, our current impression of the cabin layout is that the space was divided into sections based on their function.

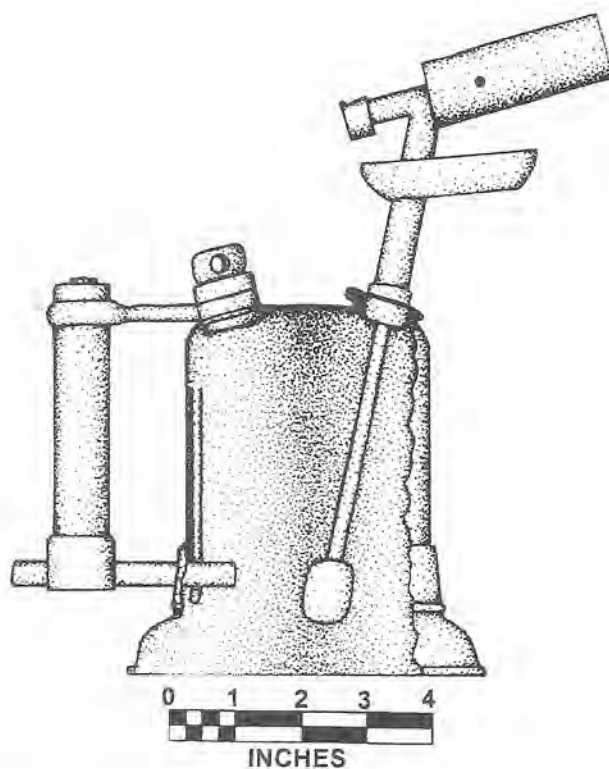


Figure 11. *Brass blowtorch found in the middle of the cabin floor of the Sloop Island vessel, likely used for melting pitch for caulking planking seams (LCMM Collection; drawn by Gordon Cawood and Adam Loven).*

The cabin stairwell on the Sloop Island Canal Boat was located along the after end of the cabin along the port side. Beneath the stairs was a storage area containing a tool box (Figure 10). To the port of the stairs, under the walkway alongside the cabin were a couple of shelves used for storing food. The artifacts recovered from this area included ceramic crocks, glass bottles, glass canning jars, and a ceramic jug. One glass canning jar was full of small fish bones (possibly the remains of pickled fish) and two crocks held grape seeds (i.e., fresh grapes) and pig bones (i.e., salt pork). The glass bottles once contained root beer, beer, and wine. Also located on the shelving were two oil lamps. Forward of the shelving unit was a chest of drawers, which contained tools, shoes, and money. Forward of this and also under the deck along the port side was a folding iron bed. In the center of the cabin was a caned armed rocking chair, presumably near the location of the dining table. Located in the forward starboard corner of the cabin was a cast iron double bed and a stool (Figure 11).



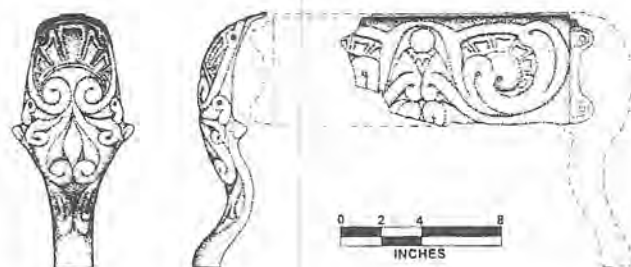


Figure 12. Stove skirt fragment and leg recovered from near the Sloop Island vessel's cook range, made by Liberty Stove Company, Philadelphia (LCMM Collection; drawn by Gordon Cawood and Adam Loven).

Along the starboard side of the cabin were two shelves used to store tin ware dishes. Aft of (behind) the bed was a large cast iron cook range, which was separated from the rest of the cabin by a panel wall and linoleum flooring (Figure 12). To port of the stove was a large hutch with multiple shelves and drawers housing the family's dishes, glasses, utensils, and patent medicines (Figure 13).

The artifacts found within the cabin and booby suggest that the vessel's crew consisted of a nuclear family, with a father, mother, and at least one child. Articles of clothing and shoes were found in the cabin. A wool coat was discovered near the center of the cabin and appears from its size, shape, and design to be for a pregnant woman. The heel of a woman's shoe was also found. Located within one of the hutch drawers were several colored clay marbles and small buttons, which may have belonged to a young child. Also suggestive of a child's presence aboard the vessel is a checker recovered from the tool box. The heel of a man's shoe was found in the chest of drawers.

The continued analysis of the artifacts and their provenience will guide researchers in determining the organization, layout, and functions of the cabin and booby. The artifacts also have the potential to help us better understand the economic and physical well-being of the canal boat household, their access and preference to goods, their needs, and the crew's activities within the cabin and booby.

### Vessel Construction

The vessel's hull, like that of nearly all canal boats, is box-shaped with vertical sides, a flat bottom and blunt ends – a shape designed to carry as much cargo as possible within the confines of the size allowed by the canal locks. The Sloop Island vessel is 97 feet 3½ inches long, 17 feet 10 inches wide, and its depth amidships is 9 feet 10 inches (Figure 14).

The hull was built using “edge-fastening” construction, a technique often used to build canal boats from the 1840s onward. The primary characteristics of an edge-fastened hull are vertical sides held together by iron drift bolts driven

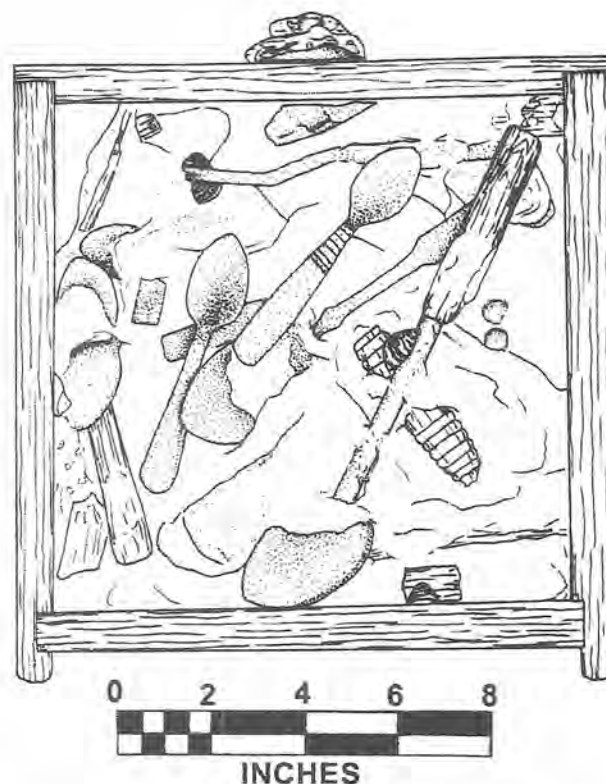


Figure 13. This drawer, found in the cabin near the stove, was once part of a cupboard. The drawer contained children's toy marbles, small buttons, door hardware, a cork screw, knives, forks, and spoons; some made by the Royal Manufacturing Company of Detroit (c. 1894-1908) (LCMM Collections; drawn by Adam Loven).

straight down into the edges of the planking. The drift bolts are hammered into pre-drilled holes which pass down through two or more “strakes.” As each strake is added a new set of drift bolts is driven through that strake connecting it to those below. In this technique the side planks are so thoroughly locked together that they act as a single timber, lending significant longitudinal strength to the hull. This technique was used extensively in the latter half of the nineteenth century for building vessels with vertical sides.

The hulls of canal boats with their high length-to-beam ratio, 5.5 to 1 in this case, were prone to hogging and sagging, or longitudinal disfigurement. Edge-fastened construction helped counter this tendency. The strength of an edge-fastened hull is largely derived from the vessel's sides, as opposed to “plank-on-frame” construction, the more traditional building technique, where the hull's strength comes from the skeleton-like internal framing. In plank-on-frame construction a ship's hull is commonly described as being akin to a human torso. The backbone of the ship is its keel, while its frames maintain

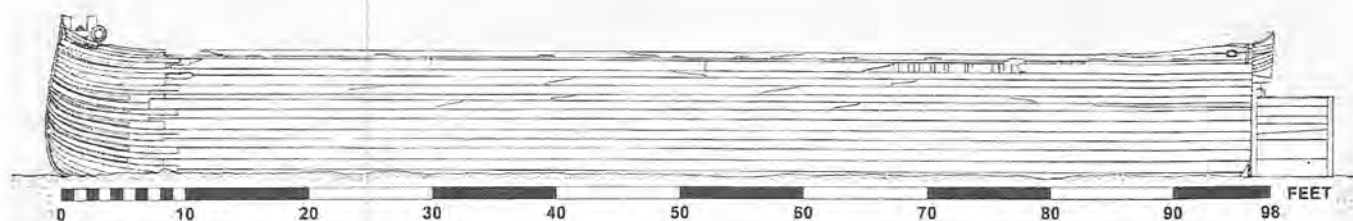


Figure 14. *Exterior profile of the Sloop Island Canal Boat* (LCMM Collection; drawn by Adam Kane, Chris Sabick, and Adam Loven).

the shape of the hull with the ribs as their counterpart. Water is kept out of the hull by planking, which forms a skin over the framing. This simplified analogy is not applicable to the edge-fastening construction technique. They are fundamentally different; an edge-fastened hull derives its strength and rigidity from its sides, not its internal framing.

The canal boat's curved bow was built very differently from the rest of the hull. Due to its complex shape the bow was not edge-fastened, but was built using the more traditional shipbuilding technique of plank-on-frame construction. Overall, the bow is extremely bluff, with the planks fastened into the stem at a near 90° angle. The top of the stem is "raked," or angled, slightly aft, creating a recessed area where a lantern could be hung. The exterior of the bow is reinforced with eight rubrails; the leading edge of each is covered with an iron band. These were used to limit wear from frequent abrasion with other canal boats, and the canal locks and prism. The bow was constructed primarily of white oak and elm, as opposed to much of the rest of the hull, which was white pine.

The canal boat's stern is much simpler in construction than the bow. The bottom portion of the stern is vertical, with planks oriented transversely. Unlike the vertical planks along the hull's side, the stern planks are not edge-fastened. Planks are rabbetted into the vertical sternpost. At the very bottom of the stern the planks abruptly curve from the vertical plane of the stern into the horizontal plane of the bottom of the hull. Above the vertical portion of the stern was a slightly curved transom that overhangs the lower part of the stern. The transom once had the vessel's name and homeport painted on it, but only small flecks of paint remain today on the Sloop Island vessel.

There are four openings along the deck, each giving access to a separate interior area of the vessel. From forward to aft these areas are the forecabin, hold, cabin, and booby.

Access to the forecabin, or the interior of the bow, was gained through the forecabin hatch (Figure 15). The forecabin was separated from the hold and its cargo by a tongue-and-groove plank bulkhead. Several feet of silt have accumulated in the bow of the Sloop Island vessel, making the study of this area difficult. Many boat-related artifacts such as a broken capstan, a roll of tar paper, a paint pot with a brush, a marlin spike, an iron block, and numerous iron fasteners were found

here, indicating that it served as a storage area for tools and other equipment. Many items were still sitting on top of the large breasthooks; it is likely that many other pieces of boat-related equipment remain buried below the sediments.

The canal boat's dominant feature is its large cargo hatch. At 51 long and 9 feet wide the cargo hatch spanned much of the main deck. As its name suggests, the hatch allowed access to the hold so that cargo could be loaded and unloaded. It was surrounded by a tall coaming necessary for keeping water out. The hold was filled with coal to a depth of 3 to 5 feet above the boat's bottom. The cargo made documentation of the construction of the bottom of the hull impossible.

Just aft of the cargo hatch is the cabin. The opening for the cabin is 13 feet long and 12½ feet wide, though the cabin itself is actually 17 by 12½ feet because it extends under the walkways of the deck. The cabin floor is constructed of thin tongue and groove planks supported by cabin floor beams. The forward and after walls of the cabin were delineated by a tongue-and-groove panel wall, whereas the port and starboard sides of the cabin were formed by the sides of the boat.

The booby hatch is the aftermost opening on the canal boat's deck. Located along the starboard half of the stern deck, the booby hatch allowed the canal boat's stern to be loaded with cargo both behind and underneath the cabin floor, which is 5 feet off the vessel's bottom. Loading cargo in the stern helped take some strain off of the amidships section of the

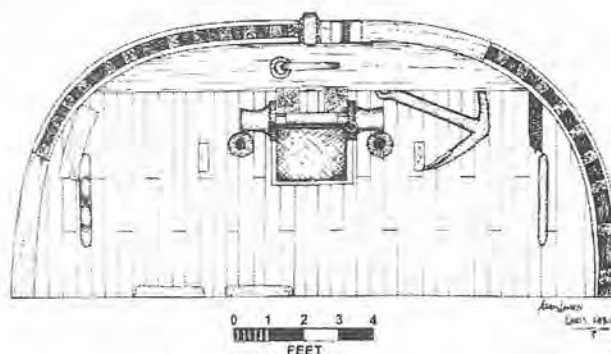


Figure 15. *Plan view of the Sloop Island Canal Boat's bow* (LCMM Collection; drawn by Chris Sabick and Adam Loven).

boat (Godfrey 1965:1). This loading technique was used in the Sloop Island Canal Boat as evidenced by the coal loaded in the booby and underneath the cabin. A number of artifacts were located inside the booby. However, it is believed that nearly all of these spilled into that section of the boat as the bulkhead separating the booby from the cabin collapsed. Only one artifact, an axe, was located in the booby far enough from the cabin to suggest that its original provenience is the booby.

The vessel contains a number of pieces of deck equipment and related gear essential for operating the boat. The bow houses an iron windlass mounted to two large wooden towing bitts. The windlass was used to raise and lower the anchor, whereas the bitts were essential for tying the canal boat into the tow. The canal boat also has six iron cleats, three on each side along the length of the boat. These were used for tying off to an adjacent vessel in a tow, or to a dock. The cleats on the port side still had cable wrapped around them suggesting that the vessel was cut loose rather than untied. The stern deck contains a small windlass used for snugging the canal boat up to the adjacent boat in a tow. Just forward of the cabin, the boat's iron wheel and steering mechanism is still intact.

The documentation of the canal boat's hull construction and dimensions indicates that it was built between 1873 and 1915. As required by law, the vessel's registration number was carved into one of its deck beams. Unfortunately, the number is not legible, though we could determine that it likely consisted of six digits. Six digit numbers were not issued until after the early 1880s.

### Conclusion

Much remains to be learned about the men, women, and children who lived and died on the Northern Waterway. Past maritime histories have left out canalers. Fortunately, Lake Champlain has proven to be the ideal location to study the archaeological remains of this way of life. The Sloop Island Canal Boat represents one of several dozen canal boats that sank unexpectedly in the lake; all capturing a glimpse into this unique maritime community. The results of the study of the Sloop Island Canal Boat will help expand our understanding of the larger social and economic processes that shaped the development of this unique group.

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