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# **VALCOUR BAY RESEARCH PROJECT:**

## **1999-2002 RESULTS FROM THE ARCHAEOLOGICAL INVESTIGATION OF A REVOLUTIONARY WAR BATTLEFIELD IN LAKE CHAMPLAIN, CLINTON COUNTY, NEW YORK**

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Cover Image courtesy of the National Archives of Canada



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## ABSTRACT

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This report presents the results from the 1999 through 2002 field seasons of the Valcour Bay Research Project (VBRP): a Phase I underwater archaeological investigation of the submerged battlefield at Valcour Bay, in Lake Champlain. Valcour Bay is located in Clinton County, New York, between the town of Peru and Valcour Island.

On October 11, 1776, General Benedict Arnold engaged the British Navy in perhaps the most important naval contest of the American Revolution. After an intensive five-hour battle with heavy casualties on both sides, darkness finally ended the conflict. With some 60 men killed and wounded on the American side and three-quarters of their ammunition gone, Arnold and his officers executed a daring nighttime escape past a British blockade. Two days later, on October 13, the British fleet caught up with Arnold and a second running battle ensued. Outgunned and surrounded, Arnold deprived the British of battle prizes by intentionally destroying five of his own vessels in the spot known today as "Arnold's Bay" and escaped south to Fort Ticonderoga. This engagement deposited an invaluable collection of Revolutionary War materials on the bottomlands of Lake Champlain.

For more than a century, the submerged battlefield at Valcour Island has seen numerous efforts to locate and raise archaeological materials. This collecting has led to the dispersal of a priceless archaeological collection around the region and nation. Many of these recovered artifacts are destroyed as they degrade from lack of conservation treatment and poor storage conditions.

In 1999, New York State Police diver Edwin Scollon discovered a cannon believed to be from the Battle of Valcour Island. This discovery triggered the beginning of the Valcour Bay Research Project (VBRP). The VBRP is a cooperative effort between a dedicated team of volunteer sport divers and the Lake Champlain Maritime Museum (LCMM). The VBRP is designed to systematically map the submerged Valcour Island battlefield, while providing sport divers a way to channel their interest in history and archaeology into a formally permitted project.

The artifact scatter thus far mapped is largely the result of the explosion of a cannon onboard the gunboat *New York*. At the end of the 2002 field season a total of 125,000ft<sup>2</sup> (11,613m<sup>2</sup>) of bottomlands had been surveyed, locating 52 Revolutionary War era artifacts. Twenty-two artifacts were recovered from the site in 2001, and are currently displayed in the LCMM exhibit "Valcour Bay Research Project: Rediscovering a Moment in Time."



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## DEDICATION

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The Valcour Bay Research Project could not have succeeded without its dedicated team of volunteers. Foremost among these individuals is Edwin Scollon. In 1999 while diving in Valcour Bay, Ed found the muzzle section of a broken cannon. Realizing the significance of his discovery, he consulted with researchers at the Lake Champlain Maritime Museum and officials at the New York State Museum. The Valcour Bay Research Project came into being from these meetings. In the four years since that period, Ed, the co-principal investigator for the VBRP, has not only logged hundreds of hours of bottom time in Valcour Bay, but just as importantly has spent countless hours at his computer constructing the project's written record. He has also made great efforts to bring the results of his work to the public through numerous presentations.

More than just the founder of the VBRP, however, Ed is a community leader. In 1988, Ed became a New York State Trooper, and shortly thereafter joined the New York State Police dive team. As a State Trooper, Ed also finds himself patrolling Lake Champlain as a member of the NYSP Troop B Boat Patrol. Under Ed's quiet leadership, the VBRP has grown and succeeded beyond anyone's expectations.

Since 1999, Ed has worked at building a solid volunteer team for the VBRP. The collective skills of this group strengthen the project immensely. The VBRP volunteers come from all walks of life and bring their unique talents to the project. These specialized skills include diving, photography, web-site design, videography, wood working, and boat handling, to name a few. The following volunteers have all contributed in their own way to the VBRP: Terry Aubin, Tim Aubin, Todd Bissonette, Matt Booth, John Butler, Dan Carpenter, Greg Durocher, Jerry Forkey, Chris Fox, Roger Harwood, Richard Heilman, Doug Jones, Tom Keefe, Phil LaMarche, Bill Leege, Sarah Lyman, Dennis O'Neil, Jim Millard, Scott Padeni, Steve Nye, Dan Rock, Desi Recicot, John Tomkins, and



Ed Scollon addressing the crowd at the 2001 artifact raising (photograph by John Butler).

Tony Tyrell.

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## **ACKNOWLEDGEMENTS**

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The Valcour Bay Research Project could not have happened without the support and funding from a number of State, Federal, and Regional institutions. A project of this complexity also requires community support; the VBRP has enjoyed an outpouring of encouragement from people throughout the Champlain Valley.

Funding from the American Battlefield Protection Program (ABPP) of the National Park Service (NPS) was instrumental in implementing the 2001 field season and in writing this report. The VBRP was also supported financially by a Department of Defense Legacy Program grant administered by the Naval Historical Center (NHC). William Dudley, Robert Neyland, Barbara Voulgaris of the NHC provided invaluable assistance to this project.

Many New York State agencies and employees have provided advice, encouragement, and permits to facilitate this project. We are especially grateful for the support of the New York State Museum (NYSM), New York Office of General Services (NYOGS), New York Office of Parks, Recreation, and Historic Preservation (NYOPRHP), and New York Department of Environmental Conservation (NYDEC).

The VBRP has enjoyed the strong support of the Office's of U.S. Senator Patrick J. Leahy, Vermont, and U.S. Senator Hillary R. Clinton, New York. They have provided leadership and guidance instrumental to designing and implementing this project. Our sincere gratitude also goes out to New York State Senator Ronald B. Stafford for his long-standing support for historic preservation activities and his important support of this project.

We are grateful to the Lake Champlain Basin Program (LCBP), the Clinton County Historical Association (CCHA), and the Fort Ticonderoga Museum for their cooperation and ongoing support of this project.

Thanks to the New York State Police and the Clinton County Sheriffs Department for their ongoing support.

A dedicated team of historians engaged in new research about the Battle of Valcour Island, expanding our understanding of those events. They are Robert Maguire, Peter Barranco, Russel Bellico, George Quintal, Christopher Fox, and Art Cohn. We were particularly indebted to Dan Lacroix and Marilyn Day of the Westford (Mass.) Historical Society for their work transcribing the Jonas Holden pension documents.

The 2001 artifact recovery could not have occurred without the special support provided by the Lake Champlain Transportation Company (LCTC). LCTC



donated the vessel and personnel making the recovery possible. We are especially thankful to Ray Pecor, Trey Pecor, Henry Sorrel, Monica Lalime, Captain B.J. Bombard, Bill Dumbleton, John Paul, and Russell Fox for their generous and talented support. The crane for the cannon recovery was graciously donated and ably operated by Barrett's Tree Service and the family of Gary Barrett.

An extraordinary contribution of food for the three hundred members of the public during the cannon raising was provided in style by Breakwaters Restaurant on Burlington's Historic King Street Dock. We thank Kim and Al Gobeille and their team for helping to make the day even more memorable.

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Our particular thanks go out to our dedicated, talented, and expanding dive team, without whom the Valcour Bay Research Project would not have succeeded. Foremost among the volunteers is co-principal investigator Edwin Scollon. His discovery of the cannon triggered the VBRP, and his dedication has inspired and brought together an extraordinary group of regional divers. Volunteer divers Terry Aubin, Tim Aubin, Todd Bissonette, Matt Booth, John Butler, Dan Carpenter, Greg Durocher, Jerry Forkey, Chris Fox, Roger Harwood, Doug Jones, Tom Keefe, Phil LaMarche, Bill Leege, Sarah Lyman, Dennis O'Neil, Jim Millard, Scott Padeni, Steve Nye, Dan Rock, Desi Recicot, John Tomkins, and Tony Tyrell have donated freely of their time, skills, and energy to the project. We cannot thank these individuals enough. A special thanks to Steve Nye and Dan Carpenter for project contributions well beyond the call of duty. Thanks also to Dr. Richard Heilman for donating the use of his boat *Great Republic* and his captain skills in 2002.





The dive team from the Lake Champlain Maritime Museum provided technical support for the VBRP. LCMM divers include Adam Kane, Pierre LaRocque, Bill Atkinson, Erick Tichonuk, Chris Sabick, Rob Wilczynski, Sara Brigadier, Sarah Lyman, and Art Cohn.

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## **AUTHOR'S NOTE**

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This report is the first in a series of reports on the Valcour Bay Research Project. This report details the results from the 1999 through 2002 field seasons, which examined a portion of the eastern side of the American line-of-battle. Future reports in this series will provide updates on the study of the eastern side of the American line, as well as the study of the British line and the western side of the American line.

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## CHAPTER I:INTRODUCTION

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### PROJECT LOCATION AND DESCRIPTION

This report presents the results from the 1999 through 2002 field seasons of the Valcour Bay Research Project: a Phase I underwater archaeological investigation of the submerged battlefield at Valcour Bay, in Lake Champlain. Valcour Bay is located in Clinton County, New York, between the town of Peru and Valcour Island (, Figure 1:2, and Figure 1:3). Today, the waters around Valcour Island are frequented by recreational boaters who are drawn to the sparsely developed area for its Adirondack and Green Mountain vistas, and the sheltered waters created by the inlets around the Island. Valcour Island remains undeveloped, and is currently administered by the New York State Department of Environmental Conservation as the Valcour Island Primitive Area. The present tranquility of Valcour Bay belies the violent naval battle that took place there in 1776.

On October 11, 1776, General Benedict Arnold commanded an American fleet of fifteen fighting vessels which engaged the British Navy near Valcour Island. After an intense five-hour battle with heavy casualties on both sides, darkness finally ended the conflict. With perhaps 60 men killed and wounded on the American side and with three-quarters of their ammunition gone, Arnold and his officers executed a daring nighttime escape past a British blockade. Two days later, on October 13, the British fleet caught up with Arnold and a second running battle ensued. Outgunned and surrounded, Arnold, in what is today known as “Arnold’s Bay”, in Panton, Vermont, intentionally destroyed five of his own vessels and escaped to Fort Ticonderoga on foot. Only four of his fifteen vessels survived the three-day affair, and at its conclusion, control of the strategically important Lake Champlain invasion corridor belonged to the British.

Sir Guy Carleton, Governor General of Canada, content with achieving control of the lake, broke off the attack and returned to Canada for the winter. During the spring of 1777, the British moved their army and navy south past the hastily abandoned American fortifications at Ticonderoga and Mount Independence and launched an invasion of the Hudson Valley. At Saratoga, General John Burgoyne and his army were defeated on the field of battle by a strong American force. Burgoyne was forced to surrender his army and the tide of the American Revolution changed. Writing more than a century later, naval historian Alfred Thayer Mahan perhaps said it best when he wrote:

The little Navy on Lake Champlain was wiped out, but never had any force, large or small, lived to better purpose or died more gloriously. That the Americans were strong enough to impose a capitulation of the British Army at Saratoga was due to the invaluable year of delay secured by their little Navy on Lake Champlain (Mahan 1969).

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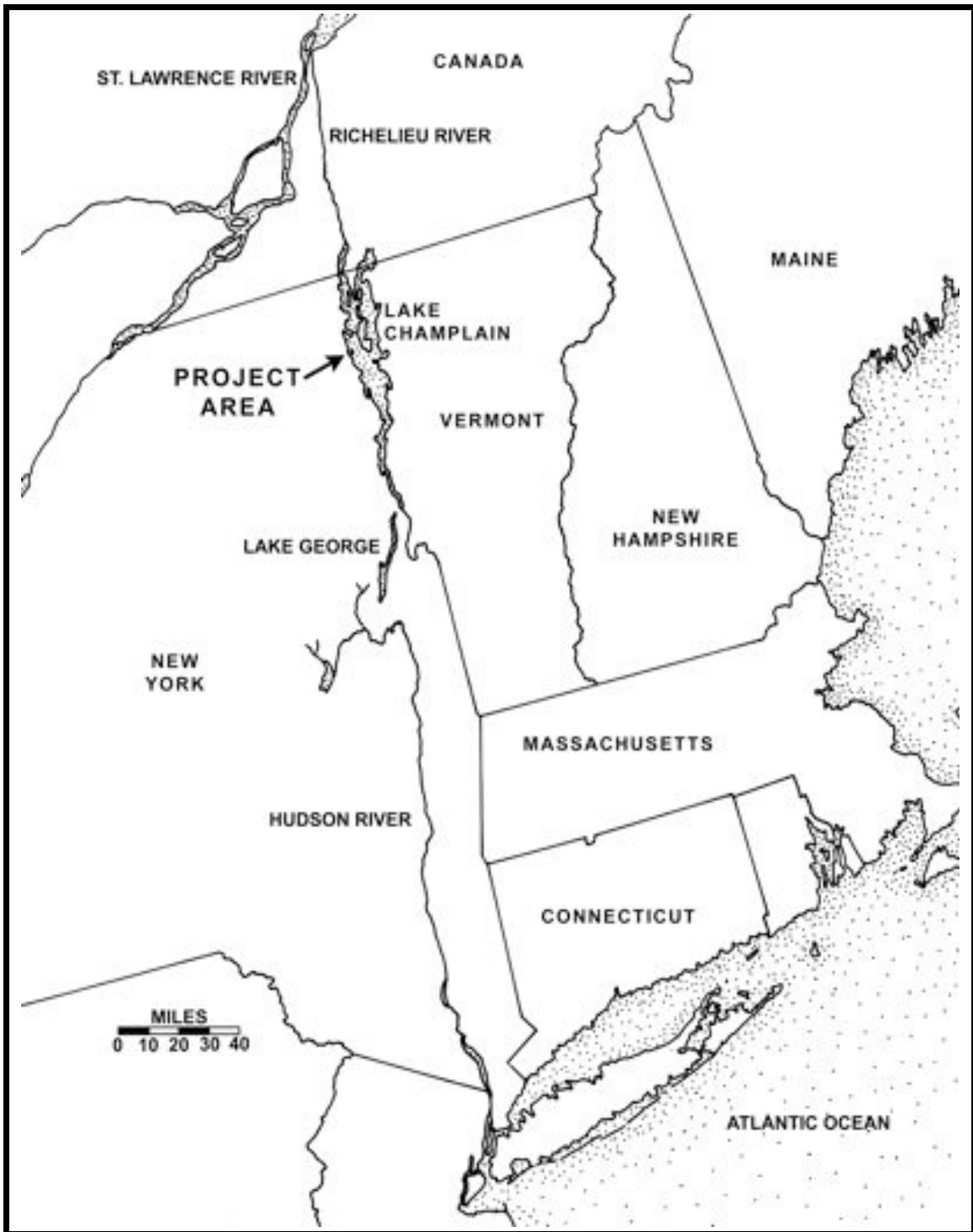


Figure 1:1. Map of the northeastern United States showing the location of the Project Area.

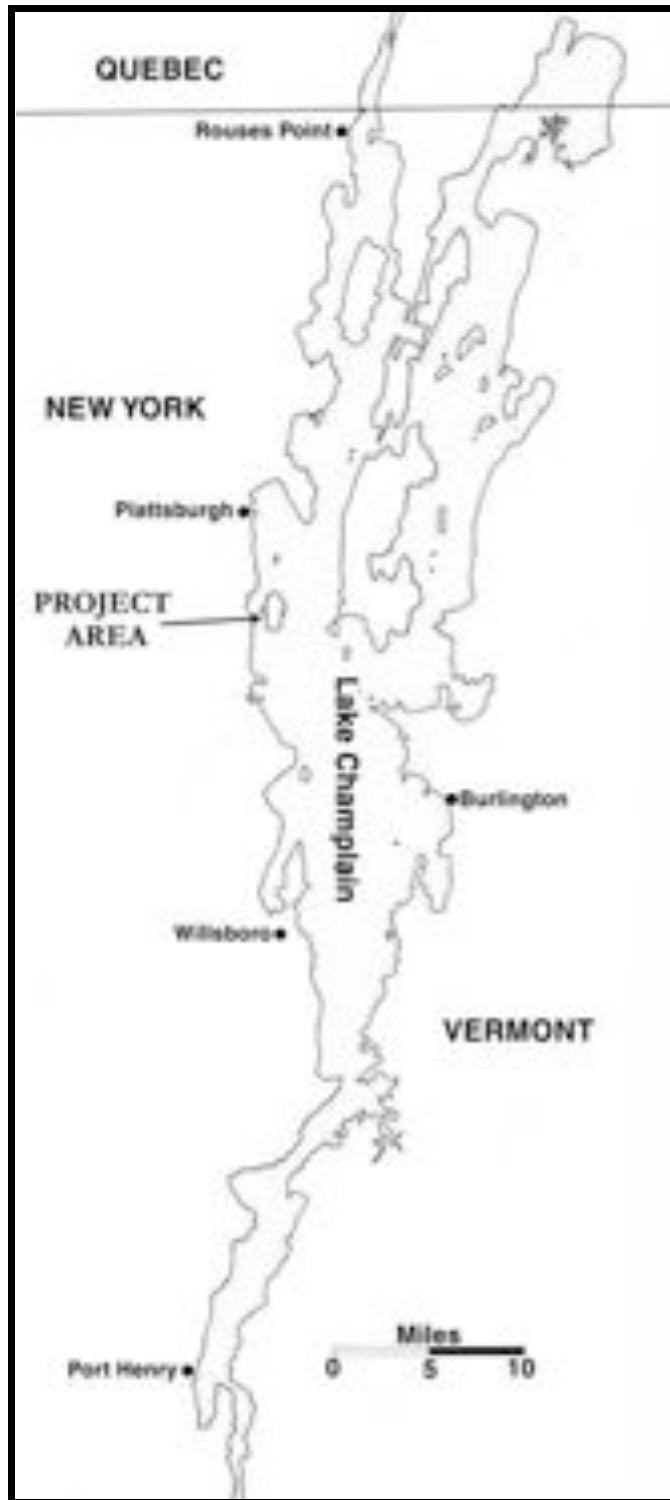


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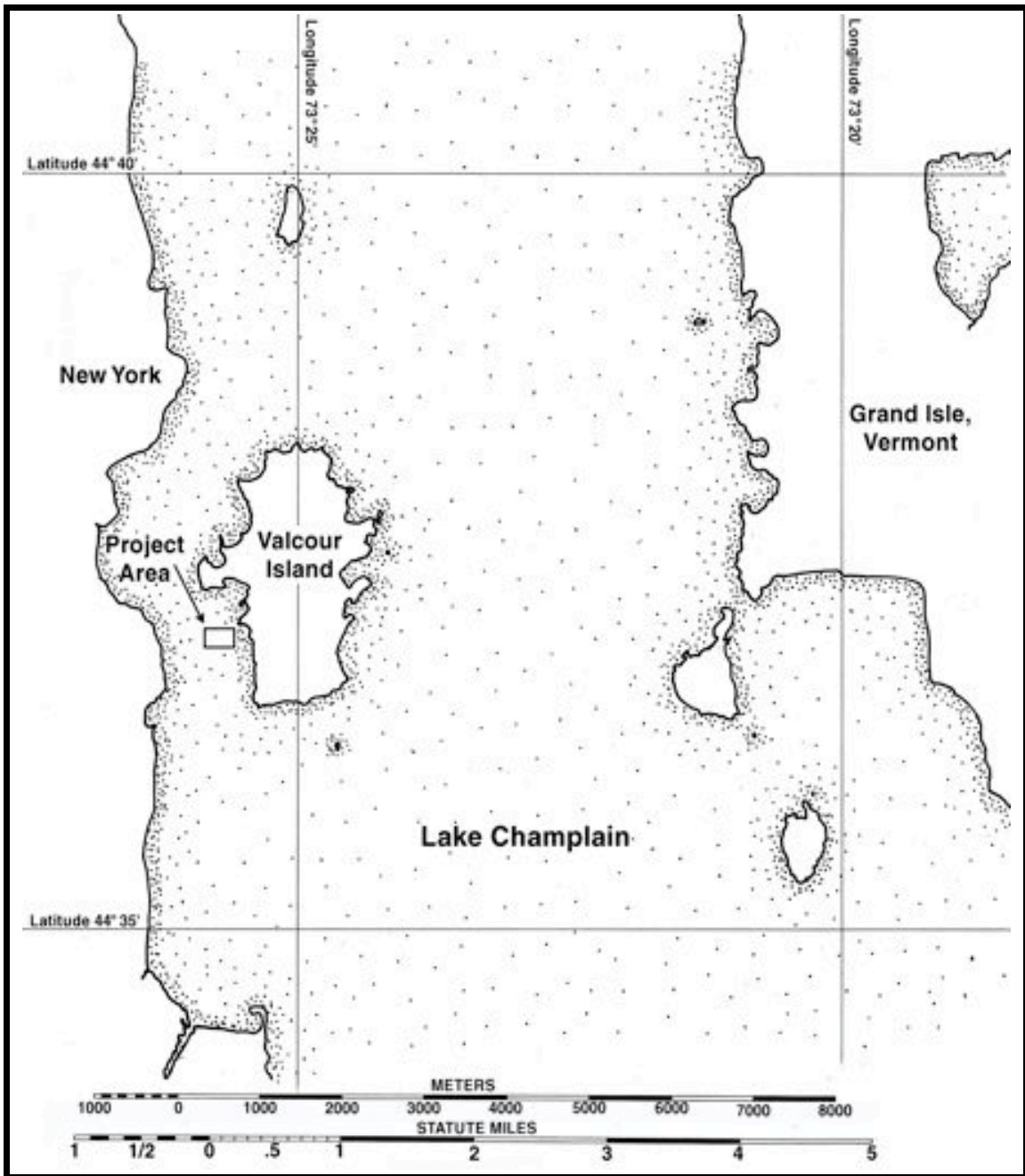


Figure 1:3. Chart of Lake Champlain showing Valcour Island and the Project Area (base map from Coast and Geodetic Survey 1988).



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This naval engagement, commonly known as the Battle of Valcour Island, left behind significant quantities of military related artifacts and debris. During the twentieth century many individuals have searched the underwater battlefield for the tangible remains of the conflict. The most notable, Colonel Lorenzo F. Hagglund, raised the American flagship *Royal Savage* and the Gunboat *Philadelphia* in 1934 and 1935, respectively. Since the widespread application of scuba technology many individuals have collected smaller artifacts from Valcour Bay. In recent years, however, society has gained a greater appreciation for preserving these submerged cultural resources. This evolving preservation-oriented attitude has led to federal and New York State legislation aimed at protecting cultural heritage. Although legislation such as the federal government's Abandoned Shipwreck Act of 1987 and New York State's Education Law 233 are designed to preserve this heritage, they have often proven difficult to implement and enforce. The core of the Valcour Bay Research Project is the preservation of this battlefield through a grassroots effort to include interested divers, many of whom were formerly collectors, in a formal archaeological project designed to map the debris field. The Lake Champlain Maritime Museum believes that this is the most effective way to ensure the preservation of this important archaeological site.

## **RESEARCH DESIGN AND OBJECTIVES**

The Valcour Bay Research Project has three objectives: 1) to systematically map the artifact scatter associated with the Battle of Valcour Island in order to gain a greater understanding of the battle, its participants, and site formation processes; 2) to interpret the history of the Battle of Valcour Island for the public; and 3) to incorporate local divers into the survey crew, thus instilling in them a sense of stewardship for the site and for submerged cultural resources in general.

This archaeological fieldwork was implemented through a systematic inspection of the bottomlands of Valcour Bay using handheld metal detectors. Focusing on the area of the bay where the American line was located, the bottomlands were divided into 50ft by 50ft (232.3m<sup>2</sup>) areas. These "grids" were surveyed along transects spaced at 3ft (.91m) intervals. Crew members used metal detectors to locate buried metallic objects. When an artifact was located its provenience was recorded, and its location plotted on the master site map. Between 1999 and 2002 approximately 125,000ft<sup>2</sup> (11,613m<sup>2</sup>) of bottomlands were surveyed. The survey methodology ensured 100 percent coverage within each grid.

During the survey significant artifacts were raised, photographed, measured, and reburied in the same location from which they originated, while artifacts such as cannon balls and shot were not raised, only plotted on the site map. All of the artifacts were, for a time, left buried below the sediments of the lakebed because the archaeological permit issued by the New York State Museum did not include any provisions for recovering artifacts. Moreover, the LCMM subscribes to the Annex Rules in the United Nations Education, Scientific and Cultural Organization's (UNESCO) Convention on the Protection of the Underwater Cultural Heritage, which maintain that *in situ* preservation is the first option for

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managing underwater cultural heritage (UNESCO 2001).

The second objective of the VBRP, the interpretation of the battle to the public, was met by recovering and displaying a number of artifacts from the site. In accordance with the Annex Rules, artifacts were recovered “for the purpose of making a significant contribution to protection or knowledge or enhancement of underwater cultural heritage” (UNESCO 2001). The artifacts located between 1999 and 2000 were raised in June 2001. They were recovered under a permit issued by the Naval Historical Center. The artifacts were stabilized at the LCMM’s Conservation Laboratory, and were incorporated in an exhibit “Valcour Bay Research Project: Rediscovering a Moment in Time.”

The third objective of the VBRP, incorporating local divers into the survey crew, was achieved through extensive teambuilding efforts. The VBRP’s volunteer base of recreational divers has remained strong during each year of the survey. In 1999, 9 divers volunteered, while in 2000 the number grew to 11, in 2001, 22 divers donated their time, and in 2002 the team consisted of 12 volunteers.

## **ORGANIZATION OF THE REPORT**

Chapter 1 presents a general description of the project, its location, and objectives. The project area’s environmental setting is described in Chapter 2, while the historical context is developed in Chapter 3. Chapter 4 presents the methodology employed for the underwater archaeological survey. Chapter 5 contains the results of the investigations via narratives about each field season, a description of the 2001 artifact recovery, and an analysis of each of the artifacts. Chapter 6 contains the report’s conclusions, including the interpretation of the archaeological data, recommendations for interpretive signage, and the continually evolving regional diver ethics.

This report also contains eleven appendices intended to present much of the data used in writing this report. Appendix 1 is a glossary which defines the specialized terms used in this document. A list of the abbreviations is contained in Appendix 2, while Appendix 3 contains detailed views of each grid square examined during the survey. Appendices 4 and 5 include articles on the VBRP from various periodicals. Appendix 6 contains a tabular summary of the 1999 through 2002 field seasons. Copies of the archaeological permits for the VBRP are in Appendix 7. Appendices 8 and 9 contain reproductions of the exhibit “Valcour Bay Research Project: Rediscovering a Moment in Time” and the interpretive panels at the Peru Boat Launch, respectively. Appendix 10 contains information about the conservation techniques used for the artifacts recovered from Valcour Bay. Finally, Appendix 11 is the transcription of Jonas Holden’s Pension Records.

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## **CHAPTER II: ENVIRONMENTAL SETTING OF LAKE CHAMPLAIN**

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### **CHAMPLAIN VALLEY**

Lake Champlain is the focal point of the geographical region known as the Champlain Valley, which is characterized by rolling hills, islands, wetlands, river systems, and Lake Champlain. The topography and landforms visible today throughout the Champlain Valley are products of ancient mountain-building processes and of glaciers and rivers that gouged the valley and scoured the surfaces of the surrounding mountains. The Champlain Valley is cradled by the Green and Taconic Mountains to the east and the Adirondack Mountains to the west. These three mountain ranges represent the highest elevations surrounding the Champlain Valley and form the headwater areas of tributaries entering Lake Champlain (Lake Champlain Basin Program 1998).

Lake Champlain is an elongated lake that occupies a portion of a long, north-south valley that extends from the St. Lawrence River to Long Island Sound. Lake Champlain lies in this valley with the Hudson River to the south and the Richelieu River to the north. With a mean elevation of 95ft (29m) above sea level, Lake Champlain has a maximum length of 120mi (200km), a maximum width of 13mi (21km), and a maximum depth of 400ft (122m).

After the Great Lakes, Lake Champlain is the sixth largest freshwater lake in the United States. The lake flows north from Whitehall, New York, across the U.S.-Canadian border to its outlet at the Richelieu River in Quebec. From the Richelieu River, the water joins the St. Lawrence River and eventually drains into the Atlantic Ocean at the Gulf of St. Lawrence. For much of its length, Lake Champlain defines the state border between Vermont and New York. The lake's watershed is bound to the east by the Connecticut River basin and to the southwest by the Hudson River basin, which is connected to Lake Champlain by the Champlain Canal. The environmental setting of Lake Champlain is unique because of its narrow width, its great depth, and the size of its watershed (LCBP 1998).

In most areas surrounding Lake Champlain the shoreline profile is quite gentle, except for some steep cliffs along certain areas of the New York shoreline. Unlike many other lakes, which are bowl-shaped and tend to be more evenly mixed, Lake Champlain is made up of lake segments, each with different physical and chemical characteristics, split apart by the lake's 80 islands. Morphologically, the lake is divided into three distinct, but connected sections (Figure 2:4).

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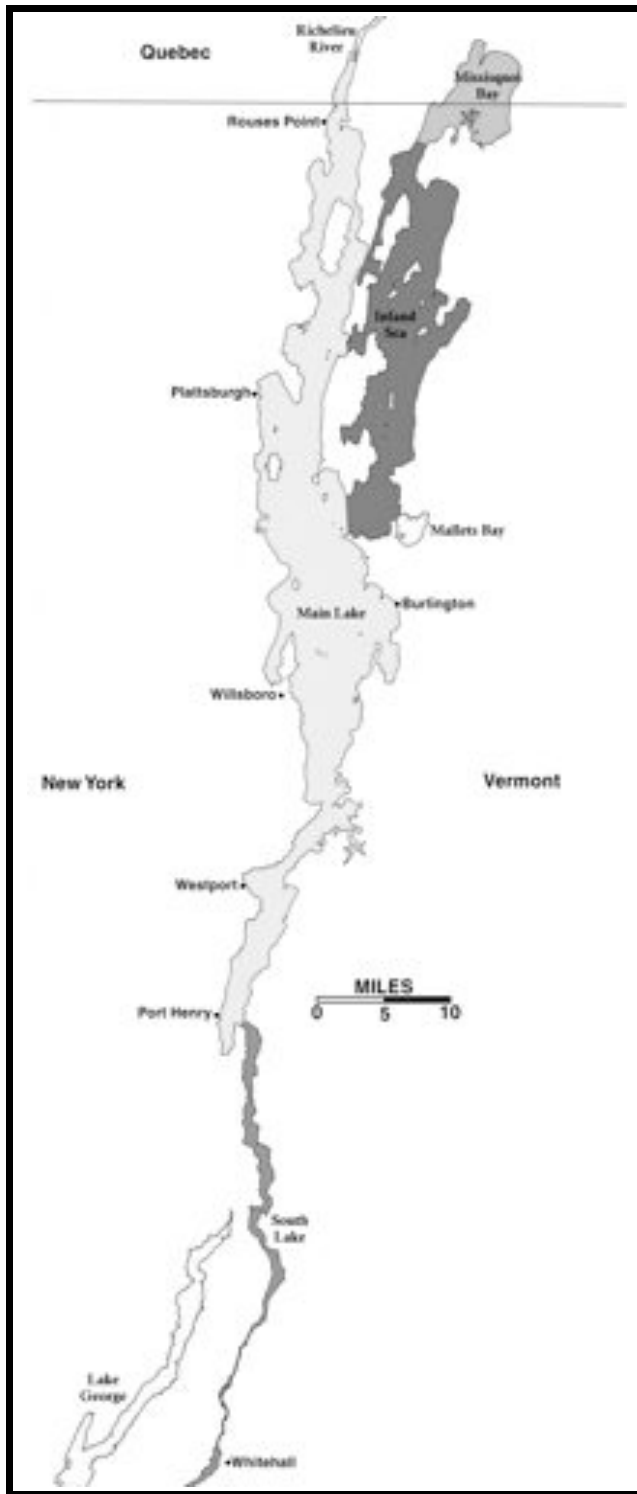


Figure 2:4. Lake Champlain showing the lake sections (drawn by A. Kane).

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The largest section is called the Main Lake, which extends from Isle aux Têtes (Ash Island), Quebec, to Crown Point, New York, west of the Champlain Islands. This segment contains about 81 percent of the volume of the entire lake and has the deepest, coldest water. The lake reaches its maximum depth and width in the Main Lake, near Thompson's Point, Vermont, and north of Burlington, Vermont, respectively (LCBP 1998).

The second section of Lake Champlain is known as the Restricted Arm, which is located to the east of the Main Lake and is composed of three primary basins, including Mallets Bay, the Inland Sea (often referred to as the Northeast Arm or East Bay), and Missisquoi Bay. These primary basins are connected to each other and the Main Lake by shallow narrow passages, all of which are part of the Restricted Arm. Mallets Bay is along the Colchester, Vermont, shoreline, southeast of Grand Isle, Vermont. The Inland Sea is east of the Champlain Islands, stretching from the Sand Bar causeway in Colchester north to Missisquoi Bay, and includes the narrow passages between the islands of Grand Isle and North Hero and Alburg Tongue. Missisquoi Bay begins at the southern end of Hog Island, Swanton, Vermont, and extends into Quebec.

The third section of Lake Champlain is the South Lake. Resembling a river with an average depth of 20ft (6.1m) and a width of less than 1mi (1.6km), the South Lake runs from Whitehall to Crown Point, New York. At the lake's southern end in Whitehall, the Champlain Canal (completed 1823) connects Lake Champlain to the Hudson River (LCBP 1998).

## **WATER COLUMN**

The hydrodynamics of Lake Champlain are still very much unknown. Complex processes that change both seasonally and over longer periods constantly move the water of Lake Champlain. In the last two decades scientists have begun to study flow patterns within Lake Champlain that control the transport of sediment, nutrients, and toxic substances. Most of these studies have examined actual movement of the lake water at varying depths. A few of these studies, including LCMM's Lake Survey Project, have also looked at bottom sediment features created by currents (LCBP 1998).

Varying bottom currents affect the lake's sediment erosion, transport, and deposition, but they create predictable geomorphic features. Oceanographers have identified and defined a number of bottom sediment features related to predictable situations, most of which can be found in the bottom geomorphology of Lake Champlain. The most efficient and effective way to map these features is with side scan sonar and computer technology that can create a mosaic of the lake bottom. This type of research has been completed in Lake Champlain only during the last few years.

Previous studies have generated several facts about Lake Champlain. For example, the general flow of water in the Main Lake is from south to north. Water movement is different, however, in the Restricted Arm, where the water generally

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moves south and west to reach the Main Lake through the narrow openings between the Champlain Islands and modern transportation causeways. The variation of the flow patterns in the Restricted Arm changes with the seasons and the weather. Like other deep lakes, Lake Champlain stratifies in the spring and summer into water layers with distinctly different temperatures. In the spring, the sun warms the surface of the lake. This warmer water is less dense than the colder, deeper water, so it floats on the surface and forms a layer called the epilimnion. This layer is typically about 33ft (10m) deep in the Main Lake during the summer. Below this layer, sharp transitions in temperature define the boundary of the next layer, called the metalimnion, and the much colder waters below, called the hypolimnion (LCBP 1998).

Wind and temperature primarily are the forces that drive water currents in the lake. Once the lake stratifies by temperature in the early summer, changing wind directions and speeds can set up an internal wave, called a seiche, within the lake. This large wave, which involves water at the surface and at deeper depths, causes the general northward flow of bottom water to reverse direction. A few days of consistent winds from the south gradually pile up warm surface waters at the northern end of the lake, pushing the colder, deep water to the southern end of the lake. When the wind slows or reverses its direction, surface water flows southward and the bottom current flows northward, causing a sloshing motion of the lake water. This very long wave creates currents of up to 1mph (1.6kmph) in the Main Lake. The internal seiche causes a mixing of water and also a turbulent resuspension of sediments to create unique sedimentary features on the lake bottom. As the surface waters cool in late fall, they become more dense than the underlying water. As the denser, colder surface water sinks, it mixes with the water below. In the winter the temperature of the entire lake approaches 39°F (4°C), while the surface waters are cooled to the freezing point and form ice (LCBP1998).

The Restricted Arm is shallower and smaller than the Main Lake, resulting in different thermal stratification and water movement patterns. This area also has an internal seiche and variable currents, but they are not as pronounced as those observed in the Main Lake. Most of the Restricted Arm is readily mixed with strong winds (LCBP 1998).

Some bottom sediment features are caused by the movement of groundwater rather than by water currents. These features can provide significant information about the locations of groundwater sources in Lake Champlain. Bottom sediment features created by groundwater movement also reveal the whereabouts of faults that lie deep within the underlying bedrock.

## **BOTTOM COMPOSITION AND MORPHOLOGY**

The soils throughout the Champlain Valley originated from piles of clay, silt, sand, gravel, and rocks that the retreating glaciers' margins distributed during the last ice age. Streams and rivers pulverized and redistributed this sediment and deposited it throughout the Champlain Valley and Lake Champlain. The bottom

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sediments of the lake range in thickness from 0 to over 410ft (0 to over 125m). Over the last 12,000 years, these sediments have been deposited, re-suspended, and moved by bottom currents and the upward movements of groundwater and gases. Evidence of these actions is present in the surface topography and soil profiles of the lake bottom.

Several studies on the surface bottom sediments of Lake Champlain have been completed, but most of these studies have been restricted to selected regions of the lake or to a very limited number of stations throughout the lake. In the early 1970s, Professor Allen Hunt of the Department of Geology at the University of Vermont performed a comprehensive study of the entire lake bottom using standard instruments and consistent statistical spacing. During the study, about 2000 samples of surface bottom sediments were taken from sites spaced approximately 3100ft (945m) apart in the north-south direction and 2700ft (823m) apart in the east-west direction.

## **CLIMATE AND BIOTA**

Because of the protection offered by mountains on three sides and the moderating effect of Lake Champlain, the climate in the Champlain Valley is the mildest in Northern New York and Vermont. The temperatures of the region are moderated year round by the lake. Cool breezes blow inland off the lake in the summer. In the winter, the lake holds more heat than the land and air, so nearby land areas stay warmer as well. Of all the surrounding regions, the Champlain Valley receives the least precipitation. Ample rainfall, moderately warm summers, and fairly cold winters are characteristic of the Champlain Valley. The north-south orientation of the Champlain Valley creates prevailing winds in the same direction. They tend to blow from the south in the summer, although north winds and south winds are about equally frequent in the winter. The frost-free season is longer, the precipitation less abundant, and the temperatures not so extreme in the Champlain Valley as in other surrounding regions.

The current climate in the Champlain Valley differs from that in surrounding geographic regions because of three main factors: the distance from the valley to the North Atlantic Coast, the shape and orientation of the valley, and the moderating influence of Lake Champlain. When the prevailing winds from the west reach the mountains and rise to move over them, the air is cooled, causing rain in the summer and snow in the winter. For this reason, higher elevations surrounding the valley receive greater amounts of precipitation. The average annual precipitation in the mountains is generally over 50in (127cm), as compared to about 30in (76cm) in the valley. The growing season also varies in different parts of the valley, lasting only 105 days in the higher, cold pockets of the basin, but 150 days along Lake Champlain. The longer growing season and the region's fertile soil make the valley a rich agricultural area (LCBP 1998).

Forests covered the Champlain Valley since the retreat of the glaciers, although the predominant trees changed over time with fluctuations in temperature and precipitation. At the time of the European discovery of the Champlain Valley, the

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region was dominated by an oak-chestnut forest that appeared as average temperatures rose after about 3000 B.C. For lack of data, little can be said about changes in mammal, reptile, amphibian, bird, and fish populations that must have occurred after the forest was cleared around Lake Champlain. The oak-chestnut forest remained until it was clear-cut in the nineteenth century.

## **NON-NATIVE AQUATIC NUISANCE SPECIES**

One of the most significant effects of human activity on Lake Champlain has been the recent introduction of several non-native aquatic nuisance species. These plants and animals, most of which were inadvertently carried into the Champlain Valley via the Champlain Canal and the Richelieu River, are causing severe problems for the lake's ecology and cultural resources. Although zebra mussels are impacting the lake's shipwrecks most profoundly, other organisms such as water chestnuts and Eurasian watermilfoil introduced to Lake Champlain in the 1940s and 1962 respectively, are also problematic. These nuisance plants form dense mats on the surface of the water that severely restrict boat traffic and limit access to the lake's underwater cultural resources. Such conditions make it especially difficult to locate and document submerged resources in shallow waters where the plants grow.

No methods have yet been found that successfully eradicate these invaders from the lake system or prevent other non-native nuisance species from entering. The future impact of any species introduced to Lake Champlain is unknown, but past experience has shown that control of all non-indigenous species is extremely difficult.

The most profoundly disruptive phenomenon to have occurred in Lake Champlain during human history is the introduction of the zebra mussel (*Dreissena polymorpha*), a small freshwater mollusk native to the Eurasian Caspian and Black Seas (Figure 2:5). The zebra mussel was accidentally introduced to North America in 1987, ejected into Lake St. Clair with the ballast water from a transatlantic vessel. This is the same way that many other non-native species now thriving in North America have entered. Zebra mussels were first discovered in the Great Lakes region in 1988. Since then, the mussels have spread across eastern North America by following the flow of water, by attaching themselves to boat hulls, and by the inadvertent transport of zebra mussel juveniles, called veligers.

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Figure 2:5. Photograph showing zebra mussels (photograph by A. Kane).

In 1993, zebra mussels were found in the southern section of Lake Champlain and in the north near Rouses Point, New York. After gaining a foothold in the Champlain Valley, they have rapidly expanded their range within the lake. The microscopic planktonic zebra mussel larvae, which are free-swimming, can be unknowingly transported in bait buckets, bilge water, scuba equipment, and boat engine cooling systems. Once the mussels mature enough to grow a shell, they settle out of the water column and generally attach to a hard surface (or substrate). The mussels grow rapidly, with adult colonies reaching densities as high as 700,000 mussels per 1.2yd<sup>2</sup> (1m<sup>2</sup>). Zebra mussels encrust boat hulls, engine cooling systems, intake/outtake pipes, and the entire lake bottom within their optimum depth range. These mussels also threaten to encrust any historic object lying on the lake bottom, thus presenting the single largest threat to Lake Champlain's cultural resources. Once the mussels have covered these resources, documentation is much more difficult, an eventuality that has generated the current urgency to locate, inventory, and document the collection of cultural resources on the bottom of Lake Champlain.

In February 1995, LCMM was selected to identify the effects of zebra mussels on underwater historic shipwrecks and to outline the available methods for protecting these resources. The museum sent delegates to the Fifth Annual Zebra Mussel Conference in Toronto, Canada. The delegates produced a comprehensive report that presented an overview of all known information about the potential impact of zebra mussels on historic shipwrecks, as well as known protection and treatment options, and made recommendations about the probable effects of zebra mussels on the lake's historic shipwrecks (Cohn et al. 1996).

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LCMM has also worked with the joint New York/Vermont Department of Environmental Conservation Zebra Mussel Monitoring program. At LCMM's suggestion, two shipwreck sites were included in the monitoring program. The additional sites significantly expanded the database that the states of Vermont and New York were compiling about the density and distribution of zebra mussel veligers. LCMM established a water analysis laboratory to test for the presence and density of the microscopic zebra mussel veligers at four shipwreck sites around the lake. The facility was staffed by a lab technician/educator who performed the dual role of analyzing water samples and interpreting for the public the issues surrounding zebra mussels and techniques for slowing their spread to other Vermont and New York water bodies. Museum visitors were introduced to procedures for basic water quality testing and the connection between zebra mussels, historic shipwrecks, and Lake Champlain's ecosystem.

The results of LCMM's zebra mussel survey did not suggest a promising future for Lake Champlain. The study determined that Lake Champlain's water chemistry and food supply were sufficient to sustain zebra mussels throughout the entire lake. Despite all the research on a biological control for zebra mussels, no easily applicable method has been found to eliminate the zebra mussel or to protect Lake Champlain's submerged cultural resources. Since the study was completed in 1995, no solution to the problem has been discovered, and zebra mussels are now found in even greater numbers throughout Lake Champlain (Cohn et al 1996:29 and 51).

In 1999, LCMM commenced the study "Zebra Mussels, Shipwrecks, and the Environment" in partnership with the University of Vermont's School of Natural Resources to investigate zebra mussels' direct effect on Lake Champlain's cultural resources (Figure 2:6). Six of the lake's shipwrecks were selected and monitored as study sites. The first season's preliminary results indicated a demonstrably higher level of dissolved iron in the water column just above the zebra mussel colony than in the water column in general. This data leads to the troubling hypothesis that zebra mussel colonies are dissolving the iron fasteners on shipwrecks at a measurable rate and may therefore threaten the wrecks' long-term structural integrity.

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Figure 2:6. Photograph showing a zebra mussel settlement table upon recovery from Lake Champlain (Photograph by A. Cohn).

In 1991, the quagga mussel (*Dreissena bugensis*), another non-native mussel very similar to zebra mussels in both appearance and characteristics, was discovered in the Great Lakes. This species is now present in the Erie Canal System and is migrating eastward. No one knows how long it will take for quagga mussels to reach Lake Champlain, but it is almost inevitable that they will become part of Lake Champlain's growing list of invasive species. The habitat of quagga mussels ranges from 0 to 350ft (0 to 107m) in water depth, which includes almost the entire bottom surface of Lake Champlain.

Fortunately, the current zebra mussel infestation and any future quagga mussel colonization is unlikely to have a significant negative impact on the cultural resources in Valcour Bay. All of the battle-related debris thus far located has been buried below the bottom sediments, thereby protecting it from mussel colonization.

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## CHAPTER III: HISTORICAL CONTEXT

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Lake Champlain is the most historic body of water in the Western Hemisphere: a silver dagger from Canada to the heartland of the American Colonies that forged the destiny of France and England in America, and of the United States (Hill 1977:4).

Lake Champlain has played a crucial role in the history of North America. During the first two centuries of European habitation, Lake Champlain was the setting for a continual struggle for control of its strategic waterway in a period when the only practical means of transportation was by water. Numerous raids by the French and English occurred via Lake Champlain during the seventeenth century and major English expeditions reached the lake in 1690, 1709, and 1711. King George's War (1744-1748) renewed the open conflict between the rival French and English powers, concluding with a French capitulation in 1760. In nearly all of these campaigns, large armies were transported on the lake in massive fleets of bateaux accompanied by radeaux, row galleys, schooners, and sloops. More extensive naval engagements would occur during the American Revolution. Although the hastily-constructed American fleet of 1776 under Benedict Arnold was defeated at the hands of a more heavily-armed British force, the presence of the American vessels delayed the British advance and ultimately changed the course of the American Revolution. The clouds of war engulfed Lake Champlain once again in a renewed rivalry with Great Britain during the War of 1812. The decisive defeat of the British flotilla at Plattsburgh Bay in 1814 by the American fleet under Commodore Thomas Macdonough was instrumental in concluding the war under the Treaty of Ghent.

Following the wars, Lake Champlain continued to play a pivotal role in a new era of expanding trade and commerce. Before railroads and trailer trucks, the water highways of the lakes provided the only economical means of transporting cargoes of pulpwood, iron ore, coal, granite, marble, graphite, and lumber from the resource-rich areas of the north to the markets of the middle-Atlantic and New England states. Lake Champlain was a natural trade route from Canada to the United States. Its commercial importance increased with the building of the Champlain Canal in New York with its connection to the Hudson River, and the Chambly Canal in Canada. Schooners, canal boats, and majestic steamboats plied the water passageway of Lake Champlain for more than a century. With the aid of America's evolving transportation network during the nineteenth century, tourism to Lake Champlain flourished and continued through the twentieth century.

### PREHISTORY OF LAKE CHAMPLAIN

The scenery of Lake Champlain is the product of multiple geological forces beginning over a billion years ago. Geologists' understanding of the origins of the lake basin have resulted from studies of various rock formations in the region. The Grenville rocks of the present-day Adirondack Mountains were formed about 1200 million years ago as a result of mountain-building activity which metamorphosed older igneous rocks into schists, marbles, quartzites, and

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gneiss. Thereafter, perhaps from 640 to 450 million years ago, the Cambrian Sea flooded the region, depositing sandstones and limestones in the area.

This marine advance was irregular, causing erosion of some of the sediments during intermittent periods when the sea retreated. Two hundred million years later, additional mountain-building, particularly in New England, created faults that moved huge blocks of earth from east to west, further defining the eastern section of the Champlain basin. Somewhat less than a million years ago, the first of several great glaciers of the Pleistocene period began creeping across North America, gouging out the modern-day Champlain depression. Reaching as far as present-day New Jersey, the last of the great glaciers finally retreated from the Champlain Valley about 12,000 years ago. As this glacier receded, bare bedrock was exposed in many areas and debris, once encased in the ice, was spread unevenly over the valley. Salt water from the Atlantic Ocean was then able to flow into the depression left by the ice, forming the Champlain Sea inhabited by marine life forms, including whales. But without the weight of the ice, the Champlain Valley slowly rebounded and the contours of the modern-day lake were circumscribed. The inflow of the water from the north reversed direction and gradually formed a freshwater lake.

The first people to inhabit the Lake Champlain Valley were Paleoindians whose hunting camps have been discovered by archaeologists in present-day East Highgate, Vermont, and in other locations on the eastern side of Lake Champlain. Scientific evidence suggests that the Paleoindians entered the area about 9300 B.C. (Haviland and Power 1981: 15). Paleoindian artifacts, including fluted points and stone scrapers, have also been found on the western shore of Lake Champlain at Crown Point (Ritchie 1994: 19-22). The Paleoindians most likely moved into the Champlain Valley from the south, hunting large animals such as caribou or perhaps marine mammals living in the Champlain Sea. With the changeover to a freshwater lake and concomitant reduction in the number of large animal species in the region, the mobile Paleoindians moved on (Haviland and Power 1981:89). By approximately 3500 B.C., new peoples, who subsisted by hunting, fishing, and gathering, arrived in the Champlain Valley (Haviland and Power 1981: 59, 86; Ritchie 1995:84-89). Linked to an archaeological site on Otter Creek, the Vergennes Archaic peoples may in fact be the ancestors of the western Abenakis. Although hunting-fishing-gathering tasks dominated the lives of native people in the subsequent Woodland period (1000 B.C.-1600 A.D.), additional activities associated with this era included hide processing, woodworking, burial ceremonialism, trade, and the making of pottery, smoking pipes, and copper tools (Haviland and Power 1981: 129, 131, 91; Ritchie 1995:179-80, 185) (Figure 3:7).

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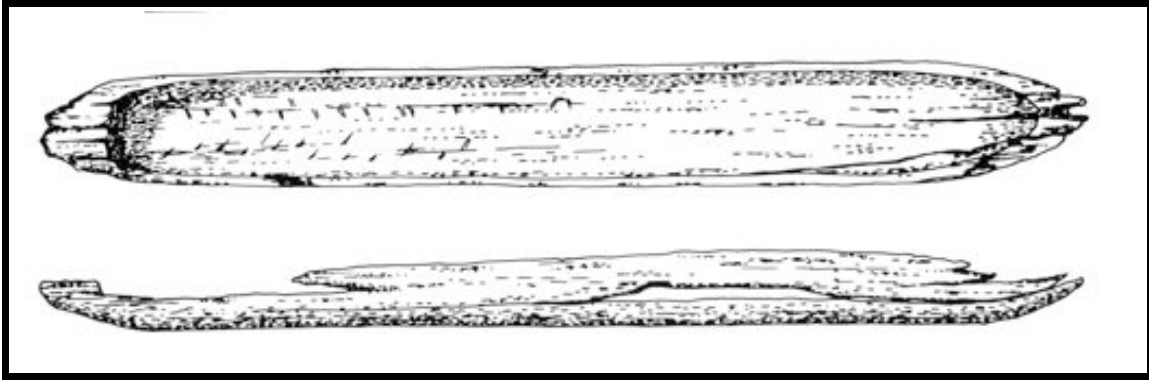


Figure 3:7. Native American dugout canoe, circa 1450, found in Shelburne Pond, Shelburne, Vermont (top) and a Native American clay pot found in Lake Champlain (bottom) (LCMM Collection).



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## THE COLONIAL WARS

Prior to European migration to North America, the Algonquin peoples dominated the North Atlantic coastal areas, as well as the interior of the Northeast. The Iroquois, who had gradually migrated northward into New York, eventually challenged the Algonquin presence in eastern New York, including that of the Mahicans (Mohicans) (Haviland and Power 1981:199; Dunn 1994:91-92; Snow 1994:19-21; Delage 1993:104, 122-123). In 1600, the western Abenakis (Algonquin Confederacy), whose ancestors can be traced to the late Woodland peoples, inhabited the eastern side of Lake Champlain (Haviland and Power 1994:150, 199). By then Lake Champlain represented the boundary between the Algonquin and Iroquois peoples. However, the hunting ground of the Mohawks of the Iroquois Confederacy (Five Nations) extended along Lake Champlain and as far north as the St. Lawrence River. The continuing encroachment by the Iroquois ultimately led to a violent confrontation at the lake. At the time of Samuel de Champlain's 1609 voyage on Lake Champlain, the Mohawks had so usurped the Algonquins in the region that Champlain referred to the Richelieu River as "the river of the Iroquois." (Biggar 1925:76) Although Native Americans had occupied the shoreline of Lake Champlain for thousands of years, the elaborate Tercentenary celebration 1909 commemorated Samuel de Champlain as the "discoverer of Lake Champlain." (Hill 1913:1)

In the summer of 1609, Champlain was persuaded by the Algonquins and Hurons to join in a campaign against their enemies at a lake to the south (Lake Champlain). Since Champlain needed the Hurons for the fur trade and geographic information on the region, he felt obligated to participate in the expedition or risk compromising France's harmonious relations with the northern tribes. In July 1609, Champlain and his crew traveled as far as the Richelieu River in a "shallop" or small sailing galley. Encountering the rapids in the Richelieu, Champlain and two Frenchmen transferred to Indian canoes. The war party of Algonquins, Hurons, and Montagnais proceeded in 24 canoes up "the River of the Iroquois" or Richelieu. The Indians informed Champlain that the place where they anticipated meeting their Iroquois enemies had a "rapid" [falls at Ticonderoga] and beyond that area lay a "lake which is some nine or ten leagues [Lake George]" (Biggar 1925: 93). Champlain and the Indians traveled at night to avoid detection, but on the evening of July 29 they encountered a party of Iroquois paddling in canoes "at the extremity of a cape which projects into the lake on the west side" (Biggar 1925: 96). Since there is ample evidence that the Ticonderoga area had once been a Native American camp and that Champlain later observed the "rapid" at Ticonderoga, it is probable that this is the cape rather than Crown Point. That same night, Champlain's band confronted a group of Mohawk warriors of the Iroquois nation on the lake near the end of a "cape" on the western shore. The parties hurled insults at one another and agreed to a battle at daylight. The ensuing engagement, in which Champlain's superior firearms devastated the opposing force, has long been debated by historians for its effect on subsequent conflicts between the French and the Five Nations (Figure 3:8).

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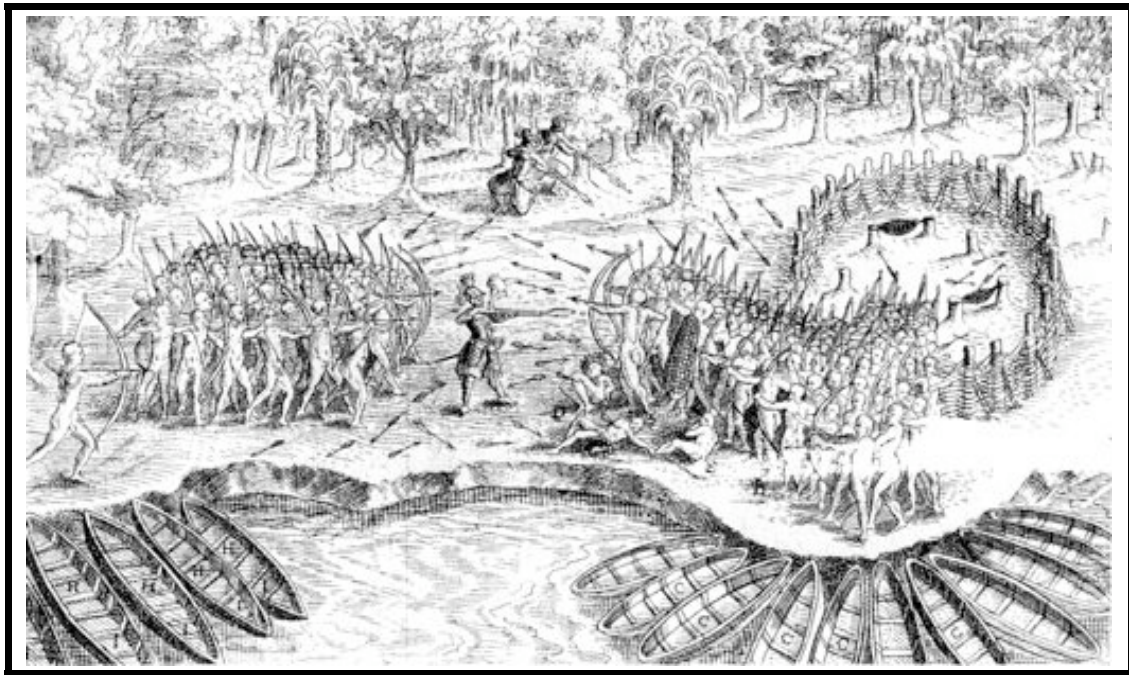


Figure 3:8. Drawing of the 1609 battle with Champlain and his allies fighting against a group of Mohawk warriors (Bellico 1992:11)

The collision course between the rival colonial powers was prompted by a series of Iroquois raids on Canadian settlements in the 1660s. The danger of Iroquois attacks convinced the French to rebuild Fort Richelieu at the mouth of the Richelieu River, build new fortifications in the region, and deploy a regiment of seasoned Carignan-Salières regulars in New France. In December 1665 a peace treaty was concluded between New France and the Iroquois, but the Mohawks failed to take part in the agreement. In the next month the governor-general of New France, Daniel de Courcelles, led a raid to destroy the Iroquois villages along the Mohawk River. The expedition failed, and French leaders in Canada continued with plans to eliminate the Mohawk threat. During the summer of 1666 Captain de la Motte (Pierre de Saint-Paul, Sieur de la Motte-Lussière) and his regiment of regulars were dispatched to an island at the northern end of Lake Champlain (present-day Isle La Motte) to begin construction of a fort. A peace overture by representatives of the Five Iroquois Nations occurred that summer, but new Mohawk incursions precipitated a 1,300-man French expedition in early fall which destroyed four Iroquois villages on the Mohawk River, inducing the Iroquois to offer peace the following spring.

Relative peace lasted for nearly two decades, but new English land grants, sporadic skirmishes with the Iroquois, and the belief that the English were covertly trying to renew Iroquois wars against the French generated a proposal in 1688 by the governor of New France to build a fort at the end of Lake Champlain. According to contemporary French maps, this terminology (end of the lake) referred to Crown Point (Coolidge 1989: 53). On August 1, 1689, upon the

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outbreak of King William's War (1689-1697), 1,300 Iroquois warriors attacked the village of La Chine near Montreal. In response, a 210-man French expedition, which included 96 Native American allies, was dispatched on a raid against Fort Orange (Albany), but instead attacked and burned the village of Schenectady on February 9, 1690. In late March the governor of New York sent Captain Jacobus de Warm and a small party to establish an advance post near Crown Point. De Warm chose Chimney Point on the east side of the lake for a "little stone fort." (Coolidge 1989: 59)

By the summer, plans for a major offensive by English colonists against New France were well underway. An expedition under Major General Fitzjohn Winthrop of Connecticut was slated to invade Canada through Lake Champlain while a second force under Sir William Phips was dispatched to seize Quebec City via the St. Lawrence River. Winthrop's army reached the southern end of Lake Champlain near present-day Whitehall, but a shortage of boats and supplies ended the campaign on August 15, 1690. However, a party of militia and Mohawks under Captain John Schuyler assailed La Prairie near Montreal. After a cannon duel with Quebec City's shore batteries and the landing of 2,000 soldiers, Sir William Phips withdrew his ill-prepared force from the St. Lawrence River and returned with his fleet to Boston. The war ended with the Treaty of Ryswick in 1697.

The fragile peace was only temporary since the War of Spanish Succession in Europe engulfed North America in the conflict known as Queen Anne's War (1702-1713). English plans for a two-pronged campaign against New France in 1709, a strategy similar to that of 1690, were again thwarted. An army under the command of Colonel Francis Nicholson reached Wood Creek at the southern end of Lake Champlain in the summer of 1709, but the expedition was later abandoned when English warships scheduled to attack Quebec City were redirected to Lisbon, Portugal. Two years later the same basic plan was again put into action. In 1711, 2,000 troops with 600 bateaux under Lieutenant General Francis Nicholson were to invade Canada through Lake Champlain via Lake George. Some of Nicholson's advance units reached Lake George in September when news that a massive English fleet under Admiral Hovendon Walker had withdrawn from the St. Lawrence River following a calamitous navigation accident that destroyed eight transports and two supply vessels. Nicholson once again abandoned his campaign, burned the recently-rebuilt Fort Anne, and returned to Albany with his troops. The Treaty of Utrecht ended the war in 1713, leaving the boundary between New York and New France at Split Rock on Lake Champlain. The treaty also recognized the Iroquois Five Nations as allies of Great Britain.

In 1731, French workmen and soldiers built a small stockaded fort at "Point à la Chevelure"; three years later a more substantial stone fort was begun on the west side of the lake at Crown Point. Fort St. Frédéric was nearly finished by 1737, but underwent further enlargement in subsequent years. King George's War (1744-1748), known in Europe as the War of the Austrian Succession, renewed the open conflict between France and Great Britain. Using Fort St.

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Frédéric as a base during the war, the French and their Native American allies attacked Saratoga, Fort Massachusetts, Fort Number Four (New Hampshire), and other English settlements in the region. Governor William Shirley of Massachusetts called for an expedition against Fort St. Frédéric during King George's War, but a successful campaign in 1745 against the French fortress of Louisbourg on Cape Breton Island prevented any large-scale military activity in the Lake Champlain region. Fort St. Frédéric remained a major French base in North America when the Treaty of Aix-la-Chapelle ended the war in 1748.

The uneasy peace following King George's War began to unravel in 1754 with the surrender of Lieutenant Colonel George Washington's provincial force at Fort Necessity in western Pennsylvania and through subsequent decisions by the British and French to commit several thousand fresh troops to North America. In April 1755 at a conference of English colonial governors, the die was cast for the final confrontation in the struggle for the political and economic control of North America when General Edward Braddock, the British military commander in chief, approved plans to forcibly remove the French from four strategic forts in North America. The French and Indian War, as it was known in the colonies, would eventually establish Britain as the dominant colonial power in North America.

One expedition, which had been considered during King George's War, finally came to fruition with the commitment of a provincial army to capture the French fortress at Crown Point on Lake Champlain. William Johnson, a militia officer in New York and an expert on Indian affairs, was chosen to lead the military expedition to capture Fort St. Frédéric. On August 28, 1755, Major General William Johnson and his provincial troops reached the shores of Lake St. Sacrement (renamed Lake George by Johnson). As the English provincial force organized its camp at the southern end of Lake George, a French expedition under the leadership of Jean-Armand de Dieskau proceeded from Fort St. Frédéric south on Lake Champlain to attack the new fort at the "Great Carrying Place." Leaving more than half his army at Ticonderoga, Major General Dieskau moved swiftly to South Bay with 1,500 Canadians, Indians, and regular troops. Fearing cannons at the fort and arguing that the English outpost was "on territory rightfully belonging to them," the Indians refused to attack Fort Lyman (Edward), causing Dieskau to divert his expedition to Johnson's Lake George Camp (O'Callaghan 1850:342). After three engagements between French and English troops on September 8, 1755, the surviving French force retreated to Ticonderoga. Although hailed as a victory, the primary objective of the campaign (taking Fort St. Frédéric) was not achieved, as the English army never proceeded beyond the southern end of Lake George. The provincial troops, however, built Fort William Henry in the fall of 1755. The Crown Point Expedition of 1756 never moved beyond the southern end of Lake George and a year later a French and Native American force destroyed Fort William Henry.

The spring and summer of 1758 brought renewed military activity to the lake as the struggle for political and economic claim over the continent resulted in ever-larger campaigns. The largest European military expedition assembled to date in

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North America gathered at the southern end of Lake George under the leadership of Major General James Abercromby, the 52-year-old British commander in chief. An army of 6,367 British regulars and 9,024 colonial troops massed at the ruins of Fort William Henry in early July of 1758. The objective of the 1758 operation was to capture Fort Carillon first, which had by then supplanted Fort St. Frédéric (Figure 3:9) as the most important French fortress on Lake Champlain. On July 5, 1758, the immense army was transported to the northern end of Lake George in approximately 900 bateaux, 135 whaleboats, a number of rafts, and three small radeaux or floating batteries (Boston Gazette 1758a). Shortly after disembarking in Ticonderoga, Brigadier General George Augustus Howe, the army's field commander, was killed in a skirmish in the densely forested western shoreline along the outlet of Lake George.

The French army of 3,526 men entrenched themselves behind a long defensive breastwork of logs about a quarter-mile west of Fort Carillon. Relying on a faulty assessment of the strength of the log wall, on July 8 Abercromby sent wave after wave of British regulars and provincials without the aid of artillery against the French lines. Abercromby's precipitous decision to attack the French breastwork was based not only on poor engineering advice, but also on information from French prisoners who disclosed the expectation of reinforcements at Carillon. By seven in the evening, orders were given to stop the reckless bloodbath, but nearly 2,000 of the British and provincial troops had been killed or wounded. Panic-stricken by the defeat, some of the army left for the southern end of Lake George in bateaux during the night. Abercromby and his main force, however, did not depart until the next morning. The British and provincial troops remained at the southern end of Lake George for the rest of the year engaged in building vessels for use in future campaigns against the French. The troops built the sloop *Earl of Halifax*, several row galleys, and two radeaux including the 52ft (15.9m) *Land Tortoise* (Champion 1891:420, 431; Boston Gazette 1758b). Since Fort William Henry had been burned the previous year, the newly constructed vessels were purposely sunk in late October by provincial troops for safekeeping over the winter.

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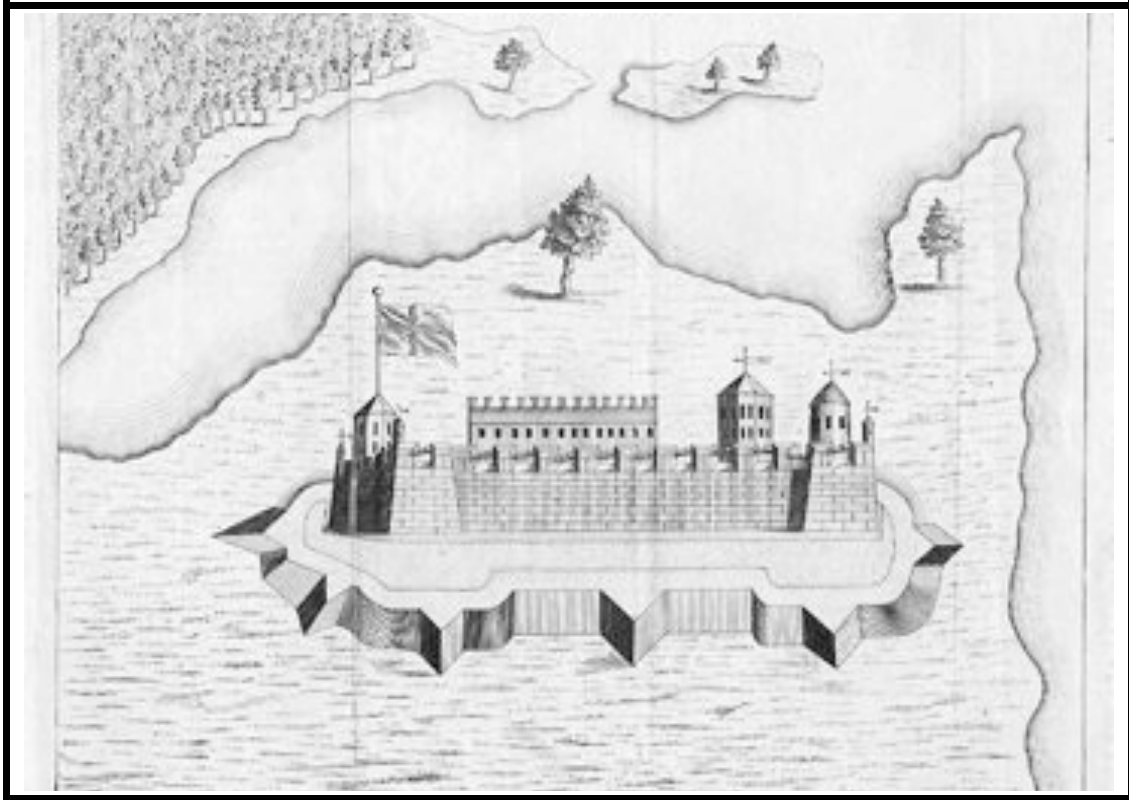


Figure 3:9. Engraving of Crown Point (Proud 1759).

Under the competent leadership of the new British commander in chief, Major General Jeffery Amherst, assaults were methodically planned on Forts Carillon and St. Frédéric and from there a push onward to Canada during the 1759 season. On July 21, a flotilla of vessels (the sloop *Halifax*, two row galleys, the newly-constructed radeaux *Invincible*, provision vessel *Snow Shoe*, rafts, bateaux and whaleboats) departed for Ticonderoga (Hawks 1911:41-44; Wilson 1857:87-90; Zaboly 1993:374-79; Barnard n.d.). Five days later a token French force evacuated Fort Carillon. The day following the French departure from Ticonderoga, Amherst ordered Captain Joshua Loring to place the sawmill back in operation in order to build a fleet capable of challenging the French vessels on Lake Champlain: the schooner *La Vigilante* and three sloops or "xebecs", *La Musquelongy*, *La Brochette*, and *L'Esturgeon*.

Amherst's main army departed for Crown Point on August 4, four days after the French had destroyed Fort St. Frédéric and fled to Isle-aux-Noix in the Richelieu River. To gain naval control of Lake Champlain, Amherst subsequently ordered the building of the brig *Duke of Cumberland*, the sloop *Boscawen*, and the radeau *Ligonier*. Two smaller radeaux and several other vessels were also built for Lake Champlain. The row galleys and most of the bateaux and whaleboats had been transferred from Lake George to Lake Champlain. The British and provincial army embarked on the long-planned Canadian invasion on October 11, but was hampered by adverse weather and returned to Crown Point ten days

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later. The naval fleet under the direction of Joshua Loring, however, was successful in forcing the French to scuttle their three sloops. The sloops were later raised and used by the British in the 1760 campaign. The last major campaign of the French and Indian War involved the convergence in 1760 of three British armies against the French position in Montreal. The Champlain fleet was employed as part of a three-pronged advance on Montreal. The British and provincial troops successfully captured the French fort and fleet at Isle-aux-Noix, including the schooner *La Vigilante*, sloop *Waggon*, and row galleys *Petit Diable* and *Grand Diable*. The capture of Montreal brought about an end to France's colonial presence in North America. Unable to mount an effective response, France capitulated and the war ended in 1763.

The French and Indian War on Lake Champlain had finally determined the dominant European culture in eastern North America: Great Britain. For the first time, control over the entire Champlain waterway, from the St. Lawrence to New York City, was under the jurisdiction of a sole nation. The resulting period of peace and stability stimulated resettlement of the area, and led to the resumption and expansion of trade in the Champlain Valley. This peace, however, was short-lived. Just fifteen years after the cessation of warfare in the Champlain Valley, trade and taxation disputes between the American colonists and the Royal government fomented into a full-blown revolution.

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## REVOLUTIONARY WAR

### 1775: Rebellion Comes to the Champlain Valley

The signing of the Treaty of Paris in 1763 ended the French and Indian War and eliminated the threat of hostilities with France, but the yoke of British rule seemed increasingly heavy to self-reliant and restive British colonists in North America (Figure 3:10). The colonists viewed the increased taxes, perceived limitations of rights, and trade duties levied by their distant government as tyranny, while the British government considered growing colonial resistance a movement that required vigorous suppression. The leaders of the imminent American rebellion grew more vocal in their advocacy of human rights and liberty. The colonies first unified to condemn the Stamp Act of 1765, but they reacted even more quickly to the passage of the Coercive ["Repressive" or "Intolerable"] Acts in 1774, which Parliament had instituted in response to the Boston Tea Party. As King George III informed Prime Minister Lord North in September 1774, "the die is now cast, the colonies must either submit or triumph....We must not retreat; by coolness and remitted pursuit of the measures that have been adopted I trust they will submit" (Middlekauf 1982:261). The king's confident wish did not come true.

On the evening of April 18, 1775, the inevitable finally occurred when British troops marched out of Boston to seize patriot supplies in nearby Concord, Massachusetts. The next morning, shots were fired at neighboring Lexington, Massachusetts and left eight Americans dead on the green. Further volleys were exchanged at Concord, and American militiamen hotly pursued the British force on its entire retreat to Boston. By nightfall of April 19, a ring of patriot militias had taken up arms in the call for resistance and encircled British-held Boston. The British attempt to discourage the "rude rabble without plan" with a display of force had instead led to conflict (Middlekauf 1982:266).

From the outset, rebel leaders knew that they must expel the besieged British garrison in Boston, but such an undertaking was impossible without heavy artillery. Such weaponry was at that time completely unavailable to colonial militias. However, cannon were known to be in ample supply at the weakly-manned British forts at both Ticonderoga and Crown Point on Lake Champlain. The Americans immediately devised plans to seize the guns and bring them to Boston.

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Figure 3:10. Map showing the British North American Colonies in 1772 (Bell 1772).

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Once again, as had been the case in the French and Indian War, Lake Champlain became a critical strategic arena. If the Americans could capture the lake's British forts, they would gain not only cannons but also control of the lake. They would then command the most direct invasion route to British Canada. On the other hand, if the British maintained their presence on Lake Champlain, then geography would favor their endeavors, allowing them to divide New England from the other colonies and conquer them all piecemeal.

Prior to the British firing on the militia assembled at Lexington on April 19, 1775, only about one-third of the American population supported the Revolution (roughly one-third remained loyal to the crown and the rest were effectively neutral). However, the British consistently underestimated the rebels' determination and will. The colonists' desire to create a nation where they and their descendents could participate in political and economic decisions was an ideal many summed up in a single word: liberty. For this principle, they were willing to sacrifice their comfort, their property, and their lives.

### **Challenge to British Rule**

On May 10, 1775, three weeks after the engagements at Lexington and Concord, the Americans undertook offensive action against the British on Lake Champlain. Colonists in the region had been in conflict for some time; for years, both New York and New Hampshire had laid claim to present-day Vermont, then known as the New Hampshire Grants. Under the leadership of Connecticut native, Ethan Allen, the "Green Mountain Boys" had risen up to support New Hampshire's claims against New York settlers. Colonial rivals now dropped their previous animosity to unite against a common enemy.

Early in May 1775, Connecticut authorized Ethan Allen and two hundred Green Mountain Boys to attack Fort Ticonderoga and capture its cannon for the siege of Boston. Fort Ticonderoga and Crown Point, another fortification eleven miles to the north, were both lightly garrisoned and in severe disrepair. On the eve of the planned attack, Benedict Arnold arrived with a colonel's commission and orders from the Massachusetts Committee of Safety, bent on the same mission. After a heated dispute between the two leaders to determine who was in charge of the attacking party, Arnold and Allen finally agreed to share the command. In the early-morning hours of May 10, they entered the fort side by side with a force of 81 and took the sleeping garrison by surprise.

In his memoirs, Ethan Allen wrote his version of events that May night at Fort Ticonderoga:

[I] ordered the commander, Captain Delaplace, to come forth instantly or I would sacrifice the whole garrison, at which time the Captain came immediately to the door, with his breeches in his hand, when I ordered him to deliver the fort instantly. He asked me by what authority I demanded it. I answered him, 'In the name of the great Jehovah, and the Continental Congress' (Allen 1807).

Contemporary legends record a more direct and blunt quotation, one even more in keeping with Allen's brash and volatile personality: "Come out of there, you damned old rat!" (Bellesiles 1993:118).

Allen's fellow leader on the Fort Ticonderoga expedition was Benedict Arnold, who in

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1775 was a courageous officer staunchly loyal to the American cause (Figure 3:11). Raised in Connecticut, Arnold proved himself a brilliant military leader of uncommon bravery in the early years of the American Revolution. Generals George Washington, Philip Schuyler, and Horatio Gates all respected Arnold's ability to overcome seemingly insurmountable obstacles time and time again. Despite his long list of military successes and crippling war wounds, however, Arnold was continually passed over for promotion as the war continued. In some instances he was never paid or reimbursed for his services, and a politically divided Continental Congress never honored him for his victories.



Figure 3:11. Portrait of Colonel Benedict Arnold (Private Collection).

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As a result of these actions, the dissatisfied Arnold turned to the British. Eventually, Arnold's tale reached its climax when British Major John Andre was captured in September 1780 on his way back to New York City, bearing plans of West Point after a clandestine meeting with Arnold. His defection uncovered, Arnold escaped to New York City to join the British, and later he led an expedition into Virginia against his former countrymen. Because of his later treason, Arnold has traditionally been cast as the arch-villain of the American Revolution, his reviled name synonymous with the word *traitor*. In recent years, however, historians have taken a more comprehensive view of Arnold's complex character, acknowledging his indispensable leadership during the critical early years of the Revolution when the scene of the conflict was the Champlain Valley.

Along with Fort Ticonderoga, Allen and Arnold quickly captured the fort at Crown Point in May 1775. At the southern end of the lake, the Loyalist settlement of Skenesborough (present-day Whitehall), New York, fell to the Americans as well. At Skenesborough, the Americans seized Philip Skene's schooner *Katherine*, the first vessel to be captured in the war and the first designated warship of the rebellious colonies. In his journal, Lieutenant Eleazar Oswald noted the event: "We set sail from Skenesborough in a schooner belonging to Major Philip Skene, which we christened *Liberty*" (Oswald 1775).

Arnold immediately assumed command of *Liberty* when the schooner arrived at Ticonderoga and embarked for St. Johns, Canada, at the northern end of the lake. There he surprised and captured the "King's sloop" *Betsy*. Arnold renamed the sloop *Enterprise* and confidently reported, "At present, we are Masters of the Lake." Thus, just over a year before the signing of the Declaration of Independence, American forces on Lake Champlain were in complete control of a water highway that led directly into the heart of Quebec. To capitalize on their strategic advantage, the Americans made immediate plans to invade Canada (Bellico 1992:117-118).

### **Invasion of Canada**

The American invasion of Canada in the fall of 1775 was a two-pronged attack. Philip Schuyler and Richard Montgomery commanded a force that moved north on Lake Champlain, while Benedict Arnold led an army overland through Maine and Canada to Quebec. The advance of Schuyler and Montgomery was successful, although Schuyler was forced to relinquish command due to poor health. Montgomery and his forces overcame the British garrisons at Chambly, St. John's, and Montreal, capturing two additional vessels and one that was under construction. The completed ships, renamed *Royal Savage* and *Revenge*, were added to the American fleet on Lake Champlain. Despite these American victories, the determined defense of the British garrison at St. John's delayed the Americans' plans to advance on Quebec before winter.

In the meantime, Benedict Arnold led a force of 1000 men through the Maine wilderness. However, what had originally been estimated as a three-week journey over 180mi (290km) was in fact a grueling 360mi (579km) trek across rugged terrain, which required six weeks to complete. In a letter to Philip Schuyler, Arnold described the ordeal his soldiers faced:

The men having with the greatest fortitude and perseverance hauled their bateaux up

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rapid streams, obliged to wade almost the whole way, near 180 miles, carried them on their shoulders near forty miles over hills, swamps and bogs almost impenetrable, to their knees in mire...famine staring us in the face, an enemy's country and uncertainty ahead. Notwithstanding all these obstacles, the officers and men, inspired and fired with the love of liberty and their country, pushed on with fortitude...and most of them had not one day's provisions for a week! (Arnold 1775)

Arnold recognized the sacrifices his men made as they toiled along in their journey and managed to set an example that kept the spirits of his men alive. Twenty-two-year-old Abner Stocking of Connecticut spoke of "our bold though inexperienced general...[who] inspired us with resolution. The hardships and fatigues he encountered, he accounted as nothing in comparison with the salvation of his country" (Randall 1990:188). Arnold established his leadership abilities there in Maine and in the Canadian wilderness, and his success prompted General Washington to inform General Schuyler: "The merit of that officer [Benedict Arnold] is certainly great, and I heartily wish that fortune may distinguish him....He will do everything which prudence and valor will suggest" (Randall 1990:189).

In November 1775, Arnold and Montgomery joined forces at Quebec City (Figure 3:12). They surrounded British General Carleton and his garrison, and a long Canadian winter lay ahead. Since Canada had been a French colony only 16 years earlier, many Americans believed that French Canadians might seize this opportunity to assist the Americans and free themselves from British rule. A daring assault on the city was undertaken during a blizzard on New Year's Eve, but it left Montgomery dead, Arnold wounded, and more than 400 Americans as prisoners. After this disaster, few Canadians demonstrated much interest in joining the rebellion.

The weakened American force camped outside Quebec throughout the harsh northern winter. Despite famine and disease, they maintained the siege of the city. Reinforcements from New York, Pennsylvania, Massachusetts, New Hampshire, and Connecticut marched hundreds of miles north along frozen Lake Champlain and the St. Lawrence River, but they were too few and too late to save the American effort.

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Figure 3:12. View of Quebec, circa 1755 (Le Rouge 1755).

### Retreat from Canada

The Americans stubbornly maintained their siege of Quebec throughout the winter of 1775-1776, but Carleton knew that English assistance would arrive as soon as the St. Lawrence River was clear of ice. In May 1776, a British convoy from Europe at last reached Quebec, carrying 10,000 British regulars and German troops. Their arrival triggered a hasty and disorganized American retreat from around the city fortress, as the American commanders realized they could only hope to save their army. They stopped at Ile-aux-Noix in the Richelieu River to regroup, but it was a desperate scene. Three thousand ailing soldiers camped on the island, and at least 15 to 20 perished every day for want of medical supplies. Dr. Samuel Meyrick, a surgeon from Massachusetts, wrote: "Great numbers could not stand, calling on us for help, and we had nothing to give them. It broke my heart, and I wept until I had no more power to weep" (Trumbull 1841:299-300).

Realizing that they had no hope of defending the island with a force that grew weaker each day, the remaining colonial troops evacuated Ile-aux-Noix to retreat to Crown Point. Encamped at the ruins of the largest fort ever constructed in North America, the remnants of the American [Continental] Northern Army had better access to supplies, but the ravages of disease continued. Losses climbed daily as more soldiers were buried in unmarked graves.

During the time the Americans lay at Ile-aux-Noix and Crown Point, the fresh British

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army rested at St. John's and awaited orders to invade. The King's troops knew of the deplorable condition of the American army, but they elected not to take advantage of the situation. For the moment, the Americans' four little ships captured in 1775 blocked the British advance. The French and Indian War had demonstrated that whoever controlled the waters of Lake Champlain controlled the Champlain Valley. Despite the condition of their army, in July 1776 the Americans had vessels sailing the waters while the British had no fleet available. Until the British could gain naval supremacy on Lake Champlain, their army could not advance unprotected.

### **The Americans: Building a Fleet from a Forest**

I know of no better method than to secure the important posts of Ticonderoga and Crown Point, and by building a number of armed vessels to command the lakes, otherwise the forces now in Canada will be brought down upon us as quick as possible, having nothing to oppose them... They will doubtless try to construct some armed vessels and then endeavor to penetrate the country toward New York. (Brigadier General John Sullivan to George Washington, June 24, 1776, Naval Documents 5:701-702).

The Americans had captured and armed four vessels in 1775: *Liberty*, *Enterprise*, *Royal Savage*, and *Revenge*. These ships temporarily gave the Americans the upper hand on Lake Champlain and prevented the British army from advancing south. Throughout the summer of 1776, American and British forces at opposite ends of the lake worked furiously to assemble naval squadrons. The success of their efforts depended in part upon the delivery of supplies and equipment from many sources, some of them thousands of miles away.

When the American army returned to Lake Champlain in the summer of 1776, Benedict Arnold was selected to oversee the American shipbuilding efforts. The southern lake town of Skenesborough, although swampy and mosquito-infested, served as the fleet's building center. Skenesborough had two sawmills and an ironworks to supply the shipyard, and the local landscape favored its protection (Figure 3:13). Arnold directed skilled shipwrights from Connecticut, Rhode Island, Pennsylvania, and Massachusetts, and vital naval supplies arrived from all over the Northeast. In just over two months, the American shipbuilding effort produced one small galley constructed from timbers captured at St. Johns, eight new 54ft (16.5m) gondolas (or gunboats) (Figure 3:14), and four 72ft (22m) row galleys. Each completed hull was rowed to Fort Ticonderoga and fitted out with masts, sails and rigging, guns, and supplies. By early October 1776, the American fleet numbered 16 vessels.

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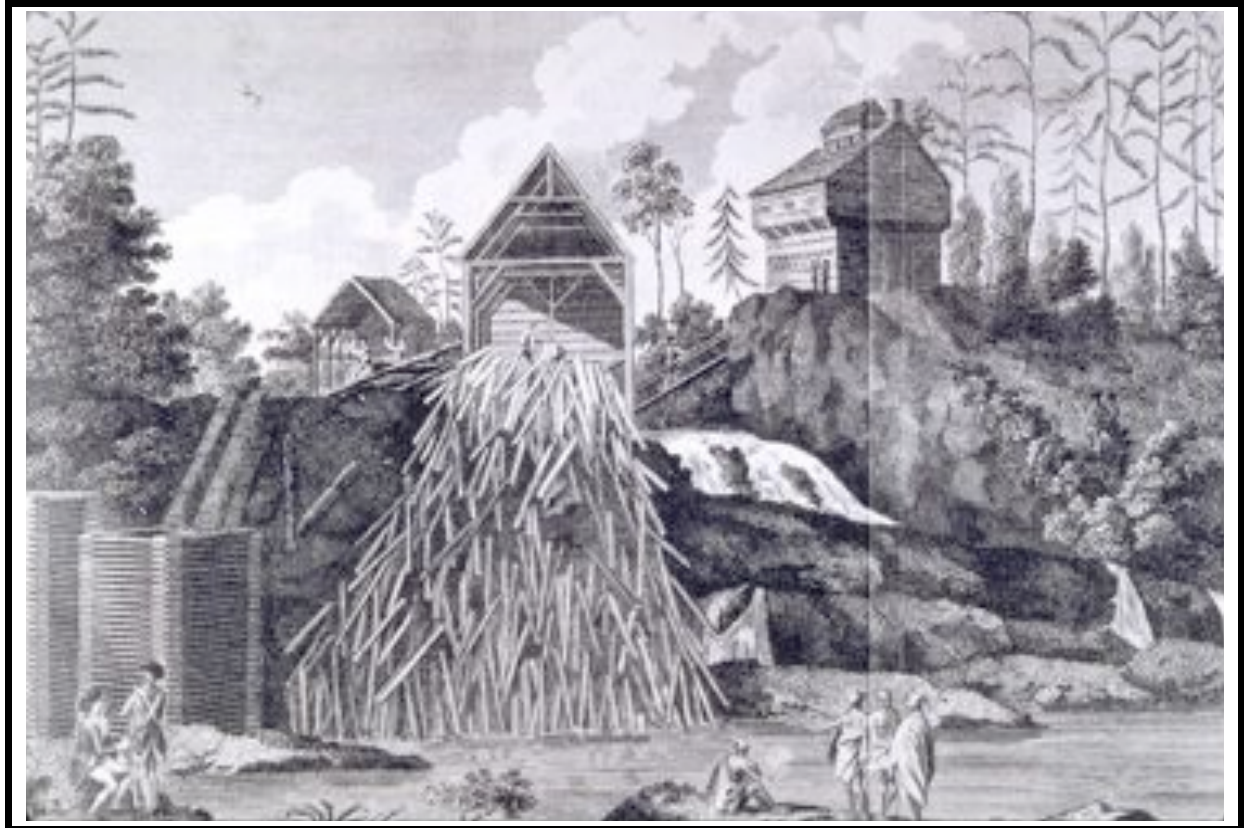


Figure 3:13. View of a colonial-era sawmill (Courtesy of the National Archives of Canada, Rare Books Division).

Arnold's task was difficult, but he succeeded in carving a fleet out of the wilderness under the most challenging conditions. A silent partner to his success was Philip Schuyler, wealthy landowner, veteran of the French and Indian War, and commander of the American northern theater. Schuyler had supported the patriots' cause since the start of the war. In 1775 he had led the Northern Army prior to its ill-fated invasion of Canada, but poor health forced him to relinquish command to his subordinate, Richard Montgomery. In 1776, Schuyler played a pivotal role in supplying the forces on Lake Champlain by bringing in materials from the Hudson River valley and New England. To outfit the fleet, he stripped American vessels anchored in the Hudson, which the British navy had blocked from sailing. History has tended to overlook his achievements, but he performed miracles for the cause.





Figure 3:14. Photograph of *Philadelphia II*, the LCMM's replica of the 1776 Gunboat *Philadelphia* (LCMM Collection).

Schuyler's relationship with New Englanders and with the politically motivated General Gates, however, were poor, and Schuyler eventually offered his resignation on September 15, 1776. Schuyler's resignation was denied, and in 1777 he found himself again in charge of the Northern Army when General St. Clair abandoned Fort Ticonderoga to the advancing British. Rumors circulated that Schuyler had sold out to the British or was simply inept. He tendered his resignation again, and this time his nemesis, Horatio Gates, replaced him during the Saratoga campaign. Even then, Schuyler continued his efforts to supply the American army.

An assistant to Schuyler and another unsung hero of the early revolutionary years on Lake Champlain was Richard Varick of New York. Varick served as military secretary and was responsible for locating and procuring supplies and equipment for the Skenesborough shipbuilding project. Varick became a great friend of General Arnold, and in August 1780 he was appointed Arnold's aide-de-camp. After Arnold's treason at West Point in the summer of 1780, Varick fell under suspicion for his association with the general. A court of inquiry cleared him, but he nonetheless resigned from the army. In May 1781 General Washington selected Varick as his confidential secretary and laid to rest all doubts of Varick's loyalty. After the war, he became a leader in Federalist politics and served as mayor of New York City from 1789 to 1801.

## **The American Fleet**

We are as well prepared for the enemy as our circumstances will allow. They will never

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have it in their power to surprise us. The men are daily trained in the exercise of their guns. If powder was plenty, I would wish to have them fire at a mark with their great guns often. At present, we cannot afford it. (Benedict Arnold to General Horatio Gates, September 21, 1776 [Arnold 1776a])

By the autumn of 1776, the American navy on Lake Champlain was a combined fleet of captured and newly built ships (Table 3:1 and Figure 3:15). Under the command of General Benedict Arnold, the fleet was manned by volunteers and troops drafted from the Northern Army. Arnold, who had sought troops with some maritime experience, was not very pleased with his recruits. He wrote to General Horatio Gates, Commander of the Northern Department, “We have a wretched motley crew in the fleet, the marines the refuse of every regiment, and the seamen, few of them ever wet with salt water.” Experienced sea officers, not tempted by the potential riches of privateering, were sent from the New England colonies to command the ships. Benjamin Rue, a twenty-five-year-old Pennsylvanian who had commanded a vessel on the St. Lawrence during the Canadian campaign, was given command of the gunboat *Philadelphia*.

Name of Vessel	Vessel Type	Armament
<i>Royal Savage</i>	Schooner	six 6-lb, four 4-lb, and 12 swivel guns
<i>Revenge</i>	Schooner	eight 4-lb and 10 swivel guns
<i>Enterprise</i>	Sloop	ten 4-lb and 12 swivel guns
<i>Lee</i>	Cutter	one 12-lb, one 9-lb, and four 4-lb, and 10 swivel guns
<i>Trumbull</i>	Galley	one 18-lb, one 12-lb, two 9-lb, and two 6-lb, two 4-lb, and 10 swivel guns
<i>Washington</i>	Galley	one 18-lb, three 12-lb, four 6-lb, and 10 swivel guns
<i>Congress</i>	Galley	two 18-lb, two 12-lb, four 6-lb, and 10 swivel guns
<i>Philadelphia</i>	Gondola (Gunboat)	one 12-lb and two 9-lb cannon
<i>New York</i>	Gondola (Gunboat)	one 9-lb and two 6-lb cannon
<i>Jersey</i>	Gondola (Gunboat)	one 12-lb and two 9-lb cannon
<i>Connecticut</i>	Gondola (Gunboat)	one 12-lb and two 9-lb cannon
<i>Providence</i>	Gondola (Gunboat)	three 9-lb cannon
<i>New Haven</i>	Gondola (Gunboat)	one 12-lb and two 9-lb cannon
<i>Spitfire</i>	Gondola (Gunboat)	three 9-lb cannon
<i>Boston</i>	Gondola (Gunboat)	one 12-lb and two 9-lb cannon
Total: 15 vessels		

Table 3:1. Details of the American fleet at the battle of Valcour Island (based on the Townsend Document).

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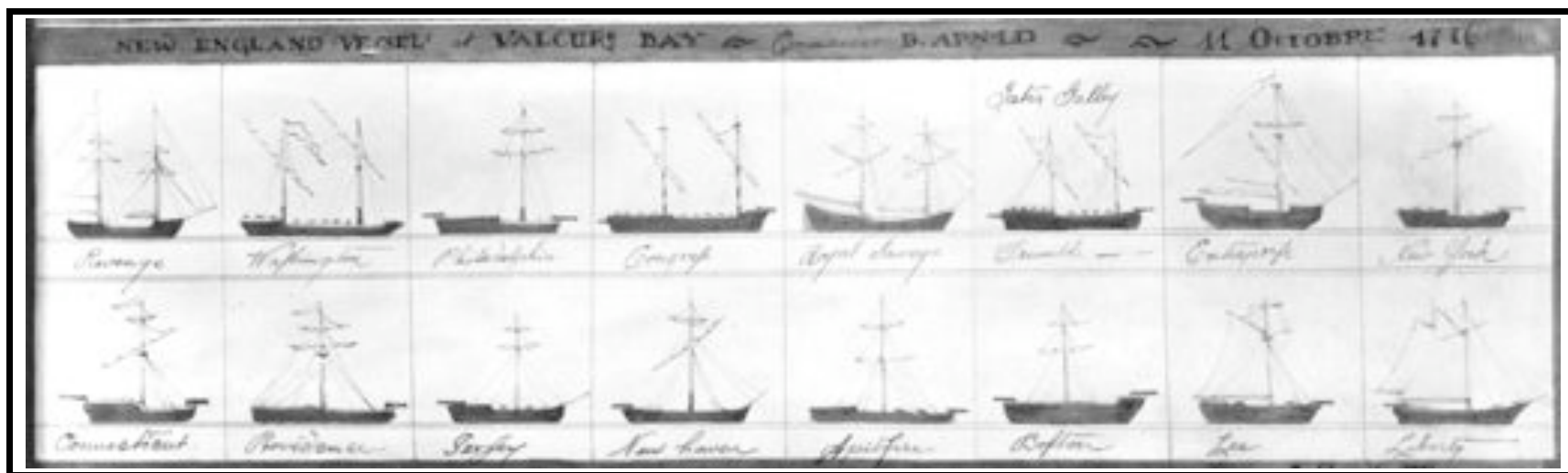


Figure 3:15. Detail from *God Bless Our Arms* showing profiles of each vessel in the American Fleet (Courtesy of the Fort Ticonderoga Museum).

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On October 6, General David Waterbury Jr., an experienced mariner from Connecticut, joined the fleet aboard the newly outfitted galley *Washington* as Arnold's second in command. Waterbury was not unfamiliar with the Champlain Valley; a soldier since the start of the war, he commanded the outpost at Skenesborough during the fleet's construction. Waterbury brought with him a letter from Gates, informing Arnold that the 200 experienced seamen promised from New York had not yet arrived and should not be expected. Arnold had to be content with the collection of ships and men already under his command. The sloop *Liberty*, though part of the fleet, was serving as a message and supply carrier between the fleet and Ticonderoga and was not involved at Valcour Island.

### **The British: Transporting Ships to an Inland Lake**

When the British fleet arrived at the basin below Quebec in May 1776, it brought troops to reinforce Montreal and also signaled the end of any American invasion of Canada. Thus began a British counter-thrust into the colonies. The British anticipated that their 1776 campaign might take place "on the lakes," and prefabricated parts of gunboats from England were already arriving in Quebec.

British General Guy Carleton selected the outpost at St. John's as the center for the British shipbuilding effort. The series of rapids and shallows in the Richelieu River above [between St. John's and] Chambly, Quebec, created a formidable barrier for ships traveling from the St. Lawrence River to Lake Champlain. Naval Lieutenant John Schank, a man of great mechanical skill, was put in charge of the British effort and devised a way to overcome the region's topographical limitations. The British could have moved past the rapids and constructed a fleet from the forest as the Americans did at the southern end of the lake, but Schank realized that such an endeavor would require the entire campaign season. His solution was to transport all of Quebec's available vessels (in varying stages of completion) over or around the rapids.

The first vessel, the schooner *Maria*, was partially dismantled and dragged overland around the rapids. This arduous chore, however, expended too much time and manpower. A more successful solution was found when a second schooner, *Carleton*, was dismantled into large pieces and carried over the rapids on longboats. The gondola *Loyal Convert* came over the rapids as well, while the huge radeau *Thunderer* was built entirely at St. John's and launched there. Ten smaller gunboats were hauled around the rapids by wagon. The ship *Inflexible*, then in frames at Quebec, was also dismantled and carried over the rapids. Once the pieces of *Inflexible* reached St. John's, reassembly took only 28 days, but the wait for this large vessel postponed the sailing of the British fleet until early October. This delay later proved to be critical.

In addition to Lieutenant Schank, several other British officers played crucial roles in the fleet's construction. First and foremost was Governor General Guy Carleton. In 1775, Carleton was Governor of Quebec and commander of all British forces in Canada. He organized the successful defense of Quebec, and in 1776 he directed the offensive against the retreating American army and accompanied the British fleet on Lake Champlain. During the Battle of Valcour Island, Carleton, on board the flagship *Maria*, was noted for his cool composure. The Americans noted his humanity when General Waterbury and the crew from the captured *Washington* were brought aboard Carleton's

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vessel: “As soon as the action was over, Sir Guy gave orders to the surgeons of his own troops to treat the wounded prisoners with the same care as they did his own” (Maguire 1978:147). Carleton’s decision to break off the invasion in late October 1776 was not well received in England, and General John Burgoyne was appointed to command the invasion of 1777. Ironically, after the war, when Benedict Arnold, crippled by wounds suffered in the service of America, was presented to King George III, he was supported on the arm of his old adversary, Sir Guy Carleton (Maguire 1978:147).

Aby assisting Carleton was the British fleet commander on the St. Lawrence, Captain Charles Douglas. Under orders from Governor General Carleton to hasten the construction of a naval force to pursue the fleeing rebels, Douglas worked tirelessly throughout the summer of 1776 overseeing a small army of shipwrights, sailmakers, and other artisans, organizing supplies and vessels, reassigning officers and men from the regular navy, and drafting seamen from the transport service. By early October, he had assembled the largest naval force ever to sail on Lake Champlain. Douglas was rewarded the following year with a baronetcy.

Commanding the lake fleet was Captain Thomas Pringle. His performance during the battle provoked considerable controversy and initiated the action of three of his officers to publish a critical rebuttal of his official account of the engagement. Despite this blemish on his record, Pringle later rose to the rank of admiral.

### **The British Fleet**

The British fleet on Lake Champlain (Table 3:2) was constructed for two purposes: 1) to overcome the American fleet then patrolling the lake, and 2) to escort and protect the army that was preparing to invade the colonies. The larger vessels were manned by Royal Navy officers and seamen from the St. Lawrence naval and transport ships, and the gunboats were manned by British and Hessian artillerymen. These professional forces were far superior to the untrained novices aboard the American fleet. Captain Pringle commanded from the deck of *Maria*, and General Carleton accompanied him on the same vessel.

Some 650 Native Americans supported the British fleet. Native Americans were important to both British and Americans as trading partners, as diplomats in frontier negotiations, and as military allies. Officially neutral, the Haudenosaunee (Six Nations) Confederacy was politically divided during the Revolution. Mohawk chief Joseph Brant actively urged alliance with the British, but the Oneidas and Tuscaroras aided Washington’s troops. Whatever their allegiance, the collaboration of Native Americans often gave an army a psychological advantage over its enemies, who tended to remember previous encounters fearfully.

<b>Name of Vessel</b>	<b>Vessel Type</b>	<b>Armament</b>
<i>Inflexible</i>	Ship	eighteen 12-pounders
<i>Carleton</i>	Schooner	fourteen 6-pounders
<i>Maria</i>	Schooner	sixteen 6-pounders
<i>Loyal Convert</i>	Gondola	five 9-pounders
<i>Thunderer</i>	Radeau	six 24-pounders, eighteen 12-pounders
4 unnamed longboats	Longboat	(various, some sources cite two 2-pounders)
20-24 gunboats, listed below		(each had one gun from 6 to 24 pounds)

<i>Baleine</i>	Gunboat	
<i>Blast</i>	Gunboat	
<i>Carcase</i>	Gunboat	
<i>Desperate</i>	Gunboat	
<i>Destruction</i>	Gunboat	
<i>Etna</i>	Gunboat	
<i>Firebrand</i>	Gunboat	
<i>Furious</i>	Gunboat	
<i>Infernal</i>	Gunboat	
<i>Invincible</i>	Gunboat	
<i>Pluto</i>	Gunboat	
<i>Renown</i>	Gunboat	
<i>Repulse</i>	Gunboat	
<i>Resolution</i>	Gunboat	
<i>Revenge</i>	Gunboat	
<i>Tartar</i>	Gunboat	
<i>Terrible</i>	Gunboat	
<i>Thunderbolt</i>	Gunboat	
<i>Vesuvius</i>	Gunboat	
Total: 30–34 vessels		81–85 guns; firepower 1,023 lbs.

Table 3:2. Details of the British fleet at the Battle of Valcour Island.

### **Battle of Lake Champlain**

The two fleets met at Valcour Island on October 11, 1776. The American fleet consisted of eight gondolas, three row galleys, two schooners, one sloop, one cutter and bateaux. The vessels in the British fleet were not only larger with better sailing characteristics, but they were also crewed by professional sailors under the command of skilled naval officers. The British force, under the direction of Captain Thomas Pringle and the overall command of Governor Guy Carleton, had almost twice the Americans' firepower in cannon.

American fleet commander Benedict Arnold selected the battle site. Lying about halfway between Crown Point and St. John's, Valcour Island provided the American fleet with both a natural defensive position and relief from the increasingly blustery autumn weather (Figure 3:16). Arnold's vessels sheltered to the west of the island, knowing that the British fleet would sail past on the east side. The Americans were both outgunned and outmanned in seamanship, and they hoped that the British vessels would have difficulty beating back against the wind after spotting the American line at anchor.

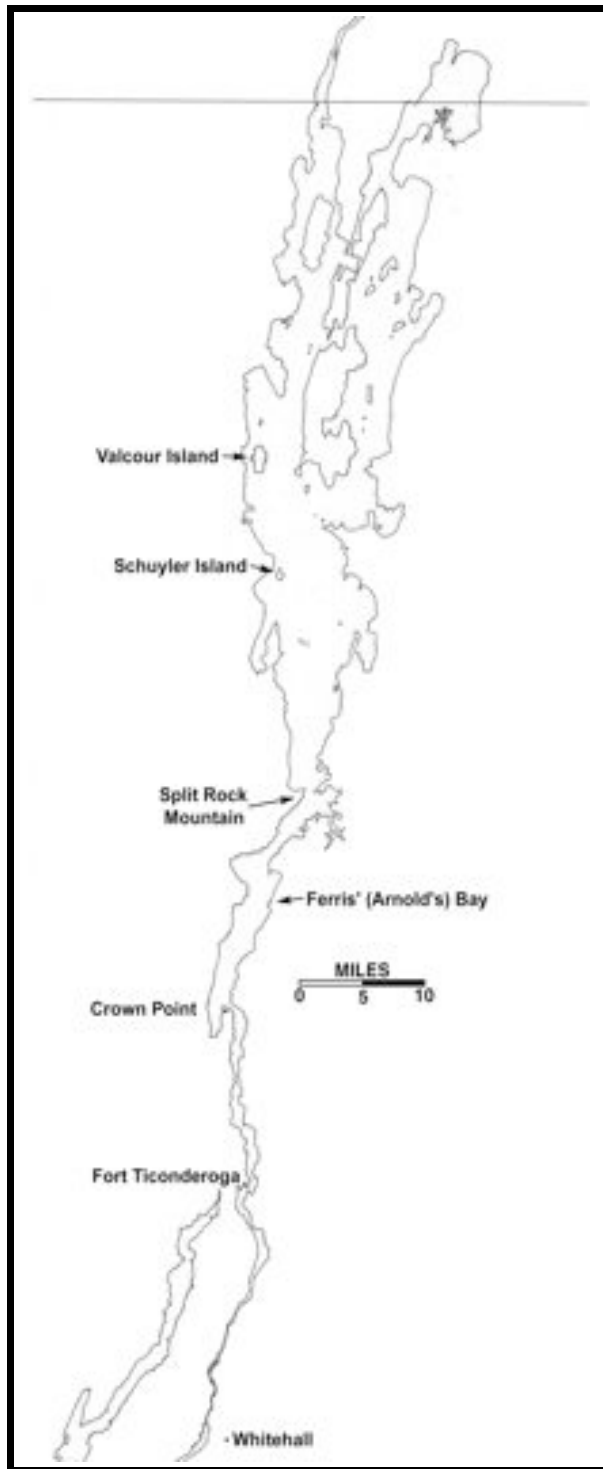


Figure 3:16. Map of Lake Champlain showing the key geographic feature in the Battle of Lake Champlain (by Adam Kane).

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On the morning of October 11, the British ships sailed past the southern end of Valcour Island, then turned north against the wind as they approached to engage the American fleet. For the next several hours the British and American vessels fought an intense battle (Figure 3:17 through Figure 3:20).

Fortunately for the outmatched Americans, most of the large British vessels were unable to work far enough against the wind to engage them. Instead, the bulk of the fighting that day was undertaken by British gunboats that rowed within musket range of the American line. Both sides sustained significant casualties, and the American schooner *Royal Savage*, one of Arnold's largest vessels, ran aground on the southwestern corner of Valcour Island.

The battle halted at nightfall, and one hour after the fighting stopped the gunboat *Philadelphia* sank from damage suffered in the exchange of cannon fire. At dusk, Arnold called a council of war, and the American officers agreed to attempt an escape by rowing past the British. As the British burned *Royal Savage* and provided a distraction on the eastern side of the inlet, the American fleet rowed south to safety along the New York shoreline with oars muffled and a shrouded light in each vessel's stern. Remarkably, the fleet passed the British undetected, and by morning they reached Schuyler Island and halted to stop their leaks and mend their sails. Arnold had abandoned two weakened gunboats, *Spitfire* and *Jersey*, during the flight. One of these vessels, *Spitfire*, was located in 1997 by the LCMM's Lake Survey Project (Figure 3:21) (see Cohn and Kane 2002).

As Arnold and his fleet recovered at Schuyler Island, the sun rose over a British fleet that expected to complete a rapid and decisive victory at Valcour Island. They were mortified to discover that the Americans had slipped past their blockade and hastily set off in pursuit. As the British moved south, they overtook and claimed the abandoned gunboat *Jersey*, while *Spitfire* was already resting on the bottom of the lake.

The weary American crews, struggling against a southerly wind, rowed for their lives. On the morning of October 13, near Split Rock Mountain, the fresh British fleet caught up with the vessels that were straggling at the end of the American line. The British surrounded the row galley *Washington*, which was forced to surrender after taking several broadsides (Figure 3:22). The British pressed on in a running gun battle that threatened the row galley *Congress* and four lagging gunboats. Arnold, who was commanding *Congress*, ordered his men to run the five vessels aground in Ferris Bay, near Panton, Vermont. He and his marines ascended the bank and blew up the ships with their flags still flying to deny them to the British. Arnold, the ships' crews, and the local residents of Panton narrowly escaped overland to Mount Independence and Fort Ticonderoga.

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Figure 3:17. *Battle of Valcour Island*, by Henry Gilder, circa 1776 (courtesy of Queen Elizabeth II).



Figure 3:18. *The Attack and Defeat of the American Fleet... Upon Lake Champlain* by William Faden, 1776 (courtesy of the National Archives of Canada).



Figure 3:19. The American line of battle during the Battle of Valcour Island by Randle (courtesy of the National Archives of Canada).



Figure 3:20. The British line of battle during the Battle of Valcour Island by Randle (courtesy of the National Archives of Canada).

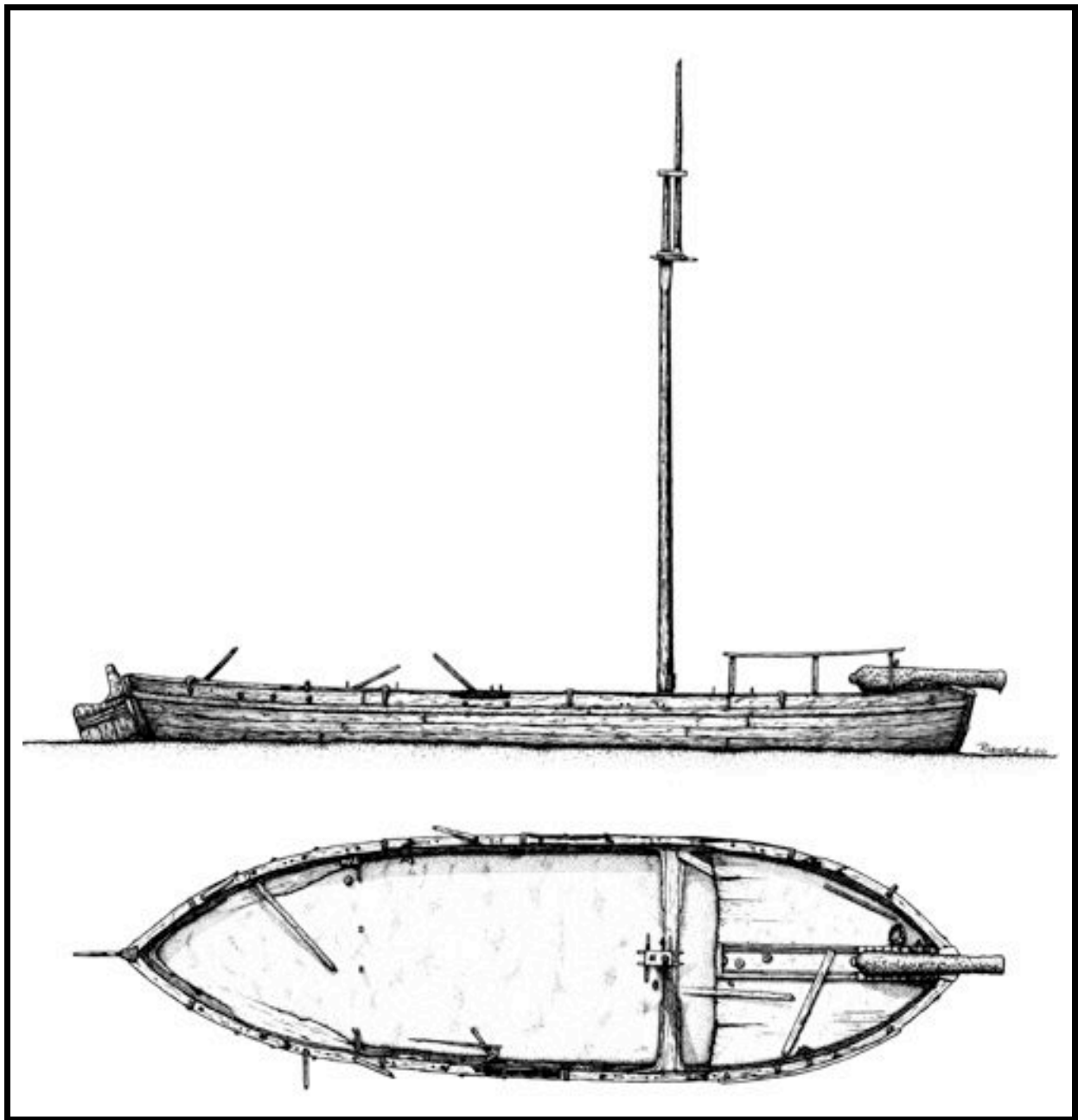


Figure 3:21. Preliminary profile and plan view of the gunboat *Spitfire* (LCMM Collection, drawn by David Robinson).

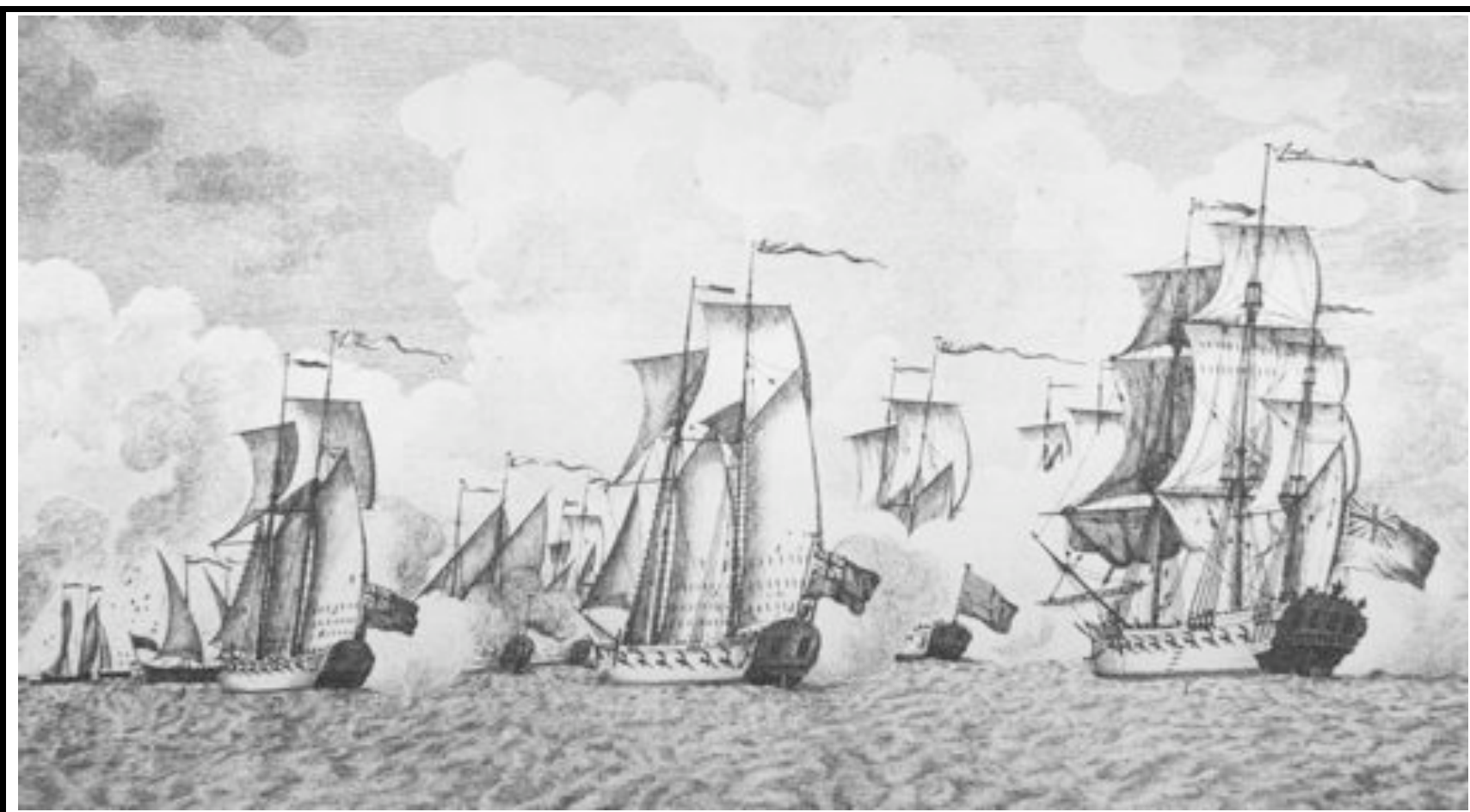


Figure 3:22. British depiction of the events of October 13, 1776 (Sayer and Bennett 1776).

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Out of Arnold's fleet of 15 vessels, only four returned safely to Fort Ticonderoga. Meanwhile, the American troops at Fort Ticonderoga and Mount Independence worked feverishly to increase the strength of their fortifications. The local militia was called to arms, and by late October the American defensive lines were manned with more than 12,000 troops. Considering the strength of the rebel force, the lateness of the season, and a sense that they had already made sufficient gains in that year, the British decided to break off the campaign and return to Canada for the winter.

Tactically, the Battle of Valcour Island was a sound defeat that resulted in the Americans' loss of control of Lake Champlain. Strategically, however, it proved to be one of the most decisive engagements of the war. The presence of the American fleet on Lake Champlain in 1776 forced the British to delay their invasion long enough to build a flotilla that could challenge the enemy. The British fleet was certainly superior, but the 1776 campaign season was essentially over by the time the ships were built and the battle was won. The following year, the British invaded swiftly through the Champlain Valley, but they were surprised to find death and defeat at Saratoga. Arnold's brave little fleet had slowed the British invasion long enough to give the Americans time to amass a larger, stronger, and better-prepared rebel army, placing the 1776 naval contest on Lake Champlain at the heart of that victory.

### **Primary Accounts**

#### ***Battle of Valcour Island: 11 October 1776***

Contemporary correspondence, presented below, reveals some of the most vivid and instructive information about the Battle of Lake Champlain. Several participants from both sides provided eyewitness accounts of the encounter. Benedict Arnold wrote a letter to Philip Schuyler when he arrived at Schuyler's Island, 12 October 1776:

...[A]t eight o'clock the enemy's fleet...appeared off Cumberland Head. We immediately prepared to receive them. The galleys and Royal Savage were ordered under way, the rest of our fleet remained at anchor. At eleven o'clock they ran under the lee of Valcour and began the attack. At half-past twelve the engagement became general and very warm. Some of the enemy's ships and all their gondelos beat and rowed to within musket-shot of us. They continued a very hot fire with round and grape shot until five o'clock when they thought it proper to retire about six or seven hundred yards distance, and continued fire until dark.

The Congress and Washington have suffered greatly... The New York lost all her officers except her Captain. The Philadelphia was hulled in so many places that she sank about an hour after the engagement was over. The Congress received seven shot between wind and water; she was hulled a dozen times; had her mainmast wounded in two places and her yard in one. The Washington was hulled a number of times, her mainmast shot through... The whole killed and wounded amounted to about sixty... We suffered much from want of seamen and gunners. I was obliged myself to point most of the guns on board the Congress, which I believe I did with good execution (Arnold 1776b).

Sir Guy Carleton, on board Maria off Valcour Island, wrote a letter to General Burgoyne on 12 October 1776:

We found the Rebel fleet... behind the Island of Valcour apparently... unapprized either of our force or motions. One of their vessels perceived us only a little before we came abreast of the Island, and our van [advanced force] got to the southward of it in time enough to stop them just as they were making off. They then worked back into the narrow part of the passage between

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the Island and main, where they anchored in a line. Their principal vessel, the Royal Savage, one of the first endeavoring to get out, in her confusion, upon finding our ships before her, ran upon the south end of the Island, and our gunboats got possession of her...

After we had, in this manner, got beyond the enemy and cut them off, the wind which had been favorable to bring us there— however entirely prevented our being able to bring our whole force to engage them, as we had a narrow passage to work up, ship by Ship, exposed to the fire of their whole line. The gunboats and Carleton only got up, and they sustained a very unequal cannonade of several hours, and were obliged to be ordered to fall back, upon finding that the rest of the fleet could not be brought up to support them (Carleton 1776a).

On the evening of October 11, General Carleton and Captain Pringle were fully convinced that they had the battered American fleet trapped within the confines of Valcour Bay. They planned to recommence action at dawn and were supremely confident of a decisive British victory. However, the morning mist burned off the lake on October 12 to reveal that the Americans were gone. During the night, Arnold and his captains had realized that they faced certain disaster if they remained to fight another day and consequently plotted a stealthy but daring retreat. As Arnold described in the above-mentioned, October 12 letter to Philip Schuyler:

On consulting with General Waterbury and Colonel Wigglesworth it was thought prudent to return to Crown Point, every vessel's ammunition being three-fourths spent, and the enemy greatly superior to us in ships and men. At seven o' clock... the Trumbull got under way; the gondelos and small vessels followed: and the Congress and Washington brought up the rear. The enemy did not attempt to molest us.

...On the whole I think we have had a very fortunate escape, and have great reason to return our humble thanks to Almighty God for preserving and delivering so many of us from our more than savage enemies (Arnold 1776b).

Under cover of darkness, the American vessels rowed quietly in single file between the British blockade and the New York shoreline. Guided only by a single shrouded lantern in the stern of each vessel, the Americans successfully crept past the unsuspecting British, who had not extended their line far enough to the west. The fleeing Americans rowed all night, then collected themselves at Schuyler Island much fatigued from the events of the previous 24 hours. The frustrated British shortly located the American fleet to their south, thanks to the sharp eyes of a lookout perched on a masthead, and immediately set sail for the chase.

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Sir Guy Carleton described the action in the above-mentioned letter to General Burgoyne:

[On the night of 11 October] We then anchored in a line opposite the Rebels within the distance of Cannon shot, expecting in the morning to be able to engage them with our whole fleet, but, to our great mortification we perceived at day break [October 12], that they had found means to escape us unobserved by any of our guard boats or cruisers, thus an opportunity of destroying the whole rebel naval force, at one stroke, was lost, first by the impossibility of bringing all our vessels to action, and afterwards by the real diligence used by the enemy in getting away from us.

We have been attempting to get up with part of them, which is still in our sight, this morning, but the wind is blowing very strong from the southward we have been obliged to give over the chase for the present. The enemy has however been retarded as well as us (Carleton 1776a) .

### ***Splitting of a Cannon***

One of the most catastrophic events during the battle was lost to historians until recently. In 1997 LCMM researchers located the Gunboat *Spitfire*, the last unaccounted for vessel from Benedict Arnold's Valcour Island fleet. When the gunboat was first located, its identity was not known and a new research effort was launched. This research lead LCMM historians to re-examine all known accounts of the Battle of Valcour Island and to search archives and libraries for new information. During this effort, historian George Quintal located a pension record for one of the American participants, Sergeant Jonas Holden. Sergeant Holden was born in 1751 in Groton, Massachusetts, and was a staunch patriot from the earliest days of the American Revolution. In 1775, he was a minuteman and participated in the battles of Concord and Bunker Hill.

In early 1776, Jonas volunteered to join the Northern Army and was sent to Lake Champlain. Along with his brother Sartell and his fellow townsman Lieutenant Thomas Rogers, he was assigned to the gunboat *New York*, one of the eight gunboats in the American fleet and the sister ship to both *Philadelphia* and *Spitfire*. Through his pension record, we learned that during the battle on October 11, one of the gunboat *New York's* cannon burst during firing, injuring sergeant Holden in the right arm and side. Holden recovered from these wounds and continued to fight for the American cause until the British surrender at Yorktown on October 19, 1781. He died at the age of 83 in Wallingford, Vermont. He and his wife Sarah were the parents of twelve children and have over 200 surviving descendants.

Jonas Holden's pension record also reveals that when *New York's* cannon burst causing his own wounds, the explosion killed Lieutenant Thomas Rogers. Although Arnold reported "the *New York* lost all her Officers except her Captain," the *New York* was the only gunboat to survive the battle. Sometime after his death, Lieutenant Rogers' wife, Molly, who was pregnant at the time of her husband's death, erected a marker in his memory the Fairview Cemetery in Westford, Massachusetts. The monument reads:

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Memento mori  
This Monoment is Erected  
to the memory of Lieu<sup>t</sup> Thomas  
Rogers by M<sup>rs</sup>: Molly his  
Sorowfull widow He was  
Killed by the splitting of  
a Cannon on the Lake  
Champlain on the 11<sup>th</sup>: day  
of Oct<sup>r</sup> 1776 in the Continental  
Army in the serves of his  
Country and in the  
caus of Liberty  
Aged 26 years and  
9 months

Holden's pension record indicates that there is a strong potential that the cannon fragments found during the VBRP are from the Gunboat *New York* (see Chapter 5: Results of Investigations).

***Southward Retreat: 12 October 1776***

This day the wind at South, in the morning our Enemies appeared in sight. The General [Arnold] ordered that the whole fleet to get under way. The Enemy came hard against us so that we were obliged to leave three gondolas and make the best of our way with boats, two of which we destroyed and one of them the enemy made a prize of. The rest made their escape this day by rowing all night (Journal of Bayze Wells, 12 October 1776 [Wells 1776]).

The American fleet arrived at Schuyler Island in the early-morning hours of October 12 and paused to make immediate necessary repairs. During their flight the night before, they had been forced to abandon two sinking gunboats. As the British appeared to the north, Arnold pressed his fleet south by sail and oar toward the protection of the guns of Fort Ticonderoga and Mount Independence.

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Benedict Arnold wrote to Philip Schuyler from Fort Ticonderoga on 15 October 1776:

We remained no longer at Schuyler's Island than to stop our leaks and mend the sails of the *Washington*. At two o'clock, P.M., the 12th, weighed anchor with a fresh breeze to the southward. The enemy's fleet at the same time got underway; our gondola made a little way ahead. In the evening the wind moderated, and we made such progress that at six o'clock next morning we were about off Willsborough, twenty-eight miles from Crown Point. The enemies fleet were very little above Schuyler's Island; the wind breezed up to the southward, so that we gained very little by beating or rowing, at the same time the enemy took a fresh breeze from the northeast and by the time we had reached Split-rock, were alongside of us (Arnold 1776c).

***Battle of Split Rock Mountain: 13 October 1776***

The British vessels, better sailing ships and largely undamaged in the first day's fight, soon caught up with the galley *Washington* at the tail of the American line. Already heavily battered from the fight at Valcour Island, *Washington* took several British broadsides and then was forced to strike its colors and surrender, unfortunately with second-in-command General Waterbury aboard. Benjamin Rue and sixteen of his *Philadelphia* crewmen escaped from *Washington* in a bateau shortly before the galley's capture.

The crew of the galley *Lee* ran their vessel aground and escaped into the forest. The British quickly gained upon the galley *Congress* and four of the American gunboats, and for over two hours they engaged Arnold and his fleet in a running battle along the lake's eastern shore. Recognizing that his fleet could not prevail, Arnold took his flagship *Congress* and four gondolas into Ferris Bay and ordered the vessels run aground with flags still flying in defiance of the enemy. His marines scaled the steep bank and defended the ships until they could be destroyed. Arnold and his men gathered at the home of Peter Ferris, then marched through the woods to Chimney Point, where they were ferried across to Crown Point. The Ferris family, now refugees of the conflict, accompanied Arnold's men to the safety of the American fortifications. Pressing forward with his troops, Arnold arrived back at Fort Ticonderoga at 4:00 a.m. on October 14.

From Fort Ticonderoga, Benedict Arnold described what had happened in a letter to Philip Schuyler on 15 October 1776:

The *Washington* and *Congress* were in the rear, the rest of our fleet ahead, except for two gondolas sunk at Schuyler's Island. The *Washington* galley was in such shattered condition, and had so many men killed and wounded, she struck to the enemy after receiving a few broadsides. We were then attacked in the *Congress* galley by a ship mounting twelve eighteens, a schooner of fourteen sixes, and one of twelve sixes, two under our stern, and one on our broadside, within musket shot. They kept up an incessant fire on us for about five glasses [2 1/2 hours], with round and grapeshot which we returned as briskly. The sails, rigging, and hull of the *Congress* were shattered and torn to pieces, the First Lieutenant and three men killed, when to prevent her falling into the enemy's hands, who had seven sail around me, I ran her ashore in a small creek ten miles from Crown Point, on the east side, when after saving our small arms, I set her on fire with four gondolas with whose crew I reached Crown Point through the woods that evening (Arnold 1776c).

On board *Maria* on 14 October 1776 Sir Guy Carleton wrote a letter to Lt. General Burgoyne:

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[On October 12] the wind sprung up fair and enabled us, after a long chase, Yesterday [October 13] to get up to the Rebels, and in our second action, we have been much more successful; only three of their Vessels...having escaped. Their second in command Mr. Waterbury struck to us in the *Washington* Galley, but Arnold run that he was on board of on shore, and set fire to her and several others of his Vessels... The rebels upon the approach of the shattered little remains of their fleet, set fire to all buildings in and about Crown Point, abandoning the place and retired precipitately to Ticonderoga.

This success cannot be deemed less than a complete victory; but considering it was obtained over the King's subjects, that, which in other circumstances ought to be a proper cause for public rejoicing, is, in these, matter only of great concern; and therefore though it may be right to communicate it to the Troops, yet, I dare say they think with me, that we should suppress all signs of triumph on this occasion (Carleton 1776b).

Four American vessels escaped the British pursuit: *Trumbull*, *Enterprise*, *Revenge*, and the gondola *New York*. When they reached Ticonderoga, *Liberty* was also there, in addition to *Gates*, the last row galley to be completed. These vessels could still assist in guarding the narrow lake channel, but the British were now unquestionably in command of the main lake.

### **Control of the Lake**

It has pleased Providence to preserve General Arnold. Few men ever met with so many hair-breadth 'scapes in so short a space of time (Letter by Horatio Gates to Philip Schuyler, 15 October 1776 [Gates 1776]).

The 1776 battle for Lake Champlain was over. The British emerged in firm control of the waterway, while the Americans counted themselves fortunate still to have six ships afloat, four of which had participated in the fighting. Now relying on land fortifications at Fort Ticonderoga and Mount Independence, the Americans anticipated an imminent attack and called on the militia to confront the British army. The British, however, could not immediately follow up on their naval successes, since contrary lake winds prevented a rapid advance. When the winds finally cooperated and the British disembarked in sight of the fortifications, they realized that a long siege was in order. Facing the prompt onset of winter, Carleton decided that the campaign of 1776 was at an end. With surprise and relief, the Americans learned in early November that the British had abandoned Crown Point and returned to Canada for the winter.

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## Effects of the Battle of Valcour Island

That the Americans were strong enough to impose the capitulation of the British army at Saratoga was due to the invaluable year of delay secured by their little navy on Lake Champlain....The little American navy on Lake Champlain was wiped out, but never had any force, large or small, lived to better purpose or died more gloriously (Mahan 1969:25).

During the winter of 1776-1777, the Americans reduced their garrisons on Lake Champlain from nearly 13,000 to 2,500 men. Lieutenant Colonel Jeduthan Baldwin, a Massachusetts engineer, was entrusted with further strengthening the fortifications before the spring offensive. Already during the summer and fall of 1776, he had directed the refurbishing of the French Lines, erected a string of redoubts west of Ticonderoga, and had built Mount Hope to guard the portage to Lake George. On the Vermont shore the Americans had carved a large-scale fortification out of a 300-acre peninsula jutting northwards into the lake. Named Mount Independence, it featured a water battery, protective batteries, and a picket fort atop its highest height. Baldwin's troops lacked sufficient food and supplies for winter, but they used the ice as a platform to construct a the "Great Bridge" across the lake, linking Fort Ticonderoga and Mount Independence (Figure 3:23).



Figure 3:23. Detail of the Wintersmith Map showing the fortifications of Fort Ticonderoga and Mount Independence, including the Great Bridge which joined the two (Courtesy of the Fort Ticonderoga Museum).

In the spring of 1777, 8,000 British troops under the command of General John Burgoyne began the invasion of the colonies. They reached Ticonderoga and Mount Independence in late June, and at once began to haul cannon to the top of nearby

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undefended Mount Defiance, which overlooked the American fortifications. Burgoyne had discovered the Achilles heel of the two forts. The American garrisons under General Arthur St. Clair had no choice but to evacuate their positions in the middle of the night on July 5 and 6.

The easy British success was short-lived. After chasing part of the fleeing American army to Skenesborough, and fighting with the American rear guard at Hubbardton, Burgoyne chose to proceed south overland through 26mi (42km) of swampy woodland. The retreating Americans destroyed supplies, felled trees, and burned bridges to slow the invaders. In August, a substantial British force in search of supplies suffered a crushing defeat at the Battle of Bennington. Burgoyne finally encountered the American Northern Army entrenched on Bemis Heights, 20mi (32km) north of his intended destination of Albany. His first serious battle with the Americans, the First Battle of Freeman's Farm, on September 19, further weakened British strength and morale.

On October 7, at the Second Battle of Freeman's Farm, while Gates occupied Bemis Heights, Arnold led a charge that rallied the American troops, and Burgoyne's once-proud army suffered its final defeat. With his options waning, and his escape route to the northward cut off by flanking Americans, General John Burgoyne was forced to surrender his army. Burgoyne himself was allowed to return home, where he was called upon to explain the reasons for the dire outcome of his expedition from Canada. Testifying on the decisive battle, he attributed the result directly to the actions of Benedict Arnold:

I have reason to believe my disappointment on that day proceeded from an uncommon circumstance in the conduct of the enemy. Mr. Gates, as I have been informed, had determined to receive the attack in his lines; Mr. Arnold, who commanded on the left, foreseeing the danger of being turned, advanced without consultation with his general, and gave, instead of receiving battle. The stroke might have been fatal on his part if he failed. But ... had the other idea been pursued, I should in a few hours have gained a position, that in spite of the enemy's numbers, would have put them in my power (Burgoyne 1780).

Burgoyne's surrender at Saratoga on October 17, 1777 is generally regarded as the turning point in the war. The collapse of the British army along the Champlain-Hudson waterway encouraged France to enter the war as an American ally. More than five years would pass before peace was concluded, but it was now obvious that the British would be unable to hold the interior of the American continent.

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## CHAPTER IV: METHODOLOGY

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### **SURVEY STANDARDS**

The Valcour Bay Research Project was carried out according to the principles and standards established by the Secretary of the Interior's Standards and Guidelines (NPS 1983) and the New York Archaeological Council (1994). The Valcour Bay Research Project was conducted under a New York State Archaeological Permit (#AR9904) issued by the New York State Museum. The 2001 artifact raising was executed under a permit issued by the Naval Historical Center (LCMM-2001-001)

The methods and procedures used to document the site and artifacts are standards in the field. They can be found in any underwater archaeological manual (Anderson, Jr. 1988; Dean et al. 1995; Green 1990; Lipke et al. 1993; Steffy 1994). The archaeological conservation techniques are practiced by most archaeological conservators (Cronyn 1990; Hamilton 1996; Singley 1988). The methods and procedures employed during this project have been developed through the training and experience of the Lake Champlain Maritime Museum's staff over the past 15 years.

### **RESEARCH METHODOLOGY**

Most terrestrial archaeological projects follow established methodologies; ones which have been tested and refined through the investigation of many sites. However, the submerged battlefield at Valcour Bay is a type of site for which there were no archaeological precedents from which to derive the methodology. To the authors' knowledge the study at Valcour Bay is the first systemic archaeological study of a submerged battlefield. Although the methodology that was eventually developed was inspired by the Phase I techniques developed for surveying terrestrial battlefields, the details of the VBRP methodology differ in many aspects.

The topography of Valcour Bay was the central factor in the development of survey techniques. The area of Valcour Bay investigated in the 1999 through 2002 field campaigns lies beneath 40ft to 50ft (12.2 to 15.2m) of cold, freshwater, with underwater visibility ranging from 5ft to 25ft (1.5 to 7.6m), depending on the complex interplay of the season, currents, and water temperatures. The bottom sediments are uniformly composed of a brownish-gray clayey silt. The landscape of Valcour Bay is generally a featureless plane of this loosely packed sediment. The only landmarks in the survey area were an occasion tree stump or branch, miscellaneous garbage, and fresh water mollusks. Without the use of a compass a diver can become disoriented within a matter of minutes.

The qualities of the bottom sediments are the most important characteristic of the site for several reasons. These sediments, which are anaerobic in nature and slightly basic in their composition, are the ideal environment for the preservation of submerged cultural resources. Nearly all types of artifacts recovered from Valcour Bay are extremely well preserved. This includes not just metallic artifacts, but also bone, wood, and leather materials. These same sediments, however, also create the single largest

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difficulty in the survey: underwater visibility. The clayey silt is so loosely packed and fine-grained that with minimal disturbance it becomes suspended in the water column. Visibility can be reduced from 25ft (7.6m) to a few inches (<15cm) within moments. Once the particles become suspended they can take hours to settle out of the water column. Fortunately, Valcour Bay is often subject to significant lake currents, which can make diving more strenuous, but, when present, tend to clear out the suspended sediments.

With the bottom conditions in mind, a basic methodology was developed; one which could be implemented underwater in less than optimum conditions. In brief this methodology entailed dividing the bottomlands into 50ft by 50ft (232.3m<sup>2</sup>) areas. These “grids” were systematically inspected along transects spaced at 3ft (.91m) intervals. Crew members used metal detectors to locate buried metallic objects. When an artifact was located its provenience was recorded, and its location plotted on the site map. Although the methodological approach was simple and straightforward, implementing it underwater made the process much more challenging. Dive plans were commonly rehearsed on the surface because communication underwater is limited to hand signals and notes written on clipboards (Figure 4:24).

Over the three field seasons of the VBRP the methodology was refined, however, its essentials, described below, remain unchanged. The bottomlands were divided into 50ft by 50ft (232.3m<sup>2</sup>) grids, with 1½in (3.8cm) PVC grid posts marking each corner. The location of the muzzle cannon fragment (artifact 99-01) was used as the “zero point” for the survey grid. Initially, an east-west baseline was laid along the bottom, allowing researchers to place grid posts at 50ft (15.2m) intervals along it. With the grid posts along the baseline set, additional grid posts were built off of this baseline. This was accomplished by attaching measuring tapes to two grid posts 50ft (15.2m) apart and pulling the tapes from them; one 50ft (15.2m) either north or south, while the second tape formed the diagonal across the square to be laid out. This diagonal, which forms the hypotenuse of a right triangle, was pulled to a length of 70ft 8½in (21.9m). The point at which the corresponding measurements met on the two tapes was marked with a grid post. This technique is commonly used to lay out test units on terrestrial archaeological sites, albeit generally on a smaller scale.

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Figure 4:24. Photograph of the 2000 survey crew “rehearsing” their dive on land before executing those same procedures underwater (LCMM Collection).

The area encompassed by the grid was surveyed via north-south oriented transects spaced 3ft (.91m) apart. The transects were laid out between 3ft (.91m) long transect posts made out of 1in (2.5cm) diameter PVC pipe. The transect posts were sunk approximately 2ft (.61m) into the bottom sediments at 3ft (.91m) intervals along the east-west axes of the grid squares. The transect tape was strung between a set of transect posts, giving the surveyor a visual reference by which to survey for metallic anomalies.

Divers searched for anomalies by using a hand-held metal detector. As the diver progressed along the transect tape, he or she passed the detector at least 2ft (.61m) to each side of the tape. This created a 1ft (.31m) overlap between transects and ensured thorough coverage of the site. Divers were urged to survey slowly and methodically, with complete coverage over the site being more valuable than the amount of area covered. When anomalies were found they were marked with a 1in (2.5cm) diameter PVC pipe, known as an “anomaly post”, sunk into the bottom sediments next to the anomaly. The anomaly post had a letter written on it, which was used for recording the position of the anomaly and referring to it in the future. Figure 4:25, a handout given to VBRP divers, illustrates the survey methodology.



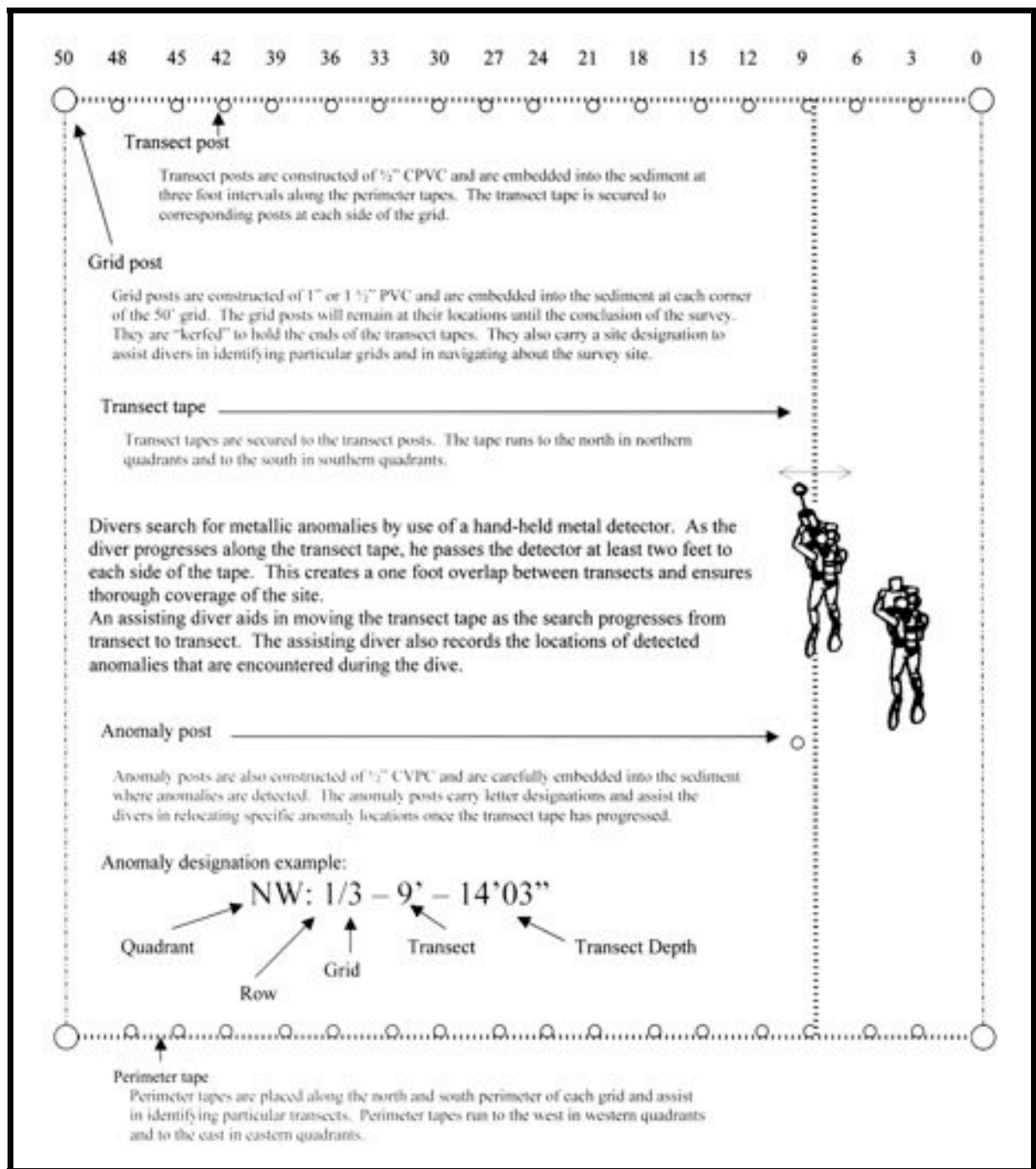


Figure 4:25. VBRP handout used to orient new divers to the methodology used to survey the submerged battlefield (by Edwin Scollon).

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Surveying was typically conducted by a two-person buddy team, with the team members designated as either the surveyor or recorder. The surveyor operated the metal detector and dictated the pace of the survey, while the recorder performed numerous tasks to ensure the efficiency of the survey. Typical tasks for the recorder included assisting in moving the transect tape as the search progressed from transect to transect, marking anomalies with the anomaly post, and recording the locations of anomalies found during the dive. Buddy teams were kept consistent as much as possible during the field operations because divers that worked together on multiple dives tended to survey more efficiently.

Using this system a team of two divers systematically surveyed transects within a grid. Typical bottom times were at least 30 minutes with a maximum bottom time of 45 minutes. In this period a team typically surveyed between three and six transects. Progress was slowed if the team found multiple anomalies, if currents were swift, or if visibility was poor.

When an anomaly was initially found the recorder noted its position and the team continued surveying on that transect. Anomalies were verified on subsequent dives as scheduling permitted. A single diver did this with a metal detector and a clipboard. The clipboard contained the locational information for each anomaly to be verified, and a space to write-up the results of the verification. Greater than fifty percent of the anomalies upon verification were determined to be modern trash related to recreational boating the area. Items such as bottle caps, pop-tops, and beer cans were collected by the diver and disposed of onshore.

When Revolutionary War era artifacts were located a variety of protocols were instituted. Artifacts deemed to be more commonplace, such as cannon balls, grape shot, and unidentified metal fragments, were verified on the bottom and reburied in their original location. More unusual artifacts, such as the cartridge box, sword fragment, bayonet, hand axe, and the smaller cannon fragment were either raised to the surface, documented, and immediately reburied in their original position on the lake bottom, or documented on the lake bottom and reburied in their original location. Larger cannon pieces, which would have required significant effort to raise, were recorded through video and measurements on the bottom.

At the end of each dive survey teams were required to fill out a survey log (Figure 4:26). This form detailed the activities undertaken during that dive, thus ensuring an appropriate level of documentation regarding each team's activities.

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# VALCOUR BAY RESEARCH PROJECT

## LOG SHEET

DATE:

NAME:

OTHER DIVERS/PERSONNEL PRESENT:

WEATHER:

UNDERWATER VISIBILITY:

OBJECTIVES & TASKS COMPLETED:

COMMENTS:

### ANOMALIES DETECTED:

TARGET	TRANSECT	DEPTH	INVESTIGATION RESULT

GRID:

PERIMETER TAPE DIRECTION

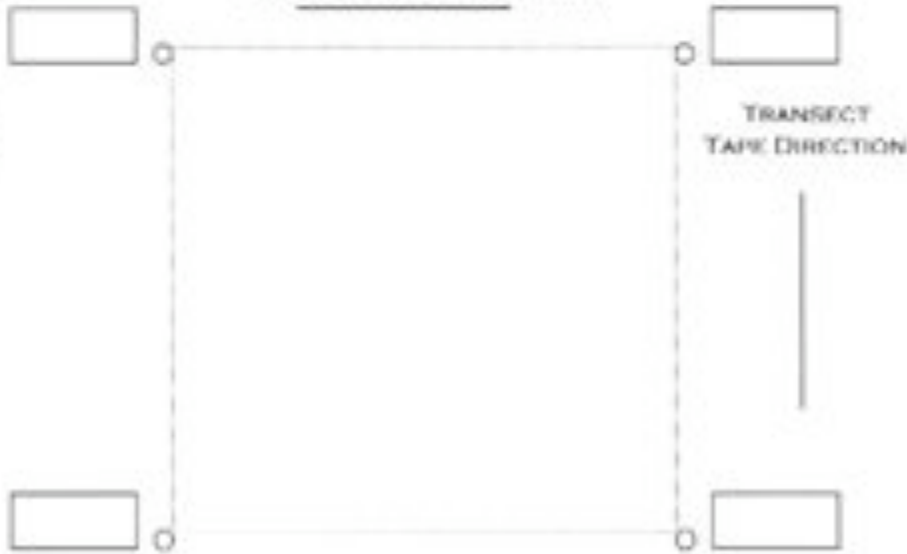


Figure 4:26. Survey Log form.

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## SAFETY CONSIDERATIONS

Safety was the first priority of the VBRP. No data is worth the risk of injury, which automatically defeats all educational and research goals. Throughout the VBRP safe scientific diving and work practices were conducted at all times following research and industry standards (Flemming and Max 1996; Miller 1991). The safety procedures followed during the survey were based on those used by the National Association of Underwater Instructors (NAUI). All the project members were certified divers from an internationally recognized scuba diver training organization. All LCMM staff members were certified in first aid and CPR. A dive master, who was equipped with a hand-held VHF marine radio, cell phone, first aid kit, and an oxygen kit, oversaw diving operations.

As in all diving activities, there are risks of an accident. All of the possible hazards were explained to the crew to protect the participating organizations and individuals. Each participant then signed a NAUI Waiver and Release Agreement Form, which are on file at the LCMM.

At the conclusion of every dive beyond the depth of 30ft (9m), divers observed a safety stop at 15ft (4.6m) for a minimum of 3 minutes. Each diver was required to surface with a minimum of 300psi (21 bar) in his or her primary scuba tank. At the conclusion of a diver's second dive of the day a 5-minute stop at 15ft (4.6m) was required. Each diver carried a back-up breathing system in the form of a pony bottle (Figure 4:27).



Figure 4:27. Diver wearing a pony bottle (photograph by Jerry Forkey).

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## PROJECT PERSONNEL

The Valcour Bay Research Project team consisted several dozen individuals, many of whom volunteered hundreds of hours of their time. These dedicated volunteers are mentioned in the acknowledgments of this report. The principal LCMM and VBRP survey team members consisted of nine personnel, all of whom contributed a wide range of skills and abilities to the project.

Matt Booth is 25-year veteran of the Plattsburgh City Police Department, retiring in February 2000 as the Chief of Police. He has 31 years diving experience in Lake Champlain, and has worked on underwater surveys of both the Valcour Battle site and the Battle of Plattsburgh, Cumberland Bay site. He has been an integral member of the VBRP since 2000.

Arthur B. Cohn has a B.A. in sociology from the University of Cincinnati in Cincinnati, Ohio, and a J.D. from Boston College Law School. Director of the Lake Champlain Maritime Museum and the Maritime Research Institute, he is the co-principal investigator for the VBRP. Cohn is a professional diver and has coordinated and participated in Lake Champlain's archaeological projects for the past twenty years. As the VBRP's co-principal investigator, Cohn organized and supervised much of the 2000, 2001, and 2002 survey, organized the 2001 artifact recovery, contributed to the survey's historical research, and oversaw the production of this report.

Christopher D. Fox is the Curator of the Fort Ticonderoga Museum. He is a volunteer member of the LCMM's Maritime Research Institute's dive team, participating in the 2001 and 2002 VBRP field seasons as an archaeologist. Fox has an extensive knowledge of eighteenth century military material culture, and has a B.A. in anthropology from the University of Michigan.

Adam I. Kane is a member of the Maritime Research Institute dive team. He participated in the 2000, 2001, and 2002 VBRP field seasons as an archaeologist, and contributed to, organized, edited, and finalized the project report. Kane has a B.A. in anthropology from Millersville University of Pennsylvania, and a M.A. in anthropology from the Nautical Archaeology Program at Texas A&M University.

Pierre A. LaRocque is a member of the Maritime Research Institute dive team. He participated in the 2000, 2001, and 2002 VBRP field seasons as an archaeologist, divemaster, and boat captain. LaRocque is a dive instructor and has a B.A. in history from the University of Vermont.

Steven E. Nye has been a New York State Corrections Officer for the past 18 years. He has participated in the VBRP as a diver, boat captain, and underwater photographer since 1999. He has been involved with the Plattsburgh YMCA scuba program since 1978.

Christopher R. Sabick is a member of the Maritime Research Institute dive team, and is the LCMM's Director of Conservation. He served as archaeologist in the 2001 and 2002 VBRP field season and contributed to the project report. He earned a B.A. in history and anthropology from Ball State University in Muncie, Indiana, and he is

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completing a M.A. in anthropology from the Nautical Archaeology Program at Texas A&M University.

Ed Scollon studied management science at the State University of New York at Plattsburgh before becoming a New York State trooper in 1988. Scollon is a 13-year veteran of the New York State Police (NYSP) and a 12-year veteran of the NYSP Dive team. Scollon is the co-principal investigator for the VBRP. In this capacity his responsibilities include the management of a corps of volunteer divers, overseeing the survey, compiling daily and annual reports, educating area divers about protecting submerged cultural resources, and interpreting the VBRP to the public.

Erick Z. Tichonuk is a member of the Maritime Research Institute dive team, and is an LCMM educator. He participated in the 2001 and 2002 VBRP field season. Tichonuk is a dive instructor and has a B.A. in History from University of Vermont. He has been on the staff of the Lake Champlain Maritime Museum since 1985 and has participated in a number of the museum's archaeological projects.

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## CHAPTER V: RESULTS OF INVESTIGATIONS

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### 1999 FIELD SEASON

In July 1999, Edwin Scollon, while diving recreationally in Valcour Bay, discovered a substantial section of a cannon. Upon making this discovery, Scollon sought the assistance and advice of Arthur Cohn, director of the Lake Champlain Maritime Museum. Cohn notified officials at the New York State Museum and the Naval Historical Center about the find, and discussions were started regarding the best method to preserve the artifact and to manage the battlefield in general. With the encouragement of Philip Lord at the NYSM and using the cannon discovery as the catalyst, Cohn and Scollon developed a methodological approach to systematically survey the submerged battlefield (see Chapter 4: Methodology). In September 1999, the Valcour Bay Research Project was formally begun with the issuance of a permit from the New York State Museum to collect and excavate archeological materials on state land. The permit (#AR9904) was held jointly by Cohn and Scollon (see Appendix 7).

The Valcour Bay Research Project was formed both as an archeological survey and as a means to address cultural resource management issues at Valcour Bay. The survey, conducted primarily through the support and cooperation of local volunteer sport divers, made participants aware of the archaeological permit process and the legislation that protects submerged cultural resources. Additionally, they were exposed to a management approach that fosters the long-term preservation of submerged cultural resources. This involvement was intended to foster a stewardship ethic in the local dive community.

In the 1999 field season the Lake Champlain Maritime Museum provided technical assistance and support, although museum conducted only a one-day site-assessment for the project. Survey operations in 1999 were modest. Remnant storm systems of hurricane *Floyd* arrived in mid-September; lake temperatures at Valcour Bay dropped from 68 F to 52 F (20 C to 11 C) in a two-day period. Volunteer diver involvement, a key component to the VBRP, was significantly hampered by the poor diving conditions. Between mid-September and the beginning of November, six survey grids were inspected for metallic anomalies and the cannon site was further investigated. A total of 85 dives by nine volunteer divers were conducted during the 1999 field season, with a total of 12 Revolutionary War-era artifacts located (Table 5:3).



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<b>Artifact No.</b>	<b>Date Located</b>	<b>Location</b>	<b>Description</b>
99-01	15-Jul-99	SE:1/1-12-01' 02"	Cannon Muzzle
99-02	31-Aug-99	NE:1/2-05-05' 05"	Belt Ax
99-03	15-Sep-99	SW:1/1-20-02' 06"	6 Pound Round Shot
99-04	16-Sep-99	NW:1/1-36-40' 10"	Iron Fragment
99-05	16-Sep-99	NW:1/1-36-26' 05"	Cartridge Box
99-06	16-Sep-99	NW:1/1-30-35'11"	Iron Fragment
99-07	18-Sep-99	NW:1/1-13-35' 04"	Grapnel Anchor
99-08	26-Sep-99	NW:1/1-08-43' 09"	Iron Bracket
99-09	26-Sep-99	NW:1/1-08-43' 09"	Lead Plating
99-10	26-Sep-99	NW:1/1-08-43' 09"	Wood Fragment
99-11	27-Sep-99	NE:1/1-09-15' 06"	Bayonet
99-12	05-Oct-99	NW:2/1-36-35' 00"	Grape Shot

Table 5:3. Artifacts located during the 1999 field season of the Valcour Bay Research Project.

All artifacts found during 1999, with the exception of the cannon muzzle (99-01), were raised to the surface, photographed, sketched, and reburied in their original locations. Artifact provenience was recorded on the master survey map.

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## 2000 FIELD SEASON

The 2000 field season began on March 21 and concluded on November 16; sixteen participants made 219 dives on the site during 54 days of surveying. Nineteen additional grid units (47,500ft<sup>2</sup> [4414.5m<sup>2</sup>]) were completed during fifty-four days of active survey, bringing the 1999 and 2000 survey total to 25 grid units, covering 62,500ft<sup>2</sup> (5808.5m<sup>2</sup>) of lakebed.

The field season was anchored by a one-week joint survey by LCMM archaeologists and VBRP volunteer divers between July 31 and August 4. The crew was housed in a camp owned by Dr. David McDowell in Peru, New York, overlooking Valcour Bay. The morning of July 31 was devoted to discussing survey objectives, survey operations, dive protocol, and safety issues. A “dry run” of the survey was simulated on the camp’s lawn. This oriented the divers to the use of metal detectors and the survey’s grid search pattern, an essential process given the limited ability to communicate while underwater. On-site survey operations commenced that afternoon.

The survey split into two teams with one group on *Terri Ann*, a 23ft (7m) fiberglass hull powerboat Captained by Pierre LaRocque, and the second group on *Northern Comfort*, a 26ft (7.9m) pontoon boat Captained by Steve Nye (Figure 5:28). Arthur Cohn served as divemaster for the VBRP group and coordinated survey efforts throughout the week. Each group completed two grids of survey during a week hampered by severe weather. Doug Jones, owner of Champlain Dive Center, conducted underwater videographic documentation of the survey process. Jerry Forkey, a VBRP member, photographed survey activities that occurred on the surface.

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Figure 5:28. VBRP survey vessels, *Terri Ann* (top) and *Northern Comfort* (bottom).

Ten artifacts were located during the 2000 survey. The most significant finds were a portion of a cannon carriage's left side and two additional cannon fragments. The carriage fragment (artifact 00-01) was discovered approximately 59ft (18m) southeast of the cannon muzzle. The first cannon fragment (artifact 00-04), which included portions of the cannon's cascabel and first reinforce, was located approximately 70ft (21.3m) southeast of the cannon's muzzle. This fragment was buried approximately 30in (76.2cm) below the lake sediments. The second fragment, which fit with the cascabel part, also contained part of the first reinforce (artifact 00-05). This fragment was found 86ft (26.2m) southeast of the muzzle, and was located below 18in (45.7cm) of sediment. All three of these artifacts were lifted from the site, and documented with photographs and video on the surface. In order to comply with the survey permit, the artifacts were redeposited to the site and buried in proximity to their original locations.

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An archaeological placard was attached to the artifacts (Figure 5:29). Researchers hoped that attaching the placard might deter relic hunters from recovering the artifact in the unlikely event that they were discovered.

Survey operations concluded on November 16. Approximately 70% of the cannon was located, and ten additional Revolutionary War artifacts were found (Table 5:4).

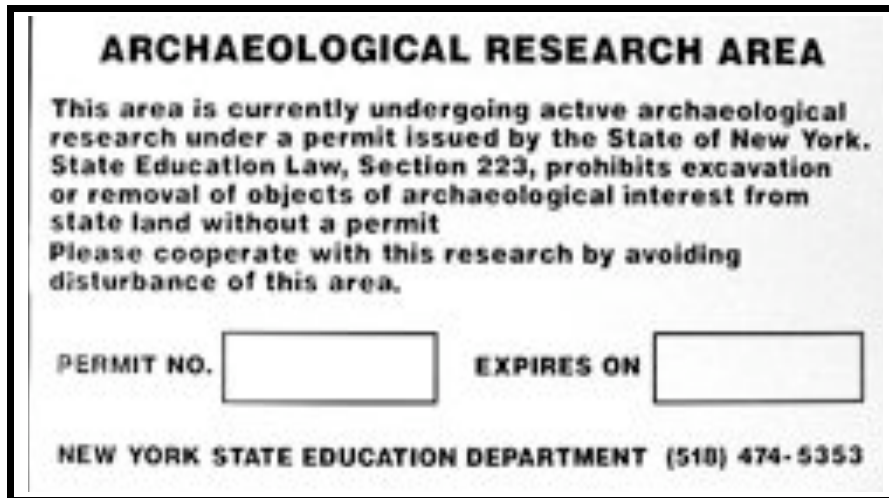


Figure 5:29. Photograph of an archaeological placard placed on the site.

<b>Artifact No.</b>	<b>Date Located</b>	<b>Location</b>	<b>Description</b>
00-01	19-Apr-00	SE:1/2-06-40' 06"	Carriage Fragment
00-02	20-Apr-00	SE:1/2-18-13' 04"	9 Pound Round Shot
00-03	25-Apr-00	SE:1/2-24-35' 10"	Iron Thimble
00-04	26-Apr-00	SE:1/2-24-35' 10"	Cannon Cascabel
00-05	2-Aug-00	SE:2/2-18-17' 00"	Cannon 1st Reinforce
00-06	16-Aug-00	SE:3/1-09-18' 10"	Sword Fragment
00-07	22-Sep-00	SW:3/1-12-16' 02"	Bar Shot
00-08	29-Sep-00	SW:4/1-39-34' 01"	Grape Shot
00-09	11-Oct-00	SE:4/1-03-30' 08"	Grape Shot
00-10	11-Oct-00	SE:4/1-12-26' 01"	Grape Shot

Table 5:4. Artifacts located during the 2000 field season of the Valcour Bay Research Project.

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## 2001 ARTIFACT RECOVERY AND EXHIBIT

The 1999 and 2000 VBRP field season located 22 artifacts, comprising a significant collection of Revolutionary War artifacts. In the winter of 2000/2001 LCMM and VBRP personnel assessed the legal, political, and financial implications of recovering the artifacts, all of which still rested in Valcour Bay. VBRP team members decided that recovery and conservation would greatly add to the interpretation of the Battle of Valcour Island.

After LCMM and VBRP personnel agreed that raising was feasible, financial and permit issues became paramount. Initially LCMM researchers were unsure if the U.S. Navy or New York State actually held title to the artifacts. After discussions with officials at the Naval Historical Center and the New York State Museum, it was established that, although the artifacts rested on New York State lands, these military-related artifacts still were under the jurisdiction of the U.S. Navy.

On June 30, 2001 the LCMM, with the extraordinary support of numerous partners, successfully raised this newly found collection of artifacts (Figure 5:30). The raising coincided with the 225<sup>th</sup> anniversary of the battle and brought Senators Patrick Leahy and Hillary Clinton together to celebrate the extraordinary historical legacy contained under Lake Champlain. Partners in the recovery effort included the U.S. Coast Guard, Burlington Station and the Lake Champlain Transportation Company.

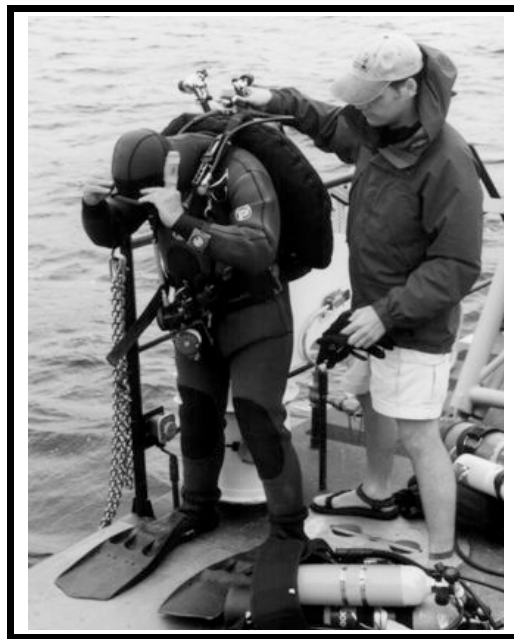


Figure 5:30. LCMM Director Arthur Cohn preparing to assist in the recovery of artifacts from Valcour Bay (photograph by Jerry Forkey).

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The recovered artifacts were immediately put under the care of LCMM conservators and stabilized for their journey to the conservation lab at Basin Harbor, Vermont. The conservation process took approximately one year to complete. The conserved artifacts were displayed in a specially designed exhibit entitled “The Valcour Bay Research Project: Rediscovering a Moment in Time.” Senator Patrick Leahy (D-VT) opened the exhibit on July 1, 2002 at the LCMM. After being displayed for the summer at the LCMM, the exhibit was moved to the Clinton County Historical Association (CCHA) in Plattsburgh, New York. The exhibit was formally opened on October 11, 2002, commemorating the 226<sup>th</sup> anniversary of the battle. The exhibit will be moved to the Navy Museum in Washington, DC, for an opening in the fall of 2003. Appendix 8 contains images of the exhibit panels.



Figure 5:31. Photographs of the Valcour cannon raising. Co-principal investigator Arthur Cohn addresses the crowd with Ed Scollon in the background (left). Senators Patrick Leahy (VT) and Hillary Clinton (NY) attended the event (photographs by Jerry Forkey).

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## 2001 FIELD SEASON

The 2001 field season began on May 6 and concluded on October 15; a total of 28 participants made 215 dives during 28 days of fieldwork. Dive operations before the June 30 artifact recovery were focused on rigging the cannon fragments and relocating smaller artifacts. Survey operations were extremely limited after the events of September 11, 2001, because of the co-principal investigator New York State Trooper Edwin Scollon's increased law-enforcement duties. During 2001, 13 additional grid units (32,500ft<sup>2</sup> [3,020.5m<sup>2</sup>]) were surveyed. Two of these grid units were initially surveyed in 2000, and were resurveyed in 2001 as a survey check. At the end of the 2001 field season the total area surveyed between 1999 and 2001 amounted to 89,400ft<sup>2</sup> (8308.5m<sup>2</sup>).

The field season was anchored by a two-week joint survey by six LCMM archaeologists and 18 VBRP volunteers between August 20 and 31 (Figure 5:32). This survey was facilitated by a grant provided by the American Battlefield Protection Program of the National Park Service (No. GA-2255-01-008). As in the previous year, the crew was housed in a camp owned by Dr. David McDowell in Peru, New York. The morning of the first day of the survey was devoted reviewing survey objectives, survey operations, dive protocol, and safety issues. New volunteers were instructed in the use of metal detectors and the methodology employed for the underwater survey. On-site operations were initiated in the afternoon of August 20.

Survey operations were structured in a manner similar to the 2001 field season with the survey crew divided into two teams. Dive operations were staged from two vessels; one team used *Northern Comfort*, a 26ft (7.9m) pontoon boat captained by Steve Nye, while a second team was onboard *Terri Ann*, a 23ft (7m) Mako powerboat. A third vessel, a 12ft (3.7m) inflatable powerboat, was also employed as a tender. Diving conditions were ideal during the two weeks, with visibility averaging 20ft (6.1m) and water temperatures of approximately 65°F (18.3°C). The survey was facilitated by generally clear weather, with only minor disruptions due to afternoon thunderstorms.

During the 2001 survey operations seven Revolutionary War-era artifacts were located (Table 5:5). The most significant finds were three additional cannon fragments located 140 to 180ft (42.7 to 54.9m) northwest of the cannon's muzzle. These cannon fragments all originated from the upper half of the back portion of the gun.

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Figure 5:32. Photographs of the 2001 VBRP survey (photographs by Jerry Forkey).



Artifact No.	Date Located	Location	Description
01-01	20-Aug-01	SE:1/2-24-46'10"	Lead Bushing
01-02	21-Aug-01	SE:2/2-45-19'06"	Sword
01-03	23-Aug-01	NW:2/3-18-12'00"	Cannon Fragment
01-04	23-Aug-01	NW:2/3-24-18'00"	Cannon Fragment
01-05	27-Aug-01	NW:2/3-43-28'00"	6 Pound Round Shot
01-06	27-Aug-01	SW:2/4-9-21'06"	Grape Shot
01-07	30-Aug-01	NW:1/4-15-27'00"	Cannon Fragment

Table 5:5. Artifacts located during the 2001 field season of the Valcour Bay Research Project.

During the 2001 field season two grid squares that were originally surveyed in 2000 were resurveyed. These grid squares encompassed an area of the lakebed believed to be a “dump zone”, where debris was thrown out of *New York* immediately after the explosion. Due to the high concentration of artifacts located in this area in 2000 (5 artifacts, including 2 cannon fragments) the grid squares were selected for resurveyed to verify the presence/absence of additional artifacts. During this exercise two additional artifacts, a sword (artifact 01-02) and a lead bushing (artifact 01-01), were located. This unanticipated discovery lead researchers to stress to all survey participants the need to survey slowly and methodically, with thorough coverage valued more than area covered.

All artifacts discovered during the 2001 survey were left in their original locations on the lakebed. Several artifacts, such as the sword (artifact 01-01), the lead bushing (artifact 01-01), and a cannon fragment (artifact 01-03) were preliminarily documented by a diver on the bottom.

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## 2002 FIELD SEASON

The 2002 field season began on April 22 and concluded on October 15; thirteen participants made 162 dives on the site during 28 days of surveying. Ten additional grid units (25,000ft<sup>2</sup> [2,322.6m<sup>2</sup>]) were completed bringing the 1999 through 2002 survey total to 46 grids, covering 125,000ft<sup>2</sup> [11,613m<sup>2</sup>]) of lakebed.

The field season was centered around a two-week joint survey by LCMM archaeologists and VBRP volunteer divers from August 19 through 23 and 26 through 30. The crew was housed in two locations; a cottage owned by Dr. David McDowell and a guesthouse owned by Chris Booth, both located in Peru, New York. The morning of the first day of field operations was devoted to reviewing survey objectives, survey operations, dive protocols, and safety issues. On site operations were begun that afternoon with one dive team preparing the site by setting up survey grids. The full dive team began surveying on August 20.

During the two-week field operation the survey team used three vessels. The main survey platform was *Great Republic*, a 30ft fiberglass hulled powerboat Captained by Richard Heilman. A secondary survey vessel, *Terri Ann*, captained by Pierre LaRocque was used on days when the survey team was too large to be accommodated on *Great Republic*. A third vessel, a 12ft (3.7m) inflatable powerboat, was employed as a tender. Diving conditions were ideal during the survey with visibility averaging 20ft (6.1m) and water temperatures of approximately 65 F (18 C). The survey was facilitated by clear warm weather.

Twenty-three artifacts were located during the 2002 survey. Nineteen of the artifacts were ordnance; the largest proportion of this class of artifact found to date during the survey. This pattern seems to be due to the progress of the survey away from the area where the gunboat *New York's* cannon exploded. The bottomlands away from this area are more typical of the scatter of ordnance to be expected along the entire American line.

The 2002 field season also saw the extension of the VBRP into two additional parts of the battlefield. These efforts were the outcome of the survey's expansion to include additional individuals interested in studying the underwater battlefield. One group of investigators focused on the western end of the American line, while the second began mapping the eastern end of the British line. These researchers used the same methodology described in Chapter 4. These investigations focused primarily on setting up grid systems during 2002, however, some surveying was begun. The surveying along the British line focused on the area where the schooner *Royal Savage* was known to have gone aground. Researchers located a number of artifacts in this area; an unexpected result given the extremely heavy artifact collecting activity that has occurred there for decades. The results of these investigations will be detailed in a future report.

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<b>Artifact No.</b>	<b>Date Located</b>	<b>Location</b>	<b>Description</b>
02-01	22-May-02	SE:2/2-7-41'05"	4 Pound Round Shot
02-02	28-May-02	SE:2/2-20-21'03"	6 Pound Round Shot
02-03	21-Aug-02	NW:2/4-33-46'06"	Grenade
02-04	21-Aug-02	NW:2/4-36-22'00"	Grenade
02-05	22-Aug-02	NW:2/8-33-39'09"	Nail
02-06	23-Aug-02	NW:1/5-4-36'05"	4 Pound Round Shot
02-07	23-Aug-02	NW:1/8-12-49'06"	Grape Shot
02-08	23-Aug-02	NW:1/8-15-31'03"	Swivel Shot
02-09	24-Aug-02	NW:1/9-1-3'09"	Nail
02-10	26-Aug-02	NW:1/7-12-30'02"	Grape Shot
02-11	26-Aug-02	NW:1/7-20-4'00"	Grape Shot
02-12	27-Aug-02	NW:1/7-33-16'08"	Musket Ball
02-13	29-Aug-02	NW:2/7-36-25'00"	Tin Fragment
02-14	29-Aug-02	NW:2/7-43-8'08"	Copper Fragment
02-15	30-Aug-02	NW:2/6-27-40'03"	Lead Pellet
02-16	3-Sep-02	NW:2/6-33-26'10"	Grape Shot
02-17	3-Sep-02	NW:2/6-38-35'02"	Grape Shot
02-18	3-Sep-02	NW:2/6-42-6'08"	Grape Shot
02-19	6-Sep-02	NW:1/6-6-42'06"	Musket Ball
02-20	11-Sep-02	NW:1/6-35-8'03"	Mortar Fragment
02-21	12-Sep-02	NW:1/6-39-35'05"	Musket Ball
02-22	12-Sep-02	NW:1/6-39-46'04"	Grape Shot
02-23	12-Sep-02	NW:1/6-43-38'11"	Lead Pellet

Table 5:6. Artifacts located during the 2002 field season of the Valcour Bay Research Project.

## Survey Site Schematic: 1999-2002

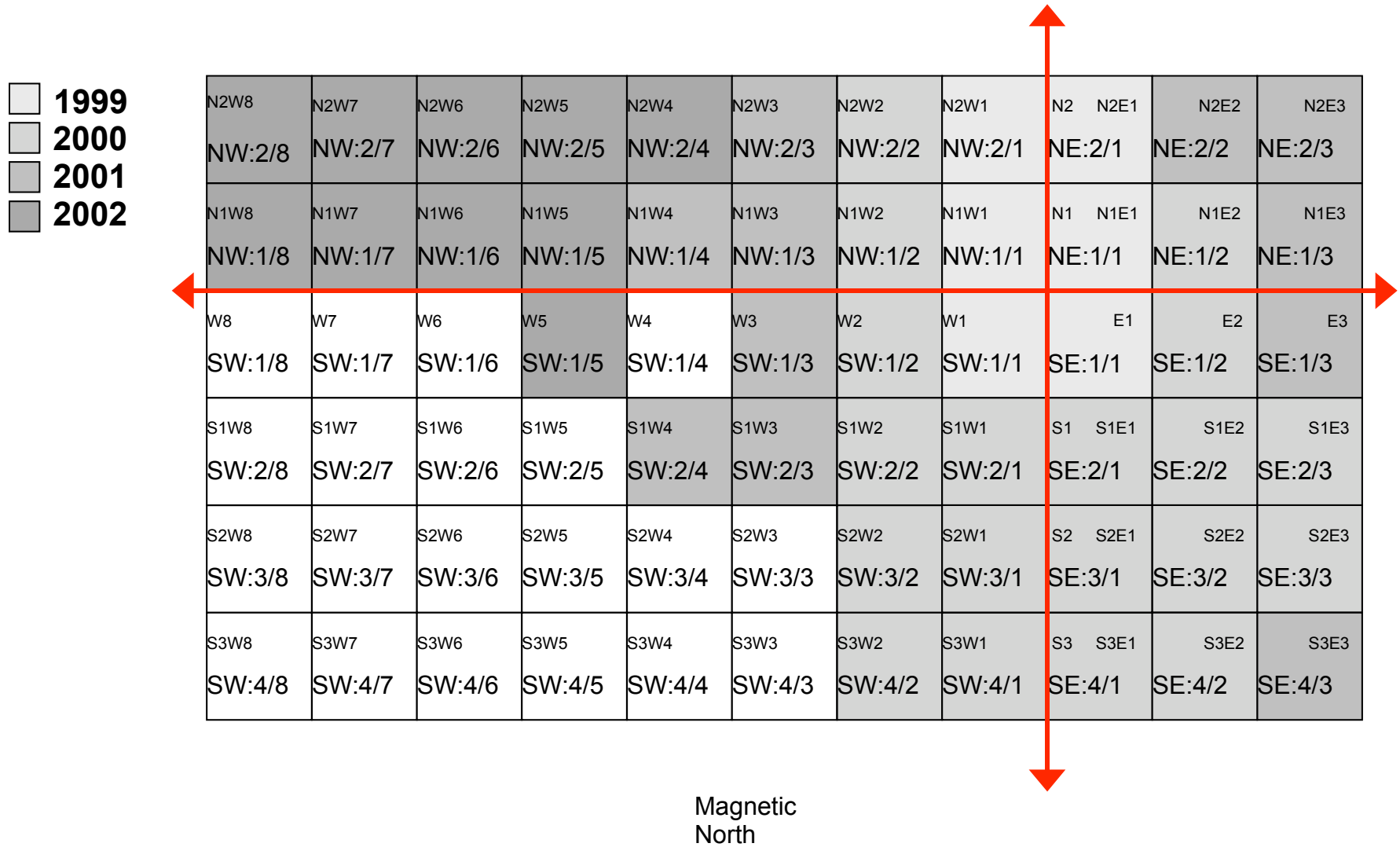


Figure 5:33. Map showing the grid squares surveyed during each year of the VBRP (by Edwin Scollon).

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## COORDINATE OBSERVATIONS

In 2001 and 2002 the VBRP was fortunate to have the assistance of Richard Bennett, a Public Lands Surveyor Examiner from the State of New York's Office of General Services. His surveying expertise allowed researchers to assign accurate locational information to five points within the survey grid in 2001 and 17 points in 2002.

GPS observations were taken at pre-determined locations within the survey grid in order to determine coordinate values for those points. Points were located by a diver on the bottom towing a dive float. Once at a pre-determined grid location, the diver pulled the buoy line taught, thereby removing any slack in the line. At this time a survey crew in an inflatable motorboat recorded the position of the dive flag with a Trimble GeoExplorer 3 code receiver and Trimble Pathfinder Office Software V.2.8 (Figure 5:34). Observations of points were taken by collecting code positions at one-second epochs with the handheld GPS receiver positioned over a dive buoy at the surface of the lake. Data was collected for about 30 seconds until the boat drifted away from the buoy. After the observations were completed, the boat returned to the buoy and one of the observers tugged on the buoy rope, signaling the diver that the observations were complete. The diver then moved to the next location and the procedure was repeated until all positions were observed.



Figure 5:34. Surveyor taking GPS readings on the dive flag located just below him (photograph by Jerry Forkey).

After recording the information in the field, the uncorrected code observation data was downloaded to a PC and post-processed using data obtained via the Internet from a base station operated by the Vermont Agency of Transportation located at the Vermont State Capital. Due to a southerly wind moving the boat in a northerly direction off of the buoy, only the first half of the observations were used most of the time. The equipment used is specified to give results in the one-meter range.

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This methodology was used during both the 2001 and 2002 field seasons. The coordinates recorded in 2001 were located exclusively within the original VBRP survey area. However, in 2002, with the expansion of the survey area into three locations (see page 78), coordinate information was recorded at all three sites. The resulting information is presented in Figure 5:35, Figure 5:36, and Figure 5:37.

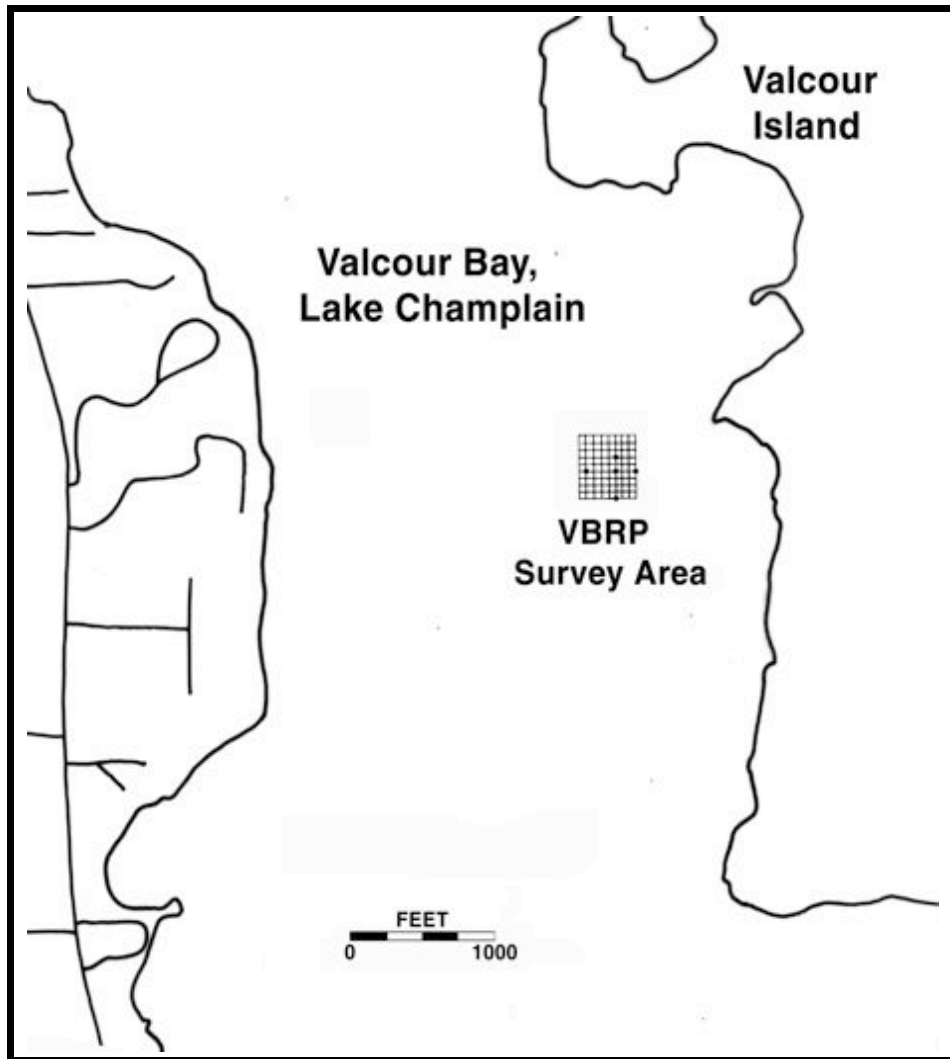


Figure 5:35. Map showing the VBRP survey area. The dots within the grid indicate grid axes where locational data was recorded in 2001 (courtesy of R. Bennett, NYOGS).

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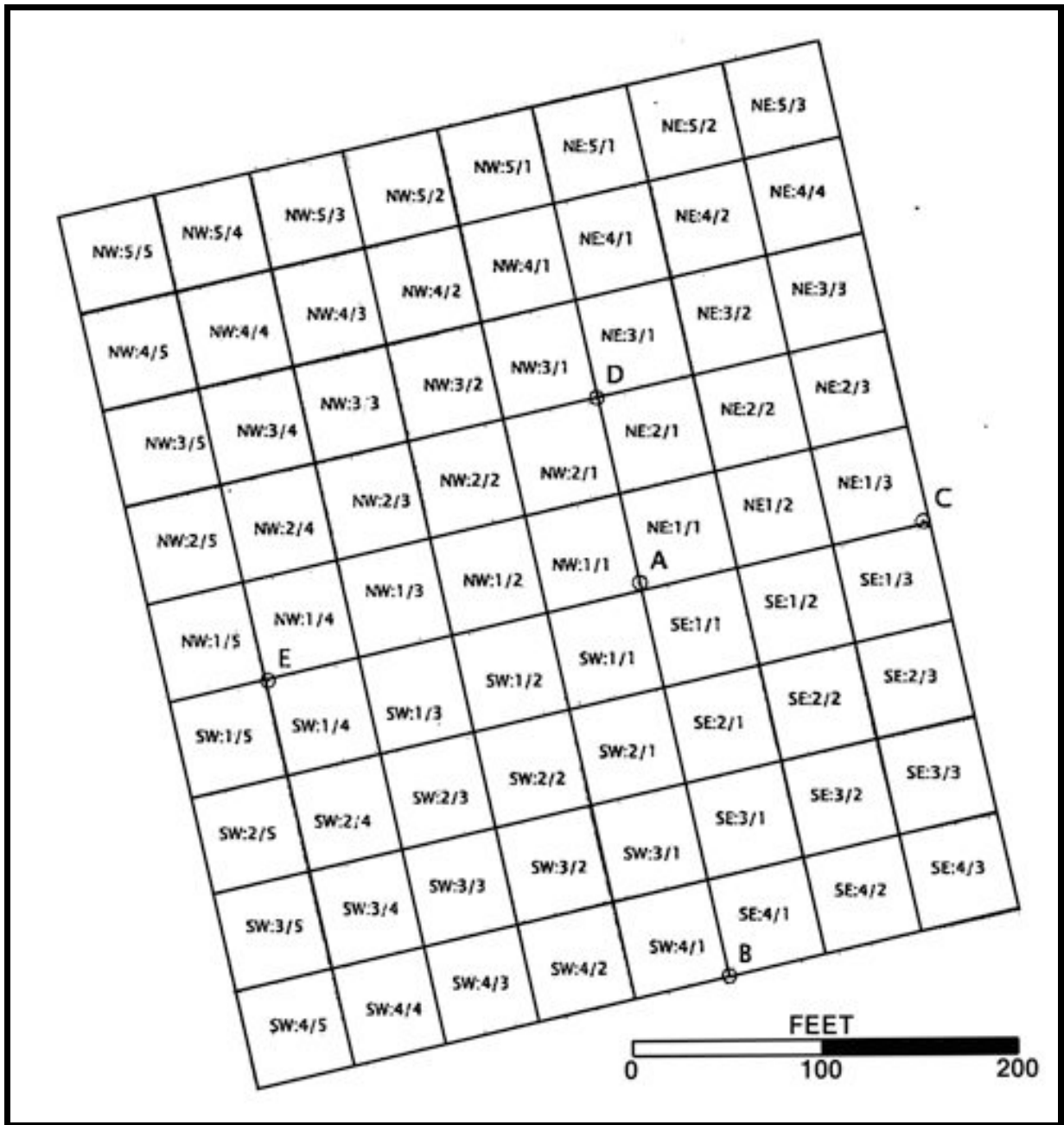


Figure 5:36. Detail of the VBRP survey grids showing the locations of grid axes where locational data was recorded in 2001 (courtesy of Richard Bennett, NYOGS).

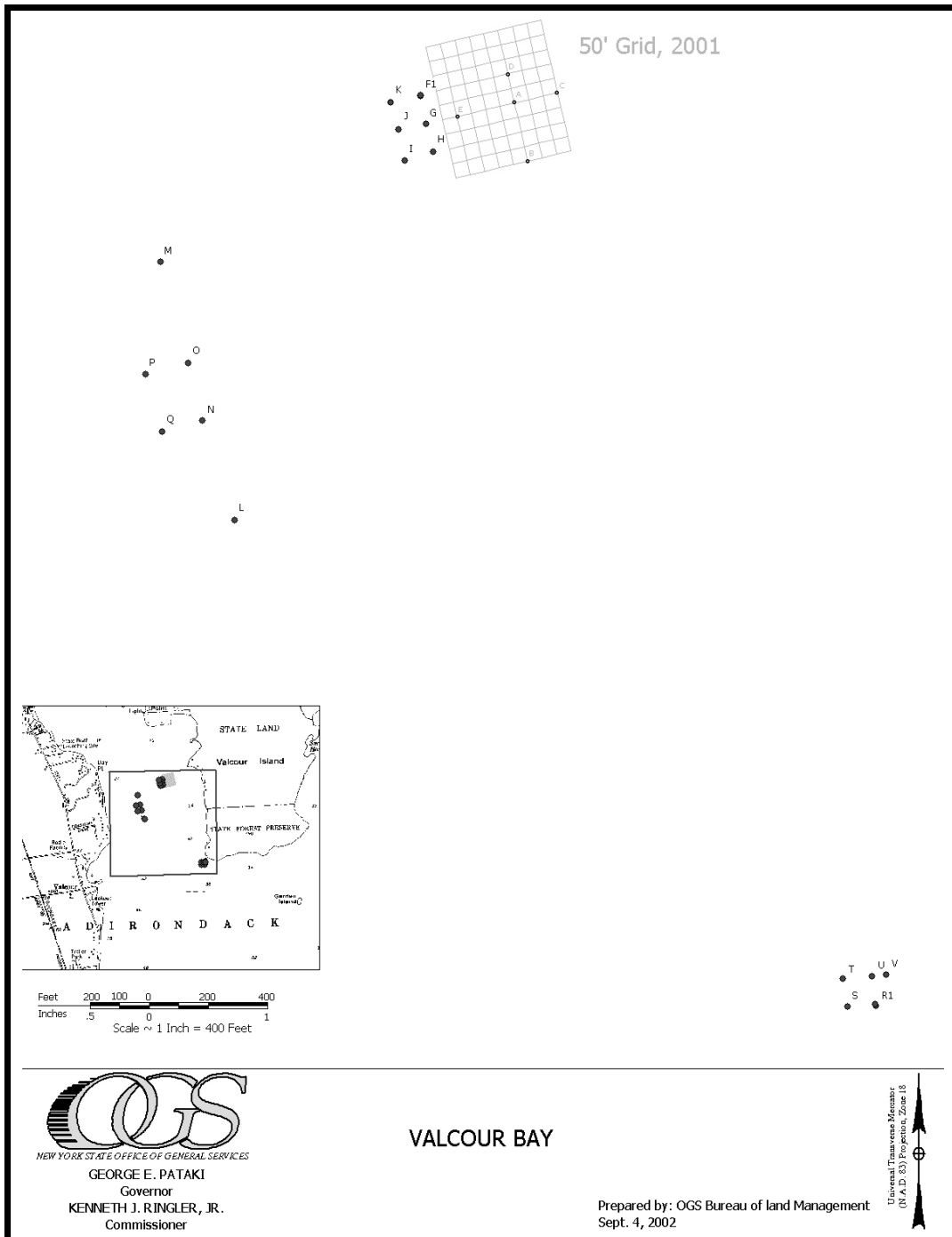


Figure 5:37. Map showing the locations of the points recorded in 2002. The grid in the upper right is the original survey area, while the six points in the middle left represent the western side of the American line, and the lower right points represent the eastern end of the British line (courtesy of Richard Bennett, NYOGS).



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## ARTIFACT DESCRIPTIONS

Though Valcour Bay has been the site of artifact collecting for several decades, the VBRP has located a number of Revolutionary War artifacts. Since 1999, 52 artifacts have been found, 23 of which have been recovered and underwent conservation during the winter of 2001/2002. The Valcour artifact collection consists of items as commonplace as iron shot, and as exceptional as the remains of a burst cannon. Each of these items and their provenience can lead to a better understanding of the events of the Battle of Valcour Island. For this analysis the artifact collection was broken down into six categories: 1) Cannon Fragments, 2) Carriage Fragments, 3) Ordnance, 4) Personal Armament, 5) Vessel Equipment, and 6) Unidentified Debris.

The description of each artifact is divided into two sections: an information summary and a textual description. Within the artifact summary, the Conservation Technique used is cited as a number. This number corresponds to a method described in Appendix 10.

### **Cannon Fragments**

#### ***Artifact 99-01: Muzzle Fragment with Trunnion***

##### *Artifact 99-01 Summary*

Found: 7/15/1999

Location: SE: 1/1 12ft – 1ft 2in

Recovered: 7/2001

Conservation Technique: 1

Conservation Completed: 6/15/2002

Current Disposition: Displayed in exhibit

Artifact 99-01 is the muzzle portion of a cast iron 6-pound cannon that burst during the Battle of Valcour Island (Figure 5:38). Artifact 99-01 was recovered during the 2001 field season. This fragment is associated with artifacts 00-04, 00-05, 01-03, 01-04, and 01-07; all are other pieces of the cannon, which in total account for approximately 80% of the weapon. The muzzle portion is 39in (152cm) long and contains a portion of the second reinforce, chase, muzzle, and right trunnion. At the broken end the barrel is 11in (28cm) in diameter, tapering to 7in (18cm) before swelling to 9in (23cm) at the muzzle of the gun. The walls of the cast iron gun are 3½in (9cm) thick. The bore is also 3½in (9cm) in diameter. This diameter corresponds with bore measurement given for six-pounders in eighteenth century sources (McConnell 1988: 87).

Only the right trunnion remains intact on the muzzle fragment, though the base of the left one is present. The trunnion is 3½in (9cm) in diameter, tapering to 3in (7.6cm). There appears to be a mark on the end of the trunnion, however, the details of the marking are not preserved well (Figure 5:39). One clearly legible marking is present on this cannon fragment. On the vertical face of the muzzle is written “N<sup>o</sup> XII” (Figure 5:40).

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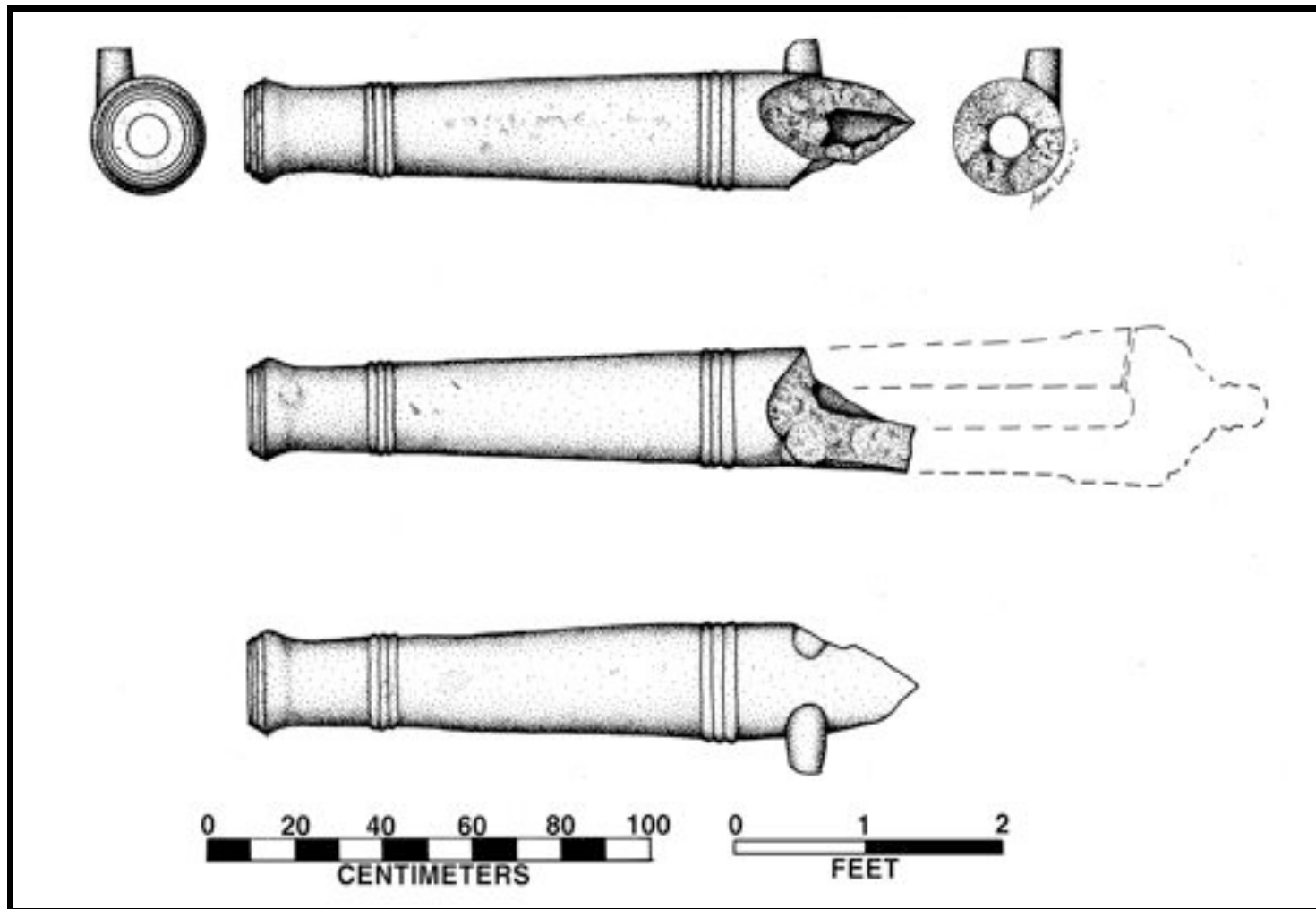


Figure 5:38. Drawing showing the cannon muzzle (99-01) (LCMM Collection, drawn by Gordon Cawood, inked by Adam Loven).



Figure 5:39. Detail of the cannon trunnion (LCMM Collection, photograph by Adam Kane).

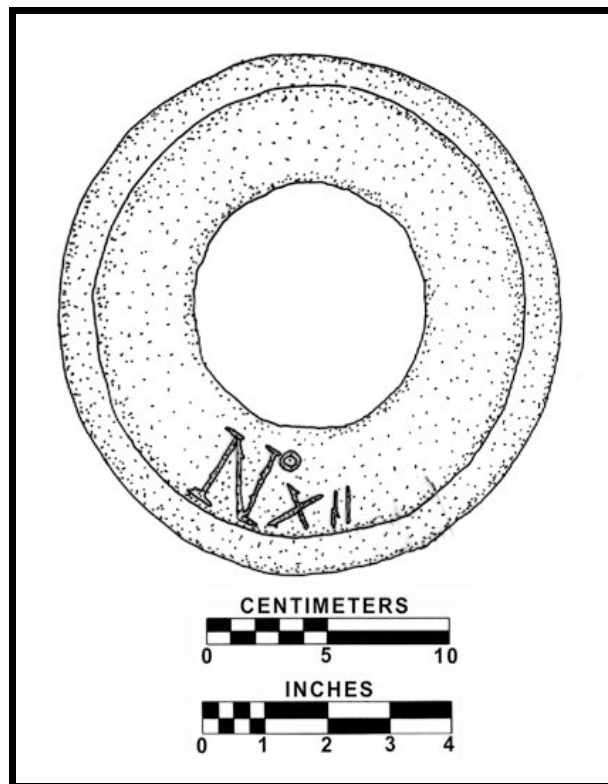


Figure 5:40. Detail of the cannon muzzle, showing the markings (LCMM Collection, drawn by Adam Kane).

**Artifact 00-04: Breech Fragment with Cascabel**

*Artifact 00-04 Summary*

Found: 4/26/2000

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Location: SE: 1/2 24ft – 35ft 10in  
Recovered: 7/2001  
Conservation Technique: 1  
Conservation Completed: 6/15/2002  
Current Disposition: Displayed in exhibit

Artifact 00-04 is a wedge shaped portion of the breech from the burst cannon (Figure 5:41). Artifact 00-04 was recovered during the 2001 field season. The fragment is from the lower right section of the barrel, it measures 25in (63cm) in length. The cascabel is also present. The maximum diameter of the barrel is 12¾in (32.5cm) with the thickness of the gun walls reaching 6in (15cm). This cannon fragment also contains the end of the bore, which is slightly rounded.

***Artifact 00-05: Barrel Fragment***

*Artifact 00-05 Summary*

Found: 8/02/2000  
Location: SE: 2/2 18ft – 17ft  
Recovered: 7/2001  
Conservation Technique: 1  
Conservation Completed: 6/15/2002  
Current Disposition: Displayed in exhibit

This fragment of the burst 6-pound cannon is from the left side of the first reinforce and a portion of the breech (Figure 5:41). Artifact 00-05 was recovered during the 2001 field season. The fractured side of this piece is 10½in (27cm) wide and 16in (41cm) long. This portion also contains the end of the bore.

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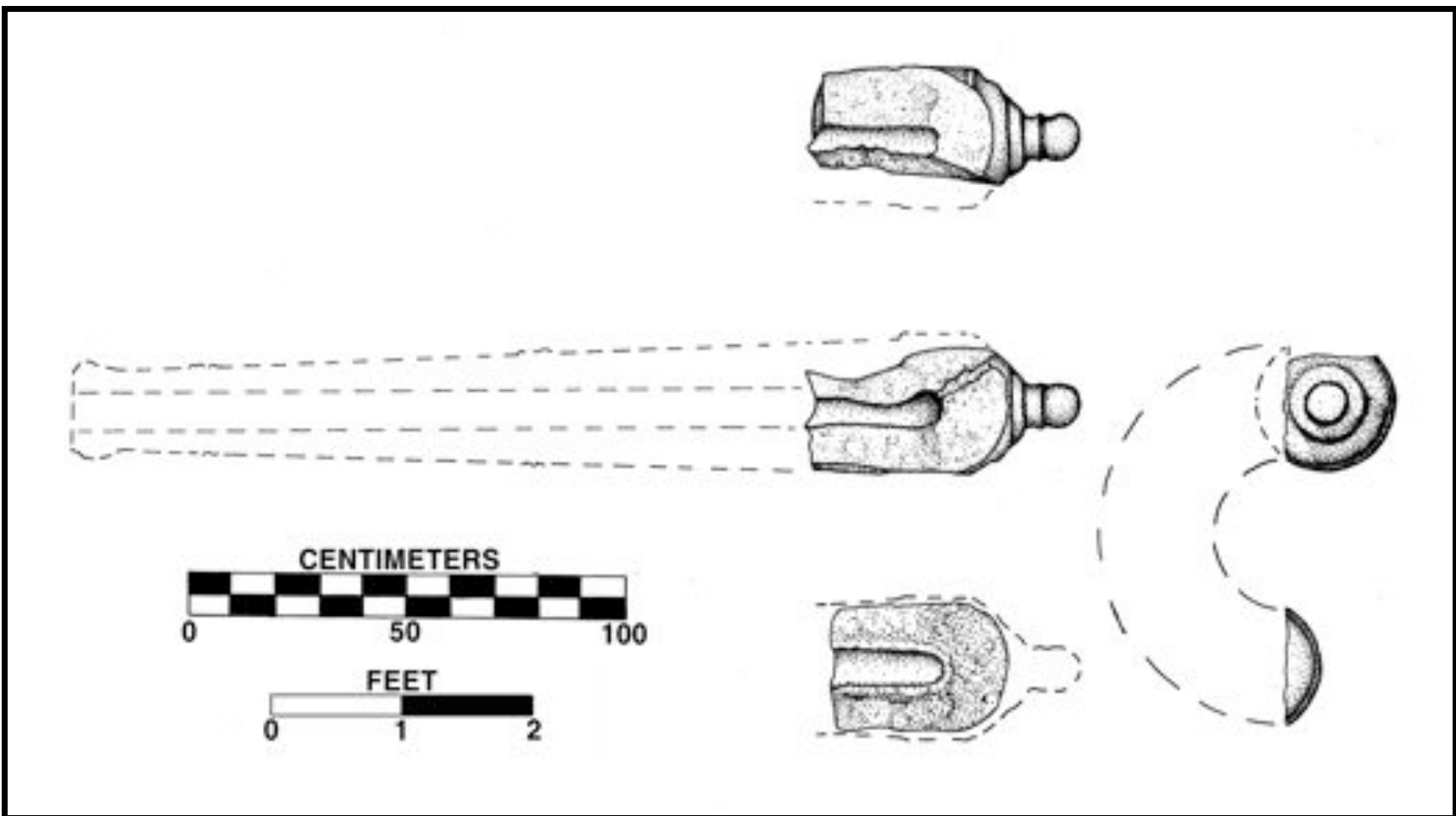


Figure 5:41. Scale drawing showing cannon fragments 00-04 and 00-05 (LCMM Collection, drawn by Gordon Cawood, inked by Adam Loven).

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**Artifact 01-03: Barrel Fragment**

*Artifact 01-03 Summary*

Found: 8/23/2001

Location: NW: 2/3 18ft – 12ft

Recovered: Proposed for spring/summer 2003

Conservation Technique: NA

Conservation Completed: NA

Current Disposition: Bottom of Valcour Bay

Artifact 01-03 is another barrel fragment containing portions of the first and second reinforce (Figure 5:42). It measures 16½in (42cm) long and 9½in (24cm) wide. It appears that this fragment fits together with artifact 01-04 which was found nearby.

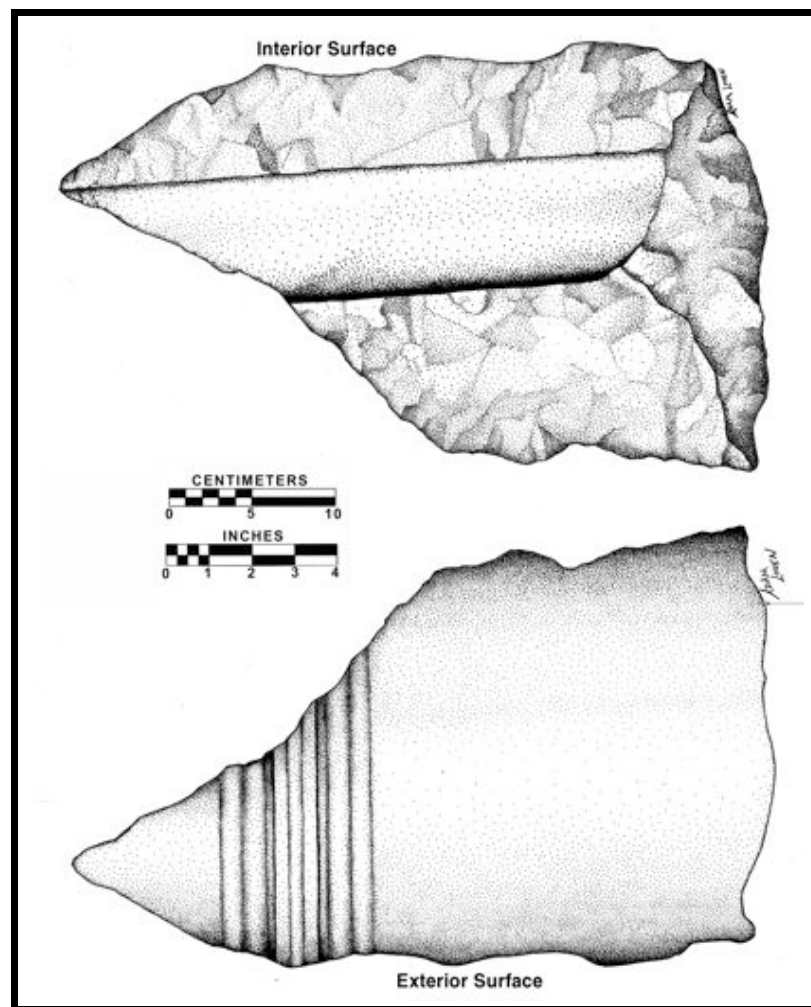


Figure 5:42. Preliminary drawing of cannon fragment 01-03 (LCMM Collection, drawn by Christopher Fox, inked by Adam Loven).

**Artifact 01-04: Fragment with Vent Field**

*Artifact 01-04 Summary*

Found: 8/23/2001

Location: NW: 2/3 24ft – 18ft

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Recovered: Proposed for spring/summer 2003  
Conservation Technique: NA  
Conservation Completed: NA  
Current Disposition: Bottom of Valcour Bay

This portion of the burst gun is 17 $\frac{1}{4}$ in (43.8cm) long, 10 $\frac{1}{2}$  in wide at the muzzle end, tapering to 7 $\frac{3}{4}$ in (19.7cm) on the breech end. It contains the vent field and portions of the base ring and vent field rings. The vent is a simple angled hole into the bore of the gun that measures  $\frac{3}{8}$ in (.9cm) in diameter.

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### **Artifact 01-07: Barrel Fragment**

#### *Artifact 01-07 Summary*

Found: 8/30/2001

Location: NW: 1/4 15ft – 27ft

Recovered: Proposed for spring/summer 2003

Conservation Technique: NA

Conservation Completed: NA

Current Disposition: Bottom of Valcour Bay

Artifact 01-07 is the sixth fragment of the six-pound cannon that has been found. This piece contains portions of the first and second reinforce. This artifact is 18½in (47cm) long and 10½in (26.7cm) at its widest point. This artifact has not been documented in detail.

### **Cannon Assemblage Conclusion**

The six fragments of the burst six-pounder represent 80 to 90% of the gun. The only major missing element is the left trunnion. The cast iron of all of the fragments is well preserved with only minimal corrosion. Many of the cannon's surface details were preserved by a dense layer of sediment adhering to the metal of the gun.

Initial research into the history of the cannon has proven challenging. Without the cartouche found on many cannon it is difficult to verify the country of origin or its age. However, the lack of a cartouche and of any broad arrows does indicate that the cannon is not of British origin, as British armaments tend to be well marked. Two cannon from the American Fleet are currently displayed in Whitehall, New York. Both of these cannon are British, and both have cartouches and broad arrows.

Comparison with other Revolutionary War cannon located throughout the Champlain Valley suggests that the gun may be of Swedish manufacture. The arrangement of the reinforcement rings and the generally utilitarian nature of the casting are very similar to the guns recovered from the gunboat *Philadelphia*. Research revealed that *Philadelphia's* guns were manufactured in Sweden during the late seventeenth century (Bratten 1997:180-184). These characteristics were also found on several Swedish cannon in the collection of the Fort Ticonderoga Museum. Research into the origin of the weapon is ongoing; it is anticipated that future reports on the VBRP will update the status of research into the cannon's origin.

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## Carriage Fragments

### **Artifact 99-08: Iron Bracket**

#### *Artifact 99-08 Summary*

Found: 9/26/1999

Location: NW: 1/1 8ft – 43ft 9in

Recovered: 7/2001

Conservation Technique: 1

Conservation Completed: 8/23/2001

Current Disposition: Displayed in exhibit

Artifact 99-08 is an arched iron bracket from a cannon carriage (Figure 5:43). This bracket almost certainly originated from the carriage that held the burst cannon from *New York*. This bracket sat between the trunnion of the gun and the wood of the carriage. The artifact is 7¼in (18.4cm) long and 2¾ (7cm) wide and the metal is ¾in (1.9cm) thick. The trunnion arch is 1¾in (4.4cm) deep. Several small iron spikes pass through the horizontal flanges on either side of the trunnion arch. These held the bracket down onto the carriage assembly. A small filler piece of wood (99-10) was found concreted to one of these flanges.

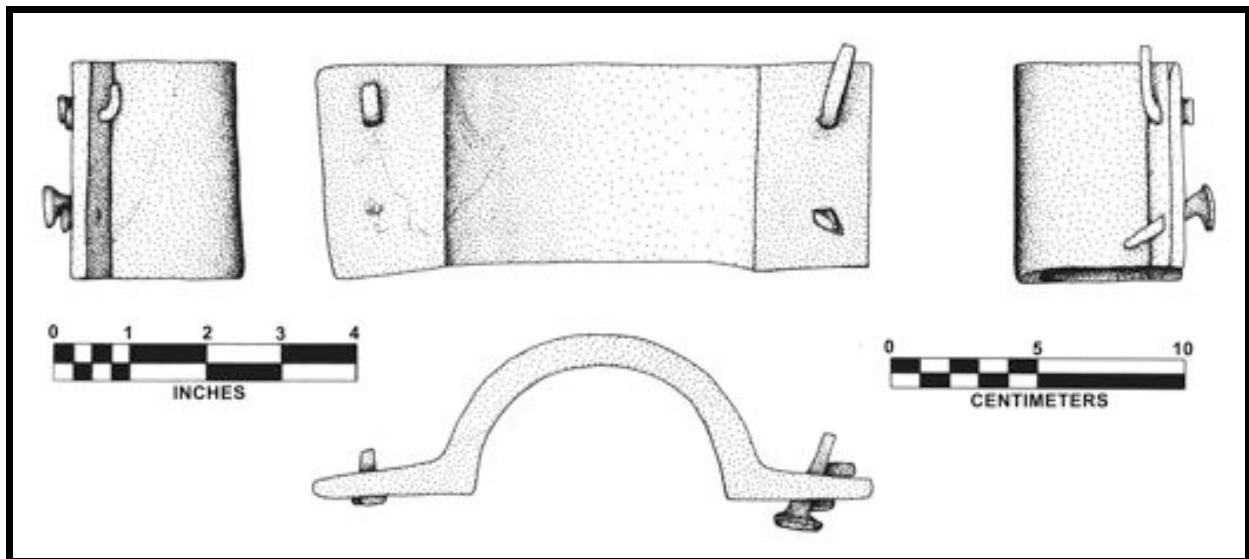


Figure 5:43. Scale drawing of artifact 99-08, an iron bracket from the cannon carriage (LCMM Collection, drawn by Adam Loven).

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**Artifact 99-09: Lead Bushing**

*Artifact 99-09 Summary*

Found: 9/26/1999

Location: NW: 1/1 8ft – 43ft 9in

Recovered: 7/2001

Conservation Technique: 2

Conservation Completed: 12/15/2002

Current Disposition: Displayed in exhibit

Artifact 99-09 is lead sheeting folded over several times and moulded into the shape of a “C” (Figure 5:44). This artifact appears to be part of the carriage from the cannon that burst. The shape of the lead indicates that it was used as a bushing between the cannon trunnion and carriage. This suggests that the carriage was designed to hold a larger cannon, but was pressed into service for the six-pounder. The artifact’s close association with items 99-08 and 99-10 support the theory that these are all part of a gun carriage assembly. This object is almost identical to 01-01.

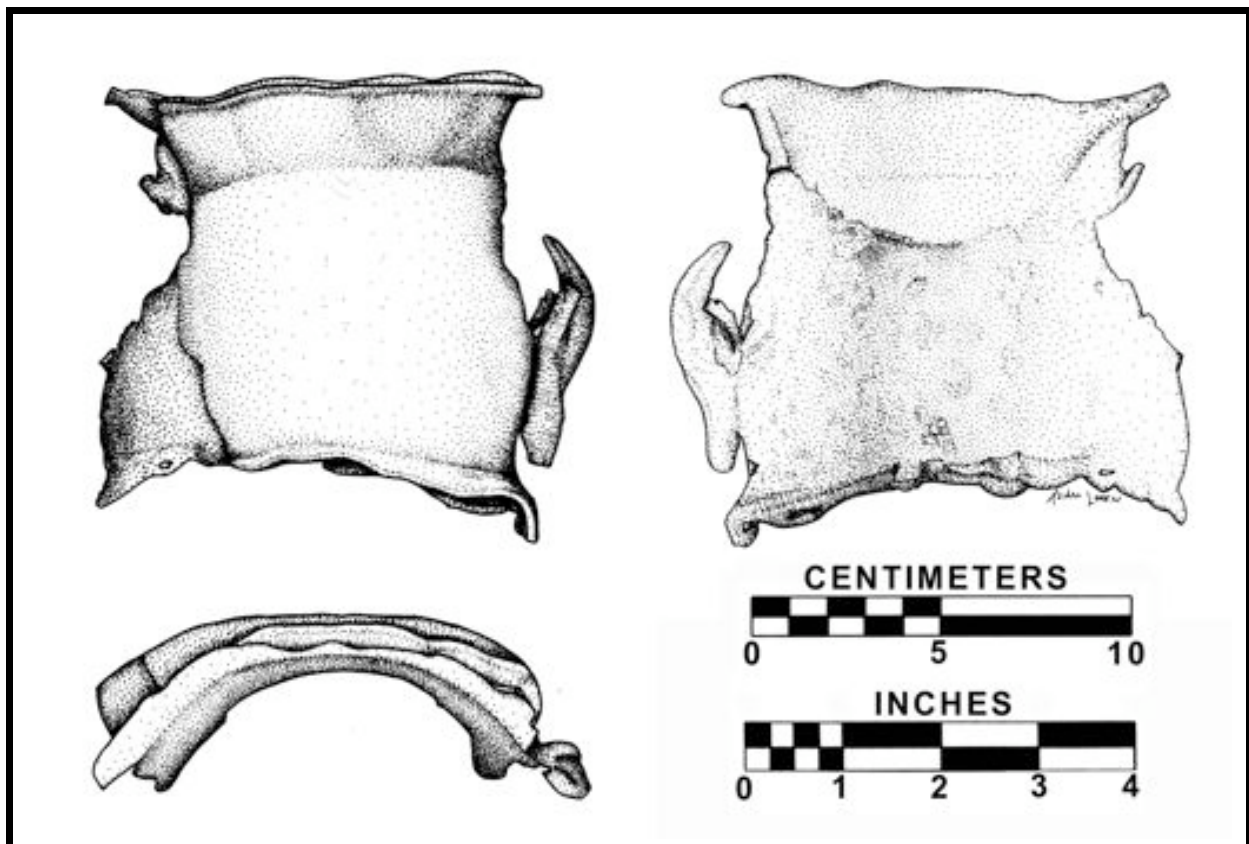


Figure 5:44. Scale drawing of artifact 99-09, a lead bushing (LCMM Collection, drawn by Adam Loven).

**Artifact 99-10: Wood Fragment**

*Artifact 99-10 Summary*

Found: 9/26/1999

Location: NW: 1/1 8ft – 43ft 9in

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Recovered: 7/2001  
Conservation Technique: 4  
Conservation Completed: 2/6/2002  
Current Disposition: Displayed in exhibit

Artifact 99-10 is a fragment of wood from the cannon's carriage (Figure 5:45). The artifact is 11½in (29.2cm) long 2¼in (5.7cm) wide and 1½in (3.8cm) thick. One rounded surface of the artifact suggests that it too was part of the carriage/trunnion junction. The shape of this surface fits around the trunnion arch of artifact 99-08.

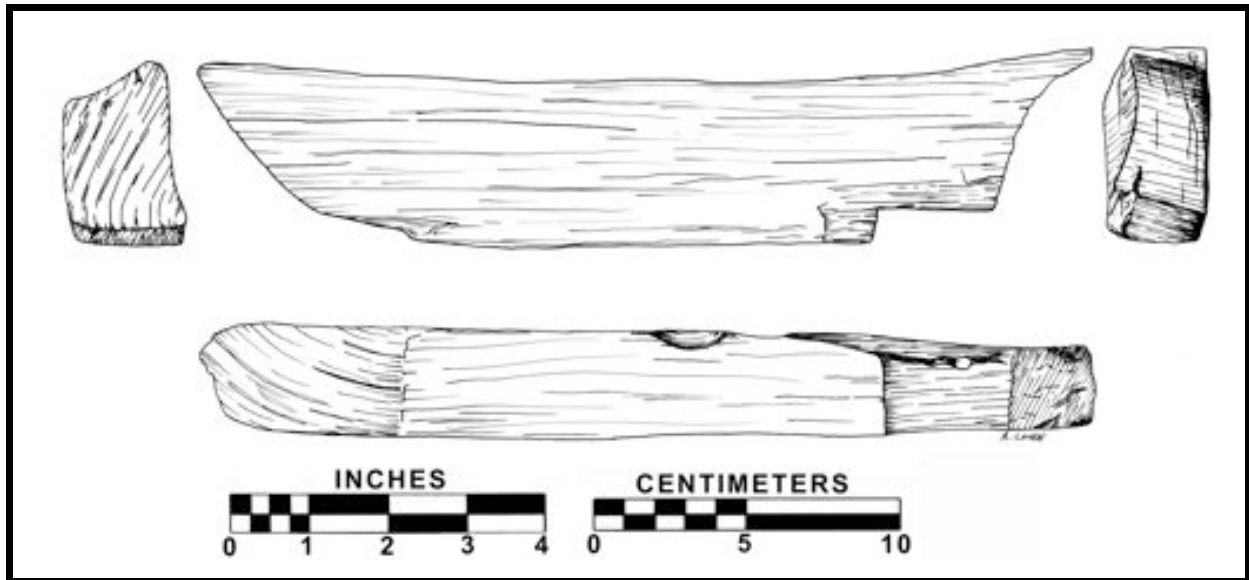


Figure 5:45. Scale drawing of artifact 99-10, a wood fragment from the carriage (LCMM, Collection, drawn by Adam Lovén).

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***Artifact 00-01: Wood and Iron Carriage Fragment***

*Artifact 00-01 Summary*

Found: 4/19/2000

Location: SE: 1/2 6ft – 40ft 6in

Recovered: 7/2001

Conservation Technique: 4

Conservation Completed: Completion expected in 7/2003

Current Disposition: Displayed in exhibit

This artifact is a portion of the left cheek of a gun carriage with remains of three timbers connected by large wrought iron through bolts, a iron ring that was a part of the gun tackle, and the capsquare that held the gun onto the carriage (Figure 5:46). This artifact is 38in (96.5cm) long, 18in (45.7cm) wide, and 3in (7.6cm) thick. The outward bend of the through bolts indicates that this portion of the carriage was bent violently out and downward before it detached from the rest of the carriage and the cannon.

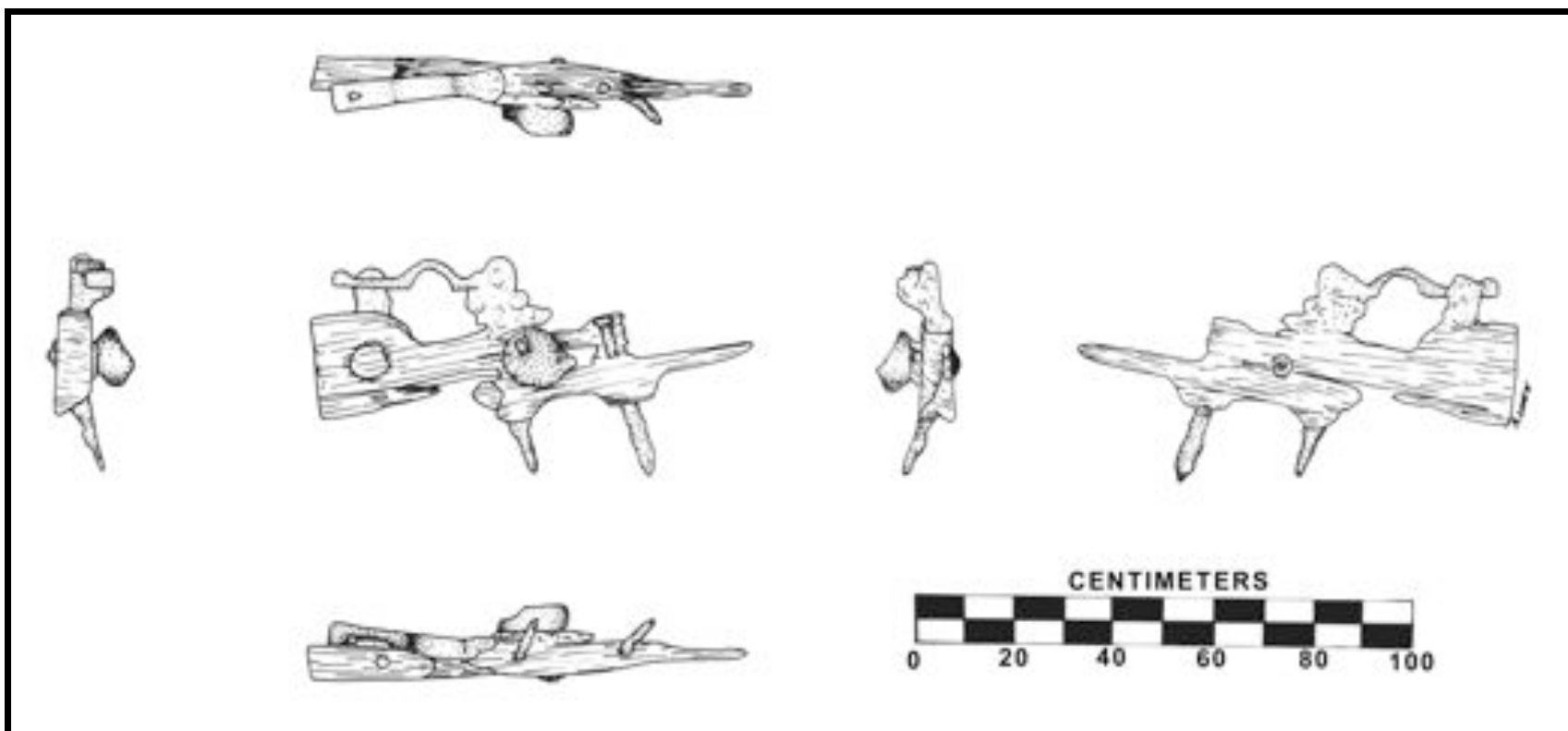


Figure 5:46. Scale drawing showing artifact 00-01, a cannon carriage fragment (LCMM Collection, drawn by Gordon Cawood, inked by Adam Loven).

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**Artifact 01-01: Lead Bushing**

*Artifact 01-01 Summary*

Found: 8/20/2001

Location: SE: 1/2 24ft – 46ft 10in

Recovered: Proposed for spring/summer 2003

Conservation Technique: NA

Conservation Completed: NA

Current Disposition: Bottom of Valcour Bay

Artifact 01-01 is a folded lead sheet that has been flattened and formed into a “C” shape (Figure 5:47). It is almost identical to artifact 99-09. It is believed that this artifact was used as a bushing between the cannon’s trunnion and the carriage on which the gun sat.

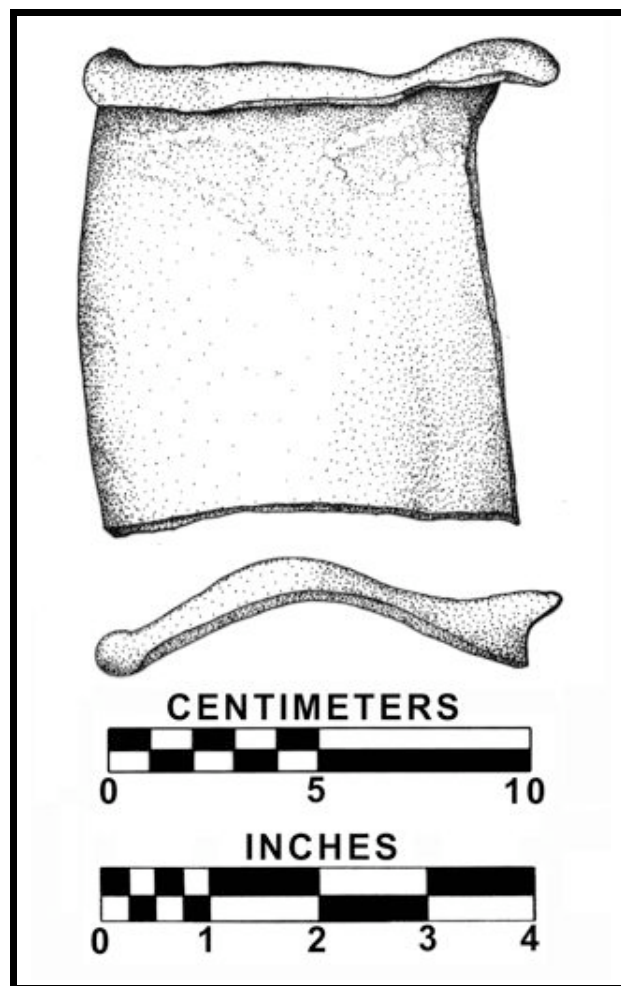


Figure 5:47. Preliminary sketch of artifact 01-01, a lead bushing (LCMM Collection, drawn by Pierre LaRocque, inked by Adam Loven).

**Ordnance**

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**Artifact 98-01: 8-Inch Shell****Artifact 98-01 Summary**

Found: 1998

Location: Unprovenanced

Recovered: 7/2001

Conservation Technique: None

Conservation Completed: 2/15/2002

Current Disposition: Displayed in exhibit

This artifact consists of a 41-pound (18.6kg), 8-in (20.3cm) diameter hollow cast iron sphere with 1in (2.5cm) thick walls. A slightly conical hole allows access to the powder cavity; it measures 1¼in (3.1cm) diameter at the top and 1½in (2.6cm) at the bottom. A portion of the wooden plug fuse was found in this hole. The fuse is made of a tapered piece of wood with a ¾in (.95cm) hole bored through its 2in (5cm) length. This cavity would have been filled with a mixture of gunpowder, saltpeter, and alcohol that acted as the ignition mechanism for the large powder charge (approximately 2½ lbs [1.1kg]) located in the shell.

The discovery of the shell at the Valcour Island Battlefield is perplexing. Exploding shells were typically used in siege operations or from naval vessels in shore bombardments. The only vessel known to have carried any shell-guns in the Battle of Valcour Island was the British Radeau Thunderer which carried a couple of howitzers. Earlier in 1776 attempts were made to arm some of the American gunboats with mortars on their quarterdecks. When one of these mortars burst during trials the experiment was abandoned. The origin of this artifact remains unclear.

**Artifact 99-03: 6-Pound Round Shot****Artifact 99-03 Summary**

Found: 9/15/1999

Location: SW: 1/1 20ft – 2ft 6in

Recovered: 7/2001

Conservation Technique:

Conservation Completed:

Current Disposition: Displayed in exhibit

Artifact 99-03 is a piece of 6-pound iron round shot. The shot is 3<sup>7</sup>/<sub>16</sub>in (8.7cm) in diameter. It is unclear whether this piece of shot was fired at the American vessels or was lost off one of them. It is possible that this piece of shot was the projectile in the cannon that burst, however, this is impossible to verify.

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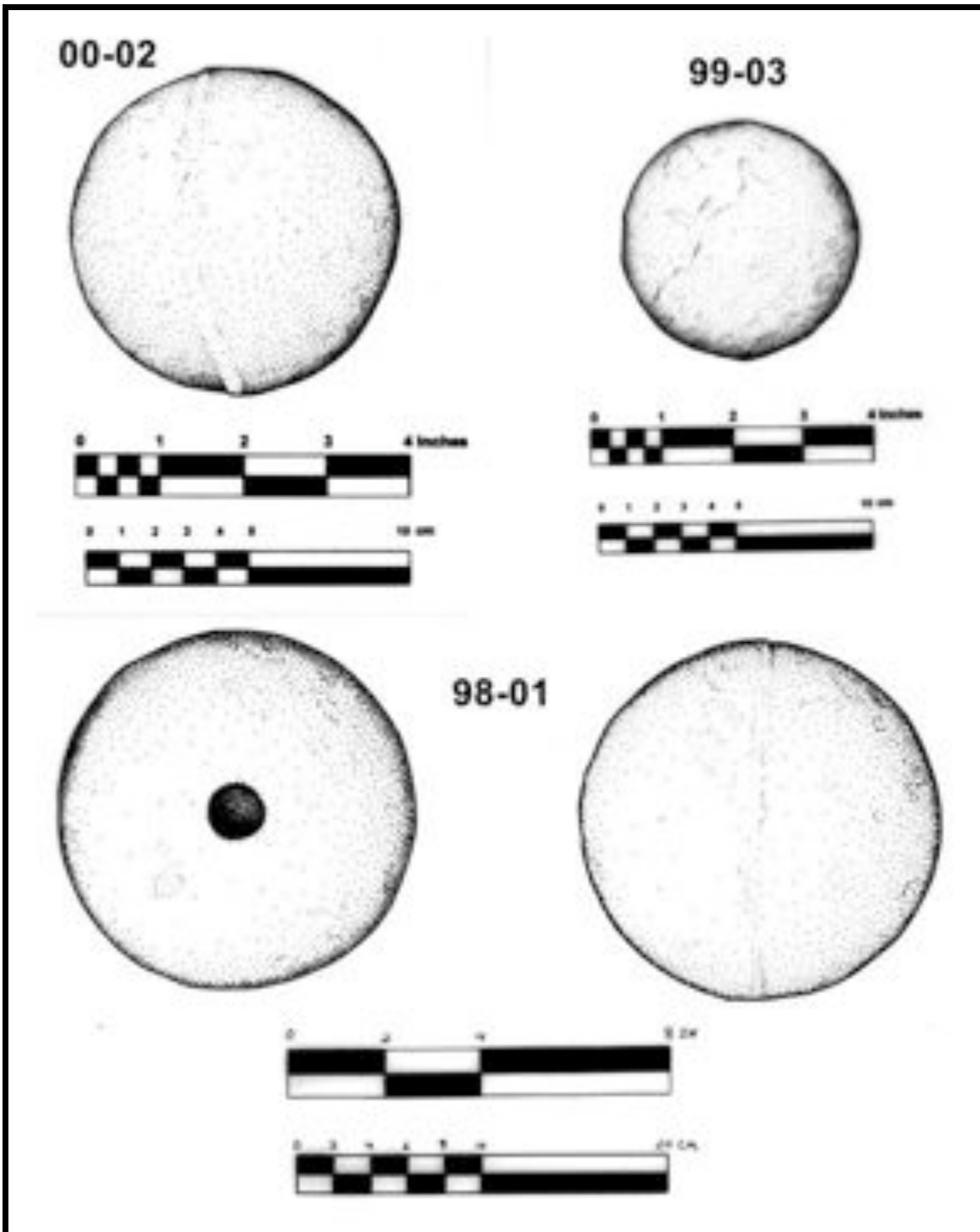


Figure 5:48. 9-pound round shot, 6-pound round shot, and 8in. mortar bomb (LCMM Collection, drawn by Adam Loven)



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**Artifact 99-12: Iron Canister or Case Shot**

**Artifact 99-12 Summary**

Found: 10/05/1999

Location: NW: 2/1 36ft – 35ft

Recovered: 7/2001

Conservation Technique: 1

Conservation Completed: 7/27/2001

Current Disposition: Displayed in exhibit

Item 99-12 is a piece of cast iron canister or case shot (Figure 5:49). The ball measures  $\frac{7}{8}$ in (2.2cm) in diameter and weighs 1.4 oz (39g). The size and weight of the ball suggests that it came from a small caliber weapon, quite possibly a swivel gun (Caruana 1997: 222). Unfortunately, it is impossible to determine if this projectile is of American or British origin.

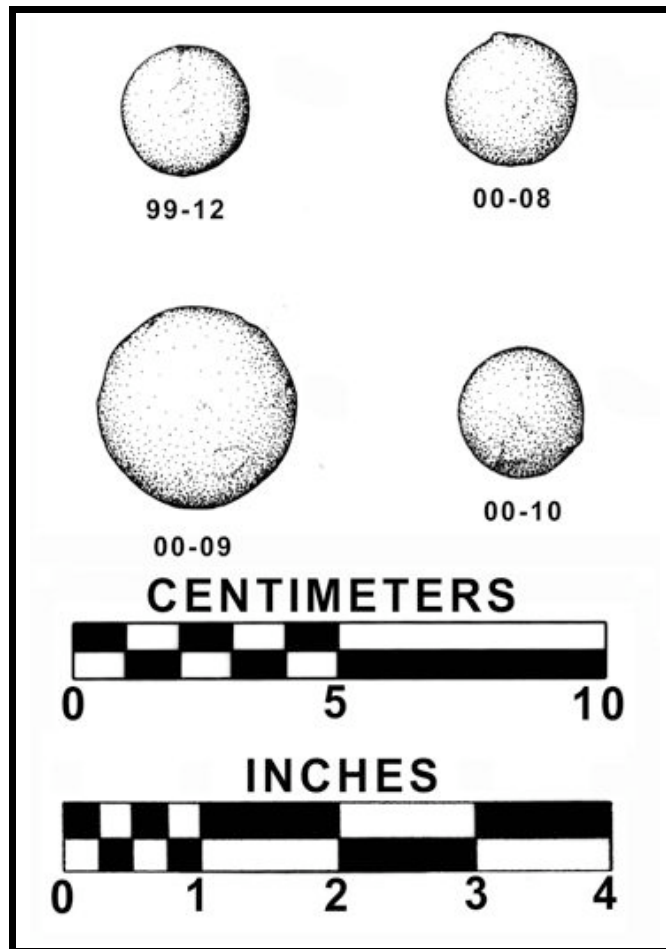


Figure 5:49. Scale drawings of artifacts 99-12, 00-08, 00-09, and 00-10 (LCMM Collection, drawn by Adam Loven).

**Artifact 00-02: 9-Pound Round Shot**

**Artifact 00-02 Summary**

Found: 4/20/2000

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Location: SE: 1/2 18ft – 13ft 4in  
Recovered: 7/2001  
Conservation Technique: 1  
Conservation Completed: 7/27/2001  
Current Disposition: Displayed in exhibit

Artifact 00-02 is a 9-pound cast iron round shot that is 4in (10.1cm) in diameter, the standard size for 9-pound cannon. The ball has no legible markings and it is therefore impossible to determine its origin.

***Artifact 00-07: 9-Pound Bar Shot***

*Artifact 00-07 Summary*

Found: 9/22/2000  
Location: SW: 3/1 12ft – 16ft 2in  
Recovered: 7/2001  
Conservation Technique: 1  
Conservation Completed: 7/27/2001  
Current Disposition: Displayed in exhibit

This artifact consists of a  $\frac{3}{4}$ in (1.9cm) square  $4\frac{3}{4}$ in (12cm) long wrought iron bar with a 4in diameter cast iron head on both ends (Figure 5:50). This piece of ordnance was fired out of a 9-pound cannon into an enemy vessel's sails and rigging. As a bar shot leaves the muzzle of the gun it begins to spin and tumble, easily cutting rigging to shreds. This particular piece of bar shot is well preserved.

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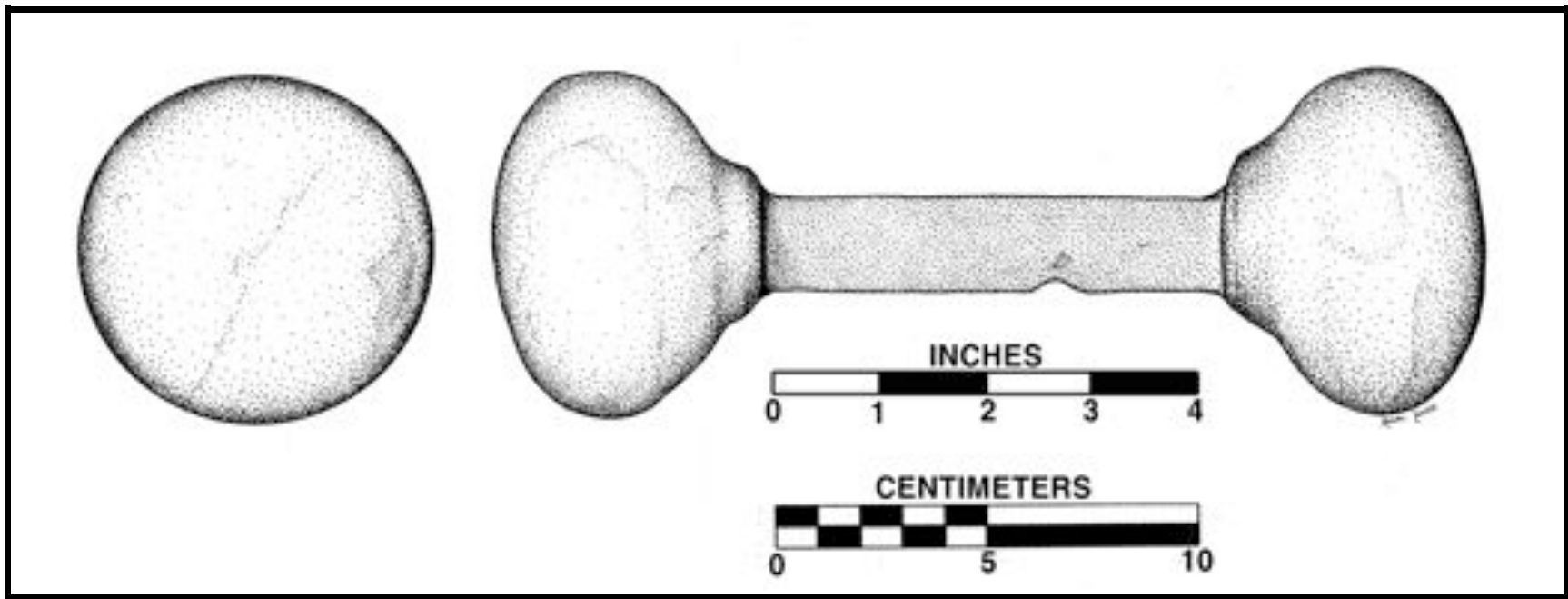


Figure 5:50. Scale drawing of artifact 00-07, a 9-pound bar shot (LCMM Collection, drawn by Adam Loven).

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**Artifact 00-08: Canister or Case Shot**

*Artifact 00-08 Summary*

Found: 9/29/2000

Location: SW: 4/1 39ft – 34ft 1in

Recovered: 7/2001

Conservation Technique: 1

Conservation Completed: 7/27/2001

Current Disposition: Displayed in exhibit

This piece of canister shot is 1in (2.5cm) in diameter and weighs 1.5 oz (42 g) (see Figure 5:49). Like artifact 99-12 these measurements suggest that this round was fired from a swivel gun (Caruana 1997: 222).

**Artifact 00-09: Grape or Canister Shot**

*Artifact 00-09 Summary*

Found: 10/11/2000

Location: SE: 4/1 3ft – 30ft 8in

Recovered: 7/2001

Conservation Technique: 1

Conservation Completed: 7/27/2001

Current Disposition: Displayed in exhibit

Artifact 00-09 is a cast iron ball measuring 1 $\frac{1}{3}$ in (3.4cm) in diameter and weighing 5.8 oz (162 g) (see Figure 5:49). These dimensions suggest two things. First, this projectile may have been fired out of an 18-pounder with 41 other balls of the same size in a round or canister. Second, the round may have been one of nine to come from a round of grape shot fired from a four-pounder (Caruana 1997: 222-228).

**Artifact 00-10: Canister or Case Shot**

*Artifact 00-10 Summary*

Found: 10/11/2000

Location: SE: 4/1 12ft – 26ft 1in

Recovered: 7/2001

Conservation Technique: 1

Conservation Completed: 7/27/2001

Current Disposition: Displayed in exhibit

Artifact 00-10 is a piece of cast iron canister or case shot (see Figure 5:49). The ball measures  $\frac{7}{8}$ in (2.2cm) in diameter and weighs 1.3 oz (36.4 g). The size and weight of the ball suggest that it came from a small caliber weapon, possibly a swivel gun (Caruana 1997: 222). Unfortunately, it is impossible to determine if this projectile is of American or British origin.

**Artifact 01-05: 6-Pound Round Shot**

*Artifact 01-05 Summary*

Found: 8/27/2001

Location: NW: 2/3 43ft – 28ft

Recovered: not recovered

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Conservation Technique: NA  
Conservation Completed: NA  
Current Disposition: Bottom of Valcour Bay

This artifact is a cast iron ball roughly 3.5in (8.9cm) in diameter and weighing approximately 6 pounds (2.7kg). However, as it has not been brought to the surface exact measurements are not available. This cannon ball has a British broad arrow cast into its surface. The cannon ball is certainly of British origin and may have been fired by a British vessel, however, it could have also been dropped overboard from an American vessel.

***Artifact 01-06: Iron Canister or Case Shot***

*Artifact 01-06 Summary*

Found: 8/27/2001

Location: SW: 2/4 9ft – 21ft 6in

Recovered: not recovered

Conservation Technique: NA

Conservation Completed: NA

Current Disposition: Bottom of Valcour Bay

Artifact 01-06 is a piece of cast iron grape or canister shot. It is similar in size to item 00-09, though exact measurements have not been taken because has not yet been raised.

***Artifact 02-01: 4-Pound Round Shot***

*Artifact 02-01 Summary*

Found: 5/22/2002

Location: SE: 2/2 7ft – 41ft 5in

Recovered: not recovered

Conservation Technique: NA

Conservation Completed: NA

Current Disposition: Bottom of Valcour Bay

Artifact 02-01 is a piece of 4-pound iron solid shot. This artifact has not been documented .

***Artifact 02-02: 6-Pound Round Shot***

*Artifact 02-02 Summary*

Found: 5/28/2002

Location: SE: 2/2 20ft – 21ft 3in

Recovered: not recovered

Conservation Technique: NA

Conservation Completed: NA

Current Disposition: Bottom of Valcour Bay

Artifact 02-01 is a piece of 6-pound iron solid shot. This artifact has not been documented.

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**Artifact 02-03: Grenade**

*Artifact 02-03 Summary*

Found: 8/21/2002

Location: NW: 2/4 33ft – 46ft 6in

Recovered: not recovered

Conservation Technique: NA

Conservation Completed: NA

Current Disposition: Bottom of Valcour Bay

Artifact 02-03 consists of a hollow cast iron sphere with a hole permitting access to the powder cavity. The artifact weighs 4lbs 1oz (1.8kg) and has a diameter of  $3^{11/16}$ in (9.4cm). This artifact has not been documented in detail.

**Artifact 02-04: Grenade**

*Artifact 02-04 Summary*

Found: 8/21/2002

Location: NW: 2/4 36ft – 22ft

Recovered: not recovered

Conservation Technique: NA

Conservation Completed: NA

Current Disposition: Bottom of Valcour Bay

Artifact 02-04 consists of a hollow cast iron sphere with a hole permitting access to the powder cavity. The artifact weighs 3lbs 5oz (1.5kg) and has a diameter of  $3^{5/16}$ in (8.4cm). This artifact has not been documented in detail.

**Artifact 02-06: 4-Pound Round Shot**

*Artifact 02-06 Summary*

Found: 8/23/2002

Location: NW: 1/5 4ft – 36ft 5in

Recovered: not recovered

Conservation Technique: NA

Conservation Completed: NA

Current Disposition: Bottom of Valcour Bay

Artifact 02-06 is a piece of 4-pound iron solid shot. This artifact has not been documented.

**Artifact 02-07: Canister or Grape Shot**

*Artifact 02-07 Summary*

Found: 8/23/2002

Location: NW: 1/8 12ft – 49ft 6in

Recovered: not recovered

Conservation Technique: NA

Conservation Completed: NA

Current Disposition: Bottom of Valcour Bay

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Artifact 02-07 is a piece of small cast-iron canister or grape shot. This artifact has not been documented.

**Artifact 02-08: Swivel Shot**

*Artifact 02-08 Summary*

Found: 8/23/2002

Location: NW: 1/8 15ft – 31ft 3in

Recovered: not recovered

Conservation Technique: NA

Conservation Completed: NA

Current Disposition: Bottom of Valcour Bay

Artifact 02-08 is a piece of small cast-iron swivel shot. This artifact has not been documented.

**Artifact 02-10: Canister or Grape Shot**

*Artifact 02-10 Summary*

Found: 8/26/2002

Location: NW: 1/7 12ft – 30ft 2in

Recovered: not recovered

Conservation Technique: NA

Conservation Completed: NA

Current Disposition: Bottom of Valcour Bay

Artifact 02-10 is a piece of small cast-iron canister or grape shot. This artifact has not been documented.

**Artifact 02-11: Canister or Grape Shot**

*Artifact 02-11 Summary*

Found: 8/26/2002

Location: NW: 1/7 20ft – 4ft

Recovered: not recovered

Conservation Technique: NA

Conservation Completed: NA

Current Disposition: Bottom of Valcour Bay

Artifact 02-11 is a piece of small cast-iron canister or grape shot. This artifact has not been documented.

**Artifact 02-12: Musket Ball**

*Artifact 02-12 Summary*

Found: 8/27/2002

Location: NW: 1/7 33ft – 16ft 8in

Recovered: not recovered

Conservation Technique: NA

Conservation Completed: NA

Current Disposition: Bottom of Valcour Bay

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Artifact 02-12 is a lead musket ball. This artifact has not been documented.

**Artifact 02-15: Lead Pellet**

*Artifact 02-15 Summary*

Found: 8/30/2002

Location: NW: 2/6 27ft – 40ft 3in

Recovered: not recovered

Conservation Technique: NA

Conservation Completed: NA

Current Disposition: Bottom of Valcour Bay

Artifact 02-15 is a lead pellet. This artifact has not been documented.

**Artifact 02-16: Canister or Grape Shot**

*Artifact 02-16 Summary*

Found: 9/03/2002

Location: NW: 2/6 33ft – 26ft 10in

Recovered: not recovered

Conservation Technique: NA

Conservation Completed: NA

Current Disposition: Bottom of Valcour Bay

Artifact 02-16 is a piece of small cast-iron canister or grape shot. This artifact has not been documented.

**Artifact 02-17: Canister or Grape Shot**

*Artifact 02-17 Summary*

Found: 9/03/2002

Location: NW: 2/6 38ft – 35ft 2in

Recovered: not recovered

Conservation Technique: NA

Conservation Completed: NA

Current Disposition: Bottom of Valcour Bay

Artifact 02-17 is a piece of small cast-iron canister or grape shot. This artifact has not been documented.

**Artifact 02-18: Canister or Grape Shot**

*Artifact 02-18 Summary*

Found: 9/03/2002

Location: NW: 2/6 42ft – 6ft 8in

Recovered: not recovered

Conservation Technique: NA

Conservation Completed: NA

Current Disposition: Bottom of Valcour Bay

Artifact 02-18 is a piece of small cast-iron canister or grape shot. This artifact has not been documented.

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**Artifact 02-19: Musket Ball**

*Artifact 02-19 Summary*

Found: 9/06/2002

Location: NW: 1/6 6ft – 42ft 6in

Recovered: not recovered

Conservation Technique: NA

Conservation Completed: NA

Current Disposition: Bottom of Valcour Bay

Artifact 02-19 is a lead musket ball. This artifact has not been documented.

**Artifact 02-20: Mortar Fragment**

*Artifact 02-20 Summary*

Found: 9/11/2002

Location: NW: 1/6 35ft – 8ft 3in

Recovered: not recovered

Conservation Technique: NA

Conservation Completed: NA

Current Disposition: Bottom of Valcour Bay

Artifact 02-20 is a fragment from a cast iron mortar. This artifact has not been documented.

**Artifact 02-21: Musket Ball**

*Artifact 02-21 Summary*

Found: 9/12/2002

Location: NW: 1/6 39ft – 46ft 4in

Recovered: not recovered

Conservation Technique: NA

Conservation Completed: NA

Current Disposition: Bottom of Valcour Bay

Artifact 02-21 is a lead musket ball. This artifact has not been documented.

**Artifact 02-22: Canister or Grape Shot**

*Artifact 02-22 Summary*

Found: 9/12/2002

Location: NW: 1/6 39ft – 46ft 4in

Recovered: not recovered

Conservation Technique: NA

Conservation Completed: NA

Current Disposition: Bottom of Valcour Bay

Artifact 02-22 is a piece of small cast-iron canister or grape shot. This artifact has not been documented.

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***Artifact 02-23: Lead Pellet***

*Artifact 02-23 Summary*

Found: 9/12/2002

Location: NW: 1/6 43ft – 38ft 11in

Recovered: not recovered

Conservation Technique: NA

Conservation Completed: NA

Current Disposition: Bottom of Valcour Bay

Artifact 02-23 is a lead pellet. This artifact has not been documented.

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## Personal Armament

### ***Artifact 99-02: Belt Axe***

#### *Artifact 99-02 Summary*

Found: 8/31/1999

Location: NE 1/2: 5ft – 5ft 5in

Recovered: 7/2001

Conservation Technique: 4

Conservation Completed: 2/12/2002

Current Disposition: Displayed in exhibit

This artifact is the head, and a portion of the handle, of a square poll belt axe or hatchet (Figure 5:51). The distinctive feature of this axe style is its elongated ears (Neumann 1991: 264). The square poll hatchet was common in the Champlain Valley during the French and Indian War, suggesting that this weapon may have been a remnant of the earlier conflict. Belt axes were commonly carried as secondary or close combat weapons and were useful around camp.

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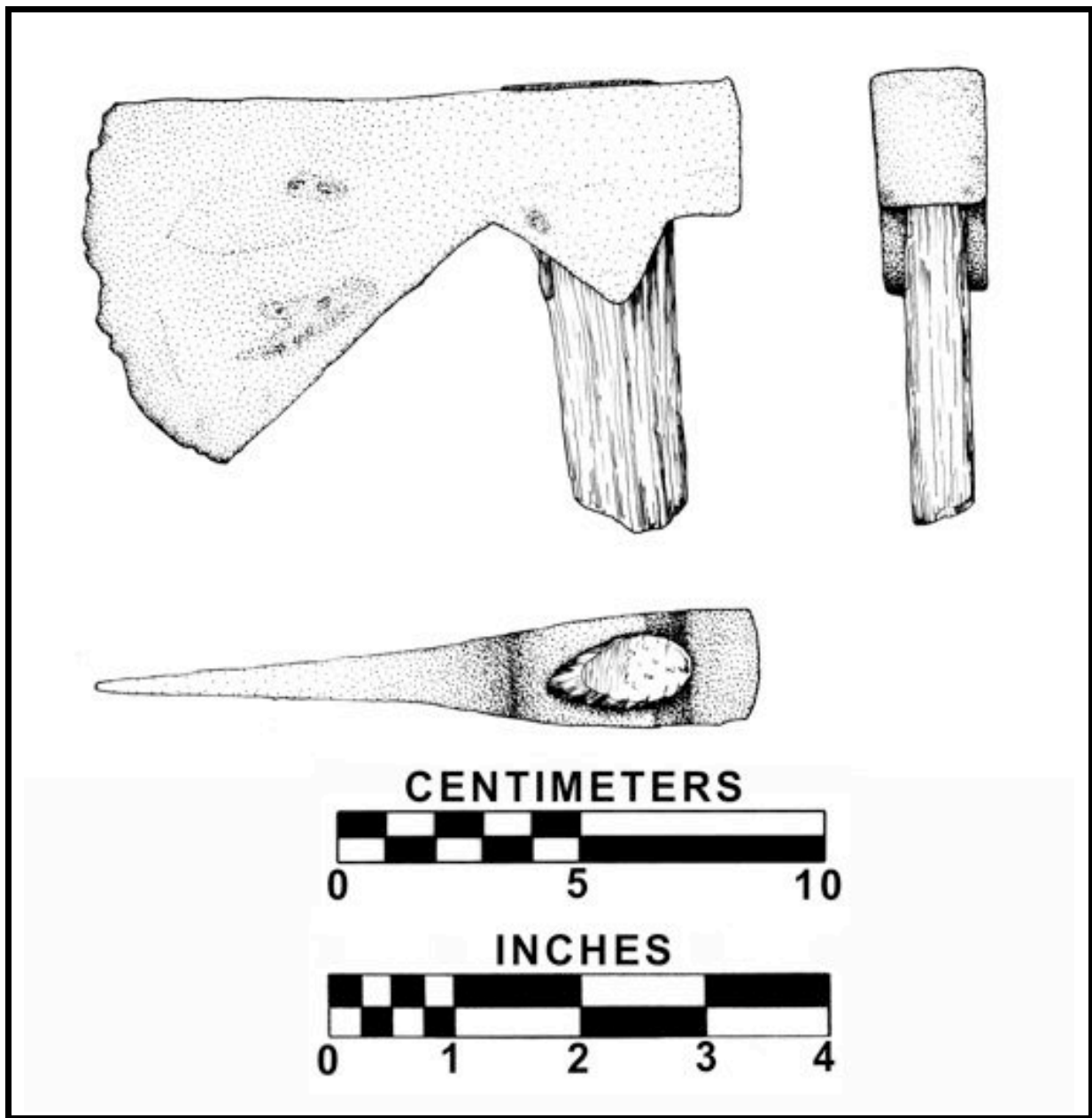


Figure 5:51. Preliminary scale drawing of artifact 99-02, a belt axe (LCMM Collection, drawn by Adam Loven).

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**Artifact 99-05: Cartridge Box Assemblage.** Artifact 99-05 is a composite artifact assemblage consisting of a Revolutionary War soldier's cartridge box and items associated with it (Figure 5:52). The cartridge box itself consists of a wooden block with 19 holes drilled into it (Figure 5:53). Each of these holes held a rolled paper musket cartridge consisting of a lead shot and a measured amount of powder wrapped in a piece of paper. A thin layer of leather originally surrounded the block. Unfortunately, this leather is in very poor condition and only fragments of it survived on the lake bottom. However, the thick leather flap that closed the top of the cartridge box has survived nearly intact. This leather flap has three small letters stamped into it. Though the first letter is illegible, the others are "M" and "B". This is most likely a manufacturer's mark and research may reveal where and when this artifact was assembled.

This 19-hole box is similar to examples dating to the earliest years of the Revolution in the Fort Ticonderoga Museum and other American collections. One original box of this type is known to have belonged to a soldier of the Connecticut Militia in 1776. New York troops carried cartridge boxes similar to this in 1775. A letter from the delegates of New York to the Continental Congress dated October 1775 states "The first and second Regiments and some part of the other Regiments are...furnished with belts and pouches for nineteen cartridges, bayonet belts, musket slings, coats, canteens, haversacks, &c." (Fernow 1887:38-39).

Twenty .57 caliber musket balls were found in the block along with 3 pieces of scrap lead. Additionally, seven musket flints were also associated with the cartridge box. The flints are the honey color typically associated with flints of French manufacture. Honey flints are a common find on Revolutionary War sites. Several of these flints show evidence of extensive use, while others were unused. A brass buckle was also found lying on the leather flap. This was probably the adjustment for a linen shoulder strap that did not survive.

The state of preservation of these artifacts is extraordinary. The same thick clay silt that has preserved the iron artifacts so well has also preserved the organic components of the cartridge box. It is hoped that further research will lead to identification of the manufacturer of the box and possibly to the regiment that was supplied with them.

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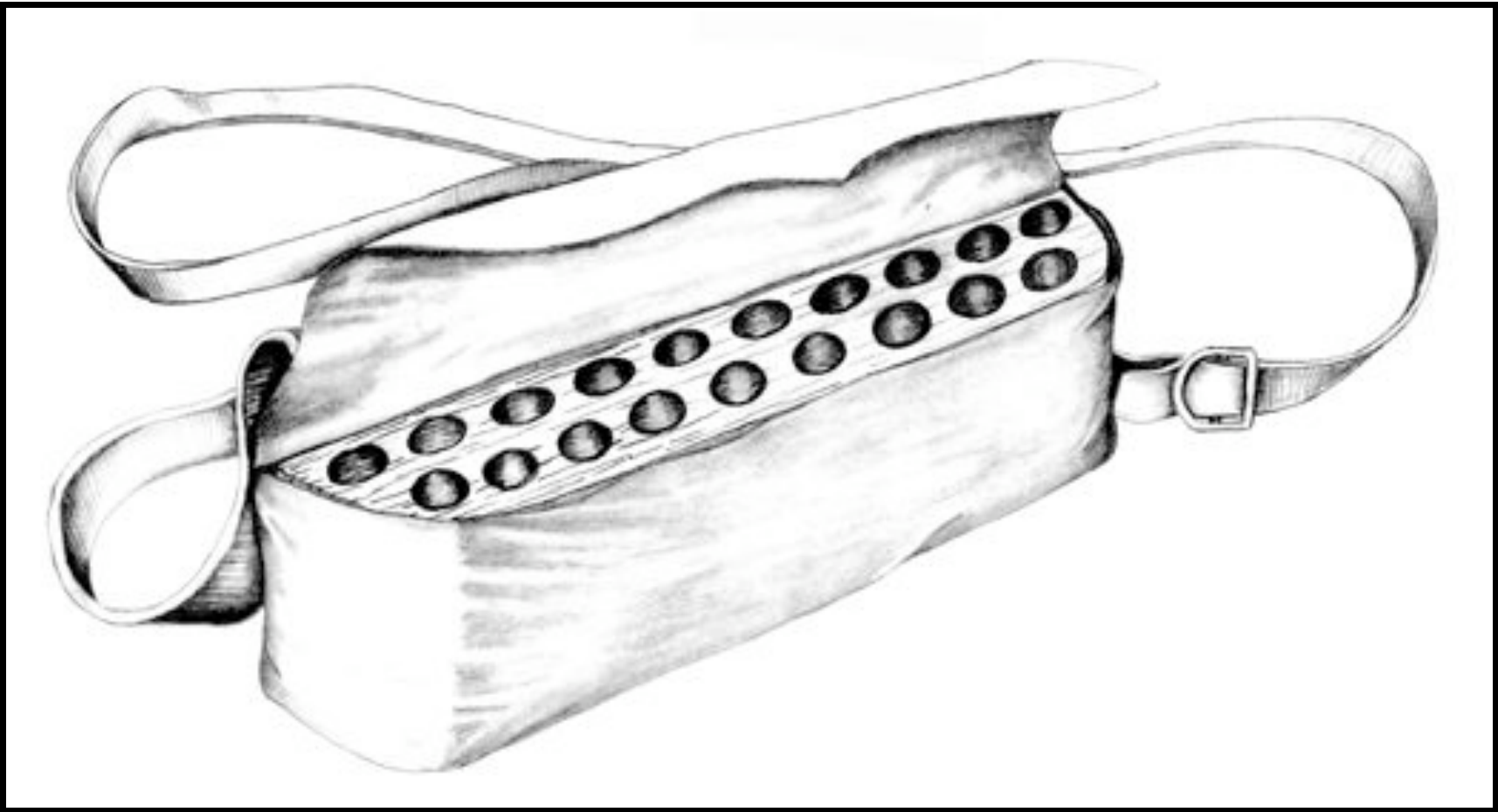


Figure 5:52. Artist's reconstruction of the cartridge box as it would have originally appeared (LCMM Collection, by Adam Loven).

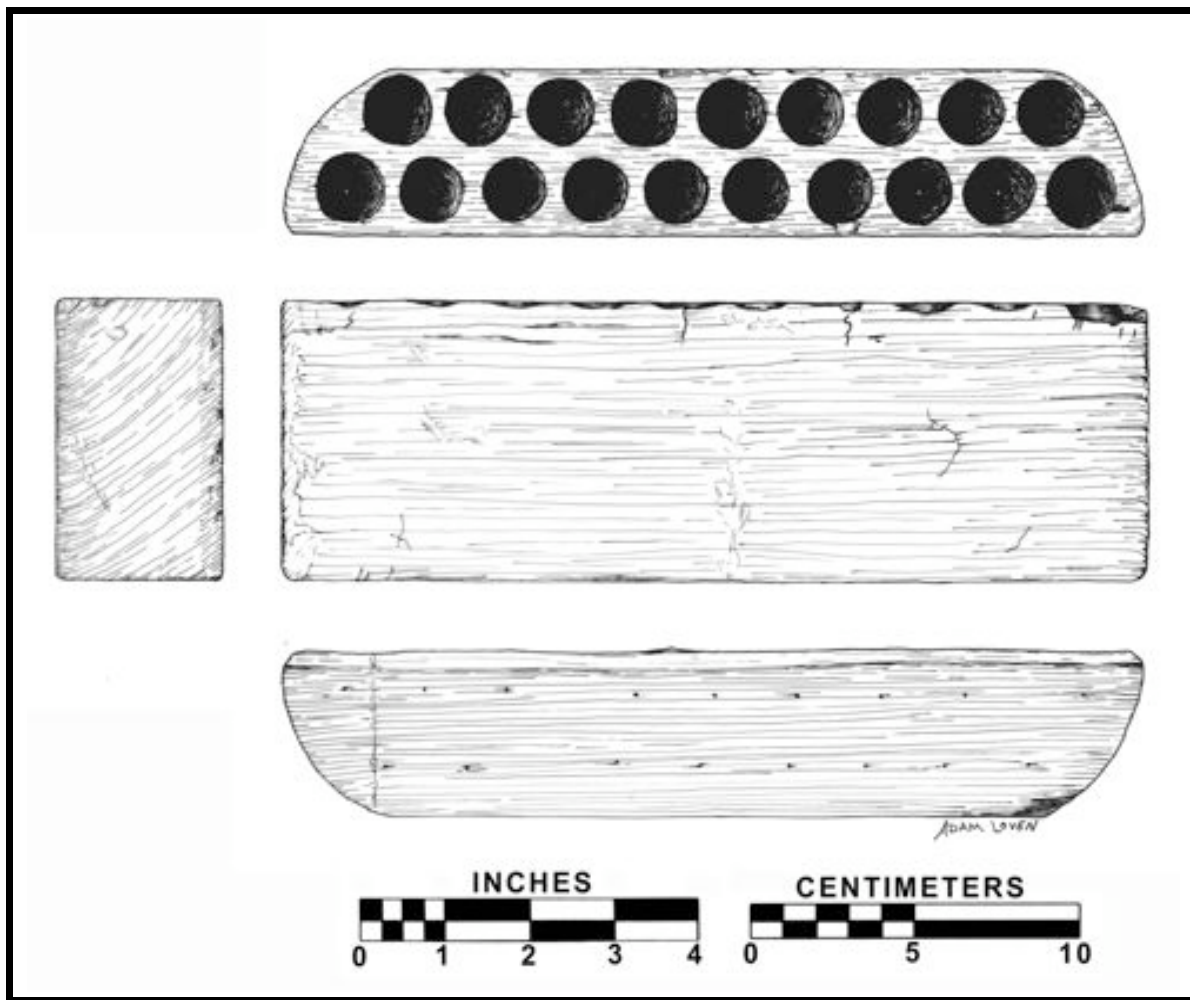


Figure 5:53. Scale drawing of the wooden block portion of artifact 99-05, a cartridge box (LCMM Collection, drawn by Adam Loven).

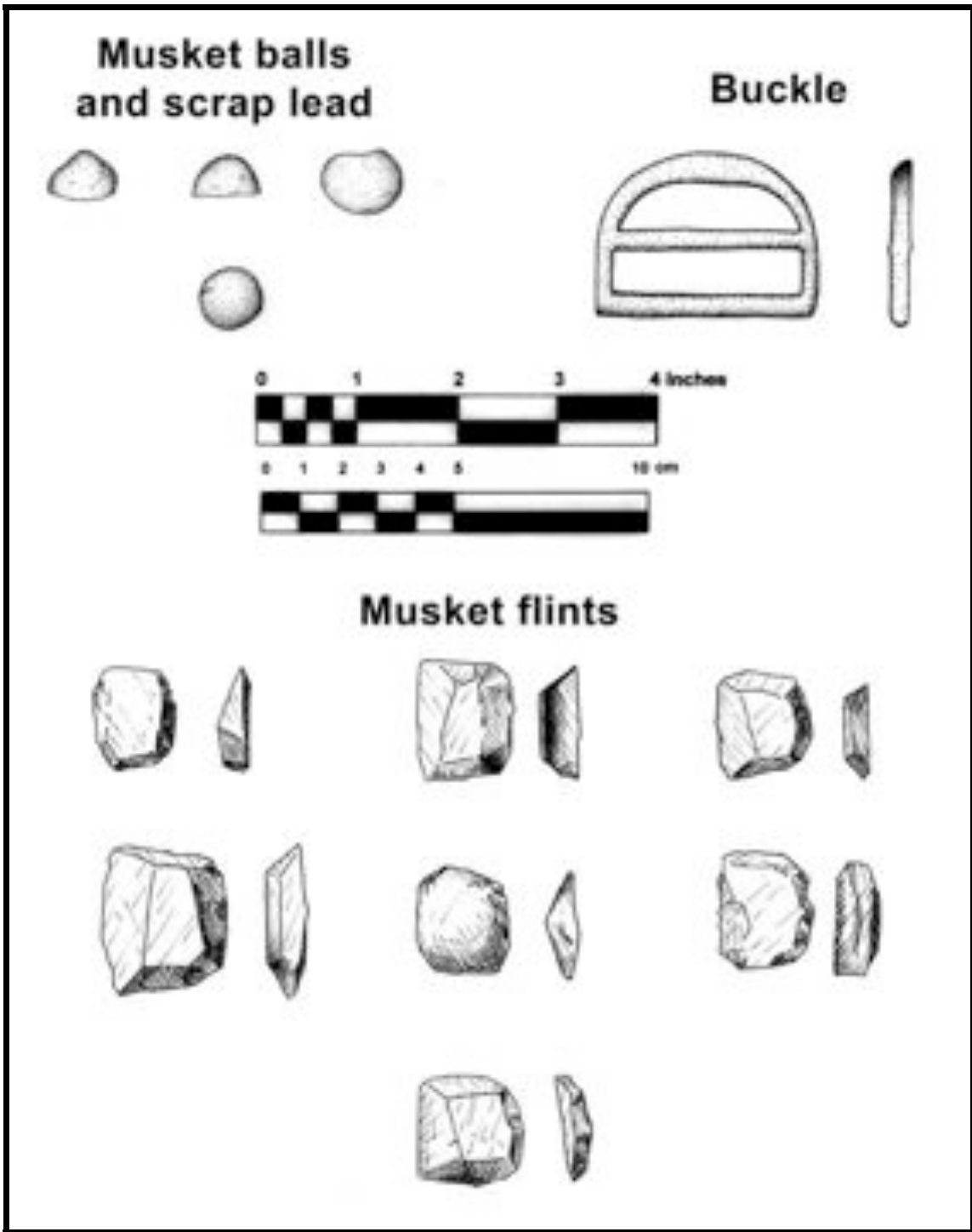


Figure 5:54. Musket balls, flints, and buckle from the cartridge box assemblage (LCMM Collection, drawn by Adam Loven).



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**Artifact 99-11: Socket Bayonet****Artifact 99-11 Summary**

Found: 9/27/1999

Location: NE 1/1: 9ft – 15ft 6in

Recovered: 7/2001

Conservation Technique: 1

Conservation Completed: 7/27/2001

Current Disposition: Displayed in exhibit

This artifact is a well-preserved British Land Pattern Musket Bayonet (Figure 5:55). The blade, which is broken into two pieces, had an original length of 17in (43.1cm) with a maximum width of 1¼in (3.1cm) and thickness of ¾in (.95cm). Overall the artifact is 22in (55.8cm) in length. This artifact appears to have been manufactured with the typical triangular blade cross section. However, at some point in this weapon's life the bottom of the blade was hammered flat. The reasoning behind this modification remains unclear. The junction of the neck to the socket displays a attachment shield where the shank of the bayonet was welded to the socket. This is characteristic of early British shield bayonets muskets, and suggests that this piece was manufactured between 1735 and 1745 (Goldstein 2000:57-61, 111). Like the belt axe (99-02) described above, this weapon appears to be a hold over from the Colonial Wars.

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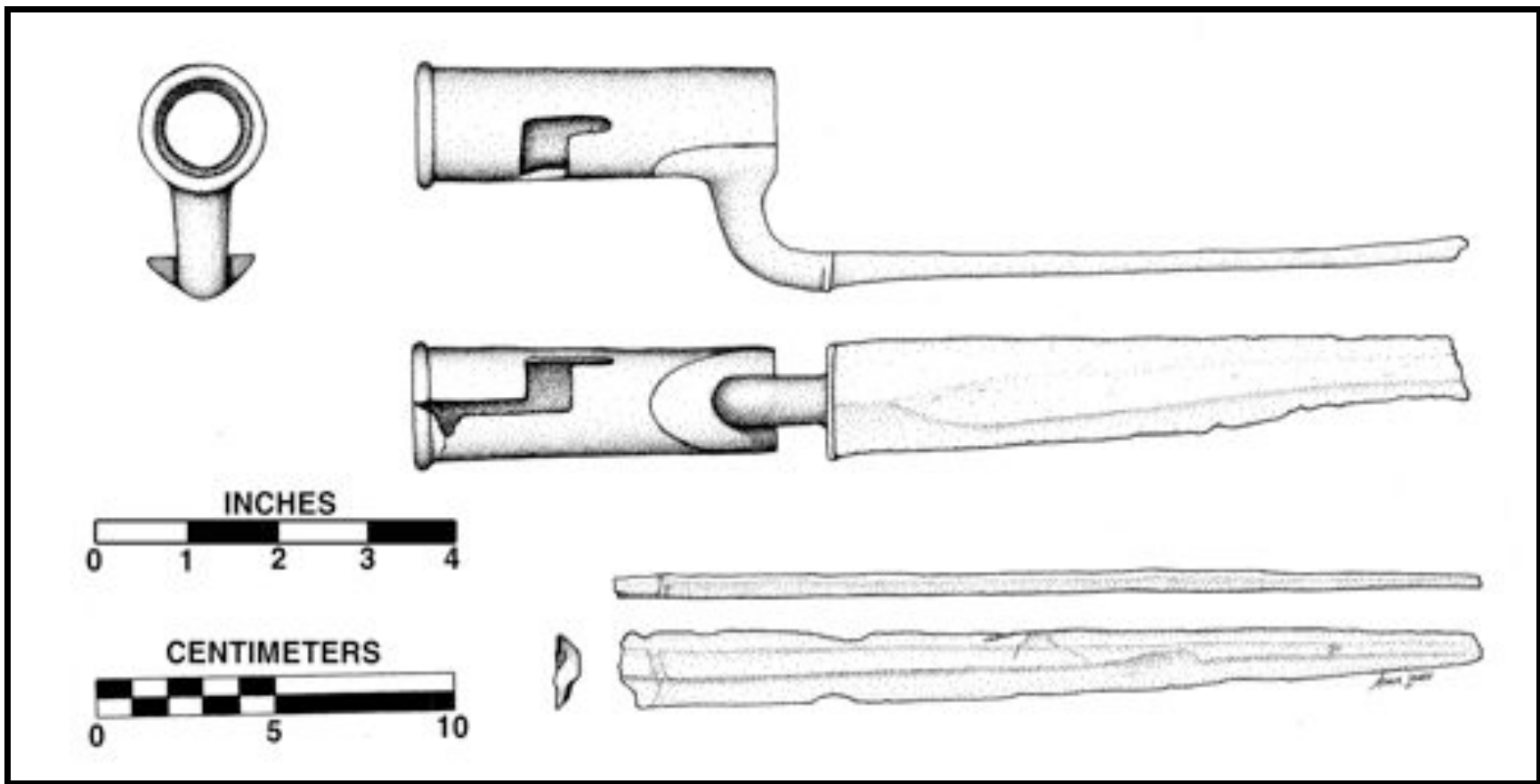


Figure 5:55. Scale drawing of artifact 99-11, a British Land Pattern Musket Bayonet (LCMM Collection, drawn by Adam Loven).

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**Artifact 00-06: Sword Fragment**

*Artifact 00-06 Summary*

Found: 8/16/2000

Location: SE 3/1: 9ft – 18ft 10in

Recovered: 7/2001

Conservation Technique: 1

Conservation Completed: 8/27/2001

Current Disposition: Displayed in exhibit

Artifact 00-06 is a fragment of a sword that may be associated with item 01-02 (Figure 5:56). The fragment is 11¼in (28.6cm) long, 5⁄8in (1.6cm) wide and 3⁄8in (.95cm) thick. The blade has a triangular cross sectional shape with a ferule running the length of the fragment. Researchers initially believed that this might be a bayonet blade, however, the width of the blade and the extension of the top-side groove along the entire length of the artifact is not consistent with a bayonet blade. The type of the blade suggests that it was part of a small sword, similar to the type an officer is likely to have worn (Chris Fox, personal communication, 2002).

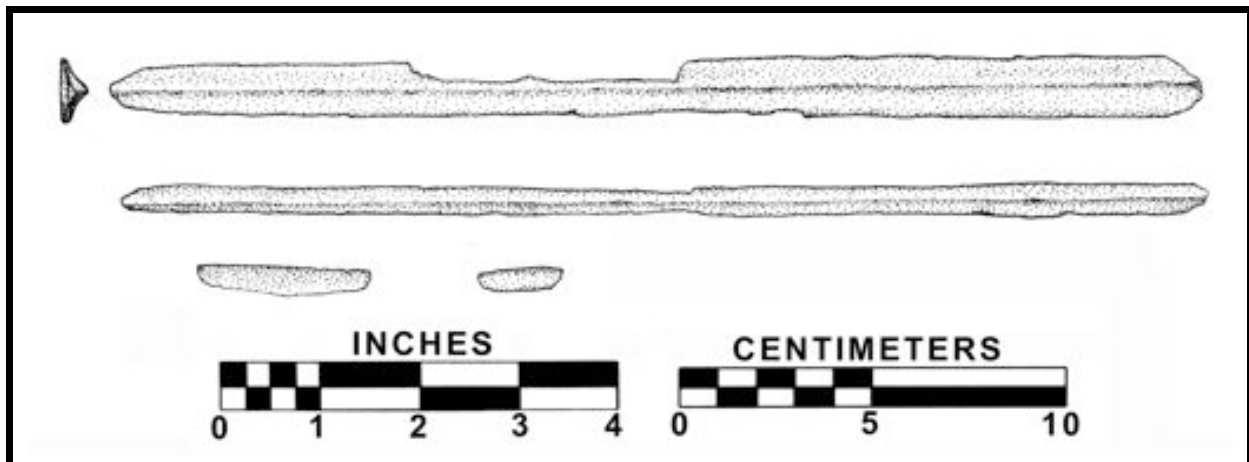


Figure 5:56. Scale drawing showing artifact 00-06, a broken sword or bayonet blade (LCMM Collection, drawn by Adam Loven).

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**Artifact 01-02: Sword**

*Artifact 01-02 Summary*

Found: 8/21/2001

Location: SE 2/2: 45ft – 19ft 6in

Recovered: Proposed for spring/summer 2003

Conservation Technique: NA

Conservation Completed: NA

Current Disposition: Bottom of Valcour Bay

Item 01-02 is a broken sword (Figure 5:57). The grip of the weapon, counter guard, scabbard hook and a portion of the blade have survived. Though artifact 01-02 was not raised, a drawing of the artifact was made on the lake bottom. Approximately 10in (25cm) of the blade remain with a width of 1¼in (3.1cm) near the grip tapering to ¾in (1.9cm) at the broken end. The blade has a triangular cross section and ferule similar to artifact 00-06.

Unfortunately, the concretion around the grip of the sword is very thick, obscuring most details. It appears that the grip is either wood or bone. Directly below the counter guard, a brass scabbard hook is bound to the blade with copper/brass wire, this would have been used to hang the weapon from a belt. It appears that the hook came loose and the wire was meant to reinforce or hold it to the leather.

Artifact 01-02, a broken sword, and artifact 00-06, a broken sword blade, may be from the same weapon. The blades of each artifact have similar cross-sections. However, the artifacts were located 100ft (30.5m) from each other, a separation which the current archaeological evidence is unable to conclusively explain. Artifact 01-02 was not raised; until the artifacts are examined together their relationship will be unresolved.

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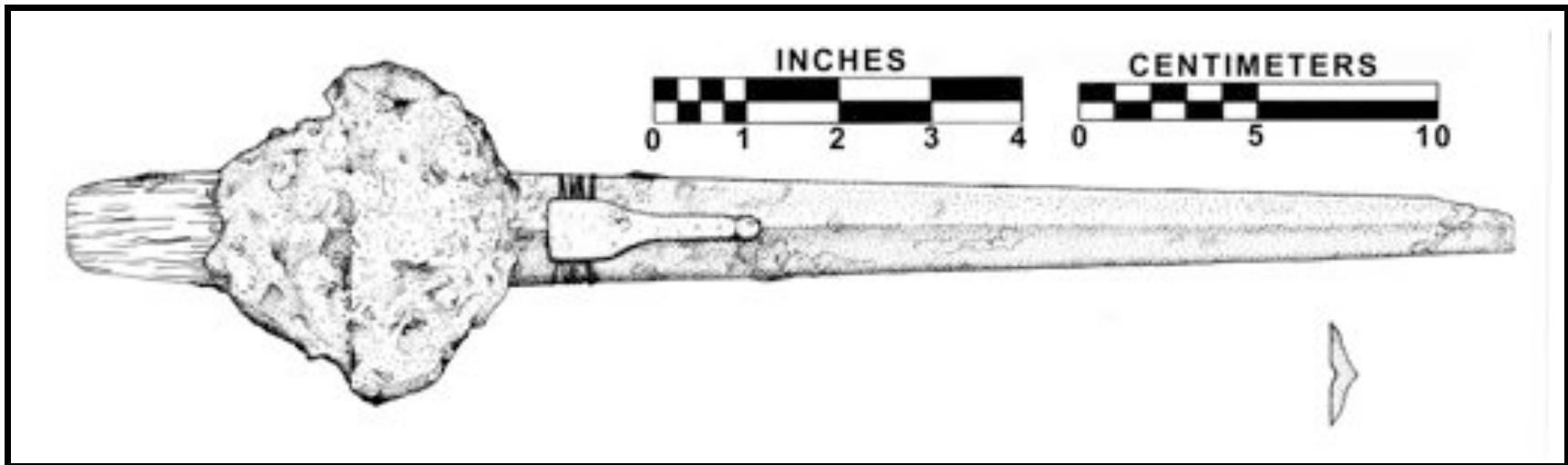


Figure 5:57. Preliminary sketch of artifact 01-02, a broken sword (LCMM Collection, drawn by Erick Tichonuk, inked by Adam Loven).

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## Vessel Equipment

### ***Artifact 99-07: Grapnel Anchor***

#### *Artifact 99-07 Summary*

Found: 9/18/1999

Location: NW 1/1: 13ft – 35ft 4in

Recovered: 7/2001

Conservation Technique: 1

Conservation Completed: 6/15/2002

Current Disposition: Displayed in exhibit

Object 99-07 is an iron four fluke grapnel anchor (Figure 5:58). The anchor is 42½in (108cm) long, with a 1¼in (3.1cm) square shaft. The shaft swells to 2¼in (5.7cm) at the top where it is pierced to hold a 5¼in (13.3cm) diameter iron ring. The shaft also swells at its lower terminus where the four arms are welded to it. The maximum spread between fluke points is 31½in (80cm). This anchor may have been used by a smaller vessel, like a bateau, as its primary anchor, or by one of the American gunboats as a spring anchor.

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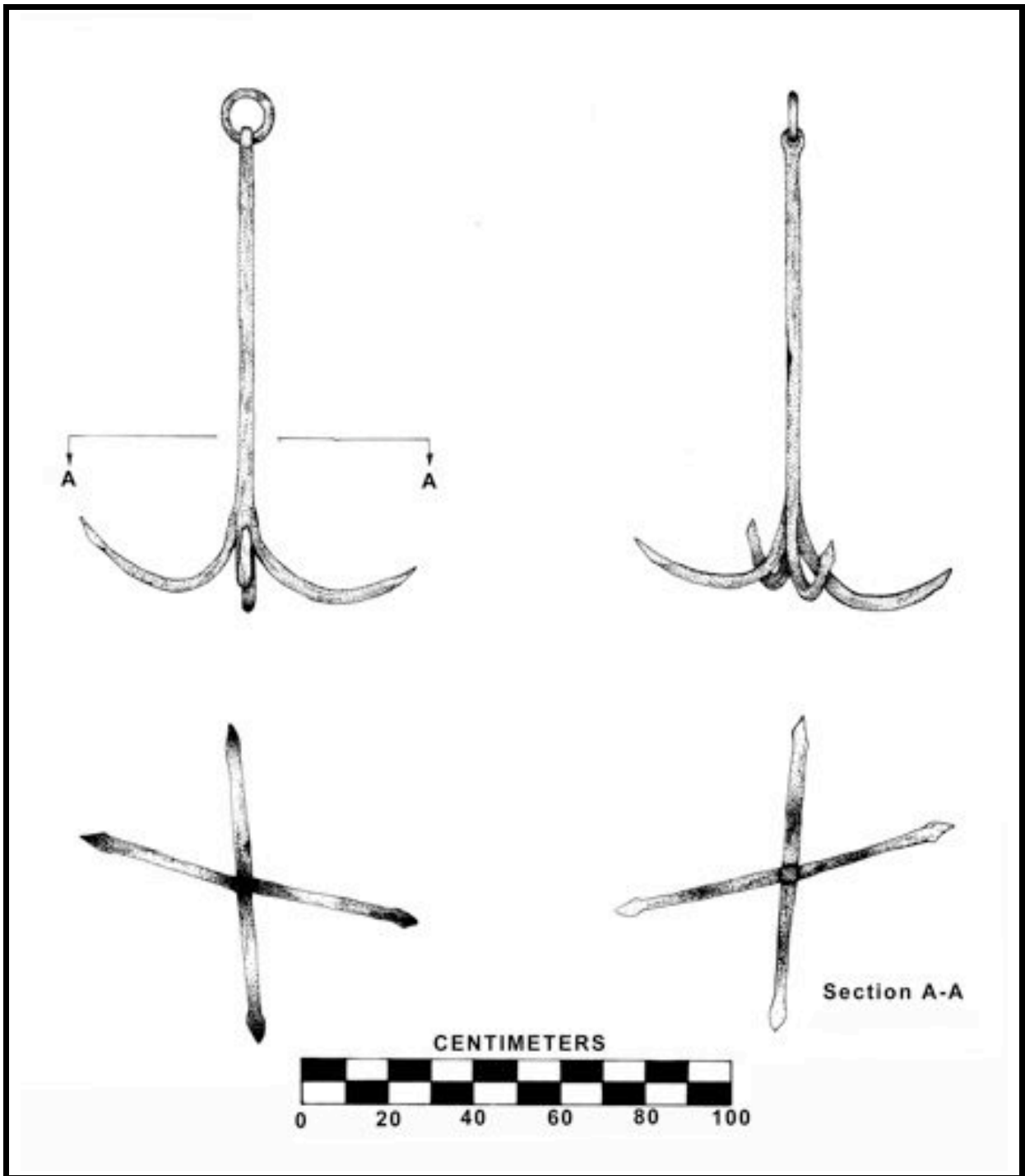


Figure 5:58. Scale drawing of Artifact 99-07, a grapnel anchor (LCMM Collection, drawn by Gordon Cawood, inked by Adam Loven).

**Artifact 00-03: Iron Thimble**

*Artifact 00-03 Summary*

Found: 4/25/2000

Location: SE 1/2: 24ft – 35ft 10in

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Recovered: 7/2001  
Conservation Technique: 1  
Conservation Completed: 8/23/2001  
Current Disposition: Displayed in exhibit

Artifact 00-03 is a wrought iron thimble (Figure 5:59). This item is circular in shape with a concave groove on its outer surface into which rope was fitted. The purpose of the thimble was to prevent the rope from chaffing. The thimble is 2½in (6.4cm) in diameter 1¼in (3.2cm) wide and ¾in (.95cm) thick. This artifact's proximity to the cannon cascabel (00-04) suggests that it may have been part of the gun tackle.

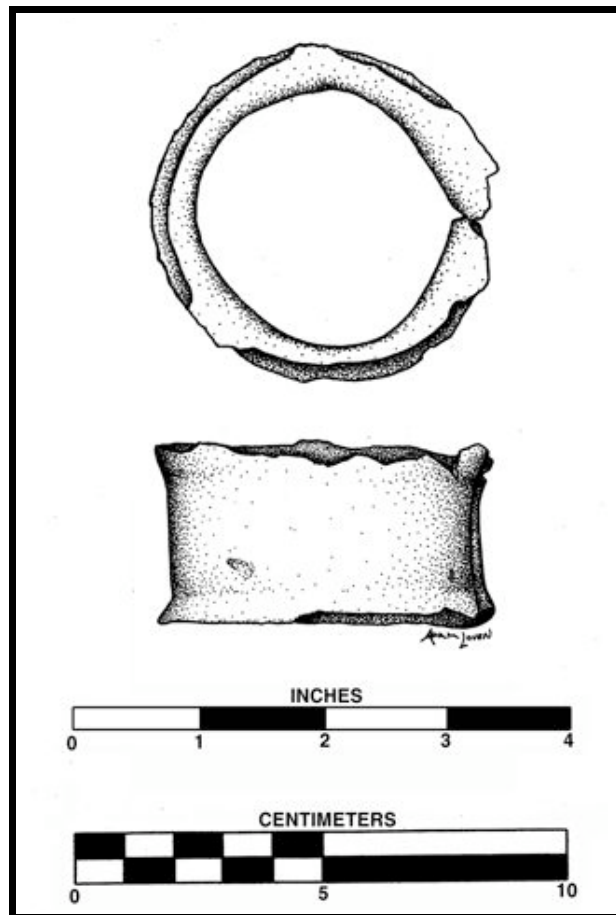


Figure 5:59. Scale drawing of artifact 00-03, an iron thimble (LCMM Collection, drawn by Adam Loven).

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**Artifact 02-05: Nail**

*Artifact 02-05 Summary*

Found: 8/22/2002

Location: NW: 2/8 33ft – 39ft 9in

Recovered: not recovered

Conservation Technique: NA

Conservation Completed: NA

Current Disposition: Bottom of Valcour Bay

Artifact 02-05 is an iron nail of unknown type. This artifact has not been documented.

**Artifact 02-09: Nail**

*Artifact 02-09 Summary*

Found: 8/24/2002

Location: NW: 1/9 1ft – 3ft 9in

Recovered: not recovered

Conservation Technique: NA

Conservation Completed: NA

Current Disposition: Bottom of Valcour Bay

Artifact 02-09 is an iron nail of unknown type. This artifact has not been documented.

**Unidentified Debris**

**Artifact 99-04: Iron Fragment**

*Artifact 99-04 Summary*

Found: 9/16/1999

Location: NW 1/1: 36ft – 40ft 10in

Recovered: 7/2001

Conservation Technique: 1

Conservation Completed: 7/27/2001

Current Disposition: Displayed in exhibit

This artifact is an amorphous iron fragment with no worked surface apparent (Figure 5:60). The piece is 1¼in (3.2cm) long, 1in (2.54cm) wide, and ¾in (.95cm) thick. It is possible that this is a fragment of the burst cannon or simply a piece of scrap metal.

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**Artifact 99-06: Iron Fragment**

**Artifact 99-06 Summary**

Found: 9/16/1999

Location: NW 1/1: 30ft – 35ft 11in

Recovered: 7/2001

Conservation Technique: 1

Conservation Completed: 7/27/2001

Current Disposition: Displayed in exhibit

This item is an amorphous iron fragment with no worked surface apparent (Figure 5:60). The piece is  $1\frac{1}{8}$ in (4.8cm) long,  $1\frac{1}{4}$ in (3.2cm) wide, and  $\frac{1}{2}$ in (1.3cm) thick. This may be a fragment of the burst cannon or simply a piece of scrap metal.

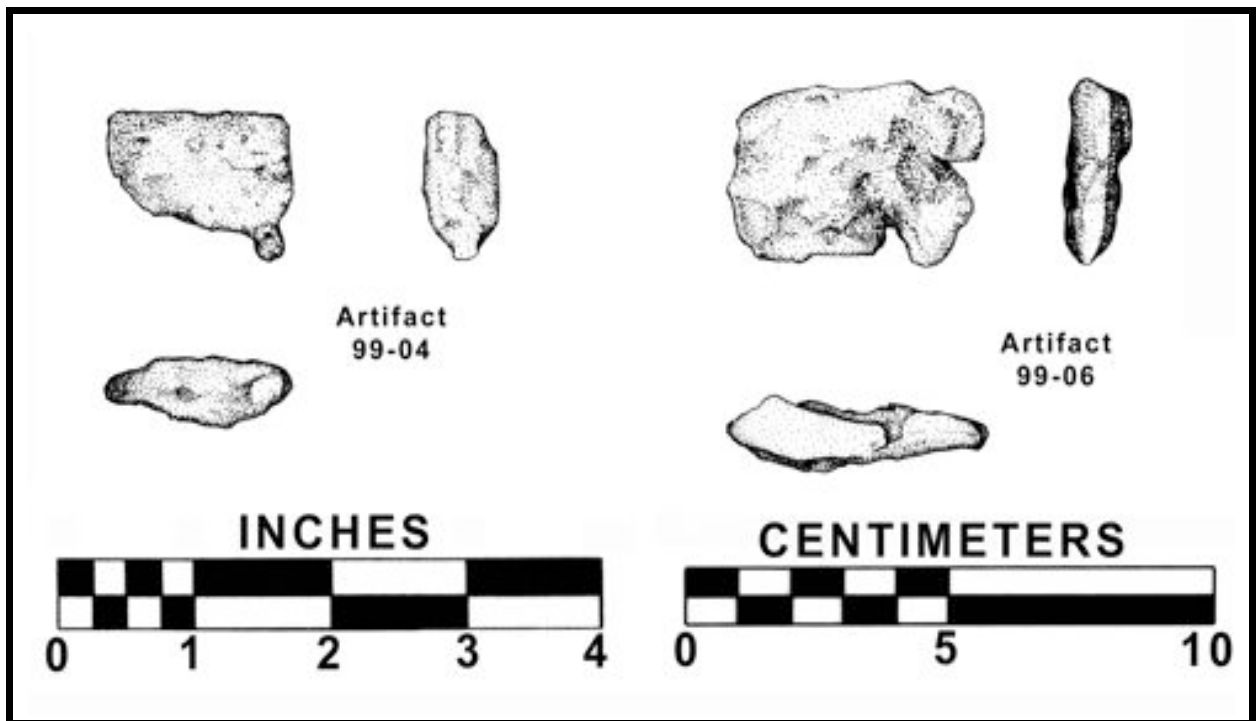


Figure 5:60. Scale drawings of artifacts 99-04 and 99-06, iron fragments (LCMM Collection, drawn by Adam Loven).

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***Artifact 02-13: Unidentified Metal Fragments***

*Artifact 02-13 Summary*

Found: 8/29/2002

Location: NW: 2/7 36ft – 25ft

Recovered: not recovered

Conservation Technique: NA

Conservation Completed: NA

Current Disposition: Bottom of Valcour Bay

Artifact 02-13 appears to be an amorphous lump consisting of several thin pieces of sheet metal, possibly tin. The artifact is poorly preserved; due to its fragile condition, researchers did not remove it from the bottom sediments. The identification of this artifact will be possible only in a conservation laboratory.

***Artifact 02-14: Copper Fragment***

*Artifact 02-14 Summary*

Found: 8/29/2002

Location: NW: 2/7 43ft – 8ft 8in

Recovered: not recovered

Conservation Technique: NA

Conservation Completed: NA

Current Disposition: Bottom of Valcour Bay

Artifact 02-14 is a small thin piece of copper or brass of unknown origin. The artifact may be a gun part, however, examination in a laboratory will be necessary for confirmation.

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## CHAPTER VI: CONCLUSIONS

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### ARCHAEOLOGICAL CONCLUSIONS

The VBRP's four years of archaeological survey demonstrate the value of a systematic archaeological survey for shedding new light on battlefield events. Artifact provenience in the project area has proven crucially important to understanding the actions leading to their deposition. Based on the survey data and primary historical accounts, researchers can piece together a credible series of events surrounding the explosion of *New York's* cannon.

#### **Is the Cannon from *New York*?**

A critical first piece in interpreting the battle scatter is establishing with reasonable certainty that the cannon in question originated from the gunboat *New York*. This can be accomplished through historical accounts of the battle and from information known about the gunboat *Philadelphia*, currently displayed in the National Museum of American History.

*New York* was a sister ship to *Philadelphia*, therefore, they were similar in size, shape, layout, and rig. *Philadelphia's* main armament consisted of three cannon: a twelve-pounder for a bow gun and two nine-pounders for waist guns. Based on *Philadelphia's* layout it can be assumed that *New York* also carried three cannon: one in the bow and two waist guns.

More specific information about the armament of *New York* is contained in the Townsend Document (Figure 6:61), a primary source of information about the American fleet. The Townsend Document became known in 2000 when John Townsend, a Connecticut book dealer, brought forward a document which had been in his family for several generations. The document proved to be a tremendously important, previously unknown source about the Battle of Valcour Island. The document was entitled "*A Return of the fleet belonging to the United States of America on Lake Champlain under the Command of Brigadier General Arnold together with the Naming of the Caps. Vessels Ticonderoga October 22, 1776.*" The "Return" was divided into columns providing the reader with "Vessel" [type], the "Name" of each vessel, "By Whom Commanded", the size and number of the cannon of each vessel, the number of men on each vessel, and "The fate of the Fleet", recounting what happened to each vessel.

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*A Return of the Fleet belonging to the United States of America in Lake Champlain under the Command of Brigadier General Amherst, together with the names of the Capt. Vessels of the Second Regt. Oct. 22. 1776.*

Vessels	Names	by Whom Commanded	The State of the Fleet											
			70	120	150	200	250	300	350	400	450	500		
Schooner	Royal Charles	Capt. Winthrop				6	4	12	22	60	Went Ashore by Blow & p. by the bar			
A <sup>o</sup>	Revenge	Capt. Jones					8	10	18	35	Arrived Safe into Port			
A <sup>o</sup>	Liberty	Jones					2	6	6	16	Alike			
Ship	Enterprise	Jones						10	12	22	Alike			
Row Gallies	See	Davis	1	1			4		6	15	Went up Onion River and burnt by fire			
A <sup>o</sup>	Enterprise	Arnold	2	2		4		10	18	70	Went Ashore by blow up by her crew			
A <sup>o</sup>	Enterprise	Thatcher	1	3		4		10	10	70	Taken by the Enemy			
A <sup>o</sup>	Enterprise	Thatcher	1	1		2	2	10	18	70	Arrived by the bar			
A <sup>o</sup>	Gates	Chapin	2	2		4		10	14	70	not started			
Armed Boat	Providence	Simmons				3			70	10	Blown up by her crew			
A <sup>o</sup>	Spitfire	Monroe				3		4	7	45	Sunk at her Anchor by the Sea			
A <sup>o</sup>	Constant	Grant				2		8	11	45	Went Ashore & blown up by her crew			
A <sup>o</sup>	Serpent	Grimes	1	2					3	45	Taken by the Enemy			
A <sup>o</sup>	Stephen	Manfield	1	2				3	11	45	Went Ashore and blown up by the crew			
A <sup>o</sup>	Providence	Jones	1	3				2	11	45	A <sup>o</sup>			
A <sup>o</sup>	Providence	See				3		8	11	45	Sunk at her Anchor			
A <sup>o</sup>	Windsor	Reed	1	1	2				3	45	Arrived Safe in port			
Total of Men and Guns			6	15	21	14	08	6	125	220				
at Ticonderoga			11											
at Fort Mifflin			128											

Figure 6:61. The Townsend Document, written on October 22, 1776 at Ticonderoga (LCMM Collection, courtesy of John Townsend).

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This document relates specific information on vessel armament, and is the best source for determining the size and number of *New York's* cannon. However, the Townsend document must be carefully scrutinized because it contains a number of errors. Of particular concern for this discussion is the misnaming of the gunboat *New York* as the gunboat *Success*. It is known that one of the gunboats was originally named *Success*, but was later renamed *New York*. The gunboat *New York* was under the command of Captain Reed, who is listed as the captain of *Success* in the Townsend Document.

Additionally, there are numerous errors in the calculations of the exact numbers and caliber of the guns aboard the fleet. Each column for a particular weight of cannon is tallied at the bottom; in several of the columns the arithmetic is incorrect. Specifically, *New York* is listed as carrying one twelve-pounder, one nine-pounder, and two six-pounders. The total number of cannon, which based on this tally should amount to four, is listed as only three in the "total" column. This discrepancy is easily explained through an error during the compilation of the document. The row for *Philadelphia*, which is located directly above that for *Success (New York)*, indicates that *Philadelphia* carried two nine-pounders and eight swivel guns, for an incorrect total of eleven guns. The inconsistencies in the numbers of cannon for both of these vessels can be removed if one of the twelve-pound guns attributed to *New York* is moved up one row and given to *Philadelphia*. This leaves *New York* with one nine-pounder and two six-pounders, and *Philadelphia* with one twelve-pounder and two nine-pounders.

The cannon onboard the 1776 gunboats were distributed in a manner designed to maximize the vessel's stability, with the largest gun in the bow and two equally sized cannon amidships. In the case of *New York*, the nine-pounder was placed in the bow and the two six-pounders in the waist. Further analysis of the Townsend document reveals that only five of the fifteen American vessels engaged at Valcour Island carried six-pounders. The five vessels were: *New York*, *Royal Savage*, *Congress*, *Washington*, and *Trumbull*. Based on Randle's depiction of the American line (see page 47) only the gunboat *New York* and the galley *Trumble* were stationed on the eastern side of the line-of-battle.

In conclusion, both the historical and archaeological evidence support the assertion that the cannon is from the gunboat *New York*. The Townsend document indicates that *New York* carried two six-pound cannons; the same weight as the cannon located during this project. Six-pound cannons were carried by only five of the 15 American vessels, with only two vessels (*New York* and *Trumble*) stationed on the eastern end of the American line. Finally, the only known account of a cannon exploding during that battle was onboard *New York*, therefore it can safely be presumed that the cannon originated from that vessel.

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## **Artifact Scatter Analysis**

A cursory inspection of the artifact scatter suggests that its distribution is solely the result of the blast from the explosion of the cannon, resulting in a roughly linear distribution of debris combined with a random scattering of shot across the project area. A closer analysis of the data, however, proves otherwise.

### ***Cannon Explosion***

The plan view of the artifact scatter shows that there are three areas containing cannon fragments (Figure 6:62 and Figure 6:63). One to the southeast in grids SE 1/2 and SE 2/2 containing two fragments: the cannon cascabel (00-04) and a smaller piece consisting of the first reinforce (00-05). The second area contains only one fragment. This piece of the cannon (99-01), containing the muzzle, chase, and right trunnion, is located near the zero point of the grid. The third grouping is found to the northwest in grids NW 2/3 and NW 1/4. These three fragments (01-03, 01-04, and 01-07) are between 140 and 180ft (42.6 and 54.9m) from the cannon's muzzle.

The muzzle fragment almost certainly marks the epicenter of the explosion and the position of the *New York* at the time of the mishap. We can assume that the gunboat's broadside was facing in a southerly direction toward the British line. We do not know, however, which direction the bow and stern were facing. For the purpose of the following discussion, we will presume that the bow was facing east. During the explosion the cannon split into at least seven, perhaps as many as eight or nine pieces; the largest fragment consisted of its muzzle and right trunnion. Without counterweight of the first and second reinforce, the muzzle's center of gravity was moved forward of the vessel's gunwale. As the cannon broke into several pieces the muzzle toppled directly into the water.

The explosion also caused the back half of the cannon to fracture into multiple pieces, sending fragments hurling in the opposite direction from the expanding gases in the cannon's bore. The fragments located along the upper face of the gun were sent into the air, while others on the underside were directed down into the carriage and the vessel's hull.

The fragments that were propelled into the air came to rest in the northwestern portion of the survey area. These fragments, one of which includes the vent field, were located on the cannon's upper face. Other debris was also ejected toward the northwest during the explosion. Grid square NW 1/1 contains fragments of the right side of the carriage, two metal fragments, and the cartridge box. These items, having considerably less mass than the cannon fragments and positioned further from the center of the explosion, were not propelled as far.

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Figure 6:62. Diagram showing the survey area with *New York* just before the explosion of its cannon (LCMM Collection, by Adam Kane).

REPLACE WITH 11x17

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Figure 6:63. Diagram showing the survey area with *New York* after the explosion of its cannon (LCMM Collection, by Adam Kane).

REPLACE WITH 11x17

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The explosion certainly must have stunned the majority of the crew. From Holden's pension record, we know that it injured Sgt. Holden and killed Lt. Rogers. In a dispatch to Major General Horatio Gates, Brigadier General Benedict Arnold reported that the *New York* had lost all of her officers with the exception of its captain. Certainly, the splitting of the six-pounder was a contributing factor to that circumstance.

Although we can surmise that the scene immediately after the explosion was dreadful, the archaeological evidence speaks of a rapid attempt to bring the gunboat back into a fighting state (Figure 6:63). Critical to this hypothesis are the cannon and carriage fragments located in grid squares SE 1/2 and SE 2/2. The two cannon fragments, which were located on the underside of the cannon, were not ejected from the vessel by the explosion, but were sent careening into the vessel's interior. The portion of the carriage cheek recovered in this area also demonstrates this pattern. The through bolts in the cheek are bent outward, indicating that the cheek was bent out and down before dislodging from the remainder of the carriage. This pattern suggests that immediately after the explosion several pieces of the cannon and the carriage were still inside the vessel.

At the time of the explosion the gunboat's broadside faced in a southerly direction. The archaeological evidence suggests that after the explosion *New York* moved toward the southeast. During this movement the decks were cleared of debris, creating a dump field. The artifacts located in SE 1/2 and SE 2/2 provide evidence of this process. The clutter of cannon and carriage fragments was thrown into the lake, as were broken personal armaments such as the hatchet and sword.

The distribution of this dump field also provides clues as to the sequence of events after the explosion. The fragment of the cannon in SE 1/2 comprises the cascabel and a portion of the right side of the gun, while the first reinforce in SE 2/2 is from the left side of the rear of the gun. Logically, during the explosion the cascabel would have been directed in a westerly direction (right), while the first reinforce toward the east (left). If these fragments were sent in opposite directions, and came to rest some distance from each other inside the gunboat, then the vessel's eastern end must have led the boat in its southeasterly movement. We can assume this based on the relative positions of the cannon fragments on the lake floor. The exact method by which the vessel moved is unknown. It could have been propelled by its crew using the sweeps, by warping, or it may have been adrift.

### **Ordnance Scatter**

The only class of artifact not yet discussed in this analysis is the scatter of ordnance around the site. Not surprisingly, the various types of ordnance, including bar shot, six- and nine-pound shot, grenades, grape shot, and canister shot are distributed across much of the survey area. These artifacts represent spent British ordnance, or some may be American ordnance that was dropped overboard. One particular piece of shot, a six-pound cannonball (02-02) located in SE 2/2 may be the ball that was in *New York's* cannon when it exploded. This cannonball, in addition to being the proper size to be fired from a 6-pound cannon, is located in the dump field. The cannon ball may have ended up in the bottom of the gunboat's hull after the explosion, and been thrown overboard as the decks were being cleared. A preliminary inspection of this cannonball also revealed it to be misshapen, which could have contributed to the explosion.

The most interesting scatter of ordnance is that located in the western portion of the survey area. The concentration of shot in NW 1/7, NW 1/6, NW 1/5, and NW 2/5 may be the result of a vessel being anchored in that area (see Figure 6:63). This concentration of shot is considerably denser than the area where *New York* was located when its cannon exploded, and may represent the location of the next vessel to the west of *New York*. The distance between the *New York's* station and the western shot concentration is 150 to 200ft (46 to 61m), which would seem an appropriate vessel spacing along the line of battle. The importance of this shot concentration is not necessarily in being able to map where the next vessel west of *New York* was located, but the promise it holds for future years of the survey. If the pattern of shot concentrations located where vessels were anchored is consistent across the bay, researchers will be able to map the exact locations of the vessel in the fleet. This has the potential to answer research questions as the alignment of the vessel of the fleet (linear or staggered), and whether some vessels received more fire than others.

Researchers anticipate that future years of the VBRP will come across additional shot concentrations, marking the locations of vessels. As a larger view of the line-of-battle is gained, the analysis of shot patterns will be a valuable tool in site analysis, and the prediction of shot concentrations will be useful in guiding the survey.

### **Artifact Interpretation**

Contemporary accounts of the American shipbuilding effort on Lake Champlain in 1776 suggest significant problems acquiring the necessary supplies and armament to build and fit-out a naval fleet. These hardships are reflected in many of the artifacts located during the VBRP.

At least three of the armaments appear to date from earlier North American conflicts. The bayonet (99-11) and the belt axe (99-02) both are types that were common during the French and Indian War. The cannon (99-01, 00-04, 00-05, 01-03, 01-04, and 01-07), although not yet conclusively identified, has similarities to the seventeenth century Swedish cannon found onboard the gunboat *Philadelphia*. These artifacts seem to confirm the belief that the Americans were gathering all available supplies from the long used fortifications at Crown Point and Ticonderoga.

Other artifacts located during the VBRP appear to be modified in unusual ways. The sword (01-02) has a decidedly homebuilt appearance. The weapon has a narrow thin blade joined to a small undecorated wooden handle. The sword lacks the refinement expected if a professional sword maker made the weapon. The cannon carriage (99-08, 99-09, 99-10, 00-01, and 01-01) was modified to fit a six-pound cannon. The two lead bushings (99-09 and 01-01) were used to enlarge the diameter of the cannon's trunnion, thereby making it fit more snugly into the carriage's brackets. The lead bushings suggest that the carriage was built to hold a cannon larger than a six-pounder.

The small sample of artifacts thus far located by the VBRP confirms many of the previously held beliefs about the American Fleet at Valcour Island. The army was clearly having difficulty finding arms and equipment to supply the fleet. This is reflected in the archaeological record by an unusually high percentage of artifacts that appear either to be from an earlier conflict or to be modified for their current usage.

### **Artifact Analysis Conclusions**

The information gained from the analysis of the Valcour artifact scatter demonstrates how crucial site integrity and artifact provenience are in the analysis of battlefield scatters. If major elements of the scatter such as the cannon or carriage fragments, personal armaments or even ordnance were missing or their provenience was unknown the interpretation would have materially suffered. The results achieved in the four years of surveying the underwater battlefield unequivocally prove both the effectiveness of the methodology and the value of the mapping underwater battlefields.

The artifact collection attests to a surprising degree of site integrity in the area thus far surveyed. Although researchers will never know what artifacts were previously collected from the survey area, the presence of so many large metallic artifacts indicates that collecting has not been as widespread as researchers believed. This is especially surprising in the case of the cannon fragments. Thus far six cannon fragments have been found; they are large ferrous objects which metal detectors located with relative ease. The six fragments account for at least 80 percent of the gun,

with perhaps only one or two pieces still unaccounted for. The missing section of the gun is in the area of the left trunnion, which, if the current interpretation of the scatter is correct, should have been found in the dump field. Its absence may be the result of artifact collecting or metal detector or operator error during the survey. In either case, the multiple cannon fragments attest to a high degree of site integrity, despite the efforts of artifact collectors over the years.

## **INTERPRETIVE SIGNAGE**

Regional facilities such as the Clinton County Historical Museum, the Fort Ticonderoga Museum, and the Lake Champlain Maritime Museum all interpret the Revolutionary War in the Champlain Valley, however, historical interpretation in proximity to Valcour Island is lacking. The most cost-effective way to interpret the Battle of Valcour Island to the local population and recreational boaters is through outdoor signage. Two locations are well-suited to convey this information: the Peru Boat Launch and the Bluff Point Lighthouse Station on Valcour Island. Each of these sites would serve different segments of the population of recreational boaters.

The Peru Boat Launch is located on the western shore of Lake Champlain approximately one mile (1.6km) from Valcour Island. The boat launch, which is administered by the NYDEC, is used primarily by local boaters for day-use activities. Mainly residents of Clinton County, New York would read signage at that location. Signage at the Bluff Point Lighthouse, a structure listed on the National Register of Historic Places, would be read by recreational boaters from outside Clinton County. The natural harbors created by Valcour Island draw many overnight boaters to those locations. These persons are from a larger region; the majority are Canadian, however, boaters from Vermont, New York, and all of New England also frequent the area. They overnight close to the island and often explore the hiking trails around Valcour Island during the day. The Bluff Point Lighthouse is owned by the State of New York and managed by the NYDEC. The lighthouse is part of a conservation easement that gives the responsibility for maintaining the historic structure to the Clinton County Historical Association. The CCHA is currently negotiating with the NYDEC to place interpretive signage about the lighthouse at or near the lighthouse itself; this could reduce potential obstacles in placing signage about the Battle of Valcour Island there as well (John Tomkins, pers. comm. 2001).

There is currently a program sponsored by the Lake Champlain Basin Program (LCBP) for creating low-cost interpretive outdoor signage in the Lake Champlain region. The signs, generally modeled after those used by the National Park Service, are 2ft by 3ft (.61 to .91m), and allow for approximately 200 words and several images. The LCBP charges only for the cost of materials, which for an outdoor sign is approximately \$1000.

Since the publication of the draft version of this report in January 2002, the Lake Champlain Basin Program has underwritten a signage project at the Peru Boat Launch. The display will include four signs: 1) Battle of Valcour Island, 2) Valcour's Archaeological Legacy, 3) Valcour Island Primitive Area, and 3) Lake Commerce (see Appendix 9). The signs will be installed in the spring of 2003.

The content for the Peru Boat Launch signs was developed by the Lake Champlain Maritime Museum, the Clinton County Historical Association, and the New York State Department of Environmental Conservation.



## **EVOLVING DIVER ETHICS**

One of the significant accomplishments of the Valcour Bay Research Project is the involvement of a large number of sport divers in a formally permitted archaeological project. Since the development of SCUBA in the 1950s and its popularization in recent decades, sport divers have frequently been the first people to locate and disturb submerged cultural resources. In the recent past, divers were encouraged to go out and find artifacts through national diver certification agencies that sanctioned “Collecting” as a specialized activity. Whole weekends were planned at historic sites to see who could find the best artifact. Designed to keep divers interested in diving, a vast quantity of cultural material was collected and today is in a variety of venues and states of preservation.

The development of diving equipment placed divers on society’s leading edge for locating and recovering underwater cultural heritage. For decades, submerged cultural material was simply managed by the “finders-keepers” approach. In recent years society has struggled with traditional salvage law. Maritime salvage law evolved over centuries to reward the recovery of commercial property. In recent times it has become clear that the application of salvage law to historic properties has resulted in the irretrievable loss of valuable information about humankind. In the United States, the conflict between traditional salvage law and advocates who recognized the value of underwater cultural heritage came to a head in 1987 with the passage of the Abandoned Shipwreck Act (ASA). The ASA essentially eliminated salvage law jurisdiction to historic shipwrecks and transferred their management to the States. On the international stage, the debate about the nature, value and management options for underwater cultural heritage is currently taking place under the supervision of the United Nations.

On a societal level the debate about the value of underwater cultural heritage has only begun to be appreciated by the public. New concepts about what constitutes a public resource and how that resource should be managed take time to become understood and accepted. The diving community has been engaged in this debate for several decades, and a variety of points of view have developed. Many diving instructors now teach preservation of both natural and cultural resources, but to some die-hard wreck divers the doctrines of salvage law and free enterprise are used to justify their collecting activities. While the overall position of the dive community seems to be slowly moving toward preservation, for many divers the issue is unclear.

On Lake Champlain the debate over public access to submerged cultural sites is more than two decades old. Rather than just deny recreational diver access to historic properties, a more foresighted plan was implemented. Central to the Lake Champlain approach was fostering a preservation ethic within the dive community. To that end, the Vermont Underwater Historic Preserve was established in the Vermont waters of Lake Champlain in 1985. It provided engineered diver access to selected historic

shipwrecks. It currently includes eight shipwreck sites in both Vermont and New York waters, and is now known as the Lake Champlain Underwater Historic Preserve. The Vermont Underwater Historic Preserve took root in Vermont, and with the support of the local dive instructor community, helped develop a new and largely preservation-based approach to Vermont recreational diving. The same preservation path has been slower to develop in the New York waters of Lake Champlain.

In New York waters, the artifact collecting is more firmly established. The waters around Plattsburgh Bay and Valcour Island were the scene of two major naval battles, the Battle of Plattsburgh Bay (1814) and the Battle of Valcour Island (1776). The resulting artifact scatter became a great incentive for people to take up and continue diving. In the past, regional dive operators actively promoted the activity both locally, and as a means of attracting out-of-town dive groups to the area. Over the past four decades, literally thousands of artifacts have been recovered. Privately held artifact collections of museum quality material are currently housed in homes and garages all around region. The New York State Divers Association (NYSDA) while recognizing the preservation value of not collecting, still stages an annual Valcour Island dive weekend.

The discovery of the Valcour Island cannon by Ed Scollon provided a unique opportunity to demonstrate that mapping a submerged battlefield was possible. Beyond that important goal, however, a second equally important opportunity emerged. The Valcour Bay Research Project had the potential to be a mechanism for significant sport diver involvement in a permitted archaeological project. Shortly after the 1999 discovery of the cannon, a meeting was held at LCMM with Ed Scollon, the diver who triggered the project; Art Cohn, LCMM director and coordinator of the Lake Champlain Underwater Historic Preserve; and Phil Lord, permit manager from the New York State Museum. The goal was to determine how best to configure the proposed project to achieve the greatest good. It was determined that by using the cannon as the zero point, we could establish grid squares on the bottomlands and begin systematically mapping the submerged American battle-line. However, we were also aware that a number of still active collectors had been utilizing metal detectors to work the Valcour Island site for many years. How should we deal with this active collecting? Clearly it violated New York State law, but the law was little known and had never been applied in an underwater context. What emerged from this discussion was a separate and equal project goal of protecting the integrity of the underwater sites by inviting all community sport divers, including the collecting divers to participate in an active, permitted archaeological project.

A permit was issued to Ed Scollon and LCMM by the New York State Museum to begin mapping an area encompassing a portion of the American line. Our method of study was to sub-divide the bottom into 50 by 50ft (232.3m<sup>2</sup>) areas to be examined by divers using hand-held metal detectors. The project's characteristics provided a good scenario for active participation by a large number of sport divers. The site was large, in fact, very large. Working at a water depth of approximately 50ft (15.2m), the maximum depth was modest. The bottom was a flat, soft mud which, while prone to silt-out conditions,



had limited archaeological sensitivity. As boring and non-descript as the bottom appeared, the sub-surface silt contained an important collection of Revolutionary War material. These characteristics provided a perfect opportunity for involving large numbers of sport divers. The divers would need to be comfortable in 50ft (15.2m) of cold water, and have good buoyancy control skills to minimize silting out the visibility, but with a modest level of experience, a large number of divers could be trained to actively participate in the project.

Ed Scollon, who invited many of his fellow dive buddies to participate in the project, led the 1999 effort. That first season Ed and the crew, supported by the LCMM, established the underwater grid system and began mapping the bottom. Everyone involved saw it as a good start to a long-term project. In 2000, Ed and the crew took the initiative to perform the bulk of the survey, but this year LCMM was able to schedule a weeklong participation of five members of its archaeological team. The LCMM crew worked with the local dive group to provide training in underwater archaeological techniques, learn the mapping process, and extend the area covered. The 2000 project was a success with everyone feeling a sense of participation in a project that was larger than themselves. One of the participants had been a diver who had collected in the Valcour Island area for more than twenty years, but his conversations with Ed had encouraged him to participate. At the conclusion of the project he was so pleased with the positive nature of working under the permit process, he inquired about getting his own permit for a similar study of the British battle line. While we would have preferred to incorporate this new initiative under the existing permit, it was agreed that encouraging the diver would be valuable, and a separate permit with LCMM providing institutional support was submitted.

During this time, there was a concern about the on-going activities of another group of divers who had recently begun collecting in the Valcour Island area. This created a dilemma for project participants. Ed Scollon was a State Trooper and in 2000 had been made a member of their boat patrol. Ed as a trooper had responsibility to enforce New York law and as a permit holder was concerned about protecting his assigned area. He was also sensitive about aggressively enforcing a law that had never been enforced on Lake Champlain, and the polarizing effect that this would have upon the dive community. We decided to open a dialogue with the divers and let them know our goals and direct concern for the permitted area. The conversations ranged from hard to cooperative, but at least everyone knew each other's positions. During the winter of 2000, a meeting of interested divers was held at Roger Harwood's home to allow Ed Scollon to make a presentation on his ongoing work. This presentation stressed the importance of a coordinated effort by all divers in the area, and did a great deal to help in the understanding of the project. As a result of this presentation, the seeds were planted that led to more complete participation and cooperation in the project.

Also during the winter of 2001 we began planning for the coming season and decided to attempt two ambitious project undertakings. To commemorate the 225<sup>th</sup> anniversary of the Battle of Valcour Island, we would stage a recovery of the artifacts already located

from the battle. This would meet the concerns of some project participants who believed that the materials located thus far were at some jeopardy from collectors. It also provided the opportunity for the project to reconnect the public to this important history. In addition, LCMM, after receiving a grant from the American Battlefield Protection Program of the National Park Service, planned a two-week field project involving many volunteer divers.

The successful artifact recovery was executed in late June and has been addressed in other parts of this report (see pg. 73). During the preparation for the recovery, divers who had not previously been involved with the VBRP offered to assist with recovery of the heavy artifacts from the permitted area. This was facilitated by Roger Harwood, a retired teacher and history enthusiast with lines of communication to both groups. In the course of the discussions, the outside group offered to help Ed with preparations to lift the heavy cannon pieces. This was a positive development and these divers provided great support for this aspect of the project.

A new dialogue was begun with the various parties as we tried to work through the pros and cons of various scenarios. It soon became clear to everyone involved with the project that there was a need to discuss the possibility of a unified permit for the entire Battle of Valcour area. It also became clear to everyone that no forward motion could take place unless any previously recovered artifacts were returned to their original positions in the lake. As the project progressed during the final week of the August 2001 survey, one of the great moments of the project happened. One evening, after a long day on the water, the “nonmembers” appeared at the VBRP camp. They stated that they had returned the previously recovered material back to the water prompting discussions about how we all might work together under a unified permit.

This action proved to be an energizing and validating event that had all the project participants confident that we could achieve a breakthrough in diver cooperation. We agreed that after the field project ended we would convene a meeting of all parties having an interest in the permitted project. The meeting took place at the home of Roger Harwood. Present were Ed Scollon, a permit holder for a portion of the American line; Tony Tyrell, a permit holder for the British line; Arthur Cohn, Director of the LCMM and co-permit holder with both Ed and Tony; John Tompkins, director of Clinton County Historical Museum and Association; and Greg Durocher and Dennis O’Neil, new diver/investigators cooperating in the project. Art Cohn acted as the meeting facilitator and laid out a proposed re-organization of the entire project and permit structure for comment.

LCMM proposed that the two existing permits be merged into one new umbrella permit to include the entire Battle of Valcour battle site. The new boundaries would be significantly larger than previously established and would incorporate all the areas currently being examined. The permit would be taken out in the name of LCMM and all the involved divers as project investigators. The Clinton County Historical Association also became another institutional partner. We would establish a standardized set of

archaeological, record keeping, and on-water procedures and all project participants would agree to follow them. No artifacts would be raised unless it was part of the pre-approved permit process. A good discussion followed in which all participants had the opportunity to express their hopes and concerns. At the conclusion of the discussion it seemed that we had emerged to consensus to move forward in the future as one integrated group. In doing so, some very talented and competent divers have been added to the VBRP.

After allowing some time for reflection, a memorandum of understanding was circulated to the participants and all responded with agreement to the key elements of the new permit format:

A new permit application will be drafted by LCMM. We will coordinate with New York State officials and project participants to facilitate this process.

A report summarizing the project's results will be prepared for all the agencies sponsoring the project.

Conservation on the 2001 recovered artifacts will be continued

Work will continue with the New York Office of General Services to establish better geographic references

Project participants will continue their public education and outreach presentations throughout the community

A public exhibit about the Battle of Valcour and the Valcour Bay Research Project incorporating the 2001 recovered material will be developed to open at LCMM in June and the Clinton County Historical Museum in November

Proposals for 2002 project funding will be developed, and presuming that effort is successful, it will lead to an artifact recovery and conservation of selected additional material for Spring 2002.

The enlarged project team will stage an additional two weeks of survey and mapping fieldwork in August 2002.

Looking forward, the participants of the VBRP are poised to enlarge, consolidate, and maximize their efforts. In December 2001 a permit application was submitted to the NYSM outlining the new structure and naming the VBRP's additional participants. Researchers are only now beginning to fully realize the archaeological potential of systematically surveying significant portions of this submerged battlefield. Thus far the results, both archaeologically and in regards to incorporating local volunteer divers into the survey, have exceeded all of the principle investigators' expectations. Future years of research will undoubtedly lead to a greater understanding of the events of October 11, 1776 and to a more secure future for the preservation of the battlefield.

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## **APPENDIX 1: GLOSSARY**

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**Aft** Near or at the stern of a vessel.

**Amidships** The middle of a vessel.

**Archaeological Site** Locations where signs of human activity are found.

**Archaeology** A subdiscipline of anthropology involving the study of the human past through its material remains.

**Artifact** Any object used or manufactured by humans.

**Bateau** (plural **bateaux**) A lightly built, flat-bottomed, double-ended boat.

**Bathymetry** Data through study and examination of water depths

**Bedrock** A mining term for the unweathered rock below the soil

**Boat** An open vessel, usually small and without decks, intended for use in sheltered water.

**Brig** A two-masted vessel square-rigged on both fore and main masts.

**Cultural Resource** A nonrenewable historical resource such as archaeological sites, artifacts, and standing structures.

**Cutter** A single-masted fore-and-aft rigged sailing vessel with a running bowsprit, mainsail, and two or more headsails.

**Deck** A platform extending horizontally from one side of a ship to the other.

**Epilimnion** The layer of water above the thermocline

**Escarpment** the steeper slope of a geomorphological unit consisting of a gently inclined surface parallel to the dip of the bedding planes.

**Fault** A fracture in rock along which there has been an observable amount of displacement

**Fore** Located at the front of a vessel.

**Fore-and-aft** From stem to stern, from front to back, oriented parallel to the keel.

**Galley** A shallow-draft vessel that is propelled by sails or oars.

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**Gneiss** A term applied to banded rocks formed during high-grade regional metamorphism.

**Gondola** A large, flat-bottomed, double-ended vessel propelled by oars or sails.

**Gunboat** see Gondola.

**Harbor** A safe anchorage, protected from most storms; may be natural or manmade; a place for docking and loading.

**Historic** The period after the appearance of written records for a given region. For the Champlain Valley this date is AD 1609.

**Hold** The lower interior part of a ship, where the cargo is stored.

**Hull** The structural body of a vessel, not including the superstructure, masts, or rigging.

**Hull plank** A thick board used to create the outer shell of a hull.

**Hypolimnion** The layer of water below the thermocline

**Inboard** Toward the center of the vessel.

**Keel** The main longitudinal timber upon which the framework or skeleton of a hull is mounted; the backbone of a hull.

**Keelson** An internal longitudinal timber, fastened on top of the frames above the keel for additional strength.

**Knee** An L-shaped timber used to strengthen the junction of two surfaces on different planes.

**Outboard** Outside or away from the center of a vessel's hull.

**Plank** A thick board used as sheathing on a vessel.

**Port** The left side of a vessel when facing forward.

**Primary Source** An artifact, document, or individual that provides information based on personal observations. A firsthand account.

**Provenience** The location of an artifact within an archaeological site.

**Quagga Mussels** a small freshwater mollusk native to the Eurasian Caspian and Black

Seas.

**Radeau** (plural **radeaux**) A flat-bottomed barge partially enclosed by inward sloping sides, propelled by both sails and oars, and carrying heavy guns.

**Rigging** Hardware and equipment that support and control the spars and sails of a vessel.

**Schooner** A fore-and-aft-rigged sailing vessel with two or more masts.

**Seiche** The oscillation of the water of a lake, bay, etc., caused by wind or earthquake.

**Shallop** a small vessel with a single mast, fore-and-aft rigged.

**Sloop** A single-masted, fore-and-aft-rigged sail boat.

**Spar** A pole used to help support the sail of a vessel.

**Spike** A large nail.

**Starboard** The right side of a vessel when facing forward.

**Stern** The after end of a vessel.

**Strake** A continuous line of planks, running bow to stern.

**Timber** In a general context, all wooden hull members; specially those that form the framework or skeleton of the hull.

**Underwater archaeology** The archaeological study of submerged cultural resources.

**Underwater cultural resource** A nonrenewable historical resource that partially or entirely lies below water, such as submerged prehistoric archaeological sites, artifacts, bridges, piers, wharves, and shipwrecks.

**Veligers** Zebra mussels during the juvenile stage of their lifecycle.

**Vessel** A watercraft, larger than a rowboat, designed to navigate on open water.

**Zebra Mussels** a small freshwater mollusk native to the Eurasian Caspian and Black Seas.



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## APPENDIX 2: ABBREVIATIONS

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**ABPP:** American Battlefield Protection Program  
**AD:** *Anno Domini* (in the year of the Lord)  
**AM:** *ante meridiem* (before noon)  
**A&M:** Agriculture and Mechanics  
**A.B.:** *Artium Baccalaureus* (Bachelor of Arts)  
**A.S.:** Associates of Science  
**ASA:** Abandoned Shipwreck Act  
**B.A.:** *Baccalaureus Artium* (Bachelor of Arts)  
**BC:** before Christ  
**BP:** before present (1950)  
**B.S.:** Bachelor of Science  
**°C:** Celsius  
**c.:** circa  
**CCHA:** Clinton County Historical Association  
**cm:** centimeter  
**CMS:** Champlain Maritime Society  
**CPR:** cardiopulmonary resuscitation  
**DC:** District of Columbia  
**ed.:** edition  
**e.g.:** *exempli gratia* (for example)  
**EPA:** Environmental Protection Agency  
**et al.:** *et alii* (and others)  
**°F:** Fahrenheit  
**ft:** feet  
**GPS:** Global Positioning System  
**hp:** horsepower  
**i.e.:** *id est* (that is [to say])  
**in:** inch  
**Inc.:** incorporated  
**kHz:** kilohertz  
**km:** kilometer  
**km<sup>2</sup>:** square kilometers  
**LCBP:** Lake Champlain Basin Program  
**LCMM:** Lake Champlain Maritime Museum  
**LCT:** Lake Champlain Transportation  
**LCTC:** Lake Champlain Transportation Company  
**L:** liter  
**m:** meter  
**M.A.:** *Magister Artium* (Master of Arts)  
**mi:** mile  
**mi<sup>2</sup>:** square miles  
**Ms.:** manuscript

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**NAD:** North American Datum  
**NAUI:** National Association of Underwater Instructors  
**NHC:** Naval Historical Center  
**n.d.:** no date  
**No. or no.:** number  
**NOAA:** National Oceanic and Atmospheric Administration  
**NPS:** National Park Service  
**NY:** New York  
**NYDEC:** New York Department of Environmental Conservation  
**NYOPRHP:** New York Office of Parks, Recreation, and Historic Preservation  
**NYS:** New York State  
**NYSDA:** New York State Diver's Association  
**NYSM:** New York State Museum  
**p.:** page  
**Ph.D.:** *Philosophiae Doctor* (Doctor of Philosophy)  
**pp.:** pages  
**PM:** *post meridiem* (after noon)  
**RV:** research vessel  
**SRB:** Sulfur reducing bacteria  
**TAMU:** Texas A&M University  
**UNESCO:** United Nations Education, Scientific and Cultural Organization  
**U.S.:** United States of America  
**USGS:** United States Geological Survey  
**UTM:** Universal Transverse Mercator  
**VBPR:** Valcour Bay Research Project  
**VT:** Vermont

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## **APPENDIX 3: GRID SQUARE MAPS**

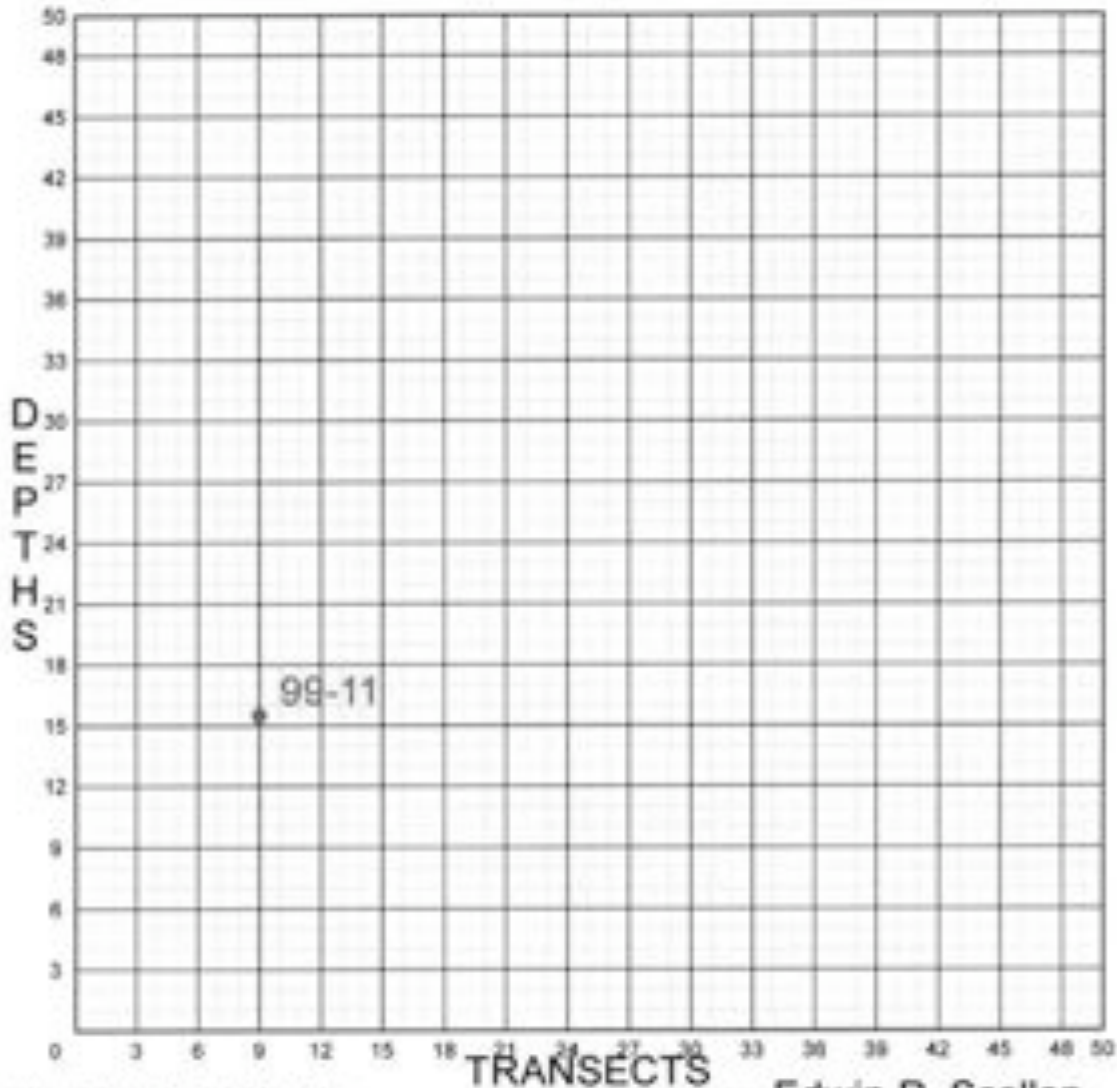
---

Use for grids in NE Quadrant only

GRID - NE 1 / 1

# SURVEY - AR9904

object	transect	depth	object	transect	depth
A 99-11 Bayonet	9	15' 6" E			
B	/		F	/	
C	/		G	/	
D	/		H	/	



COORDINATES READ AS FOLLOWS

QUADRANT ROW / BOX TRANSECT DEPTH ON TRANSECT

NE 1 / 1 12 35' 4"  
 For grids in East quadrant: transect markers are placed every 2' from west to east  
 For grids in West quadrant: transect markers are placed every 2' from east to west  
 For grids in North quadrant: depths are measured from south to north  
 For grids in South quadrant: depths are measured from north to south  
 Each grid measures 50' by 50' and measurements are subject to above rules

Surveyors

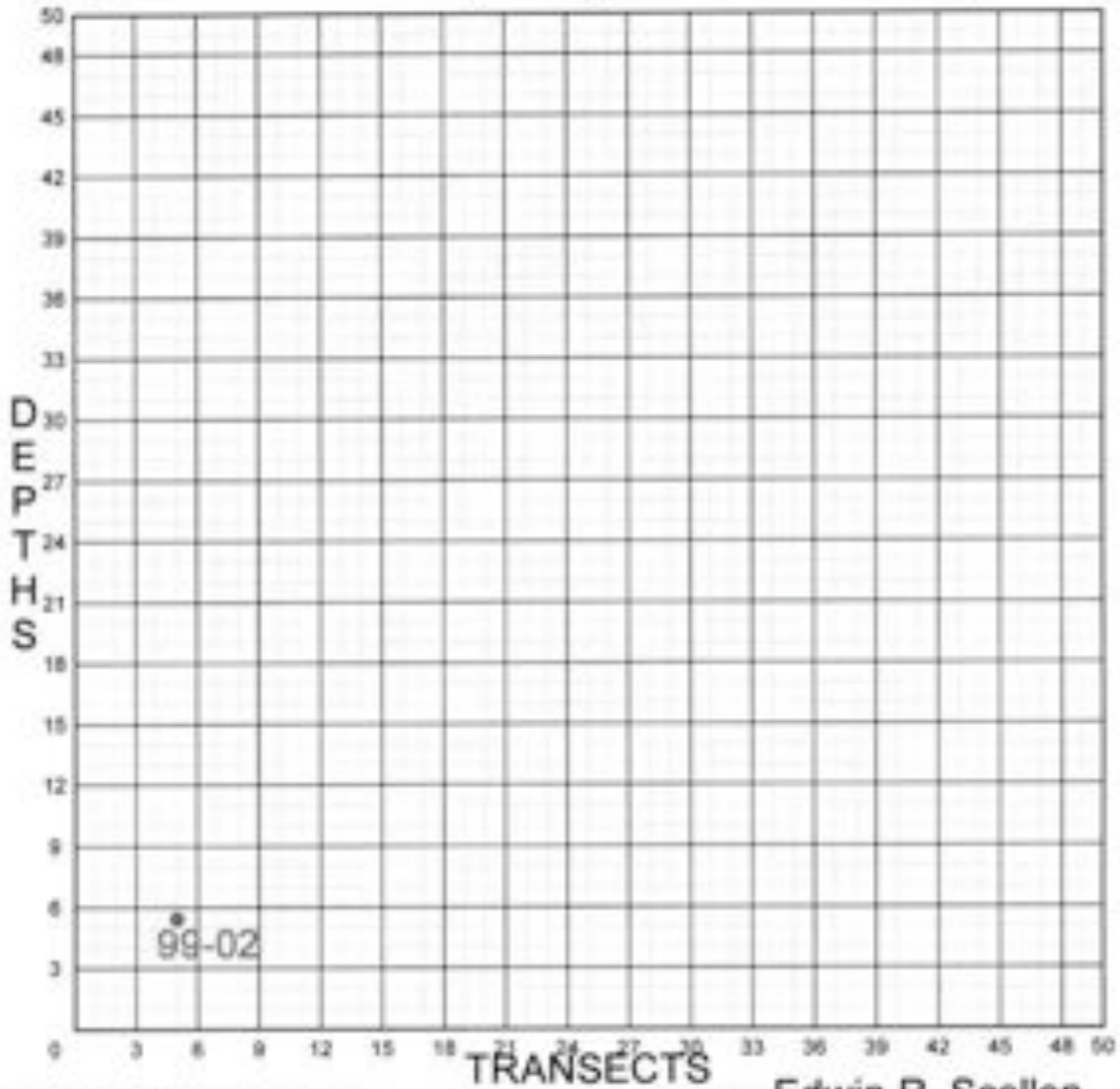
**Edwin R. Scollon**  
**Anthony Tyrell**



Use for grids in NE Quadrant only  
**GRID - NE 1/2**

# SURVEY - AR9904

object	transect	depth	object	transect	depth
A 99-02 Belt Ax	5	5' 5"	E		
B	/		F	/	
C	/		G	/	
D	/		H	/	



COORDINATES READ AS FOLLOWS

QUADRANT ROW / BOX TRANSECT DEPTH ON TRANSECT  
 NW 1 / 1 12 30' 0"

For grids in East quadrant: transect markers are placed every 3' from west to east  
 For grids in West quadrant: transect markers are placed every 3' from east to west  
 For grids in North quadrant: depths are measured from south to north  
 For grids in South quadrant: depths are measured from north to south  
 Each grid measures 50' by 50' and measurements are subject to above rules

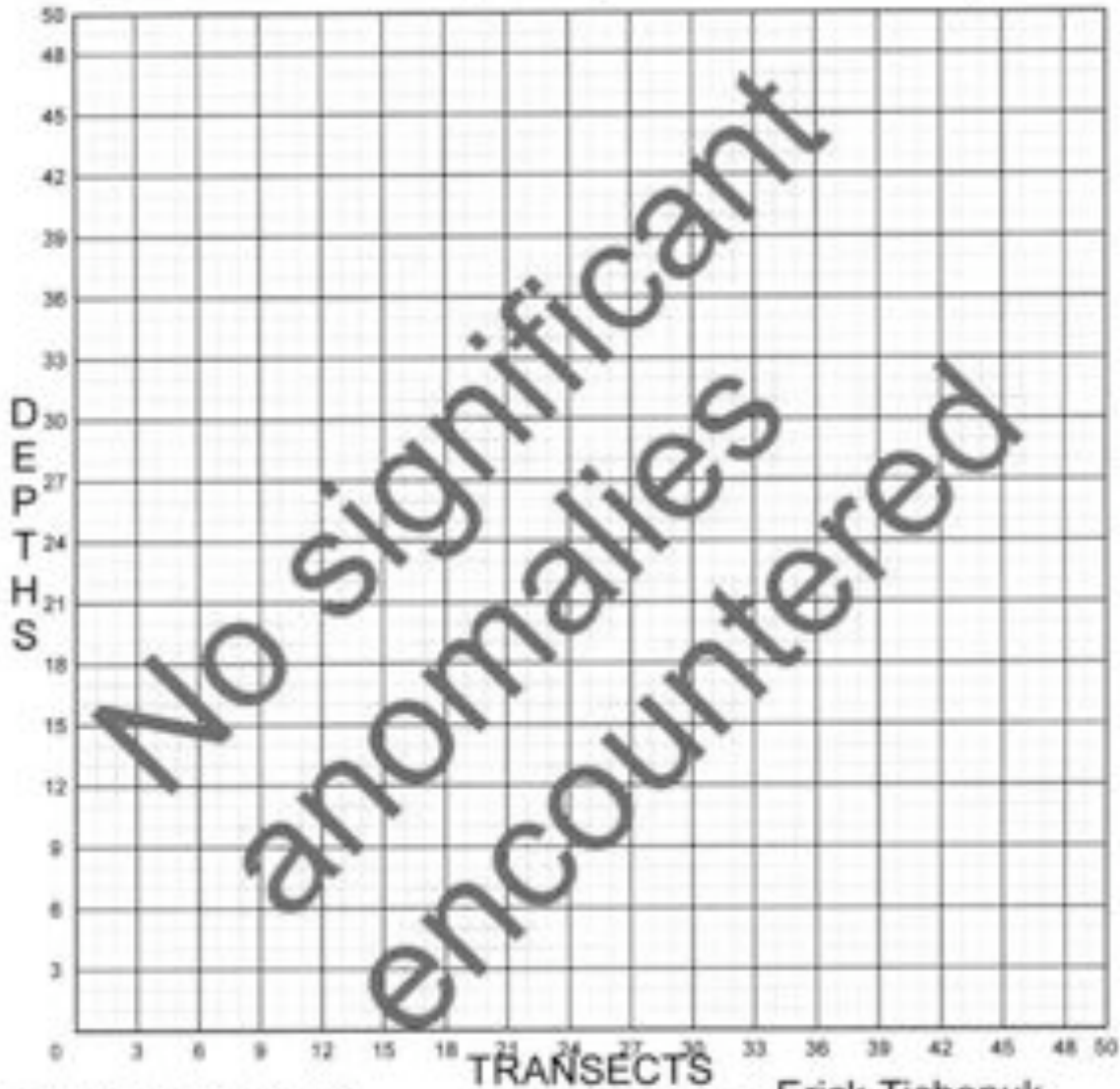
Surveyors **Edwin R. Scollon**  
**Matt Booth**  
**Dan Carpenter**  
**Adam Kane**



Use for grids in NE Quadrant only  
**GRID - NE 1 / 3**

# SURVEY - AR9904

object	transect	depth	object	transect	depth
A	_____	/ _____	E	_____	/ _____
B	_____	/ _____	F	_____	/ _____
C	_____	/ _____	G	_____	/ _____
D	_____	/ _____	H	_____	/ _____



COORDINATES READ AS FOLLOWS

QUADRANT ROW / BOX TRANSECT DEPTH ON TRANSECT  
 MW 1 / 1 12 35' 4"

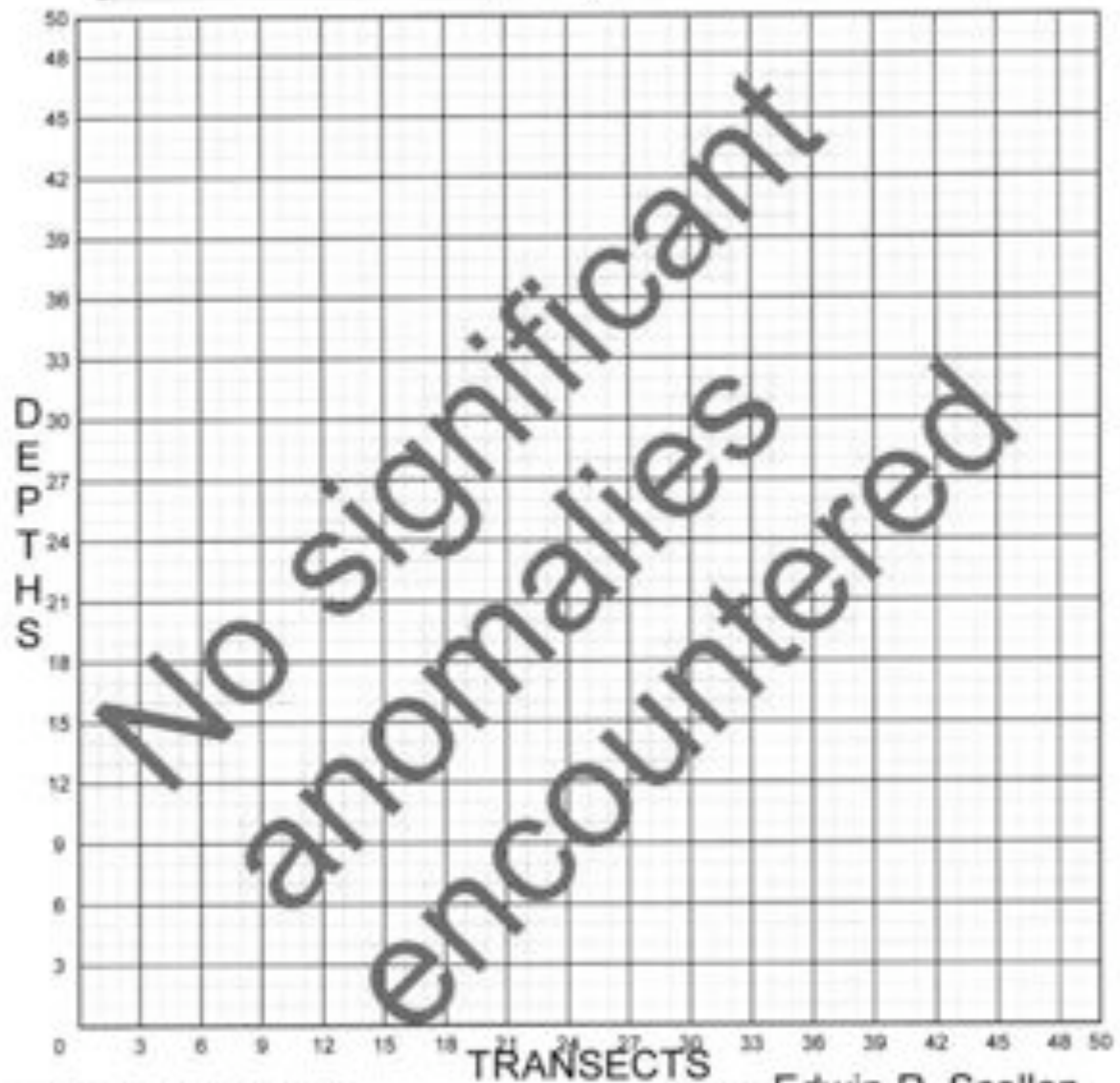
For grids in East quadrant: transect markers are placed every 3' from west to east  
 For grids in West quadrant: transect markers are placed every 3' from east to west  
 For grids in North quadrant: depths are measured from south to north  
 For grids in South quadrant: depths are measured from north to south  
 Each grid measures 50' by 50' and measurements are subject to above rules

Surveyors **Erick Tichonuk** \_\_\_\_\_  
**Tom Keefe** \_\_\_\_\_  
**Matt Booth** \_\_\_\_\_  
**Bill Leege** \_\_\_\_\_

Use for grids in NE Quadrant only  
**GRID - NE 2 / 1.**

# SURVEY - AR9904

object	transect	depth	object	transect	depth
A. _____	/	/	E. _____	/	/
B. _____	/	/	F. _____	/	/
C. _____	/	/	G. _____	/	/
D. _____	/	/	H. _____	/	/

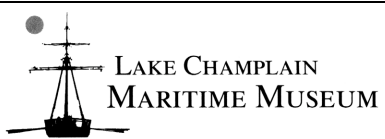


COORDINATES READ AS FOLLOWS

QUADRANT ROW / BOX TRANSECT DEPTH ON TRANSECT  
 NW 1 / 1 12 33' 4"

For grids in East quadrant: transect markers are placed every 2' from west to east  
 For grids in West quadrant: transect markers are placed every 2' from east to west  
 For grids in North quadrant: depths are measured from south to north  
 For grids in South quadrant: depths are measured from north to south  
 Each grid measures 50' by 50' and measurements are subject to above rules

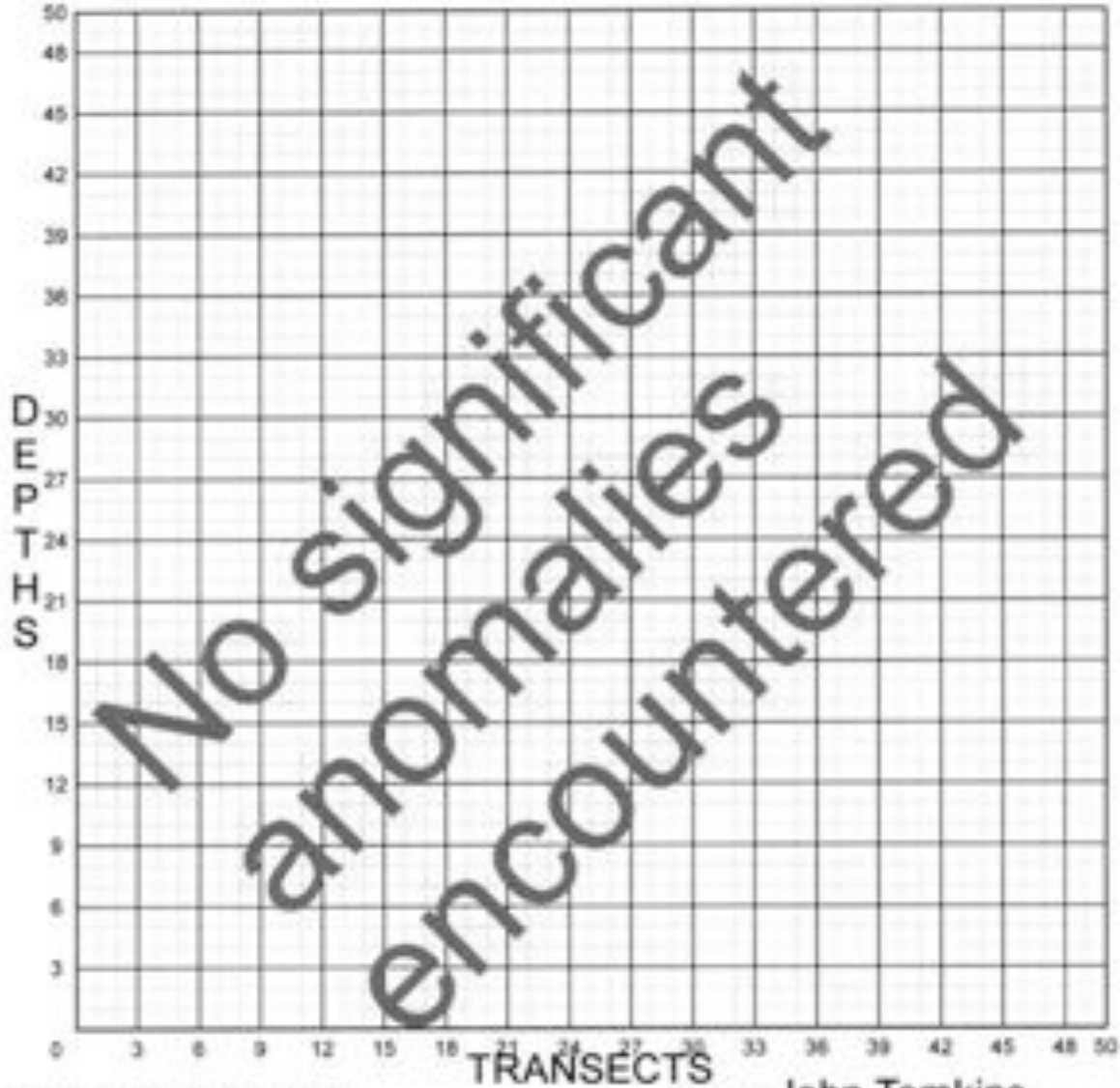
Surveyors **Edwin R. Scollon**



Use for grids in NE Quadrant only  
**GRID - NE 2 / 2**

# SURVEY - AR9904

object	transect	depth	object	transect	depth
A	_____	/	E	_____	/
B	_____	/	F	_____	/
C	_____	/	G	_____	/
D	_____	/	H	_____	/



COORDINATES READ AS FOLLOWS

QUADRANT ROW / BOX TRANSECT DEPTH ON TRANSECT  
 MV 1 / 1 12 30 4"

For grids in East quadrant: transect markers are placed every 3' from west to east  
 For grids in West quadrant: transect markers are placed every 3' from east to west  
 For grids in North quadrant: depths are measured from south to north  
 For grids in South quadrant: depths are measured from north to south  
 Each grid measures 50' by 50' and measurements are subject to above rules

Surveyors John Tomkins  
Steve Nye  
Adam Kane  
Chris Fox

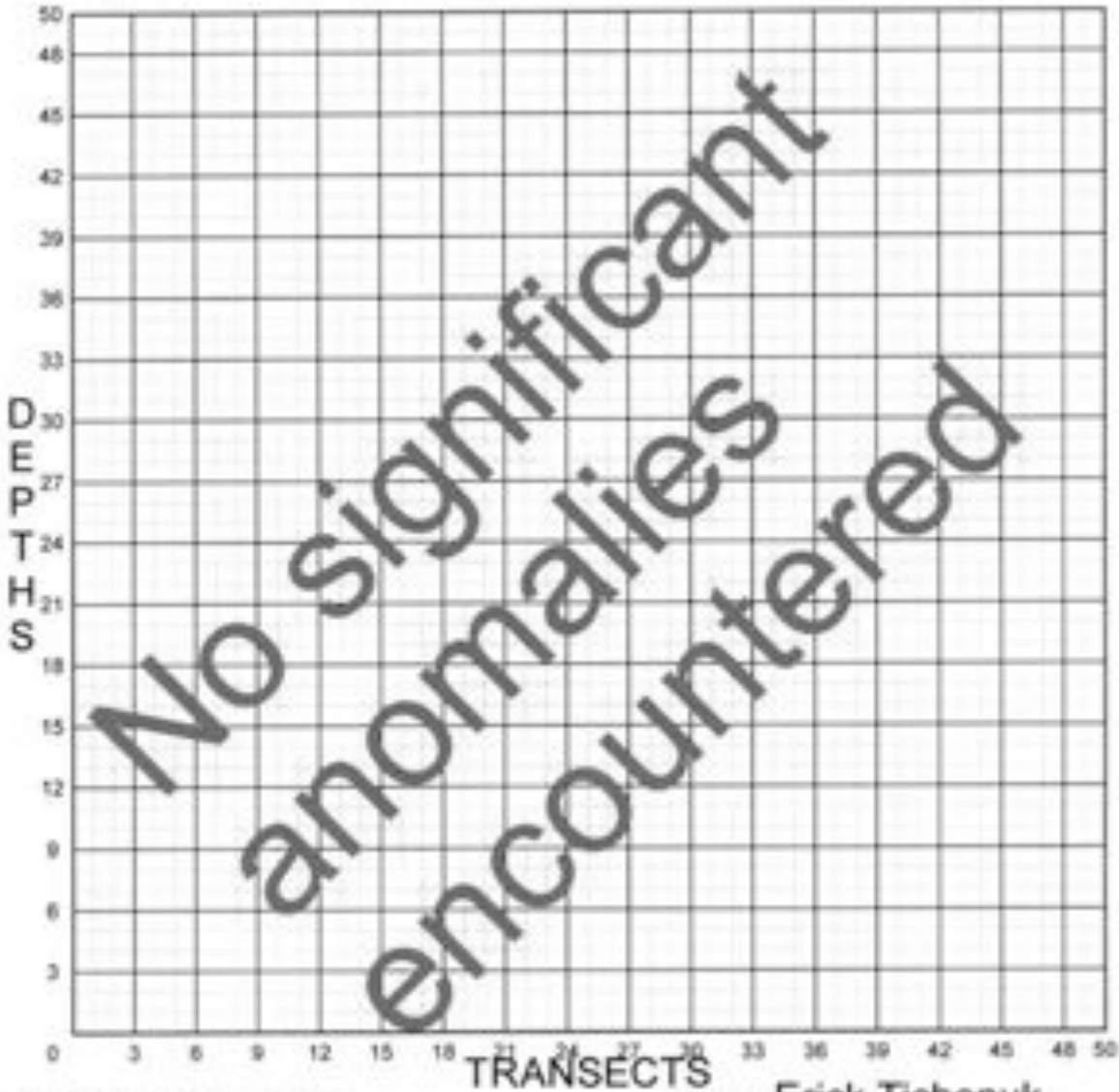


Use for grids in NE Quadrant only

GRID - NE 2 / 3

# SURVEY - AR9904

object	transect	depth	object	transect	depth
A. _____	/	_____	E. _____	/	_____
B. _____	/	_____	F. _____	/	_____
C. _____	/	_____	G. _____	/	_____
D. _____	/	_____	H. _____	/	_____



COORDINATES READ AS FOLLOWS

QUADRANT ROW / BOX TRANSECT DEPTH ON TRANSECT

NE 1 / 5 12 35' 4"

For grids in East quadrant: transect markers are placed every 3' from west to east

For grids in West quadrant: transect markers are placed every 3' from east to west

For grids in North quadrant: depths are measured from south to north

For grids in South quadrant: depths are measured from north to south

Each grid measures 50' by 50' and measurements are subject to above rules

Surveyors Erick Tichonuk \_\_\_\_\_  
 Bill Atkinson \_\_\_\_\_  
 Matt Booth \_\_\_\_\_  
 Tom Keefe \_\_\_\_\_

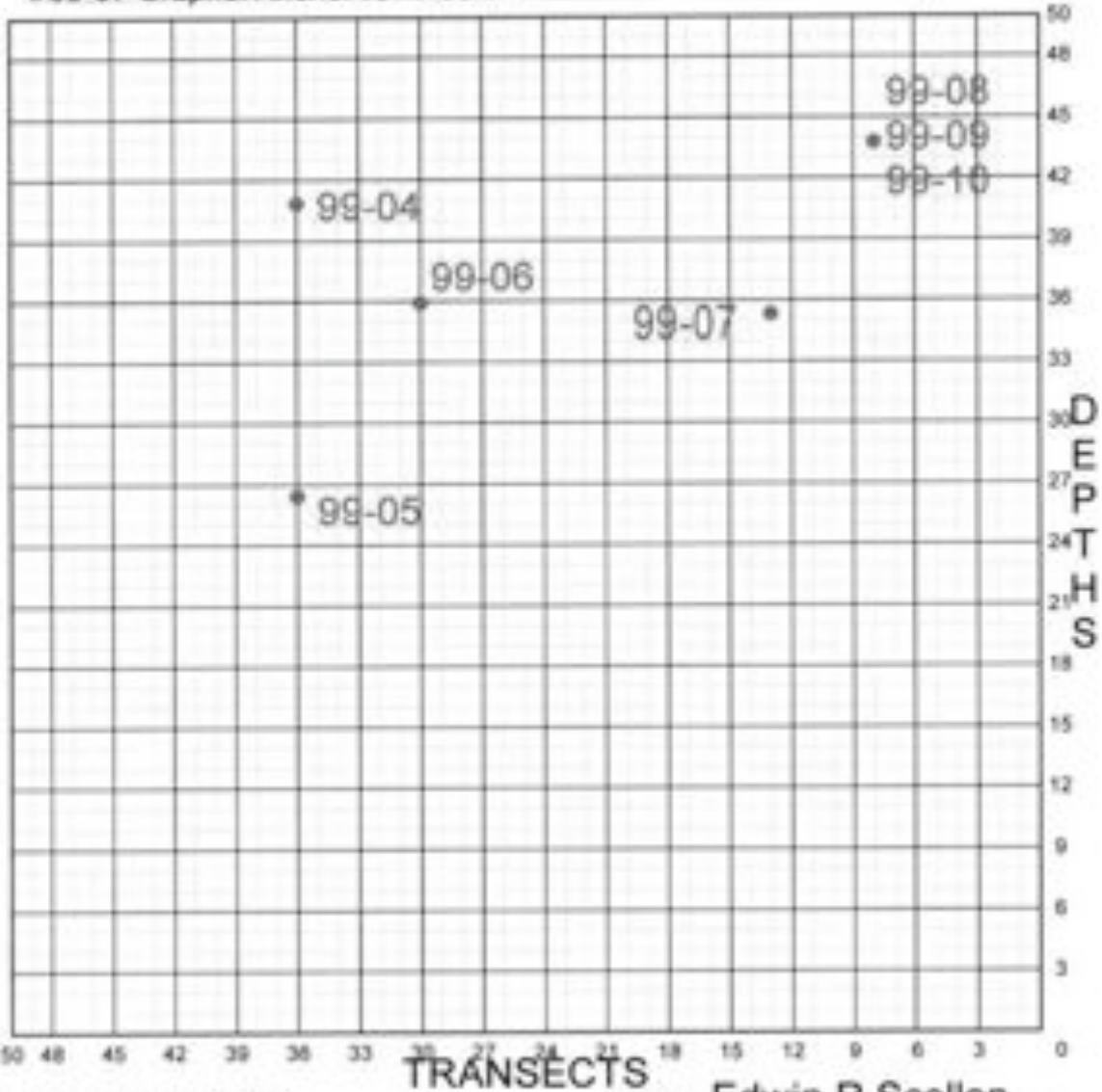




Use for grids in NW Quadrant only  
**GRID - NW 1 / 1**

# SURVEY - AR9904

object	transect	depth	object	transect	depth
A 99-04 Metal Fragment	36	40'10"	E 99-08 Metal Bracket	8	43'9"
B 99-05 Cartridge Pouch	36	26'5"	99-09 Lead Plating	8	43'9"
C 99-06 Metal Fragment	30	35'11"	99-10 Wood Fragment	8	43'9"
D 99-07 Grapnel Anchor	13	35'4"			



COORDINATES READ AS FOLLOWS

QUADRANT ROW / BOX TRANSECT DEPTH ON TRANSECT  
 NW 1 / 1 12 35' 4"

For grids in East quadrant, transect markers are placed every 3' from east to west  
 For grids in West quadrant, transect markers are placed every 7' from east to west  
 For grids in North quadrant, depths are measured from south to north  
 For grids in South quadrant, depths are measured from north to south  
 Each grid measures 50' by 50' and measurements are subject to above rules

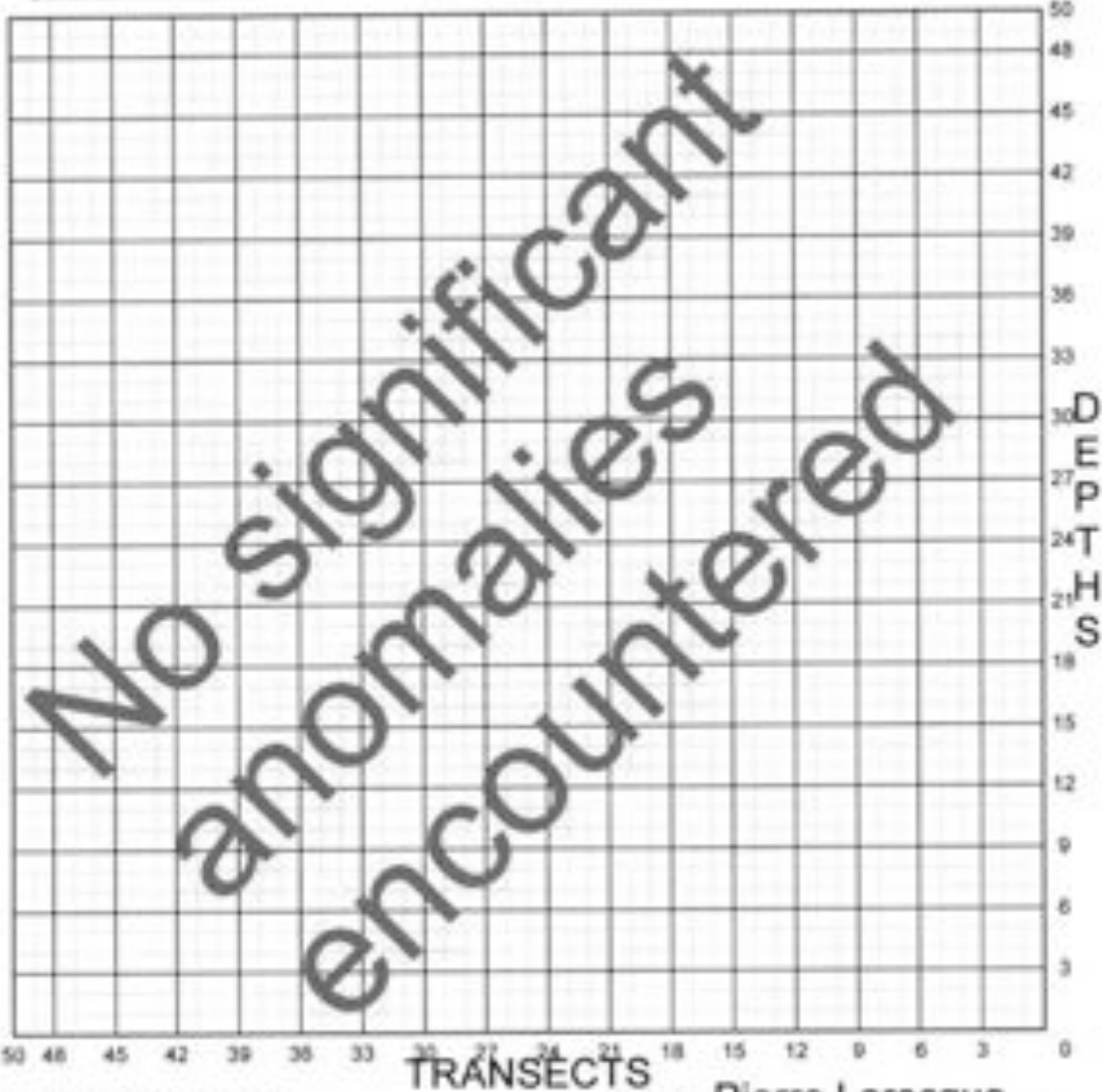
Surveyors **Edwin R Scollon**  
**Jerry Forkey**  
**Tony Tyrell**



Use for grids in NW Quadrant only  
**GRID - NW 1/2**

# SURVEY - AR9904

object	transect	depth	object	transect	depth
A. _____	/	/	E. _____	/	/
B. _____	/	/	F. _____	/	/
C. _____	/	/	G. _____	/	/
D. _____	/	/	H. _____	/	/



COORDINATES READ AS FOLLOWS

QUADRANT ROW / BOX TRANSECT DEPTH ON TRANSECT  
 NW 1 / 1 12 30 4"

For grids in East quadrant: transect markers are placed every 3' from west to east  
 For grids in West quadrant: transect markers are placed every 3' from east to west  
 For grids in North quadrant: depths are measured from south to north  
 For grids in South quadrant: depths are measured from north to south  
 Each grid measures 50' by 50' and measurements are subject to above rules

Surveyors **Pierre Larocque** \_\_\_\_\_  
**Bill Atkinson** \_\_\_\_\_  
**Adam Kane** \_\_\_\_\_  
**Rob Wilczynski** \_\_\_\_\_

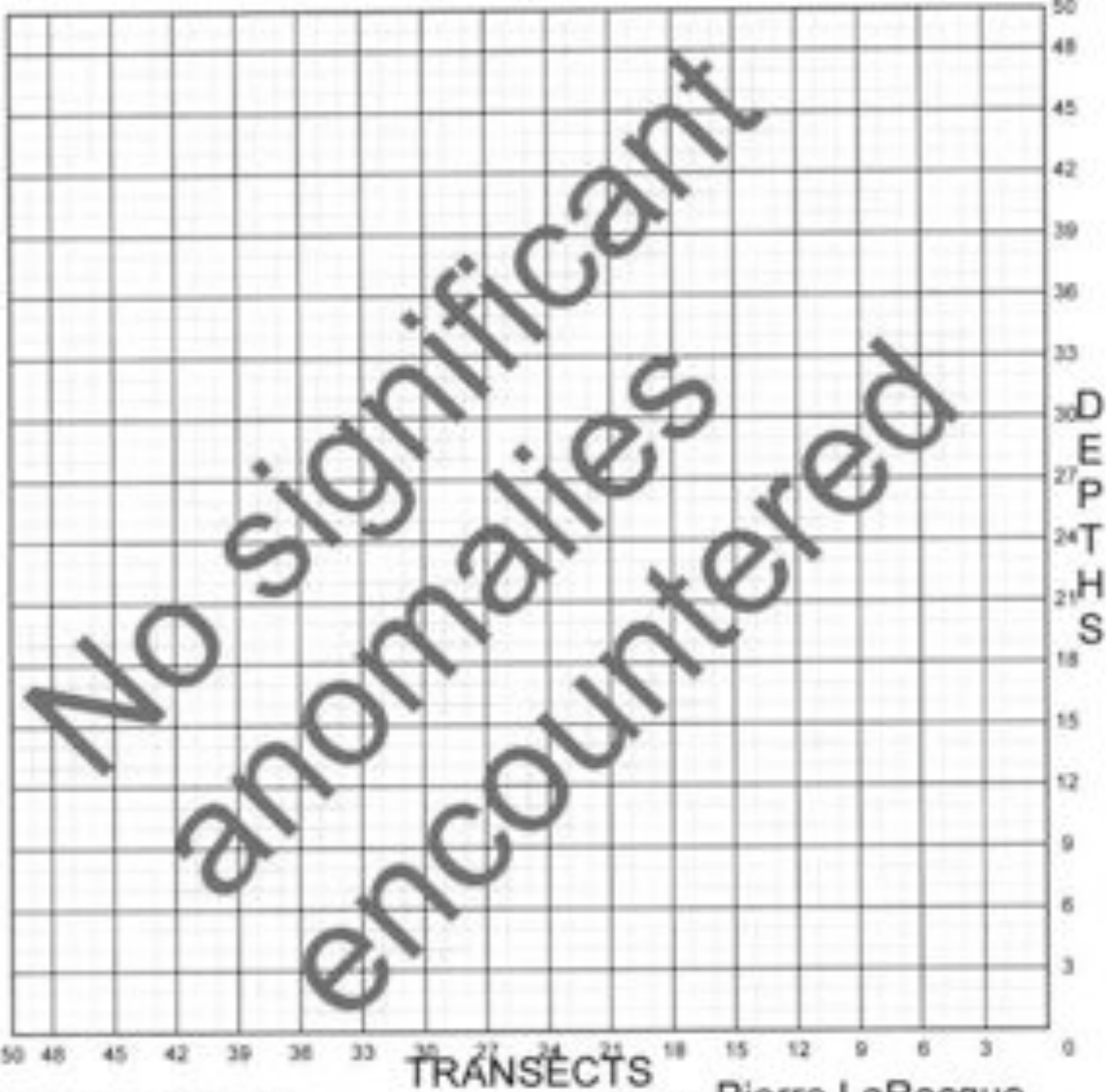


Use for grids in NW Quadrant only

GRID - NW 1 / 3

# SURVEY - AR9904

object	transect	depth	object	transect	depth
A. _____	/	_____	E. _____	/	_____
B. _____	/	_____	F. _____	/	_____
C. _____	/	_____	G. _____	/	_____
D. _____	/	_____	H. _____	/	_____



COORDINATES READ AS FOLLOWS

QUADRANT ROW / BOX TRANSECT DEPTH ON TRANSECT

NW 1 / 1 12 35' 4"  
 For grids in East quadrant: transect markers are placed every 3' from east to west  
 For grids in West quadrant: transect markers are placed every 3' from east to west  
 For grids in North quadrant: depths are measured from south to north  
 For grids in South quadrant: depths are measured from north to south  
 Each grid measures 50' by 50' and measurements are subject to above rules

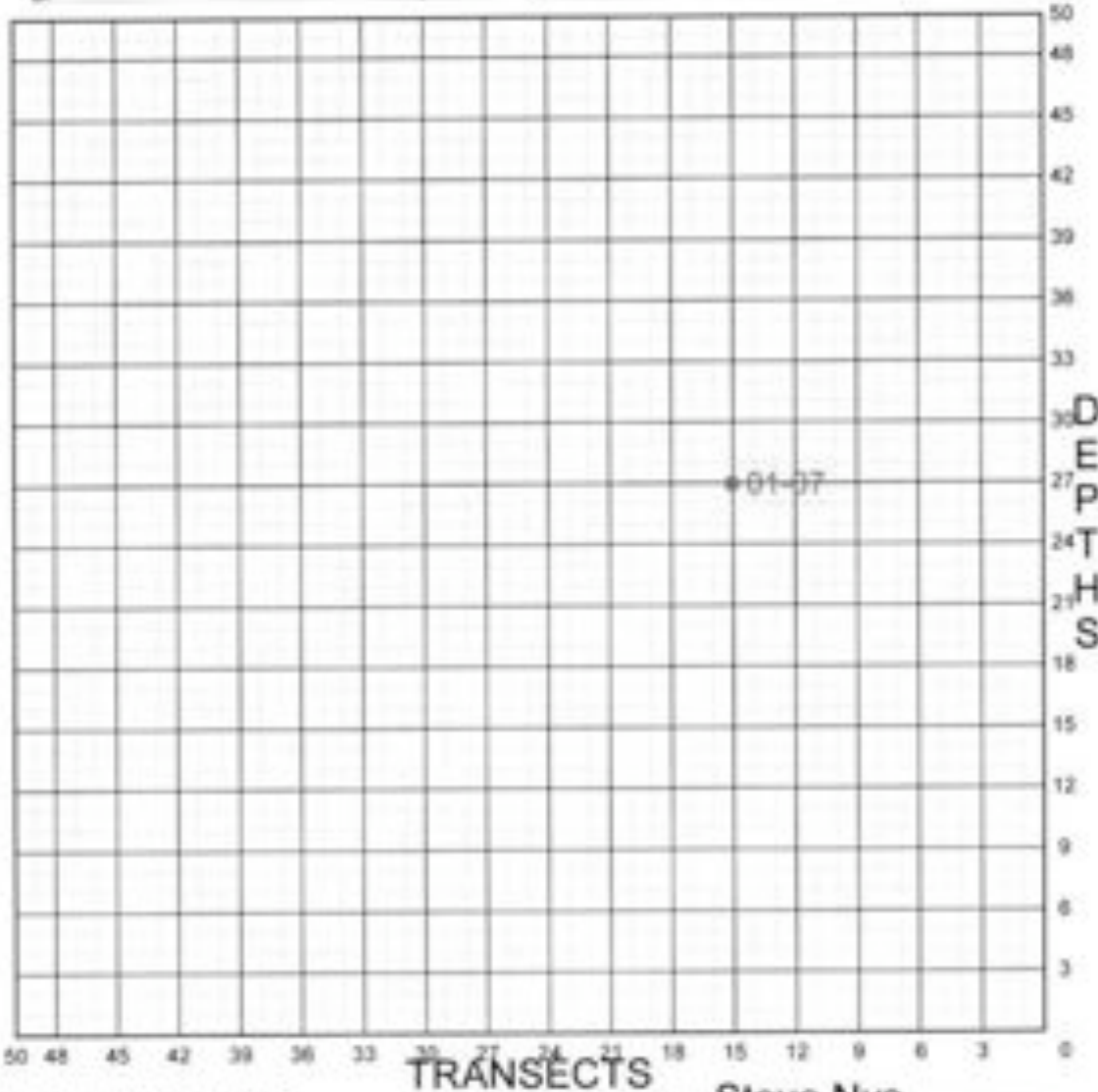
Surveyors

Pierre LaRocque  
 Phil LaMarche  
 Chris Sabick  
 Matt Booth

Use for grids in NW Quadrant only  
**GRID - NW 1/4**

# SURVEY - AR9904

object	transect	depth	object	transect	depth
A. 01-07 Cannon Fragment	152	7'00"	E.		/
B.	/	/	F.		/
C.	/	/	G.		/
D.	/	/	H.		/



COORDINATES READ AS FOLLOWS

QUADRANT: NW / BOX: TRANSECT DEPTH ON TRANSECT  
 MW 1 1 12 35 4'

For grids in East quadrant: transect markers are placed every 3' from west to east  
 For grids in West quadrant: transect markers are placed every 3' from east to west  
 For grids in North quadrant: depths are measured from south to north  
 For grids in South quadrant: depths are measured from north to south  
 Each grid measures 50' by 50' and measurements are subject to above rules

Surveyors: **Steve Nye**  
**Phil LaMarche**  
**Matt Booth**  
**Bill Leege**

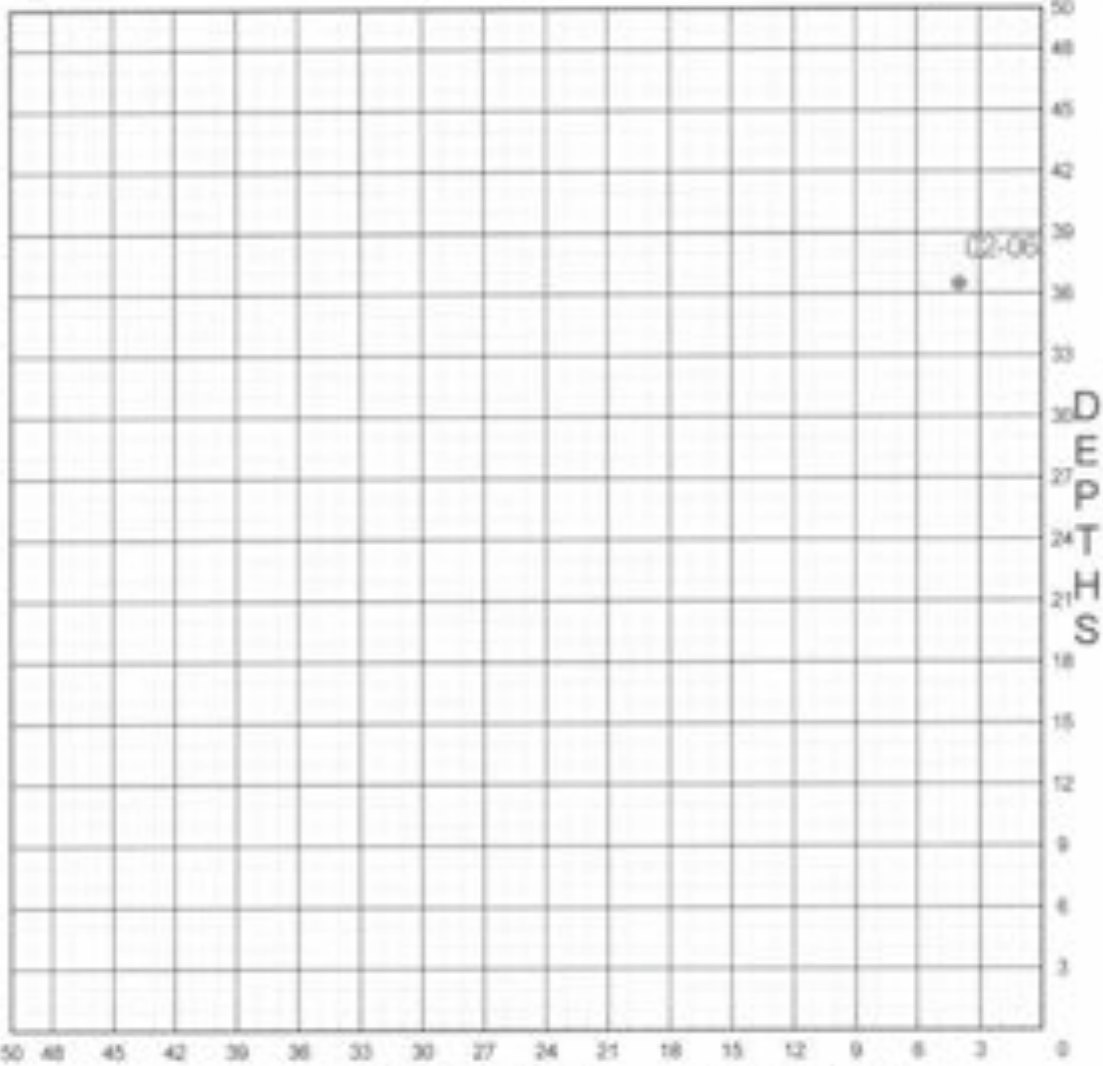


Use for grids in NW Quadrant only

GRID - NW 1/5

# SURVEY - AR9904

object	trawled	depth	object	trawsect	depth
A. 02-06 4lb Round Shot	04	36'05" E			
B. _____	/		F. _____	/	
C. _____	/		G. _____	/	
D. _____	/		H. _____	/	



COORDINATES READ AS FOLLOWS

TRANSECTS

Surveyors

Ed Scollon

Phil Calvert

Art Cohn

Bill Leege

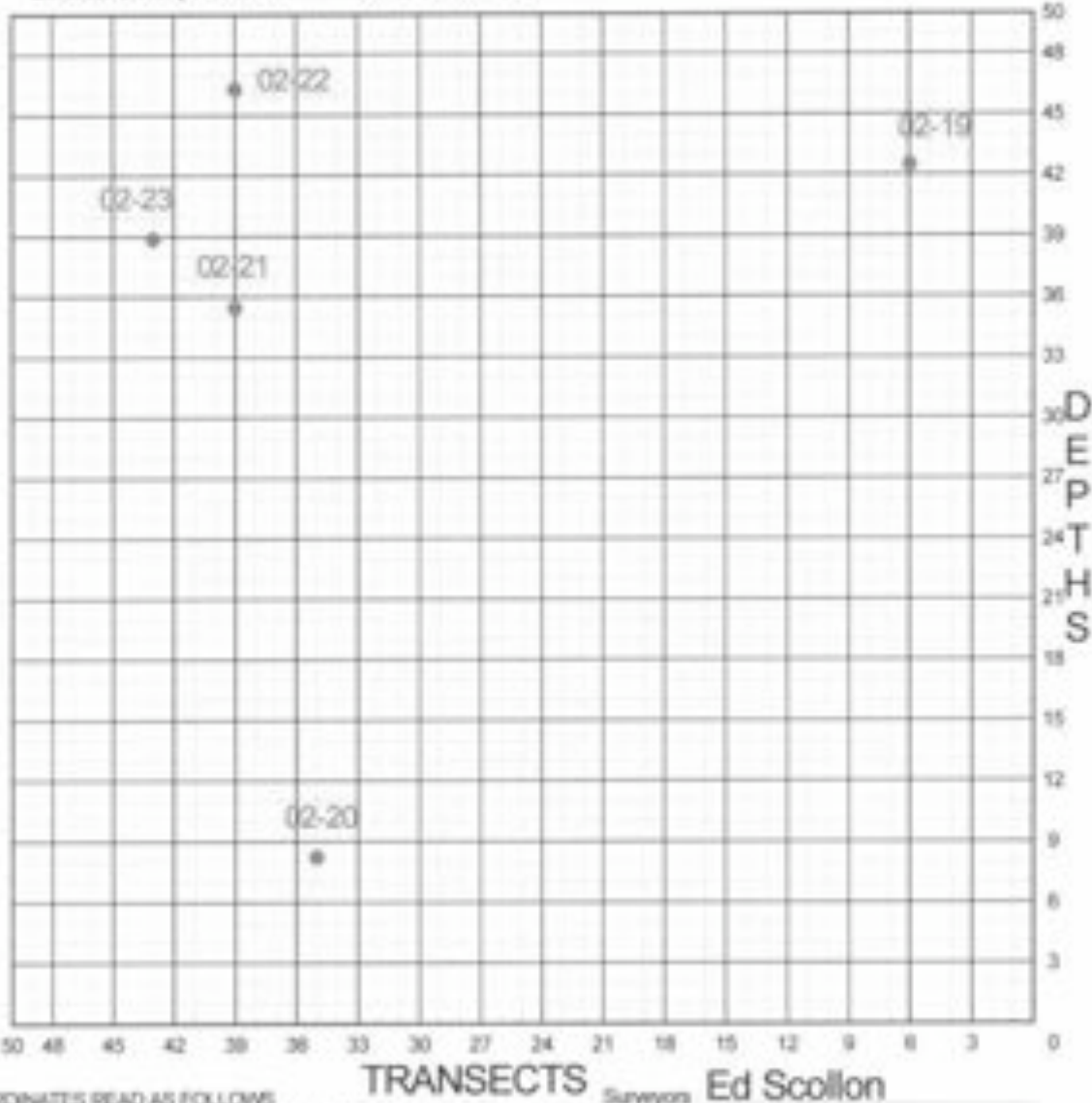
TRAWSECT, TROLL FOL, TRAWSECT, TRAWSECT, TRAWSECT  
NW 1 1 10 30' 4"

For grids in East quadrant: trawsect markers are placed every 3' from east to west  
For grids in West quadrant: trawsect markers are placed every 3' from east to west  
For grids in North quadrant: depths are measured from south to north  
For grids in South quadrant: depths are measured from north to south  
Each grid measures 30' by 30' and measurements are subject to above rules

Use for grids in NW Quadrant only  
**GRID - NW 1 / 6**

# SURVEY - AR9904

object	transect	depth	object	transect	depth
A 02-19 Musket Shot	6	42'06"	E 02-23 Lead Pellet	43	38'11"
B 02-20 Bomb Fragment	35	8'03"	F		
C 02-21 Musket Shot	39	35'05"	G		
D 02-22 Grape Shot	39	46'04"	H		



COORDINATES READ AS FOLLOWS

QUADRANT ROW/BOX TRANSECT DEPTH ON TRANSECT  
 NW 1 / 1 12 20 4'

For grids in East quadrant, transect markers are placed every 3' from west to east.  
 For grids in West quadrant, transect markers are placed every 3' from east to west.  
 For grids in North quadrant, depths are measured from south to north.  
 For grids in South quadrant, depths are measured from north to south.  
 Each grid measures 50' by 50' and measurements are subject to above rules.

Surveyor Ed Scollon

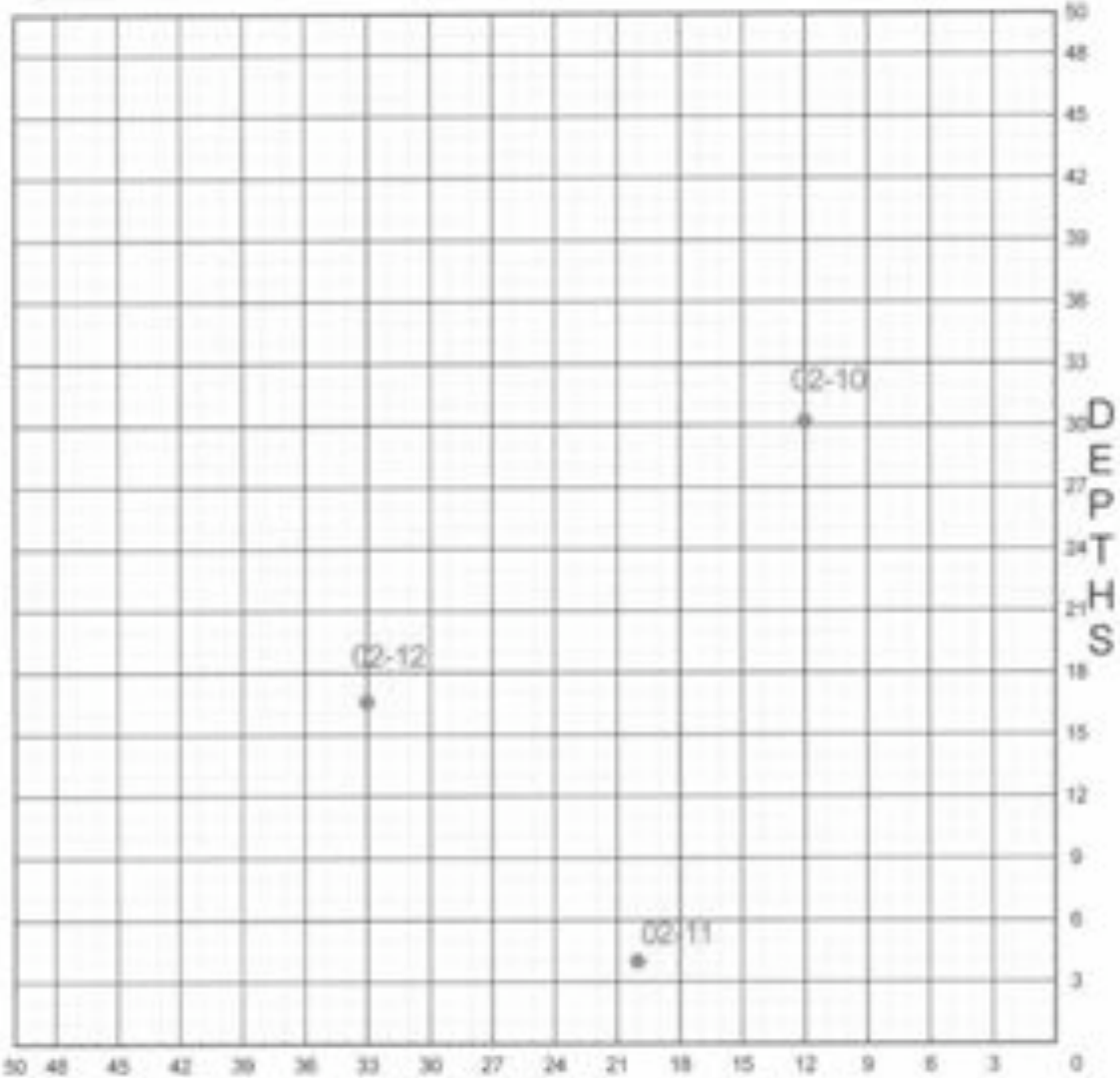


Use for grids in NW Quadrant only

GRID - NW 1 / 7

# SURVEY - AR9904

object	transect	depth	object	transect	depth
A 02-10 Grape Shot	12	30'02" E			
B 02-11 Grape Shot	20	4'00" F			
C 02-12 Musket Ball	33	16'08" G			
D			H		



COORDINATES READ AS FOLLOWS

QUADRANT ROW/BOX TRANSECT DEPTH ON TRANSECT  
 NW 1 / 7 12 30' 4"

For grids in East quadrant, transect markers are placed every 3' from west to east  
 For grids in West quadrant, transect markers are placed every 3' from east to west  
 For grids in North quadrant, depths are measured from south to north  
 For grids in South quadrant, depths are measured from north to south  
 Each grid measures 50' by 50' and measurements are subject to above rules

TRANSECTS

Surveyors

Adam Kane  
 Rob Wilczynski  
 Sarah Brigadier  
 Pierre LaRocque

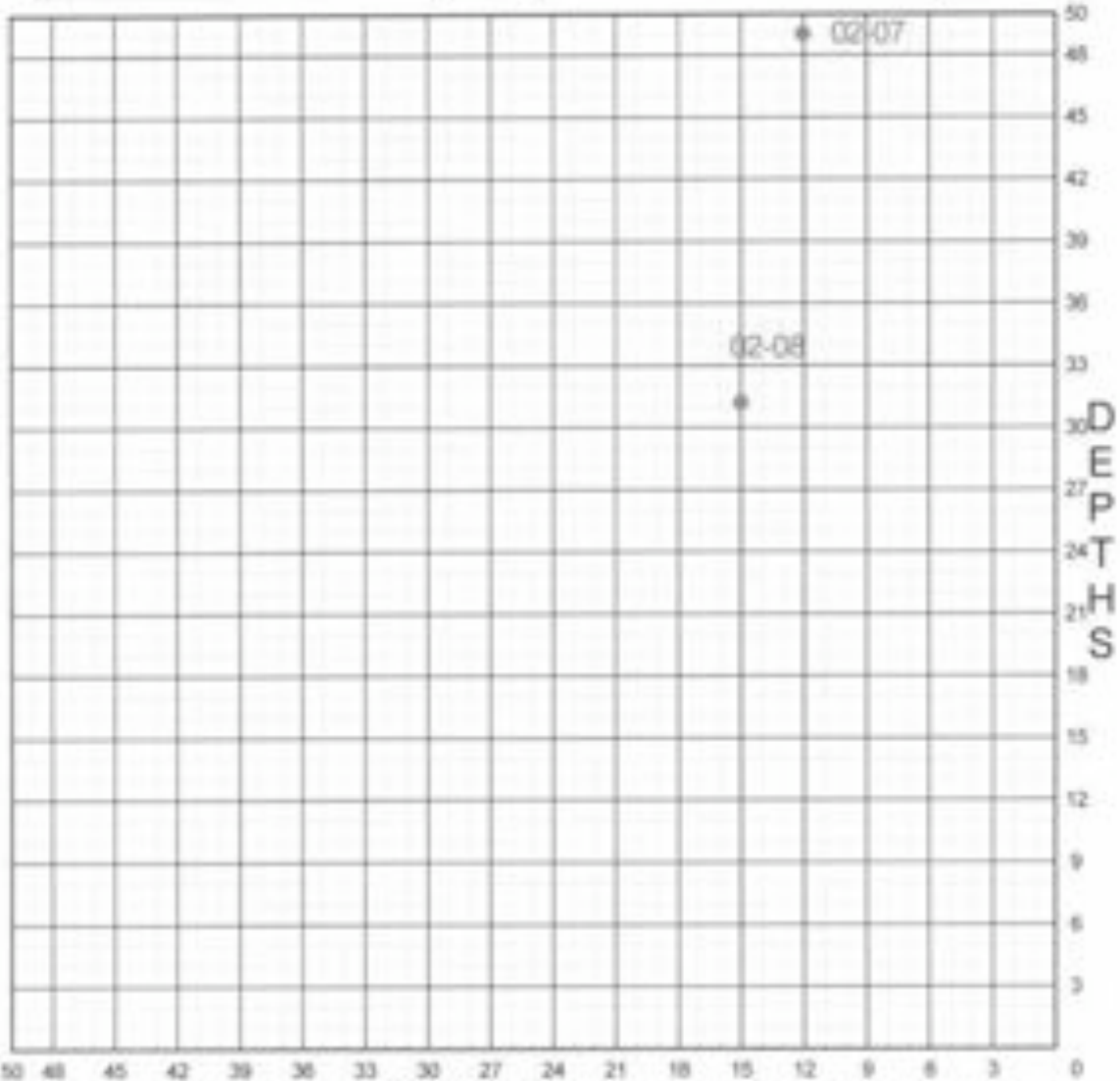


Use for grids in NW Quadrant only

GRID - NW 1/8

# SURVEY - AR9904

object	transect	depth	object	transect	depth
A 02-07 Grape Shot	12	49'06"E			
B 02-08 Swivel Shot	15	31'03"E			
C			G		
D			H		



COORDINATES READ AS FOLLOWS

QUADRANT ROW/BOX TRANSECT DEPTH ON TRANSECT  
 NW 1 / 1 12 30'4"

For grids in East quadrant: transect markers are placed every 3' from west to east  
 For grids in West quadrant: transect markers are placed every 3' from east to west  
 For grids in North quadrant: depths are measured from south to north  
 For grids in South quadrant: depths are measured from north to south  
 Each grid measures 50' by 50' and measurements are subject to above rules

TRANSECTS Surveyors

Pierre LaRocque  
 Sarah Lyman  
 Adam Kane  
 Rob Wilczynski



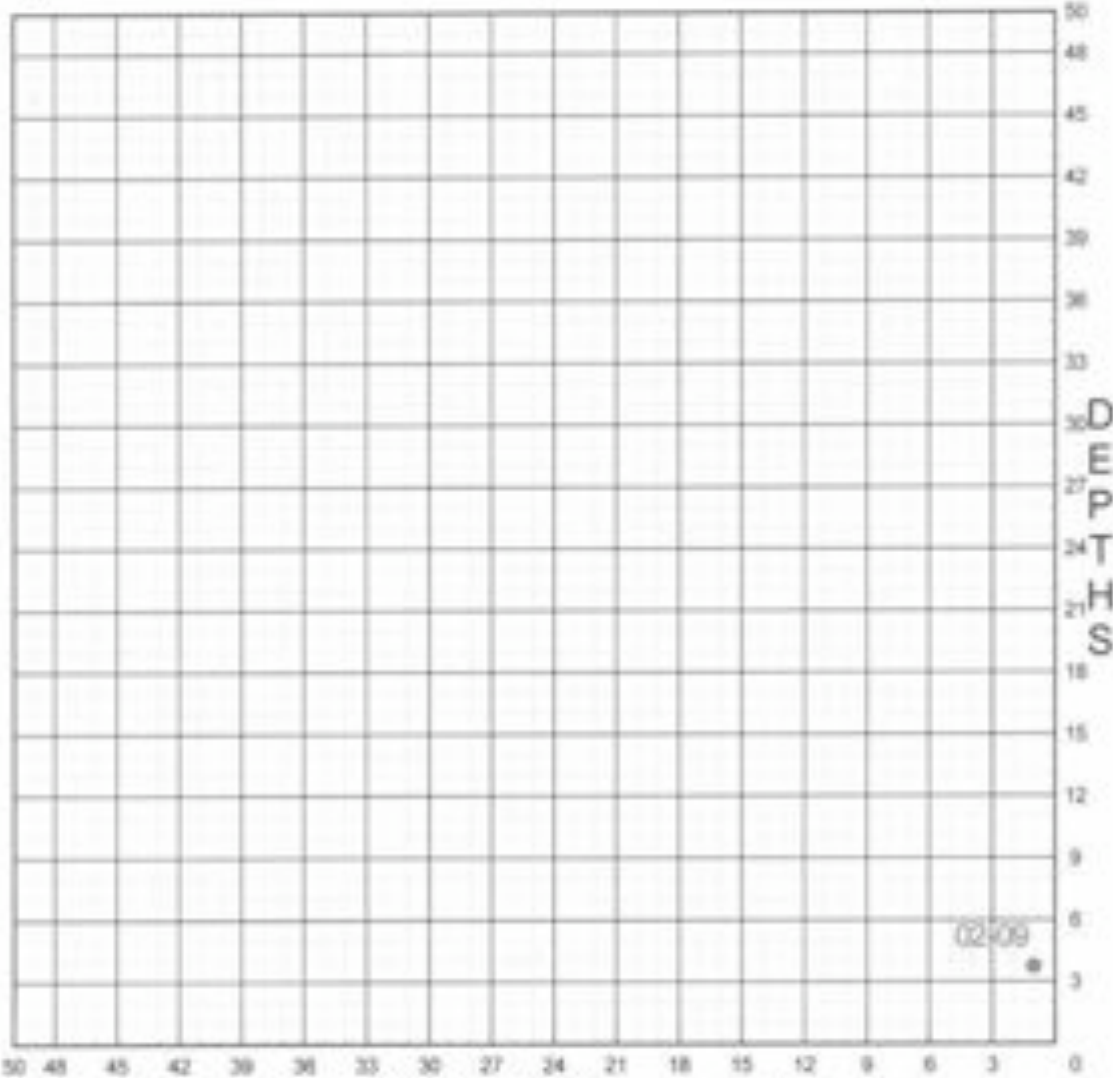


Use for grids in NW Quadrant only

GRID - NW 1 / 9

# SURVEY - AR9904

object	transect	depth	object	transect	depth
A. 02-09 Nail	01	3'09"	E.	/	/
B.	/	/	F.	/	/
C.	/	/	G.	/	/
D.	/	/	H.	/	/



TRANSECTS Surveyors Ed Scollon

**COORDINATES READ AS FOLLOWS:**

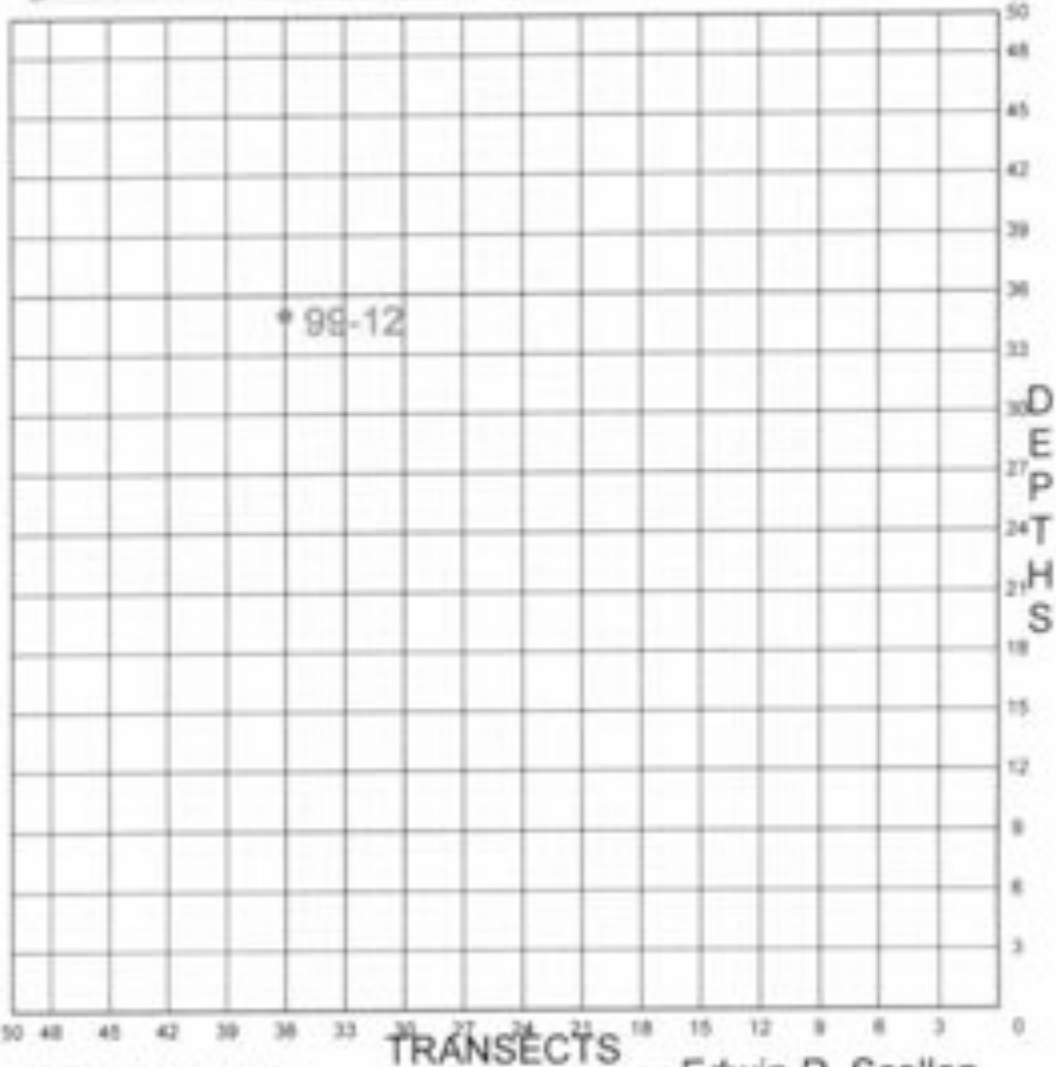
QUADRANT: NW ROW / COL: 1 / 1 TRANSECT: 12 DEPTH ON TRANSECT: 37' 4"

- For grids in East quadrant, transect markers are placed every 3' from west to east
- For grids in West quadrant, transect markers are placed every 3' from east to west
- For grids in North quadrant, depths are measured from south to north
- For grids in South quadrant, depths are measured from north to south
- Each grid measures 50' by 50' and measurements are subject to above rules

Use for grids in NW Quadrant only  
**GRID - NW 2/ 1**

# SURVEY - AR9904

object	transect	depth	object	transect	depth
A 99-12 Grape Shot	36	35'0"	E		
B	/	/	F	/	/
C	/	/	G	/	/
D	/	/	H	/	/



COORDINATES READ AS FOLLOWS

QUADRANT ROW / BOX TRANSECT DEPTH ON TRANSECT  
 NW 1 / 1 12 30 4'

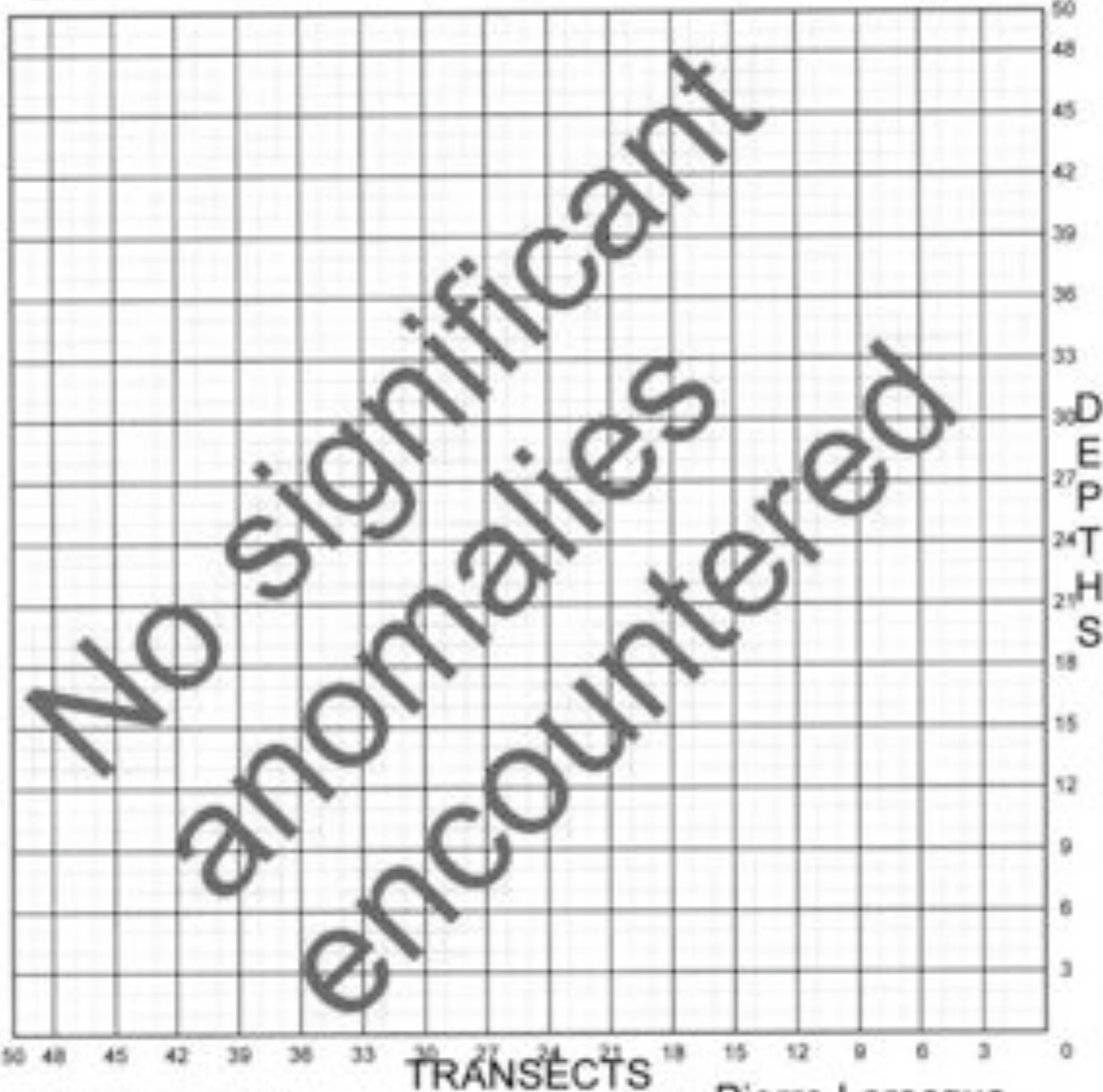
- For grids in East quadrant, transect markers are placed every 3' from west to east
- For grids in West quadrant, transect markers are placed every 3' from east to west
- For grids in North quadrant, depths are measured from south to north
- For grids in South quadrant, depths are measured from north to south
- Each grid measures 30' by 30' and measurements are subject to above rules

Surveyors **Edwin R. Scollon**

Use for grids in NW Quadrant only  
**GRID - NW 2/2**

# SURVEY - AR9904

object	transect	depth	object	transect	depth
A	/		E	/	
B	/		F	/	
C	/		G	/	
D	/		H	/	



**COORDINATES READ AS FOLLOWS**

QUADRANT ROW / BOX TRANSECT DEPTH ON TRANSECT  
 NW 1 / 1 12 30 4'

For grids in East quadrant: transect markers are placed every 3' from west to east  
 For grids in West quadrant: transect markers are placed every 3' from east to west  
 For grids in North quadrant: depths are measured from south to north  
 For grids in South quadrant: depths are measured from north to south  
 Each grid measures 50' by 50' and measurements are subject to above rules

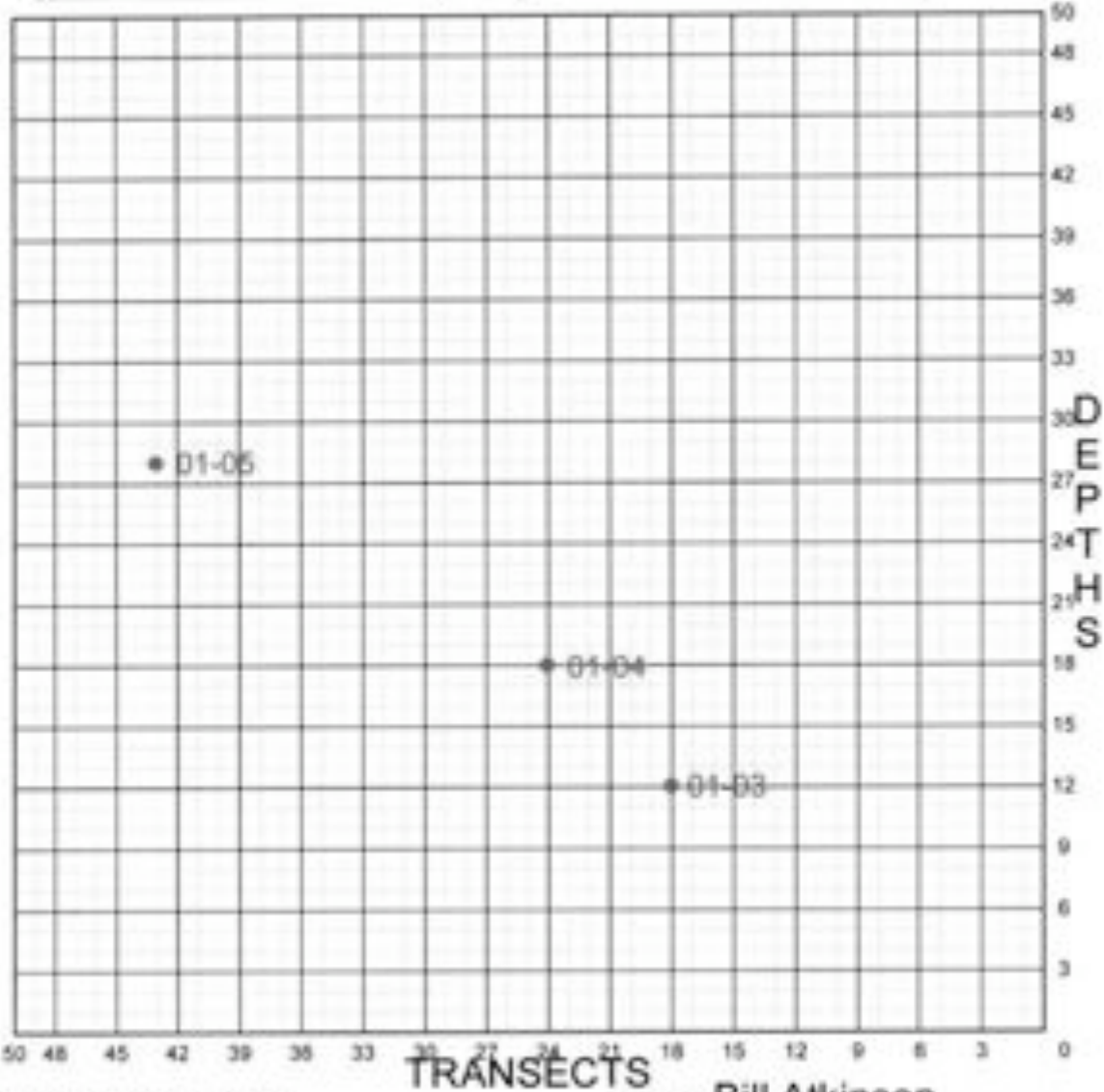
Surveyors **Pierre Larocque**  
**Bill Atkinson**  
**Adam Kane**  
**Rob Wilczynski**



Use for grids in NW Quadrant only  
**GRID - NW 2 / 3**

# SURVEY - AR9904

object	transect	depth	object	transect	depth
A. 01-03 Cannon Fragment	18	12'00"	E.		f
B. 01-04 Cannon Fragment	24	18'00"	F.		f
C. 01-05 6lb round shot	43	28'00"	G.		f
D.			H.		f



COORDINATES READ AS FOLLOWS

QUADRANT ROW / BOX TRANSECT DEPTH ON TRANSECT  
 MV 1 / 1 12 30' 4"

For grids in East quadrant: transect markers are placed every 3 from west to east  
 For grids in West quadrant: transect markers are placed every 3 from east to west  
 For grids in North quadrant: depths are measured from south to north  
 For grids in South quadrant: depths are measured from north to south  
 Each grid measures 50' by 50' and measurements are subject to above rules

Surveyors **Bill Atkinson**  
**Matt Booth**  
**Bill Leege**  
**Pierre LaRocque**

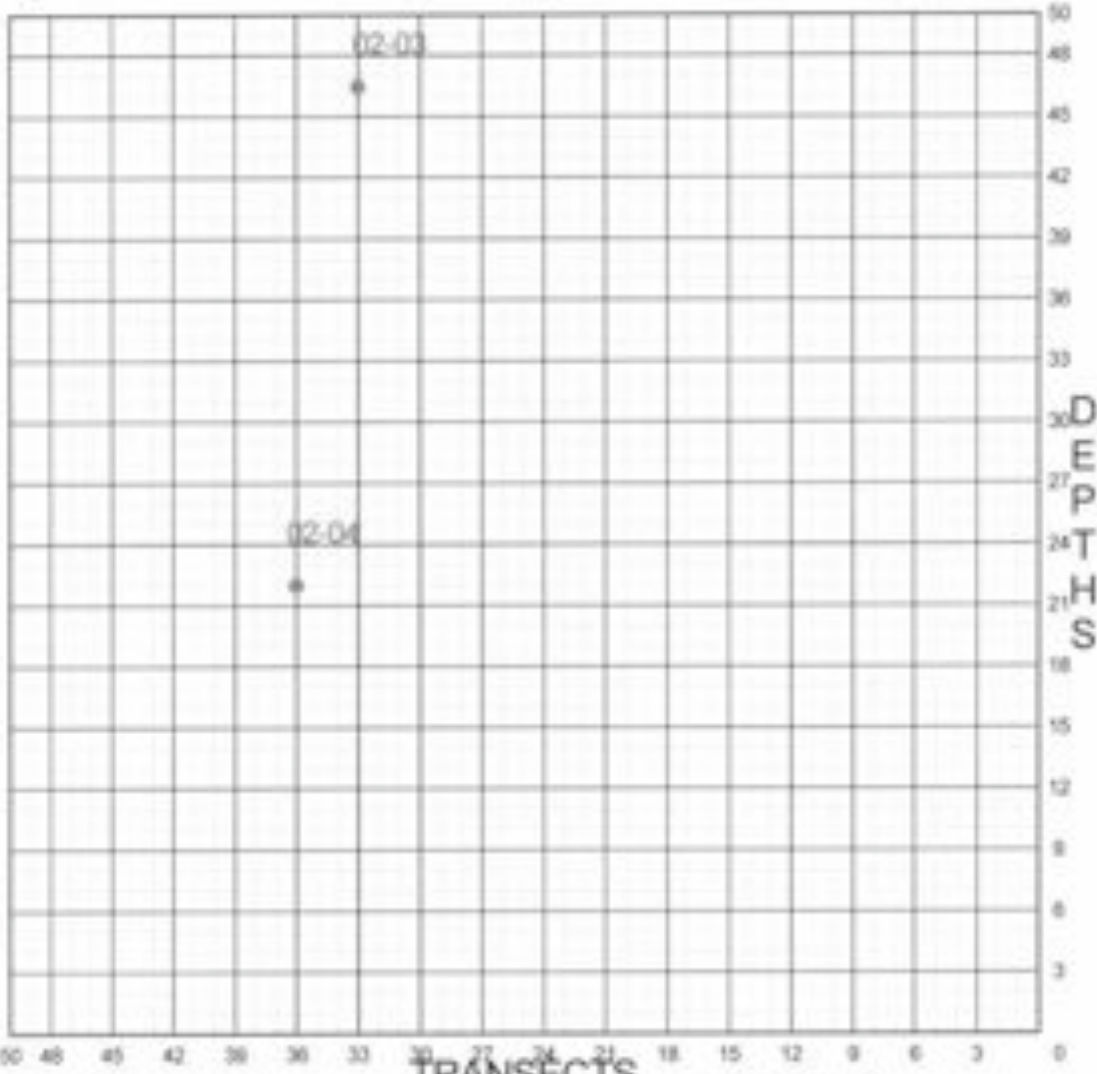


Use for grids in NW Quadrant only

GRID - NW 2/4

# SURVEY - AR9904

object	transect	depth	object	transect	depth
A 02-03 Bomb	33	46'06" E			
B 02-04 Bomb	36	22'00" F			
C			G		
D			H		

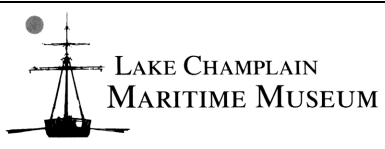


COORDINATES READ AS FOLLOWS

QUADRANT    ROW/BOX    TRANSECT    DEPTH ON TRANSECT  
 NW            1 / 1            12            22' 4"

For grids in East quadrant: transect markers are placed every 3' from west to east  
 For grids in West quadrant: transect markers are placed every 3' from east to west  
 For grids in North quadrant: depths are measured from south to north  
 For grids in South quadrant: depths are measured from north to south  
 Each grid measures 50' by 50' and measurements are subject to above rules

Surveyors **Bill Leege**  
**Art Cohn**  
**Erick Tichonuk**  
**Sarah Lyman**



Use for grids in NW Quadrant only  
**GRID - NW 2/5**

**SURVEY - AR9904**

object	transect	depth	object	transect	depth
A	/	/	E	/	/
B	/	/	F	/	/
C	/	/	G	/	/
D	/	/	H	/	/



COORDINATES READ AS FOLLOWS

QUADRANT ROW/BOX TRANSECT DEPTH-ON-TRANSECT  
 NW 1 / 1 12 30' 0"

For grids in East quadrant: transect markers are placed every 2' from west to east  
 For grids in West quadrant: transect markers are placed every 2' from east to west  
 For grids in North quadrant: depths are measured from south to north  
 For grids in South quadrant: depths are measured from north to south  
 Each grid measures 50' by 50' and measurements are subject to above rules

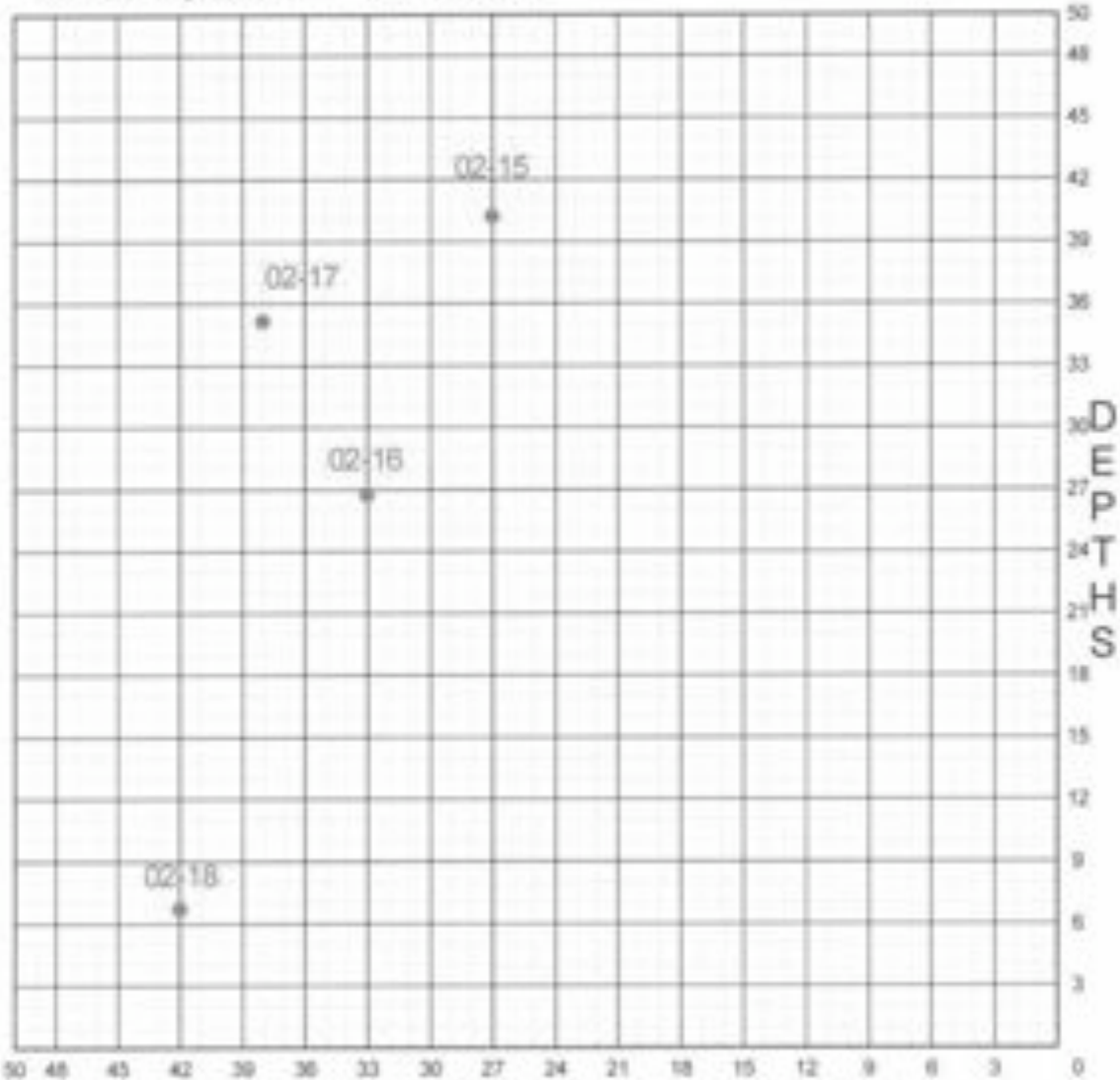
Surveyors **Pierre LaRocque**  
**Matt Booth**  
**Sarah Brigadier**  
**Erick Tichonuk**

Use for grids in NW Quadrant only

**GRID - NW 2 / 6**

**SURVEY - AR9904**

object	transect	depth	object	transect	depth
A 02-15 Lead Pellet	27	40'03"	E		
B 02-16 Grape Shot	33	26'10"	F		
C 02-17 Grape Shot	38	35'02"	G		
D 02-18 Grape Shot	42	6'08"	H		



COORDINATES READ AS FOLLOWS

QUADRANT ROW/BOX TRANSECT DEPTH ON TRANSECT

NW 1 / 1 12 30.4'

For grids in East quadrant: transect markers are placed every 2' from west to east  
 For grids in West quadrant: transect markers are placed every 2' from east to west  
 For grids in North quadrant: depths are measured from south to north  
 For grids in South quadrant: depths are measured from north to south  
 Each grid measures 50' by 50' and measurements are subject to above rules

TRANSECTS Surveyors Ed Scollon

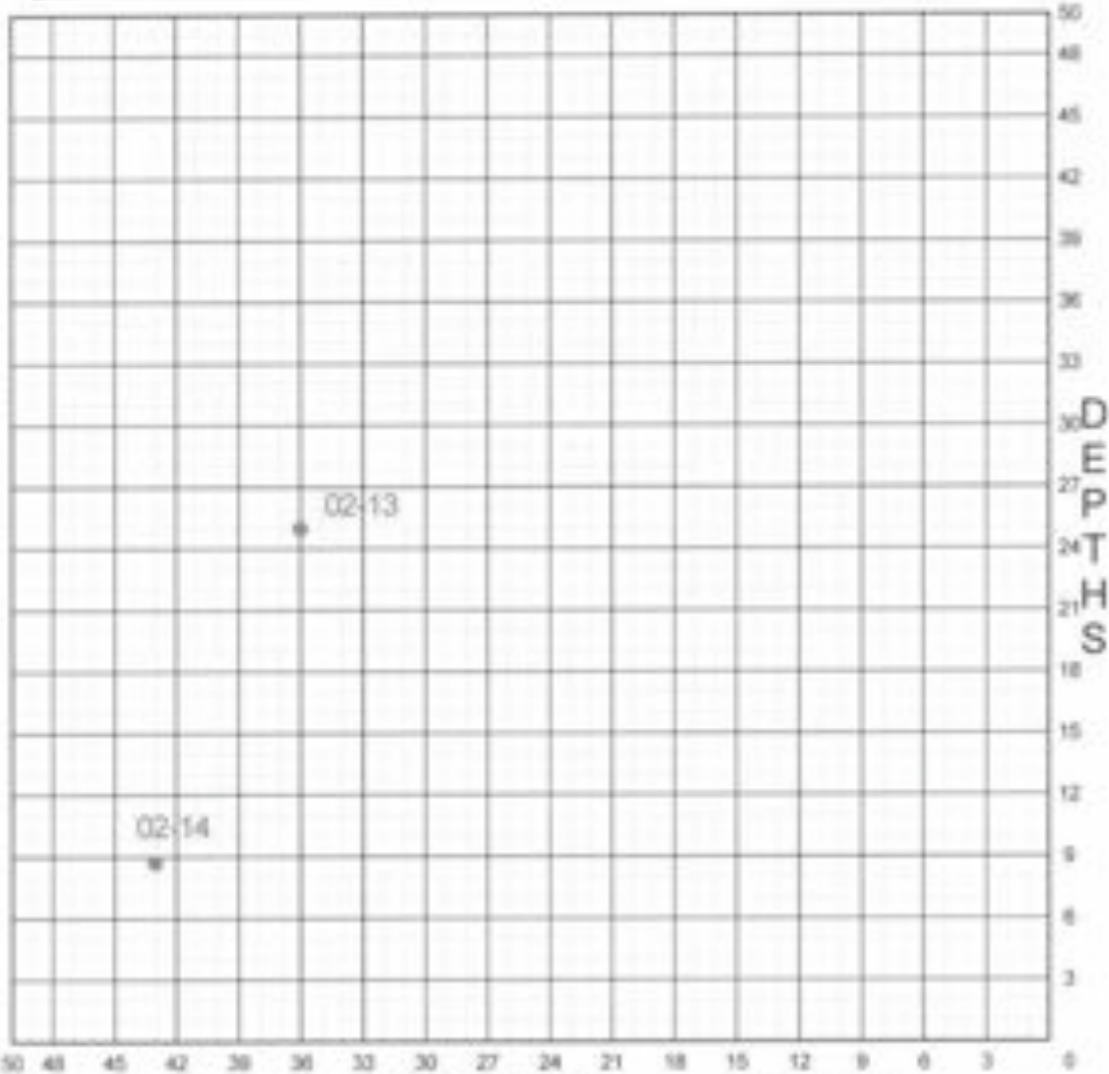


Use for grids in NW Quadrant only

**GRID - NW 2 / 7**

**SURVEY - AR9904**

object	transect	depth	object	transect	depth
A 02-13 Tin Fragment	36	25'00" E			
B 02-14 Copper Fragment	43	8'08" F			
C			G		
D			H		



COORDINATES READ AS FOLLOWS

**TRANSECTS**

Surveyors

QUADRANT ROW / BOX TRANSECT DEPTH ON TRANSECT  
 NW T / T 12 20' 4"

For grids in East quadrant, transect markers are placed every 2' from west to east  
 For grids in West quadrant, transect markers are placed every 2' from east to west  
 For grids in North quadrant, depths are measured from south to north  
 For grids in South quadrant, depths are measured from north to south  
 Each grid measures 50' by 50' and measurements are subject to above rules

Adam Kane  
 Sarah Brigadier  
 Rob Wilczynski  
 Chris Fox



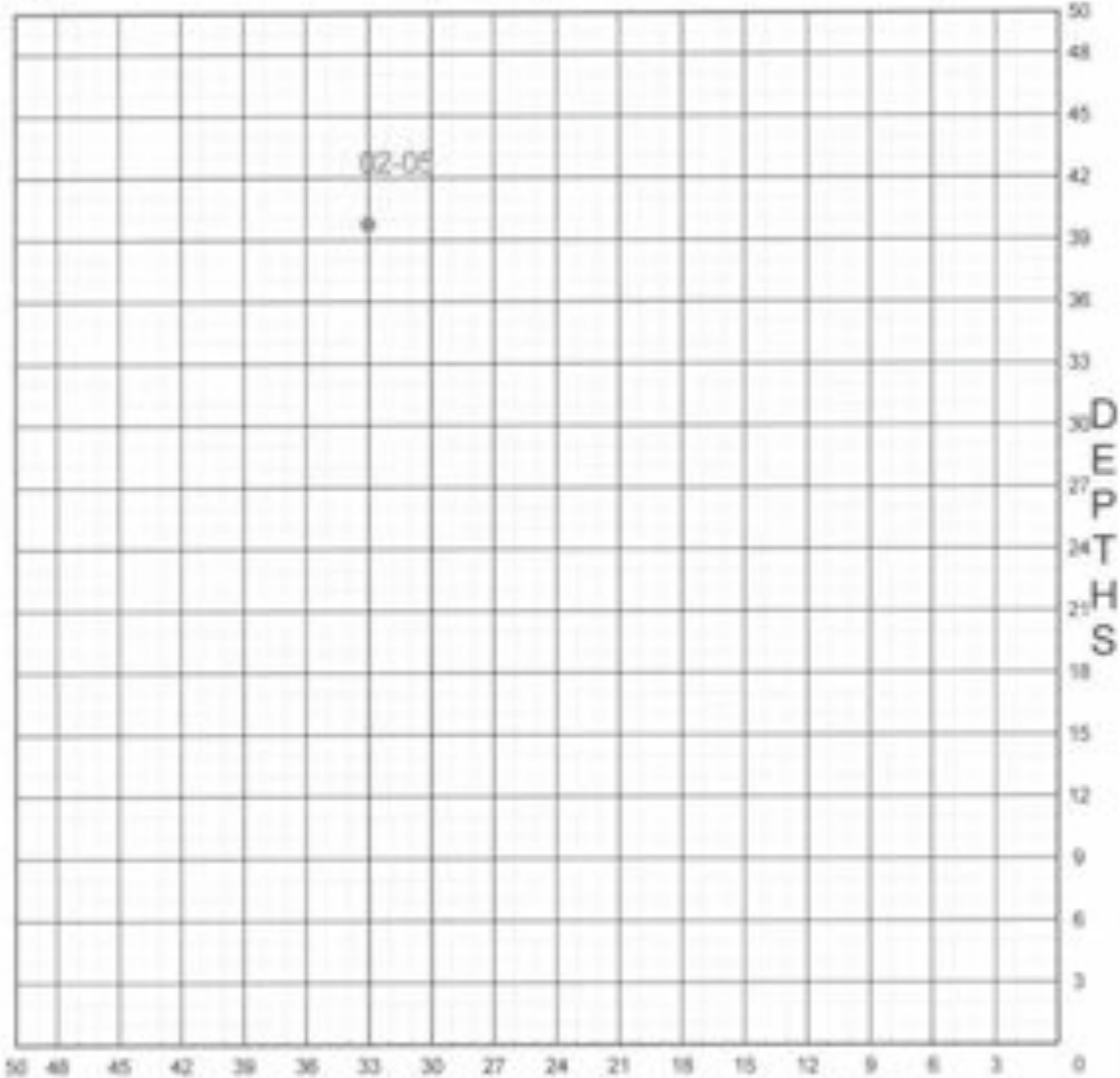


Use for grids in NW Quadrant only

GRID - NW 2/8

# SURVEY - AR9904

object	transect	depth	object	transect	depth
A. 02-05 Nail	33	39'09" E			
B.	/		F.	/	
C.	/		G.	/	
D.	/		H.	/	



COORDINATES READ AS FOLLOWS

QUADRANT ROW/BOX TRANSECT DEPTH ON TRANSECT

NW 2 / 8 33 39' 09"

For grids in East quadrant: transect markers are placed every 3' from west to east  
 For grids in West quadrant: transect markers are placed every 3' from east to west  
 For grids in North quadrant: depths are measured from south to north  
 For grids in South quadrant: depths are measured from north to south  
 Each grid measures 50' by 50' and measurements are subject to above rules.

TRANSECTS

Surveyors

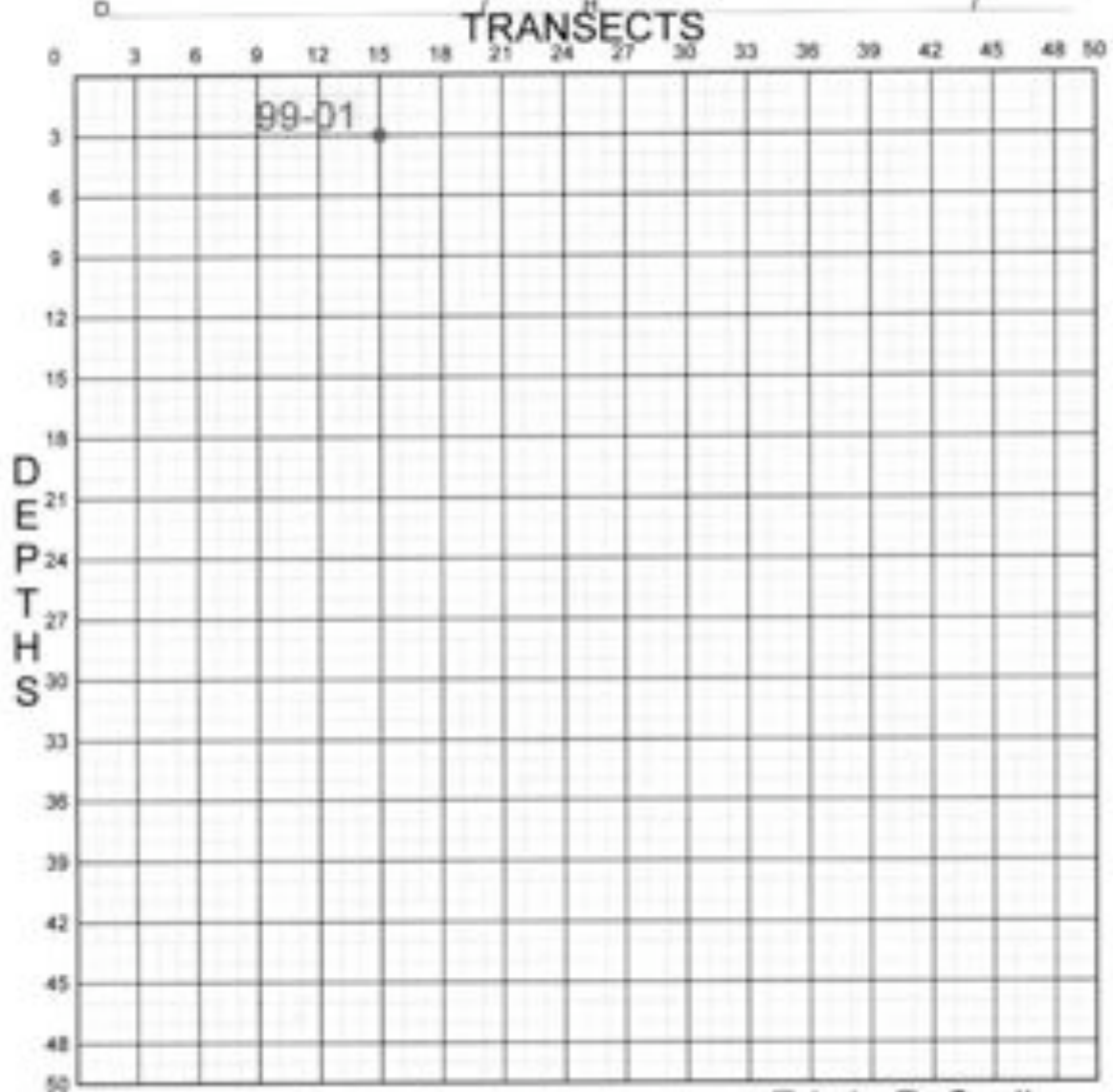
Pierre LaRocque  
 Todd Bissonette  
 Erick Tichonuk  
 Sarah Lyman



Use for grids in SE Quadrant only  
**GRID - SE 1 / 1**

# SURVEY - AR9904

object	transect	depth	object	transect	depth
A. 99-01 Cannon	15	3	E.		
B.			F.		
C.			G.		
D.					



**COORDINATES READ AS FOLLOWS**

QUADRANT ROW / BOX TRANSECT DEPTH ON TRANSECT  
 NW 1 / 1 12 35 4'

For grids in East quadrant: transect markers are placed every 3' from west to east  
 For grids in West quadrant: transect markers are placed every 3' from east to west  
 For grids in North quadrant: depths are measured from south to north  
 For grids in South quadrant: depths are measured from north to south  
 Each grid measures 50' by 50' and measurements are subject to above rules

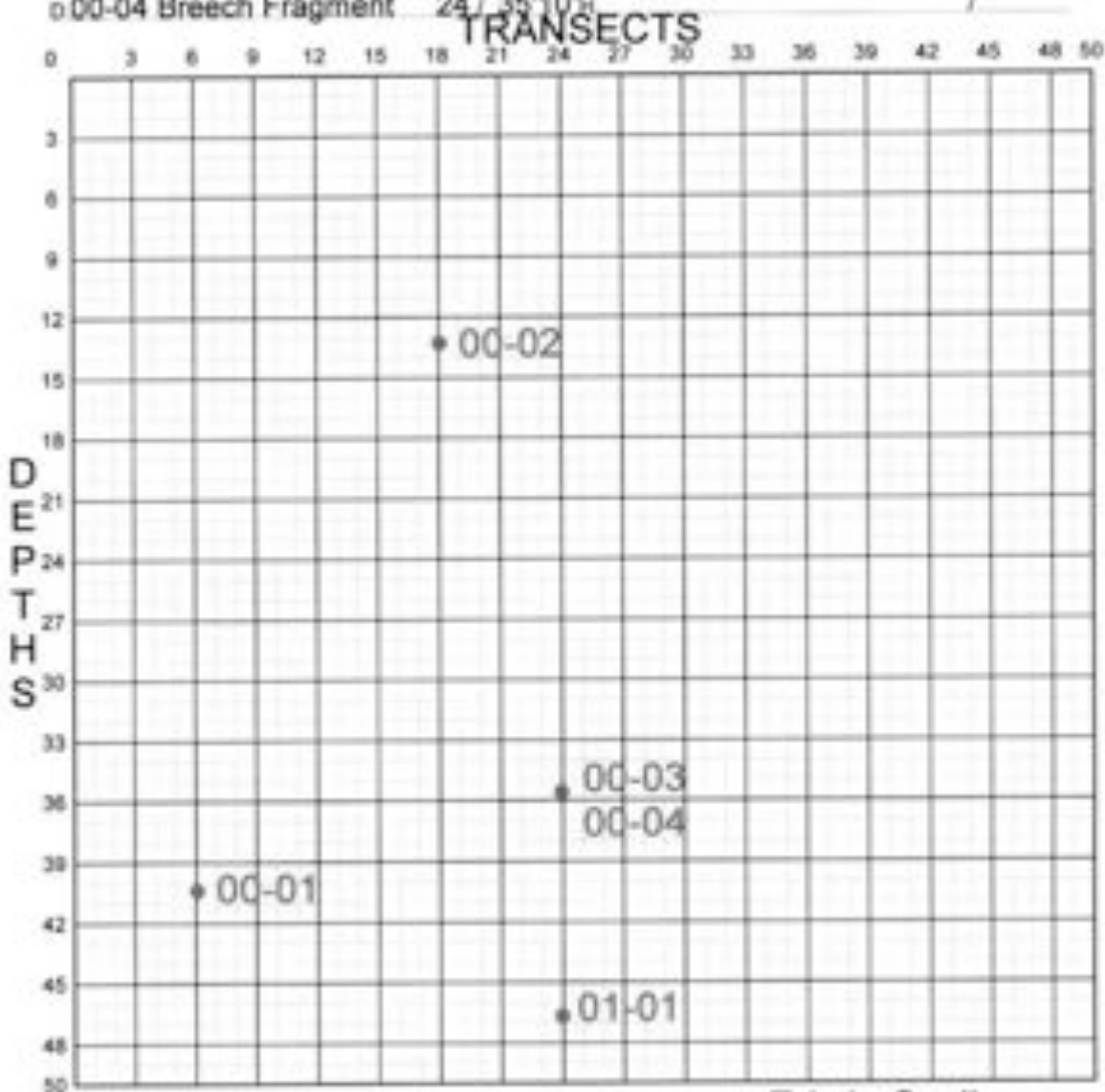
Surveyors **Edwin R. Scollon**  
**Timmy Aubin**  
**Steve Nye**  
**Anthony Tyrell**



Use for grids in SE Quadrant only  
**GRID - SE 172**

# SURVEY - AR9904

object	transect	depth	object	transect	depth
A.00-01 Carriage Fragment	6	40'6"	E.01-01 Lead Bushing	24	46'10"
B.00-02 Round Shot	18	13'4"			
C.00-03 Thimble	24	35'10"			
D.00-04 Breech Fragment	24	35'10"			



COORDINATES READ AS FOLLOWS

QUADRANT ROW / BOX TRANSECT DEPTH ON TRANSECT  
 NW 1 / 1 12 30' 4"  
 For grids in East quadrant: transect markers are placed every 3' from west to east  
 For grids in West quadrant: transect markers are placed every 3' from east to west  
 For grids in North quadrant: depths are measured from south to north  
 For grids in South quadrant: depths are measured from north to south  
 Each grid measures 50' by 50' and measurements are subject to above rules

Surveyors **Edwin Scollon**  
**Erick Tichonuk**  
**Todd Bissonette**  
**Phil LaMarche**



Use for grids in SE Quadrant only  
**GRID - SE 1/3**

# SURVEY - AR9904

object	transect	depth	object	transect	depth
A	/	/	E	/	/
B	/	/	F	/	/
C	/	/	G	/	/
D	/	/	H	/	/



COORDINATES READ AS FOLLOWS

QUADRANT ROW / BOX TRANSECT DEPTH ON TRANSECT  
 NW 1 / 1 12 30 4'

For grids in East quadrant: transect markers are placed every 3' from west to east  
 For grids in West quadrant: transect markers are placed every 3' from east to west  
 For grids in North quadrant: depths are measured from south to north  
 For grids in South quadrant: depths are measured from north to south  
 Each grid measures 50' by 50' and measurements are subject to above rules

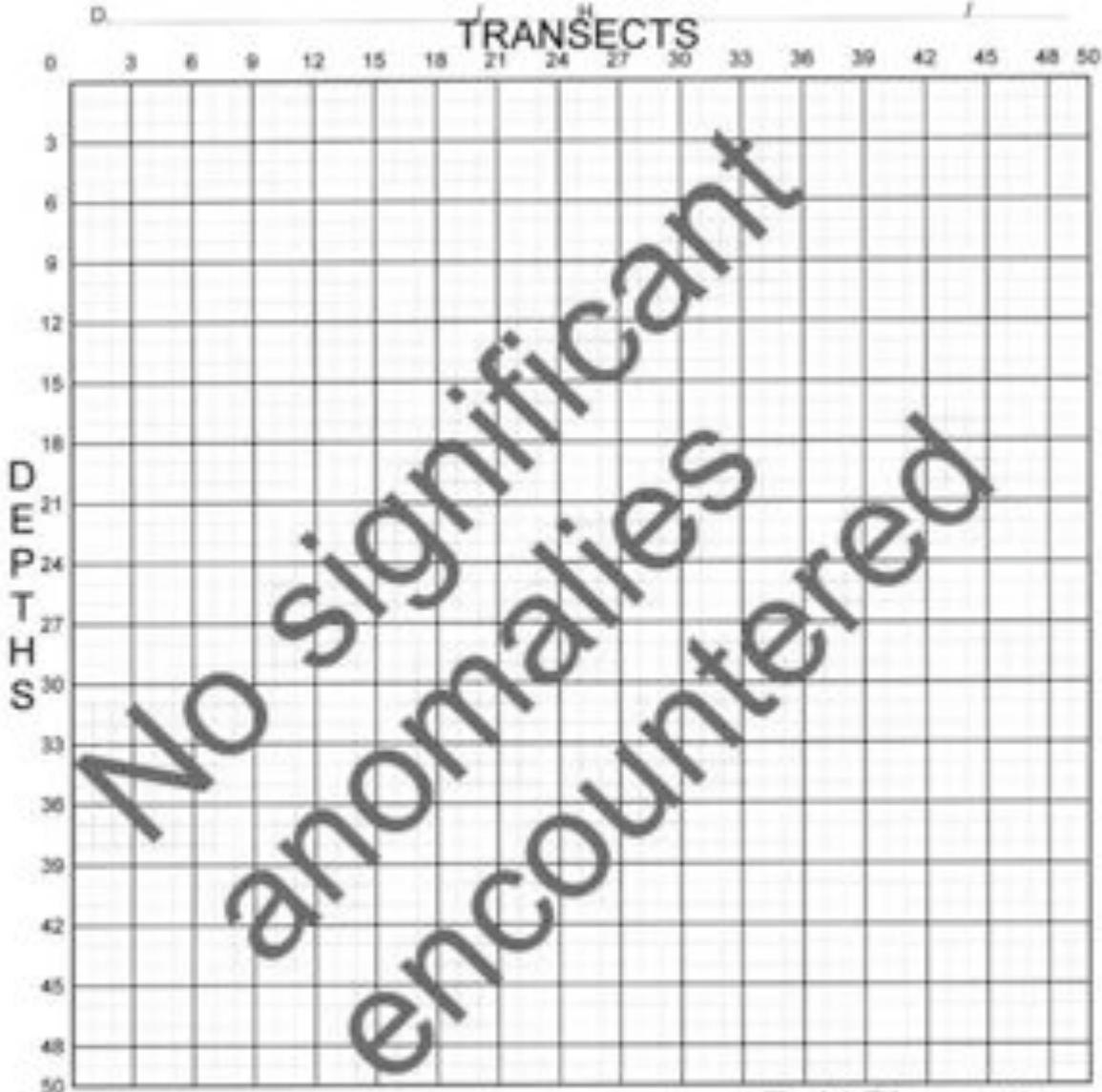
Surveyors Art Cohn  
John Butler  
Tom Keefe  
Tony Tyrell



Use for grids in SE Quadrant only  
**GRID - SE 2 / 1**

# SURVEY - AR9904

object	transect	depth	object	transect	depth
A	/		E	/	
B	/		F	/	
C	/		G	/	
D	/			/	



COORDINATES READ AS FOLLOWS

QUADRANT ROW / BOX TRANSECT DEPTH ON TRANSECT  
 MV 1 / 1 12 30' 4"

For grids in East quadrant: transect markers are placed every 3' from east to west  
 For grids in West quadrant: transect markers are placed every 3' from east to west  
 For grids in North quadrant: depths are measured from south to north  
 For grids in South quadrant: depths are measured from north to south  
 Each grid measures 50' by 50' and measurements are subject to above rules

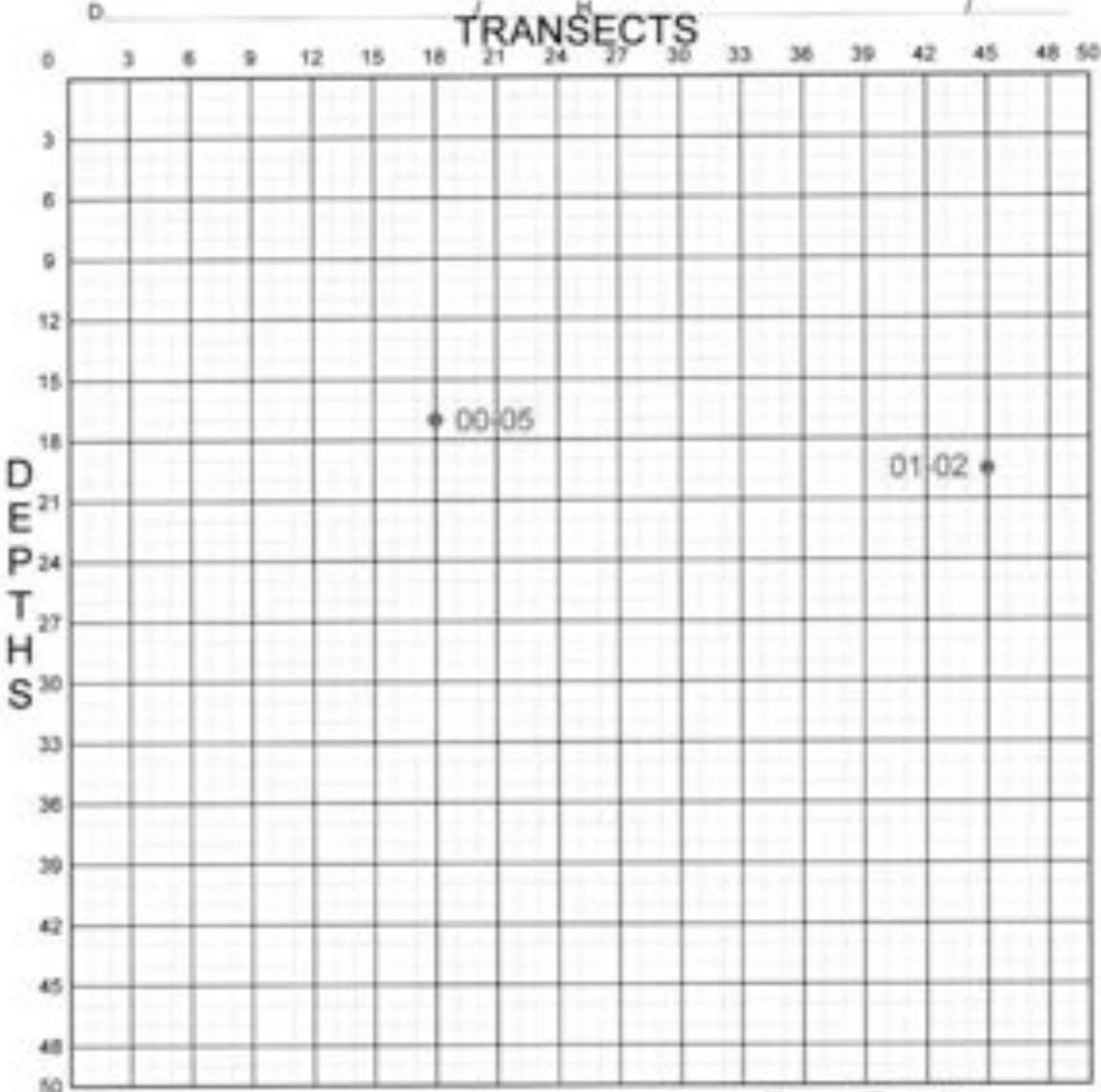
Surveyors **Todd Bissonette**  
**Art Cohn**  
**Steve Nye**  
**Matt Booth**



Use for grids in S/E Quadrant only  
**GRID - SE 2/2**

# SURVEY - AR9904

object	transect	depth	object	transect	depth
A 00-05 Breech Fragment	18	17'0"	E		/
B 01-02 Sword	45	19'6"	F		/
C	/	/	G		/
D	/	/	H		/



**COORDINATES READ AS FOLLOWS**  
 QUADRANT ROW / BOX TRANSECT DEPTH ON TRANSECT  
 NW 1 / 1 12 30' 4"

For grids in East quadrant: transect markers are placed every 3' from west to east  
 For grids in West quadrant: transect markers are placed every 3' from east to west  
 For grids in North quadrant: depths are measured from south to north  
 For grids in South quadrant: depths are measured from north to south  
 Each grid measures 50' by 50' and measurements are subject to above rules

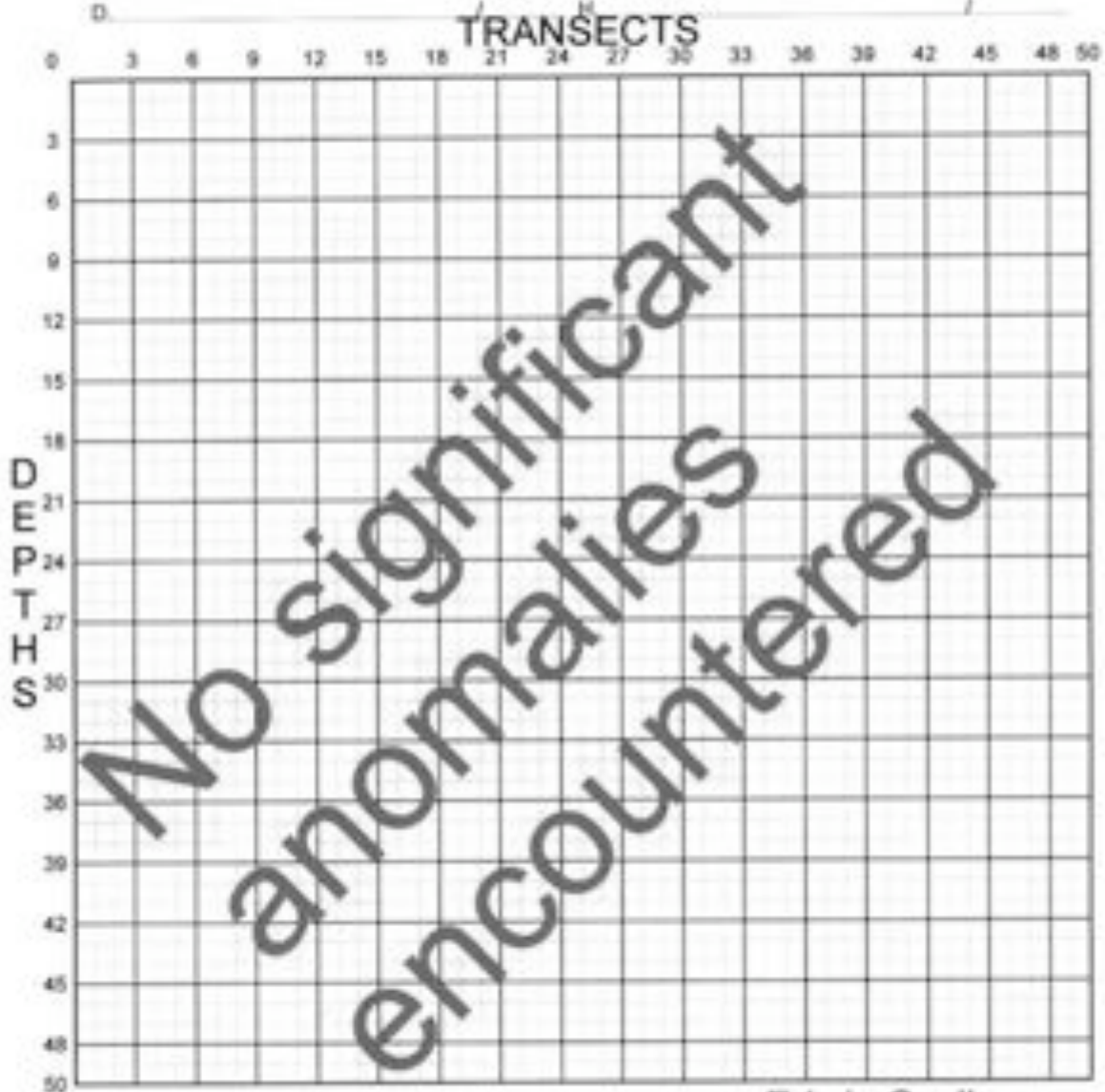
Surveyors: **Tony Tyrell**  
**Erick Tichonuk**  
**Steve Nye**  
**Todd Bissonette**



Use for grids in SE Quadrant only  
**GRID - SE 2 / 3**

# SURVEY - AR9904

object	transect	depth	object	transect	depth
A	/		E	/	
B	/		F	/	
C	/		G	/	
D	/			/	



COORDINATES READ AS FOLLOWS

QUADRANT ROW / COL TRANSECT DEPTH ON TRANSECT  
 MV 1 / 1 12 35 4'

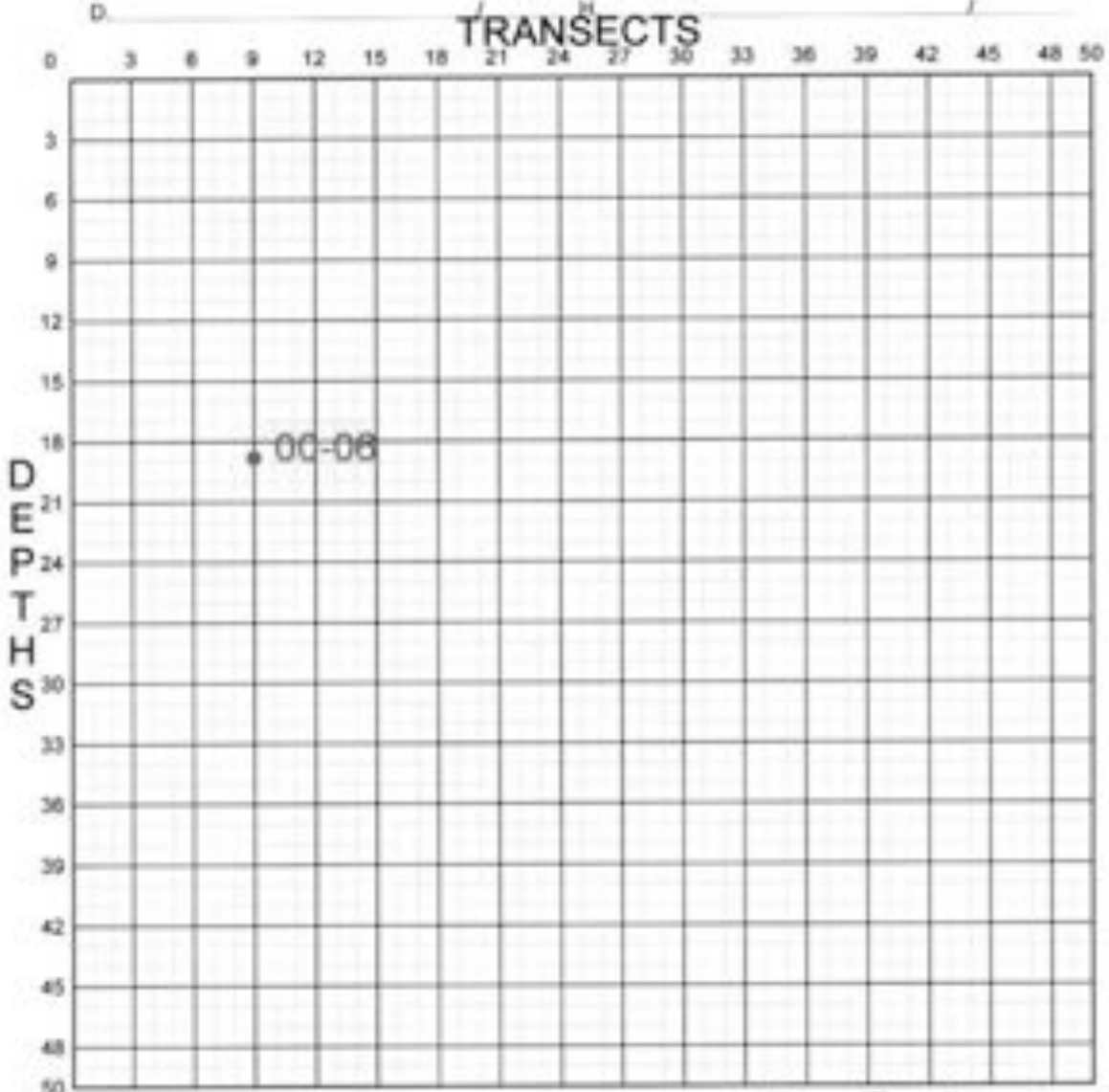
For grids in East quadrant: transect markers are placed every 3' from west to east  
 For grids in West quadrant: transect markers are placed every 3' from east to west  
 For grids in North quadrant: depths are measured from south to north  
 For grids in South quadrant: depths are measured from north to south  
 Each grid measures 50' by 50' and measurements are subject to above rules

Surveyors Edwin Scollon  
Jerry Forkey  
Matt Booth

Use for grids in SE Quadrant only  
**GRID - SE 3 / 1**

# SURVEY - AR9904

object	transect	depth	object	transect	depth
A. 00-06 Sword Fragment	9	18'10"			
B. _____	/		F. _____	/	
C. _____	/		G. _____	/	
D. _____	/			/	



**COORDINATES READ AS FOLLOWS**

QUADRANT ROW / BOX TRANSECT DEPTH ON TRANSECT  
 NW 1 / 1 12 30 4"

For grids in East quadrant: transect markers are placed every 3' from west to east  
 For grids in West quadrant: transect markers are placed every 3' from east to west  
 For grids in North quadrant: depths are measured from south to north  
 For grids in South quadrant: depths are measured from north to south  
 Each grid measures 50' by 50' and measurements are subject to above rules

Surveyors: **Tony Tyrell** \_\_\_\_\_  
**Jerry Forkey** \_\_\_\_\_  
**Matt Booth** \_\_\_\_\_  
**Edwin Scollon** \_\_\_\_\_





Use for grids in S/E Quadrant only

GRID - SE 3 / 2

# SURVEY - AR9904

object	transect	depth	object	transect	depth
A	/		E	/	
B	/		F	/	
C	/		G	/	
D	/			/	



COORDINATES READ AS FOLLOWS

QUADRANT ROW / BOX TRANSECT DEPTH ON TRANSECT

MV 1 / 1 12 30 4"

For grids in East quadrant: transect markers are placed every 3' from west to east  
 For grids in West quadrant: transect markers are placed every 3' from east to west  
 For grids in North quadrant: depths are measured from south to north  
 For grids in South quadrant: depths are measured from north to south  
 Each grid measures 50' by 50' and measurements are subject to above rules

Surveyors Edwin Scollon  
Jerry Forkey

Use for grids in S/E Quadrant only  
**GRID - SE 3 / 3**

# SURVEY - AR9904

object	transect	depth	object	transect	depth
A. _____	_____	_____	E. _____	_____	_____
B. _____	_____	_____	F. _____	_____	_____
C. _____	_____	_____	G. _____	_____	_____
D. _____	_____	_____		_____	_____



COORDINATES READ AS FOLLOWS

QUADRANT ROW / BOX TRANSECT DEPTH ON TRANSECT

NW 1 / 1 12 35 4'

For grids in East quadrant: transect markers are placed every 3' from west to east

For grids in West quadrant: transect markers are placed every 3' from east to west

For grids in North quadrant: depths are measured from south to north

For grids in South quadrant: depths are measured from north to south

Each grid measures 50' by 50' and measurements are subject to above rules

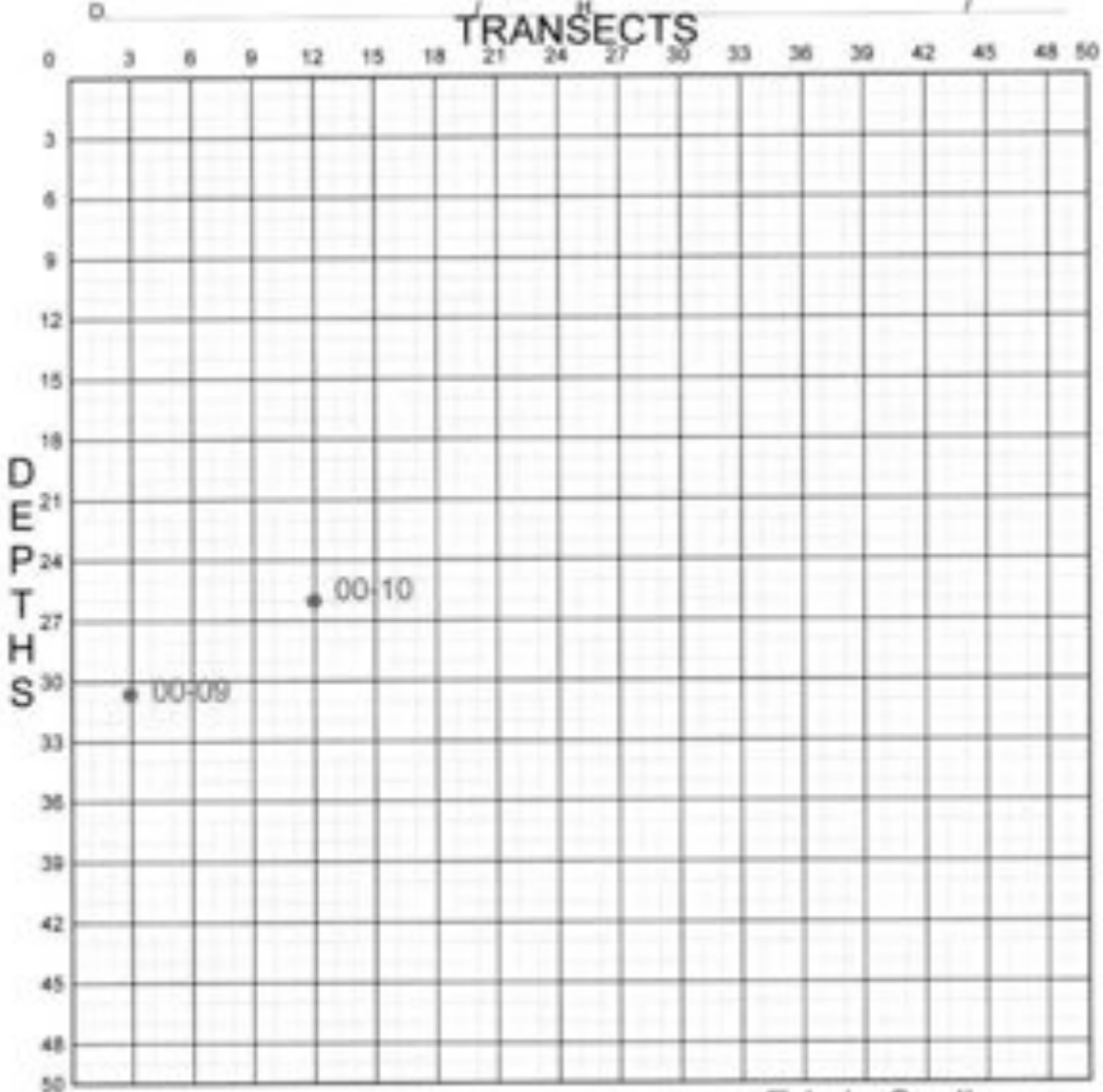
Surveyors **Edwin Scollon** \_\_\_\_\_  
**Jerry Forkey** \_\_\_\_\_  
**Matt Booth** \_\_\_\_\_  
**Tony Tyrell** \_\_\_\_\_



Use for grids in SE Quadrant only  
**GRID - SE 4 / 1**

# SURVEY - AR9904

object	transect	depth	object	transect	depth
A.00-09 Grapeshot	3	30'8" E.			
B.00-10 Grapeshot	12	26'1" F.			
C.			G.		
D.					



COORDINATES READ AS FOLLOWS

QUADRANT ROW / BOX TRANSECT DEPTH ON TRANSECT  
 NW 1 1 12 30'4"

- For grids in East quadrant: transect markers are placed every 3' from west to east
- For grids in West quadrant: transect markers are placed every 3' from east to west
- For grids in North quadrant: depths are measured from south to north
- For grids in South quadrant: depths are measured from north to south
- Each grid measures 50' by 50' and measurements are subject to above rules

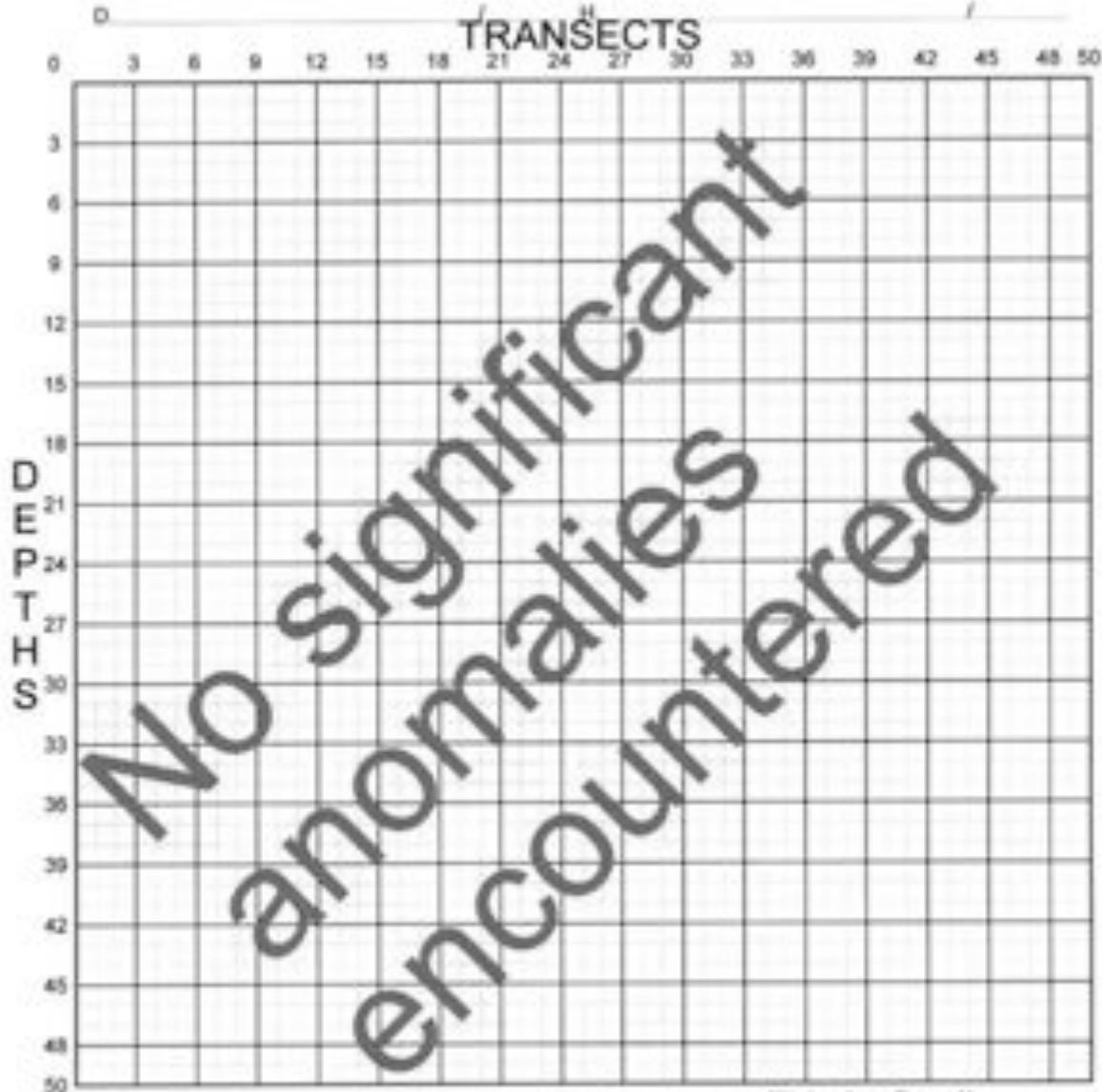
Surveyors **Edwin Scollon**



Use for grids in SE Quadrant only  
**GRID - SE 4 / 2**

# SURVEY - AR9904

object	transect	depth	object	transect	depth
A	_____	f	E	_____	f
B	_____	f	F	_____	f
C	_____	f	G	_____	f
D	_____	f	H	_____	f



COORDINATES READ AS FOLLOWS

Surveyors **Edwin Scollon** \_\_\_\_\_

QUADRANT ROW / BOX TRANSECT DEPTH ON TRANSECT  
 NW 1 / 1 12 33 4'

For grids in East quadrant: transect markers are placed every 3' from west to east  
 For grids in West quadrant: transect markers are placed every 3' from east to west  
 For grids in North quadrant: depths are measured from south to north  
 For grids in South quadrant: depths are measured from north to south  
 Each grid measures 50' by 50' and measurements are subject to above rules



Use for grids in S/E Quadrant only

GRID - SE 4 / 3

# SURVEY - AR9904

object	transect	depth	object	transect	depth
A		/	E		/
B		/	F		/
C		/	G		/
D		/			/



COORDINATES READ AS FOLLOWS

QUADRANT ROW / BOX TRANSECT DEPTH ON TRANSECT  
 SE 4 / 3 12 35' 4"

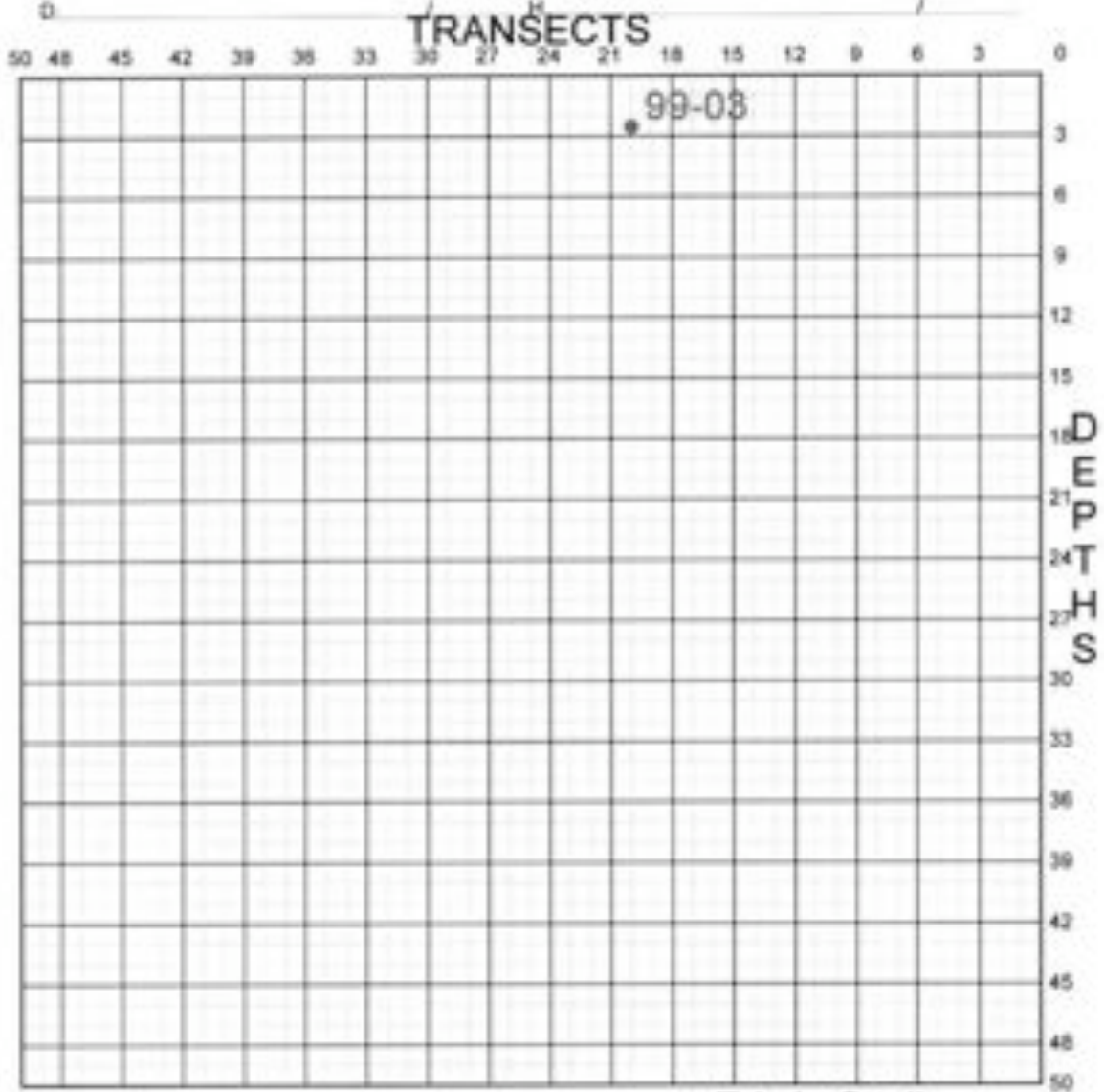
For grids in East quadrant: transect markers are placed every 3' from west to east  
 For grids in West quadrant: transect markers are placed every 3' from east to west  
 For grids in North quadrant: depths are measured from south to north  
 For grids in South quadrant: depths are measured from north to south  
 Each grid measures 50' by 50' and measurements are subject to above rules

Surveyors Edwin Scollon  
Matt Booth  
Roger Harwood

Use for grids in SW Quadrant only  
**GRID - SW 1 / 1**

# SURVEY - AR9904

object	transect	depth	object	transect	depth
A 99-03 6lb. Round Shot	20	2'06"	E		/
B	/	/	F	/	/
C	/	/	G	/	/
D	/	/		/	/



**COORDINATES READ AS FOLLOWS**

QUADRANT ROW / BOX TRANSECT DEPTH ON TRANSECT  
 NW 1 / 1 12 30 4"

For grids in East quadrant: transect markers are placed every 3' from west to east  
 For grids in West quadrant: transect markers are placed every 3' from east to west  
 For grids in North quadrant: depths are measured from south to north  
 For grids in South quadrant: depths are measured from north to south  
 Each grid measures 50' by 50' and measurements are subject to above rules

Surveyors **Edwin Scollon**  
**Anthony Tyrell**



Use for grids in SW Quadrant only  
**GRID - SW 1 / 2**

# SURVEY - AR9904

object	transect	depth	object	transect	depth
A	/		E	/	
B	/		F	/	
C	/		G	/	
D	/			/	



Surveyors **Edwin Scollon**

**COORDINATES READ AS FOLLOWS**

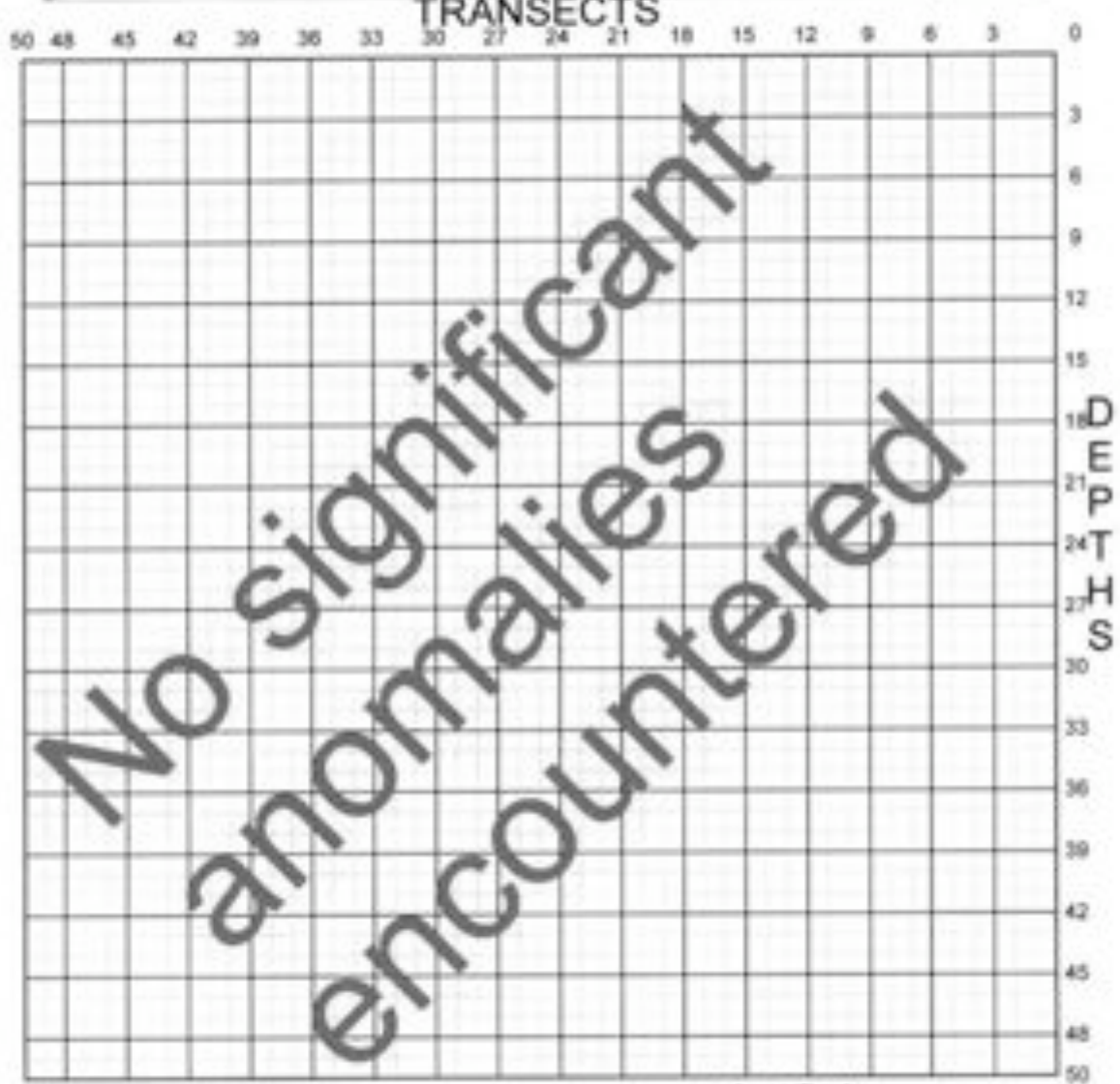
QUADRANT ROW / BOX TRANSECT DEPTH ON TRANSECT  
 MW 1 / 1 12 30 47  
 For grids in East quadrant: transect markers are placed every 3' from west to east  
 For grids in West quadrant: transect markers are placed every 3' from east to west  
 For grids in North quadrant: depths are measured from south to north  
 For grids in South quadrant: depths are measured from north to south  
 Each grid measures 50' by 50' and measurements are subject to above rules



Use for grids in SW Quadrant only  
**GRID - SW 1 / 3**

# SURVEY - AR9904

object	transect	depth	object	transect	depth
A. _____	/	_____	E. _____	/	_____
B. _____	/	_____	F. _____	/	_____
C. _____	/	_____	G. _____	/	_____
D. _____	/	_____	H. _____	/	_____



**COORDINATES READ AS FOLLOWS**

QUADRANT ROW / BOX TRANSECT DEPTH ON TRANSECT  
 NW 1 / 1 12 30 4'

For grids in East quadrant: transect markers are placed every 3' from west to east  
 For grids in West quadrant: transect markers are placed every 3' from east to west  
 For grids in North quadrant: depths are measured from south to north  
 For grids in South quadrant: depths are measured from north to south  
 Each grid measures 50' by 50' and measurements are subject to above rules

Surveyors Art Cohn  
Adam Kane  
Steve Nye  
Tom Keefe





Use for grids in SW Quadrant only  
**GRID - SW 1/5**

# SURVEY - AR9904

object	transect	depth	object	transect	depth
A		1	E		1
B		1	F		1
C		1	G		1
D		1	H		1



**COORDINATES READ AS FOLLOWS**

QUADRANT SW/SE TRANSECT DEPTH ON TRANSECT  
 SW 1 / 1 12 25 4'

For grids in East quadrant, transect markers are placed every 3' from west to east  
 For grids in West quadrant, transect markers are placed every 3' from east to west  
 For grids in North quadrant, depths are measured from south to north  
 For grids in South quadrant, depths are measured from north to south  
 Each grid measures 30' by 30' and measurements are subject to above rules

Surveyors **Matt Booth**  
**Erick Tichonuk**  
**Art Cohn**  
**Chris Fox**



Use for grids in SW Quadrant only  
**GRID - SW 2 / 1**

# SURVEY - AR9904

object	transect	depth	object	transect	depth
A.		/	E.		/
B.		/	F.		/
C.		/	G.		/
D.		/	H.		/

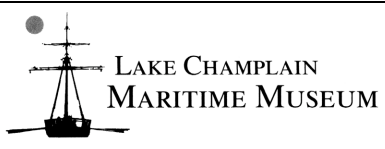


**COORDINATES READ AS FOLLOWS**

QUADRANT ROW / BOX TRANSECT DEPTH ON TRANSECT  
 NW 1 / 1 12 30' 4"

For grids in East quadrant: transect markers are placed every 2' from west to east  
 For grids in West quadrant: transect markers are placed every 2' from east to west  
 For grids in North quadrant: depths are measured from south to north  
 For grids in South quadrant: depths are measured from north to south  
 Each grid measures 50' by 50' and measurements are subject to above rules

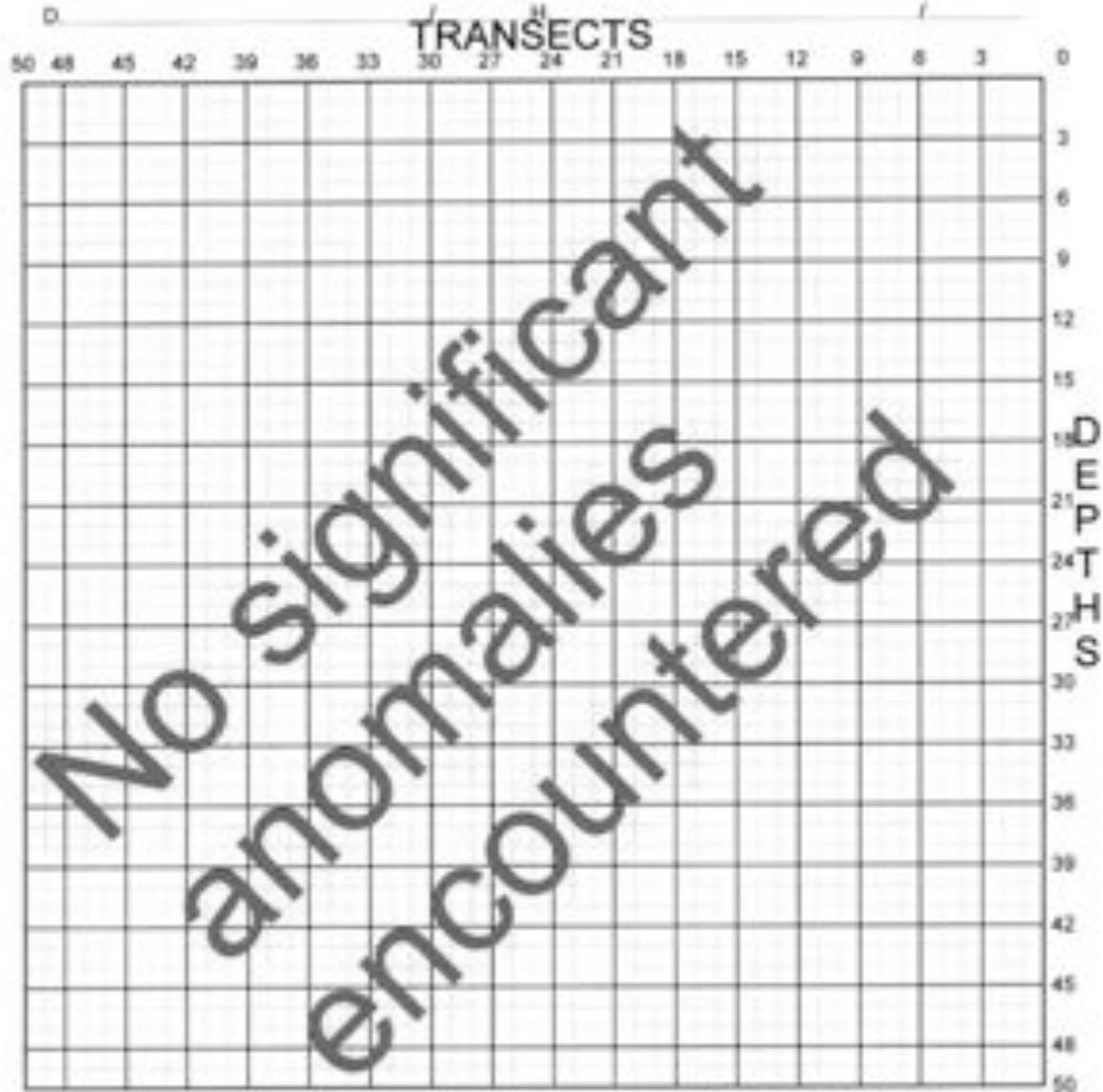
Surveyors **Edwin Scollon** \_\_\_\_\_  
**Tony Tyrell** \_\_\_\_\_  
**Greg Brunet** \_\_\_\_\_  
**Jerry Forkey** \_\_\_\_\_



Use for grids in SW Quadrant only  
**GRID - SW 2 / 2**

# SURVEY - AR9904

object	transect	depth	object	transect	depth
A. _____	/		E. _____	/	
B. _____	/		F. _____	/	
C. _____	/		G. _____	/	
D. _____	/		H. _____	/	



COORDINATES READ AS FOLLOWS

QUADRANT ROW / BOX TRANSECT DEPTH ON TRANSECT  
 MV 1 / 1 12 30' 4"

For grids in East quadrant: transect markers are placed every 3' from west to east  
 For grids in West quadrant: transect markers are placed every 3' from east to west  
 For grids in North quadrant: depths are measured from south to north  
 For grids in South quadrant: depths are measured from north to south  
 Each grid measures 50' by 50' and measurements are subject to above rules

Surveyors **Edwin Scollon** \_\_\_\_\_  
**Matt Booth** \_\_\_\_\_  
**Tony Tyrell** \_\_\_\_\_

Use for grids in SW Quadrant only  
**GRID - SW 2 / 3**  
 object                      transect    depth

# SURVEY - AR9904

A. \_\_\_\_\_ / \_\_\_\_\_ E. \_\_\_\_\_ / \_\_\_\_\_  
 B. \_\_\_\_\_ / \_\_\_\_\_ F. \_\_\_\_\_ / \_\_\_\_\_  
 C. \_\_\_\_\_ / \_\_\_\_\_ G. \_\_\_\_\_ / \_\_\_\_\_  
 D. \_\_\_\_\_ / \_\_\_\_\_



**COORDINATES READ AS FOLLOWS**

QUADRANT    ROW / BOX    TRANSECT    DEPTH ON TRANSECT  
 NW            1 / 1            12            35' 4"

For grids in East quadrant: transect markers are placed every 3' from west to east  
 For grids in West quadrant: transect markers are placed every 3' from east to west  
 For grids in North quadrant: depths are measured from south to north  
 For grids in South quadrant: depths are measured from north to south  
 Each grid measures 50' by 50' and measurements are subject to above rules

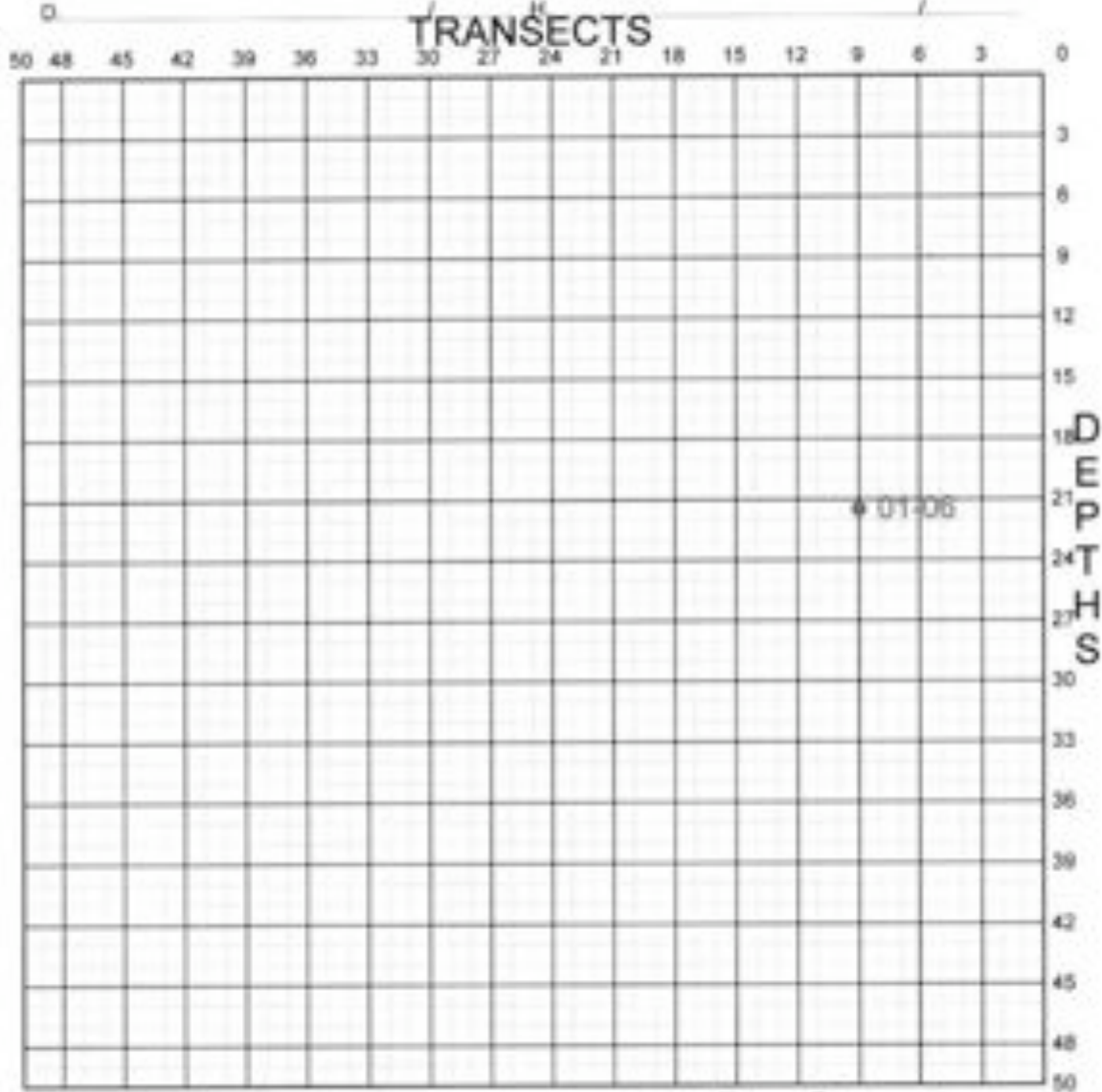
Surveyors **Edwin Scollon** \_\_\_\_\_  
**Tony Tyrell** \_\_\_\_\_  
**Bill Atkinson** \_\_\_\_\_  
**Pierre LaRocque** \_\_\_\_\_



Use for grids in SW Quadrant only  
**GRID - SW 2 / 4**

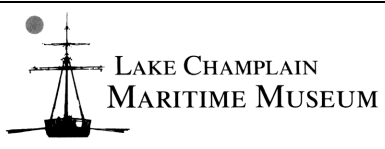
# SURVEY - AR9904

object	transect	depth	object	transect	depth
A. 01-06 Grape Shot	9	21'6"	E.		
B.			F.		
C.			G.		
D.					



**COORDINATES READ AS FOLLOWS**  
 QUADRANT ROW / BOX TRANSECT DEPTH ON TRANSECT  
 NW 1 / 1 12 30' 4"  
 For grids in East quadrant: transect markers are placed every 3' from west to east  
 For grids in West quadrant: transect markers are placed every 3' from east to west  
 For grids in North quadrant: depths are measured from south to north  
 For grids in South quadrant: depths are measured from north to south  
 Each grid measures 50' by 50' and measurements are subject to above rules

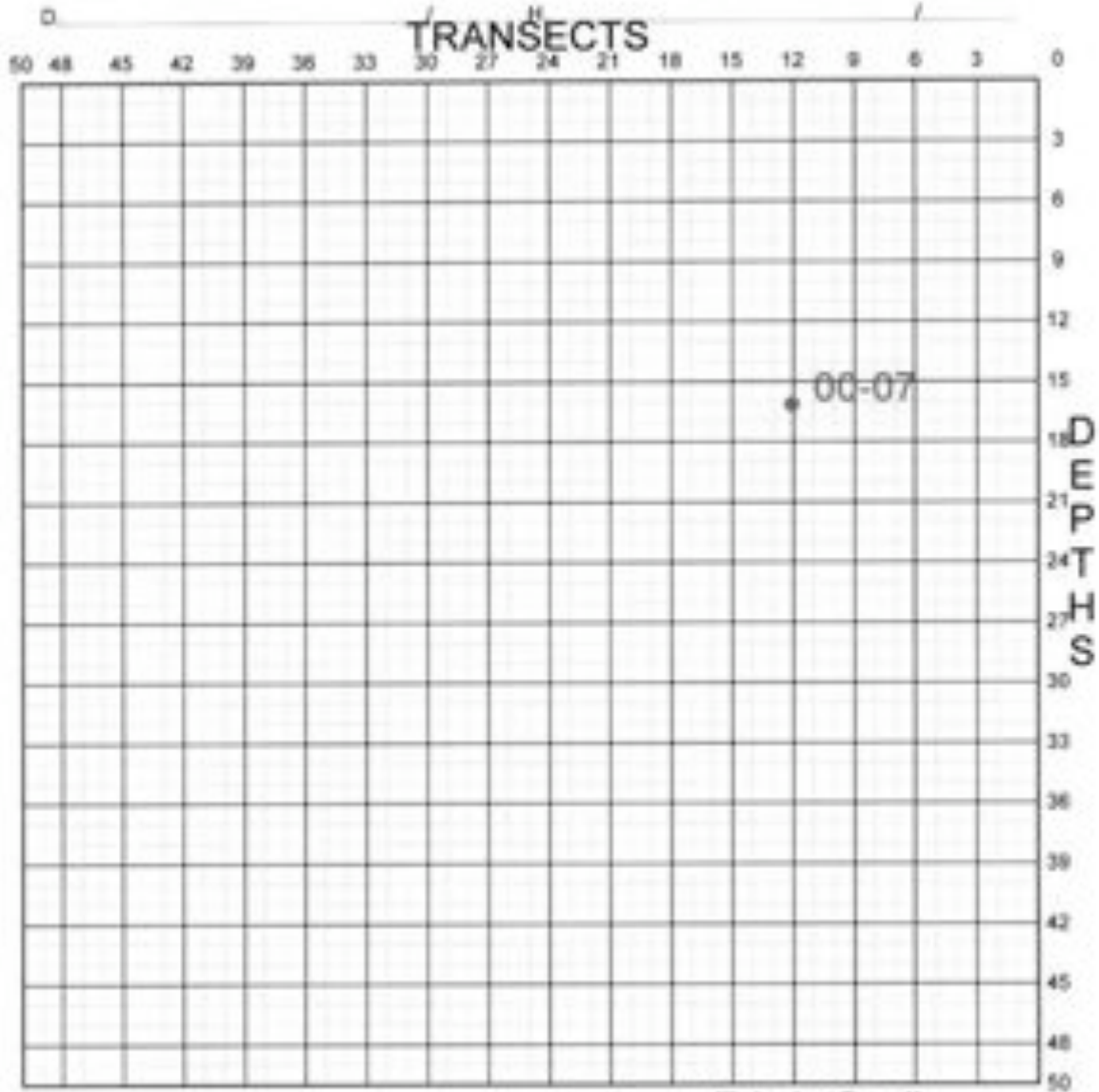
Surveyors **Dan Carpenter** \_\_\_\_\_  
**Tony Tyrell** \_\_\_\_\_  
**Dan Rock** \_\_\_\_\_  
**John Tomkins** \_\_\_\_\_



Use for grids in SW Quadrant only  
**GRID - SW 3 / 1**

# SURVEY - AR9904

object	transect	depth	object	transect	depth
A 00-07 Bar Shot	12	16'2" E			
B	/		F	/	
C	/		G	/	
D	/			/	



COORDINATES READ AS FOLLOWS

Surveyors **Edwin Scollon**

QUADRANT ROW / BOX TRANSECT DEPTH ON TRANSECT  
 MN 1 / 1 12 30' 4"

For grids in East quadrant: transect markers are placed every 3' from west to east  
 For grids in West quadrant: transect markers are placed every 3' from east to west  
 For grids in North quadrant: depths are measured from south to north  
 For grids in South quadrant: depths are measured from north to south  
 Each grid measures 50' by 50' and measurements are subject to above rules



Use for grids in SW Quadrant only  
**GRID - SW 3 / 2**

# SURVEY - AR9904

object	transect	depth	object	transect	depth
A.		1	E.		1
B.		1	F.		1
C.		1	G.		1
D.		1	H.		1



**COORDINATES READ AS FOLLOWS**

QUADRANT ROW / BOX TRANSECT DEPTH ON TRANSECT  
 NW 1 / 1 12 35' 4"

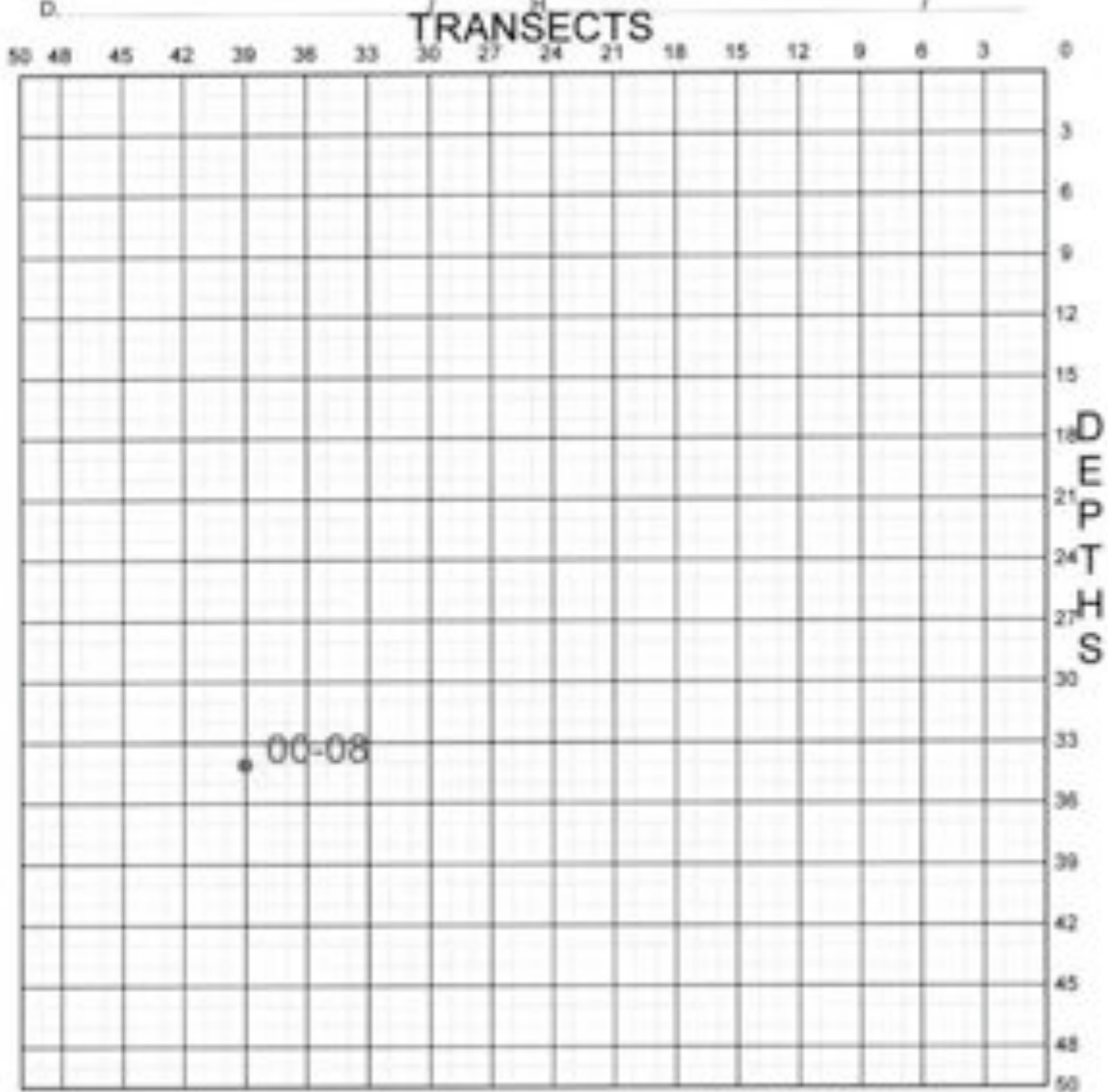
For grids in East quadrant: transect markers are placed every 3' from west to east  
 For grids in West quadrant: transect markers are placed every 3' from east to west  
 For grids in North quadrant: depths are measured from south to north  
 For grids in South quadrant: depths are measured from north to south  
 Each grid measures 50' by 50' and measurements are subject to above rules

Surveyors **Edwin Scollon**  
**Tony Tyrell**

Use for grids in SW Quadrant only  
**GRID - SW 4 / 1**

# SURVEY - AR9904

object	transect	depth	object	transect	depth
A 00-08 Grapeshot	39	34'1"	E		
B			F		
C			G		
D					



COORDINATES READ AS FOLLOWS

Surveyors **Edwin Scollon**

QUADRANT ROW | BOX TRANSECT DEPTH ON TRANSECT  
 NW 1 | 1 12 30' 4"

For grids in East quadrant: transect markers are placed every 3 from west to east  
 For grids in West quadrant: transect markers are placed every 3 from east to west  
 For grids in North quadrant: depths are measured from south to north  
 For grids in South quadrant: depths are measured from north to south  
 Each grid measures 50' by 50' and measurements are subject to above rules





Use for grids in SW Quadrant only  
**GRID - SW 4 / 2**

# SURVEY - AR9904

object	transect	depth	object	transect	depth
A. _____	/		E. _____	/	
B. _____	/		F. _____	/	
C. _____	/		G. _____	/	
D. _____	/		H. _____	/	



Surveyors **Edwin Scollon**

**COORDINATES READ AS FOLLOWS**

QUADRANT ROW / BOX TRANSECT DEPTH ON TRANSECT  
 NW 1 / 1 12 30 4'

For grids in East quadrant: transect markers are placed every 3' from west to east  
 For grids in West quadrant: transect markers are placed every 3' from east to west  
 For grids in North quadrant: depths are measured from south to north  
 For grids in South quadrant: depths are measured from north to south  
 Each grid measures 50' by 50' and measurements are subject to above rules

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## APPENDIX 4: PRESS CLIPPINGS

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PRESS REPUBLICAN 14 AUGUST 2000

### Project looks to uncover history on lake floor

By JEFF MEYERS  
Staff Writer

VALCOUR — Divers have begun mapping the lake bottom near Valcour Island to better understand what happened during the eventful Oct. 11, 1776, Battle of Valcour.

"We've already completed an exhaustive examination of the historical and archival records of the battle," said Arthur Cohn, executive director for the Lake Champlain Maritime Museum in Basin Harbor, Vt.

"Now we're adding an archaeological study to that history to better understand and preserve the area for future generations."

#### Mapping the floor

Using metal detectors, about 14 divers are mapping the silty lake bottom, identifying any objects they might pick up buried in the mud.

"It's a pretty tedious but straightforward process," Cohn said. "If you think about a battlefield above ground, we're trying to do that same kind of study under water by determining what

### Arnold's gutsy strategy led to shocking victory

By JEFF MEYERS  
Staff Writer

VALCOUR — When Benedict Arnold sailed his fleet of 15 vessels into the channel between Valcour Island and New York's mainland, he was taking a defensive position against a much superior enemy.

He knew the British ships would not enter the channel from the north but swing around the outside of Valcour and come in from the south. That meant Arnold's fleet didn't fear an attack from the

rear and could concentrate on the deep south entrance.

Arnold also believed a strong wind from the north would further hinder the British attack as they moved into position.

On Oct. 11, 1776, the British fleet passed Valcour and came into view of the Americans south of the island. Arnold sent the flagship Royal Savage and four smaller galleys into the bay to entice the British into battle.

However, the Royal Savage struck the shallows at the southern tip of Valcour and

eventually had to be abandoned. Several British sailors boarded the flagship and actually turned its cannons against the Americans.

The battle lasted throughout the day with both sides suffering severe losses. As twilight approached, the Americans were nearly defeated, having lost several vessels. The British set up a barricade along the southern edge of Valcour, satisfied they would capture the Americans the next morning.

Please see **BATTLE** Page A10 ▶

objects might still remain there."

#### Piece of cannon

The concept to map the battle site was actually born last year when New York State Police diver Ed Scollon found a portion of a cannon in the murky waters last summer.

"I have a historical interest in the area," Scollon said. "I was trying to approximate where the American line was (during the Battle of Valcour) and came across a lot of large debris."

The lake bottom at Valcour, about 40 to 50 feet below the

surface, is extremely silty, and Scollon was using a metal detector when he discovered the debris. But there was no way of knowing exactly what it was because it was buried deep in the muck.

Please see **PROJECT** Page A10 ▶

# Project: Local divers give time to mapping

► From Page A1

By sticking his hand into the silt, however, Scollon traced the outline of the object and realized it was a fairly large piece of cannon.

Familiar with historical references to the area, he knew that a cannon had exploded during the battle aboard one of the American vessels.

He also knew the name of a man, Lt. Thomas Rogers, who was killed by the splitting of that piece of artillery on Lake Champlain during the battle.

With other large pieces still uncovered in the area, Scollon believed he had found the site where the explosion occurred.

"It's not conclusive, but the more evidence we collect points to it," he said.

So Scollon contacted the Maritime Museum, and the concept of mapping the battle site was born. Within a month, a permit was issued by the state to conduct the survey.

## Preserved underwater

Divers are cataloging the items they find, but all objects are staying on the lake bottom. The cool, fresh water and silty bottom are perfect environments for protecting the artifacts until a plan can be devised for preserving and displaying them in a public setting.

"As divers, we get to look at these objects first-hand," said former Plattsburgh City Police Chief Matthew Booth, one of the volunteer divers working on the project.

"But if we can recover these artifacts and put them on display, then everyone gets a chance to appreciate and study them.

"They belong to everybody, not just the city or county or state of New York. This is a regional effort. Lake Champlain is a corridor where a lot of important history took place. It's everybody's job to preserve that."

## Link to people of past

Besides cannons, bayonets and ammunition, the survey is also identifying the human aspect of the battle. For instance, one of the objects surveyed is a cartridge box that still has part of the leather cover and clear initials, "GMB," of the man who used it.

"We've narrowed (the man's identity) down to two possibilities," Scollon said. "Finding a cannon is one thing, but when you start to find things that identify people, that changes your entire perception of things. These men were our first veterans."

"Look at the human sacrifice that took place here," Booth added. "When you think of the conditions they were placed in, it's just amazing. When you make these kinds of discoveries, it personalizes their sacrifices."

## Line of defense

Scollon believes the survey has

## Battle: British delayed at Valcour

► From Page A1

But, using darkness and a thick fog, Arnold led his remaining boats out of the channel that night. At daylight, the British were startled to find no trace of the Americans.

The British turned south and chased the remaining American boats down Lake Champlain. Several boats were eventually captured or sunk, and only four made their way to Fort Crown Point.

British Commander Sir Guy Carleton planned to attack Ticonderoga following the battle at Valcour, but a stiff southerly wind arose Oct. 15 and prevented his fleet from moving south four days.

Finally, when the weather let the British reach Ticonderoga, they found the area rich with 13,000 American troops. Carleton turned his fleet around and sailed back to Canada for the winter.

"The little Navy on Lake Champlain was wiped out, but never had any force, large or small, lived to better purpose or died more gloriously," wrote naval historian Alfred Thayer Mahan in 1913.

"That the Americans were strong enough to impose capitulation of the British Army at Saratoga was due to the invaluable year of delay secured by their little Navy on Lake Champlain."

already clearly identified the American line of defense during the battle. The permit allows the divers to search a 1,000-square-foot section of the lake bottom. It may take several years to fully identify the remains of the battle, but to those involved, the effort is more than worth it.

"If you're a history buff and appreciate the culture that this lake offers, then this is fun," said volunteer Jerry Farkey. "We're finding objects that haven't been seen in 224 years. To me, that's very significant."

"It's very exciting," added Tony Tyrell, who works for the Department of Environmental Conservation as the Valcour Island caretaker.

"This area almost takes on a sacred graveyard atmosphere. These men were our forefathers. They're why we're not paying tea taxes today."

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PRESS REPUBLICAN 23 AUGUST 2000



## LETTERS TO THE EDITOR 8-23-2000

### Irked at being stopped

**To the Editor:** I am writing about a recent experience a coworker and I had while out on lunch break in Westport.

It was about 7:30 in the evening when we left to go to a local store to pick up something for dinner. On the way to the store, we passed a State Police with someone pulled over. When we were returning to work, we passed the same State Police as he was heading in the opposite direction. I turned into the parking lot at work and started to park. While parking, the State Police pulled us over. Uncertain of what I had done, the young trooper informed me that I was traveling a little fast. Knowing that this was not true, I handed him my driver's license and started searching for my registration. When I was searching, I told the trooper that we were on break and just picked up dinner. After observing the facility and the back of my truck, the officer asked if I were a Mountain Dew man. My response was, I guess so, and he handed back my license and was gone before we continued hacking in.

I just find it ironic how this officer was aggressively pulling over

southbound traffic appearing to have passed the only bar I ever recognized in Westport. Is there an overabundance of law enforcement in these small communities or was this trooper just being aggressive to give out a DWI?

After speaking to several other co-workers I heard several other similar situations. Maybe it is just time for the law officers to lighten up a little and let people live.

**Brian Osher**  
Plattsburgh

### Project credited

**To the Editor:** I am greatly appreciative of Staff Writer Jeff Meyers's coverage of the Valcour Bay Research Project's efforts. Many positive steps have been taken to preserve the heritage of the Champlain Valley in the last few years. The Press-Republican has played an integral role in bringing these efforts and related issues to the public's eye.

I believe it's also important to give credit where credit is due. The Valcour Bay Research Project was developed mainly through the advice and support of Arthur Cohn, director of the Lake Champlain Maritime Museum; and Dr. Philip Lord, Jr., historical survey chief of the New York State Museum. The

project's main goal is to conduct a formal, systematic survey of Valcour Bay and accurately assess its wealth of historical resources. It is also designed as a means to introduce the local diving community to New York state's archeological-permit process. It's an opportunity for local divers to proactively and legally explore these fragile and finite resources. It's a volunteer effort, and the reward is in protecting these objects for all to enjoy.

LCMM Historian George Quintal uncovered the historical reference of a cannon exploding upon the New York and fatally injuring Lt. Thomas Rogers. We were made aware of this reference after the discovery of the cannon. Mr. Quintal continues to compile significant information about the participants of this battle. Undoubtedly, his work will be invaluable in placing these objects in their proper historical context.

It's also important to mention the many divers and supporters who were not included in Monday's article. They are: Tim and Terry Aubin, Tammy and Steve Bezio, Todd Bissonette, Dan Carpenter, John Kelley, Jeff LaBombard, Andre Lawliss, Bill Leege, Dr. David Mc Dowell, Steve Nye, Steve Posada, Dan Rock, Valerie and Walter Stanley.

**Ed Scollon**  
Saranac

PRESS REPUBLICAN 28 JULY 2001

# A tug of war

## Display site of local war artifacts at issue

By JOE LoTEMPLO  
Staff Writer

PLATTSBURGH — The artifacts that will be raised Saturday from the Revolutionary War Battle of Valcour will be displayed in both Vermont and New York.

Organizers of the event say the idea is to promote the history of the entire lake as one package instead of dividing it.

"This is a true partnership," said Art Cohn, director of the Lake Champlain Maritime Museum in Basin Harbor, Vt.



Photo Editor Dave Pappas

Frank Pabst is a fervent advocate of any Battle of Valcour artifacts retrieved from Lake Champlain staying in Plattsburgh, although he sees the need for taking them to Vermont for preservation and he doesn't object to their being temporarily displayed in Vermont.

But the question has been raised as to whether the artifacts, which were found in New York waters, should stay on this side of the lake permanently.

"It's Plattsburgh's history, and it should stay in Plattsburgh," said Frank Pabst, a longtime sea captain, diver and steward of Lake Champlain history.

"We have to make sure that our history doesn't get away from us."

Plattsburgh Mayor Daniel Stewart also said he would like to see the artifacts eventually wind up in Plattsburgh on permanent display.

But Pabst is backing off a full-fledged protest of the display-sites in deference to the work that was done by the Lake Champlain Maritime Museum, the Valcour Bay Research Project, the Clinton County Historical Association and several other groups to bring the items to the surface.

### PABST STILL CONCERNED

"For the greater good, I will settle down, but I still have some concerns."

The artifacts were discovered two years ago as a group of about 20 New York divers searched the battle site off Valcour Island just south of Plattsburgh.

The battle occurred on Oct. 11, 1776, and featured legendary Revolutionary War figure Benedict Arnold. The centerpiece of the discoveries is a ship-cannon that exploded during the battle.

Diver Ed Scollon, who led the diving expedition, said the artifacts were found in an area that ranges from 40 to 60 feet deep.

"There is a deep layer of silt that has protected many of the artifacts, and they are in great shape," Scollon said.

Among those is a leather pouch.

### SATURDAY CEREMONY

More details of each artifact will be unveiled Saturday when they are brought to the surface.

The ceremony will be witnessed by about 200 officials, including U.S. Sens. Hillary Clinton of New York and Patrick Leahy of Vermont, both Democrats.

The artifacts will be taken to the Lake Champlain

Please see ARTIFACTS Page A5 ▶

## Artifacts: Grant funding preservation

▶ From Page A1

Maritime Museum in Vermont, where it will take about a year to have them preserved.

The preservation, which cost about \$20,000, is being paid for by a federal grant.

Once they are preserved, the artifacts will be displayed in both Vermont and New York.

The tentative schedule has the artifacts being displayed at the Maritime Museum in Vermont starting next summer and then moving to Clinton County in October.

"They could stay in Plattsburgh for six months or maybe even longer than that," Cohn said. "We haven't worked all of that out yet."

Cohn said the lake should be tested as one area of history within the entire country.

"We have tried every way that we know how to make this a positive experience," he said.

"We're trying to remove any boundaries."

Scollon, the New York diver who found the cannon, supports the display-schedule agreement.

"It's not a matter of being New York or Vermont property; it's federal property, and we are not going to be territorial about this," Scollon said.

"Everyone should have a chance to see it."

Cohn hopes the discovery of the Battle of Valcour artifacts will hasten the movement to build a historical museum in Plattsburgh to showcase the Battle of Plattsburgh, which occurred in Plattsburgh Bay in September of 1814.

"We support that wholeheartedly, and this will fuel the need for a public place in Plattsburgh where there already is so much stuff."

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PRESS REPUBLICAN 23 JUNE 2001

# Senators to help mark raising of Battle of Valcour artifacts

By **JOE LoTEMPPIO**  
Staff Writer

PLATTSBURGH — Artifacts from the Revolutionary War Battle of Valcour Island will be raised from the bottom of Lake Champlain next Saturday.

Officials hope the find will dramatically raise the profile of the historic battle to the level that the Battle of Plattsburgh is now achieving.

"This could be a catalytic event for the Battle of Valcour, and it will give people a whole new perspective," said Art Cohn, director of the Lake Champlain Maritime Museum in Basin Harbor, Vt.

The Maritime Museum, the Valcour Bay Research Project and the Clinton County Historical Museum are joining efforts to bring about 20 artifacts out of the water on Saturday, June 30.

U.S. Sens. Hillary Clinton (D-New York) and Patrick Leahy (D-Vermont) are expected to attend the event.

Cohn said the senators from both states were invited because the Battle of Valcour and so many other historic events on the lake have forever linked both sides of the lake as well as Canada.

"Our goal is to put the spotlight on the history of the lake in general," he said.

The Battle of Plattsburgh, which many historians point to as the turning point of the War of 1812, has become much more well known in recent years since the discovery of the anchor of the British warship *The Confiance*.

Those involved in the Battle of Valcour project believe the discovery and retrieval of the arti-

facts could be the event that propels the battle to the front pages of lake history publications.

"Since the anchor was found, the Battle of Plattsburgh has taken on a life of its own, and this could be the same for Valcour," Cohn said.

In addition to the artifacts from the battle, divers have been trying to systematically map out the battle area on the lake through their discoveries.

"This will be the catalyst for even more research," Cohn said.

About 200 invited guests will also attend the raising of the artifacts along with Clinton and Schumer.

The group will leave via ferry from Port Kent at 9 a.m., weather permitting.

Joe LoTempio can be reached by e-mail: [jlotempio@pressrepublican.com](mailto:jlotempio@pressrepublican.com)

PRESS REPUBLICAN 01 JULY 2001

## 1776 Battle of Valcour cannon recovered

By DIANE PETRYK  
Staff Writer

By DIANE PETRYK  
Staff Writer

PLATTSBURGH — The barrel of a 300-pound cannon blasted from its support structure in a Revolutionary War battle 225 years ago was hoisted on deck of a Lake Champlain ferry Saturday as more than 200 guests watched.

Among them, Senators Hillary Clinton (D-N.Y.) and Patrick Leahy (D-Vt.) and state Sen. Ronald Stafford.

The politicians had joined local officials and history buffs on a trip to the waters off Valcour Island, where a crane hoisted up the cannon barrel to the delight of the crowd on board and spectators in a cluster of small boats that followed.

The event focused attention on an underground mapping project that is helping historians understand what took place there during the War for Independence.

The cannon, they feel, is one that burst apart during the Battle of Valcour Island on Oct. 11, 1778. Historians know of accounts that mentioned the cannon explosion, including the inscription on the tombstone of a 26-year-old sailor it apparently killed.

In that battle, 15 vessels and 700 men commanded by Benedict Arnold were attacked by the British for five hours, Lake Champlain Maritime Museum Director Art Cohn told the gathering.

The fighting only stopped when it was too dark to aim, he said.

As Cohn continued the tale, Clinton nodded as if the story were familiar to her.

Arnold and his men made a daring nighttime escape past the British blockade.

During the spring and summer of 1777, the British moved their army and navy south. Gen. John Burgoyne and his army were defeated at Saratoga by a strong American force, and the tide of the American Revolution changed.

The little navy on Lake Champlain was wiped out, Cohn said, but none was ever lost for better purpose and no sailor ever died more gloriously, for the battle bought the patriots an invaluable year's delay in which to gather strength.

"We'd be citizens of different countries if not for that battle, Leahy said.

Clinton thanked New York

Please see CANNON Page A4 ▶



A Revolutionary War cannon is lowered aboard Lake Champlain Transportation Company's Adirondack ferry Saturday morning near Valcour Island in Lake Champlain.



Senators Patrick Leahy and Hillary Clinton talk with guests of the Lake Champlain Maritime Museum before boarding a ferry at Port Kent Saturday morning.

## Cannon: Items to go to museum for display

► From Page A1

State Police diver Edwin Scollon, who discovered the metal object buried in 5 feet of silt two years ago. The discovery triggered a Valcour Bay Research Project.

"We have a lot to celebrate today," Clinton said. "We are honoring our history.

"When I was in the White House, we began to look for ways to celebrate the millennium. We decided to look where America has been, to where we are, to where we're going."

Part of that, she said, was creating a program to save America's treasures, like the remnants of a Revolutionary War battle.

"It sends a message, particularly to young people," Clinton said. "We did not get here by accident.

**"It sends a message, particularly to young people. We did not get here by accident.**

Hillary Clinton

"We got here because a lot of brave people, particularly a lot of brave men, gave their lives.

"That is really what we are celebrating here today. Before we had a Constitution, before we had a Constitutional Convention, there were people dreaming of liberty."

As the excursion started back, a thunderstorm overtook the ferry, whipping rain water onto a sumptuous lunch. Spirits remained undampened, however,

with the opportunity to chat with Clinton and possibly pose for a photo with her or

get her autograph.

Cohn said he hopes publicity from the event will bring more funding for the underwater mapping and retrieval of more Revolutionary War artifacts.

"This is just the tip of the iceberg," he said.

To date, divers have examined more than 63,000 square feet of lake bed under the battlefield. Twenty artifacts located during the survey include a leather cartridge pouch and cannon shot.

The items will go to the Lake Champlain Maritime Museum for conservation and display. In October 2002 they will be exhibited at the Clinton County Historical Museum in Plattsburgh.

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BURLINGTON FREE PRESS 01 JULY 2001

# Cannon raised to lake surface

*The Associated Press*

— ABOARD THE ADIRONDACK — Historians, divers and politicians gathered Saturday aboard the Adirondack, a Lake Champlain ferry, to watch a crane haul an 800-pound Revolutionary War cannon to the surface and lay it on the deck.

The trip was set up to call attention to a mapping project that details the events that took place in the area during the Revolutionary War and garner more money for projects aimed at restoring the lake's war relics.

Democratic Sens. Hillary Rodham Clinton of New York and Patrick Leahy of Vermont went along, as did the mayors of Burlington, Vt., and Plattsburgh, N.Y., and an assemblyman from St. Jean, Quebec.

The cannon, buried 5 feet beneath the bottom of the lake between Vermont and New York, appears to be the one that burst during the Battle of Valcour Island in 1776, killing one soldier and injuring others.

The battle took place on Oct. 11, 1776, when 15 vessels commanded by Benedict Arnold were attacked by the British near what is now Plattsburgh before escaping under cover of night.



**ALDEN PELLETT, The Associated Press**  
**Sen. Hillary Rodham Clinton, D-N.Y. and Sen. Patrick Leahy, D-Vt., inspect a cannon brought up Saturday from the bottom of Valcour Bay. Story, Page 6A**

## INSIDE

Today the underwater museum of Lake Champlain faces the triple threat of pilferage, politics and parasites. Yet curators say public respect and government goodwill have led to minimal disruption.

**Story, Page 6A**

# Historic cannon hauled ashore

■ Weapon from Revolutionary War rescued from Lake Champlain mud.

THE ASSOCIATED PRESS

ABOARD THE ADIRONDACK — New York State Police Diver Ed Scollon was 50 feet underwater in Lake Champlain and deep in a cloud of silt when he realized he had found something significant.

Scollon's metal detector had alerted him to a Revolutionary War cannon buried 5 feet under the bottom of the lake between Vermont and New York.

On Saturday, two years later, he stood on a ferry crowded with historians, divers and politicians to watch a crane haul the 800-pound cannon to the surface and lay it on the deck.

Scollon, of Dannemora, Clinton County, is a diver who loves the lake and its history. He said the cannon and other artifacts found on the bottom are more than relics of a long-ago war.

"They may also serve to enlighten and remind us of the many great sacrifices that were made in the pursuit of American independence — an effort that was forged more through the mettle of men than by the metal of guns," he said to a crowd gathered on the deck.

And so it went on the Adirondack, a Lake Champlain ferry requisitioned Saturday by the Lake Champlain Maritime Museum for a trip to Valcour Island.

The trip was set up to call attention to a mapping project that

details the events that took place in the area during the Revolutionary War.

Democratic Sens. Hillary Rodham Clinton of New York and Patrick Leahy of Vermont went along, as did the mayors of Burlington, Vt., and Plattsburgh, Clinton County, and an assemblyman from St. Jean, Quebec.

The ferry departed Burlington Saturday morning and took about 100 passengers to Port Kent, Essex County, where it picked up Clinton, her small entourage, and another 125 or so historians, divers and politicians.

It then stopped near Valcour Island, where a crane hauled up the cannon.

As the crowd gazed down at the cannon from nearby and from an upper deck, snapping pictures, Art Cohn, the executive director of the maritime museum, explained its significance and thanked Leahy for helping the museum get funding it needs for his research.

Clinton questioned Scollon closely about how he found the cannon.

Meanwhile, a small flotilla of rafts, sailboats and other craft full of curious onlookers bobbed around the ferry as Clinton made her first-ever voyage on the 125-mile-long lake.

"It makes it more real if you can actually see it, touch it, feel the experience of the people who were willing to risk their lives for a totally unproven idea," she said of the soldiers who

fought in the Revolutionary War. "To stand against the British Navy — what an incredible act of faith."

The cannon appears to be the one that burst during the Battle of Valcour Island in 1776, killing one soldier and injuring several others. Historians had found accounts that mentioned the explosion before the cannon was found.

The battle took place on Oct. 11, 1776, when 15 vessels commanded by Benedict Arnold were attacked by the British near what is now Plattsburgh before escaping under cover of night.

Although most of Arnold's fleet was eventually destroyed or damaged, many historians believe that Arnold's actions led to delays for the British that set up the American victories the following year.

"Here we are on the eve of the Fourth of July celebrations," Cohn said to the crowd. "It's fitting that we recall the events in the Champlain Valley that took place on the eve of the American Revolution."

Cohn waited two years to

bring up the cannon because he wanted to have the mapping project in place. He hopes the publicity from the event Saturday will garner more funding for projects aimed at restoring Lake Champlain's Revolutionary War relics.

The cannon was an exciting draw, but Clinton's presence was the main attraction on the ferry. She shook hands, posed for photographs and signed autographs for most of the several-hour trip, chatting with dozens of people who crowded around her as she moved from one place to another on the ship.

She ignored the raindrops that started falling as Cohn was finishing his presentation, and the thunderstorm that sent rain lashing into the open sides of the ferry.

"We are honoring our history by doing this," Clinton said.

"It sends a message to people, particularly to young people, that we did not get here by accident," she said.

"We got here because a lot of brave people, particularly a lot of brave young men, gave their lives." □

PRESS REPUBLICAN 08 JULY 2001

## Relics belong in New York

Here's hoping the relics raised from the bottom of Lake Champlain off Plattsburgh over the weekend wind up permanently displayed on this side of the lake.

This could occur either in the museum that will be housed in the Old Stone Barracks on the former Plattsburgh Air Force Base or in a separate building but on the same campus.

In a show of solidarity, U.S. Sens. Hillary Clinton (D-N.Y.) and Patrick Leahy (D-Vt.) attended a ceremony in Plattsburgh last weekend celebrating the recovery of some Revolutionary War relics from the bottom of Lake Champlain just off the northern New York shore.

The plan is to alternately display the artifacts in Vermont and New York, as Lake Champlain Maritime Museum near Vergennes, Vt., was key in recovering them.

Nevertheless, Northern New Yorkers must feel that the finds belong in New York, since the Battle of Valcour, whence the items came, was fought on the New York side of the lake.

It may seem somewhat petty, at this point, to haggle over their eventual siting, but their whereabouts will become more important with the passing months, as a comprehensive museum on Northern New York's military history comes into focus.

The Battle of Valcour was one of America's most important naval battles. While the fight was eventually lost, it occupied British forces long enough to keep them from proceeding to Saratoga,

where they might have reversed the outcome of the pivotal fight of the entire Revolutionary War.

The key artifact is a 300-pound cannon that apparently was lost when it exploded during the battle and sank to the bottom of the lake.

The Maritime Museum has earned the respect of historians in both states for its research into the early years. It has opened a satellite in Burlington, and perhaps now is the time to explore the idea of becoming a partner here, with the Battle of Plattsburgh Association.

The military museum proposed for the Old Base would be the ideal repository for any findings on the New York side of the lake, such as the artifacts newly unveiled.

These findings would be centerpieces of the Plattsburgh museum's exhibition on the Revolution. It seems a shame to have to share them, especially since they are so pivotal to our history and so peripheral to Vermont's.

If dreams of a Northern New York historic corridor, as envisioned by Assemblyman Chris Ortloff (R-Plattsburgh) and others, are to come to fruition, the best pieces available must stay here. From Saratoga to Plattsburgh, the new nation's key battles were fought. This rich heritage will be diluted as long as the best testaments to it are exhibited elsewhere.

We hope that the Maritime Museum will become a partner with northern New York for the mutual benefit of both.

PRESS REPUBLICAN 15 JULY 2001

## IN MY OPINION

# Broader view urged in artifacts placement

By ART COHN

I would like to take this opportunity to respond to the Viewpoint editorial of July 8 titled "Relics Belong in New York."

Much in the editorial is both positive, and complimentary, i.e., the recognition of "a show of solidarity U.S. Sen. Hillary Clinton (D-N.Y.) and Patrick Leahy (D-Vt.)" and that the Lake Champlain Maritime Museum "has earned the respect of historians in both states" and was "key in the recovery."

"The editorial even concludes with the "hope that the Maritime Museum will become a partner with northern New York for the mutual benefit of both."

The museum sincerely appreciates these sentiments. However, within the editorial is a historical perspective that is troubling and counter-productive and will certainly limit how well our communities can work together.

It was disturbing that, even before the artifacts were raised, concern was expressed that they would be going to Vermont and would not immediately reside in New York. It was reminiscent of the undertone that accompanied recovery of the "Confiance" anchor just a few years ago.

While, in our view, the museum was playing a constructive role in facilitating the anchor's management and conservation, we heard a persistent message that the anchor should never have gone to Vermont and might never be returned to New York.

Ahead of schedule and a month before the September, 2000, Battle of Plattsburgh celebration, the museum returned the fully conserved anchor to your community.

The museum's involvement in the Valcour Day Research Project came at the request of a dedicated team of local New York divers. This excellent partnership included permits and support from the New York State Museum, the New York Office of General Services, the New York Historic Preservation Field Service Bureau, Lake Champlain Basin Program, the Navy Historical Center and, importantly, the Clinton County Historical Museum.

There is a conservation schedule that will return the conserved artifacts to the Plattsburgh community in the fall of 2002 for exhibit at the Clinton County Historical Museum.

Long term, the project participants, the New York State Museum and the Navy, with input from the public, will determine the most appropriate place for the artifacts to reside.

A new interpretive center in Clinton County would certainly be a contender, but should not the Massachusetts community that sent Lt. Thomas Rogers to Valcour Island be considered eligible for a traveling exhibit?

The most troubling statement in the editorial suggested "it seems a shame to have to share them (artifacts) with Vermont, especially since they (artifacts) are so pivotal to our history and so peripheral to Vermont's."

In many ways, this sentiment is at the heart of the problem. It seems to be the perception of some in the community that the extraordinary history made at Valcour Island and Plattsburgh Bay somehow uniquely belongs only to them.

With all due respect, this is a distortion of history and a counter-productive excess of community pride. We know that the shipbuilders and participants at Valcour Island came from all the New England states and beyond. One has to wonder how this nationally significant event, which took place over three days, 60 miles of lake and deposited five vessels in what is now Arnold's Bay, Vt., becomes so "pivotal" to Plattsburgh's history, a town which did not exist in 1776, that it excludes consideration of other interests.

The Battle of Plattsburgh Bay certainly took place in your community, but where did the fleet come from? The American fleet was built in an extraordinary effort in Vergennes, Vt. On the banks of the Saranac River, as many as 2,500 Vermont volunteers crossed the lake and stood shoulder to shoulder with the New York militia to defend the Champlain Valley and turn back the British army.

The point is not to argue over which state made the greater contribution to the legacy of history we share but to recognize that Champlain Valley history is a shared history.

The military history of the Champlain Valley didn't happen in one place or on one side of the lake but succeeded because we came together to accomplish important results. The museum applauds and supports efforts to create a new historical interpretive center in Clinton County, but the bickering is not productive.

Managing and interpreting this important heritage is now our generation's opportunity and challenge. If we are to properly preserve and share the Champlain Valley's history with our citizens, school children and visitors, we must work together.

The decisions we make today will determine what is preserved for future generations. It is in that spirit that the Lake Champlain Maritime Museum has worked for more than two decades on both sides of Lake Champlain.

As the honorable Sen. Ronald Stafford declared at the 1991 launching of LCMM's replica "Philadelphia," "The lake should be a bridge, not a barrier."

Art Cohn is executive director of the Lake Champlain Maritime Museum and managing director of the Allied Lake Champlain Maritime Research Institute.

**It was disturbing that, even before the artifacts were raised, concern was expressed that they would be going to Vermont and would not immediately reside in New York. It was reminiscent of the undertone that accompanied recovery of the "Confiance" anchor just a few years ago.**



PRESS REPUBLICAN SEPTEMBER 2001

# Valcour Bay discovery a first in underwater battleground mapping

By JEFF MEYERS  
Staff Writer

VALCOUR — Lives were shattered in an instant when a cannon exploded aboard the gondola New York some time during the Battle of Valcour in 1776.

Amid the violent action between American sailors and an invading British force on that chilly Oct. 11 battle, the explosion aboard the American vessel injured many and killed at least one young patriot.

Today, researchers have taken to the depths of Valcour Bay to search for more clues about that tragic moment.

"It's like a police officer collecting evidence at an accident scene to determine the cause of the accident," said area diver Edward Scollon, who has helped develop an extensive plan to map the lake bottom under the site of the Battle of Valcour.

"We know what vessel suffered the explosion, and from our work we can determine the movement of the boat itself. Every object we find is a clue."

Historical records have identified first-hand accounts of the explosion that confirm the accident happened aboard the New York, one of eight gondolas in Benedict Arnold's tiny American fleet. The New York was the only gondola to successfully make the trip south to Fort Ticonderoga following the fierce battle along the western shore of Valcour Island.

Last year, divers discovered convincing evidence of the explosion when they found several pieces of a shattered cannon in about 50 feet of water in the area where the New York was positioned during the battle.

These remnants were raised earlier this summer and are now being preserved at the Lake Champlain Maritime Museum in Basin Harbor, Vt. They will likely go on display at the Clinton County Museum later next year as part of a new exhibit on the Revolutionary War battle.

Divers found the largest artifact, the cannon's barrel, on the silty lake bottom exactly where it should have been, according to the historical reports.

However, other pieces were found away from the barrel. Their placement suggests that they were probably tossed overboard by the New York's crew as the boat was being moved into an attack position following the loss of one of its guns.

Divers returned to the area for two weeks this summer as part of an on-going effort to find more evidence of this and other events during the battle.

"This has been a positive, up-beat experience for us all," said Arthur Cohn, director of the Lake Champlain Maritime Museum. "We've had 20 people participate over the two weeks, and we've exceeded our expectations



Many of the divers participating in the mapping of the lake bottom at the Battle of Valcour site pose on the shore after spending a long day in the murky depths of Lake Champlain. Several organizations and individuals are working to find more evidence of the battle 275 years after it took place.

## IF YOU GO

Edward Scollon, one of several divers participating in the mapping of the Battle of Valcour underwater battlefield, will give a presentation on the diving activities during a presentation at York Hall on the campus of Plattsburgh State University 7 p.m.

Thursday. The event will feature several speakers looking at the history of Lake Champlain from 1776 to 2001. The presentations, part of the Battle of Plattsburgh Weekend, are free to the public.

in terms of what we hoped to accomplish.

"This is history in the making."

Professional historians and archaeologists joined forces with area divers to map the region off Valcour Island where the American boats formed a crescent-shaped line from the island to the mainland. From there, the Americans engaged the British fleet, which had passed the island to the east before turning about to do battle.

"Obviously, there have been archaeological mappings of land battlefields such as Little Bighorn, but no one has ever mapped an underwater battlefield," Cohn said. "This project is proof that it can be done."

Working in pairs, divers stazed 50-foot grids on the lake bottom, one person using a metal detector and the second mapping the location of any objects they find. They've found several other pieces of the cannon as well as musketballs and other objects from the battle.

"We've found 90 to 95 percent of the cannon," Scollon said. "We're missing one or two pieces, but with this methodical search of the bottom, who knows how much more we'll find."

For now, all the artifacts found are remaining on the bottom. Most are buried in the mud and are protected from decay by the cold environment.

"This year marks the 225th

anniversary of the battle, so we thought it was important to re-connect the public with the significance of this battle," Cohn said. "That's why we felt it was important to raise and preserve this cannon. We'll have to try and figure what would be the best management plan for the remaining artifacts we discover."

Divers also discovered three personal artifacts — including a knife and ammunition pouch, near the cannon. Those items were located several feet apart in a straight line, suggesting that they may have come from a body as it was placed in the lake while the New York moved its position.

The region has placed a lot of significance on the Battle of Valcour of late, including a recent celebration of the event and a planned memorial on the 275th anniversary date. But the underwater research will only enhance the recognition of the event.

"We don't yet have any specifics, but we will be opening a display on this time period," said John Thompson III, director for the Clinton County Historical Association. "We will be giving detailed information on the battle and background on the dive activity."

Representatives from Fort Ticonderoga, which played an important role in activities on the lake during the war, were also involved in the dive.

"This site has a big tie-in with Ticonderoga, where the fleet was outfitted," said Chris Fox, curator at Fort Ticonderoga. "It's been a great opportunity for us to help study such an important part of this region's history. This history of this fleet teaches from Whitehall (where most were built) to Valcour and everywhere in between."

Scollon will present information on the dive during a presentation Thursday evening as part of the Battle of Plattsburgh celebration being held this weekend.

Jeff Meyers can be reached by e-mail: [jmeyers@pressrepublican.com](mailto:jmeyers@pressrepublican.com)



## **PRESS REPUBLICAN 12 MARCH 2002**

Rare pieces of history  
Battle of Valcour relics to be displayed locally

By JEFF MEYERS, Staff Writer

PLATTSBURGH — Several artifacts removed from the waters under the Battle of Valcour site will soon be coming home for display.

Over the past few years, divers have been surveying the murky lake bottom off Valcour Island, where more than 225 years ago American and British ships confronted each other in one of the most significant naval battles of the Revolutionary War.

Historians hope the archaeological work will help them gain a better understanding of what happened on Oct. 11, 1776, when Benedict Arnold's American fleet took on a much larger and more powerful British flotilla.

The Americans could not withstand the British power and had to flee Valcour Bay under cover of night following the day-long battle.

Historians believe the time and energy spent at Valcour cost the British in the long run, as they had to retreat to Canada as winter approached.

Divers, using records from the battle, located the line of defense the American ships set up between Valcour and the New York shoreline.

During an extensive search of the battle line, they discovered several artifacts, including an American cannons that had exploded some time during the confrontation.

Those remnants were raised last summer and have been taken to the Lake Champlain Maritime Museum in Basin Harbor, Vt., where they are now undergoing an extensive preservation process.

"Valcour Bay has a wonderfully preserved submerged battlefield," said Arthur Cohn, executive director of the museum. "Preserving artifacts from the site will provide a wonderful opportunity to display an exhibit on what was a most significant event in the birth of our nation."

One artifact is a bayonet and a wooden cartridge box that still carries the initials of its owner, as well as the leather strap he used to carry it.

The artifacts are nearly through an extensive process to make sure they can go on display without it damaging them.

"Coming out of their submerged environment, these objects are in good condition," Cohn said. "They've been under water for 225 years. If they're not put through a conservation process to stabilize the material, they couldn't be put into an air environment without corroding."

The huge anchor from the British flagship *Confiance*, which was removed from Plattsburgh Bay several years ago, underwent a similar conservation process and is now on display at City Hall in Plattsburgh. Cohn visited the display recently and said the anchor is holding up very well on display.

The artifacts from Valcour will be put in display later this summer at the Maritime Museum.

But Cohn is already working with Clinton County Museum curator John Tomkins III on opening a display in Plattsburgh in time for the annual recognition of the battle in October.

"We've said all along that these artifacts are owned by the public and should be put on display for the community," Cohn said. "This is a wonderful thing for the Plattsburgh community. It's a legacy we all share and can only be a positive thing for the community."

Cohn has been working with Tomkins on where and how the Valcour display will fit into the museum's repertoire of exhibits.

Meanwhile, divers will return to Valcour Bay this summer to continue their vast survey of the lake bottom. What they find this year will add to the growing legacy of the role Lake Champlain played in creating the United States.

## **PRESS REPUBLICAN 11 OCTOBER 2002**

Battle of Valcour on display  
Traveling exhibit unveiled in Clinton County Museum today

By JEFF MEYERS, Staff Writer

PLATTSBURGH — A traveling historical display depicting the Battle of Valcour has arrived in Plattsburgh and will open to the public today at noon.

Historians from Vermont and New York joined local divers in setting up the display at the Clinton County Historical Association Museum on Court Street in Plattsburgh.

The exhibit, featuring artifacts from the battle site at Valcour Bay, was designed earlier this year and first opened at the Lake Champlain Maritime Museum in Basin Harbor, Vt.

"When we designed this exhibit, we knew it was eventually coming here," said Arthur Cohn, executive director of the museum, as he and other officials and volunteers placed artifacts and historical markers on display.

"We designed panel sizes and heights so they would appropriately fit in this room. We knew even before some of these artifacts were recovered that we would be developing a traveling exhibit."

The centerpiece of the exhibit is an American cannon that exploded during the Oct. 11, 1776, battle and plunged to the lake bottom, where it remained for more than 220 years. The cannon was discovered and raised from the lake a few years ago. After undergoing extensive restoration, it became the symbol of the significance of the Battle of Valcour.

"The Battle of Valcour, which actually took place over a three-day period, was one of the most significant engagements in the Revolutionary War," Cohn said.

"The connection between this event and the American victory at Saratoga in 1777 can't be lost."

The American fleet at Valcour, commanded by Benedict Arnold, confronted a much larger British fleet in the bay between the southern tip of Valcour and the New York mainland.

Although taking heavy losses during the battle, Arnold's ships withstood the assault on the 11th and slipped away from the British under the cover of darkness that night.

The British pursued the Americans the next day and eventually caught up with them at Arnold's Bay in Vermont on the 13th, where the Americans were finally defeated.



But that delay forced the British to retreat back to Canada before winter, and the Americans had enough time to regroup at Saratoga for the important victory in '77.

"This exhibit allows for reflection," Cohn said. "It's called 'Rediscovering a Moment in Time,' because it captures a singular event during the battle."

The exhibit shows the connection between the cannon and the death of a sailor aboard the gunboat New York, giving visitors a strong sense of what happened during that battle 226 years ago.

The exhibit also features information on the current archaeological activity being conducted at Valcour. Historians and volunteer divers have spent the last three years mapping the lake bottom below the site of the American and British lines of boats.

The Clinton County Historical Association had to do some revamping of museum exhibits to create the new display.

"It's exciting to have this new exhibit, not only for its national historical significance but also for the links between the cannon, document records and the headstone of a participant of the battle," said John Tomkins III, director for the museum.

"The exhibit has taken up a tremendous amount of space, but we've also had to consider the space that needs to remain open and unused for visitors to the exhibit."

Some of the exhibits displaced by the Valcour material have been moved to other parts of the museum, and some have been placed in storage.

The exhibit will be in Plattsburgh for one year before moving on, possibly to the U.S. Navy museum in Washington, D.C.

## **PRESS REPUBLICAN 7 JULY 2002**

Valcour battle revealed in new 2-state exhibit

By JEFF MEYERS, Staff Writer

BASIN HARBOR, Vt. — American history was made during a decisive battle at Valcour Island more than 225 years ago.

An important moment in local history was etched into the record books Monday morning when an exhibit honoring that Revolutionary War encounter opened at the Lake Champlain Maritime Museum in Basin Harbor, Vt.

The display, a compilation of artifacts and information collected from a unique underwater archaeological survey at Valcour, emphasizes a growing effort between New York and Vermont to recognize the connection between both states.

"We come together on a day of celebration, of reflection and of thanks," said Arthur Cohn, executive director for the Maritime Museum. "We celebrate the achievements of a combined effort between New York and Vermont to work together in cooperation."

For years, the two states sharing Lake Champlain were often divided when it came to lake-related issues. But the efforts at Valcour have gone a long way in cementing a working relationship between the states.

Divers from both states have been spending the past two summers surveying the bottom of the lake — under where American Commander Benedict Arnold challenged a much larger invading British fleet at Valcour.

The Americans eventually lost that Oct. 11, 1776, battle, but the time Arnold gained for the new nation enabled the Americans to rebound victoriously in 1777.

"This exhibit has exceeded our expectations," Cohn said. "The story was there. We had to tell it, and we had to tell it right."

The centerpiece of the exhibit is undoubtedly the broken pieces of a large American cannon found a few years ago in the murky lake bottom by New York diver Ed Scollon.

The discovery coincided with newly found records that showed an American sailor had died during the Battle of Valcour when a cannon on his boat exploded.

Connecting those records with the location of Scollon's find helped identify the American line of boats as Arnold battled the British fleet. Much of the research has centered on that line, and the newly unveiled display chronicles the discoveries.



"We Vermonters and the residents of New York have a duty, an obligation to preserve the heritage of Lake Champlain," said Vermont Sen. Patrick Leahy, who was on hand for Monday's ceremony.

"It's our responsibility to hold these artifacts in trust for the rest of the nation. This project (at Valcour) epitomizes what a valuable trust that is."

The display also features several cannonballs and other artifacts from the site and includes background information on the lake-bottom survey, including a look at the divers involved.

"By putting what we find on the bottom on display, now everyone can appreciate it," said Matthew Booth of Plattsburgh, one of the New York divers at the site. "There is no other way for most people to see what we are finding down there."

"This is quite a dynamic exhibit. The way it's laid out gives the non-diver an appreciation of what it's like down there."

In October, researchers will move the display from Basin Harbor to the Clinton County Historical Association Museum on Court Street, Plattsburgh, where it will be available for further review by local residents.

"It's exciting to be both a part of the project and to see the results on display for the public," said John Tomkins III, curator for the Clinton County museum.

"I'm glad the Clinton County Historical Association is a partner in the project and has been given the opportunity to re-utilize the exhibit and share it with the North Country."

Meanwhile, divers will return to the water in August to continue their underwater survey, including expanding searches along the British line of ships.

Cohn said they hope to uncover even more of the story surrounding that significant chapter in the formation of the new nation.

## APPENDIX 5: LCMMNEWS ARTICLES

### LCMMNEWS SPRING/SUMMER 2000

#### *The Battle of Valcour Island*

##### Research uncovers new information about participants

**L**CMM historian George Quintal is compiling significant information about the men who fought with Benedict Arnold at the Battle of Valcour Island on October 11-13, 1776. His list of participants in the 1776 campaign in the Champlain Valley currently contains over 400 names. One of these American heroes on Lake Champlain was **Sergeant Jonas Holden**, who was born in 1751 in Groton, Mass., and was a staunch patriot from the earliest days of the American Revolution. In 1775, he was a minuteman in Westford, Mass., and participated in the battles at Concord and Bunker Hill.

In early 1776 Jonas volunteered to join the Northern Army. Along with his brother Sartell and his fellow townsman **Lieutenant Thomas Rogers**, he was assigned to the gunboat *New York*, one of eight gunboats in the fleet and a sister ship to both *Philadelphia* and the intact gunboat located in Lake Champlain in 1997. During the battle on October 11, one of *New York's* cannon burst, killing Thomas Rogers (leaving his pregnant wife a widow) and wounding Jonas in the right arm and side. After the American squadron's daring escape that night from the British, Jonas was wounded again during the ensuing two-day running battle. *New York* lost all of its officers except Captain John Read, but it was the only one of the eight gunboats that survived the retreat back to Fort Ticonderoga.

Jonas continued to fight for the American cause until the British surrender at Yorktown on 19 October 1781. He died at the age of 83 in Wallingford, Vt., exactly sixty years to the day after his first service at the Battle of Concord, and was buried in the Doty Cemetery in South Wallingford. He and his wife Sarah were the parents of twelve children and have over 200 surviving descendants.

Jonas's shipmate Thomas Rogers, a casualty of the Battle of Valcour, is buried in the Fairview Cemetery in Westford, Mass. His monument reads:

##### MEMENTO MORI

This monument is Erected to the memory of Lieu: Thoma' Rogers by M<sup>rs</sup>. Molly his Sorowefull widow He was Killed by the Splitting of a Cannon on the Lake Champlain on the 11<sup>th</sup> day of Oct' 1776 in the Continenta' Army in the Serves of his Country and in the caus [sic] of Liberty Aged 26 years and 9 months.



*The grave monument of Lieutenant Thomas Rogers, killed on board the gunboat New York during the Battle of Valcour, stands in Westford, Mass.*

## LCMMNEWS SPRING 2001

### Valcour Island Survey

In July 2000, LCMM conducted, in association with a team of local New York State divers, an archaeological survey of the submerged Valcour Island Battle site. Our team, together with about a dozen other divers led by New York State Police diver Ed Scollon, worked under a permit issued by the New York State Museum, with support from the Department of Defense Legacy Program and the Navy Historical Center.

The survey focused on the area of the bay where the American lines were located. The artifact scatter from the battle is buried under a layer of fine silt, with artifacts typically one to two feet below the surface. The survey uncovered numerous artifacts related to the conflict, the most significant of which were three large cannon fragments. The cannon is believed to have exploded and shattered during the engagement. Research has determined that a cannon explosion on the gunboat *New York* killed its lieutenant, Thomas Rogers, and the cannon in question may be the one associated with this fatal event (see *LCMMnews*, Spring/Summer 2000).

Our efforts to protect this important Revolutionary War battle site will continue in 2001. With the support of the Department of Defense Legacy Program, LCMM will raise several of the artifacts located during the previous surveys. Look for several large cannon fragments to arrive at the Conservation Laboratory in mid-summer.



*The Valcour Island crew "rehearses" techniques on land before performing the survey operations in the cold, dark lake waters.*

LCMMNEWS FALL/WINTER 2001

## Cannon Raising Sheds New Light on the Battle of Valcour Island

On June 30, 2001, a throng of supporters and well-wishers looked on as LCMM raised an important relic from the Revolutionary War site of the crucial Battle of Valcour Island. The raising was all the more special because it took place in the year of the battle's 225th anniversary.

### THE HISTORY OF THE BATTLE

On October 11, 1776, General Benedict Arnold commanded an American fleet of fifteen fighting vessels and engaged the British Navy near Valcour Island, New York. After an intense five-hour battle, with heavy casualties on both sides, darkness finally

Photo by John Butler



A portion of the Valcour cannon is raised from the lake bottom, where it has lain for 225 years.

Photo by John Butler



LCMM director Art Cohn speaks about the significance of the day's events.

ended the conflict.

With perhaps sixty men killed and wounded on the American side and three-quarters of their ammunition gone, Arnold and his officers executed a daring night-time escape and passed a British blockade. Two days later, on October 13, the British fleet caught up with Arnold and a second running battle was joined. Arnold, outgunned and surrounded in what is

known today as Arnold's Bay, intentionally destroyed five of his own vessels and escaped back to Fort Ticonderoga on foot. Only four of his original fifteen vessels survived the three-day affair. At its conclusion, control of the strategically important Lake Champlain invasion corridor had shifted to the British.

Sir Guy Carleton, Governor General of Canada, content with achieving control of the lake, broke off the attack and returned to Canada for the winter. During the spring of 1777, the British moved their army and navy south, past the hastily abandoned American Fort Ticonderoga and Mount Independence, and launched an invasion of the Hudson Valley. Here, at Saratoga, Gen-

Please turn to page 3

Photo by John Butler



As Senator Patrick Leahy looks on, Senator Hillary Rodham Clinton addresses the crowd at the cannon raising.

Cannon Raising, continued from page 1

eral John Burgoyne and his army were defeated on the field of battle by a strong American force. Burgoyne was forced to surrender his army and the tide of the American Revolution changed.

Writing more than a century later, naval historian Alfred Thayer Mahan said, "The little Navy on Lake Champlain was wiped out, but never had any force, large or small, lived to better purpose or died more gloriously."

**LCMM PICKS UP THE STORY**

LCMM has been engaged in research on the Battle of Valcour Island for more than two decades. In 1991, it launched a full-sized replica of the gunboat Philadelphia. In 1997, LCMM located the last unaccounted-for vessel from Benedict Arnold's Valcour Island fleet.

We quickly launched a new research effort to identify the gunboat. In addition to learning that the gunboat is Spitzise, we also uncovered some new information about the battle. Historian George Quintal, while compiling information about the men who fought at Valcour Island, found a pension record for one of the American participants, Sergeant Jonas Holden (see LCMMnews, Spring/Summer 2000).

In early 1776, Holden volunteered to join the Northern Army and was sent to Lake Champlain. Along with his brother, Sartell, and fellow townsman Lieutenant Thomas Rogers, he was assigned to the gunboat New York, one of the eight gunboats in the American fleet. Through the pension record, we learned that during the October 11 battle, one of New York's cannon burst while attempting to be fired, injuring Sergeant Holden in the right arm

and side. Holden recovered from these wounds and continued to fight for the American cause until the British surrender at Yorktown on October 19, 1781.

Jonas Holden's pension record also reveals that when the cannon burst, it killed Lieutenant Rogers. Although Arnold reported that "the New York lost all her Officers except her Captain," New York was the only gunboat to survive the battle.

**VBRRP STARTS DIVING**

Paralleling this new research was the 1999 discovery of a cannon muzzle near Valcour Island by New York State Police diver Edwin Scollon. We determined that the cannon fragment was from a six-pound gun, quite probably the same cannon that burst aboard New York. Scollon's discovery and our desire to expand understanding of this battle spawned the Valcour Bay Research Project or VBRRP (see LCMMnews Spring 2001).

In 1999 and 2000 the VBRRP, with the support of the New York State Museum, the Department of Defense Legacy Program, and the Navy Historical Center, conducted an archaeological survey

of the submerged battlefield.

During this survey, the VBRRP located two additional cannon fragments, a wood and leather cartridge box, and many pieces of ordnance. Team members left the newly found artifacts on the bottom of Valcour Bay while we obtained funding for their conservation and the necessary permits to raise them.

**JUNE 30: A BANNER DAY**

On June 30, 2001, the LCMM, with the



Photograph by Jerry Fortson

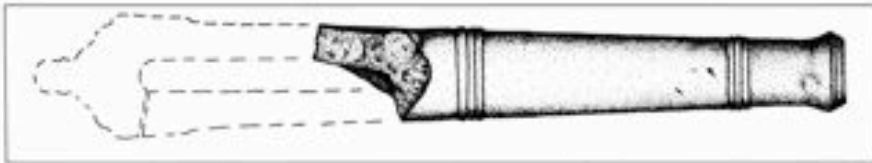
LCMM archaeologist Pierre LaRoque prepares to dive in Valcour Bay.

extraordinary support of numerous partners, successfully raised this newly found collection of artifacts. The raising brought Senators Patrick Leahy and Hillary Clinton together to celebrate the extraordinary historical legacy contained under Lake Champlain.

The recovered artifacts were immediately put under the care of LCMM conservators and stabilized for their journey to the Conservation Lab at Basin Harbor, Vermont. The conservation process is expected to take approximately one year to complete. Once the artifact conservation is finished, LCMM will place the material on public exhibit in LCMM's "Key to Liberty" exhibit. In October 2002, the artifacts will cross the lake for exhibition at the Clinton County Historical Museum in Plattsburgh, New York. :-

The cannon raising was possible only with the tremendous support of the Lake Champlain Transportation Company, Barrett's Tree Service, the U.S. Coast Guard/Burlington Station, and Breakwaters. Thank you!

LCMM will explain the tremendously successful Valcour Bay Research Project, an archaeological survey to map the battlefield site, in the Spring 2002 issue of LCMMnews. You can get an update now at [www.historiclakes.org](http://www.historiclakes.org).



Scale drawing of the cannon muzzle recovered from Valcour Bay (drawn by Gordon Caswood, inked by Adam Lovett).

LCMMNEWS SPRING/SUMMER 2002

# LCMMnews



SPRING/SUMMER 2002

## LCMM Preserves History

Photos by Sharon Bell



*Conservation Lab director Chris Sabick and educational specialist/blacksmith Dale Henry inspect a Revolutionary War cannon fragment raised from the Valcour Battlefield site. LCMM's Valcour Bay Research Project is starting to bear fruit in a big way, and museum visitors can see recently conserved artifacts from the submerged battlefield in a new exhibit at the museum in Basin Harbor beginning in June. Story, page 2.*

## ... And Brings It to Life!

*LCMM found this hidden gem, the 'Captain White Place,' beneath the facade of the Chickenbone Cafe at 43 King Street in Burlington. LCMM is renovating it to help bring a chapter in Burlington's maritime history back to life, and to provide a year-round education center for its working shipyard just one block away. Read more about this new LCMM site on page 3.*

Photo by Sharon Bell





## MARITIME RESEARCH INSTITUTE

### Valcour Survey Pieces History Together

The summer of 2002 saw the completion of the third field season of the Valcour Bay Research Project (VBRP), an underwater archaeological investigation of the submerged Revolutionary War battlefield at Valcour Bay, in Lake Champlain. Today, the waters around Valcour Island are frequented by recreational boaters who are drawn to the sparsely developed area for its Adirondack and Green Mountain vistas, as well as for the sheltered waters created by the inlets around the island. The present tranquility of Valcour Bay belies the violent naval battle that took place there in 1776.

In October 1776, Benedict Arnold and his small flotilla fought a pitched battle against a superior British fleet. The debris from this historic activity is scattered across the lake bed, and the relics have been sought after by many people with a desire to reconnect to this important battle. The collecting has, however, spread many artifacts all around the region and country. Lacking conservation treatment, they slowly decay despite the best intentions of the collector. It's an unfortunate outcome for everyone involved.

In 1999, LCMM was presented with an



LCMM archaeologist Adam Kane studies Art Coles prior to a dive in Valcour Bay.

opportunity to channel this collecting activity into a systematic survey of the battlefield. This came about through the discovery of a broken cannon in Valcour Bay by Ed Scollon (see LCMMnews Fall/Winter 2002). Our association with Ed and his dedicated team of divers led to the Valcour Bay Research Project. In 1999 and 2000 we had great success with the survey, mapping large portions of the bay.

In August 2001 we launched the most ambitious field project to date. With the help of twenty-five volunteer divers, we meticulously surveyed 30,000 square feet of the lake bottom. The first week turned up one exciting artifact: a sword, complete with its wood and leather scabbard. Although this was a tremendous find, all of the team members had hoped to find additional pieces of the cannon. Week two did not disappoint; the team succeeded in locating three more pieces! They were found nearly 200 feet from the point where the original cannon fragment was found. We estimate that these three new fragments, combined with the three previously located, account for about 80 percent of the gun.

#### EARLY RESEARCH RESULTS

We are now convinced that the six cannon fragments discovered in Valcour Bay were from the Gunboat New York. This archival research, combined with the archaeological data, has allowed us to make some conclusions about the events of October 11, 1776.

The distribution of the cannon pieces and other artifacts suggests that the cannon fragments on the upper face of the gun were blown into the air, but others on the underside were sent into the bottom of the gunboat. The largest piece of the cannon, the muzzle, likely plunged directly into the water after the explosion. We see this pattern on the lake bed with the muzzle by itself at the center of the explosion and the fragments of the upper face of the gun almost 200 feet northwest of the muzzle. The pieces on the underside, which remained in the hull after the

### Exhibit of Valcour Bay Artifacts Opens in June at Basin Harbor

Last June, with three hundred people looking on, LCMM and the crew from the Valcour Bay Research Project recovered a burst cannon that hadn't seen the light of day since October 11, 1776.

Once the cannon fragments and other artifacts were recovered and the speeches delivered, the collection of material was delivered to the LCMM Conservation Laboratory for stabilization. Having largely accomplished that goal, it is our great pleasure to report that LCMM plans to exhibit these items, with the opening slated to take place in June in the Nautical Archaeology Center's West Gallery. The exhibition will remain at LCMM until mid-October. The exhibit will then be transported to the Clinton County Historical Association in Plattsburgh, New York, so it can be shared with Champlain Valley residents there. The CCHA has been an important partner in the VBRP, and we are looking forward to the fall opening. (See page 13.)

explosion, were found southeast of the muzzle. These artifacts are part of a "dump zone" resulting from the gunboat's crew throwing the pieces overboard as the vessel was adrift after the explosion.

#### MORE WORK YET TO DO

The VBRP has thus far mapped only a very small portion of the Valcour battlefield. Future years of research will undoubtedly provide us with a greater understanding of this important naval engagement.

The Valcour Bay Research Project is made possible with funding from the American Battlefield Protection Program of the National Park Service and the Department of Defense Legacy Program. We will return to the waters of Valcour Bay in 2002 to continue this important project. ↴

## MARITIME RESEARCH INSTITUTE

### Conservation Laboratory Humming

The winter of 2001-2002 has seen the continuation of a number of projects that were begun during the previous season, keeping lab technician Robert Wilczynski and lab director Chris Sabick quite busy.

#### VALCOUR BAY RESEARCH PROJECT

Treatment of the artifacts recovered from the Valcour Island Battlefield site during the summer of 2001 is nearing completion. This amazing collection consists of a variety of artifact types, including various pieces of ordnance, personal items, military equipment, and, the centerpiece of the collection, a fractured six-pound cannon and portions of its carriage. These items will be the focus of the new display in the Nautical Archaeology Center, which is scheduled to open in June.

A careful cleaning of the cannon muzzle revealed some unexpected features. The cannon has two markings, one on the trunnion and one on the muzzle. The trunnion marking, probably the maker's mark, is eroded, making it difficult to see. In contrast, the marking chiseled into the muzzle—"N<sup>o</sup> XII"—is crystal clear.

Although this marking is of great interest, it is doubtful it will lead to any conclusions about the cannon's origin. Because the marking was put there after the cannon's manufacture, it is likely an inventory number. It could have been chiseled into the weapon at any point during its life span. And that may well have been quite a life span. The cannon is very similar to ones found onboard the gunboat *Philadelphia*,

one of New York's sister ships. *Philadelphia's* guns were cast in Sweden in the seventeenth century. The cannon we are now treating may thus have been an antique even when it was being used in 1776!

#### FORT TI CONSERVATION PROJECT

More than eighty artifacts from excavations carried out at the Fort Ticonderoga Museum during the summer of 2001 are undergoing treatment in the LCMM Conservation Laboratory. The range of artifacts in this collection is quite wide. A large number of buttons have been stabilized, as have a number of engraving tools and musket parts. ↓

### LCMM Thanks Its Conservation Interns

The Conservation Laboratory staff has been aided this winter by a wonderful group of interns from colleges throughout Vermont. These students were given the opportunity to learn about archaeology and artifact conservation through hands-on work in our conservation laboratory. LCMM hopes that this experience will help them in deciding on career choices and prepare them for work on future archaeological projects.

Three interns from Middlebury College spent four weeks working in the Conservation Laboratory this past January. Amanda Bohnsack, Katie Curler, and Julia Delafield logged more than a 300 hours of lab time during Middlebury's I-Term, learning the basic tenets of conservation and applying them to artifacts from a variety of projects. During their time at LCMM, the Middlebury interns completed the treatment of more than forty artifacts. Their help this winter was invaluable.

Pierre LaFlamme, a senior at Johnson State College, has also spent a considerable amount of time in the lab over the last few months. Pierre splits his time at LCMM be-

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tween working with the gig-building crew and working on artifacts in the Conservation Laboratory. Pierre has focused on working on artifacts from the Lake Champlain Archaeological Association Collection, which consists of items from the Revolutionary War and War of 1812 periods.

The conservation staff at LCMM would like to extend a very heartfelt "thank you" to these volunteers and all the others who have made our work in the lab over the last year much more interesting and a lot more fun. We would also like to take this opportunity to invite others interested in volunteering in the Conservation Laboratory to contact us to make arrangements.

Photos by Chris Sabick



Detail of cannon muzzle showing marking.



Middlebury College interns Katie Curler, Julia Delafield, and Amanda Bohnsack cleaning brass artifacts.

## LCMMNEWS FALL/WINTER 2002-2003

### MARITIME RESEARCH INSTITUTE

#### **VBRP: Rediscovering a Moment in Time**

On October 11, 1776, an American fleet under the command of Benedict Arnold fought the British near Valcour Island, New York. The intensive fighting left heavy casualties on both sides and two American vessels lost. In 1999, the significant underwater discovery of an exploded cannon led to the initiation of the Valcour Bay Research Project (VBRP), a systematic examination of the lake bottom below the location of the Battle of Valcour Island.

The project is a partnership between an extraordinary group of New York State divers and the Lake Champlain Maritime Museum. Our goal is to systematically survey the submerged, scattered Valcour Battle site and, through the distribution of artifacts from the battle and ongoing historical research, add to our knowledge of this important naval engagement.

This year has been very good for the VBRP. After a year of conservation, the artifacts raised in 2001 (see the Fall 2001 LCMMNews) were incorporated in a major new exhibition entitled "Rediscovering a Moment in Time." The exhibit was opened by Senator and Mrs. Patrick Leahy on July 1, just in time to provide reflection on historical events as well as the events of the past year. The exhibition, which traveled to the

Clinton County Historical Association in Plattsburgh on October 11, explains the history of the battle and how and why we are executing the underwater research project.

In between exhibit openings, our crew of divers returned to Valcour Bay to complete a fourth season of field survey. We worked on both ends of the American line and also began investigation of the site where the first American flagship, *Royal Savage*, ran aground and was burned. The results of our two-week survey and the ongoing work of the New York volunteers are impressive. We will complete the publication detailing the first four years of the survey this winter. We are also planning to return to Valcour Bay in 2003.

A special thanks to new team member Captain Dick Heilman, who provided a great diving platform appropriately named *Great Republic*. Much appreciation to the New York State Office of General Services and surveyor Richard Bennett for their assistance during the project. We want to also extend a warm thanks to the Dr. McDowell



Senator Patrick Leahy helps open the Valcour Bay Research Project exhibit on July 1, 2002. Art Cohen and his son Nathan look on.

Family and to Chris Booth and family for providing us with great support and hospitality. We are particularly grateful to the Naval Historical Center and the Department of Defense Legacy Program for providing funding for this year's project.

#### **2002 Volunteer Dive Team**

Todd Bissonette, Matt Booth  
Greg Durocher, Jerry Forkey  
Chris Fox, Roger Harwood  
Richard Heilman, Phillip Lamarche  
Bill Leege, Dennis O'Neil  
Edwin Scollon, Tony Tyrell

#### **Canal Boat Research: We Need Your Help!**

As the sailing canal boat *Leis McClure* is being constructed on the Burlington Waterfront, LCMM archaeologist Scott A. McLaughlin is uncovering the history of the people who lived and worked on Lake Champlain's canal boats.

Photo: © Scott McLaughlin



For the past two years, Scott has been researching the household strategies, social networks, and culture of Lake Champlain's canalers for a Ph.D. dissertation in anthropology from Binghamton University. Scott has located thousands of documents relating to the construction and operation of the lake's canal boats, from which he will reconstruct the canalers' largely forgotten way of life.

Nearly 4,000 canal boats called Lake Champlain home from 1819 to 1940. The community of mariners that op-

erated these boats likely numbered greater than 10,000. Scott is exploring every facet of the canalers' life. While custom records, newspaper notices, and canal records make it relatively easy to trace the movement, growth, and decline of the canalers' way of life, the day-to-day experiences, aspirations, and family life has proven more difficult to recreate. Diaries, letters, and ship's logs are rare; of those that exist, probably most remain in family hands.

Scott has created an extensive database containing details about the lake's canal boat shipwrights, owners, and captains that is on the museum's Web site. Please take a look at the list of canalers. If you have any information about any of them, please contact the museum.

[www.lcmm.org](http://www.lcmm.org)

Fall/Winter 2002-03 5

## APPENDIX 6: 1999-2002 SURVEY SUMMARY

<b>1999 SURVEY SUMMARY - PERMIT #AR9904</b>			
DATE	DIVERS/PERSONNEL	#DIVES	SURVEY OBJECTIVE
7-AUG	ED SCOLLON	1	PLACED ARCHAEOLOGICAL PLACARD
	TONY TYRELL	1	PLACED ARCHAEOLOGICAL PLACARD
20-AUG	ED SCOLLON	5	SITE PREPARATION, SITE ORIENTATION
	STEVE NYE	2	UNDERWATER PHOTOS
	ART COHN	1	ARTIFACT DOC., SITE ASSESSMENT
	JONATHON EDDY	1	ARTIFACT DOC., SITE ASSESSMENT
25-AUG	ED SCOLLON	3	ARTIFACT DOC., SITE ORIENTATION
	TIM AUBIN	1	ARTIFACT DOCUMENTATION
	DAN CARPENTER	2	ARTIFACT DOCUMENTATION
	DAN ROCK	2	ARTIFACT DOCUMENTATION
31-AUG	ED SCOLLON	4	ARTIFACT DOC., GRID FORMATION
2-SEP	ED SCOLLON	4	SET UP OF GRID SE:1 / 1, ANOMALY INV.
	STEVE NYE	2	SURVEY GRID SE:1 / 1, ARTIFACT DOC.
	TONY TYRELL	2	SURVEY GRID SE:1 / 1, ARTIFACT DOC.
13-SEP	ED SCOLLON	2	GRID FORMATION
15-SEP	ED SCOLLON	3	SURVEY GRID SW:1 / 1*, SET UP NW:1 / 1
	TONY TYRELL	1	SURVEY GRID SW:1 / 1
16-SEP	ED SCOLLON	3	SURVEY GRID NW:1 / 1, ANOMALY INVEST.
18-SEP	ED SCOLLON	1	ANOMALY INVESTIGATION GRID NW:1 / 1
19-SEP	ED SCOLLON	2	ANOMALY INVESTIGATION GRID NW:1 / 1
	JERRY FORKEY	2	SITE ORIENTATION, ANOMALY INVEST.
25-SEP	ED SCOLLON	4	SURVEY GRID NW:1 / 1
	TERRY AUBIN	1	SITE ORIENTATION
	JERRY FORKEY	3	SURVEY GRID NW:1 / 1
26-SEP	ED SCOLLON	4	SURVEY GRID NW:1 / 1, ANOMALY INVEST.
27-SEP	ED SCOLLON	3	SURVEY GRID NW:1 / 1*, NE:1 / 1
	TONY TYRELL	2	SURVEY GRID NW:1 / 1, NE:1 / 1
28-SEP	ED SCOLLON	3	SURVEY GRID NE:1 / 1*, SET UP NW:2 / 1
5-OCT	ED SCOLLON	3	SURVEY GRID NW:2 / 1, ANOMALY INVEST.
12-OCT	ED SCOLLON	3	ARTIFACT DOC., UNDERWATER VIDEO
	TONY TYRELL	1	ARTIFACT DOCUMENTATION
15-OCT	ED SCOLLON	3	SITE PREPARATION
19-OCT	ED SCOLLON	1	SITE PREPARATION
21-OCT	ED SCOLLON	2	SURVEY GRID NW:2 / 1*, VIDEO
25-OCT	ED SCOLLON	3	SURVEY GRID NE:2 / 1, ANOMALY INVEST.
1-NOV	ED SCOLLON	2	SURVEY GRID NE:2 / 1*, ANOMALY INVEST.
23-NOV	ED SCOLLON	1	UNDERWATER VIDEO OF SURVEY OPS.
14-DEC	ED SCOLLON	1	SITE INSPECTION
23	TOTAL SURVEY DAYS	85	TOTAL DIVES FOR 1999

<b>2000 SURVEY SUMMARY - PERMIT #AR9904</b>			
<b>DATE</b>	<b>DIVERS/PERSONNEL</b>	<b>#DIVES</b>	<b>SURVEY OBJECTIVE</b>
21-MAR	ED SCOLLON	2	SURVEY OF GRID SE:1/1
24-MAR	ED SCOLLON	2	SURVEY OF GRID SE:1/1*, SE:1/2
19-APR	ED SCOLLON	2	SURVEY OF GRID SE:1/2
20-APR	ED SCOLLON	2	SURVEY OF GRID SE:1/2
25-APR	ED SCOLLON	3	SURVEY OF GRID SE:1/2
26-APR	ED SCOLLON	1	ANOMALY INVESTIGATION GRID SE:1/2
27-APR	ED SCOLLON	3	SURVEY OF GRID SE:1/2*, NE:1/2
29-APR	ED SCOLLON	2	ARTIFACT DOCUMENTATION GRID SE:1/2
3-MAY	ED SCOLLON	2	ARTIFACT DOCUMENTATION GRID SE:1/2
22-MAY	ED SCOLLON	2	ARTIFACT DOCUMENTATION GRID SE:1/2
26-MAY	ED SCOLLON	1	SITE ORIENTATION
	TODD BISSONETTE	1	SITE ORIENTATION
	STEVE NYE	0	SITE ORIENTATION
30-MAY	ED SCOLLON	3	SURVEY OF GRID NE:1/2
2-JUN	ED SCOLLON	2	SURVEY OF GRID NE:1/2
5-JUN	ED SCOLLON	2	SURVEY OF GRID NE:1/2
	MATT BOOTH	2	SURVEY OF GRID NE:1/2
16-JUN	ED SCOLLON	3	GRID FIELD EXTENSION
19-JUN	ED SCOLLON	3	GRID FIELD EXTENSION
20-JUN	ED SCOLLON	3	GRID FIELD EXTENSION
26-JUN	ED SCOLLON	2	GRID FIELD EXTENSION
28-JUN	ED SCOLLON	2	GRID FIELD EXTENSION
6-JUL	ED SCOLLON	2	GRID FIELD EXTENSION
7-JUL	ED SCOLLON	3	GRID FIELD EXTENSION
12-JUL	ED SCOLLON	3	GRID FIELD EXTENSION
	MATT BOOTH	3	GRID FIELD EXTENSION
15-JUL	ED SCOLLON	3	GRID FIELD EXTENSION
30-JUL	ED SCOLLON	1	SET UP OF GRID NW:2/2
	TONY TYRELL	1	SET UP OF GRID NW:2/2
31-JUL	ED SCOLLON	2	SITE PREPARATION
	MATT BOOTH	2	SITE PREPARATION
	ADAM KANE	1	SURVEY OF GRID NE:1/2
	ROB WILCZYNSKI	1	SURVEY OF GRID NE:1/2
	PIERRE LAROCQUE	1	SURVEY OF GRID NW:2/2
	BILL ATKINSON	1	SURVEY OF GRID NW:2/2
2-AUG	ED SCOLLON	4	SITE PREPARATION - NE:1/2
	DAN CARPENTER	2	SURVEY OF GRID NE:1/2*
	DAN ROCK	2	SURVEY OF GRID NE:1/2
	BILL LEEGE	1	SITE PREPARATION
	TONY TYRELL	2	SITE PREPARATION, SURVEY GRID SE:2/2
	ART COHN	1	SURVEY OF GRID SE:2/2
	ROB WILCZYNSKI	2	SURVEY OF GRID NW:2/2
	ADAM KANE	2	SURVEY OF GRID NW:2/2

*Valcour Bay Research Project: 1999-2002 Survey Results*

	PIERRE LAROCQUE	2	SURVEY OF GRID NW:2/2
	BILL ATKINSON	2	SURVEY OF GRID NW:2/2
3-AUG	ED SCOLLON	1	SURVEY OF GRID SE:2/2*
	STEVE NYE	1	SURVEY OF GRID SE:2/2
	ART COHN	2	SURVEY OF GRID SE:2/2
	BILL LEEGE	1	SURVEY OF GRID SE:2/2
	TODD BISSONETTE	1	SURVEY OF GRID SE:2/2
	ADAM KANE	2	SURVEY OF GRID NW:2/2
	ROB WILCZYNSKI	2	SURVEY OF GRID NW:2/2
	DOUG JONES	2	VIDEO OF SURVEY OPERATIONS
	PIERRE LAROCQUE	1	SURVEY OF GRID NW:2/2*
	BILL ATKINSON	1	SURVEY OF GRID NW:2/2
4-AUG	ED SCOLLON	1	ANOMALY INVESTIGATION GRID SE:2/2
	BILL LEEGE	1	ANOMALY INVESTIGATION GRID SE:2/2
	TODD BISSONETTE	1	SURVEY OF GRID SE:2/1
	ART COHN	2	SURVEY OF GRID SE:2/1
	STEVE NYE	1	SURVEY OF GRID SE:2/1
	MATT BOOTH	1	SURVEY OF GRID SE:2/1
	ADAM KANE	2	SURVEY OF GRID NW:1/2*
	ROB WILCZYNSKI	2	ANOMALY INVESTIGATION GRID NW:1/2
	PIERRE LAROCQUE	2	ANOMALY INVESTIGATION GRID NW:2/2
	BILL ATKINSON	2	ANOMALY INVESTIGATION GRID NW:2/2
8-AUG	ED SCOLLON	3	SURVEY OF GRID SE:2/1
	MATT BOOTH	2	SURVEY OF GRID SE:2/1
	JERRY FORKEY	2	SURVEY OF GRID SE:2/1
9-AUG	ED SCOLLON	1	ARTIFACT DOCUMENTATION GRID SE:2/2
	TONY TYRELL	1	ARTIFACT DOCUMENTATION GRID SE:2/2
10-AUG	ED SCOLLON	4	SURVEY OF GRID SE:2.1*
	MATT BOOTH	3	SURVEY OF GRID SE:2/1
	JERRY FORKEY	2	SURVEY OF GRID SE:2/1
16-AUG	ED SCOLLON	2	SURVEY OF GRID SE:3/1
	JERRY FORKEY	2	SURVEY OF GRID SE:3/1
17-AUG	ED SCOLLON	2	SURVEY OF GRID SE:3/1
	MATT BOOTH	2	SURVEY OF GRID SE:3/1
	JERRY FORKEY	2	SURVEY OF GRID SE:3/1
	TONY TYRELL	1	SURVEY OF GRID SE:3/1
18-AUG	ED SCOLLON	2	SURVEY OF GRID SE:3/2
	JERRY FORKEY	2	SURVEY OF GRID SE:3/2
	MATT BOOTH	2	SURVEY OF GRID SE:3/1*
	TONY TYRELL	1	SURVEY OF GRID SE:3/1
24-AUG	ED SCOLLON	2	SURVEY OF GRID SE:3/2*
25-AUG	ED SCOLLON	4	SURVEY OF GRID SE:3/3*
	JERRY FORKEY	2	SURVEY OF GRID SE:3/3
	MATT BOOTH	1	SURVEY OF GRID SE:3/3
	TONY TYRELL	1	SURVEY OF GRID SE:3/3
31-AUG	ED SCOLLON	2	SURVEY OF GRID SE:2/3
	JERRY FORKEY	2	SURVEY OF GRID SE:2/3
	MATT BOOTH	2	SURVEY OF GRID SE:2/3



*Valcour Bay Research Project: 1999-2002 Survey Results*

1-SEP	ED SCOLLON	2	SURVEY OF GRID SW:2/1
	JERRY FORKEY	2	SURVEY OF GRID SW:2/1
5-SEP	ED SCOLLON	2	SURVEY OF GRID SW:2/1*
	TONY TYRELL	1	SURVEY OF GRID SW:2/1
	GREG BRUNET	1	SURVEY OF GRID SW:2/1
7-SEP	ED SCOLLON	1	SURVEY OF GRID SW:2/2
	MATT BOOTH	1	SURVEY OF GRID SW:2/2
14-SEP	ED SCOLLON	2	SURVEY OF GRID SW:2/2
15-SEP	ED SCOLLON	4	SURVEY OF GRID SW:2/2*, SW:1/2
	TONY TYRELL	1	SURVEY OF GRID SW:2/2
18-SEP	ED SCOLLON	2	SURVEY OF GRID SW:1/2*
22-SEP	ED SCOLLON	3	SURVEY OF GRID SW:3/1
25-SEP	ED SCOLLON	2	SURVEY OF GRID SW:3/1*, SW:3/2
27-SEP	ED SCOLLON	2	SURVEY OF GRID SW:3/2
	TONY TYRELL	1	SURVEY OF GRID SW:3/2
28-SEP	ED SCOLLON	3	SURVEY OF GRID SW:3/2*, SW:4/2
29-SEP	ED SCOLLON	3	SURVEY OF GRID SW:4/2*, SW:4/1
9-OCT	ED SCOLLON	3	SURVEY OF GRID SW:4/1*
11-OCT	ED SCOLLON	3	SURVEY OF GRID SE:4/1
13-OCT	ED SCOLLON	3	SURVEY OF GRID SE:4/1*
14-OCT	ED SCOLLON	3	SURVEY OF GRID SE:4/2
3-NOV	ED SCOLLON	3	SURVEY OF GRID SE:4/2*, SE:4/3
16-NOV	ED SCOLLON	1	SURVEY OF GRID SE:2/3*
54	TOTAL SURVEY DAYS	219	TOTAL DIVES FOR 2000
77	SURVEY DAYS TO DATE	304	TOTAL DIVES TO DATE

<b>2001 SURVEY SUMMARY - PERMIT #AR9904</b>			
<b>DATE</b>	<b>DIVERS/PERSONNEL</b>	<b>#DIVES</b>	<b>SURVEY OBJECTIVE</b>
6-MAY	ED SCOLLON	1	VISUAL CHECK OF SITE
10-MAY	ED SCOLLON	3	SURVEY GRID SE:4/3
15-JUN	ED SCOLLON	1	RECOVERY PREPARATIONS
	DAN CARPENTER	1	RECOVERY PREPARATIONS
	PHIL LAMARCHE	1	RECOVERY PREPARATIONS
16-JUN	ED SCOLLON	5	RECOVERY PREPARATIONS
	ROGER HARWOOD	2	RECOVERY PREPARATIONS
	DENNIS O'NEIL	2	RECOVERY PREPARATIONS
	GREG DUROCHER	1	RECOVERY PREPARATIONS
	JIM MILLARD	0	RECOVERY PREPARATIONS
17-JUN	ED SCOLLON	1	SITE INSPECTION
18-JUN	ED SCOLLON	4	RECOVERY PREPARATIONS
	ROGER HARWOOD	2	RECOVERY PREPARATIONS
	DENNIS O'NEIL	2	RECOVERY PREPARATIONS
	GREG DUROCHER	2	RECOVERY PREPARATIONS
20-JUN	ED SCOLLON	3	RECOVERY PREPARATIONS
	GREG DUROCHER	3	RECOVERY PREPARATIONS
	DENNIS O'NEIL	2	RECOVERY PREPARATIONS
	ROGER HARWOOD	0	RECOVERY PREPARATIONS
	JIM MILLARD	0	RECOVERY PREPARATIONS
23-JUN	ED SCOLLON	3	RECOVERY PREPARATIONS
	PHIL LAMARCHE	2	RECOVERY PREPARATIONS
	ROGER HARWOOD	1	RECOVERY PREPARATIONS
	GREG DUROCHER	1	RECOVERY PREPARATIONS
	DENNIS O'NEIL	0	RECOVERY PREPARATIONS
25-JUN	ED SCOLLON	3	RECOVERY PREPARATIONS
	ROGER HARWOOD	1	RECOVERY PREPARATIONS
26-JUN	ED SCOLLON	0	RECOVERY PREPARATIONS
	ART COHN	0	RECOVERY PREPARATIONS
	PIERRE LAROCQUE	0	RECOVERY PREPARATIONS
	ADAM KANE	0	RECOVERY PREPARATIONS
	ROGER HARWOOD	0	RECOVERY PREPARATIONS
	DAN CARPENTER	0	RECOVERY PREPARATIONS
	DAN ROCK	0	RECOVERY PREPARATIONS
	TONY TYRELL	0	RECOVERY PREPARATIONS
	MATT BOOTH	0	RECOVERY PREPARATIONS
	JERRY FORKEY	0	RECOVERY PREPARATIONS
	BILL LEEGE	0	RECOVERY PREPARATIONS
	DENNIS O'NEIL	0	RECOVERY PREPARATIONS
	GREG DUROCHER	0	RECOVERY PREPARATIONS
	PHIL LAMARCHE	0	RECOVERY PREPARATIONS
28-JUN	DAN CARPENTER	1	SITE VIDEO
	DAN ROCK	1	SITE VIDEO





*Valcour Bay Research Project: 1999-2002 Survey Results*

29-JUN	ED SCOLLON	1	ARTIFACT RECOVERY
	ART COHN	3	ARTIFACT RECOVERY
	PIERRE LAROCQUE	3	ARTIFACT RECOVERY
	TODD BISSONETTE	1	ARTIFACT RECOVERY
	STEVE NYE	2	RECOVERY VIDEO
	PHIL LAMARCHE	0	SURFACE SUPPORT
	ROGER HARWOOD	0	SURFACE SUPPORT
	DAN ROCK	0	SURFACE SUPPORT
	DAN CARPENTER	0	SURFACE SUPPORT
	MATT BOOTH	0	SURFACE SUPPORT
	BILL ATKINSON	0	SURFACE SUPPORT
	ADAM KANE	0	SURFACE SUPPORT
30-JUN	ALL MEMBERS	0	ARTIFACT REMOVAL
1-JUL	ED SCOLLON	1	EQUIPMENT RECOVERY
19-JUL	ED SCOLLON	2	SURVEY GRID SE:4/3*
	MATT BOOTH	1	SURVEY GRID SE:4/3
	ROGER HARWOOD	1	SURVEY GRID SE:4/3
6-AUG	ED SCOLLON	3	SITE PREPARATION
	MATT BOOTH	2	SET UP OF GRID SE:1/3
	JERRY FORKEY	1	SET UP OF GRID SE:1/3
20-AUG	ED SCOLLON	3	SET UP OF GRID SE:1/2, SE:2/2
	ART COHN	0	SURVEY COORDINATION
	PIERRE LAROCQUE	1	SITE PREPARATION
	BILL ATKINSON	0	SURFACE SUPPORT
	ADAM KANE	1	SURVEY GRID SE:2/2
	ERICK TICHONUK	1	SURVEY GRID SE:1/2
	JOHN BUTLER	1	SURVEY GRID SE:1/2
	TOM KEEFE	0	SURFACE SUPPORT
	MATT BOOTH	2	SET UP OF GRID SE:1/2, SE:2/2
	BILL LEEGE	0	SURVEY ORIENTATION
	JERRY FORKEY	0	SURVEY ORIENTATION
	TODD BISSONETTE	1	SURVEY GRID SE:1/2
	TONY TYRELL	0	SURVEY ORIENTATION
	DAN ROCK	0	SURVEY ORIENTATION
	STEVE NYE	1	SURVEY GRID SE:2/2
	DOUG JONES	1	UNDERWATER VIDEO OF SURVEY OPS
	PHIL LAMARCHE	1	SURVEY GRID SE:1/2
	ROGER HARWOOD	0	SURVEY ORIENTATION
	CHRIS FOX	1	SURVEY GRID SE:2/2
	JOHN TOMKINS	1	SURVEY GRID SE:2/2
21-AUG	PIERRE LAROCQUE	2	SURVEY GRID SE:1/2*
	BILL ATKINSON	2	SURVEY GRID SE:1/2
	ART COHN	2	SURVEY GRID SE:2/2, SE:1/3
	BILL LEEGE	1	SURVEY GRID SE:2/2
	ERICK TICHONUK	2	SURVEY GRID SE:2/2*, SE:1/3*, NE:1/3
	TOM KEEFE	2	SURVEY GRID SE:2/2, SE:1/3, NE:1/3
	MATT BOOTH	2	SURVEY GRID SE:1/3, SITE PREP.
	ED SCOLLON	4	ANOMALY INVESTIGATION, SITE PREP.

*Valcour Bay Research Project: 1999-2002 Survey Results*

	JOHN TOMKINS	1	SURVEY GRID NE:2/2
	STEVE NYE	2	SURVEY GRID SE:1/3, NE:2/2
	TONY TYRELL	2	SURVEY GRID SE:1/3, NE:1/3
	JOHN BUTLER	2	SURVEY GRID SE:1/3, NE:1/3
22-AUG	MATT BOOTH	2	SURVEY GRID NE:1/3*, NE:2/3*
	BILL LEEGE	2	SURVEY GRID NE:1/3, NE:2/3
	ADAM KANE	2	SURVEY GRID NE:2/2
	CHRIS FOX	2	SURVEY GRID NE:2/2
	STEVE NYE	2	SURVEY GRID NE:2/2*
	DAN ROCK	2	SURVEY GRID NE:2/2
	ED SCOLLON	2	SET UP GRID NE:2/3, ANOMALY INVEST.
	ERICK TICHONUK	1	SURVEY GRID NE:2/3
	TOM KEEFE	1	SURVEY GRID NE:2/3
	PIERRE LAROCQUE	2	SURVEY GRID NE:2/3, SW:2/3
	BILL ATKINSON	2	SURVEY GRID NE:2/3, SW:2/3
	ART COHN	2	SET UP GRID SW:2/3, SURVEY SW:1/3
	TONY TYRELL	2	SET UP GRID SW:2/3, SURVEY SW:1/3
23-AUG	ADAM KANE	1	ARTIFACT DOCUMENTATION GRID SE:2/2
	TOM KEEFE	1	ARTIFACT DOCUMENTATION GRID SE:1/2
	ADAM KANE	1	SURVEY GRID SW:1/3*
	TOM KEEFE	1	SURVEY GRID SW:1/3
	PIERRE LAROCQUE	2	SURVEY GRID SW:2/3*, NW:2/3
	BILL ATKINSON	2	SURVEY GRID SW:2/3, NW:2/3
	ED SCOLLON	2	SURVEY GRID SW:2/3, ANOMALY INVEST.
	TODD BISSONETTE	2	SURVEY GRID SW:2/3, ANOMALY INVEST.
	JOHN TOMKINS	2	SURVEY GRID SW:1/3, NW:2/3
	ART COHN	1	SURVEY GRID SW:1/3
	STEVE NYE	1	SURVEY GRID SW:1/3
	DAN ROCK	1	SURVEY GRID SW:1/3
	MATT BOOTH	2	SURVEY GRID NW:2/3
	BILL LEEGE	1	SURVEY GRID NW:2/3
25-AUG	ED SCOLLON	3	SITE PREPARATION, ANOMALY INVEST.
27-AUG	ART COHN	2	SITE PREPARATION, SURVEY GRID NW:1/3
	JOHN TOMKINS	2	SURVEY GRID NW:2/3*, NW:1/3
	PHIL LAMARCHE	2	SURVEY GRID NW:2/3, NW:1/3
	PIERRE LAROCQUE	2	SURVEY GRID NW:2/3, NW:1/3
	BILL LEEGE	1	SURVEY GRID NW:2/3
	DAN CARPENTER	2	SURVEY GRID SW:2/4
	STEVE NYE	2	SURVEY GRID SW:2/4
	ERICK TICHONUK	1	SURVEY GRID SW:2/4
	MATT BOOTH	1	SURVEY GRID SW:2/4
28-AUG	PIERRE LAROCQUE	1	SURVEY GRID NW:1/3
	BILL ATKINSON	1	SURVEY GRID NW:1/3
	CHRIS SABICK	1	SURVEY GRID NW:1/3
	ERICK TICHONUK	1	SURVEY GRID NW:1/3
	TONY TYRELL	1	SURVEY GRID SW:2/4
	MATT BOOTH	1	SURVEY GRID SW:2/4
	DAN CARPENTER	1	SURVEY GRID SW:2/4

*Valcour Bay Research Project: 1999-2002 Survey Results*

	JOHN TOMKINS	1	SURVEY GRID SW:2/4
29-AUG	MATT BOOTH	2	SURVEY GRID NW:1/3*
	BILL LEEGE	2	SURVEY GRID NW:1/3,
	STEVE NYE	2	SURVEY GRID SW:2/4*, NW:1/4
	DAN ROCK	2	SURVEY GRID SW:2/4, NW:1/4
	PHIL LAMARCHE	2	ANOMALY INVESTIGATION
	CHRIS FOX	2	ARTIFACT DOCUMENTATION GRID NW:2/3
	CHRIS SABICK	2	ARTIFACT DOCUMENTATION GRID NW:2/3
	ED SCOLLON	3	ANOMALY INVESTIGATION
30-AUG	MATT BOOTH	1	SURVEY GRID NW:1/4
	BILL LEEGE	1	SURVEY GRID NW:1/4
	JOHN TOMKINS	1	SURVEY GRID NW:1/4
	PHIL LAMARCHE	1	SURVEY GRID NW:1/4
	CHRIS FOX	1	ARTIFACT DOCUMENTATION GRID NW:2/3
	ED SCOLLON	1	UNDERWATER VIDEO, ANOMALY INVEST.
	ADAM KANE	1	ANOMALY INVESTIGATION
	ERICK TICHONUK	1	ANOMALY INVESTIGATION
	PIERRE LAROCQUE	1	DGPS SURVEY OF SITE COORDINATES
	RICHARD BENNETT	0	DGPS SURVEY OF SITE COORDINATES
	ART COHN	1	EQUIPMENT RECOVERY
	CHRIS SABICK	1	EQUIPMENT RECOVERY
17-SEP	ED SCOLLON	3	ANOMALY INVESTIGATION
18-SEP	ED SCOLLON	1	ARTIFACT DOCUMENTATION GRID NW:1/4
15-OCT	ED SCOLLON	2	UNDERWATER VIDEO, EQUIPMENT RECOV.
	PHIL LAMARCHE	2	ARTIFACT DOCUMENTATION GRID SW:2/2
28	TOTAL SURVEY DAYS	215	TOTAL DIVES FOR 2001
105	SURVEY DAYS TO DATE	519	TOTAL DIVES TO DATE

<b>2002 SURVEY SUMMARY - PERMIT #AR9904</b>			
<b>DATE</b>	<b>DIVERS/PERSONNEL</b>	<b>#DIVES</b>	<b>SURVEY OBJECTIVE</b>
22-APR	ED SCOLLON	1	SET UP OF GRID SE:2/2 FOR RESURVEY
24-APR	ED SCOLLON	2	SURVEY OF GRID SE:2/2
22-MAY	ED SCOLLON	2	SURVEY OF GRID SE:2/2, ANOMALY INVEST.
28-MAY	ED SCOLLON	3	SURVEY GRID SE:2/2, ANOMALY INVEST
29-MAY	ED SCOLLON	3	SURVEY OF GRID SE:2/2, ANOMALY INVEST.
2-JUN	ED SCOLLON	2	SURVEY OF GRID SE:2/2*, ARTIFACT DOCUM.
3-JUN	ED SCOLLON	3	SURVEY OF GRID SE:1/2, ANOMALY INVEST.
5-JUN	ED SCOLLON	2	SURVEY OF GRID SE:1/2
31-JUL	ED SCOLLON	1	GRID FIELD EXTENSION
5-AUG	ED SCOLLON	2	GRID FIELD EXTENSION
9-AUG	ED SCOLLON	3	GRID FIELD EXTENSION
14-AUG	ED SCOLLON	3	GRID FIELD EXTENSION
15-AUG	ED SCOLLON	4	SITE PREPARATION
19-AUG	ED SCOLLON	2	SITE PREPARATION
	TODD BISSONETTE	1	SITE PREPARATION
	PIERRE LAROCQUE	2	SITE PREPARATION
20-AUG	MATT BOOTH	2	SURVEY GRID NW:2/8
	CHRIS FOX	2	SURVEY GRID NW:2/8
	ERICK TICHONUK	2	SURVEY GRID NW: 2/4
	SARAH LYMAN	2	SURVEY GRID NW:2/4
	ART COHN	1	SURVEY GRID NW:2/4
	BILL LEEGE	1	SURVEY GRID NW:2/4
	ADAM KANE	1	SURVEY GRID NW:2/8
	ROB WILCZYNSKI	2	SURVEY GRID NW:2/8
	PIERRE LAROCQUE	2	SURVEY GRID NW:2/8
	TONY TYRELL	2	SURVEY GRID NW:2/8
21-AUG	ED SCOLLON	2	ANOMALY INVEST. SURVEY OF GRID NW:2/4*
	CHRIS FOX	2	ANOMALY INVEST. GRIDS NW:2/4 NW:2/8
	TODD BISSONETTE	2	ANOMALY INVEST. GRIDS NW:2/4 NW:2/8
22-AUG	TODD BISSONETTE	1	SURVEY GRID NW:2/8
	PIERRE LAROCQUE	1	SURVEY GRID NW:2/8
	ERICK TICHONUK	1	SURVEY GRID NW:2/8
	SARAH LYMAN	1	SURVEY GRID NW:2/8
	ADAM KANE	1	SURVEY GRID NW:2/8*
	ROB WILCZYNSKI	1	SURVEY GRID NW:2/8
23-AUG	BILL LEEGE	2	SURVEY GRID NW:1/4*, NW:1/5
	ART COHN	2	SURVEY GRID NW:1/4, NW:1/5
	SARAH LYMAN	2	SURVEY GRID NW:1/8
	PIERRE LAROCQUE	2	SURVEY GRID NW:1/8
	PHIL LAMARCHE	2	SURVEY GRID NW:1/5, ANOMALY INVEST.
	ED SCOLLON	2	SURVEY GRID NW:1/5, ANOMALY INVEST.
	ROB WILCZYNSKI	2	SURVEY GRID NW:1/5, NW:1/8
	ADAM KANE	2	SURVEY GRID NW:1/5, NW:1/8



*Valcour Bay Research Project: 1999-2002 Survey Results*

24-AUG	ED SCOLLON	3	SURVEY GRID NW:1/8*, ANOMALY INVEST.
26-AUG	ADAM KANE	2	SURVEY GRID NW:1/7
	ROB WILCZYNSKI	2	SURVEY GRID NW:1/7
	BILL LEEGE	2	SURVEY GRID NW:1/5*, NW:2/5
	ART COHN	2	SURVEY GRID NW:1/5, NW:2/5
	SARAH BRIGADIER	2	SURVEY GRID NW:1/7*
	PIERRE LAROCQUE	2	SURVEY GRID NW:1/7
	ED SCOLLON	2	SITE PREPARATION, ANOMALY INVEST.
27-AUG	MATT BOOTH	2	SURVEY GRID NW:2/5*
	PIERRE LAROCQUE	2	SURVEY GRID NW:2/5
	ADAM KANE	2	SURVEY GRID NW:2/7
	ROB WILCZYNSKI	2	SURVEY GRID NW:2/7
	SARAH BRIGADIER	2	SURVEY GRID NW:2/5, SW:1/5
	ERICK TICHONUK	2	SURVEY GRID NW:2/5, SW:1/5
	ED SCOLLON	2	ANOMALY INVESTIGATION
28-AUG	ED SCOLLON	2	OGS DGPS SURVEY, BRITISH L. SURVEY
	ART COHN	2	BRITISH LINE SURVEY @ SAVAGE ROCK
	TONY TYRELL	2	BRITISH LINE SURVEY @ SAVAGE ROCK
	ADAM KANE	2	BRITISH LINE SURVEY @ SAVAGE ROCK
	MATT BOOTH	2	BRITISH LINE SURVEY @ SAVAGE ROCK
	CHRIS FOX	2	BRITISH LINE SURVEY @ SAVAGE ROCK
	ROB WILCZYNSKI	2	BRITISH LINE SURVEY @ SAVAGE ROCK
	SARAH BRIGADIER	2	BRITISH LINE SURVEY @ SAVAGE ROCK
	ERICK TICHONUK	2	BRITISH LINE SURVEY @ SAVAGE ROCK
	PIERRE LAROCQUE	1	BRITISH LINE SURVEY @ SAVAGE ROCK
29-AUG	ADAM KANE	2	SURVEY NW:2/7, ANOMALY INVEST.
	SARAH BRIGADIER	2	SURVEY NW:2/7, ANOMALY INVEST.
	MATT BOOTH	1	SURVEY GRID SW:1/5
	ERICK TICHONUK	2	SURVEY GRID SW:1/5
	ROB WILCZYNSKI	2	SURVEY GRID SW:1/5, NW:2/7*
	CHRIS FOX	2	SURVEY GRID SW:1/5, NW:2/7
	ART COHN	1	SURVEY GRID SW:1/5
	ED SCOLLON	2	OGS DGPS SURVEY, AM.WEST/BRITISH
30-AUG	ROB WILCZYNSKI	1	SURVEY GRID SW:1/5*
	CHRIS FOX	1	SURVEY GRID SW:1/5
	ERICK TICHONUK	2	EQUIPMENT RECOVERY @ SAVAGE ROCK
	ED SCOLLON	3	SURVEY GRID NW:2/6, ANOMALY INVEST.
3-SEP	ED SCOLLON	3	SURVEY GRID NW:2/6*, ANOMALY INVEST.
6-SEP	ED SCOLLON	3	SURVEY GRID NW:1/6, ANOMALY INVEST.
11-SEP	ED SCOLLON	2	SURVEY GRID NW:1/6, ANOMALY INVEST.
12-SEP	ED SCOLLON	2	SURVEY GRID NW:1/6*, ANOMALY INVEST.
28	TOTAL SURVEY DAYS	162	TOTAL DIVES FOR 2002
133	SURVEY DAYS TO DATE	681	TOTAL DIVES TO DATE

## APPENDIX 7: ARCHAEOLOGICAL PERMITS

Edwin Scollon - Permit AR9904 Page 1

**From:** "Phil Lord" <plord@MAIL.NYSED.GOV>  
**To:** NYSPTRB.TRBGENRL\_PO(E:Scollon)NYSPGATE.GWIA(tom:m@  
**Date:** Mon, Sep 13, 1999 12:48:14PM  
**Subject:** Permit AR9904

The application for this permit, to survey the Valcour Island area as indicated, has been approved by the State Education Department and the Office of General Services, which constitutes approval of the permit for one year of the date.

Phil Lord, Jr.  
Acting Chief, Historical Survey  
New York State Museum  
Albany, NY 12230  
plord@mail.nysed.gov  
Website: <http://www.nyam.nysed.gov>

Edwin Scollon - Header Page 1

Received: from MAIL.NYSED.GOV  
([149.10.178.8])  
by troopers.state.ny.us; Mon, 13 Sep 1999 12:52:30 -0400  
Received: from DOMAIN1-Message\_Server by MAIL.NYSED.GOV  
with Novell\_GroupWise; Mon, 13 Sep 1999 12:49:28 -0400  
Message-Id: <57dc2d5.099@MAIL.NYSED.GOV>  
X-Mailer: Novell\_GroupWise 5.2  
Date: Mon, 13 Sep 1999 12:48:44 -0400  
From: "Phil Lord" <plord@MAIL.NYSED.GOV>  
To: tom:m@svwr.net, escollon@troopers.state.ny.us  
Subject: Permit AR9904  
Mime-Version: 1.0  
Content-Type: text/plain; charset=US-ASCII  
Content-Transfer-Encoding: quoted-printable  
Content-Disposition: inline



## Permit for Intrusive Archaeological Research on U.S. Naval Cultural Resources

PERMITTEE NAME- Arthur B. Cohen

ADDRESS- 4472 Basin Harbor Rd., Vergennes, VT 05491

PHONE- 802-475-2022

FAX- 802-475-2953

E-MAIL ADDRESS- kman@vernet.net

AFFILIATION- Director, Lake Champlain Maritime Museum

PROJECT TITLE- Valcour Bay Research Project

PROJECT'S NHC ASSIGNED NUMBER- LCMM-2001-001

SCOPE OF NON-INTRUSIVE WORK ALLOWED- Recovery of specific scatter artifacts, sediment removal via manual means, large holes to be refilled. All objects to be under the care of museum's conservator.

LOCATION, INCLUDING LATITUDE AND LONGITUDE AND/OR UTM DATA- Information protected by NHC.

NAME OF THE SHIP WRECK OR BUREAU NUMBER OF THE AIRCRAFT WRECK- Isolated scatter field of objects believed to be from the Revolutionary War battlefield site, Valcour Island.

NAME OF PRINCIPAL INVESTIGATOR IF DIFFERENT THAN APPLICANT-

NAME, ADDRESS, AFFILIATION AND RELATIONSHIP OF COLLEAGUES TO BE COVERED BY PERMIT- Adam I. Kane, Nautical Archaeologist, Christopher R. Sabick, Director of Conservation Lake Champlain Maritime Museum

DURATION OF PERMIT July 1, 2001- July 1, 2002

*Signature of Permittee on this permit denotes acceptance of Naval Historical Center terms and guidelines applying to this permit. Permittee accepts responsibility for all damage and liabilities incurred during permitted activity.*

Signed

*Arthur B. Cohen*

Date 6/30/01

Signed

*Barbara A. Volzgers*  
Barbara A. Volzgers - Long Branch Head

Date 6/27/01

## APPENDIX 8: VALCOUR BAY RESEARCH PROJECT: REDISCOVERING A MOMENT IN TIME

# The Battle of Valcour Island

## October 11, 1776

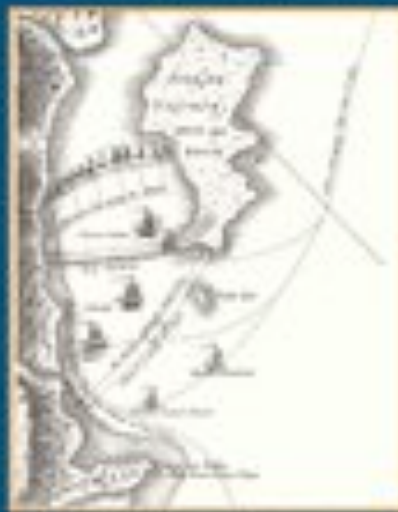
**B**efore the twentieth century, ships were the most efficient means of transport for the troops and supplies needed by invading and defending armies. This gave Lake Champlain critical strategic importance to the outcome of the American Revolution.

The Battle of Valcour Island was perhaps the most significant naval engagement of the Revolutionary War. After months of flat building, General Benedict Arnold, commanding British American warships, met the British Navy in a pitched battle for control of Lake Champlain. After more than five hours of close-range fighting, Johnson finally ended the engagement. The Americans had lost many men killed or wounded and three-quarters of their ammunition was gone. The British had suffered fewer losses, and retained their clear superiority in ships, men and guns.

Arnold, seeing no way to defeat the enemy, executed a daring and successful nighttime escape past a British blockade. Ten days later, on October 17th, the British fleet caught up with the crippled American naval force and a second battle ensued. Chagoussaint and surrounded, Arnold intentionally destroyed five of his vessels in French Bay (now known as Arnold's Bay) in Plattsburgh, Vermont as present-day visitors. As the battle's conclusion, control of the strategic Lake Champlain invasion corridor had shifted to the British. Content with their achievement, the British broke off the attack and returned to Canada for the winter. In 1777, the British moved south on the lake to launch an invasion of the Hudson Valley. A strong American force defeated the British Army at Saratoga, bringing the tide of the American Revolution.

*"The little American navy on Lake Champlain was wiped out, but never had any force, large or small, lived to better purpose or died more gloriously"*

—Alfred Thayer Mahan, *Naval History*, 1913



*"That the Americans were strong enough to impede the expedition of the British army at Saratoga was due to the invaluable year of delay caused by their little navy on Lake Champlain."*

—Alfred Thayer Mahan, 1913





## A Moment in Time

During the Battle of Valcour Island, a tragic explosion took place aboard the gunboat *New York*. A combination of recent archaeological and historical research has revealed this forgotten story.

Benedict Arnold, writing from Schuyler Island during the retreat on October 12th, had reported that "the *New York* lost all her officers except her Captain." Ironically, of the eight gunboats in Arnold's fleet, the *New York* was the only one that survived the three-day engagement in 1776. *New York* met her fate a year later when she was intentionally destroyed by her crew at Skenesborough (now Whitehall) to prevent her from falling into British hands during General John Burgoyne's invasion of Lake Champlain in July, 1777.

While researching the Battle of Valcour Island, historian George Quintal located a pension record for Jonas Holden, a sergeant aboard *New York* during the Battle of Valcour Island. In order to request government support, a Revolutionary War veteran had to describe his military service and explain his needs. From Sergeant Holden's pension record we learn that his right



Recovered fragments of the burst cannon from the gunboat *New York*.

arm and side were injured during the battle, when one of the *New York's* cannon burst while firing, and that the *New York's* Lieutenant, Thomas Rogers, was killed in the same explosion.

After the war, Sergeant Holden moved to Wallingford, Vermont where he lived to the age of 83. He and his wife Sarah were the parents of 12 children. Lieutenant Thomas Rogers left a wife, Molly, who was pregnant at the time of her husband's death. Sometime after her husband's loss, she erected a stone memorial in his memory at the Fairview cemetery in Westford, Massachusetts. The marker is reproduced below.

# Valcour Bay Research Project



© 2002

In 1999, New York State Police diver Ed Scollon made an extraordinary discovery: a cannon from the Battle of Valcour Island. This discovery triggered the beginning of the Valcour Bay Research Project.

When the guns of the battle fell silent, an array of debris remained on the lake bottom, marking the trajectories of shots fired, artifacts lost or swept overboard, and splinters of planks and rigging shattered by cannon fire. For more than a century, the submerged battlefield at Valcour Bay saw numerous attempts to locate and recover archaeological materials.

Perhaps the best remembered event occurred in 1935 when Colonel Lorenzo Huggford located and recovered the pinnace *Philadelphia*, which, according to Commodore Arnold "sank one hour after the engagement was over." After spending 25 years exhibited on Lake Champlain, in 1961 the *Philadelphia* was moved to the Smithsonian Institution in Washington D.C. for permanent exhibit in the National Museum of American History. The Battle of Valcour Island site was awarded National Historic Landmark status that same year.



The recovered cannon from Valcour Bay.



Microdiving and bottom collection site.



USS Philadelphia on display (1935).



Philadelphia ship on display at United States of America History Museum in Washington D.C.



The USS Green Goddess, captured and recovered under Fort Ripley Bay.

Only in recent times has society begun to recognize the value of "underwater cultural heritage" and discuss how it should be managed, preserved and shared. On Lake Champlain this has led to a comprehensive program of survey, documentation, exhibition, education and public access, with widespread participation.

The Valcour Bay Research Project (VBRP) is a cooperative effort between a dedicated team of volunteer sport divers and the Maritime Research Institute of the Lake Champlain Maritime Museum.



Team members of the Valcour Bay Research Project on a boat during 2002 work.

The goal of this phase of the VBRP is the preservation and systematic mapping of the submerged battlefield. Teams of divers equipped with metal detectors are surveying the site and documenting the artifacts they locate.

The VBRP has received support, encouragement and permits from New York State officials, the Naval Historical Center, the Department of Defense Legacy Resource Fund, the American Battlefield Protection Program of the National Park Service and the Lake Champlain Basin Program.

# Surveying Valcour Bay



Survey team working in Valcour Bay. The red and white flag indicates that divers are in the water.

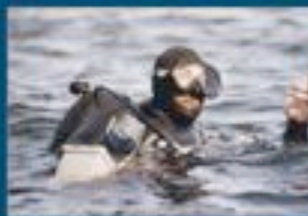
The study of underwater battlefields is a new area of research in the field of archaeology. The Valcour Bay Research Project is the first time that the scattering of artifacts that remain underwater at the site of a naval engagement (known as "underwater battlefield scatter") has been systematically examined. A new survey method was developed by the research team specifically for this project.



Boating out to the divers in Valcour Bay.

The Valcour Battlefield project area lies beneath 40–50 feet of cold fresh water. The bottom of Valcour Bay is a featureless plane of soft brownish-gray silt. These sediments have preserved the artifacts well, but can also cause poor visibility. The silt is so loosely deposited that even minor disturbances cause it to rise into the water columns where it remains suspended. Within minutes of beginning work, the movement of divers and survey equipment can reduce visibility to just a few inches.

The divers needed a survey method that could effectively guide their efforts to locate and accurately map artifacts and cultural remains. PVC (polyvinyl chloride) posts were installed on the lake bottom to mark the four corners of a 50-foot square grid. A tape measure was installed along the north



Diver used metal detector.

and south ends of the grid. Additional PVC posts were then placed at 3-foot intervals along these measuring tapes. When these posts were installed, the tape would then be removed and used to create the "transect" lines that guide the diver across the grid. Team members used metal detectors to locate buried metallic objects by slowly sweeping the detector along the designated survey lines. When an artifact was detected, its location was recorded and plotted on the site map.



Members of the Valcour Bay Research Project dive team practice techniques for surveying along the lines of the grid.

Although the approach was simple and straightforward, implementing it underwater was challenging. Dive plans were commonly rehearsed on land, because communication underwater is limited to hand signals and notes written on clipboards.

After each dive, team members were required to fill out a record to keep accurate track of the survey's progress. At the end of the 2001 field season, researchers had conducted over 500 dives on the site, and surveyed a total of 90,000 square feet of bottomlands.



The 1999 dive team prepares to recover artifacts from Valcour Bay.



Mike Ryan adds found profiles to the transect grid.

# Artifact Recovery



Cannon fragments being hoisted in 2001.



Conservation of the cannon fragments.

The recovered artifacts were immediately put under the care of LCMM conservators, and stabilized for their journey to the museum's Conservation Lab at Basin Harbor, Vermont.

This initiative is the most recent development in over two decades of ongoing LCMM fieldwork and research related to the Revolutionary War era. Previous important milestones include the

On June 30, 2001, an extraordinary group of partners, supporters and well-wishers including Patrick Leahy, U.S. Senator from Vermont, and Hillary Rodham Clinton, U.S. Senator from New York, joined Lake Champlain Maritime Museum aboard the Lake Champlain Transportation Company ferry *Adirondack* for the raising of a group of important relics from the submerged Valcour Island Battlefield. This event, which took place in the year of the 225th anniversary of the historic battle, was designed to preserve key artifacts from the submerged battlefield, and make them available for research and for public appreciation.



Left to right: Ed Bradley, the Cabin 175 Senator Hillary Rodham Clinton, US Senator Patrick Leahy, Pennsylvania Governor Ed Rendell, NY State Senator Ronald Lauder.



Museum conservator Allison Poon Valcour Bay at the conservation lab.

construction and launching of the replica 1776 gunboat *Philadelphia II* in 1989-91; locating the last missing vessel from Benedict Arnold's Valcour Island fleet in 1997; and in 1998, production of the exhibition and video *Key to Liberty: the Revolutionary War in the Champlain Valley*.



Conservators and guests examine newly raised artifacts.



Launching of LCMM's replica 1776 gunboat *Philadelphia II*.

## Conservation of Artifacts from Valcour Bay



Soak Woodblock prints in water before use in conservation lab.

Artifacts made of tar (including wood), are particularly fragile when removed from the lake. If simply allowed to dry out they shrink and collapse, becoming extremely fragile and of little value for future study. To ensure that this doesn't happen, the artifacts from Valcour Bay were impregnated with pine resin to support their waterlogged wood cells and prevent their collapse. This was accomplished by dehydrating the wood or composite artifacts in isopropyl alcohol. Once all the water in the artifacts had been replaced with alcohol, streaks of pine resin were dissolved into the alcohol in the tank. The resin seeped slowly into the wood cells and when the alcohol was allowed to evaporate the resin hardened, strengthening the cells and helping them to retain their proper shape.



Soak Woodblock prints in water before use in conservation lab.

The conservation of artifacts from an underwater site, such as the Valcour Island battlefield, is a long, complex process. Artifacts that have been buried in the thick silt at the bottom of Lake Champlain exist in an extremely stable environment. When objects are removed from this environment and exposed to the air, they can begin to deteriorate with amazing speed. Artifacts that had remained virtually unchanged on the lake bottom for more than two hundred years can crumble to dust in a matter of days or weeks. Therefore it is an excavator's responsibility to ensure that any items recovered are properly preserved for future study and interpretation.



Close-up of a rusted metal artifact.

The majority of artifacts from the Valcour Bay Research Project are composed of iron. They range in size from 2 oz. canister shot to the 700 lb. muzzle portion of the cannon. Despite this wide range

of sizes, all the iron artifacts underwent the same general treatment. Corrosion was removed using a process called "electrolysis," which flakes rust off iron by causing bubbles to form on the surface of the iron. After removing the rust, the artifacts were stained with wax and coated with tannic acid that forms a black protective layer on the metal's surface. Finally, to ensure that no new rust would form, the artifacts were submerged in molten wax that isolates them from the oxygen and humidity in the environment.



Close-up of a rusted metal artifact.



Close-up of a rusted metal artifact.

The leather flap of the cartridge box was conserved using a new technique developed at Texas A&M University. The leather was extensively dehydrated using baths of acetone and ethanol. The leather was then transferred to a container of silicone oil and placed in a vacuum chamber. The vacuum helped the silicone oil to completely penetrate the artifact. Once fully saturated the leather was exposed to another chemical that caused the silicone molecules to bond together, supporting and strengthening the cells of the artifact. This treatment produces leather that looks extremely natural and is structurally stable.

Conservation treatment to ensure the long-term stability of artifacts is an important part of the Valcour Bay Research Project. To learn more about the conservation process, please feel free to visit or contact the Conservation Lab at the Lake Champlain Maritime Museum.



Close-up of a rusted metal artifact.



## The Future: Where do we go from here?

**T**he Valcour Bay Research Project is shedding new light on a pivotal event in American history. Mapping the submerged remains of the battle has generated new information and inspired a focused reexamination of the historical record.

The systematic mapping of a submerged, scattered battlefield has never been done before, but it is now possible thanks to technology and the dedication of the volunteer dive team. In the process, the VBPR is providing regional sport divers with a rewarding alternative to private collecting. This will have, we expect, a positive impact in preserving the integrity of these underwater sites.

The submerged Battle of Valcour Island archaeological site is contained within a large area of lake bottom. It will take a number of years to fully explore the area where over 225 years ago Rebel and British forces confronted one another. The material that fell to the lake bottom during that October 11th battle connects us with the people, leaders and events that, who participated in an event that helped define the new nation.

Each season's results, when added over the years, will have a cumulative effect. The Valcour Bay Research Project participants look forward to sharing this emerging story with the public.

### The participants in the Valcour Bay Research Project would like to thank the following institutions for their support and encouragement.

American Battlefield Protection Program of the  
National Park Service, Washington, D.C.

Department of Defense Legacy Resource  
Management Program, Washington, D.C.

Naval Historical Center, Washington, D.C.

New York State Department of  
Environmental Conservation

New York State Office of Parks,  
Recreation, and Historic Preservation

New York State Museum

New York State Office of General Services

U.S. Senator Patrick J. Leahy, Vermont and staff

U.S. Senator Hillary R. Clinton, New York and staff

America's Historic Lakes, South Hero, VT

Peter Barranco, Montpelier, VT

Barnes' Tote Service, South Burlington, VT

Russell Bellon, Fording Hills, MA

Breakwater Cafe and Grill, Burlington, VT

Champlain Dive Center, Plattsburgh, NY

Clinton County Historical Association, Plattsburgh, NY

Fort Ticonderoga Museum, Ticonderoga, NY

Rod and Dodie Giler, Port Jackson, NY

Lake Champlain Basin Program, Grand Isle, VT

Lake Champlain Maritime Museum, Basin Harbor, VT

Lake Champlain Transportation Company, Burlington, VT

Dr. and Mrs. David McDowell, Peru, NY

New York State Senator Ronald B. Stafford

Shadows & Light Design, Burlington, VT

United States Coast Guard Station, Burlington, VT

Waterfront Diving Center, Burlington, VT

**APPENDIX 9: WAYSIDE EXHIBITS AT THE PERU BOAT LAUNCH**

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# Battle of Valcour Island/Bataille de l'île de Valcour

Map of Lake Champlain showing the location of Valcour Island and the battle site.

Historical map of the battle site with a photograph of a ship on Lake Champlain overlaid.


Text on the right side of the page, partially obscured by the map and image.

Text block on the left side of the page, below the map.

Text block in the middle of the page, below the map.


Text block on the right side of the page, below the map.

# Valcour's Archaeological Legacy/ Patrimoine archéologique de Valcour



The Valcour Bay area is a significant archaeological site. The bay is a natural harbor, and the surrounding land is a mix of forest and open fields. The bay is a natural harbor, and the surrounding land is a mix of forest and open fields. The bay is a natural harbor, and the surrounding land is a mix of forest and open fields.

The bay is a natural harbor, and the surrounding land is a mix of forest and open fields. The bay is a natural harbor, and the surrounding land is a mix of forest and open fields. The bay is a natural harbor, and the surrounding land is a mix of forest and open fields.




**Research Area/ Aire de recherche**

U.S. Lake Survey Chart No. 175 "Lake Champlain," Copy of England, U.S.

Ames-Land & Son de S.A., Carte en plan de 175 "Lac Champlain," Copie d'Angleterre, Année de S.G.

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# Lake Commerce/Lac Commerce



**With the opening of the Erie Canal in 1825, Lake Champlain became an important route for transportation and shipping. Improved transportation opened the growth of population centers along the lake. White and Lake Champlain became important ports, and the building and rebuilding of cities were common.**

**Usually traversing the Lake around the clock, a canal is used for lake boats. The first U.S. Canal was high above the lake was constructed in 1825. The Erie Canal, Lake Champlain and Hudson River were built in 1825.**

**The West Point Lighthouse is situated on the west side of the lake. The lighthouse was built in 1825 and the island it was built on the French-Spanish Empire in 1759. The island is now a national park and is open to the public. The lighthouse is 11 miles from the shore and is the only lighthouse in the world that is still in use.**




**White, New York, is a small town on the west side of the lake. It was founded in 1784 and is one of the oldest towns in the state. The town is situated on a peninsula and is surrounded by water on three sides. The town is known for its historic architecture and its proximity to the lake. The town is also known for its annual White Festival, which is held in July.**



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## Valcour Island Primitive Area/Le site naturel de l'île Valcour




**Map Labels:** Valcour, New York, Vermont, Champlain Canal, Champlain Valley, Champlain Islands.

**English Text:**  
 A group of 5,000 acres of forested land in the western part of the New York side of Lake Champlain. It is managed by the New York State Department of Environmental Conservation as a primitive area. The island is a natural area, and it is a part of the Champlain Islands National Park. The island is a part of the Champlain Islands National Park. The island is a part of the Champlain Islands National Park. The island is a part of the Champlain Islands National Park.

**French Text:**  
 Un groupe de 5 000 acres de forêt boisée dans la partie ouest de la rive nord-est du lac Champlain. Il est géré par le Département de l'Environnement de la Nouvelle York. L'île est une zone primitive. L'île est une zone naturelle, et elle fait partie du Parc national des îles du lac Champlain. L'île est une partie du Parc national des îles du lac Champlain. L'île est une partie du Parc national des îles du lac Champlain. L'île est une partie du Parc national des îles du lac Champlain.



**Map Labels:** Pointe du Nord, Pointe du Sud, Pointe de l'Est, Pointe de l'Ouest, Pointe de la Vallée, Pointe de la Rivière, Pointe de la Montagne, Pointe de la Vallée, Pointe de la Rivière, Pointe de la Montagne, Pointe de la Vallée, Pointe de la Rivière, Pointe de la Montagne.



## **CHAPTER VII: APPENDIX 10: CONSERVATION TECHNIQUES**

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This appendix describes the general conservation methods that were used to treat the artifacts recovered during the VBRP. Each technique has a corresponding number. Reference to this number can be found in the description of each artifact within the body of this report.

### **ARTIFACT DOCUMENTATION**

The conservation of each artifact began with a detailed recording through written descriptions, drawings, and photography. The artifact must be documented prior to any treatment to record its pre-treatment condition. Photographs and scale drawings also allow researchers to use a collection for comparison and study without actually handling the artifacts.

In addition to recording the artifact itself, it is important to carefully document every step of the conservation process for future reference. This allows conservators and curators in the future to fully assess the condition and history of an artifact and develop additional treatments should they prove necessary.

After conservation the artifact should again be carefully described, drawn and photographed. This final stage of documentation allows conservators to determine any change that occurred during treatment and makes the information available to researchers who do not have direct access to the artifact or collection.

### **1. IRON ARTIFACTS**

After initial cleaning and documentation the artifacts are put through Electrolytic Reduction (ER). ER is an electrochemical reaction maintained by an externally applied electrical current that can be used to conserve metal. An electrolytic cell is made in a vat that contains two electrodes, the anode (+ charge) and cathode (- charge), submerged in an electrolyte solution. A variety of electrolytes can be used, LCMM choose a dilute solution of Sodium Carbonate (soda ash) for the VBRP artifacts. Electricity for the cell is provided by an adjustable direct current (DC) power supply. The artifact to be cleaned is attached to the cathode, and mild steel mesh is attached as the anode. As the electrochemical reaction takes place, positively charged metallic ions are attracted to the artifact and hydrogen is evolved, while oxygen and chloride ions are attracted to the sacrificial anode. The evolution of hydrogen is the primary corrosion removing mechanism in the ER treatment, and hydrogen bubbles form along the surviving iron of an artifact; they help to loosen and flake off corrosion as they escape to the surface.

Once the corrosion has been removed, it is necessary to rinse the remaining electrolyte from the iron. This is accomplished by placing the object in three baths of boiling deionized water for 30-60 minutes each. Rinsing is followed by the application of tannic acid. When tannic acid coats the surface of an iron artifact it reacts with the metal and forms a black, protective coating of ferric tannate. Ferric tannate is a stable corrosion product that helps to create a barrier between the iron artifact and oxygen and humidity that can cause the formation of new corrosion cells.

The final step in the treatment of iron is the application of a non-permeable sealant that acts as an oxygen and moisture barrier. The VBRP artifacts were sealed by submerging them in microcrystalline wax, heated to 300 F, then allowing them to cool, leaving a thin film of wax as a sealant barrier. The use of heated microcrystalline wax also completely dehydrates the iron before sealing it. The high temperature to which the wax is heated causes any remaining moisture to evaporate before the artifact is sealed.

## **2. LEAD ARTIFACTS**

Lead artifacts were treated in a process that closely follows the technique used for iron objects. The three-step process involves corrosion removal, rinsing, and sealing. Lead oxide is the corrosion product generally found on lead artifacts from fresh water environments. Lead oxide is a stable corrosion product that hides surface details and is frequently removed to facilitate the artifact's study. Lead artifacts were put through a short ER session to remove the outer layer of lead oxide. Residual electrolyte was removed in boiling deionized water baths, and the artifacts were dehydrated and sealed from the environment with molten microcrystalline wax.

## **3. CUPREOUS ARTIFACTS**

The conservation of copper and its alloys begins with removing any corrosion that has formed on the surface of the object. This was accomplished by applying a very dilute solution of citric acid in combination with gentle mechanical cleaning. Following the citric acid treatment, the artifacts were placed in a boiling deionized water rinse to insure the removal of all traces of the acid. Placing cupreous materials in boiling water does cause it to tarnish, but this is quickly removed with a fiberglass bristle brush. Once clean of tarnish, the artifact was coated with a sealant called Inctalac that contains a dilute solution of benzotriazole (BTA). BTA creates a protective coating on the surface of the metal that retards future corrosion, while the Inctalac seals the artifact from the environment.

## **4. COMPOSITE ARTIFACTS**

Composite artifacts are those which are made of more than one type of material. Ideally, the artifact can be disassembled, and the constituent pieces treated separately, however, this is often not possible. The composite artifacts recovered during the VBRP have all been composed of iron and wood. In these cases the artifacts is cleaned of

corrosion mechanically with dental picks and toothbrushes. It is then placed in several baths of isopropyl alcohol and water, each with a higher percentage of alcohol than the previous, until it was in 100% alcohol. The alcohol dehydrates the wood. Once all water has been removed, chunks of pine rosin were dissolved into the bath. The alcohol carries the dissolved rosin into the wood cells, filling the voids with rosin. When the alcohol evaporates, the rosin remains in the wood and the artifact maintains its original shape. In the case of the composite artifacts, the alcohol bath removes the water from the iron portion of the artifact, and the rosin effectively isolates the metal from the moisture and oxygen in the atmosphere. This process produces a strong, stable artifact with a natural appearance.

## **5. LEATHER**

The leather flap of the cartridge box is one of the most unique and potentially informative artifacts recovered from the Valcour Island Battlefield; its proper conservation was vital. This artifact underwent a treatment technique developed by researchers at Texas A&M University's Conservation Research Laboratory (CRL). This process involves impregnating the leather with silicone oil then exposing it to a chemical which causes chemical bonds to form across the long polymer chains of the oil. This cross-linking locks the polymer chains in place and stabilizes the structure of the leather on a cellular level. The silicone oil treatment produces incredible stable, strong artifacts that will remain intact for many years.





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## **APPENDIX 11: JONAS HOLDEN PENSION RECORDS**

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The following documents were transcribed by Marilyn Day and Daniel P. Lacroix and made available by the Westford Historical Society, Westford, Massachusetts.