

“GUNS AND SHIPS AND SO THE BALANCE SHIFTS”:  
USING ARTIFACT PATTERNING TO CONTEXTUALIZE A SALVAGED ASSEMBLAGE  
DATED TO THE BATTLE OF YORKTOWN, 1781

By  
Jillian Schuler  
May 2023

Director of Thesis: Dr. Lynn Harris

Major Department: History, Maritime Studies

Before General Charles Cornwallis surrendered at Yorktown in 1781, he scuttled a portion of his shipping fleet along the Yorktown riverbank to defend the town from a Franco-American amphibious attack. An environment rife with maritime material culture, the river has been subject to formal and informal salvage, including a joint effort in the 1930s by the Mariners’ Museum and the National Park Service that produced a significant artifact assemblage with minimal archaeological context. This thesis will attempt to contextualize the 1930s salvaged assemblage of York River through an artifact pattern developed from four case studies: HMS *Invincible* (1758), HMS *Swift* (1770), *General Carleton* (1785), and *Betsy* (1781). The artifact pattern presents potential archaeological distinctions between British naval and merchant vessels during the second half of the 18<sup>th</sup> century.



“Guns and Ships and so the Balance Shifts”:  
Using Artifact Patterning to Contextualize a Salvaged Assemblage Dated to the Battle of  
Yorktown, 1781

A Thesis  
Presented to the Faculty of the Department of History  
East Carolina University

In Partial Fulfillment of the Requirements for the Degree  
Master of Arts in Maritime Studies

By  
Jillian Schuler  
May, 2023

Director of Thesis: Lynn Harris, Ph.D.  
Thesis Committee Members:  
Nathan Richards, Ph.D.  
Timothy Jenks, Ph.D.

© Jillian Schuler, 2023

## ACKNOWLEDGEMENTS

There are many people to whom I owe thanks for assisting me in my work. My advisor, Dr. Lynn Harris, and my committee members, Dr. Nathan Richards and Dr. Timothy Jenks, for providing me with the support and freedom to conduct this research. I want to thank the Mariners' Museum, especially Liz Williams and Bill Barker, in allowing me to look through their collections and archives on more than one occasion. I want to thank the staff at the Virginia Department of Historic Resources, especially Leslie Straub, Kate Ridgeway, and Chelsea Blake, for allowing me to study material from *Betsy*. I want to thank Dr. John Broadwater for meeting with me on multiple occasions during this thesis process, providing me with case study suggestions, and passing along the remarkable thesis advice from Dr. Gordon Watts to "just puke it up!" I want to thank my friend and fellow ECU maritimer, Lindsay Wentzel for inviting me stay in her family home in Yorktown and accompanying me to several historical sites in Virginia's Historic Triangle, alongside fellow students Lydia Downs, Alyssa Saldivar, Winston Sandahl, Michaela Hoots, and Kendra Ellis for sharing the grad school experience with me. And finally, my family, for inspiring me to do this research.

## Table of Contents

List of Tables.....	vii
List of Figures .....	viii
Chapter One: Introduction.....	1
Research Questions.....	3
Primary.....	4
Secondary.....	4
Theoretical Background.....	4
Methodology .....	6
Limitations .....	7
Chapter Outline .....	8
Chapter Two: Historical Background.....	9
The Administration and History of the Shipping System .....	10
Selection and Fitting of Chartered Vessels .....	16
Shipping and the End of the War.....	18
Shipping’s Influence on Military Action .....	19
The Battle of Yorktown on the Water.....	21
Salvaging in York River.....	24
18th Century.....	24
19th Century.....	25
20th Century.....	25
Discoveries of the Yorktown Shipwreck Archaeological Project .....	30
Conclusion.....	35
Chapter Three: Theory.....	37
Processual Theoretical Foundation .....	37
Site Formation Processes .....	39
Artifact Categorization and Patterning.....	42
Chapter Four: Case Studies for the Artifact Pattern .....	48
Introduction .....	48
HMS <i>Invincible</i> .....	48
Historical Context.....	48
Archaeological Context.....	51
HMS <i>Swift</i> .....	53
Historical Context.....	53

Archaeological Context.....	54
<i>Betsy</i> .....	57
Historical Context.....	57
Archaeological Context.....	58
<i>General Carleton</i> .....	63
Historical Context.....	63
Archaeological Context.....	65
Chapter Five: Methods and Results .....	68
Introduction .....	68
Artifact Groups.....	68
Arms and Armament.....	69
Cargo .....	70
Kitchen.....	71
Personal.....	72
Tools and Instruments.....	72
Other .....	73
Results.....	73
HMS <i>Invincible</i> .....	74
HMS <i>Swift</i> .....	77
<i>Betsy</i> .....	80
<i>General Carleton</i> .....	84
Site 1 from York River.....	87
Conclusion.....	90
Chapter Six: Discussions and Conclusions .....	91
Introduction .....	91
Comparing the Data .....	91
Arms and Armament.....	91
Cargo .....	95
Kitchen.....	97
Personal.....	98
Tools and Instruments.....	101
Other .....	103
Variables Affecting Data Reliability .....	105
Site Formation Processes .....	105
Variability in Archaeological Methodology .....	107
Avenues for Further Research and Conclusions.....	109
References .....	112
APPENDIX A: SITE 1 ARTIFACT LIST.....	121
APPENDIX B: HMS <i>INVINCIBLE</i> ARTIFACT LIST .....	123

APPENDIX C: HMS <i>SWIFT</i> ARTIFACT LIST .....	131
APPENDIX D: <i>BETSY</i> ARTIFACT LIST .....	137
APPENDIX E: <i>GENERAL CARLETON</i> ARTIFACT LIST .....	144



List of Tables

TABLE 1 COMPARISON OF THE FOUR CASE STUDIES (Table by author, 2023)..... 67

TABLE 2 CLASSES AND ASSOCIATED TYPES WITHIN THE ARMS AND ARMAMENT  
GROUP (Table by author, 2023)..... 70

TABLE 3 CLASSES AND ASSOCIATED TYPES WITHIN THE KITCHEN GROUP (Table  
by author, 2023)..... 72

TABLE 4 COMPLETE ASSEMBLAGE DISTRIBUTION FOR HMS INVINCIBLE (Table by  
author, 2023). ..... 75

TABLE 5 COMPLETE ASSEMBLAGE DISTRIBUTION FOR HMS SWIFT (Table by author,  
2023)..... 78

TABLE 6 COMPLETE ASSEMBLAGE DISTRIBUTION FOR BETSY (Table by author,  
2023)..... 81

TABLE 7 COMPLETE ASSEMBLAGE DISTRIBUTION FOR GENERAL CARLETON  
(Table by author, 2023). ..... 85

TABLE 8 COMPLETE ASSEMBLAGE DISTRIBUTION FOR SITE 1 (Table by author, 2023).  
..... 88

## List of Figures

FIGURE 1. Map of Yorktown created by Major Sebastian Bauman in 1782. The map depicts the number of vessels scuttled along the Yorktown riverbank. (Bauman & Scot 1782).....	23
FIGURE 2. Bottles salvaged in the 1930s arranged on the barge to spell 1781 (Courtesy of Virginia Department of Historic Resources).....	27
FIGURE 3. Artifacts salvaged in the 1930s at the National Park Service Yorktown Battlefield Center (Photo by author). .....	29
FIGURE 4. Various forms of shot that was salvaged in the 1930s on display at The Mariners' Museum, part of the exhibit "Defending the Seas" (Photo by author).....	30
FIGURE 5. Escutcheon plate from Fort Stanwix National Monument, featuring the British broad arrow. The symbol would be placed on a variety of items, ranging from ordnance to furnishings. (NPS 2023). .....	34
Figure 6. The research team of HMS Swift archaeological project prepare to dive in the site. (Photo: PROAS (Underwater Archaeology Program), Ministerio de Cultura, Argentina. Courtesy: Dolores Elkin).....	55
Figure 7. Archaeologist Damian Vainstub holds a tumbler full of mustard seeds at the HMS Swift site. (Photo: PROAS (Underwater Archaeology Program), Ministerio de Cultura, Argentina. Courtesy: Dolores Elkin). .....	56
FIGURE 8. Group frequency distribution from HMS Invincible assemblage (Figure by author, 2023). .....	76
FIGURE 9. Group frequency distribution from HMS Swift assemblage (Figure by author, 2023). .....	79
FIGURE 10. Group frequency distribution from Betsy assemblage (Figure by author, 2023)....	83

FIGURE 11. Group frequency distribution from General Carleton assemblage (Figure by author, 2023).....	86
FIGURE 12. Group frequency distribution from Site 1 assemblage (Figure by author, 2023)....	89
FIGURE 13. Arms and Armament group frequency of each case study (Figure by author, 2023). .....	92
FIGURE 14. Arms and Armament class frequency of each case study (Figure by author, 2023). .....	94
FIGURE 15. Cargo group frequency of each case study (Figure by author, 2023). ....	95
FIGURE 16. Cargo class frequency of each case study (Figure by author, 2023).....	96
FIGURE 17. Kitchen group frequency of each case study (Figure by author, 2023). ....	97
FIGURE 18. Kitchen class frequency of each case study (Figure by author, 2023).....	98
FIGURE 19. Personal group frequency of each case study (Figure by author, 2023). ....	99
FIGURE 20. Personal class frequency of each case study (Figure by author, 2023).....	100
FIGURE 21. Tools and Instruments group frequency of each case study (Figure by author, 2023).....	101
FIGURE 22. Tools and Instruments class frequency of each case study (Figure by author, 2023). .....	102
FIGURE 23. Other group frequency of each case study (Figure by author, 2023).....	104
FIGURE 24. Other class frequency of each case study (Figure by author, 2023).....	104

## Chapter One: Introduction

The conflict of British and French naval forces on York River was one facet of the defining Battle of Yorktown that brought victory to the Americans, and a swift end to the American War of Independence. During this battle, ships were attacked, burned, and scuttled, creating a wreck graveyard in the river rife with American and British maritime history. As a result, the site enticed salvaging throughout the 19th and 20th centuries. In 1934, the Mariners' Museum in a joint effort with the National Park Service began salvaging artifacts off several wrecks in the river. Over the course of ten months from October 1934 to July 1935, they pulled up hundreds of artifacts from various sites in York River, including glass bottles, cannons, and rigging tackle (Sands 1973:156-205).

In 1973, John Sands revisited these artifacts in his master's thesis, going through the records kept during the 1930s salvaging and attempting to contextualize them. In his research, Sands was able to create hypotheses about the origins of materials from three sites, believing them to be from either British warships or chartered merchant vessels (Sands 1973:78). These conclusions were drawn from descriptions the divers made of the wrecks as well as analysis of the artifacts themselves, however Sands conceded that these conclusions were only speculative, particularly as it is important to consider the extent of site formation processes impacting the sites (Sands 1973:77). This conclusion has limited any further work on these salvaged artifacts, Sands referring to them much more sparingly in his 1980 dissertation also on the archaeology of the York River fleet (Sands 1980:138).

In Sands' 1973 thesis, he was able to create an artifact catalog that categorized the majority of the artifacts coming from four possible sites: Site 1, Site 2, Site 3 and Site 5. The majority of the artifacts, including the notable collection of over 200 glass bottles, came from

Site 1. Additionally, Site 1's identity has been the most debated since the 1930s salvaging. Based off the limited reports from the 1930s, the original identification of the site was a naval vessel (Sands 1973:78). Sands tentatively identified the site as HMS *Fowey*, the only British naval vessel unaccounted for based on the historical record. However subsequent survey work in the river in the 1970s, the beginnings of the Yorktown Shipwreck Archeological Project (YSAP), attempted to rediscover the Site 1 wreck site, and determined that it was more likely to be a large merchant vessel due to the belief that another site, the Cornwallis Cave Wreck, was actually HMS *Fowey*. These conclusions remain tentative, and have not been explored further since the conclusions were published in the 1996 YSAP report (Broadwater 1996). Additionally, there are limited historical sources on the composition of the York River shipping fleet, historians consistently referencing the same report that Count De Grasse prepared for General George Washington (Ferguson 1939:269; Sands 1973:81; Broadwater 1996: 16-17). Therefore Site 1's status as either a naval or merchant vessel remains in question, and is the foundation of this thesis.

Despite the lack of provenience, artifacts from Site 1's assemblage have remained in display cases since its original exhibit at the Mariners' Museum in 1939. In the past 25 years, artifacts from this collection have been on display in ten exhibits at the Mariners' Museum with themes ranging from swashbuckling pirates to defense on the sea to the traditions of sea glass. Not to mention the extent of materials on loan to over six organizations, including the Jamestown/Yorktown Foundation, and materials from the salvaged assemblage remain on display at the National Park Service museum at Yorktown Battlefield. The extent to which this assemblage continues to be placed in the eye of the public indicates that this collection is not simply sitting upon shelves, collecting dust, but is rather consistently contributing to the public's

understanding of this history. Therefore, contributing additional historical context to this assemblage is worthwhile.

In his 1973 master's thesis, Sands described the assemblage as a "microcosm of transplanted British Culture," resulting in this thesis utilizing other examples of British maritime material culture as comparative case studies (Sands 1973: 71). This thesis places these artifacts within a greater archeological context using artifact patterning, based on the artifact assemblages of two British merchant vessels and two British naval vessels from the time period: *Betsy* (1781), *General Carleton* (1785), *HMS Invincible* (1758) and *HMS Swift* (1770). The creation of an artifact pattern for discerning the archeological signatures of British naval versus merchant vessels serves to distinguish how material culture can help in identifying the function of British vessels during this time period. This pattern is then applied to Site 1's assemblage in order to determine whether the pattern might suggest the identity of the vessel to either be a naval or chartered merchant vessel.

### *Research Questions*

The purpose of this thesis is to establish a distinction in the archeological signatures of British naval vessels and British merchant vessels during the 18th century through the use of artifact patterning. In order to create this framework, four case studies have been analyzed, consisting of two British naval vessels, *HMS Swift* (1770) and *HMS Invincible* (1758), and two merchant vessels, *General Carleton* (1785) and *Betsy* (1781). *Betsy* is an especially pertinent case study because it was a chartered British merchant vessel scuttled by the British during the Siege of Yorktown. As the British Navy was on the brink of establishing their global empire, it is fundamental to understand the foundations of their naval power in the utilizations of both naval and merchant ships. The secondary questions serve to support the primary question by

establishing the foundation of the artifact patterning framework, so that it can be applied to the artifact assemblage from Site 1.

### Primary

- Can a system of artifact patterning establish discernable archeological signatures in 18th century British naval and merchant vessel collections and provide historic context for the York River salvaged assemblage?

### Secondary

- What is the distinction in the archeological signatures of 18th century British naval versus merchant vessels?
- How do the quantified artifact distributions of HMS *Swift*, HMS *Invincible*, *Betsy*, *General Carleton*, and Site 1 compare?
- What are comparable artifact categories from HMS *Swift*, HMS *Invincible*, *Betsy*, *General Carleton*, and Site 1?
- How can ex situ salvaged artifact assemblages be incorporated into historical and archeological contexts?

Answering these research questions required a comparison of the history and material culture of both British naval and merchant vessels at the end of the 18th century in order to create applicable artifacts categories that may reflect distinctions in vessel function.

### *Theoretical Background*

Establishing an artifact pattern takes a processual approach to how archaeological context can address salvaged artifact assemblages. Processualism functions under the assumption that there is a scientific methodology to be applied to archeological understanding, and that one system, in this case an artifact framework, can be applied to another assemblage, the 1930s

salvaged assemblage (Johnson 2020:23). Popularized by Lewis Binford in the 1960s and 70s, processualism continues to influence modern scholarship where positivist and empirical approaches are taken (Johnson 2020:23,108). The use and creation of laws in archaeology is developed further by Michal Schiffer, who also incorporated site formation processes into the life of an artifact, prior and post abandonment. Other archaeologists have taken this processual foundation to explore other empirical methodologies in archaeology.

In his book, *Method and Theory in Historical Archeology*, South makes an argument that quantitative analysis and pattern recognition are avenues for developing new laws in archaeology. South's attempt at establishing a more nomothetic understanding of artifact distribution, takes an empirical approach to archeological sites (South 1977:39-42). South's Carolina Artifact pattern attempts to utilize quantitative analysis in intra-site artifact distribution to determine the function of a specific space (South 1977:88). This concept is similarly applied to the four case studies in order to determine if there is a similar artifact pattern depending on vessel function. In addition, South established a system of classification based upon function, a classifying method that this thesis also utilizes in its quantitative analysis (South 1977:92). South then applies the established pattern to a new site, as this thesis does in comparing this artifact pattern with Site 1's assemblage.

The utilization of artifact patterning to determine whether there is an archeological signature in a ship's function was explored by Courtney Page in her master's thesis "Going on the Account: Examining Golden Age Pirates as a Distinct Culture through Artifact Patterning." While Page's results indicated that a larger sample would be needed to determine if there were signatures in the artifact assemblages of pirate vessels, her application of artifact classification and patterning contributed to the foundation of this methodology (Page 2014).



## *Methodology*

To create an artifact patterning framework that the salvaged 1930s assemblage can be compared to, the artifact assemblages of four case studies have been categorized and compared. Two of these case studies are British naval vessels: HMS *Swift* (1770) and HMS *Invincible* (1758), while the other two are British merchant vessels: *Betsy* (1781) and *General Carleton* (1785). Context of the four case studies is reliant upon archaeological and historical research that has already been published. Additional information on the case studies was available online in the *International Journal of Nautical Archaeology*, which was especially useful for HMS *Swift*, as the project's final publication is in Spanish, with no English translation available. All four case studies' publications include datasets of the full artifact catalogs, which were the foundation for this artifact pattern (Broadwater 1996; Ossowski 2008; Bingeman 2010; Elkin et al. 2011). HMS *Invincible* has the largest assemblage at a little over 10,000 artifacts, *Betsy* has approximately 5,000, General Carlton has around 1,300, and HMS *Swift* has the smallest at 830. This thesis's artifact pattern developed quantitatively from the four assemblages through a categorization process based upon function. The established artifact groups are as follows: Arms and Armament, Cargo, Kitchen, Personal, Tools and Instruments, and Other. These categories are based upon South's (1977) Carolina Artifact Pattern with alterations based upon Page's (2014) thesis, as well as the categorization methods used in each case study's catalog. A full description of each category, with examples, is provided in chapter five. These categories are assessed quantitatively to produce an artifact pattern that reflects ship function.

Historical context of the Battle of Yorktown developed from a combination of primary and secondary resources. There is a plethora of information about the Battle of Yorktown, although much more limited information about the battle from a British perspective. John Tilley's *The British Navy and the American Revolution* (1987) and David Syrett's *The Royal*

*Navy in American Waters 1775-1783* (1989) provided information about the British Navy's movement throughout the conflict. Syrett's *Shipping and the American War 1775-1783* (1970), Arthur Bowler's *Logistics and the Failure of the British Army in America 1775-1783* (1975), and Edward Curtis' *The Organization of the British Army in the American Revolution* (1926) explained how the transport and victualler system developed during the war. These secondary sources provided foundational historical context for the assemblage.

The Mariners' Museum contains most of the remaining artifacts from the salvaging in the 1930s, with some in the possession of the National Park Service and the American Revolution Museum at Yorktown. Leather-bound artifact records located at the Mariners' Museum provided necessary historical and archaeological context for how these artifacts have been analyzed and categorized in the past, as well as how they have been used since their salvaging. Journals such as the *William and Mary Quarterly* provide firsthand accounts of the Battle of Yorktown and the salvaging efforts of the 1930s (Riley 1948; Ferguson 1939). These firsthand accounts, salvaging reports, and artifact records established the historical and archaeological context of the Battle of Yorktown and Site 1's assemblage.

### *Limitations*

The nature in which Site 1's assemblage was obtained, without any significant provenience, suggests that the artifacts may not all belong to the same wreck site. However, there are consistent reports that the salvaging occurred one vessel at a time, offering substantial confidence that all of the artifacts did indeed derive from Site 1. Additionally, this methodology presented some challenges as not all the case studies share the same historical and archaeological contexts as the salvaged assemblage. Having been excavated in York River, *Betsy* comes the closest to providing the most accurate archeological context, however as *Betsy* was scuttled

during the battle, there are limitations to the material culture found in the excavation process. HMS *Swift* and HMS *Invincible* both wrecked prior to the American War, whereas *General Carleton* wrecked a few years after the Siege of Yorktown. The case studies vary in geographical locations, dates of wrecking, and assemblage sizes. Differences in assemblage sizes is due partly to the different excavation techniques used on each site: both *Betsy* and HMS *Invincible* underwent full site excavations while HMS *Swift* and *General Carleton* were limited to certain sections. These limitations are considered in the analysis of the artifact pattern, and are discussed further in subsequent chapters.

### *Chapter Outline*

The next chapter explores how the method of chartering merchant vessels to serve as transports developed and evolved throughout the war. The second chapter also goes into detail about the history of salvaging in York River and what has previously been established about Site 1's identity. With the establishment of the historical and archeological context of the assemblage, Chapter Three explains the theoretical background for the material culture system of artifact patterning. Chapter Four provides the historical and archaeological context of the four case studies, before the methodology and artifact distributions of the four case studies, as well as the salvaged assemblage, are presented in Chapter Five. Finally, Chapter Six compares the case studies and forms conclusions about the artifact patterning framework and what that framework indicates about the identity of Site 1 and the applicability of its assemblage.

## Chapter Two: Historical Background

At the outbreak of the American War of Independence, the British soon realized that this conflict would bring forward challenges they had not endured before. One significant aspect of this was the procurement of provisions and other supplies for its army. In previous conflicts, supplies were frequently obtained from the land. During the Seven Years' War, some of the remote locations in which the British army was stationed forced them to consider how to transport materials from the colonies further north to where the men were stationed (Bowler 1975:14). However, these administrative and logistical challenges were small in comparison to the challenges brought on by the American War of Independence.

As the British were waging war with the colonies, they could not rely upon supplies from American merchantmen. While foraging for local material was carried out when possible, the majority of provisions and other materials had to be shipped from Britain. This realization presented a significant adjustment for the administrations responsible for provisioning the British army: the Treasury Board and the Navy Board (Curtis 1926:120). How these boards carried out this process has been the subject of much debate as to what role challenges of shipping played in the British's eventual surrender at Yorktown in 1781.

The Battle of Yorktown was the last major military defeat that contributed to the British surrender and marked the loss of a significant number of chartered transports and victuallers. The archaeological material that remains in Yorktown provides a facet of archaeological evidence that can contribute to a greater understanding of the system of shipping employed by the British during the American War. However, there are many challenges in attempting to identify what wreck sites remain in York River, including the materials salvaged during the 1930s from a wreck labeled as Site 1 by John Sands in his 1973 master's thesis that revisits the archaeology

conducted in York River up until that point. Subsequent work in York River during the Yorktown Shipwreck Archaeological project raised new questions and offered new conclusions about the wrecks that remain, presenting new approaches to understanding the history of British shipping during the war.

### *The Administration and History of the Shipping System*

Prior to the American War, the distribution of provisions amongst army unit stations in the colonies was locally sourced and tended to be the responsibility of the individual regiments. Materials such as uniforms, medical equipment, and camp equipment, though regulated by the War Office, tended to be supplied by the commanders of the individual regiments (Bowler 1975: 13). Food provisions consisted of a variety of foods with bread, beer, beef, pork, and peas making up a significant portion of a soldier's diet, when well supplied (Curtis 1926:170). While provisions were always the responsibility of the Treasury Board, they required little oversight as the regiments tended to source their food locally. The first challenge the Treasury Board faced in supplying provisions came during the Seven Years' War when armies were stationed in isolated and sparsely populated areas where there were no local provisions to be obtained. The Treasury addressed this challenge by contracting provisions from the Thirteen Colonies, as well as shipping provisions from Britain through subcontracts with American merchants (Bowler 1975:14-15). While this system worked well during the Seven Years' War, the nature of the conflict of the American War prevented the British from relying any further upon American assistance.

From the Battles of Lexington and Concord in April 1775, the Americans immediately cut off the British access to supplies in Boston, forcing the British to consider alternate shipping methods. The challenges that the Treasury Board (and Navy Board) would face throughout the

war were evident from the very first voyage in 1775 when the Treasury dispatched a convoy of thirty vessels containing provisions to the British army in Boston, and only eight arrived in the colonies after poor weather pushed most of the vessels to anchor in the West Indies. While the soldiers in Boston survived on limited rations throughout the winter of 1775 to 1776, the fall of 1776 saw a number of victories for the British who had committed to winning the war through army operations, and secured colonies from which they could draw provisions (Syrett 1970:122-123). However, an American campaign in the winter of 1776 to 1777 pushed the British out of resource-rich New Jersey and established a new precedent of strategy during the American War. As David Syrett calls it a “war by flea bites,” the Americans often confronted the British in small skirmishes and seizures, taking advantage of the fact that the British were tied to large military bases due to their limitations in transporting and obtaining provisions (Syrett 1970:125). This type of conflict also limited the extent the British could forage during the war, pushing their reliance almost completely on what material could be shipped from Britain.

Without the subcontracts with American Merchants, the Treasury Board had to explore alternate means for getting provisions to the colonies. When the initial shipping of material to Boston, under contract with Mure, Son and Atkinson, went awry, the Treasury quickly came to the realization that they were ill-equipped in establishing reliable and long-term shipping of provisions from Britain to the colonies. With each individual soldier requiring a third of a ton of food per year, the Treasury board had to find extensive and consistent shipping methods (Mackesy 1964:66). In 1776, the Treasury requested that the Navy Board, more familiar with shipping, take over the responsibility of provision distribution. However, the Navy Board refused, and the Treasury had to continue fulfilling the responsibility for another three years (Syrett 1970:129).

Despite the earlier challenges with the 1775 shipment to Boston, the Treasury continued their relationship with the shipping firm Mure, Son, and Atkinson, whose responsibility would be to charter vessels and organize the distribution of provisions. While the firm endured its fair share of challenges, the Treasury was generally successful in preventing any further shortages of provisions since the winter in Boston in 1775, facing only one other shortage in the winter of 1778-1779.

However, this is not to say that the provisions provided were without fault. During the approximately eighty months in which the war was fought, the British commanders maintained their preferred six-month reserve of provisions for only twenty-three of those months, the provision responsibility divided between the Treasury and the Navy boards (Bowler 1975:93). Frequently the agent victualler in charge of inspecting the provisions prior to their shipment to the colonies would find goods of such low quality they had to be rejected, delaying the shipment (Curtis 1926:94). The Treasury's intention was for any goods found unfit prior to shipment to be replaced by the contractors. Oftentimes the contractors did not have replacements, or the replacements would take so long they would delay the entire shipment (Curtis 1926:88). The result was material of questionable quality still being shipped to the colonies. With almost complete reliance on the provisions sent from Britain, the armies had little choice but to accept the provisions and eat what they could. In addition, there were the conditions the provisions faced on the crossing of the Atlantic. With menial preservation techniques in the 18th century, let alone on overseas voyages, very often the provisions sent were either rotten or moldy upon arrival. The ships were damp and dirty places, where a variety of vermin would also have a hand in spoiling produce that was poorly stored (Curtis 1926:96).

There was also the challenge of corruption within the shipping business, with bureaucrats and contractors alike making decisions on provision distribution that benefitted them financially (Bowler 1975:167). There were instances of contractors producing provisions rife with frauds, mixing bulking materials such as sand into flour orders (Curtis 1926:98). Frequently, the guilty contractors would be caught and reprimanded, but the delay in shipping caused by these manipulations had practical impacts upon the British armies in America, shortening their reserves (Curtis 1926:98-100). The bureaucrats charged with organizing the shipping system, officers and civilians alike, sought opportunities themselves in order to exploit their position for profit. There already existed a culture of corruption within the bureaucratic system in which office holders could legally profit off any deals made to make up for their low salaries (Bowler 1975:170). While this form of corruption had less of an impact on the British armies, with only some suggestions that it impacted their morale, politicians who opposed the war in London could point to the corruption as a reason to cut war funding, creating potential financial problems for the Treasury and Naval Boards down the line (Bowler 1975: 208).

Even when honest and quality provisions and other materials could be secured, there was the challenge of the materials being lost to both weather and lurking American privateers. The Treasury became acquainted with the privateer threat early, when the contractors were in charge of the shipping and arming of the vessels. An American schooner, *Hannah*, was outfitted by the Americans to take British vessels attempting to bring provisions into Boston during the provisioning shortage. From September 1775 to September 1776, *Hannah* captured twenty-three British vessels and pushed the Treasury to take command of the shipping of provisions from the contractors in order to ensure the vessels were appropriately armed. This decision proved to be



effective, with significantly fewer vessels taken during the remainder of the war (Bowler 1975:96).

Despite the Treasury's general success in maintaining the shipment of provisions, the contract with Mure, Son and Atkinson was expensive, and the board evidently wished to be rid of the onerous task as they again asked the Navy Board to take over the responsibility of the shipping. This time, under the pressure of the Admiralty which oversaw the Navy Board, they agreed (Syrett 1970:136). For the remainder of the war, the Navy Board organized the acquisition and shipping of provisions, and were able to address some of the challenges the Treasury had. Most notably, the Navy Board attempted to ameliorate the quality of the provisions. In 1780, the Navy Board asserted order by issuing penalties for subpar or delayed orders (Bowler 1975:105). It should be noted that another factor contributing to bettering the quality of provisions was the Navy Board's division from the Treasury's commitment to making the war as economical as possible, a concern the Navy Board did not share to the same extent (Bowler 1975:141). The Navy Board also attempted to address the challenges of inadequate containers that contributed to many goods spoiling on the trip over (Bowler 1975:105). While undoubtedly there were still provisions that had to be picked through by the commissary in America, the Navy Board quickly confirmed the Treasury's belief that they would be better equipped to organize the shipping.

However, the Navy Board also had to deal with new challenges. The French entered the war in 1778, and their navy presented a significantly larger threat to the British than the American privateers had. Unlike the Treasury's commitment to high armament, the Navy Board opted for less armament, sending the shipping out in protective convoys instead. The Navy Board had a much greater capacity for supplying the vessels with a protective convoy (Bowler

1975:20). The threat of the extent of destruction the French could commit also placed new pressures on the Navy Board to provide the armies with reserve supplies, in case a convoy were to be intercepted by the French (Bowler 1975:124).

In the transition, the British armies experienced a shortage during the winter of 1779 to 1780. The Commissary general in the colonies was partially to blame for not providing the board with accurate troop counts, as were the contractors for missing supply deadlines (Bowler 1975:125-126). However, the biggest influence was the rise in the cost of shipping, foreshadowing how vessel shortages would continue to plague the operations of the Navy Board for the rest of the war, and had the potential to bring a swift end to the entire shipping operation.

The vessel shortage issue originated while the shipping was still managed by the Treasury. They had severely overestimated the efficiency of the shipping system (Bowler 1975:126). The initial plan was for the shipping to be split into four quarters, with the first quarter of shipping returning in time for the third quarter, and the second the fourth. However, delays in shipping occurred almost immediately, quickly destroying any hope of maintaining this system (Macksey 1964:68). Once vessels made it to the colonies, the commissaries and generals were not quick to send the vessels back. In 1780, the Navy Board issued a report in order to ascertain how many vessels were detained in the colonies, and the report described eleven vessels employed as prison ships, hospitals, and magazines (Bowler 1975:130). An additional estimated one-third ton of shipping was needed throughout the war in order to make up for the limited number of vessels that returned (Syrett 1970). The delay in vessels returning to Great Britain was compounded by a shipping shortage in Great Britain (Bowler 1975:134).

From the beginning of the war, 50,000 vessels sailed through Britain, which is considered a very small pool of vessels to charter from (Mackesy 1964:67). The British began the war with

strict inspections and regulations about what vessels could serve what purpose, however as the shortage became more imminent, they became less fastidious.

### *Selection and Fitting of Chartered Vessels*

For merchant vessel owners, war presented both high risks and high rewards. The demand for goods and production was high, as was the chance of being attacked by enemy privateers and naval vessels. In an attempt to mitigate the risks of war while still maintaining a reliable profit, the owners of vessels would enter into contracts with the government. In exchange for their service, the Navy Board would pay the owner a competitive freight rate, and insure the vessel, should it be lost in conflict (Syrett 1970:79).

Each vessel that was considered had to be inspected at a Royal Dockyard. Some merchants did not want to spend the money to sail to a Royal Dockyard, and as the shortage became more pressing, the Navy Board offered cash incentives to the vessel owners for them to get their vessels inspected. Once at the dockyard, the Navy Board would inspect the vessel, measure out its tonnage, and, if the vessel passed inspection, fit it out for service (Syrett 1970:107). The inspection included investigations of the vessels' timbers, masts, and rigging. This inspection was taken very seriously, to not risk the loss of provisions due to a vessel structural issue, and many vessels were rejected for not being structurally sound.

There were other reasons that vessels were rejected for service. Initially, the British refused to accept any foreign-made vessels, particularly any Dutch-built vessels (Syrett 1970:110). However, as early as 1776, the shortage of suitable vessels pressured the Board into accepting vessels from the Netherlands, and eventually from Germany (Curtis 1926:130). It is important to note that no French-built vessels were accepted, the British having held a very poor

view of the construction of French vessels, despite considering their entrance into the war such a threat to their convoys (Curtis 1926:124).

Once vessels were deemed structurally sound, and their nationality acceptable, they were measured to determine their tonnage. The tonnage determined the freight rate of the vessel, and therefore was the incentive of the government to be conservatively measured, resulting in the establishment of a formula for measuring the vessel that saved them money. However, the complexity of the formula led to significant confusion and delays in outfitting the vessels, for often the vessels had to be measured, and their tonnage calculated, twice. It was generally accepted that the Board would not accept any transports less than 200 tons, however as the shipping shortage became more pressing, this regulation was overlooked for shorter contracts (Syrett 1970:110). Another significant measurement was the space between decks, specifically for transports, that had to be at least four feet ten inches, however, the Navy Board allowed for vessels of only four feet eight inches to also be accepted.

Fitting out the vessel was the responsibility of the vessel's owner, and had to be completed before the vessel could begin making money. The incentive of beginning to earn payment pushed the merchants to outfit their vessels as quickly as possible, encouraging efficiency in the chartering system when more vessels were needed. The merchants needed to supply their vessels with basic equipment such as blocks and tackle, anchors, crewmen, and provisions for the crewmen; all the items necessary to make a vessel seaworthy. The Treasury Board also required the merchants to arm their vessels, with specifications of "at least six carriage guns of six-pounders or less bore as the Board shall think proper according to the size of the ship," as well as twenty rounds of ammunition, for each gun (Syrett 1970:114-115). While it remained the responsibility of the owners to outfit the vessels' armament, the Board did begin to

provide the owners an allowance of “gun money” in order to encourage the owners to more thoroughly outfit their vessels with defense. This would become less of a priority once the Navy Board took over and emphasized sailing in convoys. Finally, the owner had to procure a license to sail the ship to America, and the vessel would enter the payroll of the Navy Board.

### *Shipping and the End of the War*

This chartering system continued throughout the war, particularly as the shipping shortage became more prevalent and the need for additional vessels more critical. Well aware of their pressing situation, the Navy Board continually submitted memorandums from 1780 onwards to the Admiralty and the Treasury Board, informing them of their growing shortage, and warning them that if a solution were not found, they would soon find themselves unable to continue shipping provisions. However, as the Navy Board was successful in mitigating other shipping challenges, and the number of provision complaints from America had fallen to an acceptable level, the Admiralty and Treasury were no longer concerned about the shipping operations (Syrett 1970:246). With little other option, the Navy Board strived to make their shipping system more efficient, in order to extend the life of the system. The board made short-term agreements with merchants and shipowners which temporarily lessened the pressure, however these were only short-term solutions, and the board had to accept that they only had enough shipping to continue fighting through 1783. Luckily for the Navy Board, the military surrender at Yorktown in 1781 saved the shipping system from being the reason for Britain’s defeat.

The final act of the shipping service was the evacuation of soldiers once the British surrendered. There were four major bases from which the British armies gathered: New York, Charleston, Savannah, and St. Augustine. These positions also had plenty of loyalists that also

needed to be evacuated as well as military supplies that either needed to be taken or destroyed. Due to the nature of the American army encroaching on these bases, it became apparent that the execution effort would have to occur all at once, and not in sections, requiring a carefully organized plan of execution. However, at least 85,000 tons of shipping would be needed to evacuate all areas simultaneously, numbers that with the vessel shortage, were not available (Syrett 1970:233-234). A letter written in April 1783 by Captain William Feilding, a captain in the marines, to Basil Feilding, the 6th Earl of Denbigh and distant relative, describes the challenges the shipping shortage placed on the evacuation. Fielding says:

A Fleet of Transports sailed this Day for [St.] Augustine for the Evacuation of that Place, a distressing Circumstance to many hundred Families (who had fled there for protection) from Charleston, and who will now be at the Mercy of Congress, not having Vessells to carry them from thence, any where else. When this place is to be evacuated I know not; as I understand there is not a sufficient Number of Transports to carry off the Troops & Stores at once, by near sixty Thousand Tons, besides assisting the Refugees (Balderston & Syrett 1975:224).

Therefore, a system was put in place, beginning in New York in 1783 and continuing down the coast to evacuate the armies, refugees, and materials. The peace treaty signed in 1783 lessened the pressure of the timeliness of the evacuation, which was necessary as the vessel shortage severely delayed the process, indicating the lasting impact the shipping challenge had on the conduct of the war.

### *Shipping's Influence on Military Action*

While the challenges of the Treasury and Navy Boards in the organization of materials seems very detached from the fighting occurring in America, very often the tactics employed and battles fought during the war hinged upon the supplies available and anticipated. From the moment the Americans adopted their “war by flea bites” approach against the British, it was apparent that shipping would play a key role in British tactics in the war. The British entered

1776 with the expectation that they would quickly end the burgeoning American army, and likely would have if not for the delays in transports and victuallers delaying military operations, and establishing the precedent of shipping determining when military advances were made (Syrett 1970:243). With the reliance upon provisions from Great Britain, the British armies in America had to consolidate their troops in stations with easy access to provisions, which meant easy access to ports. Any attempts at extending the supply lines inland faced the threat of American interference. With French entry into the war, the British were forced to take on a strategy of dispersal, and the Navy Board had to accommodate. While the Navy Board was better equipped than the Treasury to handle the new logistical challenges presented, the dispersion drastically increased the number of victuallers needed, exacerbating the developing vessel shortage (Syrett 1970:175). However, this was a unique situation, and it was much more common for the shipping to influence tactics and execution.

Shipping delays in 1780 had a similar impact to the shipping delays in 1776. At the beginning of a new decade, the British Army was the closest it had been since those early years of the war, to put an end to the conflict. However, delays in shipping prevented Clinton from taking advantage of a downtrodden American army and Benedict Arnold's recent switching of sides, to secure strategically significant ground in Rhode Island (Bowler 1975:137). While Clinton was perhaps notoriously cautious and inactive during the war, the extent to which that is because of want of provisions is debated. When the shipping was at its peak in terms of supply and reliability, Clinton did seize the opportunity to take Charleston in 1780, a significant anchor point for the British army (Bowler 1975:260-261). By 1781, the Navy Board had worked out the majority of the shipping logistics. While the inevitability of the vessel shortage continued to loom, it was the mounting opposition to the war in Britain combined with General Charles

Cornwallis's surrender at Yorktown that saved the Navy Board from facing that reality (Bowler 1975:138).

### *The Battle of Yorktown on the Water*

Having been in the midst of implementing a "Southern Strategy" Cornwallis made his way from a series of failed raids in North Carolina up to Virginia of his own volition. He had heard that General Benedict Arnold had troops active in the region and believed that a combined force could secure a significant foothold for the British in the south (Syrett 1989:173). The British conducted these operations in the south for two reasons: they wished to take over the ever-lucrative tobacco trade once again, and they also anticipated a large number of loyalists still in the south that might assist in their provisioning challenges (Sands 1983:6). A naval force of frigates and transports transported Cornwallis and his army to Yorktown, having previously anchored in Portsmouth to secure the post and disrupt American supply lines. The army took possession of the town on August 1, 1781. The decision to winter in Yorktown came in anticipation of an amphibious attack on New York, however, that was only a diversion for the joint American and French plans to attack Yorktown (Broadwater 1996:6).

General Marquis de Lafayette's fleet had conducted a steady stream of attacks on Cornwallis's fleet that while not crippling, allowed for Lafayette to keep an eye on British fleet movements (Sands 1973:2). This became particularly valuable when Cornwallis's fleet settled at Yorktown. Surprised that the fleet had not made the anticipated return to New York, Lafayette sent an optimistic letter back to Washington claiming that "should a fleet come in at this moment, our affairs would take a very happy turn" (Broadwater 1996:8). By August 17th, Washington had given the order to move his armies to Virginia. Washington's French ally, Admiral Count François Joseph Paul de Grasse, arrived with his fleet at the mouth of York River



on August 29th and established a blockade, cutting Cornwallis's fleet off from the Atlantic Ocean (Sands 1973:4).

Still, this was not the defining defeat for the British. Washington argued with Count de Grasse over whether to push the French fleet further into the river opening to prevent the British from considering an alternative escape by West point, and to keep pressure on them. Count de Grasse repeatedly refused these requests, for fear of an attack from Cornwallis's fleet which still retained the Royal Navy's reputation for clever strategy (Sands 1973:7-8). Seizing the opportunity that Count de Grasse's hesitation provided, Cornwallis continued to prepare for defending Yorktown. A great asset of Cornwallis was the extent of his shipping, including dozens of merchant vessels carrying raw goods that would be of no immediate use to the military (Sands 1973:10). In mid-September, Cornwallis weighed the odds and decided the best strategy would be to scuttle a collection of these vessels along the south bank of the York River around Yorktown to protect the town from an amphibious attack from Count de Grasse's encroaching forces (Sands 1973:12).

Eventually, Washington convinced Count de Grasse to close in on Cornwallis' fleet while Allied armies began to encircle Yorktown on land, preparing for a siege. Cornwallis attempted to inflict damage on Count de Grasse's encroaching fleet with the fireship *Vulcan*, however a tactical failure allowed for the French to identify the ship early and prevent any damage to their fleet. This last-ditch attempt was an indication to Cornwallis that defeat was a real possibility, and he ordered the scuttling of more vessels (Broadwater 1996:13).

On October 9, conflict between the French and the British resulted in the sinking of HMS *Charon*, pushing Cornwallis's fleet closer towards Gloucester Point seeking refuge. However, this failed to provide adequate protection and once again Cornwallis made the decision to scuttle

more of his shipping, his only advantage over the Allied forces (see Figure 1). As the encroaching siege on land took British positions, Cornwallis made a final attempt to get out in small boats via Gloucester Point, but a storm thwarted the plan. With most of his fleet either sunk or scuttled in York River, Cornwallis finally asked for terms of surrender on October 17, 1781 (Riley 1948:390).



FIGURE 1. Map of Yorktown created by Major Sebastian Bauman in 1782. The map depicts the number of vessels scuttled along the Yorktown riverbank. (Bauman & Scot 1782)

The composition of Cornwallis's fleet is based upon a report compiled by Count de Grasse for General Washington (Ferguson 1939:269; Sands 1973:81; Broadwater 1996: 16-17).

It is believed that all of General Cornwallis's records of the battle were lost shortly after the surrender, when his ship was boarded by French privateers in the Caribbean (Balderston & Syrett 1975: 215; Broadwater 1996:16-17). According to Count de Grasse's report, the fleet lost at Yorktown consisted of only a handful of Navy vessels, and was largely chartered merchant vessels. The extent of merchant vessels retained in the colonies for further military operation is

one consequence of the Navy Board's vessel shortage. The vessels in the fleet served a variety of purposes including prison ships and warehouses (Sands 1983:191). Perhaps the best documented purpose the fleet served was as a barricade, with the scuttling of vessels along the Yorktown riverfront, to reinforce the town's position from French-American amphibious invasion.

### *Salvaging in York River*

As aforementioned in the introduction, the York River is rife with archaeological material. When Cornwallis officially surrendered on October 19, 1781, thirty of his thirty-two known chartered merchant vessels had been sunk in York River (Sands 1983:182). The visible masts from the vessels scuttled along the riverbank served as a beacon to those onshore of the resources available just below the surface, and salvaging in the river continued long after the masts sank beneath the surface.

### 18th Century

From the very beginning, the wrecks in York River were subject to salvaging. Soon after the end of the Battle of Yorktown, the French fleet that had held the English captive in York River were the first to disturb the newly-formed archaeological site. From the personal journal of a French officer, there are records that the French had attempted to restore *Guadaloupe*, an English wreck the French considered valuable (Ferguson 1939:264). Though impossible to determine the extent of French salvaging, a German doctor named Johann David Schoepf wrote about the wrecks during a visit to Yorktown in 1783, indicating that whatever the French took, there were still very visible remains. That is the extent of historically noted salvaging in the 18th century, however it is impossible to determine the extent of informal salvaging during this time period. Particularly as the end of the American War left the residents of Yorktown to pick up the pieces of the town (Sands 1983: 117).

## 19th Century

The first governmentally recorded salvaging of the site occurred in the 19th century with Thomas Ash submitting a petition in 1852 to the Virginia General Assembly to have the exclusive right to salvage “an English frigate of large class” that he believed he could find. Despite no commitment to share his finds with the state, the assembly granted his petition, and the first state-sanctioned salvaging of a wreck in York River was underway in May 1852. The description of the wreck has led scholars to believe he was looking for HMS *Charon*, an English naval frigate, distinctively sunk by the French with hot shot, leaving distinguishable charred marks on the wreck (Sands 1983:118-119). Similar to the French salvors, it remains unknown if Ash was ever successful in finding what he was looking for. The Civil War put an end to any further salvaging in the river until the 20th century where further salvage produced the first recorded results.

## 20th Century

In 1909, the Society of the Sons of the Revolution received a donation of artifacts from a private citizen claiming them to be taken off HMS *Charon* (Sands 1983:120). This donation indicates the extent of salvaging from the river that remains unaccounted for. After the Battle of Yorktown’s 150th anniversary, the National Park Service (NPS) took over the restoration management of the battle site, and decided to conduct further research into the remains in York River (Sand 1983:121).

As oystermen operating in the river consistently pulled up archaeological material from the sunken fleet, B. Floyd Flickinger, superintendent of the Colonial National Monument (Virginia’s Historic Triangle today) decided to launch further investigations in the river in 1934. However, their technique of blindly dragging clamshell buckets along the bottom and bringing them to the service to pick through for artifacts was not conducive to recording the wrecks

(Sands 1983:121). Because these early investigations produced some material, Flickinger proposed the project to the Mariners' Museum, and the two managing groups decided to commit to the project with the introduction of a barge (Ferguson 1939:265; Sands 1983:121).

Work on the site began in earnest on October 15, 1934. The ambition for the project derived from the success of another salvage in Lake Champlain where they were able to recover the gunboat, *Philadelphia*, another revolutionary wreck, however it quickly became apparent that this was not going to happen with the wrecks in York River (Ferguson 1939:265). Specifically, the salvagers were interested in HMS *Charon*. While they believed the first site they excavated to be HMS *Charon*, they soon abandoned any ambition of raising the vessel, opting to pull as much material off of the vessel as possible, as well as a similar vessel located nearby (Sands 1983:124). While there was limited documentation of what material was taken, and from where on the site, the methodical way in which they salvaged each site makes it possible to associate the salvaged assemblages with individual wreck sites.

On December 14, 1934, the Colonial National Monument issued a statement claiming that both of the vessels salvaged must have been "war ships" (Sands 1983:125). Their justifications for these identifications came from some preliminary observations about the vessels' finished construction, the number of gun ports, and the discovery of bright red paint, believed to only be used on war ships. It is important to note that at this point in underwater archaeology, the archaeologists stayed topside, and sport divers were the only people to see the site. Also, these justifications did not necessarily rule out chartered merchant vessels (Sands 1983:125). This first site, or Site 1, reaped the most material culture due to the extent of time spent on the site. Most notably, over 200 glass bottles were found (see Figure 2), with Frank Lange, a diver on the site, famously joking, "This was not a battle ship, it was a bottle ship"

(Sands 1983:126). While some work was done on the adjacent vessel in late November, by early December the salvaging operations ceased for the winter. On May 15, 1935, work on the second vessel resumed, notably pulling up several cannon and a brass bell. Similar to the first vessel, as the amount of recovered material decreased, interest on the vessel diminished and the decision was made to move the barge to the Gloucester side of the river to work on another site. Because GPS points were taken on the Gloucester site, the vessel could later be identified during the Yorktown Shipwreck Archaeology Project as site GL 136 (Sands 1983:126-127).

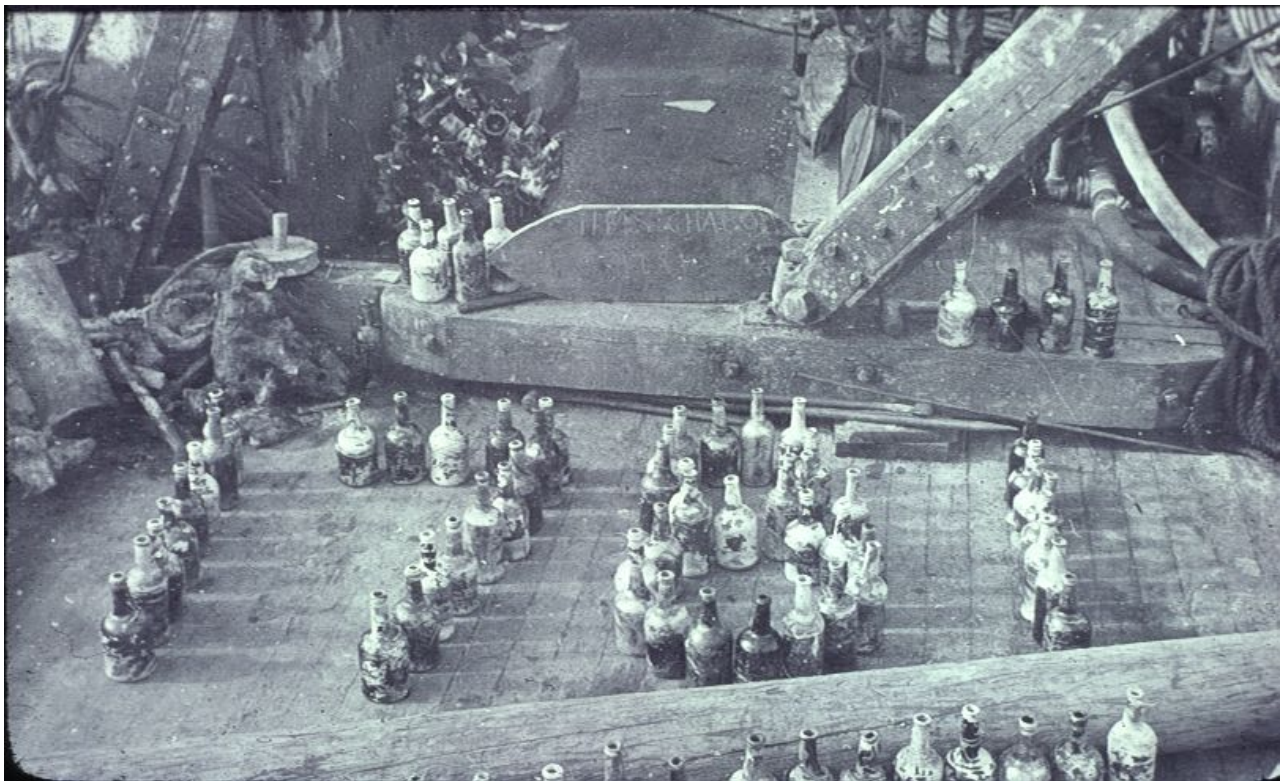


FIGURE 2. Bottles salvaged in the 1930s arranged on the barge to spell 1781 (Courtesy of Virginia Department of Historic Resources).

The salvaging stopped on July 24, 1935 due to a legal dispute over oyster fishing in the river. Neither the NPS nor the Mariners' Museum wanted to engage in a lawsuit that oysterman J.H. Jordan intended on pursuing (Sands 1983:128). The salvaged artifacts were then put on

display in the Mariners' Museum and the Naval Museum at Yorktown created by the Colonial National Historic Park (Ferguson 1939:268).

Despite the good intentions of the Mariner's Museum and NPS, very few of their plans for the artifacts were realized. The minutes of a staff meeting on November 6, 1934, indicate the NPS's plan to have not only a narrative account of the salvaging, but also a full photo catalog of all the artifacts and scaled drawings of some of the more notable materials (Sands 1983:128-129). Unfortunately, these plans were never actualized, and the NPS and Mariners' Museum underwent many managerial challenges in preserving their newly acquired collections.

This is not to say that the materials did not play a significant role in telling the story of the Battle of Yorktown and Cornwallis' fleet of chartered merchant and naval vessels. The cannons, alongside other materials pulled from the river made up a new exhibit at the NPS Battle of Yorktown visitor center complete with a reconstruction of the portside stern of a vessel similar to HMS *Charon*. The author visited this location in December of 2021, and found several of the artifacts from Site 1 still on display, with minimal archaeological context provided (See Figure 3).



FIGURE 3. Artifacts salvaged in the 1930s at the National Park Service Yorktown Battlefield Center (Photo by author).

A great deal of the material from Site 1 is also still held by the Mariners' Museum in Newport News, Virginia. The materials have been used in ten exhibits since 1997, and have been on loan to at least six organizations. Themes of these exhibits range from swashbuckling pirates, to sea defense (see Figure 4), the material representative of life aboard a vessel during the Age of Sail. The extent to which these materials continue to interact with the public justifies further research into the assemblage.





FIGURE 4. Various forms of shot that was salvaged in the 1930s on display at The Mariners' Museum, part of the exhibit "Defending the Seas" (Photo by author).

### *Discoveries of the Yorktown Shipwreck Archaeological Project*

In 1974, John Sands wrote his Master's thesis on the history of "Yorktown's Captive Fleet," reinvigorating interest in the river. During the time Sands wrote his thesis, Junius R. Fishburne Jr., the director of the Landmarks Commission, nominated the Yorktown Maritime Site to the National Register under the authority of the Virginia Historic Landmarks Commission in February of 1973 (VHCLS 1973; Sands 1983:138). It was the first underwater site to be added to the National Register.

During the spring of 1975, sport divers from the Undersea Explorers Club of Richmond contacted Sands, working at the Mariners' Museum, about the Cornwallis Cave wreck, another wreck in the York River. Due to the lack of available resources to conduct their own excavations

of the site, Sands and the Mariners' Museum decided to work with the divers in order to gain more information on the site. However, this quickly got out of hand with more and more divers coming to work on the site, threatening the overall integrity of the site. In an attempt to manage this issue, the responsibility fell to John Broadwater, at the time a sport diver and archaeologist from Richmond (Sands 1983:141). Under the support and management of the Virginia Institute of Marine Science, the Mariners' Museum and the Virginia Historic Landmarks Commission, Broadwater led a volunteer group to more formally investigate the wreck.

Due to the work of Broadwater and his team, the Virginia Landmarks Commission decided to protect the entire Yorktown Maritime Site with a memorandum on November 7, 1975 that claimed the wrecks were the property of the state of Virginia. Beyond just the wrecks themselves, the memorandum also claimed state ownership of the river itself and anything in it. After some backlash from sport divers, the Landmarks Commission added an amendment in February of 1976 to create a permit system for some recorded salvaging from the wrecks (Sands 1983:146). This is significant because it is the first legislation to explicitly outlaw salvaging the wrecks in York River without a permit-- a challenge the wrecks had endured since the ships sunk at the end of the Battle of Yorktown itself. Unlike Ash, who wrote a petition to the assembly for exclusive access to a wreck, Virginia's new legislation served to protect the site in a much more transparent way.

Following the establishment of this legislation, Fishburn along with William Kelso, chief archaeologist for the Historic Landmarks Commission, began a campaign to find funding for further exploration of the site (Sands 1983:146). Once \$15,000 for the project was approved, the Virginian Bicentennial Commission invited Dr. George Bass, a pioneer in underwater archaeology from the American Institute of Nautical Archaeology, to conduct a preliminary

study of the Cornwallis Cave wreck in 1976 (Sands 1983:148). This event was significant not only because it marked the beginning of modern governmentally sanctioned work in the river, but it was also the first time a cofferdam was used in the river.

The environment of the wreck presented poor visibility, strong currents, and stinging nettles among other challenges. Due to these challenges, Bass designed and constructed a wet cofferdam around the site. However, due to over two centuries of salvaging and the wreck's lack of structural integrity, the site did not appear to have enough potential. The excavation process was cut short due to the extensive cost burden placed upon the Virginian Historic Landmarks Commission, resulting in the commission delaying the excavation, and deciding to dedicate the money towards taking a more thorough approach to the entirety of the river to find a hull that was more intact than the Cornwallis Cave Wreck to excavate (Sands 1983:148-151).

After the brief excavation of the Cornwallis Cave Wreck, Broadwater led a series of remote sensing surveys of the area in order to find a better intact hull that would be more worthwhile to excavate. The work, as well as the support of Bass, prompted the submission of an application to the National Endowment for the Humanities (NEH) for a grant to fund a three-year excavation. A similar application had been made following the initial excavation of the Cornwallis Cave Wreck but had been withdrawn due to the decision to further survey the area. With the information from the surveys, the 1978 application received partial funding from the NEH for two years of excavation. While not what their initial application had hoped for, the Landmarks Commission considered the offer stable enough to prompt the creation of a state archaeologist position to be filled by Broadwater (Sands 1983:162). With the appointment of Broadwater, official work on the Yorktown Shipwreck Archaeological Project could begin.

During 1978, the project located and looked at nine wrecks sunk during the Battle of Yorktown (Morris 1991:14). The 1978 survey also aimed to determine whether the environment of the river was too challenging to allow for proper archaeology to occur (Broadwater 1980:230). The majority of the ships found were merchant vessels which are valuable from an archaeological perspective due to the lack of historical documents on how these ships were constructed (Morris 1991:1). Though not the key purpose of the survey work, Broadwater also worked alongside Sands to try to locate and identify the vessels excavated in the 1930s, with inconclusive results, particularly in the identification of Site 1.

According to Count de Grasse's report to Washington, there were only five naval vessels in Cornwallis' Yorktown fleet: HMS *Bonnetta*, HMS *Charon*, HMS *Fowey*, HMS *Guadeloupe*, and HMS *Vulcan* (Sands 1983). HMS *Bonnetta* survived the battle and was used in subsequent conflicts (Sands 1983:186). HMS *Guadeloupe*, though sunk, was salvaged and refloated by the French after the battle (Sands 1983:200). HMS *Vulcan* was used as a fire ship during the siege, and while it remains unaccounted for, there is likely little that remains (Sands 1983:96). HMS *Charon* was conclusively identified as site 44GL136 during a Texas A&M field school on the site during YSAP that compared the ship's measurements with the ship lines of HMS *Charon* (Broadwater 1996:40). This leaves HMS *Fowey* as the last naval vessel to be identified, and its location has been debated between two sites established during the 1978 surveys: site 44YO86 (believed to be Site 1) and site 44YO12 better known as the Cornwallis Cave wreck (Broadwater 1996:41&44).

In Sands' 1983 book, *Yorktown's Captive Fleet*, he argues the Cornwallis Cave wreck is a "large, heavily built merchant vessel," consistent with his earlier 1973 conclusions that Site 1 is actually HMS *Fowey* (Sands 1983:150; 1973:94). Additionally, Sands argues that a map noting

an HMS *Fox* in York River, located on the same beach as Site 1 provides more conclusive evidence that the site is HMS *Fowey*, as no HMS *Fox* was recorded at York River and the cartographer likely made a typo in writing HMS *Fox* (Sands 1983:199). Broadwater, on the other hand, believes the Cornwallis Cave wreck to be HMS *Fowey*, and Site 1 to be a large merchant vessel (Broadwater 1996:45). This conclusion is based on artifacts found on the site marked with the British “broad arrow” (see Figure 5) as well as the calculated tonnage of the wreck being similar to that of HMS *Fowey*. However, Broadwater concedes that there are discrepancies in the wreck site compared to HMS *Fowey*’s deck plans that make it difficult to positively identify the site as HMS *Fowey*, and the identification remains inconclusive (Broadwater 1996:45).



FIGURE 5. Escutcheon plate from Fort Stanwix National Monument, featuring the British broad arrow. The symbol would be placed on a variety of items, ranging from ordnance to furnishings. (NPS 2023).

The system of artifact patterning used in this thesis will attempt to more conclusively identify which site is HMS *Fowey* based upon the materials excavated in the 1930s. It is important to note that because no GPS coordinates were taken on Site 1, it is impossible to conclusively determine that Site 1 and site 44YO86 are indeed the same site. These earlier

surveys, though significant for this thesis, were not the primary focus of the project. Once site 44YO0088 was identified with a hull intact enough to justify further research, the project quickly shifted focus and conducted a full excavation of that site, conclusively identifying it as *Betsy*. The work conducted on *Betsy* will be discussed further in Chapter Four.

### *Conclusion*

The American War presented the Treasury and Navy Boards with a new logistical challenge. While the Treasury managed the provisions of previous wars waged in the colonies, their supplying methods relied upon provisions available in the colonies as well as contracts with American merchantmen. By the political nature of the American War, neither of these sources could be relied upon. The result was a new system of provisioning that experienced several growing pains at the expense of the British armies in North America. Once the Navy Board took over the provisioning from the Treasury, many of the challenges were addressed, however an inevitable reality still loomed: that they would eventually run out of vessels. The Battle of Yorktown saved the Navy Board from this fate, pushing a British surrender to end the war. The nature of the battle on the water, with Cornwallis' acquired shipping, indicated the ways in which British generals retained and repurposed the chartered merchant vessels, exacerbating the shipping shortage, particularly as many of these vessels ended up at the bottom of York River.

Salvaging and subsequent archaeological work in the river began immediately after the conflict and continues today. The sunken fleet in York River supplements historical sources on shipping during the American War. The material found answers questions about the various purposes these chartered merchant vessels could have, but questions in the identification of these sites still remain, as they exist in various states of degradation. The artifact pattern and four case studies used in this thesis attempts to contextualize material from one of these sites.

Understanding the shipping system used during the war, and what changes merchant vessels underwent during the chartering process, indicates distinctions in British naval and merchant vessels during this time period. Having established the distinctions determined from the historical record, the next chapter establishes the theoretical background for how this thesis will evaluate distinctions amongst the case studies in the archaeological record.

### Chapter Three: Theory

Often material culture theory is associated with post-processual concepts about the greater symbolic value and agency of an item. While this thesis is a material culture study, the theoretical concepts applied to these artifact assemblages are strictly processual. The foundation for this methodology comes from the positivist approaches established by Lewis Binford in the 1970s, and relies upon the same theories of prioritizing artifact function, and making common sense assumptions about the functions of individual artifacts as well as the ships themselves as artifacts. In this thesis, material culture is applied in order to answer greater historical questions about ship function, and how creating two artifact patterns, one naval and one merchant, might aid in the identification of another vessel's function strictly based upon the composition of its assemblage.

#### *Processual Theoretical Foundation*

Binford argued that in order for archaeology to function as a science, there needed to be an emphasis on analogy. In order to create this analogy, Binford defined two terms as archaeological concepts: *statics* and *dynamics*. *Statics* are the materials archaeologists collect and work with. *Dynamics* are the patterns and functions of the society derived from the materials. Binford's analogy for these two concepts is called the "Middle Range," where conclusions can be made by making a comparison between the *statics* and *dynamics* (Johnson 2020:55). The system of Middle Range theory is similarly applied to the data in this thesis. The *static* is the five material culture assemblages. The *dynamic* is that the historical contexts and the functions of each merchant and naval vessels are different and therefore the statics from each vessel must also reflect that difference. The analogy can be either formal or relational. Formal analogies justify their search for comparison by claiming that if some aspects of the context are similar, then other



aspects must be as well. Relational analogies rely upon greater overall cultural connections between two contexts. The analogy in this thesis compares the assemblages with each other, making a *formal* analogy (as opposed to *relational*) due to the expectation that the general function of the ship will lead to similar artifact assemblage compositions. While formal analogies are considered weaker because they are forming conclusions with less contextual evidence, this can be somewhat addressed by incorporating a large enough set of examples and comparisons (Johnson 2020:68). This thesis utilizes four case studies, each with assemblage sizes of over 800 artifacts in order to circumvent some of the limitations of a *formal* analogy.

In addition to the limitations of a *formal* analogy, application of Middle Range theory requires a couple assumptions. The first assumption is that the theory is independent from the development of “general” archeological methodology and theory, so that it may be used to evaluate other theories, without being susceptible to testing itself. The second assumption is that there is a uniformitarian assumption that the past is comparable enough to the present to allow for the same common-sense interpretations to be valid (Johnson 2020: 61). The importance of these assumptions highlights a limitation in the application of Middle Range theory; if there is evidence to suggest there is not uniformity, the accuracy of the theory is undermined. The limitations of Middle Range theory allowed for the concepts of analogy and the positivist approach to archeological data to evolve into behavioral archaeology.

Coined by Michael Schiffer, behavioral archaeology takes a slightly different approach than Binford in bridging the gap between the past and the present. While both Schiffer and Binford strive to create replicable models of archeological processes and analyses, Schiffer believed that New Archaeologists were reinforcing the laws created, but were not exhibiting enough ingenuity in creating new ones (Schiffer 1995:68). Schiffer takes the development of

these theories a step forward by incorporating more modern examples in the archeological record (Johnson 2020:70). Derived from a study of site formation processes, behavioral archaeology studies how the relationship between humans and material culture has evolved throughout time. Consideration of site formation processes and the more nuanced approaches of behavioral archaeology is applicable to this thesis research due to the variable conditions of the assemblages, particularly in their methods of extraction. In comparing these case studies, it was important to account for a variety of factors related to site formation and archaeological methodology that might contribute to the variability in the material culture assemblages to ascertain the accuracy and applicability of the artifact patterning framework.

#### *Site Formation Processes*

Schiffer's 1975 article "Archaeology as Behavioral Science," marks one of his earliest publications in reasserting archaeology's role not simply as "law consumers" but as "law producers." In order to enforce this point, Schiffer highlights the lack of laws thus far created that archeologists might be able to apply to their own work (Schiffer 1975:837). In examining the themes and laws created by archeologists, Schiffer explains why it is the purview of archeologists not only to apply laws but also create them, a responsibility considered by other theoretical schools of thought to apply strictly to social scientists. Schiffer presents four types of laws in order to exhibit how archeologists have developed laws. The first example Schiffer presents is a "c-transform," or cultural transformation, which is a process of site formation in which materials will likely be scavenged from a site and utilized in a nearby society (Schiffer 1975:839). While c-transforms are cultural site formation processes, Schiffer's second law category, n-transforms, are natural formation processes and therefore expands beyond simply archeological factors, incorporating environmental factors as well (Schiffer 1975:841). The third

example is correlates, which is a group of laws that interrelate themes of behavior and material, as well as organization and spatial awareness (Schiffer 1995). The final group is Laws of Change, which considers the variables that facilitate change within a culture, including proximity and potential for exposure to another culture (Schiffer 1975:843). The creation of these laws in the evaluation of an archaeological site are the foundation for the system of artifact patterning applied in this thesis. The application of Schiffer's laws of site formation processes are also critical in the contextualization of the four case studies and the evaluation of the applicability of the overall artifact pattern.

Schiffer's "Archaeological Context and Systemic Context" (1972) applied this processual theoretical approach by creating a system of laws around the life of an artifact and the formation processes of a site. He splits the life of the artifact into its systemic and archaeological contexts. Systemic context is the way the artifact functions within its intended cultural and behavioral context. Archaeological context is how the artifact is now perceived by archaeologists within the context of an archaeological site (Schiffer 1972:157). While not focused on maritime archaeological sites, Schiffer emphasizes that a higher proportion of "usable" artifacts are found in abandoned sites, which includes wreck sites (Schiffer 1972:160). He argues that even in abandonment scenarios, some material will be removed from the site prior to the site abandonment. His emphasis on cultural site formation processes and the interrelationship of an artifact's systemic and archaeological context are crucial considerations in the selection and evaluation of the case studies used in this thesis.

Keith Muckelroy's *Maritime Archaeology* (1978) also considers archaeological patterns and the site formation processes of a site. Muckelroy emphasizes the dichotomy of naval and merchant vessels, and considers the ship as an "element in a military or economic system"

(Muckelroy 1978:219). Muckelroy argues that unless it is a rare case in which the entire vessel is completely stripped and re-outfitted, there remains indications of the ship's function within the archaeological assemblage. This is particularly true in distinguishing naval and merchant vessels as the ship's cargo and armament, the biggest indicators of these two ship functions, are more likely to survive a wrecking (Muckelroy 1978:219). Despite arguing that there will remain evidence of the ship's function within its archaeological assemblage, Muckelroy does not see much value in that assemblage. He argues that a significant amount of historical evidence exists for naval vessels from the 17th century onward, and for merchant vessels from the 18th century onwards, which limits the value of their corresponding archaeological sites (Muckelroy 1978:237,240). However, he does not consider how these archaeological sites may assist in the contextualization of another archaeological assemblage.

In addition, Muckelroy's approach to site formation processes emphasizes the natural factors that may influence a site. Muckelroy developed a flow chart of the "evolution of a shipwreck," which considers the process of wrecking and also incorporates additional factors that impact a wreck site after the wrecking event itself (Muckelroy 1978:158). These factors are divided into two groups: extracting filters and scrambling devices. Extracting filters consist of the removal of material from the site whether during the initial wrecking process, from salvage operations later on, or from the loss of material due to biological processes such as corrosion (Muckelroy 1978:165). Scrambling devices consist of factors that influence the layout of the site, which considers the wrecking process, but also seabed movement (Muckelroy 1978:169). Muckelroy's emphasis on the natural site formation process limits the application of this theory to this thesis, because he fails to consider what action may have been taken prior to the wrecking that would impact the wreck site. As opposed to Schiffer, whose processual approach and

development of site formation processes emphasize the cultural influences on a site both prior and post abandonment.

In 1982, Jules David Prown published an article that provides an overview of approaches to material culture during the peak of Schiffer's period of Behavioral Archaeology. In support of Binford and Schiffer, Prown argues that empirical archaeology "affords a procedure for overcoming the distortions for our particular cultural stance" (Prown 1982: 5). While there are assumptions made in Behavioral Archaeology, particularly over artifact function, the empirical approach to studying the archaeological material serves to mitigate those biases. This processual theoretical foundation is critical in justifying the aims of this thesis, as it attempts to use artifact patterning to create a framework to distinguish between 18th century British merchant and naval vessels based only on their material culture. In invoking both Binford's emphasis on analogy and Schiffer's consideration of site formation processes, this thesis strives to create a model that can theoretically be applied to any wreck site within the parameters of the time period, geographical context, and national identity, while also considering its archaeological context.

#### *Artifact Categorization and Patterning*

In 1962, Binford published an article titled "Archaeology as Anthropology" in which he emphasized the role that archeologists needed to play in the advancement of anthropology. The article introduced a classification system of artifacts into three sections based upon the artifact's function: Technomic, Socio-Technic, and Ideo-Technic. Technomic artifacts had direct relationships with their environment, such as tools used to extract resources from the earth. Socio-Technic artifacts represented the "context of the cultural system," such as status symbols, with Binford citing examples such as a king's crown (Binford 1962:219). Finally, Ideo-Technic artifacts took Socio-Technic a bit further by exemplifying the "ideological rationalizations" of a

society, with examples such as figures of deities and clan symbols (Binford 1962:219). This thesis builds upon Binford's claim that a set of categories, based on function, can be developed and universally applied to a variety of different sites. However, the categorization system employed in this thesis is more nuanced and complex than Binford's three categories, as it must consider how these categories of function might indicate the overall function of the vessel.

Stanley South's *Method and Theory in Historical Archeology*, published in 1977, became the foundation for artifact categorization and patterning in archeological theory. South argued that pattern recognition is the key to understanding cultural processes, but there was an aversion to utilizing quantification analysis in recognizing patterns, because the methodology had not been thoroughly tested. South's Carolina Artifact Pattern marks a significant step in testing artifact patterning as a methodology. The goal of the Carolina Artifact Pattern was to create a framework that can then be applied to a variety of sites of colonial British material culture. In the classification of the artifacts, South made several processual assumptions based upon modern interpretations of material function (South 1977:83-84).

Prior to introducing his case studies, South provides his perspective of the division in archeological theory. South's uses the analogy of the head of a polearm in order to assign three prongs of archaeology. The first prong is "Archeology in the Humanities," which Sands describes as a "personalized, humanistic, subjective viewpoint" (South 1977:7). This is more in line with modern public archaeology. The next prong is "Particularistic Archeology," which serves to analyze one specific example, without placing it within the greater context (South 1977:8). South associates Noël Hume with this archeological approach, and emphasizes Hume's vehement interpretation of archaeology as non-scientific. In using the analogy of a polearm, South evidently argues that the strongest and most impactful prong of archaeology is the third

prong, “Scientific Archeology,” that emphasizes making objective discoveries about the past. Similar to Binford, South argues that archeologists play a role in furthering the field of anthropology (South 1977:12). While it is evident South is most supportive of the scientific approach, he cautions against “blind empiricism” in which a focus on the data prevents the exploration of nuanced archeological and anthropological conclusions (South 1977:16).

Having established the theoretical foundation of his argument, South’s Carolina Artifact Pattern provides an example of the application of patterning analysis. The subsequent comparison of the pattern to the Frontier Artifact Pattern, indicates South’s commitment to a processual nomothetic study. South’s conclusions in finding patterns amongst the British colonial material culture used in the Carolina Artifact Pattern, suggests that similar conclusions could be derived from the material culture in a British colonial maritime context. John Sands, in his 1973 thesis, described the material from York River as a “microcosm of transplanted British culture” (Sands 1973:71). The historical contextual parallel suggests that similar conclusions of discernable function can be drawn from the material, despite the addition of the maritime cultural element.

Within the context of the American Revolution, James Deetz’s book on the material culture of early colonial America creates a foundation for studying colonial material culture through the application of historical archaeology. Deetz (1997:5) defines historical archaeology as studying “the cultural remains of literate societies that were capable of recording their own histories.” Deetz argues that these materials offer an important missing link in the history of everyday people in early America, however he cautions that these materials cannot be taken at face value, because the limitations of their archaeological context can lead to false, or undeveloped, conclusions (Deetz 1997:8). In order to circumvent any biases in the interpretations

of the material, Deetz emphasizes the importance of an interdisciplinary approach, incorporating consideration of both the historical record and the material. While this thesis studies material that fits within the historical archaeological time period, the methods used in this thesis to address the limitations mentioned by Deetz draw from a more complex archaeological methodology, as opposed to relying only upon supplementary historical sources. While Deetz references more processual methods such as Stanley South's Mean Ceramic Date Formula, Deetz evaluations of the limitations of the formula indicate his emphasis on historical documentation and his residual skepticism of processual archaeological law-making (Deetz 1997:25).

In 1986, Richard Johnson and Russell Skowronek published an article in the proceedings of the 14th Conference on Underwater Archaeology that highlighted the lack of quantitative analysis application in maritime archaeology. Building from South's terrestrial investigations, Johnson and Skowronek made the argument that a parallel could be drawn between South's Frontier Artifact Pattern and the material culture on a seafaring vessel. In an attempt to indicate the validity of the method in a maritime context, Johnson and Skowronek compiled data from ten shipwreck sites spanning from the 16th to the 18th centuries. Johnson and Skowronek chose five of the samples to be from the same Spanish treasure fleet dated to 1733 to also account for thematic similarities (Johnson and Skowronek 1986:85). All ten of the vessels had either been excavated or salvaged in the twenty years leading up to the article's publication. The case studies had a combined 22,876 artifacts, which were categorized using the same categories in South's Frontier Artifact Pattern, although some subcategories were created in order to limit distortion of the data due to skewing. While the case studies were far from uniform in their historical and archaeological context, Johnson and Skowronek's preliminary results indicated evidence of artifact patterning in comparison to South's Frontier Artifact Pattern. The fact that a pattern



could be found even amongst a diverse collection of case studies indicates that an artifact patterning framework with more compatible case studies will produce even stronger results in the case for artifact patterning existing on vessels.

Annalies Corbin's master's thesis-turned-book, *The Material Culture of Steamboat Passengers* (2002), attempts to quantify features of material culture through a system of evaluation and categorization of mid-19th century steamboat material culture. By quantifying and analyzing material culture from two case studies, steamboats *Arabia* and *Bertrand*, Corbin tests a series of hypotheses that tie the material culture to the cultural and social characteristics of who the material belonged to originally. Corbin quantifies these characteristics through a series of questions about gender, age, and the luxury-quality of each item, alongside more processual functions such as whether the item is a household item or used for sewing (Corbin 2002:102). Corbin's development of hypotheses for her data indicates that her quantitative approach coincides with the empirical theoretical concepts promoted by Binford and Schiffer. Corbin's encouragement that the methodological framework could be applied to other historic sites, indicates a processual approach to creating new laws within the field of archaeology (Corbin 2002:108). However, Corbin's evaluation of the material culture based upon a series of social and cultural queries indicates a classification system based in post-processualism, as opposed to this thesis's commitment to processual inferences about artifact function and classification.

Courtney Page's MA Thesis, "Going on the Account: Examining Golden Age Pirates as a Distinct Culture through Artifact Patterning" references both South and Johnson and Skowronek's processual theoretical foundations and systems of artifact patterning, and applies them to pirate vessels in an attempt to create a "pirate pattern" (Page 2014:2-3). With *Queen Anne's Revenge (QAR)* as its anchor, Page looks at the artifact assemblages of three additional

vessels: *Wydah*, HMS *Invincible*, and *Henrietta Marie*. *Whydah* serves as the piracy counterpart to *QAR*, in order to compile an adequate collection of material culture associated with pirate activity. The naval vessel HMS *Invincible* and the slave ship *Henrietta Marie* serve as contrasts, while all four case studies operated relatively during the same time period and transatlantic region. Applying South's processual techniques, Page makes hypotheses as to which categories and distributions of artifacts will indicate certain vessel types (Page 2014:4). Page concludes from her case studies that there is a distinction between pirate and merchant vessels, however more data would be needed in order to establish clear distinctions in the three vessel types (Page 2014:85). By incorporating new data and different case studies, this thesis builds upon the foundation of distinctions that Page noticed between merchant and naval vessels.

While the processual foundation for the application of this methodology exists, there remains very few examples of this application in the maritime archaeological record. This thesis attempts to build upon the work of Johnson, Skowronek, Corbin, and Page, by taking advantage of the increasing work done in excavating and publishing on wrecks from the 18th century. With a vast database of material to work with, there is the potential for foundational patterns from merchant and naval assemblages to create new applicable models in the field of maritime archaeology.

## Chapter Four: Case Studies for the Artifact Pattern

### *Introduction*

In order to establish an artifact pattern, four case studies were selected. Each case study was evaluated based on its historical and cultural compatibility, as well as the accessibility of its data. It is necessary to establish the historical and archaeological context of each wreck site to better understand the nature and applicability of the artifact pattern. This context assists in determining what other archaeological sites may be applied to this pattern. In addition, the archaeological context of each case study establishes the limitations of the pattern. A comparison of the key aspects of each site can be found at the end of the chapter in Table 1.

### *HMS *Invincible**

#### Historical Context

HMS *Invincible* was the third in a new line of 74-gun ships designed by Pierre Morineau for the French navy (Bingeman 2010:5). The ship was launched on October 21, 1744 from Rochefort dockyard and named *L'Invincible*. HMS *Invincible* had a short career in the French navy, proving the value of its new design in a skirmish with the British Navy in 1746. However, HMS *Invincible* was outnumbered when it engaged British Admiral Lord Anson's fourteen ships-of-the-line off Cape Finisterre, Spain in 1747. Admiral Lord Anson captured *L'Invincible* on May 14, the first French prize the Royal Navy captured in the 18th century.

The vessel sat in Portsmouth dockyards for several months, undergoing surveys of its construction and condition (Lavery 1988:32). The survey's report produced a scantling list as well as noted differences between British and French ship construction. HMS *Invincible* was classed as a third rate, likely due to the vessel's unique size. This rating may have also foreshadowed the unique 74-gun design becoming a standard in the Royal Navy (Lavery 1988:34).

Anson had originally tried to introduce the 74-gun design to the Royal Navy in 1745, but his efforts were tempered by a cut in funding following the Seven Years' War (Lavery 1988:29). However, Anson's appointment as First Lord of the Admiralty in 1751 initiated many reforms in the British Navy, including the incorporation of the 74-gun design into British ship construction. The 74-gun design was a larger ship than the British second-rate warship, but carried fewer guns that were much larger. Additionally, the largest guns, 36 pounders, which were always placed on the lowest deck, were 6 feet above the waterline on 74-gun ships as opposed to only 3 feet above on British second rates. This allowed for the heavier guns to be used even on tumultuous seas. At the Battle of Trafalgar in 1805, almost half of the vessels were 74-gun ships, indicating how quickly this design became a standard in the Royal Navy (Bingeman 2010:11).

HMS *Invincible* entered the Royal Navy's service in 1748, captained by William Lloyd. Once fitted out, the ship left Portsmouth harbor on March 1, 1748, but poor rigging made its first British voyage a near disaster. These technical challenges limited the ship's participation in the remainder of the war of 1739-1748. During peacetime, HMS *Invincible* served as a guard ship, commanded by John Bentley. At the onset of the Seven Years' War, HMS *Invincible* became the flagship in Admiral the Honourable Edward Boscawen's Western Squadron in 1756, tasked with patrolling the English Channel (Lavery 1988:70). HMS *Invincible* was replaced as flagship by the brand-new first-rate *Royal George* on July 26 1756, and returned to its old position as a guard ship. The ship frequently returned to Portsmouth dockyards for repairs throughout the remainder of its service (Lavery 1988:67,76).

In 1757, HMS *Invincible* crossed the Atlantic to assist in an expedition led by Boscawen to take the Fortress of Louisbourg in Nova Scotia from the French. Unfortunately, many vessels in the fleet, including HMS *Invincible*, were severely damaged by a hurricane during the crossing

(Bingeman 2010:19). HMS *Invincible* had sustained enough damage that it had to sail back to Portsmouth under jury rig to be repaired. Once repaired, HMS *Invincible* joined another of Boscawen's expeditions to North America, this time tasked with transporting the newly-appointed Commander-in-Chief of North America, Jeffrey Amherst (Bingeman 2010:15). HMS *Invincible* was also transporting 45 soldiers from General Charles Cornwallis's 24th regiment of foot and 15 supernumeraries. On February 19, 1758, Boscawen gave the order to weigh anchor and begin the voyage, but on the way out of the channel, HMS *Invincible* ran aground.

A number of challenges contributed to this disastrous end for HMS *Invincible*. The ship's anchor remained stuck in the seabed, resulting in additional efforts to remove it. Once removed, the anchor impaled itself on the bow cutwater. During the efforts to free the anchor, the ship had begun drifting back towards Portsmouth, and changed the angle the ship could tack into the wind. When the vessel attempted to go about, the tiller jammed, and before the issues could be resolved, the ship grounded itself on the "Horse and Dean Sands" off the coast of Portsmouth (Bingeman 2010:23). Assistance came from Portsmouth Dockyard, removing guns and other stores to lighten the vessel. Attempts were made to push the vessel off the sands, but with no success; water began to fill the hull. After four days of attempted recoveries, the vessel fell onto its port side, and its wrecking was complete. Additional stores and rigging were removed from the vessel in the months following the wrecking, but no further attempts were made to refloat it (Bingeman 2010:19; Lavery 1988:104). In reviewing the wreck, the damage HMS *Invincible*'s hull suffered during the first expedition likely contributed to the vessel's inability to recover from the grounding (Bingeman 2010:19). A customary court martial was conducted on March 6, the surviving records allowing for such extensive details regarding the vessel's wrecking.

## Archaeological Context

The wreck site of HMS *Invincible* was rediscovered by Arthur Mack, a fisherman from Portsmouth, in 1979. Mack pulled a pewter jug out of his trawler nets, and had it dated to the 17th century. As other fishermen pulled up similar items from the same area, Mack believed a 17th century wreck may be in that location. Mack found the timbers from the wreck by accident on May 5, after his trawler net had caught upon it. He returned to the area and finally located the full wreck on May 15. Having located the wreck site, Mack brought two diver friends, John Broomhead and Jim Boyle, to investigate the site. Once the wreck site was confidently established, they contacted Alexander McKee, who had rediscovered *Mary Rose*, to see if he might be able to identify it. McKee put them in touch with Commander John Bingeman who would go on to author the book on the wreck. The key factor in Bingeman's identification of the wreck as HMS *Invincible* was its location on the shoals (Bingeman 2010:23).

Bingeman applied for a license for the site, under the Protection of Wrecks Act, in 1980. The first pre-disturbance survey of the site was conducted in 1980 prior to applying for the permit. The excavation policy for the site involved the removal of contents from the ship's hull prior to recording the hull structure in situ. While initially collaborating with Portsmouth City Museums in the conservation of the ship's artifacts, the committee made the decision in 1982 to create their own company, *Invincible Conservations (1744-1758) Limited*, to finance and maintain control over the project (Bingeman 2010:44).

The self-titled *Invincible (1758) Committee*, began excavating in 1981. Excavations were conducted through the digging of square trenches where all encountered artifacts were removed. The location of these trenches was determined by the surveys conducted in 1980 and subsequently in 1984. The 1983 to 1984 seasons produced an extensive number of artifacts. From 1984 to 1985, another survey of the site was conducted. Unlike the first survey that was

conducted by an archaeologically untrained team of sailors, Dr. Margaret Rule led the second survey, with a more experienced team. The 1984-1985 survey allowed for a site plan of the hull to be created. From 1986 to 1990, the hull was excavated in side-by-side sections beginning at the bow and running to the stern.

Without the support of the Portsmouth Museums Service, funding remained an issue for the project. The majority of the committee's members all had full time employment outside of the project. In January 1988, the project formed a partnership with the Chatham Historic Dockyard Trust to conserve a selection of HMS *Invincible's* assemblage in a "Representative Collection." In exchange, Chatham Dockyard paid 25,000 pounds towards the project for three years. The committee decided to approach Christie's South Kensington Limited in March 1988 to sell a collection of HMS *Invincible* artifacts to add financial stability to the project. While the sale only brought forward 64% of the committee's needed funds, it did allow for the excavation of HMS *Invincible's* coherent hull structure to be completed. Since 1991, the site's license has been reduced from excavation to survey to allow for continued monitoring of the wreck condition (Bingeman 2010:39-40).

The project produced a valuable material culture assemblage of 18th century British naval vessels. They were able to publish the results of their findings in journals such as the *International Journal of Nautical Archaeology*. Brian Lavery, a famous historian of British naval history wrote *The Royal Navy's First Invincible*, a history of the vessel. A full report on the project was published by John Bingeman in 2010, including a CD-ROM with a digital artifact catalog of over 10,600 artifacts.

## HMS *Swift*

### Historical Context

HMS *Swift* was built in a shipyard along the Thames in 1762. As a sloop-of-war, it was one of the smallest categories of fighting vessels in the Royal Navy, weighing 263 tons, armed with 14 6-pounder cannons and 12 swivel guns (Elkin 2022:225). Sloops-of-war were multipurpose vessels and could be fitted for ocean-crossing voyages, making HMS *Swift* a perfect candidate for securing Britain's stronghold in South America. Britain, France, and Spain competed for positions in South America that were crucial for extracting resources from the continent, and facilitating trade between the Atlantic and the Pacific (Elkin et al. 2007:33).

HMS *Swift* was stationed in Jamaica, before being assigned to Port Egmont, on the Malvinas (or Falkland) Islands, just off the Argentinian coast in 1769. In March 1770, HMS *Swift* left the safety of Port Egmont tasked with conducting surveys of the Falkland Islands coastline. Throughout its journey, the vessel and crew endured strong gales that pushed them towards the mainland. The decision was made to take refuge in the harbor of Puerto Deseado to give the crew a chance to rest. However, Puerto Deseado was rife with large rocks that were difficult to navigate, especially at high tide, and HMS *Swift* caught itself on one of these rocks soon after pulling into the harbor (Elkin et al. 2007:34). While able to free the vessel, the crew was not so lucky the second time around when HMS *Swift* struck on another rock that it could not get off. In an attempt to save the vessel, the crew had removed some stores including bread, gunpowder, and small firearms. As the tide went down, the immobilized vessel eventually tipped and sank (Elkin et al. 2007:34). A majority of the crew survived the wrecking by using the auxiliary boats to row to shore, and outfitted one of the vessel's oared cutters to return to Port Egmont and report the wrecking.



## Archaeological Context

Interest in HMS *Swift* developed when a descendant of one of the crew members on HMS *Swift* came to Argentina in an attempt to locate the wreck site. While he was unsuccessful, his efforts sparked the curiosity of local divers in Puerto Deseado who began searching for the wreck site, and found it in 1982 (Elkin et al. 2007:31). Some material was pulled up from the site and put in a local museum. A provincial resolution was then established declaring the site historically significant and the provincial government took over the management of the site.

The Underwater Archaeology Working Group (GTPS) conducted work on the *Swift* site in four field seasons from 1983 to 1985. HMS *Swift* was only one of several sites that GTPS worked on. While the group had no trained archaeologists, they worked on a variety of submerged sites in Argentina, testing archaeological techniques they had learned during seminars conducted by the International Committee on Monuments and Sites. A total of 80 objects were recovered from HMS *Swift* during these field seasons (Underwood 2012:134).

In 1995 the National Ministry of Culture in Argentina introduced the “Investigation and Conservation of the Argentinian Underwater Cultural Heritage” program, the first of its kind in Argentina, directed by Dolores Elkin (Dellino-Musgrave 2006:40). The *Programa de Arqueología Subacuática* (PROAS) formed within this program and began conducting academic research on the site. The project relied upon collaboration and funding at national, provincial, and municipal levels (Underwood 2012:136). The PROAS project had several goals, including contextualizing the vessel within the geopolitical climate of the time period, the ship’s reconstruction and any evidence of technological evolution, and site formation processes. The goal most relevant to this thesis was how the material culture of the site reflected the social hierarchy and life onboard the vessel (Elkin et al. 2007). The first dives on the site occurred in 1998 (see Figures 6 and 7).



Figure 6. The research team of HMS *Swift* archaeological project prepare to dive in the site. (Photo: PROAS (Underwater Archaeology Program), Ministerio de Cultura, Argentina. Courtesy: Dolores Elkin).

About 70% of the vessel's structure remains, and 60% is buried in an environment conducive to preservation (Elkin et al. 2007: 35). The structure of the vessel and large artifacts such as cannons were mapped in by trilateration. Excavation on the site ran from 2002 to 2010, and was conducted through sample sections of the wreck located in the bow, midships, and stern using a water dredge (Elkin 2022:228). The team began with the stern, where materials most likely associated with the officers' quarters would be recovered (Dellino-Musgrave 2006:43). In 2006, an excavation of the Captain's cabin was completed (Underwood 2012:157). A total of 25 m<sup>2</sup> were excavated throughout the various sections of the ship, with 750 artifacts recorded during the project (Elkin 2022:228).



Figure 7. Archaeologist Damian Vainstub holds a tumbler full of mustard seeds at the HMS *Swift* site. (Photo: PROAS (Underwater Archaeology Program), Ministerio de Cultura, Argentina. Courtesy: Dolores Elkin).

Articles in journals such as the *Age of Sail* and the *International Journal of Nautical Archaeology* provided updates on the results of the project (Murray et al. 2003; Elkin et al. 2007). In 2004, the team published an article on the vessel's biodeterioration (Bastida et al. 2004). As a change in government cut off the sources of funding for the project, the team had to rely upon sources of funding that were preferential to academic grants, such as the Antorchas Foundation that assisted Virginia Dellino-Musgrave in completing her dissertation research (Dellino-Musgrave 2006:X; Dellino & Endere 2013: 224). Dellino-Musgrave turned her dissertation into a book in 2006, describing how she took a post-processual approach to studying social relations and maritime archaeology, and utilized HMS *Swift* as a case study. In 2008,

PROAS received funding from Argentina's National Research Council and the National Geographic Society. PROAS published a book summarizing the ten-year project in 2011. The book indicates how the project has fulfilled its outlined goals, as well as goes into detail as to the types of materials acquired. Inside the book is a CD with a full artifact catalog. The site is a case study on excavation in *The Oxford Handbook of Maritime Archaeology*. The site is also referenced in an article reviewing the development of underwater heritage protection in Argentina and calling for further site management of the HMS *Swift* site (Underwood 2012; Dellino & Endere 2013). The exhibit centered around the artifacts from HMS *Swift* is located at the Museo Mario Brozoski in Puerto Deseado. Recently redesigned in 2019, the exhibit remains a major point of pride for the local community there (Elkin 2022:242).

## *Betsy*

### Historical Context

A brig of approximately 170 tons, *Betsy* was a merchant vessel built in Whitehaven, Cumbria, England in 1772 (Broadwater 1996:3, 139). As a brig collier, *Betsy* functioned as a coal carrier, running coal to Dublin from Whitehaven likely every six to eight weeks (Broadwater 1996:159). As coal was the primary fuel for domestic heating, colliers were one of the most prevalent vessel types (Morris 1991:18-19). Prior to the American War of Independence, colliers already appealed to the navy as vessels of exploration, creating the foundation of their naval preference when it came to chartering merchant vessels during the war (Morris 1991:24). According to the Lloyd's Register of shipping, *Betsy* was chartered by the Royal Navy in 1780, its rating increasing from A2 to A1 status in that year, likely due to the outfitting required of charter vessels before their contract could begin (Lloyd's Register Foundation 1780:30).

While not much is known of *Betsy*'s function post-chartering, there are some small snippets of the vessel's history. *Betsy*'s size indicates that it would have been employed as a victualler-- the size of its tonnage too small to be used as a transport. As a victualler, *Betsy*'s primary purpose would be to carry provisions and other general supplies to the colonies (Broadwater 1996:159). However, a collection of buttons from the 43rd regiment of foot found during the vessel's excavation assisted in identifying the wreck and presented another one of *Betsy*'s functions while under contract: *Betsy*, alongside two other vessels, transported the 43rd regiment from Portsmouth to Yorktown in 1781 (Broadwater 1996:138). Prior to, and during, the Battle of Yorktown, *Betsy* was commanded by John Younghusband (Sands 1983:184; Lloyd's Register Foundation 1780:30). The ship was chartered from Peter Butt for about 46 pounds and 10 shillings per month (Sands 1983:184). Additional archaeological evidence found during the site's excavation suggests the vessel may have functioned as a factory ship during the siege, due to the extent of timber and an unfinished gun carriage (Broadwater 1996:144-145). The vessel's final function was as a barricade, scuttled along the Yorktown riverfront in an attempt to protect the town from an amphibious Franco-American invasion. A clearly cut hole in the vessel's hull, along with its location along the riverbank, suggests it was one of the first vessels scuttled by General Cornwallis on September 16, 1781.

### Archaeological Context

#### YORKTOWN SHIPWRECK ARCHAEOLOGICAL PROJECT

The 1978 surveys at the onset of the Yorktown Shipwreck Archaeological Project (YSAP) served to locate a vessel with an intact enough hull to justify full excavation. Of the nine vessels surveyed, the team decided that site 44YO0088 warranted further investigation. The work, as well as the support of Dr. George Bass, prompted the submission of an application to

the National Endowment for the Humanities (NEH) for a grant to fund a three-year excavation. With the information from the surveys, the 1978 application received partial funding from the NEH for two years of excavation. While not what their initial application had hoped for, the Landmarks Commission considered the offer stable enough to prompt the creation of a state archaeologist position to be filled by Dr. John Broadwater (Sands 1983:162). With the appointment of Broadwater, official work on the YSAP could begin.

The focus on site 44YO0088 was due to the wreck's well-preserved hull. The hull settled into the sediment, and was additionally covered in a layer of sediment to allow for its preservation. In his thesis on *Betsy's* hull, John William Morris introduced the process of Redox Potential Discontinuity where under a certain level of sediment, oxidation stops, allowing for further preservation of the wood (Morris 1991:8). After the 1978 survey, Broadwater determined that the three most well-preserved merchant vessels in the river would receive the most attention. The team completed partial investigations on sites YO85 and YO86 and conducted a full excavation of site 44YO0088 due to it being well-preserved and the most susceptible to "further degradation" from erosion and storms (Broadwater 1992:39). Due to the challenges of the river environment, Broadwater also decided from this preliminary survey that a wet cofferdam would be constructed around YO0088 for the full excavation (Broadwater 1980:234).

## THE COFFERDAM

The environment in the York River is far from conducive to archaeological excavations. There are strong currents, near-zero visibility, boat traffic, and stinging jellyfish (Broadwater 1992:36). Often when these kinds of environmental challenges present themselves, there are archaeological techniques that can be applied. UNESCO describes cofferdams as "watertight

structures” (Viduka 2012:8). However, as cofferdams are used more frequently in shallow waters, Broadwater had to consider how a cofferdam could fit over a wreck buried in sediment. In addition, the cost of pumping out so much water at that depth would not have been feasible (Broadwater 1992:39). Luckily, it was not the first time that a wet cofferdam had been used in the York River, as initial investigations of site YO12, better known as the Cornwallis Cave Wreck, facilitated the construction of the first wet cofferdam in the York River: a portable prototype of what was to come.

After a planning period in 1979, Broadwater spent three years designing and building a rigid steel cofferdam to surround site 44YO0088 (Broadwater 1988:811). Due to concerns of the construction of the cofferdam potentially damaging the site, an archaeologist was onsite during the entire construction process (Broadwater 1992:40). In order to protect the wreck, “template pilings” were placed in reference points surrounding the wreck in order to determine how large to make the cofferdam so as to not cut off any part of the wreck, and Broadwater proudly declared that “no damage was observed” (Broadwater 1992:40).

Broadwater describes the cofferdam as having a “swimming pool” environment, as the cofferdam had a filtration system to increase visibility within the site. There were also the chemical additions of copper sulfate and chlorine added to the water to improve visibility (Rodgers 1989:338). The cofferdam constructed was 97 ft long by 45 ft wide, with an average water depth of 20 ft. The cofferdam had two filtration systems that continually filtered approximately half a million gallons enclosed by the cofferdam (Broadwater 1992:40). While attempts were made to fully seal the steel enclosure, river water exchange remained a challenge. Broadwater laments that the first two excavation seasons of the site were largely overshadowed by experimentation of the cofferdam’s filters, nevertheless by 1985, the filtration challenges

were overcome. He described the visibility having gone from near zero to a consistent 10 feet, and he declared in a National Geographic article in 1988 that the cofferdam and “the resulting clarity was well worth our efforts” (Broadwater 1988:811). The cost of the cofferdam was a little over \$400,000, nearly three times the planning estimates made in 1979, and was funded by an additional grant from the NEH (Morris 1991:14). Despite the challenges of the filtration system and inability to completely seal the cofferdam, Broadwater argues that the cofferdam remained a valuable tool during the excavation process, particularly as the site welcomed field school students from East Carolina University from 1982 to 1988, and the cofferdam provided a much safer environment for them to dive in as opposed to the open river (Broadwater 1992:42).

Further review of the use of the cofferdam on 44YO0088 has been conducted by Dr. Brad Rodgers in a 1989 article published in the *International Journal of Nautical Archaeology and Underwater Exploration*. Specifically, Rodgers wrote about the state of 18th century materials pulled from the site in order to determine if anything about the chemicals introduced in the cofferdam had an impact on the artifacts. Rodgers does agree with Broadwater that as a “site shielding” device, the cofferdam was largely a success. However, he presents a “mystery” of the site in which the majority of the few ferrous materials found were largely decomposed despite the sediment environment of site 44YO0088 largely being conducive to the preservation of ferrous materials (Rodgers 1989:335). After exploring a variety of environmental challenges that had the potential of causing the deterioration of the ferrous material, Rodgers notes at the end that shapeless ferrous artifacts had been pulled from the site in 1978, prior to the construction of the cofferdam. This fact leads to the conclusion that the cofferdam did not have any major impact on the deterioration of those ferrous materials. However, Rodgers cautions against the



belief that the cofferdam would have had no impact on the site over the long term. (Rodgers 1989:339).

While a hurricane in 1985 set back some of the excavation plans, the site produced extensive results from 1985 to 1988. The first public reporting on the wreck came in the form of a story in *National Geographic* written by Broadwater and published in 1988. The article focused on the unique use of the cofferdam and presented some of the earlier artifact discoveries and observations of the site.

Information from the excavation created the foundation of two Master's theses, one by Broadwater and the aforementioned other by Morris. Broadwater's thesis came first in 1989. The thesis focused on site 44YO0088 (not yet identified as *Betsy*) and presented some of the earliest analysis of the artifacts recovered from the wreck, focusing on stores and cargo. Morris, who worked alongside Broadwater during the excavation process, made the focus of his thesis on the ship's construction with special attention given to the hull. This is notable as one of the initial goals of the YSAP was identifying a wreck to be fully excavated with a well-preserved hull. The extent of information that Morris discerned from the site indicates that they succeeded in this task.

Finally, in 1996, Broadwater published the final report of the YSAP. The five-volume report included a description of the history of the site, its management and subsequent topical reports ranging from the wreck's pump well structure, to a large number of shoes recovered from the site, and a catalog of the over 5000 artifacts excavated, in which a little over half are applicable to this thesis.

## *General Carleton*

### Historical Context

*General Carleton* belonged to Nathaniel Campion, a merchant from Staithes, England. The Campion family had ties to many prominent mariner families in Staithes (Baines 2010:24). By the time of *General Carleton*'s construction, Campion had already made a name for himself as a successful merchant man after having moved from Staithes to Whitby in 1763 and becoming the owner of his first merchant vessel, *Thomas and Richards* (Baines 2010:34). Campion's shipping business grew through the Baltic trade and coal trades, and he commissioned the building of another vessel, *Valiant* in 1763. Campion made the decision to charter out *Thomas and Richards* as a transport sometime before 1774, and when he made the same decision with *Valiant* in June 1776, Campion decided to have a new vessel constructed: *General Carleton* (Baines 2010:47, 51-52).

*General Carleton* was named after Sir Guy Carleton, the Governor General of Canada and Commander of the Army, who had famously secured Canada for the British after the Siege of Quebec in May of 1776 during the American War (Baines 2010:51). After its launch in January 1777, *General Carleton* engaged in the Baltic Trade, carrying mostly timber but also occasionally iron and tar from Russia, Norway and the Baltic to Hull, England (Baines 2010:75-76). *General Carleton* was mastered by Thomas Pyman until Pyman became the master of the newly constructed *Peggy*, and William Hustler replaced him in 1781 (Baines 2010:103).

Nathaniel Campion made the decision to charter out *General Carleton* to the Royal Navy in 1780. The loss, sometime after 1778, of Campion's previously chartered transport, *Thomas and Richard*, led to the decision to charter out Campion's other vessel, *Valiant*, and eventually, *General Carleton*. As a chartered transport operating out of Riga, *General Carleton* likely

transported timber, especially masts (Bains 2010:101). However, its purpose changed as the status of the war changed.

With Cornwallis's surrender at Yorktown, it became apparent that the war was lost to the British, and the navy faced a new challenge in how to evacuate not only the British military, but also the loyalist civilians in the wake of a British surrender. *General Carleton* joined a convoy at Spithead in April of 1782 formed with the purpose of traveling to the British colony of Jamaica. From there, historians believe *General Carleton* assisted in the evacuation of troops and civilians from Savannah, Georgia, and possibly Charleston, South Carolina. While no official orders have been found with *General Carleton's* name on them, the way in which "every available transport in America" was used suggests it was there (Baines 2010:113). *General Carleton* returned to London on April 6, 1783, having sailed from Port Royal in a convoy of naval vessels and transports (Baines 2010:114).

On August 13, 1783, Nathaniel Campion died, leaving all of his belongings to his wife, Margaret Campion. With the Treaty of Paris signed on September 3, 1783, ending the war, the shift in management marked a new era for *General Carleton*. The merchant vessel resumed shipping naval stores from Norway and the Baltic to London in April of 1784 and continued to do so until its wrecking in 1785.

*General Carleton* was carrying a cargo of pitch and iron from Sweden to London during a season with an unusual plurality of storms when it wrecked. The merchant vessel had barely made it to the open sea when a storm, characteristic of the season, began to form. The storm was a mixture of rain, snow, and hail, and despite the crew's best efforts to weather it, the decision was made to head to port in Danzig (Gdansk) (Baines 2010:1-2). In the conditions of the storm, any attempts at navigation were estimations at best. It was too late before the vessel's master at

the time, William Hustler, realized that the vessel was moving towards the sands on the northern coast instead of their intended destination. In response, Hustler made the decision to anchor and allow for the majority of the crew to row to land. While Hustler, and another crewman named Nicholas Theaker, stayed aboard striving to preserve the cargo in any way they could, another storm came upon *General Carleton*, breaking the mast and the anchor cable, and sending the ship into the sand bank where the weight of its iron cargo sank the vessel (Baines 2010:12).

### Archaeological Context

The Polish Maritime Museum (now the National Maritime Museum), founded in 1960, began surveying for sites in Polish territorial waters in an attempt to replace the cultural heritage lost during the world wars. The first two wreck sites rediscovered in 1969, W-5 and W-6, created the foundation of the museum's maritime archaeological work (Ossowski 2008:35). In 1984, the Polish Navy gifted the museum a research vessel, *Kaszubski Brzeg* (Ossowski 2008:39). With the use of the research vessel, the museum was able to take on more ambitious projects, extending beyond the Bay of Gdańsk in an attempt to find sites not susceptible to the same levels of wave action as those in the bay (Ossowski 2008:43).

The initial reports on the location of *General Carleton* (site W-32) came from an old fishermen's tale that described the wrecking event and one fisherman's salvaging efforts. Dr. Michał Woźniewski, ichthyologist and scuba diver, assisted by Eugeniusz Kur and Ryszard Dominik, attempted to locate the wreck described in the story with a fishing trawler, and successfully did so in 1994. The team informed the museum of their discovery, and the site officially earned the label W-32 in the same year (Ossowski 2008:43).

Working from *Kaszubski Brzeg*, the museum's first field season produced significant results. Work began on September 5, 1995, and ran through the end of October, a month longer

than the anticipated field season (Ossowski 2008:47). Located in the shallow coastal waters of the southern Baltic, the site was susceptible to sediment transport, exacerbated by wave action that limited visibility, and also meant that extensive clearing of the site would have to take place before any major archaeological discoveries could be made (Ossowski 2008:45). The first season produced 538 inventoried items, a significant portion of the wreck's artifact catalog, largely pulled from the region near the stern (Ossowski 2008:50). These items included the ship's bell, with the name *General Carleton* on it (Baines 2010:14). A variety of rare artifacts for an archaeological site, such as clothing and paper, could be excavated and identified due the cargo of Swedish Pine Tar spilling during the vessel's wrecking, encasing the sensitive material in a protective anaerobic layer (Baines 2010:14).

A subsequent field season in 1996, despite some delays, produced another 222 artifacts. The team returned in 1997 with two primary goals: to record the structural details of the hull and to pull up the ship's stove, however the shifting sands had buried a significant portion of the wreck, limiting the extent of excavation and recording that could be conducted. Fieldwork after 1997 was limited due to the shifting sands covering the site, limiting any potential for further excavation (Ossowski 2008:55-56). While the shallow coastal environment is not conducive to the in situ preservation of the wreck's structure, sedimentation in the hull allowed for the conservation of a variety of artifacts. Throughout the excavation, a total of 1,366 artifacts were recovered and cataloged. The site continues to be monitored, and has been entered into the national register of historic sites and monuments (Ossowski 2008:63).

	<i>HMS Invincible</i>	<i>HMS Swift</i>	<i>Betsy</i>	<i>General Carleton</i>
<b>Function</b>	Naval	Naval	Merchant	Merchant
<b>Tonnage</b>	1826 tons	263 tons	170 tons	200 tons
<b>Years of operation</b>	1744-1758	1763-1770	1772-1781	1777-1785
<b>Geographic region of operation</b>	North Atlantic	South Atlantic	North Atlantic	North Atlantic Baltic Sea
<b>Year of rediscovery</b>	1979	1982	1978	1994
<b>Size of Total Assemblage</b>	10,664	830	5,037	1,366

TABLE 1  
COMPARISON OF THE FOUR CASE STUDIES (Table by author, 2023).

## Chapter Five: Methods and Results

### *Introduction*

Categorization of all the material in this thesis is based upon function, as the function of individual artifacts should serve to indicate the overall function of the ship. The foundation for the categorization used in this thesis is Stanley South's Carolina Artifact Pattern, as his "groups are based on functional activities related to the systemic context reflected by the archaeological record" (South 1977:93). The categorization system of the Carolina Artifact Pattern is the foundation for artifact patterning in 18<sup>th</sup>-century North America and South's work has been applied previously to maritime sites with relative success (Johnson and Skowronek 1986). However, there are distinctions in the type of materials uncovered from maritime wreck sites versus colonial terrestrial sites. Maritime sites have a greater emphasis on arms and armament, and the types of tools and instruments, particularly ships' stores, are different from the materials commonly found in South's Carolina Artifact Pattern. Because of these distinctions, additional groups, types, and classes were added based partially on the existing categorization methods of each case study, as well as Johnson and Skowronek's "A Quantitative Analysis of Patterning Potential in Shipwreck Artifact Assemblages" (1986), and Page's master's thesis, "Going on the Account: Examining Golden Age Pirates as a Distinct Culture Through Artifact Patterning" (2014), which also included HMS *Invincible* as a case studies.

### *Artifact Groups*

There are six main artifact groups that are the foundation of this system of categorization: Arms and Armament, Cargo, Kitchen, Tools and Instruments, Personal, and Other. While the majority of these groups are terms pulled from South's Carolina Artifact Pattern, Cargo and Tools and Instruments were added due to the differences in maritime and terrestrial sites. Each

group is defined below, providing its associated artifact classes and types, as well as examples of artifacts belonging to each group.

### Arms and Armament

Arms and Armament are any materials related to weaponry. South's group, "Arms," consists of small arms, and "Military Objects" are a separate class in the Activities group that includes the larger artillery. Despite these distinctions, South also argues that the frequency of arms is a better indicator of military function than the individual typology of the arms (South 1977:101). For this thesis, all arms and armament are placed in one group, with the expectation that a higher frequency of this material signifies military function.

Arms and Armament are split into three classes: Artillery, Small Arms, and Ammunition (Table 2). Artillery is any large weaponry such as cannons and swivel guns and includes equipment or parts pertaining to these weapons. Equipment associated with this class includes cannon carriages, tampions, rammer heads, lead aprons used to cover the cannon vent, and leather buckets that held the water used to swab out the barrel of the cannon (Bingeman 2010:122,126). Small Arms include firearms and parts, such as musket stocks, firearm side and butt plates, and trigger guards, as well as any accessories associated with these weapons such as cartridge cases, gunpowder horns, and gun flints. Swords and blades, mostly found in fragments, are also included in Small Arms. Finally, Ammunition consists of any form of projectile and its associated equipment. This class includes types based on what type of weapon would use the projectile. Large projectiles such as bar shot and cannonballs are listed under Cannon, while smaller projectiles such as musket shot, lead shot, and iron shot are listed under Small Arms. Other artifact types in this class include Explosives such as grenades found on HMS *Invincible* and shrapnel bullets found on HMS *Swift*. A unique Ammunition Accessory includes the tally



sticks used on HMS *Invincible* in order to label gun wads with the type of cannons the wads could be used for (Bingeman 2010:114). Due to the extent of types within each class, the classes and types are listed in Table 2.

<b>Class</b>	<b>Type</b>
Ammunition	Small Arms Ammunition Cannon Ammunition Explosives Ammunition Accessory
Artillery	Cannon Cannon Part Cannon Equipment Swivel Gun Artillery Accessory
Smalls Arms	Firearm Sword or Blade

TABLE 2  
CLASSES AND ASSOCIATED TYPES WITHIN THE ARMS AND ARMAMENT GROUP  
(Table by author, 2023).

### Cargo

Cargo includes all artifacts related to storage for transport. Reinder Reinders included the term as a category in his 1985 functional classification system for wreck sites, a system considered by Ossowski and the Polish Maritime Museum in the development of the artifact catalog for *General Carleton* (Ossowski 2008:281). Page also used the group in her thesis, derived from the storage class in South's activities group (South 1977:96; Page 2014:55). The number of people and extent of time that these vessels must be self-sustaining on a voyage indicates a prevalence of cargo and storage that terrestrial sites would not require. Similar to Sands' argument that a higher frequency of arms and armament signifies military activity, a higher frequency of cargo is expected to suggest merchant activity.

Cargo includes all artifacts related to storage for transport. The main class of cargo is Storage, which includes all cooperage parts and cooperage accessories such as spigots, bungs, and cooperage tools like adzes. Additionally, a number of barrels from HMS *Invincible*, believed to be full of gunpowder are included in this class as opposed to Arms and Armament due to the lack of context as to whether the gunpowder would be used for small arms or artillery. Many materials do not fall under a specific type, but are still considered storage, these are items such as baskets, jars, boxes, and unspecified vessels. Storage accessories include items such as locks, as well as lids and corks that are unassociated with a container.

### Kitchen

Kitchen group includes all material related to the preparation and consumption of food. Within the group there are two classes: Tableware and Galley. Tableware consists of any vessel and utensil used to serve and consume the food. Dishes range from bowls to plates. Drinking Vessels account for all forms of cup including mugs and tankards as well as larger items such as wine bottles, pitchers, and teapots. Serving Vessels account for large serving dishes and smaller dishes for serving condiments. Finally, Utensils account for all handheld serving instruments including forks, spoons, and knives.

The Galley class represents materials directly related to the galley. There is one type within Galley which is Food Preparation. Material within this type include parts of a galley stove excavated from HMS *Swift*, as well as more generally pans, cauldrons, griddles, and kettles. Additional material in the Galley class includes a broom from HMS *Invincible*. Identified as a galley broom due to its archaeological contexts, the broom still belongs in the Galley class, despite not being directly related to food preparation. Due to the extent of types within each class, the classes and types are listed in Table 3.

<b>Class</b>	<b>Type</b>
Tableware	Dish Drinking Vessel Serving Vessel Utensil
Galley	Food Preparation

TABLE 3  
CLASSES AND ASSOCIATED TYPES WITHIN THE KITCHEN GROUP (Table by author, 2023).

### Personal

The Personal group consists of all material classified as belonging to an individual. While South has clothing as a separate group, clothing is incorporated as a class of the Personal group, due to its close association with other personal items, particularly in maritime environments (South 1977:95; Ossowski 2008:283). Clothing includes all breeches, buttons, stockings, and shoes. Any ornamentation such as buckles and hats are considered an Accessory.

Pastime/Recreation consists of materials used in leisure, including, generally, gaming pieces and books. Within Pastime/Recreation is a type related to all pipe material used for smoking tobacco. Toiletries make up the last class, with materials such as wash basins, chamber pots, brushes, and, for the fortunate few, wig curlers. Some materials did not fit within any of these classes but are still considered personal items. Examples include a dog collar found on HMS *Swift*, as well as a carved bird head found on *Betsy*.

### Tools and Instruments

The group Tools and Instruments derives from *General Carleton's* catalog and appears in variation in the other case studies. For the purpose of this thesis, the group serves to represent a variety of smaller classes that have distinct functions, similar to Sands' Activities Group. The Architectural and Furniture groups of Sands' pattern are combined under the Furniture class

because there is a much smaller amount of these materials found within these case studies. Within the Furniture class, there is the distinction of Decoration as a type. Within Fabric Working, there are materials such as pins, needles, and thimbles that relate directly to the Sewing type. The rest of the classes do not have types. Ship Maintenance is one of the largest as it contains the majority of the ships' stores from each case study, a significant archaeological difference from terrestrial sites. The remaining classes are Writing, Measuring, Navigation, Medical Supplies, and Musical Instruments.

### Other

A small collection of material served a function directly related to the distinction of this artifact pattern: naval versus merchant vessels. These classes, Military and Commerce, were separated so that they may be highlighted in each case study. Materials that fall under the military class include a variety of buttons stamped with specific military regiments found on *Betsy* and *HMS Invincible*. Commerce items include a variety of coin currency, as well as commerce documents found on *General Carleton*. Additionally, a collection of tent pegs from Site 1 were also classified as Other, as they do not fit in any of the previous groups.

### *Results*

As each case study had some variation of artifact classification, this system of categorization was applied to each case study in order to establish consistent data for this artifact pattern. The results of this application are listed below by case study. It is important to note that artifact counts are individually identifiable pieces, and do not always guarantee a full object. The methodology for categorizing each artifact within these groups, types, and classes relied heavily upon the observations listed in the catalog description of each artifact. Without being able to access each item, the categorization of these four catalogs is subject to the biases of the

researchers and investigators who compiled the artifact catalogs of each case study and identified each artifact.

There was material omitted from analysis within each case study. The purpose of this thesis is to determine whether there is a distinct pattern of material culture, not ship construction, on merchant and naval vessels. For this reason, any material related to ship construction and function, including rope, blocks, and anchors were omitted. Additionally, some organic material such as seeds, coal, and unmodified bone were also omitted. For many of these materials, their provenience was not evident, and therefore all related material was omitted to maintain uniformity across the four case studies. However, any bone material that has clearly been repurposed, such as bone handled utensils and bone buttons were not omitted. Any concretions, unidentified items, and unidentified fragments were also omitted, as they could not confidently be placed within one of the function categories. A full list of all artifacts used from each case study and their associated categorization can be found in the appendix.

### HMS *Invincible*

The catalog for HMS *Invincible* was one of the easiest to process and categorize of the case studies. The 2010 publication on the project comes with a CD that includes a digital copy of the catalog, already in an Excel spreadsheet (Bingeman 2010). The only work that was required was categorizing the data based on the information provided in the database. There was some categorization of the material based on function in their catalog, however, not to the same degree as the categorization applied in this pattern. See Table 4 for the breakdown of HMS *Invincible*'s group and class percentage distribution.

Group	Class	Amount	Frequency within assemblage	Frequency within group
<b>Arms and Armament</b>	Artillery	175	1.681	2.102
	Small Arms	2107	20.238	25.303
	Ammunition	6045	58.064	72.595
	Total	8327	79.983	100
<b>Cargo</b>	Storage	605	5.811	99.671
	Cargo	1	0.01	0.165
	Storage Accessory	1	0.01	0.165
	Total	607	5.83	100
<b>Kitchen</b>	Tableware	311	2.987	96.285
	Galley	12	0.115	3.715
	Total	323	3.102	100
<b>Personal</b>	Personal	1	0.01	0.259
	Clothing	361	3.467	93.523
	Accessory	1	0.01	0.259
	Toiletries	10	0.096	2.591
	Pastime/Recreation	13	0.125	3.368
	Total	386	3.708	100
<b>Tools and Instruments</b>	Ship Maintenance	422	4.053	57.027
	Tools and Instruments	3	0.029	0.405
	Furniture	219	2.104	29.595
	Navigation	79	0.759	10.676
	Writing	1	0.01	0.135
	Medical Supplies	13	0.125	1.757
	Fabric Working	2	0.019	0.27
	Measuring	1	0.01	0.135
	Total	740	7.108	100
	<b>Other</b>	Military	28	0.269
Commerce		0	0	0
Total		28	0.269	100
<b>Total</b>		10411	100	

TABLE 4  
COMPLETE ASSEMBLAGE DISTRIBUTION FOR HMS *INVINCIBLE* (Table by author, 2023).

Of the 10,664 total artifacts included in the digital catalog for HMS *Invincible*, 10,411 were used in this study. Arms and Armament make up 79.983% of the total assemblage with

2.102% Artillery, 25.303% Small Arms, and 72.595% Ammunition. Cargo makes up 5.83% of the assemblage with 99.671% Storage, and .165% Cargo and .165% Storage Accessory with one artifact each. Kitchen is 3.102% with 96.285% of the group being Tableware, and 3.715% of the group Galley material. Personal makes up 3.708% of the assemblage with .259% Personal Items, 93.523% Clothing, .259% Accessory, 2.591% Toiletries, and 3.368% Pastime/Recreation. Tools and Instruments make up 7.108% of the assemblage with .405% general Tools and Instruments, 57.027% Ship Maintenance, 29.595% Furniture, 10.676% Navigation, .135% Writing, 1.757% Medical Supplies, .27% Fabric working, and .135% Measuring. Finally, Other makes up .269% of the assemblage consisting of 28 military-related items, all military buttons. Figure 8 exhibits the group distribution of HMS *Invincible*.

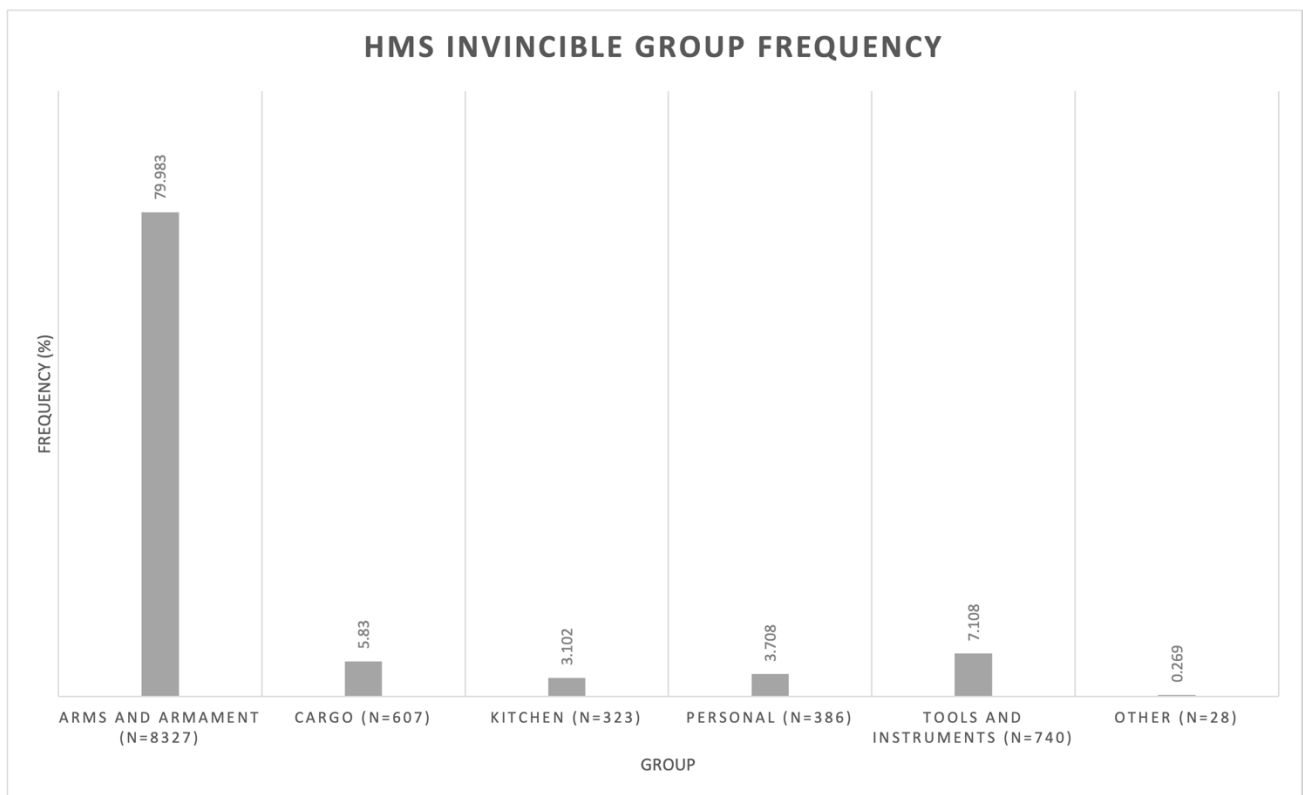


FIGURE 8. Group frequency distribution from HMS *Invincible* assemblage (Figure by author, 2023).

Arms and Armament having a much higher frequency than any of the other groups is consistent with its known function as a naval vessel. It is also consistent that Cargo, Kitchen, and Personal all make up a much smaller percentage of the overall assemblage, considering the nature of its wrecking, over the course of several days when attempts were made to refloat the vessel prior to resorting to salvage and abandonment (Bingeman 2010:19; Lavery 1988:104). The extent of ammunition was likely too heavy to be removed from the vessel, and thus remained as a significant portion of the assemblage as opposed to the other groups. Having been previously considered as a case study in Page's thesis, HMS *Invincible*'s assemblage provides an accessible example of a British transatlantic naval vessel of the 18th-century (Page 2014).

### HMS Swift

HMS *Swift* presented one of the most challenging case studies because the final publication on the site, including the artifact catalog, is in Spanish (Elkin et al. 2011). Compiling the catalog required several sources in order to confidently translate the catalog and account for variations in maritime vocabulary. HMS *Swift* was also one of the smallest case studies, the research team having only conducted sample excavations of the vessel. However, these samples were strategically placed in order to generate an accurately representative assemblage of the site (Dellino-Musgrave 2006:43). See Table 5 for a complete assemblage distribution of HMS *Swift*.



<b>Group</b>	<b>Class</b>	<b>Amount</b>	<b>Frequency within assemblage</b>	<b>Frequency within group</b>
<b>Arms and Armament</b>	Artillery	26	3.385	25
	Small Arms	1	0.13	0.962
	Ammunition	77	10.026	74.038
	Total	104	13.542	100
<b>Cargo</b>	Storage	65	8.464	100
	Storage Accessory	0	0	0
	Total	65	8.464	100
<b>Kitchen</b>	Tableware	356	46.354	88.778
	Galley	45	5.859	11.222
	Total	401	52.214	100
<b>Personal</b>	Personal	1	0.13	1.163
	Clothing	73	9.505	84.884
	Accessory	0	0	0
	Toiletries	9	1.172	10.465
	Pastime/Recreation	3	0.391	3.488
	Total	86	11.198	100
<b>Tools and Instruments</b>	Tools and Instruments	4	0.521	3.738
	Ship Maintenance	31	4.036	28.972
	Furniture	55	7.161	51.402
	Navigation	6	0.781	5.607
	Writing	3	0.391	2.804
	Medical Supplies	2	0.26	1.869
	Fabric Working	2	0.26	1.869
	Measuring	1	0.13	0.935
	Musical Instrument	3	0.391	2.804
	Total	107	13.932	100
<b>Other</b>	Military	0	0	0
	Commerce	5	100	100
	Total	5	0.651	100
<b>Total</b>		768	100	

TABLE 5  
COMPLETE ASSEMBLAGE DISTRIBUTION FOR HMS *SWIFT* (Table by author, 2023).

Combining the 80 artifacts documented in the 1980s with the 750 excavated in the early 2000s, the HMS *Swift* catalog consists of 830 artifacts, with 768 used in this study. Arms and

Armament makes up 13.542% of the assemblage, with 25% Artillery, .962% Small Arms, and 74.038% Ammunition. Cargo makes up 8.464% of the assemblage with all 65 artifacts belonging to the Storage Class. Kitchen is 52.214% of the assemblage with 88.778% Tableware and 11.222% Galley. Personal is 11.198% of the assemblage with 1.163% Personal items, 84.884% Clothing, 10.465% Toiletries, and 3.488% Pastime/Recreation. Tools and Instruments makes up 13.932% of the assemblage with 3.738% general Tools and Instruments, 28.972% Ship Maintenance, 51.402% Furniture, 5.607% Navigation, 2.804% Writing, 1.869% Medical Supplies, 1.869% Fabric Working, .935% Measuring, and 2.804% Musical Instruments. Finally, Other makes up .651% of the full assemblage with 5 coins. Figure 9 breaks down the group distribution of HMS *Swift*.

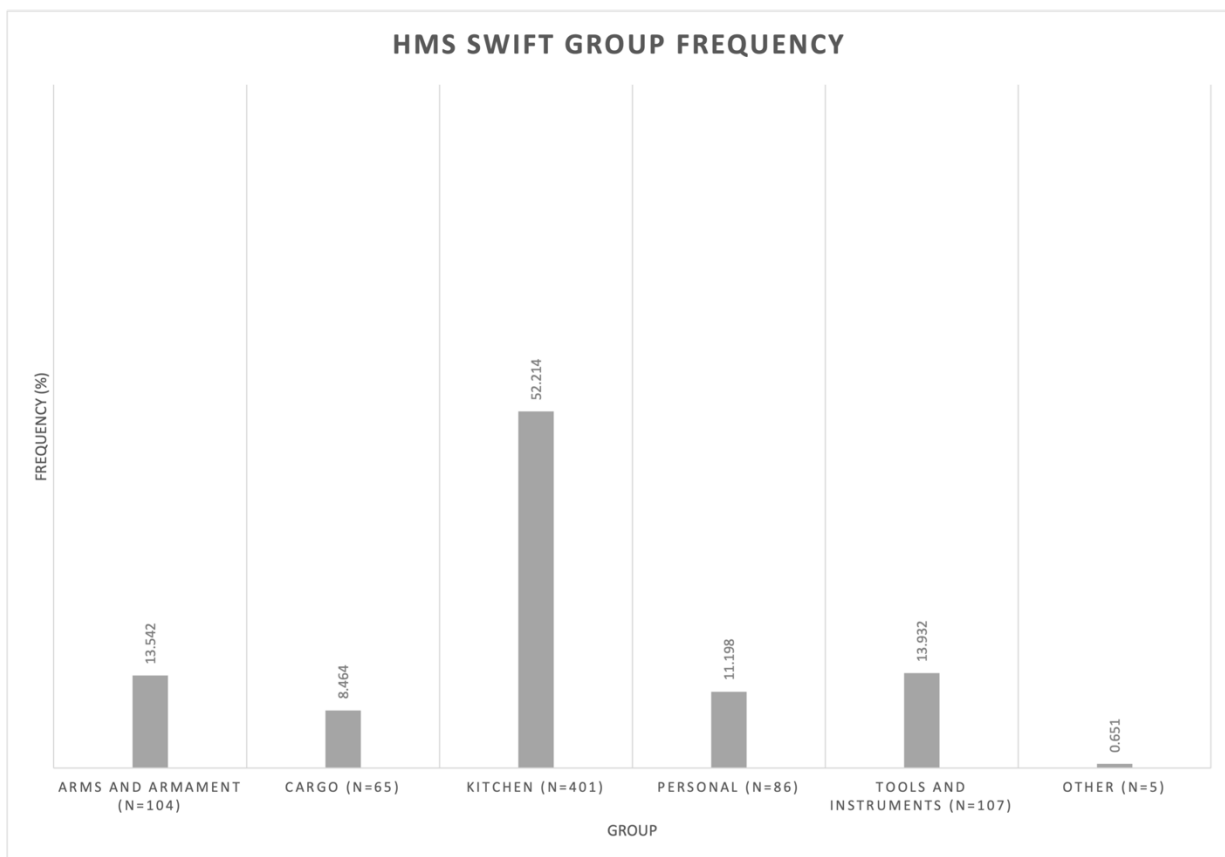


FIGURE 9. Group frequency distribution from HMS *Swift* assemblage (Figure by author, 2023).

While the small percentage of Arms and Armament may seem to contrast the known function of the vessel as Naval, the nature of the wrecking accounts for at least some of this discrepancy. As the vessel was lodged against a rock, the crew had removed some stores including gunpowder and small arms from the vessel to aid in dislodging the vessel. This action likely accounts for the relatively small percentage of Arms and Armament. As most of the crew survived the wrecking by launching auxiliary boats to shore, they were also likely to take some supplies with them (Elkin 2022:226). Luxury items related to food preparation and consumption would have been left, justifying the high percentage of the Kitchen group in this assemblage. With the excavation of the captain's cabin and officers' quarters, a significant amount of ceramics was documented, contributing to the high frequency of Tableware.

### *Betsy*

The greatest challenge with *Betsy* came in digitizing the extensive catalog of over 5,000 artifacts (Broadwater 1996). With the use of a scanning software, a PDF of the catalog from the 1996 report was digitized into an excel spreadsheet. The majority of the artifacts in the catalog were associated with a function, assisting in the categorization of the assemblage, however the entries have limited descriptions of each artifact and the report analyzes a small percentage of the thousands of artifacts. As the collection is housed at Virginia's Department of Historic Resources, the author was able to physically work with a large percentage of this collection, combining past research of the assemblage with personal interpretation. See Table 6 for a complete assemblage distribution of *Betsy*.

<b>Group</b>	<b>Class</b>	<b>Amount</b>	<b>Frequency within assemblage</b>	<b>Frequency within group</b>
<b>Arms and Armament</b>	Artillery	2	0.044	0.199
	Small Arms	25	0.55	2.483
	Ammunition	980	21.553	97.319
	Group Total	1007	22.146	100
<b>Cargo</b>	Storage	1552	34.132	100
	Storage Accessory	0	0	0
	Total	1552	34.132	100
<b>Kitchen</b>	Tableware	959	21.091	99.896
	Galley	1	0.022	0.104
	Total	960	21.113	100
<b>Personal</b>	Personal	3	0.066	1.145
	Clothing	180	3.959	68.702
	Toiletries	22	0.484	8.397
	Pastime/Recreation	57	1.254	21.756
	Group Total	262	5.762	100
<b>Tools and Instruments</b>	Ship Maintenance	22	0.484	2.91
	Furniture	714	15.703	94.444
	Navigation	16	0.352	2.116
	Writing	1	0.022	0.132
	Medical Supplies	1	0.022	0.132
	Fabric Working	1	0.022	0.132
	Measuring	1	0.022	0.132
	Group Total	756	16.626	100
<b>Other</b>	Military	8	0.176	80
	Commerce	2	0.044	20
	Group Total	10	0.22	100
<b>Total</b>		4547		

TABLE 6  
COMPLETE ASSEMBLAGE DISTRIBUTION FOR *BETSY* (Table by author, 2023).

Of the 5,037 artifacts listed in the catalog, 4,547 were used in this study. Arms and Armament made up 22.146% of the assemblage. Within the Arms and Armament group, Artillery is only .199% of the group, while Small Arms is 2.483%, and Ammunition is 97.319%. A large collection of shot attributes for the high number of ammunition artifacts. Cargo is the largest group, making up 34.132% of the assemblage. All the Cargo from the assemblage belongs under the Storage Class, which includes all Cooperage and Cooperage Accessories. Kitchen is 21.113% of the assemblage. Within the Kitchen group, Tableware makes up the majority with 99.896% of the group, with only one Galley item, a fragment of a ceramic pie pan. Personal makes up 5.762% of the assemblage, with 1.145% Personal items, 68.702% Clothing, 8.397% Toiletries, and 21.756% Pastime/Recreation. Tools and Instruments make up 16.626% of the assemblage, with 94.444% Furniture making up a significant portion of the group due to a variety of wood paneling, window fragments, and approximately a hundred pieces of a China cabinet, specially designed for seafaring. Of the other Tools and Instruments types, 2.91% is Ship Maintenance, 2.116% is Navigation, .132% each for Writing, Medical Supplies, Fabric Working, and Measuring with one artifact each. Finally, Other makes up .22% of the assemblage, with eight military regiment stamped buttons making up the Military Class and two coins making up the Commerce Class. Figure 10 breaks down the group distribution of *Betsy*.

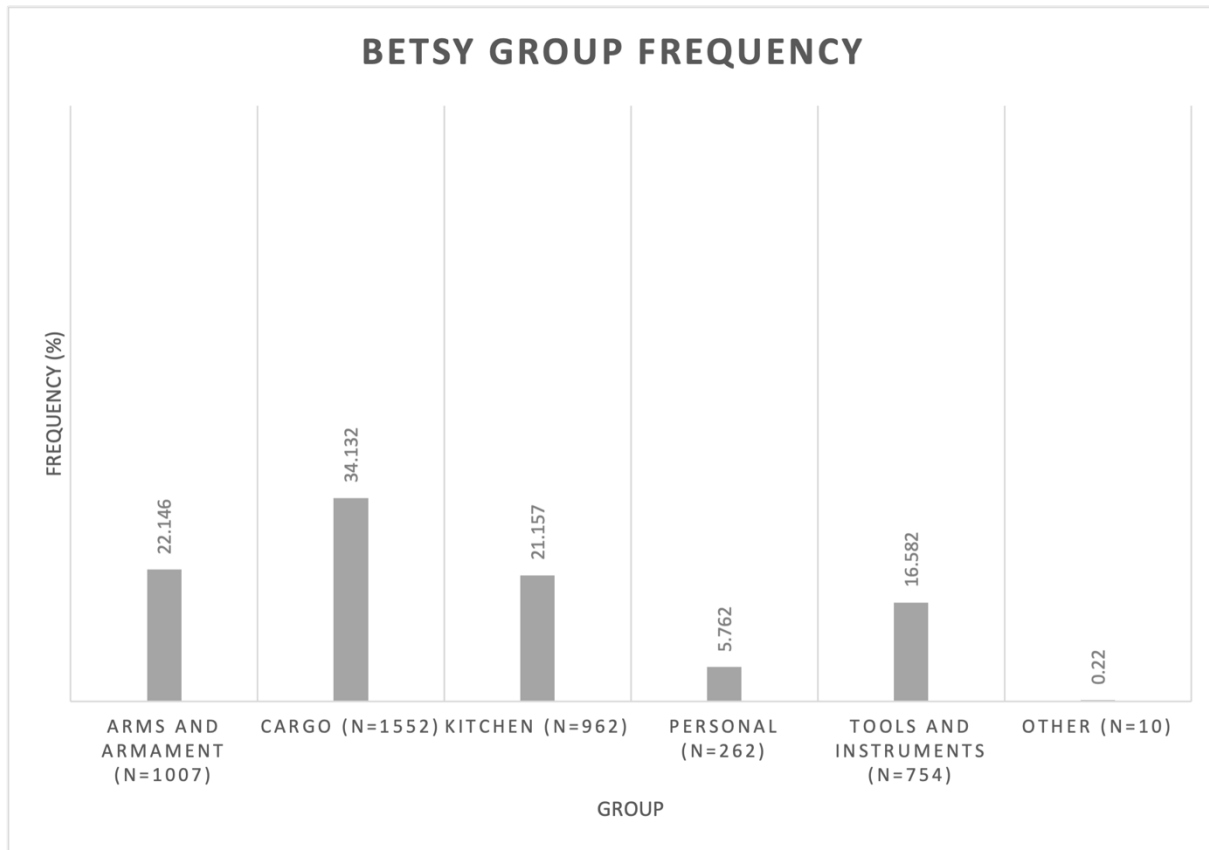


FIGURE 10. Group frequency distribution from *Betsy* assemblage (Figure by author, 2023).

*Betsy* presents one of the most applicable case studies for Site 1 due to their shared historical context and location in York River. Cargo having the highest frequency coincides with *Betsy*'s known function as a transport vessel. The relatively even distribution of all artifact groups is consistent with the vessel's mixed functions during the American War of Independence as a chartered victualler and short-term transport. In addition, while *Betsy* was scuttled and did not wreck like the other case studies, the circumstances of the Siege of Yorktown suggests that there was likely not much time or resources to remove the majority of materials off the vessel, as indicated by the wide variety of materials excavated, consistent with the amount of time that HMS *Invincible* had prior to its complete abandonment.

## General Carleton

While *General Carleton* was the only catalog that was not digitized, the catalog was incredibly well detailed, including extensive artifact descriptions with references to chapters of the report and often artifact illustrations (Ossowski 2008). The detailed catalog allowed for confidence in the categorization of the assemblage, once it had been digitized. Quantities were listed in the descriptions of some artifacts, making the official artifact count much higher than the assigned artifact identification labels may suggest. See Table 7 for a complete assemblage distribution of *General Carleton*.

Of the 1366 artifacts in the site's catalog, 1,163 of them were used in this study. Arms and Armament makes 9.458% of the assemblage, with 1.818% Artillery, 6.364% Small Arms, and 91.818% Ammunition. Cargo makes up only 1.548% of the assemblage, with all 18 artifacts pertaining to storage. Kitchen is 12.038% of the assemblage with 83.571% Tableware and 16.429% of materials pertaining to the Galley. Personal is the largest group frequency with 58.298% of the assemblage. Within Personal, Personal Items make up 1.77%, Clothing makes up 76.401%, Toiletries 7.817%, and Pastime/Recreation 14.012%. Tools and Instruments are 17.025% of the total assemblage. General Tools and Instruments make up 1.01% of the group, along with 28.788% Ship Maintenance, 21.212% Furniture, 12.626% Navigation, 2.02% Writing, 4.04% Medical Supplies, 27.273% Fabric Working, 2.02% Measuring, and 1.01% Musical Instruments. Finally, Other makes up 1.634% of the assemblage with 19 items related specifically to commerce and no military items. Figure 11 breaks down the group distribution of *General Carleton*.

<b>Group</b>	<b>Class</b>	<b>Amount</b>	<b>Frequency within assemblage</b>	<b>Frequency within group</b>
<b>Arms and Armament</b>	Artillery	2	0.172	1.818
	Small Arms	7	0.602	6.364
	Ammunition	101	8.684	91.818
	Total	110	9.458	100
<b>Cargo</b>	Storage	18	1.548	100
	Storage Accessory	0	0	0
	Total	18	1.548	100
<b>Kitchen</b>	Tableware	117	10.06	83.571
	Galley	23	1.978	16.429
	Total	140	12.038	100
<b>Personal</b>	Personal	12	1.032	1.77
	Clothing	518	44.54	76.401
	Accessory	0	0	0
	Toiletries	53	4.557	7.817
	Pastime/Recreation	95	8.169	14.012
	Total	678	58.298	100
<b>Tools and Instruments</b>	Tools and Instruments	2	0.172	1.01
	Ship Maintenance	57	4.901	28.788
	Furniture	42	3.611	21.212
	Navigation	25	2.15	12.626
	Writing	4	0.344	2.02
	Medical Supplies	8	0.688	4.04
	Fabric Working	54	4.643	27.273
	Measuring	4	0.344	2.02
	Musical Instrument	2	0.172	1.01
	Total	198	17.025	100
<b>Other</b>	Military	0	0	0
	Commerce	19	1.634	100
	Total	19	1.634	100
<b>Total</b>		1163		

TABLE 7  
COMPLETE ASSEMBLAGE DISTRIBUTION FOR *GENERAL CARLETON* (Table by author, 2023).



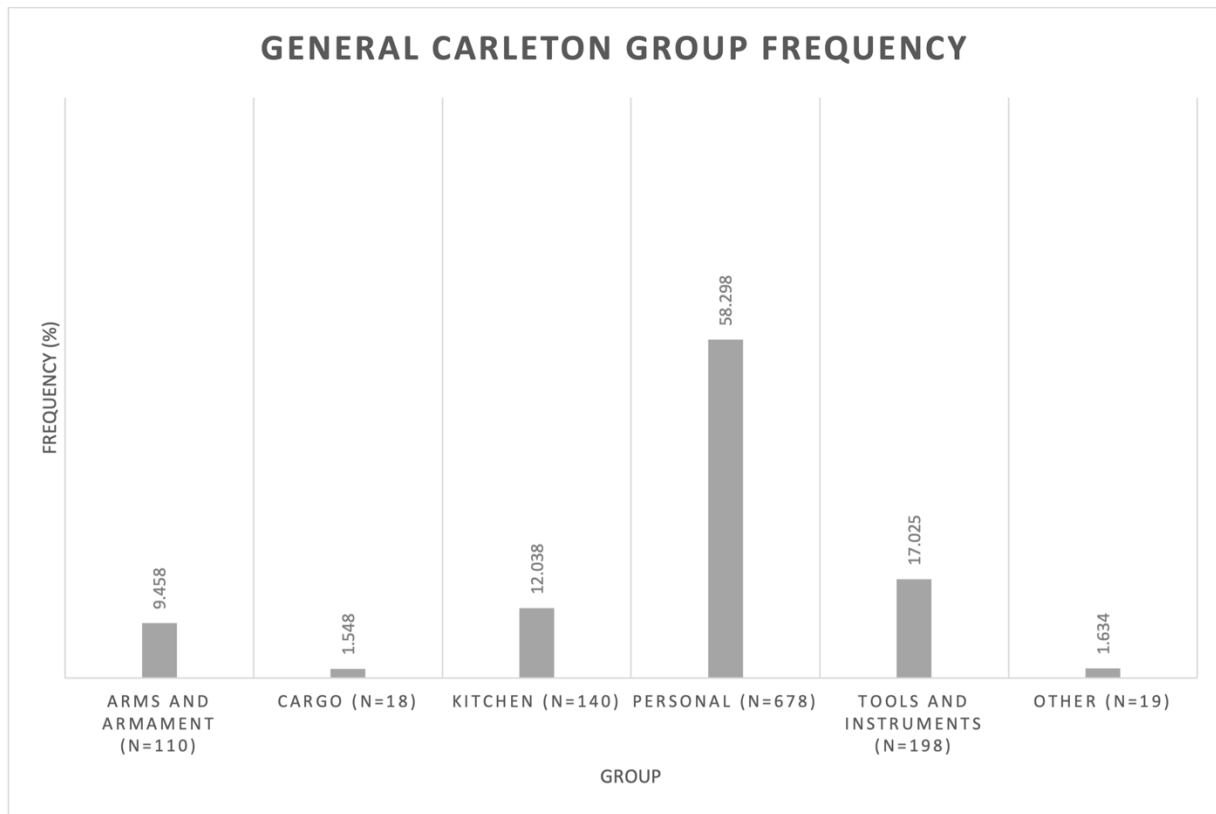


FIGURE 11. Group frequency distribution from *General Carleton* assemblage (Figure by author, 2023).

While a high frequency of cargo items would be expected for a merchant vessel, it is not unsurprising that this was not the case with *General Carleton*, considering *General Carleton* was transporting iron at the time of its wrecking (Baines 2010:1). The high frequency of personal artifacts appears to be another potential distinction of a merchant vessel compared to a naval vessel. The *General Carleton* wreck produced a notable amount of clothing items, many of them in relatively good condition, that would have been the responsibility of individuals. Another contributing factor to the amount of clothing is the geographical region in which the vessel was operating, the cold climate justifying the wool hats, stockings, and jackets identified. There were a number of chamber pots as well, that would not have been a standard for all men on a naval

vessel, suggesting a higher percentage of both clothing and toiletries may be expected on a merchant vessel (Elkin et al. 2007:50).

### Site 1 from York River

Creating the catalog for Site 1 was difficult because a comprehensive site-by-site catalog of the material salvage in the 1930s does not exist. There is very limited documentation of the work conducted in the 1930s, and a trip to the archives at the Mariners' Museum, responsible for salvaging the sites and home to many of the materials, did not produce a list of what material was pulled from each site. Luckily, John Sands, former director of the Mariners' Museum and author of *Yorktown's Captive Fleet* (1983), compiled and published a catalog of all of the known material pulled from York River that dates to the Battle of Yorktown as part of his master's thesis (Sands 1973). Sands organized the items by a hybrid categorization system that grouped some artifacts by material and others by function, with general provenience listed in the description of each entry.

By going through this catalog, a digital list of all of the material was compiled, with materials organized by site. Site 1, Site 2, and Site 3 were salvaged by the Mariners' Museum, and Site 5 was compiled from a variety of material salvage by a sport diver named Herndon Jenkins in 1968. Once the catalogs were digitized, the standard categorization method of this thesis was applied, producing the following statistics, with 227 of the 229 artifacts from Site 1 used. See Table 8 for a complete assemblage distribution of Site 1.

<b>Group</b>	<b>Class</b>	<b>Amount</b>	<b>Frequency within assemblage</b>	<b>Frequency within group</b>
<b>Arms and Armament</b>	Artillery	37	16.157	78.723
	Small Arms	1	0.437	2.128
	Ammunition	9	3.93	19.149
	Total	47	20.524	100
<b>Cargo</b>	Storage	11	4.803	100
	Storage Accessory	0	0	0
	Total	11	4.803	100
<b>Kitchen</b>	Tableware	124	54.148	100
	Galley	0	0	0
	Total	124	54.148	100
<b>Personal</b>	Personal	0	0	0
	Clothing	5	2.183	83.333
	Accessory	0	0	0
	Toiletries	1	0.437	16.667
	Pastime/Recreation	0	0	0
	Total	6	2.62	100
<b>Tools and Instruments</b>	Tools and Instruments	3	1.31	9.677
	Ship Maintenance	15	6.55	48.387
	Furniture	9	3.93	29.032
	Navigation	2	0.873	6.452
	Writing	0	0	0
	Medical Supplies	0	0	0
	Fabric Working	0	0	0
	Measuring	2	0.873	6.452
	Total	31	13.537	100
<b>Other</b>	Military	0	0	0
	Commerce	0	0	0
	Musical Instrument	0	0	0
	Other	10	4.367	100
	Total	10	4.367	100
<b>Total</b>		229	100	

TABLE 8  
COMPLETE ASSEMBLAGE DISTRIBUTION FOR SITE 1 (Table by author, 2023).

Arms and Armament makes up 20.524% of the assemblage, with 78.723% Artillery, 2.128% Small Arms, and 19.149% Ammunition. Cargo makes up 4.803% of the assemblage, all 11 artifacts belonging to the Storage Class. Kitchen is 54.148% of the assemblage, with all 124 artifacts pertaining to Tableware. Personal makes up 2.62% of the assemblage, with 83.333% Clothing, and 16.667% Toiletries. Tools and Instruments makes up 13.537% of the assemblage with 9.677% general Tools and Instruments, 48.387% Ship Maintenance, 29.032% Furniture, 6.452% Navigation, and 6.452% Measuring. Finally, Other makes up 4.367% of the assemblage with 10 tent pegs unassociated with any other group. Figure 12 breaks down the group distribution of Site 1.

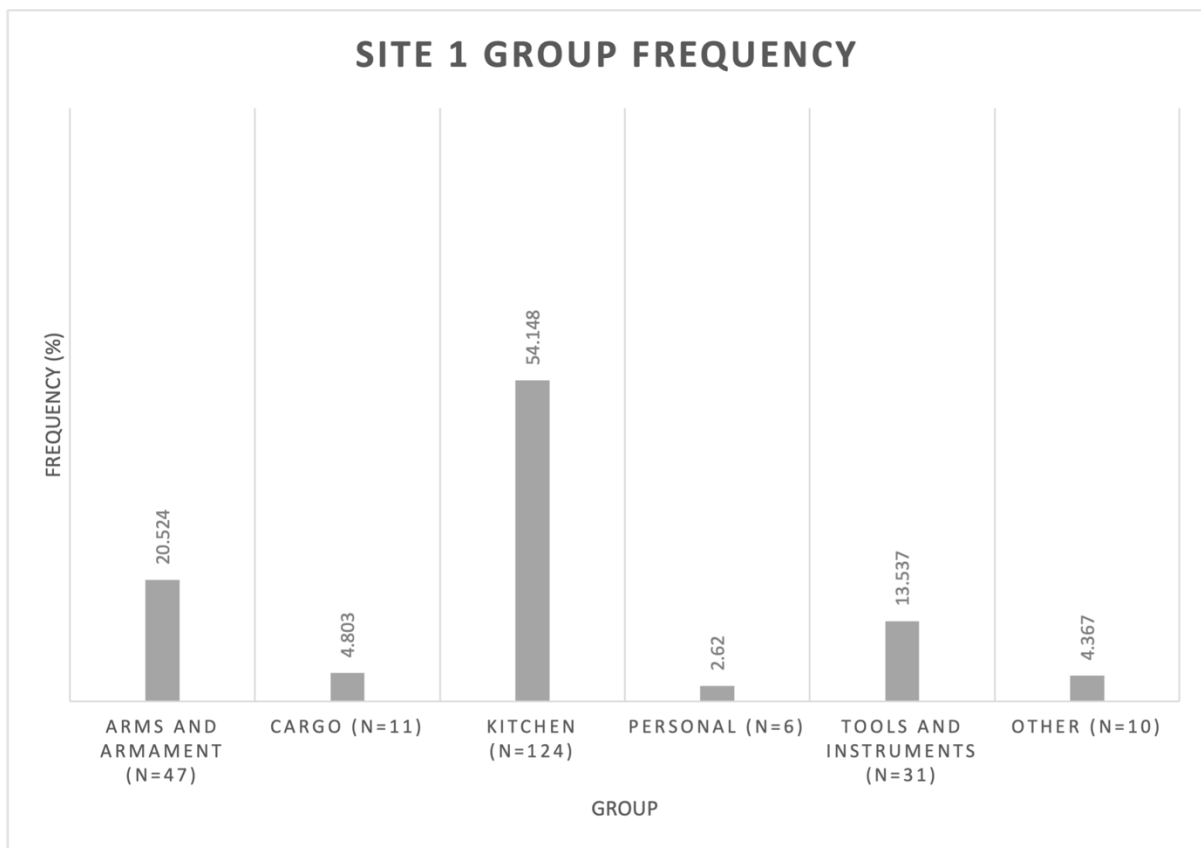


FIGURE 12. Group frequency distribution from Site 1 assemblage (Figure by author, 2023).

As this collection was compiled by a salvage operation in the 1930s, the modern standards of underwater archaeological research did not apply. There is no way of knowing the percentage of site excavated, nor the archaeological context of any of the material, other than the material comes from inside the vessel itself. Additionally, the collection of material is biased, as the intention of the operation was to find material for exhibit in the Mariners' Museum. Easily accessible and identifiable items such as wine bottles and cannons were evidently favored, contributing to a higher percentage of Arms and Armament and Kitchen materials as opposed to items that are less exciting or identifiable like Cargo and Tools and Instruments. With the previous four case studies and the compiled assemblage for Site 1, there are only limited conclusions that can be drawn about the identity of Site 1 due to the nature of its salvaging and the limited catalog that salvaging produced.

### *Conclusion*

The distribution of each case study presented some expected results as well as some unexpected, considering the historical and archaeological context of each assemblage. In the next chapter, these distributions and their contexts will be compared with one another, in order to ascertain whether there is the foundation of an artifact pattern that may indicate a discernable difference between the assemblages of naval and merchant vessels. If such a pattern does exist, the development of said pattern may offer some insight into the context of the Site 1 assemblage. However, it is important to note the limitations of any potential pattern due to the varying methods of excavation and documentation, as well as the geographical and historical contexts of each wreck site.

## Chapter Six: Discussions and Conclusions

### *Introduction*

There is no clear pattern between the naval and merchant vessel assemblages used in this case study, which limits any conclusions about the functions of Site 1. In addition, with the extent that Site 1 compares and contrasts all of the case studies with various group frequencies, it is evident that the salvaging of Site 1 produced an assemblage that is inconsistent with either vessel function. The variable role of a transport or victualler during the American War of Independence may produce a more complex artifact assemblage. However, in comparing Site 1 to *Betsy*, a known victualler and temporary transport during the war, it is evident that the discrepancies in Site 1's assemblage are due to differences in archaeological methodology rather than historical context.

In comparing the group frequencies, there are conclusions in the assemblages that present avenues for further research in artifact patterning. Arms and Armament and Cargo, though not presenting as distinct of a pattern as anticipated between merchant and naval vessels, did ultimately present some unique comparisons that warrant further research. In addition, the high frequency of Personal material culture from *General Carleton's* catalog presents another indicator of merchant activity that has not previously been considered.

### *Comparing the Data*

#### Arms and Armament

The expectation that a high frequency of Arms and Armament would indicate a naval function is not represented in this data. HMS *Invincible's* Arms and Armament group is 79.983% of HMS *Invincible's* total assemblage while the rest of the case studies' Arms and Armament frequencies are significantly lower, and do not align as expected with each vessel's known function. HMS *Swift* has only 13.542%, *Betsy* has 22.146%, and *General Carleton* has only

9.458%. The high percentage of Arms and Armament aboard HMS *Invincible* can largely be attributed to a high volume of ammunition with over 5,000 musket shot. Figure 13 compares the Arms and Armament group percentage of each case study.

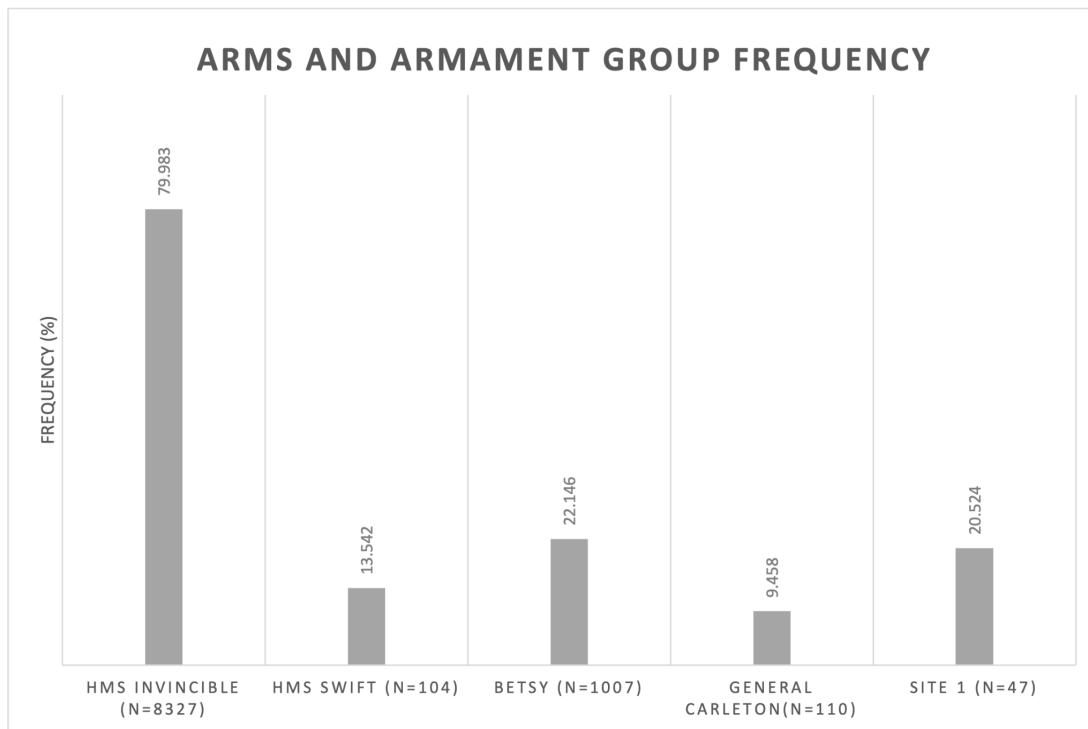


FIGURE 13. Arms and Armament group frequency of each case study (Figure by author, 2023).

While all four case studies have high percentages of Ammunition, there is a distinction in the frequency between naval and merchant vessels. HMS *Invincible*'s class distribution within the Arms and Armament group reflects the high volume of shot with 72.595% of the group being ammunition. HMS *Swift* has a similar distribution with 74.038% of the group being ammunition. Both *Betsy* and *General Carleton* have a higher frequency of ammunition with 97.139% and 91.818% respectively. A possible explanation for this is the type of arms the ammunition is compatible with. An overwhelming majority (97.03%) of *General Carleton*'s ammunition was identified as intended for small arms use. As each frequency is based on the count of individual artifacts, there would likely be a higher number of ammunition meant for small arms, as opposed for large guns, due to weight, size, and capacity to carry the material onboard. This would

suggest that small arms are more common on merchant vessels than naval vessels, based solely on the ammunition present. While there is a distinction in Ammunition, the same cannot be said for Artillery and Small Arms.

Artillery across the four case studies presented only a slight distinction between naval and merchant vessels. HMS *Invincible* has only 2.102% artillery-related materials within its Arms and Armament group. The small frequency can be attributed to the fact that HMS *Invincible* has no cannons in its artifact catalog. In the description of the wrecking process, there were four days of attempted ship recovery prior to abandonment in which many heavier materials, including guns, were removed (Bingeman 2010:19; Lavery 1988:104). In contrast, HMS *Swift* has the highest frequency of artillery at 25% of the Arms and Armament group, with 17 cannons which were all recovered during the early excavations of the site in the 1980s. *Betsy* has 0.199%, with no cannons, only cannon-related materials. Finally, *General Carleton* has 1.818% artillery also with only cannon-related materials. The consistent lack of cannons across the sites indicates that the lower percentage of artillery has more to do with the site formation processes of each wreck site than the function of the vessel. This observation limits the role that the artillery has in this artifact pattern.

Finally, the frequency of the Small Arms class within the Arms and Armament group shows no distinction between the naval and merchant case studies. A description of what is classified as a Small Arm can be found in chapter five. HMS *Invincible* has the highest frequency of Small Arms with 25.303%. This is followed by *General Carleton* at 6.364%, *Betsy* at 2.483% and finally HMS *Swift* at 0.962%. As aforementioned in the results discussion of HMS *Swift*, many of the small arms were either jettisoned from the vessel in an attempt to save it from wrecking, or taken by the men when the decision was made to abandon the vessel. The



conclusions drawn from comparing the Ammunition class of each case study may serve to mitigate the limitations of the Small Arms class. Similar to artillery, the lack of difference between the assemblages limits the role that the Small Arms class plays in the overall pattern.

Site 1's Arms and Armament frequency is consistent with the majority of the case studies, however the class distribution of Site 1 presents a stark contrast. Artillery makes up the majority of the group at 78.723%, with 10 cannons taken from the site. A low frequency of small arms is consistent. Site 1 is the only site with an Arms and Armament group that is not primarily ammunition. This is less representative of the vessel function, and more the salvaging approach taken to the site, in gathering larger, more convenient items for exhibits. From the limited similarities that can be identified across the case studies, the only conclusion that can be made about Site 1 is that the nature of its salvaging makes its class distribution of Arms and Armament not representative of merchant nor naval vessels. See Figure 14 for the full distribution of Arms and Armament class percentages across the five sites.

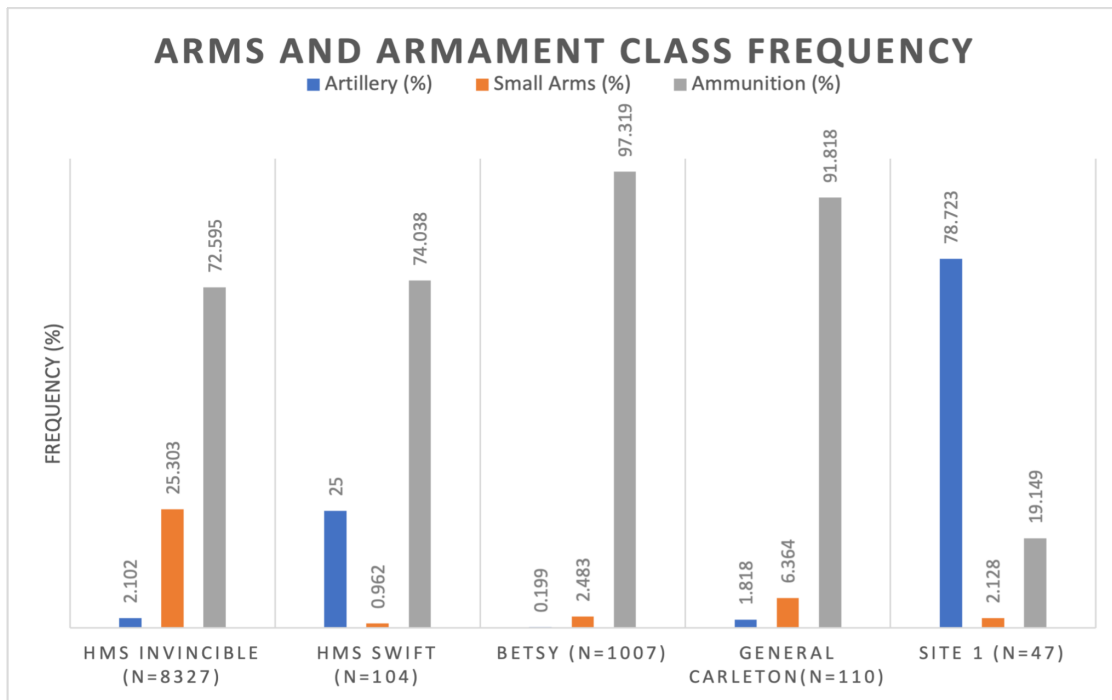


FIGURE 14. Arms and Armament class frequency of each case study (Figure by author, 2023).

## Cargo

There is no discernable difference in the frequency of Cargo between the naval and merchant vessels (see Figure 15). *Betsy* has the highest group frequency at 34.132%, followed by HMS *Swift* at 8.464%, HMS *Invincible* at 5.83%, and finally *General Carleton* with 1.548%. *Betsy* having the highest frequency of the four case studies is consistent with its role as a victualler during the war. *General Carleton* having the lowest frequency is possibly representative of the type of cargo that the vessel was transporting.

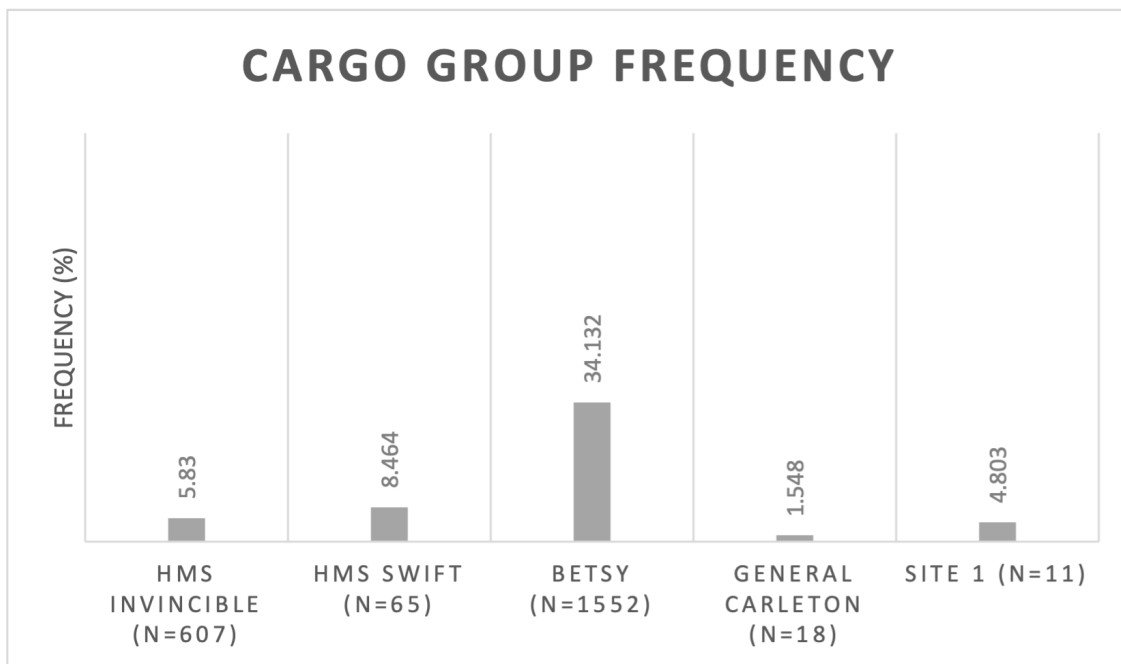


FIGURE 15. Cargo group frequency of each case study (Figure by author, 2023).

Only HMS *Swift* has any material that is classified as Storage Accessory or general Cargo. The rest of the material for the case studies falls under the class of storage, which includes cooerage, cooerage accessories, as well as other storage containers. For the naval vessels, HMS *Invincible*'s storage class is 35.372% cooerage and HMS *Swift*'s is 16.923% cooerage. *Betsy*'s storage class consists overwhelmingly of cooerage at 97.165% of the class. In contrast, *General Carleton* has only 4 cooerage artifacts, 22.222% of a class within a low frequency group. These results suggest that a high frequency of cargo, specifically cooerage, is

not indicative of merchant function, as initially expected. The Cargo group may be useful in a more specific analysis of the type of merchant vessel, based on the cargo transported and the nature of its storage. This is an avenue for further research.

Site 1 has a small percentage of Cargo, at only 4.803% of the assemblage, which is a frequency consistent with the majority of the case studies. Due to their shared historical and geopolitical context, it was expected that Site 1 and *Betsy* would be the most similar. However, they have the biggest range between their Cargo distributions, at around 30%. The high range value, considering the two site’s known similarities, suggests that the differences in Site 1 are more contingent upon the methods of excavation than the function and historical context of the vessel itself. See Figure 16 for the full distribution of Cargo class percentages across the five sites.

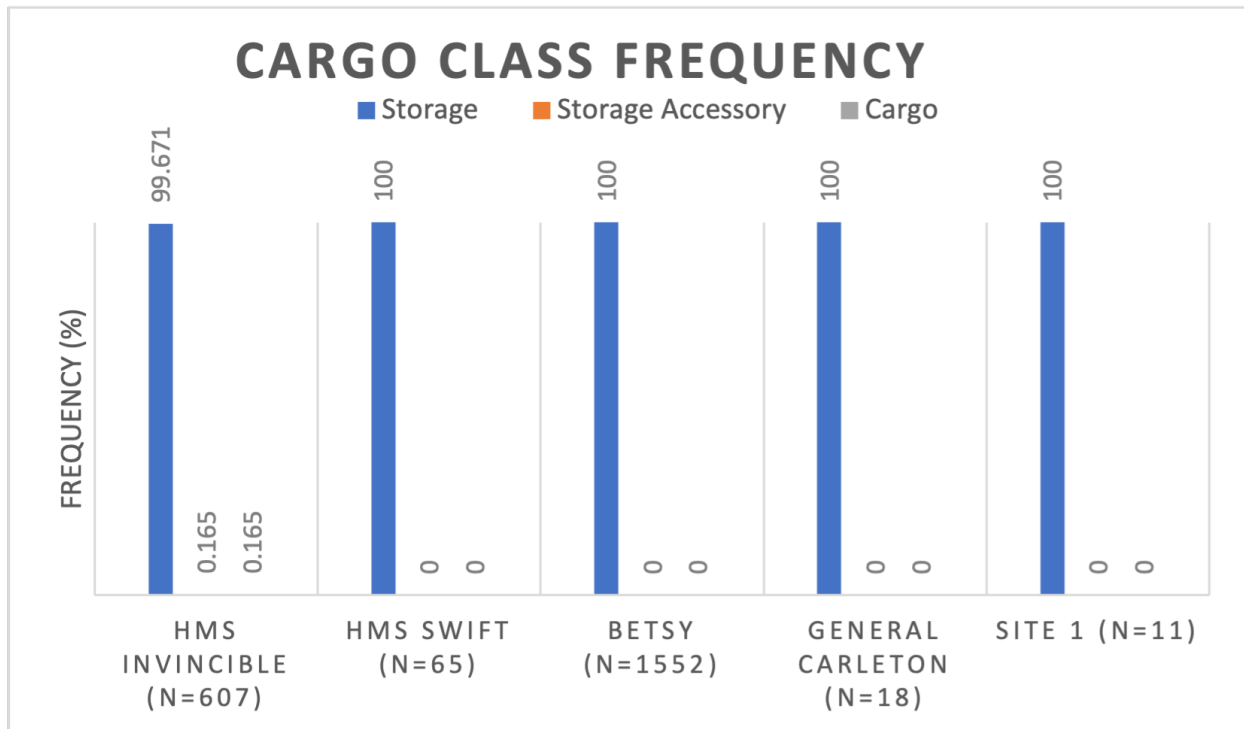


FIGURE 16. Cargo class frequency of each case study (Figure by author, 2023).

## Kitchen

The frequency of the Kitchen group varies greatly across the case studies, with no clear pattern (see Figure 17). HMS *Swift* has the highest frequency at 52.214%, followed by *Betsy* at 21.113%, *General Carleton* at 12.038%, and finally HMS *Invincible* at 3.102%. In all case studies, each group is overwhelmingly Tableware, with *Betsy* having the highest class frequency at 99.896%, followed by HMS *Invincible* at 96.285%, HMS *Swift* at 88.778%, and *General Carleton* at 83.571%. In contrast *General Carleton* has the highest percentage of Galley with 16.429%, followed by HMS *Swift* at 11.222%, HMS *Invincible* at 3.715%, and *Betsy* at 0.104%.

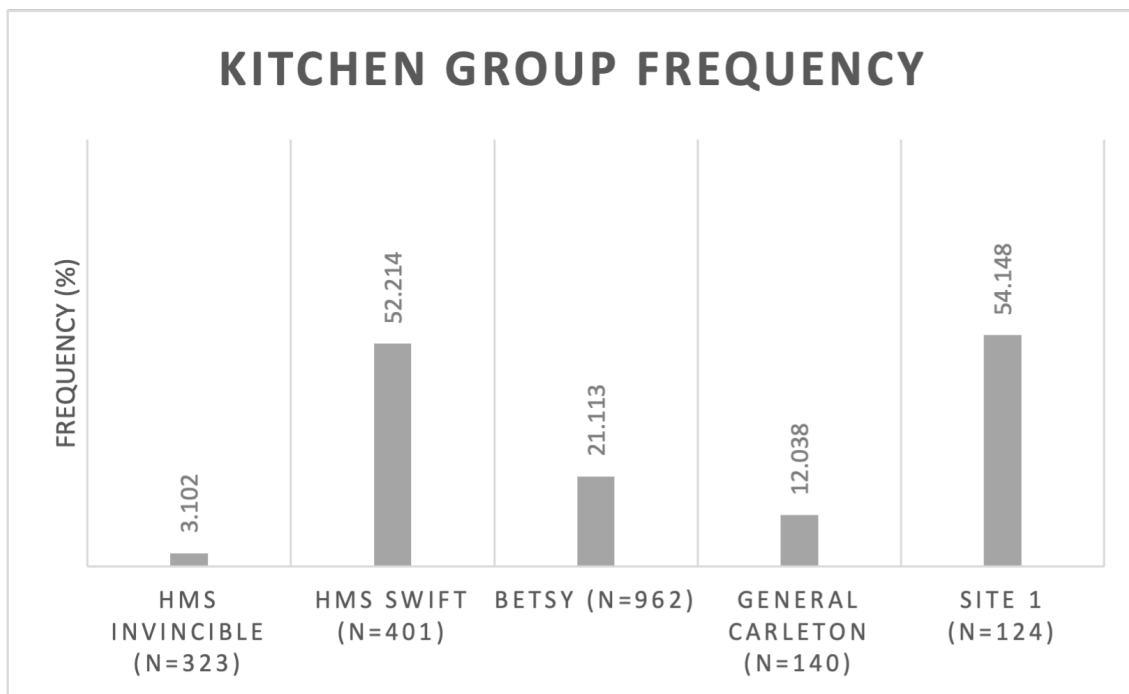


FIGURE 17. Kitchen group frequency of each case study (Figure by author, 2023).

Between the case studies with the highest Kitchen frequencies, HMS *Swift* and *Betsy*, both consist mostly of dishes and drinking vessels. For HMS *Swift*, the dishes and drinking vessels are largely complete and easily identifiable versus *Betsy*, which are mostly fragments. Site 1's Kitchen group frequency is comparable to HMS *Swift*, and is consistent with the other case studies with a high frequency of Tableware mostly made up of over 100 wine bottles.

However, the case studies lack any form of Kitchen pattern between the naval and merchant vessels. In addition, the class distribution within the Kitchen group of each case study is similar, regardless of the vessel's known function. These observations suggest that the Kitchen group is not an indicator of overall vessel function, limiting its use in adding context to Site 1. See Figure 18 for the full distribution of Kitchen class percentages across the five sites.

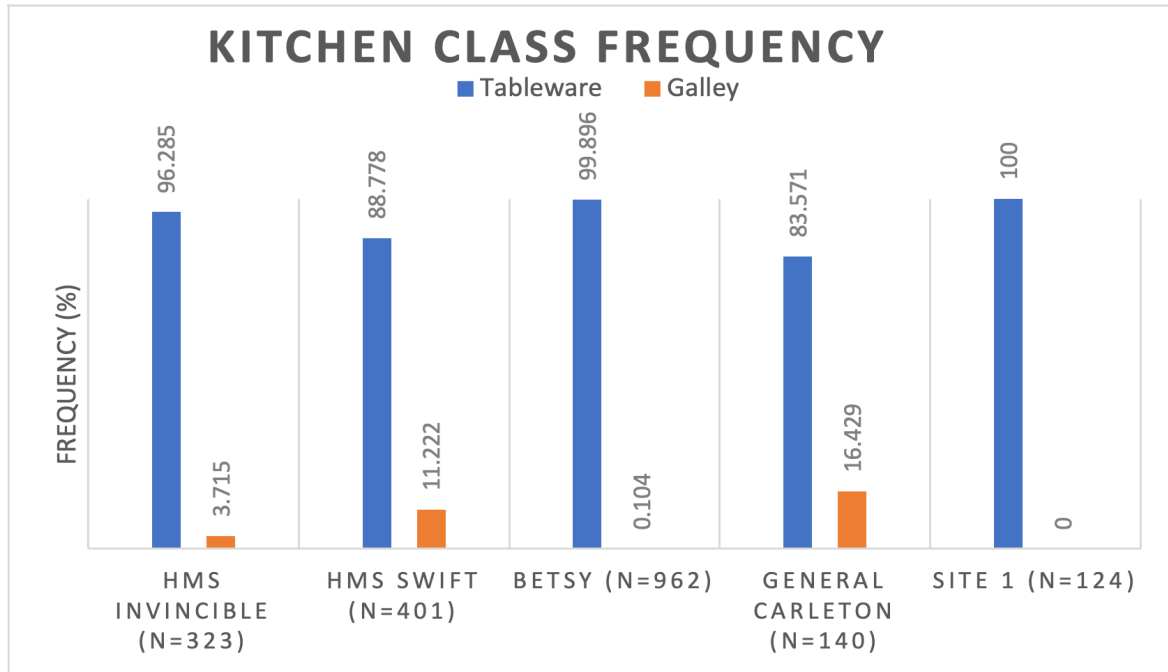


FIGURE 18. Kitchen class frequency of each case study (Figure by author, 2023).

### Personal

The Personal group presents a unique potential indicator of a merchant vessel, with a higher frequency suggesting merchant function (see Figure 19). *General Carleton* has a significantly higher frequency of the Personal group at 58.298% compared to the other case studies. *HMS Swift* follows at 11.198%, then *Betsy* at 5.762%, and finally *HMS Invincible* at 3.708%. The high frequency of personal items on *General Carleton* can be attributed to the fact that the men on board would not have received the standard issued material as the men would on a naval vessel, but rather equip themselves personally for the voyage (Elkin et al. 2007:50).

While *Betsy* was chartered, its crew would have consisted of the same sailors as on a merchant

vessel (Syrett 1970:114). However, as *Betsy* was scuttled under siege, the majority of these personal items were likely removed from the vessel prior to its sinking. In addition, many of these personal items have likely been removed in the salvaging that occurred throughout the centuries following the wrecking. More of these factors are discussed in the section “Variables Affecting Data Reliability.”

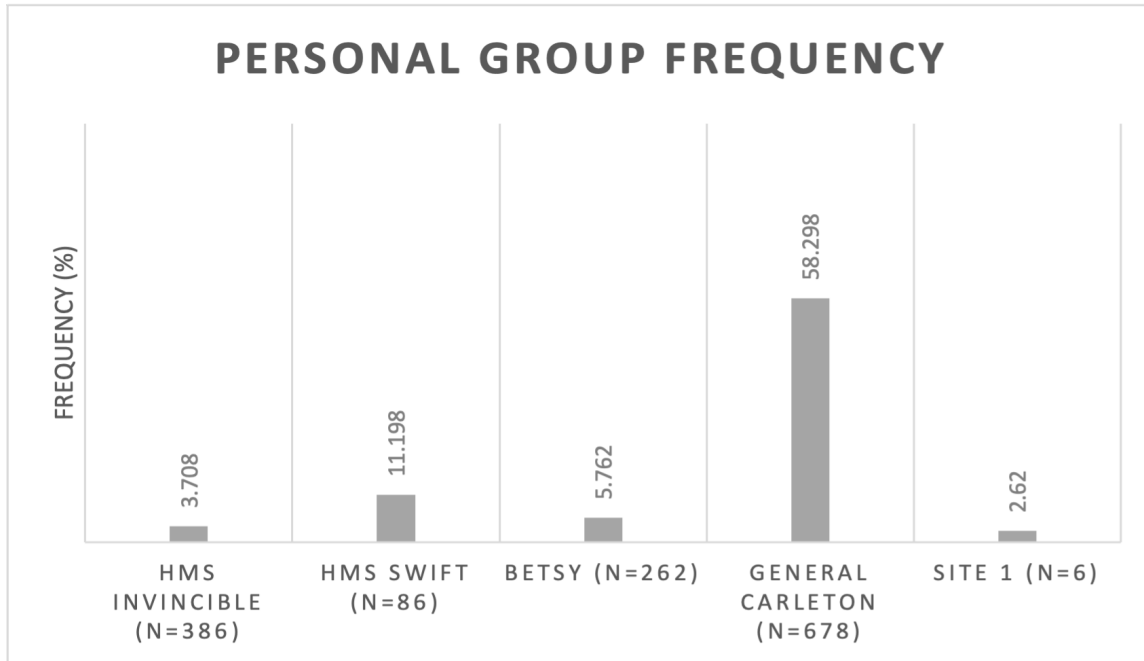


FIGURE 19. Personal group frequency of each case study (Figure by author, 2023).

Within the group, there only appears to be a pattern among Pastime/Recreation items, with merchant vessels having a higher frequency than naval. *Betsy* has the highest frequency of Pastime/Recreation at 21.756% of the group, followed by *General Carleton* at 14.012%. *Betsy* has a high percentage of tobacco-related materials making up 97.772% of the Pastime/Recreation class, whereas *General Carleton* has some tobacco-related material but is made up of more general pastime/recreation items such as books and book fragments, as well as game pieces. In contrast, both the naval vessels have a Pastime/Recreation frequency around 3%. Clothing is consistently the highest class across all four case studies. *HMS Invincible* has the highest percentage of clothing at 93.523%, followed by *HMS Swift* at 84.884%, *General Carleton* at

76.401%, and *Betsy* with the least at 68.702%. The next highest class frequency across the case studies is Toiletries, with *HMS Swift* having the most at 10.465%, followed by *Betsy* at 8.397%, *General Carleton* at 7.817% and *HMS Invincible* at 2.591%. Lastly are Accessories and other general Personal items that make up less than one percent of each case study.

Site 1’s low Personal group frequency is consistent with the majority of the case studies. Within the Personal group, Site 1 only has materials that can be categorized as clothing and toiletries. Clothing makes up 83.333% of the group with 5 shoes; a high clothing frequency is common across all of the case studies. Toiletries make up the other 16.667% consisting of a singular chamber pot. The limited total number of artifacts in this group, combined with the lack of a discernible pattern from the case studies, limits any conclusions for Site 1 based on the Personal group. See Figure 20 for the full distribution of Personal class percentages across the five sites.

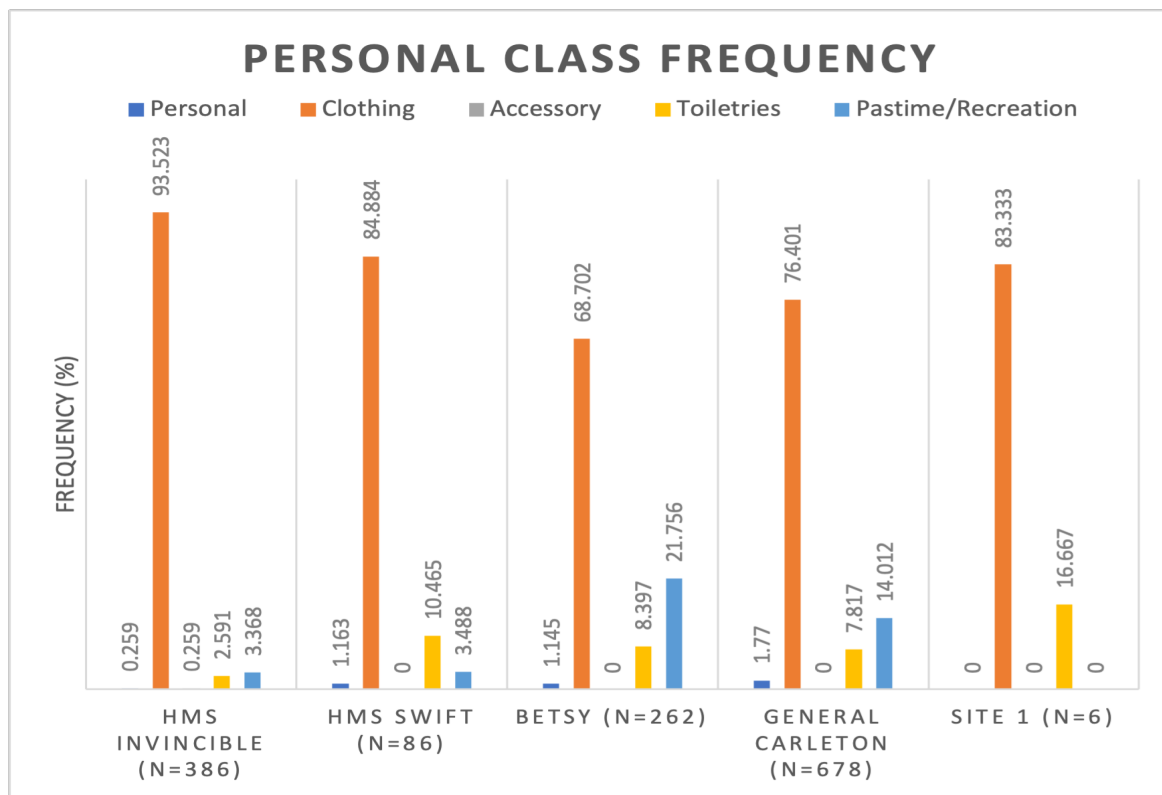


FIGURE 20. Personal class frequency of each case study (Figure by author, 2023).

## Tools and Instruments

The frequency of Tools and Instruments across the four case studies is relatively consistent (see Figure 21). The range between the frequencies is only 10%, the smallest range of all the group frequencies across the case studies. *General Carleton* has the highest percentage at 17.025%, followed by *Betsy* at 16.626%, *HMS Swift* at 13.932%, and finally *HMS Invincible* at 7.108%. However, the more important distinction comes in comparing the classes of each case study within the Tools and Instruments group, as there is much more variation.

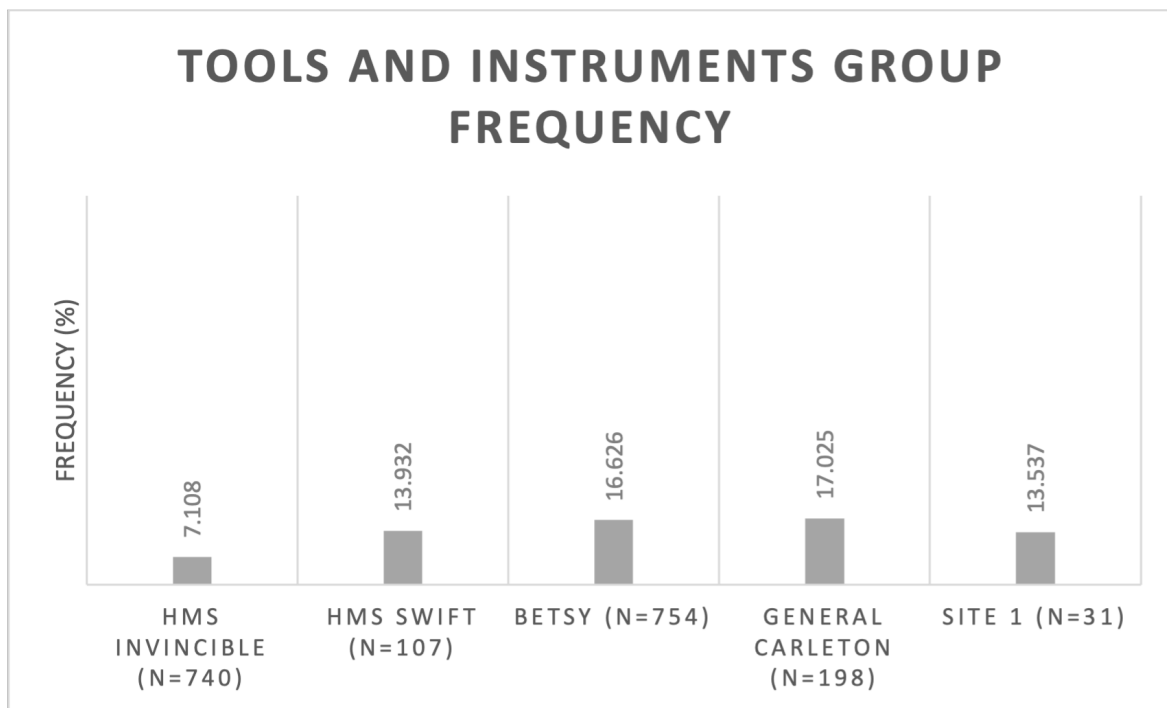


FIGURE 21. Tools and Instruments group frequency of each case study (Figure by author, 2023).

There are limited consistencies amongst the class frequencies within the Tools and Instruments group. Furniture is the most frequent class across the four case studies. *Betsy* has the most furniture at 94.444% of its Tools and Instruments group. This is due to the amount of individual pieces attributed to a china cabinet, as well as a high volume of plate glass. Next is *HMS Swift* with 51.402% furniture, followed by *HMS Invincible* with 29.595%, and finally *General Carleton* with 21.212%. Both *General Carleton* and *HMS Swift* have around 28% of the



group being general Tools and Instruments, however this is the extent of similarities. *General Carleton* is unique in that all of the group are relatively evenly distributed across the classes. While *HMS Invincible* has a uniquely high percentage of Ship Maintenance. Site 1's group distribution is similar to the other case studies. Both Site 1 and *Betsy* have the least variability in classes of Tools and Instruments, however Site 1 has the highest class frequency of general Tools and Instruments of all the case studies, however Site 1 has the highest class frequency of general Tools and Instruments of all the case studies, and *Betsy* has the lowest with a range of a little over 48%. The consistent frequencies of the Tools and Instruments group across the five sites, along with the lack of pattern of the group's classes, indicates that this category does not serve to indicate any larger vessel function. See Figure 22 for the full distribution of Kitchen class percentages across the five sites.

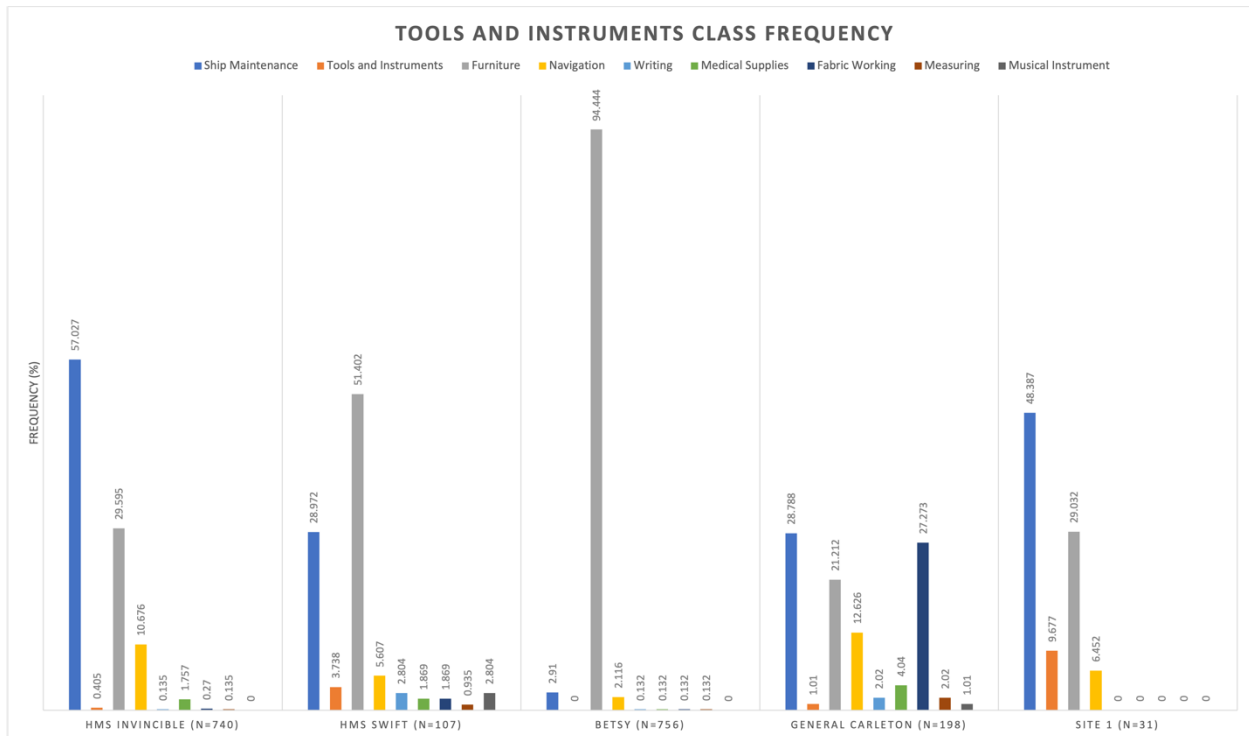


FIGURE 22. Tools and Instruments class frequency of each case study (Figure by author, 2023).

## Other

As described in the previous chapter, Other consists of materials that were extrapolated from the previous categories due to their clear identifiable quality as either a military or commerce-related item. The frequency of Other for the four case studies has a range of less than 1%. The individual classes appear to indicate function based not on the frequency of the classes, but rather a question of presence or no presence of each class (see Figure 23). HMS *Invincible* has 100% military, consisting of regimentally-stamped military buttons. *General Carleton* has 100% commerce, consisting of a variety of commerce-related documents, wallets, and currency. *Betsy* is the only case study with a mixture, 80% military and 20% commerce, which may be another material culture indicator of its function as a chartered merchant vessel during a time of war. The only inconsistency in the pattern is HMS *Swift* which contained 100% commerce items, all currency. HMS *Swift* limits the possibility that a presence of military or commerce items may indicate the overall function of the vessel, however this presents another avenue for further research using a higher volume of case studies.

Site 1 has a unique item in the Other category which consists of a collection of ten tent pegs; these pegs do not fit within the classes of military or commerce. The tent pegs were likely surplus, and deemed unnecessary prior to the scuttling or wrecking of the vessel in York River. With no material in the Other group categorized as Military or Commerce, the Other group does not serve to indicate anything about Site 1's overall function. See Figure 24 for the full distribution of the Other class percentages across the five sites.

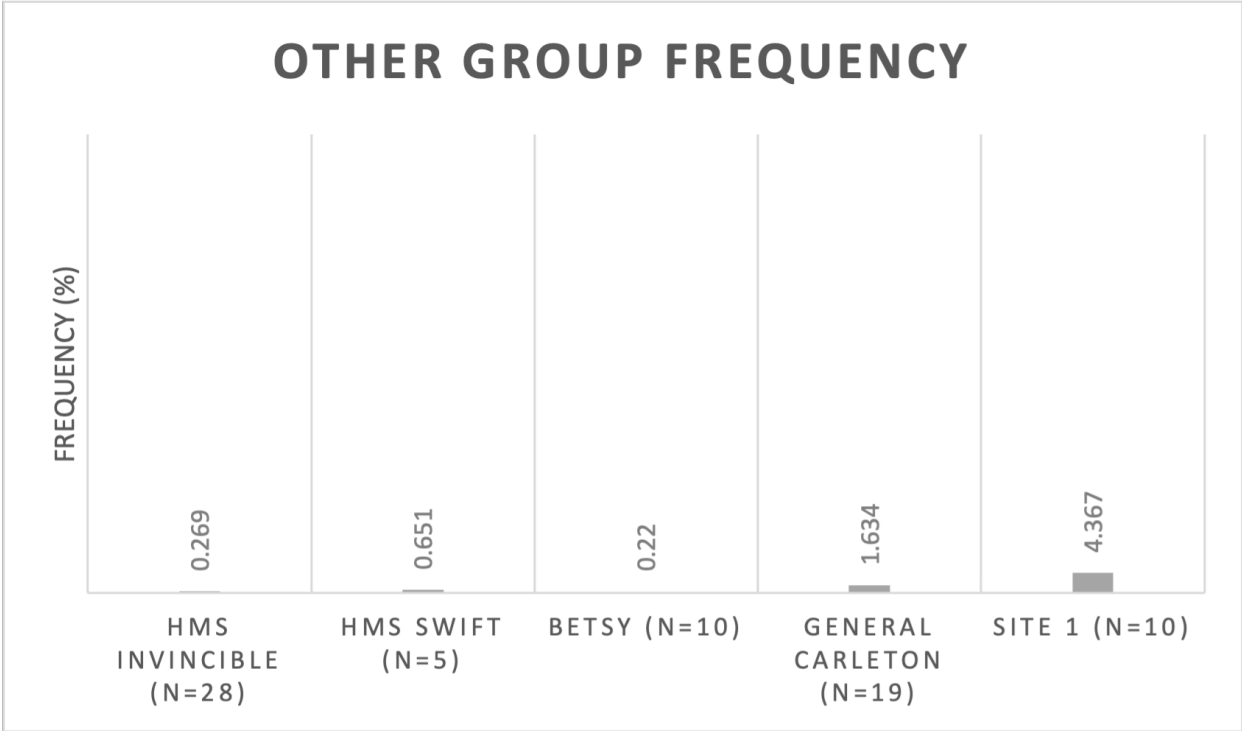


FIGURE 23. Other group frequency of each case study (Figure by author, 2023).

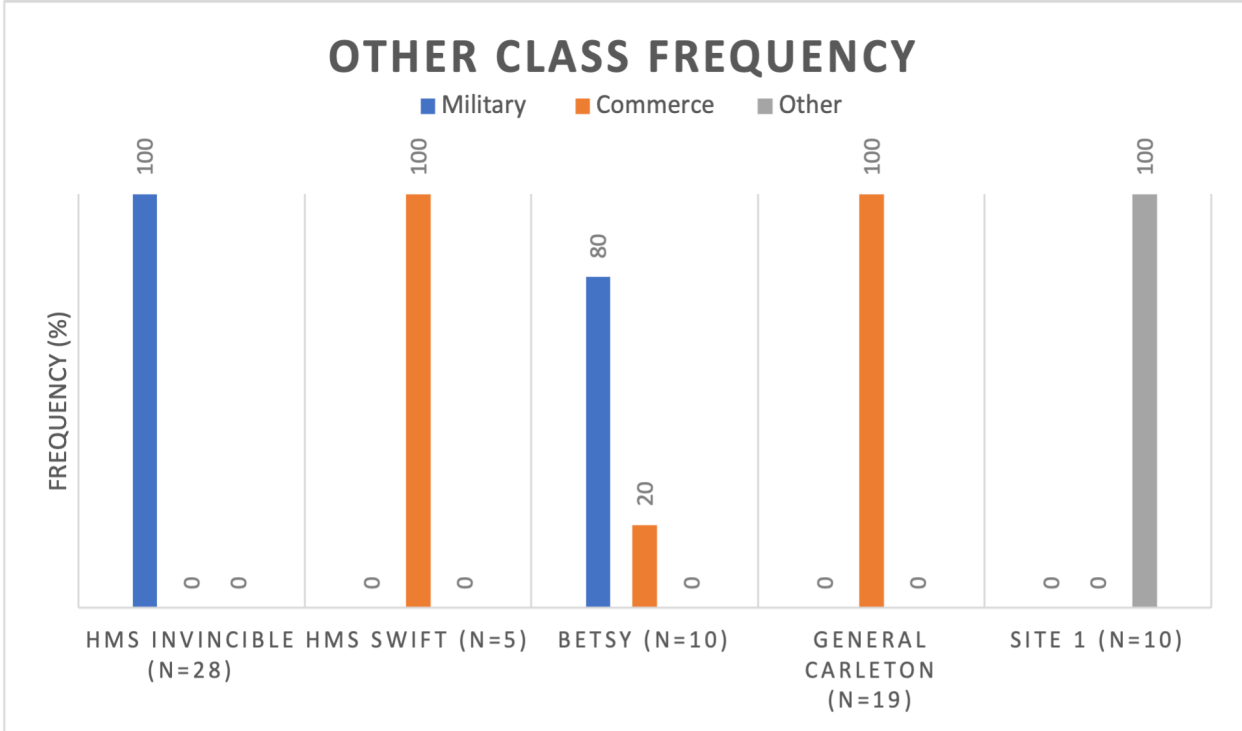


FIGURE 24. Other class frequency of each case study (Figure by author, 2023).

### *Variables Affecting Data Reliability*

Artifact patterning has been tested and validated in terrestrial settings, however its application to maritime sites is less prevalent. While early work by Johnson and Skowronek (1986) indicates the feasibility of applying this method to a variety of case studies with varying contexts, the extent to which this methodology can be applied is unknown.

The methodology and results presented in this chapter represent only the very beginning work in the application of artifact patterning to 18th century British naval and merchant archaeology wreck sites. A much greater number of sites would need to be applied and compared in order to strengthen the claims and observations made here. Unfortunately, there are not that many that exist, particularly with enough material excavated and cataloged to justify comparisons with the case studies analyzed in this thesis. In addition, each site is subject to a variety of site formation processes that must also be taken into consideration when making comparisons between the sites.

### Site Formation Processes

When considering the site formation processes of an archaeological site, there are two prominent avenues of thought. As previously discussed in the theory chapter of this thesis, Muckelroy takes a very maritime-centered approach to evaluating the site formation processes of a site, but focuses more on the natural factors that influence a site. In contrast, Schiffer considers the cultural and natural site formation processes of a site more equally. These cultural factors are equally important in considering the site formation processes of these case studies, as the geopolitical and historical backgrounds of each case study are the determining factor in the selection of each case study for this pattern.

The first site formation process is the wrecking event itself, and the circumstances of wrecking vary across the case studies. This process falls under Schiffer's evaluation of an

abandoned site, which considers that some material may be removed from the site prior to abandonment (Schiffer 1972:160). HMS *Invincible* wrecked, and over the course of four days attempts were made to rescue the vessel, which included the removal of a lot of material (Lavery 1988:104; Bingeman 2010:19). HMS *Swift* was similar but over a shorter period of time, with documented removal of smaller material, such as small arms (Elkin et al. 2007:34). *General Carleton* had the shortest period of time prior to it wrecking during a storm, which would suggest a limited amount of material taken from the vessel. *Betsy* presents a unique case because the vessel was intentionally scuttled, however by the extent of remaining material onboard, it is likely that the vessel did not have an extensive amount of time prior to its scuttling. As mentioned in the group comparisons above, there are some infrequencies in the data that may be attributed to these circumstances, and therefore should be considered in any artifact pattern.

After the wreck itself, the environment of the wreck can have a variety of influences on the preservation and placement of the wreck and its materials. These factors, which Muckelroy calls Extracting Filters and Scrambling Devices, are his primary site formation processes (Muckelroy 1978:165). Within Extracting Filters, Muckelroy includes salvaging as well as the disintegration of perishables due to the natural environment. With underwater sites, organic material is less likely to survive. However, in the case of *General Carleton*, paper as well as other organic material such as clothing were found, and can likely be attributed to the cargo of tar the vessel was carrying, spilling over the material during the wrecking process and preserving it (Baines 2010:14). Work on the wreck was hampered due to the shifting sands reburying the wreck, which also may have contributed to the wreck's overall preservation. Both *Betsy* and HMS *Swift* have similar burial environments in sediments which are conducive to preservation (Broadwater 1992:36; Elkin et al. 2007: 35). HMS *Invincible* was lodged in a fluctuating sandy-

bottom environment, and it was noted later on in the project that the wreck was susceptible to “gribble worm attack” and erosion due to the dredging of ballast occurring east of the site that possibly contributed to a drop in sea level (Bingeman 2010:47).

In addition to the preservation of material on the site, the wrecking environment can also factor into the site’s susceptibility for salvaging. The York River has a long, documented history of salvaging that dates to after the battle itself, with the French salvaging the wrecks as well as the people of Yorktown pulling material from the river in an attempt to rebuild after the battle was over. The location of Site 1 and *Betsy*, just along the river bank, makes them easily accessible for salvaging. HMS *Invincible* was also subject to interference with a number of documented instances of fishermen pulling up material from the site with their fishing trawlers (Bingeman 2010:22). These accidental discoveries ultimately contributed to the rediscovery of the vessel, however there is likely more undocumented salvaging that has occurred and influenced the material found onsite. The sport divers who initially rediscovered HMS *Swift* salvaged some material from the wreck and put them in a local museum. Considering that the wreck location was known by local sport divers in 1982, it is likely the site was subject to more salvaging prior to the government-sanctioned work on the site in 1983 to 1985, and before the PROAS project began in 1995. Less is known about the salvaging history of *General Carleton*, however the wreck’s shallow coastal location suggests it may have been a possibility. The challenge with salvaging is that there are usually more undocumented instances of it than documented, particularly for wrecks in shallow environments.

#### Variability in Archaeological Methodology

This thesis takes a step beyond site formation processes in looking at assemblages produced from excavations, and must consider the archaeological work itself as another cultural

transformation of the material from the site. Let alone did each case study vary in its wrecking environment, the wreck location and the nationality of the archaeologists working on the site also varied. While all British wrecks, each case study was conducted in and by a different country, the U.S., Great Britain, Argentina, and Poland. The time period for each archaeological project varies, with *Betsy* being the earliest in the 1970s, and HMS *Swift* being the most recent, with work on the site running through the 2000s. In addition, the artifact assemblage produced from each excavation varies from HMS *Swift* with the smallest at 830 artifacts and HMS *Invincible* with the largest at 10,664. The varying size of each assemblage can be attributed to a variety of factors including the extent of funding and time the team had to work on the site, as well as the methods of excavation used. For example, HMS *Swift* conducted excavation sampling from the bow, midships, and stern sections of the wreck site. Which varies from HMS *Invincible* and *Betsy* where the archaeologists aimed at completing full excavations that produced significantly larger assemblages. Excavations of *General Carleton* began as full excavation, although the shifting sands on the site limited the amount of excavation in later seasons.

A high volume of assemblages may serve to overcome some of the aforementioned variables. It was anticipated that the high volume of each assemblage used as a case study may overcome some of these variables and present a pattern, however this was not the case. Rather, a larger volume of case studies, with more consistent assemblage sizes, would be more likely to overcome the variables discussed here. Assemblages produced from the same functional sections of a vessel may also produce a more consistent pattern, when full excavation is not a possibility. An example of an excavation of specific functional areas is that of HMS *Swift*, with the excavation of the officers' quarters and captain's cabin likely contributing to the high percentages of Tableware (Dellino-Musgrave 2006:43; Underwood 2012:157). In contrast, the

excavation of HMS *Pandora*, having wrecked on the Great Barrier Reef in 1791 and rediscovered in the 1977, had the intention of producing an assemblage representative of the life of an average sailor onboard an 18<sup>th</sup> century British naval vessel (Forrest 2001:48-49). There is discussion as to whether project director Peter Gesner achieved the intended representative assemblage, highlighting the additional subjective challenges associated with a functional sampling methodology (Forrest 2001). Ultimately, there are not that many case studies that fit within the political and historical context of this thesis that have produced accessible artifact catalogs from either full excavation or functionally comparably sampled excavation. This is a challenge that can only be overcome by more intentional excavation for patterning.

#### *Avenues for Further Research and Conclusions*

As there is not much evidence of a discernable pattern among the four case studies, limited conclusions about the function of Site 1 can be drawn. However, there are some individual discoveries in the comparative data of the case studies that may be avenues for further research. Both Arms and Armament and Cargo, while not producing the patterns expected, present potential archaeological characteristics of naval and merchant vessels. In addition, the Personal group presented an unanticipated characteristic of merchant vessels that warrants further investigation.

While the frequency of Arms and Armament for each case study does not produce a pattern between the naval and merchant vessels, the Ammunition class within the Arms and Armament group does, with merchant vessels having a higher frequency of Ammunition than naval vessels. This might be indicative of there being a higher frequency of Small Arms on merchant vessels, as more ammunition for small arms can be carried than ammunition for artillery. Analyzing the frequency of each type of ammunition is important because small arms



do not have as high of a frequency or evidence of a pattern among the case studies. As is documented in the case of HMS *Swift*, in the midst of a wrecking, Small Arms are likely the material taken during the abandonment process, and therefore would not have as much prevalence in the archaeological record as the ammunition. Further analysis of ammunition patterning between merchant and naval vessels may make up for this lack of evidence of small arms.

Only *Betsy* had a high frequency of Cargo material, particularly cooperage. In comparing *Betsy* to *General Carleton*, the type of cargo the merchant vessel carried determines the amount of cargo materials used. While *General Carleton* was transporting barrels of tar at the time of its wrecking, it was also transporting iron, which is not stored in cooperage (Airaksinen 1996:116; Evans et al. 2002:643; Ossowski 2008:90). This may account for the lower frequency in the percentage of cooperage material. Therefore, cooperage is not as indicative of merchant function as initially expected, but the extent to which the frequency of cooperage may indicate the type of cargo the merchant was transporting is another avenue for further research.

Finally, the Personal category presents another potential indicator of a merchant vessel. *General Carleton* has a significantly higher frequency of personal items compared to the naval vessels. The common sailor onboard a naval vessel would not have as many personal items, such as clothing and toiletries, as on a merchant vessel, due to space and status (Elkin et al. 2007:50). Therefore, a higher frequency of personal items may be another indicator of a merchant vessel. While *Betsy* does not have as high of a frequency of personal material as *General Carleton*, this is likely due to the process of abandonment which would allow for more personal material to be removed prior to abandonment. Further analysis of assemblages from merchant wreck sites

would be needed in order to ascertain whether this is part of a larger pattern of merchant vessels, or unique to *General Carleton*.

Ultimately, the comparisons in the data serve to indicate that the salvaging of Site 1 failed to produce a collection representative of either a naval or a merchant vessel. This is to suggest that this ex situ salvaged assemblage has an extremely limited capacity for being incorporated into a larger historical and archaeological context, beyond its current use in museums as a general artifact example. Whether a system of artifact patterning can establish discernable archaeological signatures in 18th century British merchant and naval vessel collections is contingent upon a wider pool of case studies being available. Further research and testing can determine what variables contributed to this lack of pattern, and whether they may be overcome to produce a discernible pattern for 18th century British naval and merchant wreck sites in the future.

## References

Airaksinen, Mikko

1996 Tar Production in Colonial North America. *Environment and History* 2(1):115-125.

Baines, Stephen

2010 *The Yorkshire Mary Rose: The Ship General Carleton of Whitby*. Blackthorn Press, Pickering, UK.

Balderston, Marion and David Syrett (editors)

1975 *The Lost War: Letters from British Officers during the American Revolution*. Horizon Press, New York.

Bastida, Ricardo, Dolores Elkin, Mónica Grosso, M. Trassens, and J.P. Martin

2004 The British sloop of war HMS *Swift* (1770): a case study of the effects of biodeterioration on the underwater cultural heritage of Patagonia. *Corrosion Reviews, Special Issue: Biodeterioration of Cultural Heritage* 22.5(6):417–40.

Bauman, Sebastian, and Robert Scot

1782 To His Excellency Genl. Washington, Commander in Chief of the armies of the United States of America, this plan of the investment of York and Gloucester has been surveyed and laid down. Philadelphia. <<https://www.loc.gov/item/gm71002180/>>. Accessed 19 February 2023.

Binford, Lewis.

1962 Archaeology as Anthropology. *American Antiquity* 28(2):217-225.

Bingeman, John

2010 *The First HMS Invincible (1747-58): Her Excavations (1980-1991)*. Oxbow Books, Oxford, UK.

Bowler, R. Arthur

1975 *Logistics and the Failure of the British Army in America 1775-1783*. Princeton University Press, Princeton, NJ.

Broadwater, John

1980 The Yorktown shipwreck archaeological project: results from the 1978 survey. *The International Journal of Nautical Archaeology and Underwater Exploration* 9(3):227-235.

1988 Yorktown Shipwreck. *National Geographic Magazine* 173(6): 810-823.

1992 Shipwreck in a Swimming Pool: An Assessment of the Methodology and Technology Utilized on the Yorktown Shipwreck Archaeological Project. *Historical Archaeology* 26(4):36-46.

1996 *The Yorktown Shipwreck Archaeological Project: Final Report*. National Endowment for the Humanities. Williamsburg, VA.

Carpenter, Stanley D. M.

2019 *Southern Gambit: Cornwallis and the British March to Yorktown*. University of Oklahoma Press, Norman, OK.

Corbin, Annalies

2002 *The Material Culture of Steamboat Passengers: Archaeological Evidence From the Missouri River*. Springer.

Curtis, Edward E.

1926 *The Organization of the British Army in the American Revolution*. Yale University Press, New Haven, CT.

Deetz, James

1996 *In Small Things Forgotten, An Archaeology of Early American Life*. Anchor Books, New York, NY.

Dellino-Musgrave, Virginia

2006 *Maritime Archaeology and Social Relations: British Action in the Southern Hemisphere*. Springer, New York, NY.

Dellino, Virginia and María Luz Endere

2001 The HMS *Swift* shipwreck: The development of underwater heritage protection in Argentina. *Conservation and Management of Archaeological Sites* 4(4):219-231.

Elkin, Dolores

2022 Archaeological research and heritage management of a British shipwreck in Argentina - the legacy of HMS *Swift* (1770). *Post-Medieval Archaeology* 56(3): 225-248.

Elkin, Dolores, Amaru Argüeso, Mónica Grosso, Cristian Murray, Damián Vainstüb, Ricardo Bastida, and Virginia Dellino-Musgrave

2007 Archaeological research on HMS *Swift*: a British Sloop-of-War lost off Patagonia, Southern Argentina, in 1770. *The International Journal of Nautical Archaeology and Underwater Exploration* 36(1):32-58.

Elkin, Dolores, Cristian Murray, Ricardo Bastida, Mónica Grosso, Amaru Argüeso, Damián Vainstüb, Chris Underwood, and Nicolás Ciarloel

2011 *Nafragio de la HMS Swift 1770: arqueología marítima en la Patagonia*. Vazquez Mazzini Editores, Ciudad de Buenos Aires, Argentina.

Evans, Chris, Owen Jackson, and Göran Rydén

2002 Baltic Iron and the British Iron Industry in the Eighteenth Century. *The Economic History Review* 55(4):642-665.

Ferguson, Homer L.

1939 Salvaging Revolutionary Relics from the York River. *William and Mary College Quarterly Historical Magazine* 19(3):257-271.

Forrest, John

2001 The Apparent Invisibility of Crews Of Nineteenth Century Australian Shipping In Catalogued Collections Of Artefacts From Provenanced Sites. Honors Thesis, Department of Archaeology, Flinders University of South Australia, Adelaide, Australia.

Johnson, Matthew

2020 *Archaeological Theory: An Introduction*, 3rd edition. Wiley-Blackwell Hoboken, NJ.

Johnson, Richard E. and Russell K. Skowronek

1986 A Quantitative Analysis of Patterning Potential in Shipwreck Artifact Assemblages. In *Underwater Archaeology: The Proceedings of the 14th Conference on Underwater Archaeology*, Calvin R. Cummings, editor, pp. 85-91. Fathom Eight, San Marino, CA.

Lavery, Brian

1988 *The Royal Navy's First Invincible*. Invincible Conservations (1744-1758) Limited, Portsmouth, Hampshire.

Library of Congress (LOC)

2021 Library of Congress. <<https://www.loc.gov/>>. Accessed 18 April 2021.

Lloyd's Register Centre

1780 Lloyd's Register of Shipping. Digital scans, Lloyd's Register of Ships Online. <<https://archive.org/details/HECROS1780/page/n29/mode/2up>> Accessed 2 October 2022.

Mackesy, Piers

1964 *The War for America, 1775-1783*. Harvard University Press, Cambridge, MA.

Morris, J.

1991 Site 44YO88 The Archaeological Assessment of the Hull Remains at Yorktown, Virginia. Master's thesis, Department of History, East Carolina University, Greenville, NC.

Muckelroy, Keith

1978 *Maritime archaeology*. Cambridge University Press, Cambridge.

Murray, Cristian, Dolores Elkin, and Damián Vainstub

2003 The sloop-of-war HMS *Swift*: an archaeological approach. *The Age of Sail* 1:101–15. New York, NY.

National Park Service

2023 Escutcheon Plate. Fort Stanwix National Monument.

<<https://www.nps.gov/articles/escutcheon-plate.htm>>. Accessed 19 February 2023.

Ossowski, Waldemar (editor)

2008 *The General Carleton Shipwreck, 1785*. Polish Maritime Museum, Gdańsk, Poland.



Page, Courtney

2014 *Going On The Account: Examining Golden Age Pirates As A Distinct Culture Through Artifact Patterning*. Master's Thesis, Department of Anthropology, East Carolina University, Greenville, NC.

Pieters, M

2013 Review of *El Naufragio de la HMS Swift 1770: arqueología marítima en la Patagonia* by Elkin, Dolores, Murray, Cristian, Bastida, Ricardo, Grosso, Mónica, Argüeso, Amaru, Vainstub, Damián, Underwood, Chris and Ciarlo, Nicolás. *International Journal of Nautical Archaeology*, 42(2): 462-464.

Prown, Jules David

1982 Mind in Matter: An Introduction to Material Culture Theory and Method. *Winterthur Portfolio* 17(1):1-19.

Riley, Edward M.

1948 St. George Tucker's Journal of the Siege of Yorktown, 1781. *William and Mary Quarterly* 5(3):375-95.

Rodgers, Bradley A.

1989 The case for biologically induced corrosion at the Yorktown shipwreck archaeological site. *The International Journal of Nautical Archaeology and Underwater Exploration* 18(4): 335-340.

Sands, John O.

1973 *Shipwrecks Of The Battle Of Yorktown, 1781: A Preliminary Archaeological Study*.

Master's Thesis, Winterthur Program, University of Delaware, Newark.

1980 *Sea Power at Yorktown: The Archaeology of the Captive Fleet*. PhD Dissertation,

Graduate School of Arts and Sciences, George Washington University, Washington, D.C.

1983 *Yorktown's Captive Fleet*. The University Press of Virginia, The Mariners' Museum,

Newport News, VA.

Schiffer, Michael

1972 Archaeological Context and Systemic Context. *American Antiquity* 37(2):156-165.

1975 Archaeology as Behavioral Science. *American Anthropologist* 77(4):836-848.

1995 *Behavioral Archaeology: First Principles*. University of Utah Press, Salt Lake City, UT.

South, Stanley

1977 *Method and Theory in Historical Archaeology*. Academic Press, New York.

Syrett, David

1970 *Shipping and the American War*. The Athlone Press, University of London, London.

1989 *The Royal Navy in American Waters, 1775-1783*. Hants, England: Scholar Press.

Tilley, John A.

1987 *The British Navy and the American Revolution*. University of South Carolina Press,

Columbia, South Carolina.

Underwood, Chris

2012 Chapter 6: Excavation Planning and Logistics: The HMS *Swift* Project. *The Oxford Handbook of Maritime Archaeology*. Oxford Academic.

Viduka, Andrew J.

2012 Unit 10: Intrusive Techniques in Underwater Archaeology. UNESCO Bangkok, Asia and Pacific Regional Bureau for Education, pp.1-28. Bangkok, Thailand.

Virginia Historic Landmarks Commission Staff

1973 National Register of Historic Place Nomination Form: Yorktown Maritime Site, US Department of the Interior, National Parks Service, Newport News, VA.

APPENDIX A: SITE 1 ARTIFACT LIST

Group	Class	Type	Artifact	Amount
Arms and Armament	Ammunition	Cannon	Bar Shot	5
Arms and Armament	Ammunition	Small Arms	Ball Shot	4
Arms and Armament	Artillery	Cannon	Cannon	10
Arms and Armament	Artillery	Cannon Equipment	Cannon Ball Rack	1
Arms and Armament	Artillery	Cannon Equipment	Trunnion Clamp	7
Arms and Armament	Artillery	Cannon Equipment	Trunnion Clamp Pin	12
Arms and Armament	Artillery	Small Arms	Grape Shot	1
Arms and Armament	Artillery	Swivel Gun	Swivel Gun	6
Arms and Armament	Small Arms	Firearm Part	Musket Stock	1
Cargo	Storage	Cooperage	Barrel	1
Cargo	Storage	Cooperage	Barrel Cover	1
Cargo	Storage	Cooperage	Barrel Head	1
Cargo	Storage	Cooperage Accessory	Spigot	2
Cargo	Storage	Cooperage Accessory	Stopper	1
Cargo	Storage	Storage	Crock	3
Cargo	Storage	Storage	Jar	2
Kitchen	Tableware	Dish	Bowl	1
Kitchen	Tableware	Dish	Plate	3
Kitchen	Tableware	Drinking Vessel	Bottle	111
Kitchen	Tableware	Drinking Vessel	Jug	6
Kitchen	Tableware	Drinking Vessel	Mug	2
Kitchen	Tableware	Drinking Vessel	Tea Pot	1
Other	Other	Tent Pegs	Tent Pegs	10
Personal	Clothing	Clothing	Shoe	5
Personal	Toiletries	Toiletries	Chamber Pot	1
Tools and Instruments	Furniture	Furniture	Candlestick	2

Tools and Instruments	Furniture	Furniture	Door Handles	3
Tools and Instruments	Furniture	Furniture	Door Lock	1
Tools and Instruments	Furniture	Furniture	Ladder Rung	2
Tools and Instruments	Furniture	Furniture	Window Pane	1
Tools and Instruments	Measuring	Measuring	Weight	2
Tools and Instruments	Navigation	Navigation	Hourglass	1
Tools and Instruments	Navigation	Navigation	Sounding Lead	1
Tools and Instruments	Ship Maintenance	Ship Maintenance	Axe	1
Tools and Instruments	Ship Maintenance	Ship Maintenance	Caulking Iron	1
Tools and Instruments	Ship Maintenance	Ship Maintenance	Chafing Guard	2
Tools and Instruments	Ship Maintenance	Ship Maintenance	Felling Iron Axe	1
Tools and Instruments	Ship Maintenance	Ship Maintenance	Fid	1
Tools and Instruments	Ship Maintenance	Ship Maintenance	Mallet	2
Tools and Instruments	Ship Maintenance	Ship Maintenance	Plane	1
Tools and Instruments	Ship Maintenance	Ship Maintenance	Rope	6
Tools and Instruments	Tools and Instruments	Tools and Instruments	Bell	1
Tools and Instruments	Tools and Instruments	Tools and Instruments	Grindstone	2

APPENDIX B: HMS *INVINCIBLE* ARTIFACT LIST

<b>Group</b>	<b>Class</b>	<b>Type</b>	<b>Artifact</b>	<b>Amount</b>
Arms and Armament	Ammunition	Ammunition Accessory	Tally stick	54
Arms and Armament	Ammunition	Cannon	Cannon ball	4
Arms and Armament	Ammunition	Cannon	Shot grape	101
Arms and Armament	Ammunition	Explosive	Grenade box	1
Arms and Armament	Ammunition	Explosive	Grenade fuse	6
Arms and Armament	Ammunition	Explosive	Grenade hand	32
Arms and Armament	Ammunition	Small Arms	Shot musket	5605
Arms and Armament	Ammunition	Small Arms	Shot pistol	242
Arms and Armament	Artillery	Cannon Equipment	Apron of lead	13
Arms and Armament	Artillery	Cannon Equipment	Fragment	1
Arms and Armament	Artillery	Cannon Equipment	Gun carriage part	2
Arms and Armament	Artillery	Cannon Equipment	Gun stool bed	10
Arms and Armament	Artillery	Cannon Equipment	Handle	2
Arms and Armament	Artillery	Cannon Equipment	Leather bucket	47
Arms and Armament	Artillery	Cannon Equipment	Quoin	2
Arms and Armament	Artillery	Cannon Equipment	Rammer head	29
Arms and Armament	Artillery	Cannon Equipment	Slow match dispenser	1
Arms and Armament	Artillery	Cannon Equipment	Sponge cylinder	21
Arms and Armament	Artillery	Cannon Equipment	Tampion	23
Arms and Armament	Artillery	Cannon Equipment	Tampion reel	10

Arms and Armament	Artillery	Cannon Equipment	Truck	13
Arms and Armament	Artillery	Cannon Equipment	Vent stopper	1
Arms and Armament	Small Arms	Firearm Accessory	Cartouche	3
Arms and Armament	Small Arms	Firearm Accessory	Cartouche cover	4
Arms and Armament	Small Arms	Firearm Accessory	Cartridge case	41
Arms and Armament	Small Arms	Firearm Accessory	Cartridge Case Fragment	1
Arms and Armament	Small Arms	Firearm Accessory	Cartridge case lid	68
Arms and Armament	Small Arms	Firearm Accessory	Cartridge case with lid	20
Arms and Armament	Small Arms	Firearm Accessory	Cartridge former	1
Arms and Armament	Small Arms	Firearm Accessory	Gun flints	1921
Arms and Armament	Small Arms	Firearm Accessory	Gun powder sample	1
Arms and Armament	Small Arms	Firearm Accessory	Gun wads	37
Arms and Armament	Small Arms	Firearm Accessory	Handle	1
Arms and Armament	Small Arms	Firearm Accessory	Lantern horn	3
Arms and Armament	Small Arms	Firearm Accessory	Musket cartridge former	1
Arms and Armament	Small Arms	Firearm Accessory	Powder horn top	1
Arms and Armament	Small Arms	Firearm Accessory	Powder measure	2
Arms and Armament	Small Arms	Sword or Blade	Blade scabbard	1
Arms and Armament	Small Arms	Sword or Blade	Scabbard brass tip	1
Cargo	Cargo	Cargo	Basket contents	1
Cargo	Storage	Cooperage	Barrel	13
Cargo	Storage	Cooperage	Barrel bung	3
Cargo	Storage	Cooperage	Barrel end	44
Cargo	Storage	Cooperage	Barrel miniature	26

Cargo	Storage	Cooperage	Barrel pieces	107
Cargo	Storage	Cooperage	Barrel staves	18
Cargo	Storage	Cooperage	Barrel stool	1
Cargo	Storage	Cooperage	Cooper's tool	1
Cargo	Storage	Cooperage Accessory	Adze head	2
Cargo	Storage	Cooperage Accessory	Barrel spout	1
Cargo	Storage	Cooperage Accessory	Barrel tap	2
Cargo	Storage	Cooperage Accessory	Barrel tar	2
Cargo	Storage	Cooperage Accessory	Brass tap	1
Cargo	Storage	Cooperage Accessory	Bung	9
Cargo	Storage	Cooperage Accessory	Pipe	1
Cargo	Storage	Cooperage Accessory	Setter	1
Cargo	Storage	Gunpowder Storage	Barrel gunpowder	255
Cargo	Storage	Gunpowder Storage	Barrel gunpowder hoop	1
Cargo	Storage	Gunpowder Storage	Hide	1
Cargo	Storage	Storage	Amphora jar	1
Cargo	Storage	Storage	Basket cone shaped	2
Cargo	Storage	Storage	Box	16
Cargo	Storage	Storage	Bucket	69
Cargo	Storage	Storage	Handle	1
Cargo	Storage	Storage	Jar	8
Cargo	Storage	Storage	Wicker basket	19
Cargo	Storage	Storage Accessory	Padlock	2
Kitchen	Galley	Food Preparation	Cauldron	5
Kitchen	Galley	Food Preparation	Logs	2
Kitchen	Galley	Galley	Broom handle	1
Kitchen	Galley	Galley	Brush	3



Kitchen	Galley	Galley	Mortar	1
Kitchen	Tableware	Dish	Bowl	32
Kitchen	Tableware	Dish	Ceramic fragment	1
Kitchen	Tableware	Dish	Fragment	3
Kitchen	Tableware	Dish	Handle	1
Kitchen	Tableware	Dish	Plate	4
Kitchen	Tableware	Dish	Plate square	6
Kitchen	Tableware	Dish	Plate square part	5
Kitchen	Tableware	Dish	Porringer	1
Kitchen	Tableware	Drinking Vessel	Bottle (square)	1
Kitchen	Tableware	Drinking Vessel	Bottle fragment	78
Kitchen	Tableware	Drinking Vessel	Bottle mallet	1
Kitchen	Tableware	Drinking Vessel	Bottle 'onion'	1
Kitchen	Tableware	Drinking Vessel	Cup coconut	1
Kitchen	Tableware	Drinking Vessel	Fragment	2
Kitchen	Tableware	Drinking Vessel	Fragment glass	10
Kitchen	Tableware	Drinking Vessel	Handle	1
Kitchen	Tableware	Drinking Vessel	Tankard	18
Kitchen	Tableware	Drinking Vessel	Tankard parts	16
Kitchen	Tableware	Drinking Vessel	Wine Bottle	12
Kitchen	Tableware	Drinking Vessel	Wine bottle (small)	3
Kitchen	Tableware	Serving Vessel	Ceramic fragment	82
Kitchen	Tableware	Serving Vessel	Vessel	1
Kitchen	Tableware	Utensil	Butter pat	1
Kitchen	Tableware	Utensil	Ceramic fragment	1
Kitchen	Tableware	Utensil	Handle	5
Kitchen	Tableware	Utensil	Spoon	19
Kitchen	Tableware	Utensil	Spoon handle	5
Other	Military	Clothing	Button military	28
Personal	Accessory	Accessory	Copper & wood	1

			object	
Personal	Clothing	Accessory	Buckle	28
Personal	Clothing	Accessory	Cravat	1
Personal	Clothing	Accessory	Hat	5
Personal	Clothing	Accessory	Monmouth cap	1
Personal	Clothing	Accessory	Shoe Buckle	2
Personal	Clothing	Accessory	Shoe former	2
Personal	Clothing	Clothing	Ball of wool	1
Personal	Clothing	Clothing	Boot	5
Personal	Clothing	Clothing	Button	59
Personal	Clothing	Clothing	Cloth	4
Personal	Clothing	Clothing	Cuff link	1
Personal	Clothing	Clothing	Fabric	1
Personal	Clothing	Clothing	Pattern	3
Personal	Clothing	Clothing	Shoe	53
Personal	Clothing	Clothing	Shoe (child)	2
Personal	Clothing	Clothing	Shoe fragment	178
Personal	Clothing	Clothing	Stocking	2
Personal	Clothing	Clothing	Textile fragment	5
Personal	Clothing	Clothing	Thread samples	8
Personal	Pastime/Recreation	Pastime/Recreation	Cover, book	1
Personal	Pastime/Recreation	Pastime/Recreation	Game board	2
Personal	Pastime/Recreation	Pastime/Recreation	Game piece	5
Personal	Pastime/Recreation	Pipe	Clay Pipe	5
Personal	Personal	Personal Item	Intaglio	1
Personal	Toiletries	Toiletries	Brush	3
Personal	Toiletries	Toiletries	Chamber pot	1
Personal	Toiletries	Toiletries	Comb flea	1
Personal	Toiletries	Toiletries	Wig curler	5
Tools and	Fabric Working	Fabric Working	Needle	1

Instruments				
Tools and Instruments	Fabric Working	Sewing	Metal artefact	1
Tools and Instruments	Furniture	Decoration	Tassels	147
Tools and Instruments	Furniture	Furniture	Candelabrum	1
Tools and Instruments	Furniture	Furniture	Candle holder	4
Tools and Instruments	Furniture	Furniture	Chair parts	4
Tools and Instruments	Furniture	Furniture	Chest piece	1
Tools and Instruments	Furniture	Furniture	Clamp	1
Tools and Instruments	Furniture	Furniture	Escutcheon	2
Tools and Instruments	Furniture	Furniture	Hammock stretcher	3
Tools and Instruments	Furniture	Furniture	Handle	2
Tools and Instruments	Furniture	Furniture	Magazine racking	50
Tools and Instruments	Furniture	Furniture	Mortise lock	4
Tools and Instruments	Measuring	Measuring	Rule	1
Tools and Instruments	Medical Supplies	Medical Supplies	Bottle fragment	9
Tools and Instruments	Medical Supplies	Medical Supplies	Bottle medicine	3
Tools and Instruments	Medical Supplies	Medical Supplies	Pewter Syringe	1
Tools and Instruments	Navigation	Navigation	Compass	1
Tools and Instruments	Navigation	Navigation	Compass parts	11
Tools and Instruments	Navigation	Navigation	Dividers	2
Tools and Instruments	Navigation	Navigation	Fragment glass	1
Tools and Instruments	Navigation	Navigation	Log ship	1
Tools and Instruments	Navigation	Navigation	Log ship weight	1

Tools and Instruments	Navigation	Navigation	Logline drum end	2
Tools and Instruments	Navigation	Navigation	Sandglass	6
Tools and Instruments	Navigation	Navigation	Sandglass part	44
Tools and Instruments	Navigation	Navigation	Sounding lead	10
Tools and Instruments	Ship Maintenance	Ship Maintenance	Besom brush	236
Tools and Instruments	Ship Maintenance	Ship Maintenance	Broom handle	2
Tools and Instruments	Ship Maintenance	Ship Maintenance	Brush	11
Tools and Instruments	Ship Maintenance	Ship Maintenance	Brush deck	24
Tools and Instruments	Ship Maintenance	Ship Maintenance	Brush paint	1
Tools and Instruments	Ship Maintenance	Ship Maintenance	Carpenter's tool	2
Tools and Instruments	Ship Maintenance	Ship Maintenance	Cleat	3
Tools and Instruments	Ship Maintenance	Ship Maintenance	Drill bobbin	1
Tools and Instruments	Ship Maintenance	Ship Maintenance	Fragment	10
Tools and Instruments	Ship Maintenance	Ship Maintenance	Hammer sledge	1
Tools and Instruments	Ship Maintenance	Ship Maintenance	Handle	10
Tools and Instruments	Ship Maintenance	Ship Maintenance	Handle Besom Brush	30
Tools and Instruments	Ship Maintenance	Ship Maintenance	Holystone	3
Tools and Instruments	Ship Maintenance	Ship Maintenance	Lead object	6
Tools and Instruments	Ship Maintenance	Ship Maintenance	Leather fragment	2
Tools and Instruments	Ship Maintenance	Ship Maintenance	Mallet	3
Tools and Instruments	Ship Maintenance	Ship Maintenance	Mop & handle	1
Tools and Instruments	Ship Maintenance	Ship Maintenance	Peg	1
Tools and	Ship Maintenance	Ship Maintenance	Pipe	2

Instruments				
Tools and Instruments	Ship Maintenance	Ship Maintenance	Plate square part	1
Tools and Instruments	Ship Maintenance	Ship Maintenance	Samson bar	4
Tools and Instruments	Ship Maintenance	Ship Maintenance	Shod shovel	11
Tools and Instruments	Ship Maintenance	Ship Maintenance	Shod shovel fragment	5
Tools and Instruments	Ship Maintenance	Ship Maintenance	Split block	46
Tools and Instruments	Ship Maintenance	Ship Maintenance	Treenail	4
Tools and Instruments	Ship Maintenance	Ship Maintenance	Washer	1
Tools and Instruments	Tools and Instruments	Tools and Instruments	Grindstone	3
Tools and Instruments	Writing	Writing	Pencil	1

APPENDIX C: HMS *SWIFT* ARTIFACT LIST

<b>Group</b>	<b>Class</b>	<b>Type</b>	<b>Artifact</b>	<b>Amount</b>
Arms and Armament	Ammunition	Ammunition Accessories	Cartridge Holder Lid	2
Arms and Armament	Ammunition	Ammunition Accessories	Shot Garland	1
Arms and Armament	Ammunition	Cannon	Cannonball	6
Arms and Armament	Ammunition	Explosive	Shrapnel Bullets	37
Arms and Armament	Ammunition	Small Arms	Musket ball	31
Arms and Armament	Artillery	Cannon	Cannon	17
Arms and Armament	Artillery	Cannon Equipment	Brush	1
Arms and Armament	Artillery	Cannon Equipment	Gun Carriage (axle and wheel)	1
Arms and Armament	Artillery	Cannon Equipment	Gun carriage bench	1
Arms and Armament	Artillery	Cannon Equipment	Gun Carriage wheel	3
Arms and Armament	Artillery	Cannon Equipment	Lid to case for cannon loading	1
Arms and Armament	Artillery	Cannon Equipment	Rammer	1
Arms and Armament	Artillery	Cannon Part	Cannon Breech	1
Arms and Armament	Small Arms	Firearm Accessory	Gunpowder horn cap	1
Cargo	Storage	Cooperage	Base	2
Cargo	Storage	Cooperage	Base (incomplete)	2
Cargo	Storage	Cooperage	Base?	0
Cargo	Storage	Cooperage	Stave	8
Cargo	Storage	Cooperage Accessory	Spigot	1
Cargo	Storage	Storage Accessory	Cork	5
Cargo	Storage	Storage	Basket (base)	1
Cargo	Storage	Storage	Basket rim	1
Cargo	Storage	Storage	Box	4

Cargo	Storage	Storage	Jar	15
Cargo	Storage	Storage	Vessel	9
Cargo	Storage	Storage	Vessel (urn)	6
Cargo	Storage	Storage	Vial	1
Cargo	Storage	Storage	Vial (base)	1
Cargo	Storage	Storage Accessory	Lid	7
Cargo	Storage	Storage Accessory	Plug	1
Cargo	Storage	Storage Accessory	Stopper	3
Kitchen	Galley	Food Preparation	Colander	2
Kitchen	Galley	Food Preparation	Griddle pan	11
Kitchen	Galley	Food Preparation	Pan	1
Kitchen	Galley	Food Preparation	Pan/Container	1
Kitchen	Galley	Food Preparation	Stove	1
Kitchen	Galley	Food Preparation	Stove (andiron foot)	2
Kitchen	Galley	Food Preparation	Stove (body)	1
Kitchen	Galley	Food Preparation	Stove (burner)	1
Kitchen	Galley	Food Preparation	Stove (fire guard)	1
Kitchen	Galley	Food Preparation	Stove (frame part)	5
Kitchen	Galley	Food Preparation	Stove (front plate)	3
Kitchen	Galley	Food Preparation	Stove (hood)	1
Kitchen	Galley	Food Preparation	Stove (insulating plate)	1
Kitchen	Galley	Food Preparation	Stove (ornament)	2
Kitchen	Galley	Food Preparation	Stove (rod)	6
Kitchen	Galley	Galley	Brick	3
Kitchen	Galley	Galley	Container	1
Kitchen	Galley	Galley	Kitchen Bell	1
Kitchen	Galley	Good Preparation	Cauldron lid	1
Kitchen	Tableware	Dish	Bowl	15
Kitchen	Tableware	Dish	Bowl fragment	7
Kitchen	Tableware	Dish	Bowl or plate fragment	1
Kitchen	Tableware	Dish	Bowl type cup	46

Kitchen	Tableware	Dish	Dish	2
Kitchen	Tableware	Dish	Dish or platter	3
Kitchen	Tableware	Dish	Dish or platter fragment	6
Kitchen	Tableware	Dish	Plate	101
Kitchen	Tableware	Dish	Plate fragment	9
Kitchen	Tableware	Dish	Platter	14
Kitchen	Tableware	Dish	Platter fragment	1
Kitchen	Tableware	Drinking Vessel	Bottle	58
Kitchen	Tableware	Drinking Vessel	Bottle fragment	4
Kitchen	Tableware	Drinking Vessel	Cup	12
Kitchen	Tableware	Drinking Vessel	Cup fragment	1
Kitchen	Tableware	Drinking Vessel	Glass	5
Kitchen	Tableware	Drinking Vessel	Glass fragment	3
Kitchen	Tableware	Drinking Vessel	Glass/Cup	2
Kitchen	Tableware	Drinking Vessel	Pitcher	2
Kitchen	Tableware	Drinking Vessel	Teapot	4
Kitchen	Tableware	Drinking Vessel	Wine glass	3
Kitchen	Tableware	Serving Vessel	Condiment Holder and/or spices	1
Kitchen	Tableware	Serving Vessel	Gravy boat	1
Kitchen	Tableware	Utensil	Spoon	11
Kitchen	Tableware	Utensil	Spoon fragment	7
Kitchen	Tableware	Utensil	Utensil Handle	22
Kitchen	Tableware	Vessel	Undetermined vessel	1
Kitchen	Tableware	Vessel	Undetermined vessel fragment	8
Kitchen	Tableware	Vessel	Vessel	3
Kitchen	Utensil	Utensil	Ladle	1
Other	Commerce	Coins	Coin	5
Personal	Clothing	Accessory	Shoe former	2
Personal	Clothing	Accessory	Shoe patch	1
Personal	Clothing	Clothing	Buckle	8



Personal	Clothing	Clothing	Buckle frame	3
Personal	Clothing	Clothing	Buckle pin	3
Personal	Clothing	Clothing	Button	44
Personal	Clothing	Clothing	Cape fragment	1
Personal	Clothing	Clothing	Leg gaiters	2
Personal	Clothing	Clothing	Shoe	6
Personal	Clothing	Clothing	Shoe sole	3
Personal	Pastime/Recreation	Pastime/Recreation	Game tokens	1
Personal	Pastime/Recreation	Pipe	Pipe	1
Personal	Pastime/Recreation	Pipe	Pipe (cane?)	1
Personal	Personal	Personal	Dog collar	1
Personal	Toiletries	Toiletries	Brush	1
Personal	Toiletries	Toiletries	Brush (bristles)	1
Personal	Toiletries	Toiletries	Chamber pot/ washbasin	3
Personal	Toiletries	Toiletries	Pail	3
Personal	Toiletries	Toiletries	Toilet seat	1
Tools and Instruments	Fabric Working	Sewing	Pin	1
Tools and Instruments	Fabric Working	Sewing	Thimble	1
Tools and Instruments	Furniture	Furniture	Candlestick holder	4
Tools and Instruments	Furniture	Furniture	Candlestick holder fragment	1
Tools and Instruments	Furniture	Furniture	Chest	1
Tools and Instruments	Furniture	Furniture	Coat rack	1
Tools and Instruments	Furniture	Furniture	Counterweight	4
Tools and Instruments	Furniture	Furniture	Curve	2
Tools and Instruments	Furniture	Furniture	Door	1
Tools and Instruments	Furniture	Furniture	Door knob	2
Tools and Instruments	Furniture	Furniture	Hatchway	1

Tools and Instruments	Furniture	Furniture	Hinge	1
Tools and Instruments	Furniture	Furniture	Knob	3
Tools and Instruments	Furniture	Furniture	Latch	3
Tools and Instruments	Furniture	Furniture	Table	1
Tools and Instruments	Furniture	Furniture	Wardrobe	2
Tools and Instruments	Furniture	Furniture	Wardrobe fragment	1
Tools and Instruments	Furniture	Furniture	Window fragment	1
Tools and Instruments	Furniture	Furniture	Window leaf	1
Tools and Instruments	Furniture	Furniture	Window pane	15
Tools and Instruments	Furniture	Furniture	Window pane fragment	1
Tools and Instruments	Furniture	Furniture	Window panel	5
Tools and Instruments	Furniture	Furniture	Window panel fragment	4
Tools and Instruments	Measuring	Measuring	Slide rule	1
Tools and Instruments	Musical Instrument	Musical Instrument	Drum (body and sides)	1
Tools and Instruments	Musical Instrument	Musical Instrument	Drum stick	2
Tools and Instruments	Navigation	Navigation	Draft marker	2
Tools and Instruments	Navigation	Navigation	Hourglass	3
Tools and Instruments	Navigation	Navigation	Hourglass fragment	1
Tools and Instruments	Ship Maintenance	Ship Maintenance	Aspirant pump	1
Tools and Instruments	Ship Maintenance	Ship Maintenance	Bucket (base/bottom)	1
Tools and Instruments	Ship Maintenance	Ship Maintenance	Bucket (stave)	2
Tools and Instruments	Ship Maintenance	Ship Maintenance	Pump Valve	2
Tools and Instruments	Ship Maintenance	Ship Maintenance	Saw horse	2

Instruments				
Tools and Instruments	Ship Maintenance	Ship Maintenance	Scupper	2
Tools and Instruments	Ship Maintenance	Ship Maintenance	Spark stone	4
Tools and Instruments	Ship Maintenance	Ship Maintenance	Stone	1
Tools and Instruments	Ship Maintenance	Ship Maintenance	Stone cutter	6
Tools and Instruments	Ship Maintenance	Ship Maintenance	Suction Pump	1
Tools and Instruments	Ship Maintenance	Ship Maintenance	Tool Handle	5
Tools and Instruments	Ship Maintenance	Ship Maintenance	Tool handle fragment	1
Tools and Instruments	Ship Maintenance	Ship Maintenance	Whetstone	3
Tools and Instruments	Tools and Instruments	Medical Supplies	Medical Supplies	1
Tools and Instruments	Tools and Instruments	Medical Supplies	Medicine Drawer	1
Tools and Instruments	Tools and Instruments	Medical Supplies	Mercury	1
Tools and Instruments	Tools and Instruments	Tools and Instruments	Bell	1
Tools and Instruments	Tools and Instruments	Tools and Instruments	Capstan	1
Tools and Instruments	Tools and Instruments	Tools and Instruments	Sharpener	1
Tools and Instruments	Writing	Writing	Slate	3

APPENDIX D: *BETSY* ARTIFACT LIST

<b>Group</b>	<b>Class</b>	<b>Type</b>	<b>Artifact</b>	<b>Amount</b>
Arms and Armament	Ammunition	Ammunition Accessory	Cartridge Holder	1
Arms and Armament	Ammunition	Small Arms	Bird Shot	1
Arms and Armament	Ammunition	Small Arms	Buck Shot	9
Arms and Armament	Ammunition	Small Arms	Buckshot	428
Arms and Armament	Ammunition	Small Arms	Musket Ball	307
Arms and Armament	Ammunition	Small Arms	Shell Casing	1
Arms and Armament	Ammunition	Small Arms	Shot	15
Arms and Armament	Ammunition	Small Arms	Shot, Iron	4
Arms and Armament	Ammunition	Small Arms	Shot, Lead	212
Arms and Armament	Ammunition	Small Arms	Shot, Lead and Iron	2
Arms and Armament	Artillery	Cannon Equipment	Cannon Carriage	1
Arms and Armament	Artillery	Cannon Part	Trunnion	1
Arms and Armament	Small Arms	Firearm Accessory	Flint	6
Arms and Armament	Small Arms	Firearm Accessory	Flint Fragment	4
Arms and Armament	Small Arms	Firearm Accessory	Handspike	1
Arms and Armament	Small Arms	Firearm Accessory	Linstock Slow Match	1
Arms and Armament	Small Arms	Firearm Accessory	Tompion	1
Arms and Armament	Small Arms	Firearm Part	Breech	1
Arms and Armament	Small Arms	Firearm Part	Musket Side Plate	1
Arms and Armament	Small Arms	Firearm Part	Musket Trigger Guard	1
Arms and Armament	Small Arms	Firearm Part	Pistol Butt Plate	2

Arms and Armament	Small Arms	Sword or Blade	Folding Knife Handle	2
Arms and Armament	Small Arms	Sword or Blade	Knife Sheath	2
Arms and Armament	Small Arms	Sword or Blade	Scabbard	1
Arms and Armament	Small Arms	Sword or Blade	Sword Hand Guard	1
Arms and Armament	Small Arms	Sword or Blade	Sword Handle	1
Arms and Armament	Small Arms	Sword or Blade	Sword Pommel	1
Cargo	Storage	Cooperage	Barrel Bung	1
Cargo	Storage	Cooperage	Barrel Chock	146
Cargo	Storage	Cooperage	Barrel Hoop	1
Cargo	Storage	Cooperage	Bung	14
Cargo	Storage	Cooperage	Chock	5
Cargo	Storage	Cooperage	Lead Patch	1
Cargo	Storage	Cooperage	Musket Ball Cask	3
Cargo	Storage	Cooperage	With	7
Cargo	Storage	Cooperage	Stave	1
Cargo	Storage	Cooperage Accessory	Spigot, Pewter	1
Cargo	Storage	Cooperage Part	Cooperage Part	1325
Cargo	Storage	Cooperage Part	Hoop	11
Cargo	Storage	Storage	Jar Fragment	6
Cargo	Storage	Storage	Lock Box Door	2
Cargo	Storage	Storage Accessory	Cork	23
Kitchen	Tableware	Dish	Bowl	9
Kitchen	Tableware	Dish	Bowl Fragment	2
Kitchen	Tableware	Dish	Ceramic	488
Kitchen	Tableware	Dish	Dish Handle Fragment	2
Kitchen	Tableware	Dish	Ironstone	3
Kitchen	Tableware	Dish	Plate	6
Kitchen	Tableware	Dish	Platter Fragment	4

Kitchen	Tableware	Dish	Porcelain	1
Kitchen	Tableware	Dish	Wood Bowl	3
Kitchen	Tableware	Drinking Vessel	Bottle	2
Kitchen	Tableware	Drinking Vessel	Ceramic Jug	19
Kitchen	Tableware	Drinking Vessel	Cider Tumbler Fragment	1
Kitchen	Tableware	Drinking Vessel	Glass	26
Kitchen	Tableware	Drinking Vessel	Glass Bottle	17
Kitchen	Tableware	Drinking Vessel	Glass Bottle Fragment	1
Kitchen	Tableware	Drinking Vessel	Jug	22
Kitchen	Tableware	Drinking Vessel	Jug Fragment	26
Kitchen	Tableware	Drinking Vessel	Mug	1
Kitchen	Tableware	Drinking Vessel	Pewter Cup	1
Kitchen	Tableware	Drinking Vessel	Spout	1
Kitchen	Tableware	Drinking Vessel	Square Bottle Fragment	15
Kitchen	Tableware	Drinking Vessel	Window	3
Kitchen	Tableware	Drinking Vessel	Wine Bottle	28
Kitchen	Tableware	Drinking Vessel	Wine Bottle Fragment	281
Kitchen	Tableware	Utensil	Bone	3
Kitchen	Tableware	Utensil	Knife Handle	4
Kitchen	Tableware	Utensil	Pewter Spoon	3
Kitchen	Tableware	Utensil	Spoon Handle	4
Kitchen	Tableware	Utensil	Table Knife	1
Kitchen	Tableware	Utensil	Utensil Handle	1
Personal	Clothing	Accessory	Belt	1
Personal	Clothing	Accessory	Buckle	5
Personal	Clothing	Accessory	Cufflink	2
Personal	Clothing	Accessory	Leather Rolled Bag	1
Personal	Clothing	Accessory	Ribbon Fragment	1
Personal	Clothing	Accessory	Shoe Buckle	6
Personal	Clothing	Accessory	Silk Fragment	1

Personal	Clothing	Clothing	Button	34
Personal	Clothing	Clothing	Shoe	29
Personal	Clothing	Clothing	Shoe Former	1
Personal	Clothing	Clothing	Shoe Fragment	106
Personal	Pastime/Recreation	Pastime/Recreation	Dice	1
Personal	Pastime/Recreation	Pastime/Recreation	Game Piece	4
Personal	Pastime/Recreation	Pastime/Recreation	Possible Game Piece	1
Personal	Pastime/Recreation	Pastime/Recreation	Snuff Bottle Fragments	1
Personal	Pastime/Recreation	Pipe	Pipe Fragment	1
Personal	Pastime/Recreation	Pipe	Pipe Bowl	9
Personal	Pastime/Recreation	Pipe	Pipe Bowl and 2 Stems	3
Personal	Pastime/Recreation	Pipe	Pipe Bowl Fragment	3
Personal	Pastime/Recreation	Pipe	Pipe Stem	1
Personal	Pastime/Recreation	Pipe	Pipe Stem Fragment	33
Personal	Personal	Personal	Carved Bird Head	1
Personal	Personal	Personal	Coin	4
Personal	Toiletries	Toiletries	Chamber Pot Fragments	5
Personal	Toiletries	Toiletries	Comb	1
Personal	Toiletries	Toiletries	Personal Knife Handle	2
Personal	Toiletries	Toiletries	Privy Seat Fragment	1
Personal	Toiletries	Toiletries	Wash Basin Fragments	3
Personal	Toiletries	Toiletries	Wig Curler Fragment	1
Tools and Instruments	Fabric Working	Sewing	Needle	1
Tools and Instruments	Furniture	Decoration	Fleur de Lis Decoration	1
Tools and Instruments	Furniture	Furniture	Bookcase	1
Tools and Instruments	Furniture	Furniture	Bookcase Piece	1

Tools and Instruments	Furniture	Furniture	Brass Plate	1
Tools and Instruments	Furniture	Furniture	Chair	1
Tools and Instruments	Furniture	Furniture	Chair Arm	1
Tools and Instruments	Furniture	Furniture	China Cupboard Fragment	12
Tools and Instruments	Furniture	Furniture	China Cupboard Piece	82
Tools and Instruments	Furniture	Furniture	Clothing Hook	1
Tools and Instruments	Furniture	Furniture	Coat Hook	2
Tools and Instruments	Furniture	Furniture	Door	1
Tools and Instruments	Furniture	Furniture	Doorknob	1
Tools and Instruments	Furniture	Furniture	Escutcheon	5
Tools and Instruments	Furniture	Furniture	Finial	1
Tools and Instruments	Furniture	Furniture	Fitting	1
Tools and Instruments	Furniture	Furniture	Hinge	4
Tools and Instruments	Furniture	Furniture	Knob	1
Tools and Instruments	Furniture	Furniture	Ladder	5
Tools and Instruments	Furniture	Furniture	Ladder Piece	5
Tools and Instruments	Furniture	Furniture	Latch	1
Tools and Instruments	Furniture	Furniture	Lock Part	4
Tools and Instruments	Furniture	Furniture	Mullion	1
Tools and Instruments	Furniture	Furniture	Padlock Cast	1
Tools and Instruments	Furniture	Furniture	Plate Glass	237
Tools and Instruments	Furniture	Furniture	Plate Glass Fragment	128
Tools and	Furniture	Furniture	Rail	1



Instruments				
Tools and Instruments	Furniture	Furniture	Rung	5
Tools and Instruments	Furniture	Furniture	Shelf Pieces	2
Tools and Instruments	Furniture	Furniture	Table Leaf	4
Tools and Instruments	Furniture	Furniture	Table Leg	1
Tools and Instruments	Furniture	Furniture	Table Top	1
Tools and Instruments	Furniture	Furniture	Window Glass	3
Tools and Instruments	Furniture	Furniture	Wood Molding	169
Tools and Instruments	Furniture	Furniture	Wood Paneling	27
Tools and Instruments	Measuring	Measuring	Bevel, Carpenter	1
Tools and Instruments	Medical Supplies	Medical Supplies	Stomach Bitters Base	1
Tools and Instruments	Navigation	Navigation	Lead Sinker	2
Tools and Instruments	Navigation	Navigation	Lead Weight	2
Tools and Instruments	Navigation	Navigation	Sandglass Fragment	9
Tools and Instruments	Navigation	Navigation	Telescope Eyepiece	1
Tools and Instruments	Ship Maintenance	Ship Maintenance	Auger Handle	1
Tools and Instruments	Ship Maintenance	Ship Maintenance	Gimlet Handle	2
Tools and Instruments	Ship Maintenance	Ship Maintenance	Handspike, Windlass	1
Tools and Instruments	Ship Maintenance	Ship Maintenance	Mallet Head	2
Tools and Instruments	Ship Maintenance	Ship Maintenance	Pump Box Panel	6
Tools and Instruments	Ship Maintenance	Ship Maintenance	Rope from Hawse Pipe	2
Tools and Instruments	Ship Maintenance	Ship Maintenance	Shovel	1
Tools and Instruments	Ship Maintenance	Ship Maintenance	Toggle	1

Tools and Instruments	Ship Maintenance	Ship Maintenance	Tool Fragment	1
Tools and Instruments	Ship Maintenance	Ship Maintenance	Tool Handle	4
Tools and Instruments	Ship Maintenance	Ship Maintenance	Windlass	1
Tools and Instruments	Writing	Writing	Ink Bottle	1

APPENDIX E: *GENERAL CARLETON* ARTIFACT LIST

<b>Group</b>	<b>Class</b>	<b>Type</b>	<b>Artifact</b>	<b>Amount</b>
Arms and Armament	Ammunition	Cannon	Cannonball	1
Arms and Armament	Ammunition	Cannon	Grape Shot	2
Arms and Armament	Ammunition	Small Arms	Shot for Small Arms	98
Arms and Armament	Artillery	Artillery Accessory	Priming Wire	1
Arms and Armament	Artillery	Swivel Gun	Swivel Gun	1
Arms and Armament	Small Arms	Firearm	Pistol	4
Arms and Armament	Small Arms	Firearm Accessory	Powder Horn	1
Arms and Armament	Small Arms	Firearm Part	Flint	1
Arms and Armament	Small Arms	Firearm Part	Trigger	1
Cargo	Storage	Cooperage	Barrel Lids	2
Cargo	Storage	Cooperage	Stave	2
Cargo	Storage	Storage Accessory	Corkscrew	1
Cargo	Storage	Storage Accessory	Decanting Pump	1
Cargo	Storage	Storage Accessory	Jar	3
Cargo	Storage	Storage Accessory	Locks	3
Cargo	Storage	Storage Accessory	Taps	2
Kitchen	Galley	Food Preparation	Coffee Mill	1
Kitchen	Galley	Food Preparation	Crushing Stone	1
Kitchen	Galley	Food Preparation	Jug	1
Kitchen	Galley	Food Preparation	Kettle	5
Kitchen	Galley	Food Preparation	Pots	8
Kitchen	Galley	Food Preparation	Toasting Fork	1
Kitchen	Galley	Food Preparation	Vessel	6
Kitchen	Galley	Galley	Tea	1
Kitchen	Tableware	Dish	Bowls	11

Kitchen	Tableware	Dish	Plate	5
Kitchen	Tableware	Drinking Vessel	Bottles	4
Kitchen	Tableware	Drinking Vessel	Case Bottles	8
Kitchen	Tableware	Drinking Vessel	Cup	4
Kitchen	Tableware	Drinking Vessel	Cylindrical Bottles	28
Kitchen	Tableware	Drinking Vessel	Demijohns	22
Kitchen	Tableware	Drinking Vessel	Footed Glasses	3
Kitchen	Tableware	Drinking Vessel	Mug	1
Kitchen	Tableware	Drinking Vessel	Quadrangular Bottles	10
Kitchen	Tableware	Drinking Vessel	Tumblers	5
Kitchen	Tableware	Serving Vessel	Mustard Pot Cover	1
Kitchen	Tableware	Serving Vessel	Mustard Pots	2
Kitchen	Tableware	Tableware	Napkin	1
Kitchen	Tableware	Utensil	Knife	3
Kitchen	Tableware	Utensil	Spoon	8
Other	Commerce	Coins	Coin	16
Other	Commerce	Commerce	Document	1
Other	Commerce	Commerce	Wallet	2
Personal	Clothing	Accessory	Belt	1
Personal	Clothing	Accessory	Buckles	12
Personal	Clothing	Accessory	Cap	1
Personal	Clothing	Accessory	Clothing Buckles	9
Personal	Clothing	Accessory	Hat	4
Personal	Clothing	Accessory	Ribbons	3
Personal	Clothing	Accessory	Shoe Buckle	130
Personal	Clothing	Accessory	Spur	1
Personal	Clothing	Clothing	Boot	1
Personal	Clothing	Clothing	Boot Uppers	2
Personal	Clothing	Clothing	Breeches	6
Personal	Clothing	Clothing	Buttons	50
Personal	Clothing	Clothing	Coats	2

Personal	Clothing	Clothing	Fragment	29
Personal	Clothing	Clothing	Frame-knit silk stocking	1
Personal	Clothing	Clothing	Frame-knit wool stockings	4
Personal	Clothing	Clothing	Frame-knit wool stockings, ribbed	3
Personal	Clothing	Clothing	Hand-knit silk stocking	1
Personal	Clothing	Clothing	Hand-knit wool stocking	14
Personal	Clothing	Clothing	Hand-knit wool stocking, ribbed	1
Personal	Clothing	Clothing	Handkerchief	1
Personal	Clothing	Clothing	Jacket Fragments	2
Personal	Clothing	Clothing	Jackets	26
Personal	Clothing	Clothing	Mittens and Gloves	4
Personal	Clothing	Clothing	Shirts	2
Personal	Clothing	Clothing	Shoe	45
Personal	Clothing	Clothing	Shoe Fragment	163
Personal	Clothing	Clothing	Stocking	3
Personal	Clothing	Clothing	Vests/ Waistcoats	3
Personal	Pastime/Recreation	Pastime/Recreation	Book	83
Personal	Pastime/Recreation	Pastime/Recreation	Dice Cup	1
Personal	Pastime/Recreation	Pastime/Recreation	Fishing String	3
Personal	Pastime/Recreation	Pipe	Pipes	8
Personal	Personal	Personal	Bag	1
Personal	Personal	Personal	Blanket	3
Personal	Personal	Personal	Knife Parts	5
Personal	Personal	Personal	Knife Scabbard	1
Personal	Toiletries	Toiletries	Brushes	6
Personal	Toiletries	Toiletries	Chamber Pot	9
Personal	Toiletries	Toiletries	Comb	11
Personal	Toiletries	Toiletries	Mirror	1
Personal	Toiletries	Toiletries	Razor Boxes	6

Personal	Toiletries	Toiletries	Razor Case	1
Personal	Toiletries	Toiletries	Razor Parts	3
Personal	Toiletries	Toiletries	Razors	15
Personal	Toiletries	Toiletries	Sponge	1
Tools and Instruments	Fabric Working	Fabric Working	Fids	2
Tools and Instruments	Fabric Working	Fabric Working	Pins	9
Tools and Instruments	Fabric Working	Fabric Working	Sailmaker's needle cases	3
Tools and Instruments	Fabric Working	Fabric Working	Sailmaker's needles	1
Tools and Instruments	Fabric Working	Fabric Working	Scissors	3
Tools and Instruments	Fabric Working	Fabric Working	Seam Rubber	1
Tools and Instruments	Fabric Working	Fabric Working	Sewing Palms	3
Tools and Instruments	Fabric Working	Fabric Working	Yarn	6
Tools and Instruments	Fabric Working	Fabric Working	Yarn Winding Board	1
Tools and Instruments	Fabric Working	Sewing	Needle Case	1
Tools and Instruments	Fabric Working	Sewing	Needles	20
Tools and Instruments	Fabric Working	Sewing	Personal Sewing Kit	2
Tools and Instruments	Fabric Working	Sewing	Thimbles	2
Tools and Instruments	Furniture	Furniture	Bail Handles	4
Tools and Instruments	Furniture	Furniture	Canvas	1
Tools and Instruments	Furniture	Furniture	Decoration	2
Tools and Instruments	Furniture	Furniture	Hooks	2
Tools and Instruments	Furniture	Furniture	Keyhole Escutcheons	6
Tools and Instruments	Furniture	Furniture	Keys	4
Tools and Instruments	Furniture	Furniture	Knob	1

Tools and Instruments	Furniture	Furniture	Locks	3
Tools and Instruments	Furniture	Furniture	Ring Handles	2
Tools and Instruments	Furniture	Furniture	Rugs	3
Tools and Instruments	Furniture	Furniture	Wickerwork	3
Tools and Instruments	Furniture	Furniture	Window glass	11
Tools and Instruments	Measuring	Measuring	Bevel	1
Tools and Instruments	Measuring	Measuring	Carpenter's Square	1
Tools and Instruments	Measuring	Measuring	Folding Rulers	2
Tools and Instruments	Medical Supplies	Medical Supplies	Baluster	1
Tools and Instruments	Medical Supplies	Medical Supplies	Bottles	3
Tools and Instruments	Medical Supplies	Medical Supplies	Jar	1
Tools and Instruments	Medical Supplies	Medical Supplies	Phials	3
Tools and Instruments	Musical Instrument	Musical Instrument	Pipe (instrument)	2
Tools and Instruments	Navigation	Navigation	Compass	1
Tools and Instruments	Navigation	Navigation	Compass Parts	4
Tools and Instruments	Navigation	Navigation	Dividers	5
Tools and Instruments	Navigation	Navigation	Magnifying Glass	2
Tools and Instruments	Navigation	Navigation	Optical Instruments	8
Tools and Instruments	Navigation	Navigation	Sandglasses	5
Tools and Instruments	Ship Maintenance	Ship Maintenance	Adze	1
Tools and Instruments	Ship Maintenance	Ship Maintenance	Augers	4
Tools and Instruments	Ship Maintenance	Ship Maintenance	Axe	2
Tools and Instruments	Ship Maintenance	Ship Maintenance	Brushes	2

Instruments				
Tools and Instruments	Ship Maintenance	Ship Maintenance	Caulking Irons	3
Tools and Instruments	Ship Maintenance	Ship Maintenance	Cold-Chisel	1
Tools and Instruments	Ship Maintenance	Ship Maintenance	Crowbars	2
Tools and Instruments	Ship Maintenance	Ship Maintenance	Files	3
Tools and Instruments	Ship Maintenance	Ship Maintenance	Funnels	1
Tools and Instruments	Ship Maintenance	Ship Maintenance	Gimlets	4
Tools and Instruments	Ship Maintenance	Ship Maintenance	Hand-chisel	1
Tools and Instruments	Ship Maintenance	Ship Maintenance	Hand-clamp	1
Tools and Instruments	Ship Maintenance	Ship Maintenance	Handle Hammer	1
Tools and Instruments	Ship Maintenance	Ship Maintenance	Horsing Iron	1
Tools and Instruments	Ship Maintenance	Ship Maintenance	Knife Scabbard	1
Tools and Instruments	Ship Maintenance	Ship Maintenance	Loggerhead (loggerheat)	1
Tools and Instruments	Ship Maintenance	Ship Maintenance	Mallets	2
Tools and Instruments	Ship Maintenance	Ship Maintenance	Maul	1
Tools and Instruments	Ship Maintenance	Ship Maintenance	Paint Millstone	1
Tools and Instruments	Ship Maintenance	Ship Maintenance	Paintbrushes	2
Tools and Instruments	Ship Maintenance	Ship Maintenance	Punch	1
Tools and Instruments	Ship Maintenance	Ship Maintenance	Saw Handle	1
Tools and Instruments	Ship Maintenance	Ship Maintenance	Shovel	1
Tools and Instruments	Ship Maintenance	Ship Maintenance	Spatula	1
Tools and Instruments	Ship Maintenance	Ship Maintenance	Tongs	1
Tools and Instruments	Ship Maintenance	Ship Maintenance	Tool Handle	14



Tools and Instruments	Ship Maintenance	Ship Maintenance	Whetstone	1
Tools and Instruments	Ship Maintenance	Ship Maintenance	Wires	2
Tools and Instruments	Tools and Instruments	Tools and Instruments	Bell Clapper	1
Tools and Instruments	Tools and Instruments	Tools and Instruments	Ship's Bell	1
Tools and Instruments	Writing	Writing	Inkwells	3
Tools and Instruments	Writing	Writing	Writing Box	1

