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AN EXAMINATION OF FLINTLOCK COMPONENTS AT
FORT ST. JOSEPH (20BE23), NILES, MICHIGAN

by

Kevin P. Jones

A thesis submitted to the Graduate College
in partial fulfillment of the requirements
for the degree of Master of Arts
Anthropology
Western Michigan University
April 2019

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Kevin P. Jones

AN EXAMINATION OF FLINTLOCK COMPONENTS AT
FORT ST. JOSEPH (20BE23), NILES, MICHIGAN

Kevin P. Jones, M.A.

Western Michigan University, 2019

The purpose of this study is to identify the age, country and place of origin, function (e.g. fusil, pistol), and intended use (e.g. military, trade gun) of flintlock components recovered from Fort St. Joseph (20BE23), an eighteenth-century French mission-garrison-trading post in southwest Michigan. Flintlock muskets were a vital technology in New France throughout the fur trade era, both in their roles as weapons and as hunting implements. They were also important because their relatively complex nature necessitated localized, frontier supply and repair; their use and maintenance were integrated into many facets of frontier life. Historical documents and archaeological materials show that Fort St. Joseph was one location where flintlock-related activities occurred. Close examination of Fort St. Joseph's flintlock artifacts provides insight into the weapons that were used and maintained on the frontier, as well as the significant roles they played in the North American fur trade more widely.

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CHAPTER I

INTRODUCTION

Throughout the late seventeenth and eighteenth centuries, flintlocks were the modern military weapons for the armies of France, England, and most other European powers (Brown 1980:77; Neumann 1998:10). The flintlock was the apex of personal weaponry during the fur trade era, and was by far the most common type of firearm of this time. Not only were flintlocks the foundation of European armies of the time, but trappers, traders and woodsmen also relied heavily on them (Brown 1980:77). Flintlocks were not only used to obtain the furs for which the North American fur trade gets its name, but were also frequently exchanged for furs themselves. Flintlocks were so widely sought after by Native Americans that Native preferences helped shape the forms of many trade guns (Brown 1980:153; Gale 2010:9; Russell 1957:11). Thousands of weapons made in the workshops of Europe were intended for the hands of Native peoples (Russell 1957:15-16). Thus, flintlock weaponry was a technology used by people of diverse backgrounds during the fur trade.

As manufactured goods, flintlock weapons also required skilled labor in order to properly service and repair them. While minor repairs could be done by amateurs as the practical conditions of the frontier dictated (Bodoh 2004; Hamilton 1987:116), gun owners typically sought out blacksmiths and the more specialized gunsmiths. These skilled craftsmen could be found at most forts and militarized outposts, plying their trades for the soldiers, traders, and trappers that lived, worked, or passed through these sites. During the fur trade, access to repair services was often extended to Native allies as a way to curry favor. Smiths recorded their work so as to be later reimbursed by their respective governments (Gale 2010:7; Peyser 1978:99).

While forts may have provided these services, most trading posts lacked the tools and skilled workers necessary to properly repair the weapons of Natives or Europeans. This forced gun owners to travel in order to seek repairs, perform their own basic repairs, or dismantle or scrap their weapons all-together (Gale 2010:7).

There are a number of reasons why flintlocks are a pertinent and meaningful research topic for the historical archaeologist interested in the North American fur trade. One important aspect is the popularity and widespread use they attained during the fur trade era. For the archaeologist, this means flintlocks are both important contextually to the fur trade, and that the remains of them are often recovered archaeologically. The diversity of communities living within the frontier (e.g., soldiers, trappers, traders, Natives and Europeans alike) ensured that flintlocks were in use by a large number of individuals for various reasons. This ubiquity means flintlock weapons cut across many facets of seventeenth and eighteenth century fur trade life. Flintlocks played a role in warfare, political struggles, trade, subsistence, social life and more. Such sociocultural and economic analyses are ultimately built upon foundations of straightforward archaeological inquiry – the “who, what, when, where” of the artifacts themselves.

Due to their persistent usage through time and the steady changes which accompany the technology’s history, flintlock weapons are valuable as chronological markers. The differences inherent in their design also allows them to be classified by countries of origin and function. Authors have documented the variations in flintlock designs during the North American fur trade over time and space (e.g., Bailey 1997; Gladysz 2011; Hamilton 1987). Even within a single country's armories, weapons differed over time in their styles or by intended purpose. A weapon for cavalry would differ substantially from one intended for use by a basic soldier. A weapon for civilian and trade use would similarly differ from one meant for military use. Over time,

preferences and technology changed as expressed in the design of weapons. Stylistic conventions evolved, sizes of barrels, stocks, and lock plates were altered; and military regulations regarding firearms were modified. These changes have ensured that flintlocks and their parts are ideal chronological markers, though, some parts are more informative than others. These variations are the essential data for examining their spatial, temporal, and formal dimensions.

This study intends to answer these questions in regards to the flintlock hardware recovered from Fort St. Joseph. Excavations of Fort St. Joseph have been carried out regularly since 2002 by Western Michigan University archaeologists (Nassaney 2015:164). Over 250 flintlock components were recovered during these excavations, of which approximately 125 artifacts originated from a single cache of flintlock parts. These artifacts have not been previously analyzed. Additionally, available historical documents demonstrate the use and maintenance of flintlocks at Fort St. Joseph. For example, translations indicate that a gunsmith lived and worked at the fort, providing insight into the types of repairs and services he supplied (Peyser 1978). This combination of historical documentation and archaeological material provides ample opportunity for comparative analyses. In summary, this study seeks to identify the range of gun parts, determine their conditions, and compare the types and frequencies of the cached and non-cached artifacts.

This study is organized as follows. Chapter II is a literature review which examines the historical backgrounds of the North American fur trade, flintlock weaponry, Fort St. Joseph (20BE23), and previous studies of flintlock classification and repair. Chapter III is informed by the literature review, and outlines the framework and methodology used in this study to analyze the flintlock artifacts from Fort St. Joseph. Chapter IV presents the results of the analysis of Fort St. Joseph's flintlock artifacts. Chapter V addresses the research questions regarding the identification, condition, and comparison of Fort St. Joseph's flintlock artifacts.

CHAPTER II

LITERATURE REVIEW

From the late seventeenth through the mid-eighteenth century, the French established forts and outposts in the region of North America known as New France in order to participate in the fur trade (White 1991:12). This region is roughly defined by the Great Lakes and extends north and west to the edges of French activities and exploration into the North American frontier (White 1991:xii). The forts established in this region facilitated a network of trade which extended both into and out of the pays d'en haut. Goods such as cloth, copper kettles, beads, and axes (among a variety of other goods) were brought into New France while furs traveled out (White 1991:128). French interests in the region were maintained through alliances with Native peoples, and many of the activities which helped foster these alliances took place at these forts and outposts or through the support network provided by these installations (Peyser 1978:9; White 1991:25). One type of good which played an essential role in all these activities is the flintlock.

The Flintlock

The history and origin of the “true” flintlock is an expansive topic in its own right. Historical accounts suggest that the true or “French” flintlock was developed in northern France during the first quarter of the seventeenth century (Lenk 1939:31). Prior to the advent of the true flintlock however, there was a progressive refinement of various other types of locks, which, in relatively quick succession, brought the technology from matchlock to true flintlock. Spurring this development was the search for firing mechanisms that overcame the disadvantages of earlier designs to better suit the needs of those that used firearms. Understanding the limitations

inherent in earlier firearms helps to highlight the importance of the true flintlock and the advantages its development presented. These advantages, in turn, provide context for the importance flintlocks held in the lives of the individuals on the North American frontier.

Earlier firing mechanisms ranged from the simplistic fifteenth century matchlock (Figure 1), a burning match attached to a lever trigger, to the complex sixteenth century wheellock (Figure 2), so named for its ingenious spring-driven wheel ignition (Lenk 1939:6-7). These two weapons demonstrate two extremes in the design of early firearms. The matchlock was easy to maintain, but crude and highly susceptible to weather. However the wheellock, while well engineered, was costly and difficult to service in rugged conditions. These early mechanisms demonstrate a technological need that firearm designers were eager to fill; a weapon designed to be reliable and versatile, while also being simple enough to avoid issues of practicality and costs.

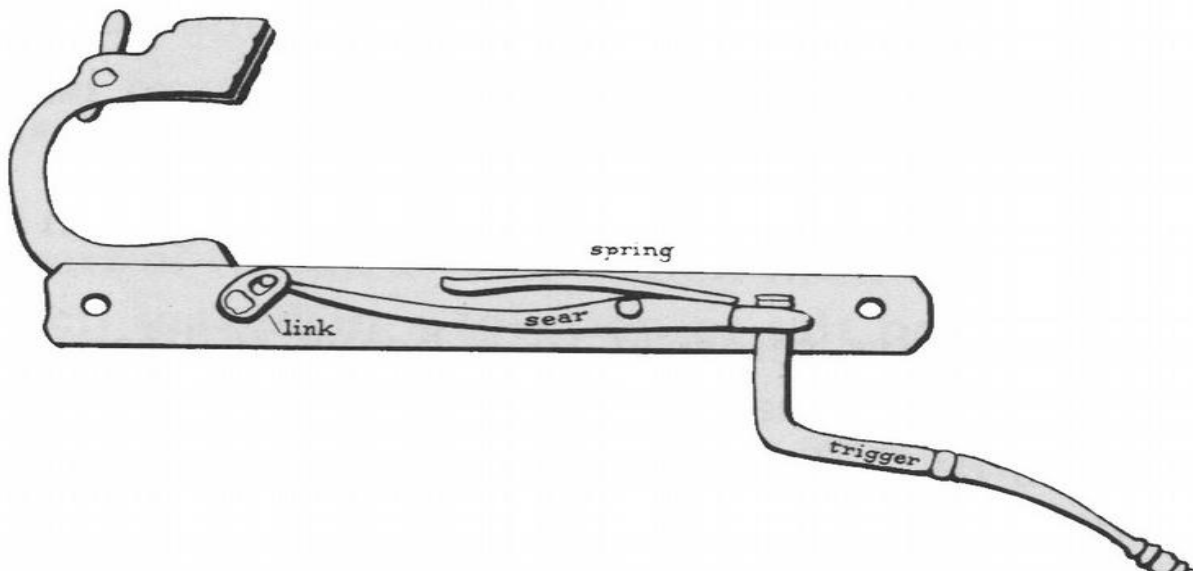


Figure 1. An Early Matchlock (Reproduced from Peterson, 1956:13)

Starting in the early seventeenth century, a number of firing mechanisms began to be developed that provided a better balance of these considerations. These mechanisms were refinements of designs based on the striking of flint and steel to create the sparks of ignition, and

were appropriately named flintlocks (Neumann 1998:7). These flintlocks, though sometimes called “firelocks,” comprised a number of similar, though distinct, mechanisms, differing primarily in the arrangements of their core components; the flint, steel, and triggering mechanism.

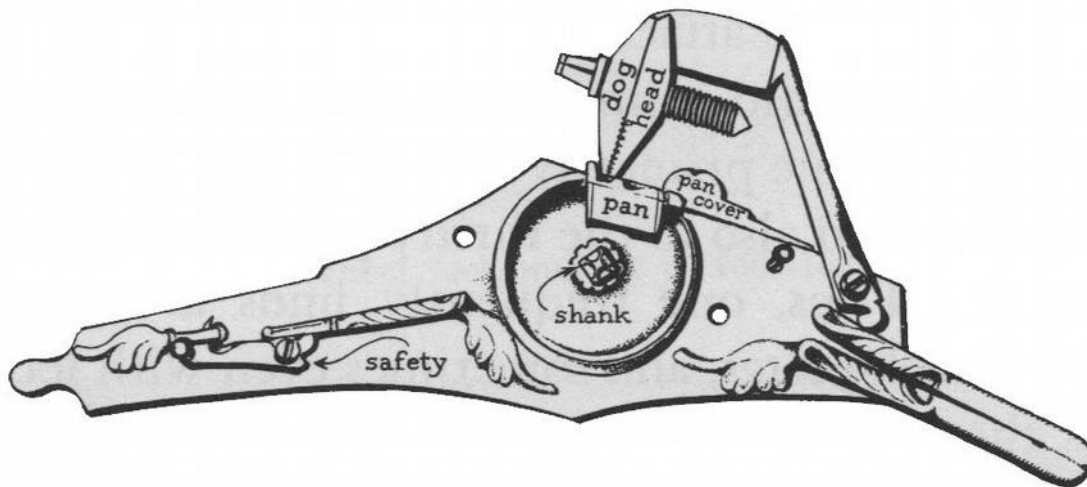


Figure 2. Wheellock Mechanism c.1565 (Reproduced from Peterson 1956:17)

The first of these flintlocks was known as a snaphaunce (Figure 3). The snaphaunce consisted of a cock, an arm or battery with a steel striking face, and a separate cover over the pan to protect priming powder (Russell 1957:11). When the trigger was pulled, the cock was released, swinging the flint forward to strike the steel battery and simultaneously opening the pan cover (Neumann 1998:8). This arrangement had the benefit of safety, as the gun could be carried while loaded and primed due to a locking sear mechanism which held the cock stationary. Safety was further improved by the addition of a half-cock tumbler, which allowed the cock to be pulled back just enough to allow the pan cover to close, but not enough to pose a risk of accidentally firing (Russell 1957:11).

The second of these flintlocks, commonly associated with Spain and Italy, is the miquelet lock (Neumann 1998:8). The miquelet lock combined the steel and pan cover into a single

pivoting frizzen (Figure 4). When the frizzen is struck on the face, the entire assemblage of steel and pan cover is pushed out of the way, allowing the resulting sparks to light the powder in the pan. This arrangement served to simplify the action of the lock while retaining the same essential functionality, and was both easier and cheaper to make (Brown 1980:74).

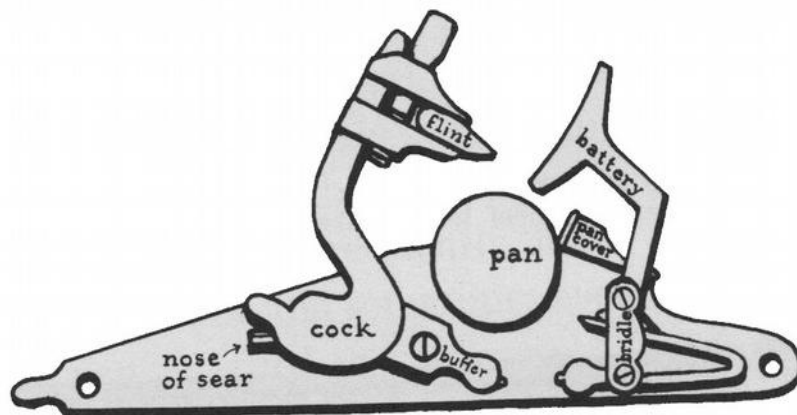


Figure 3. A Snaphaunce Lock (Reproduced from Peterson 1956:20)

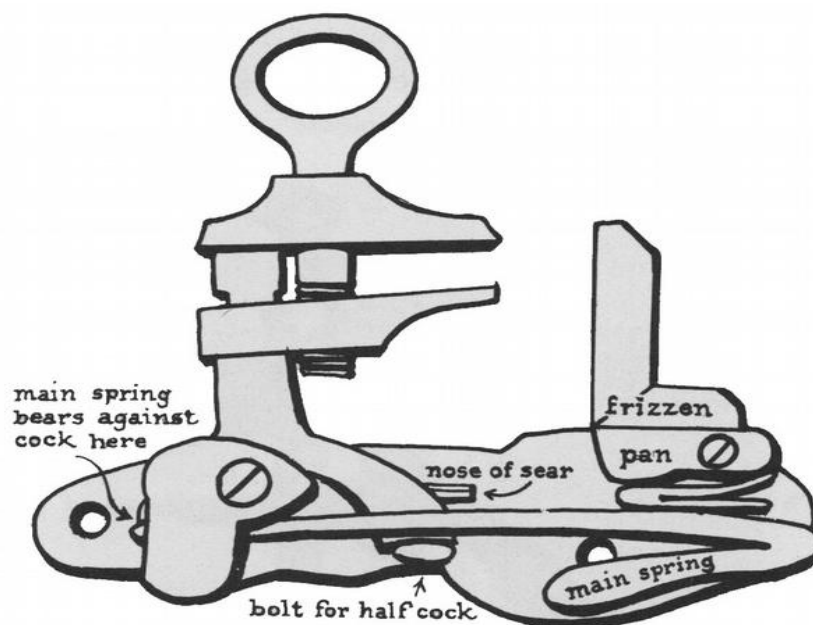


Figure 4. A Miquelet Lock (Reproduced from Peterson 1956:29)

The final of these three flintlock designs is the English lock (Figure 5). Like the Miquelet lock, the English lock streamlined the ignition process by combining the pan cover and steel into a single pivoting frizzen (Brown 1980:74). Unlike the Miquelet lock however, the English lock moved components such as mainspring to the inside face of the lock plate. The English lock incorporated an external safety catch or “dog,” which led to it also being called a “doglock.”

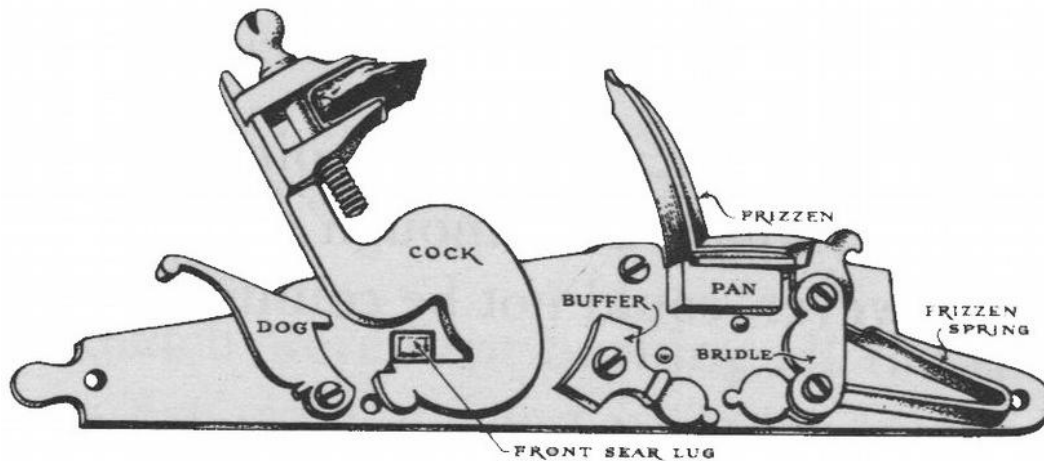


Figure 5. An Early Doglock Mechanism (Reproduced from Peterson 1956:22)

These three flintlocks were common during the first half of the seventeenth century, but would later largely fall out of favor as a more advanced lock design became available. Their innovations, such as the half-cock tumbler, the frizzen, and simplified internal mechanisms, would live on in the design of the French flintlock.

The “True” or French Flintlock

The French flintlock (Figure 6) represented the most refined firearm of the seventeenth and eighteenth centuries, being surpassed only by the introduction of the percussion cap at the start of the nineteenth century (Peterson 1956:35; Russell 1957:242). Historians disagree on exactly when the first true flintlocks were introduced, but consensus is that the first of these weapons was made sometime between 1610-1620 (Lenk 1939:41; Peterson, 1956:35).

The design of these weapons improved and simplified two main elements of earlier firearms. The first of these is the action of the sear. Previous designs, such as the English lock, utilized a horizontally pivoting sear which either contacted the cock through the lock plate or contacted the tumbler internally. The true flintlock introduced a new internal vertical sear to engage the tumbler (Peterson 1956:35). The second was the continued development of the half-cock tumbler safety position, which allowed the weapon to be carried while primed (Peterson 1956:35). By simplifying these mechanics, the French lock made the manufacture, use, and maintenance of firearms much easier, as well as spurring innovation in weapon diversity. For example, the resulting reductions in size and weight afforded by the new mechanisms proved to be a particular boon for handguns (Brown 1980:78). Throughout the era of the fur trade, innovation focused on refining the French flintlock's advantages.

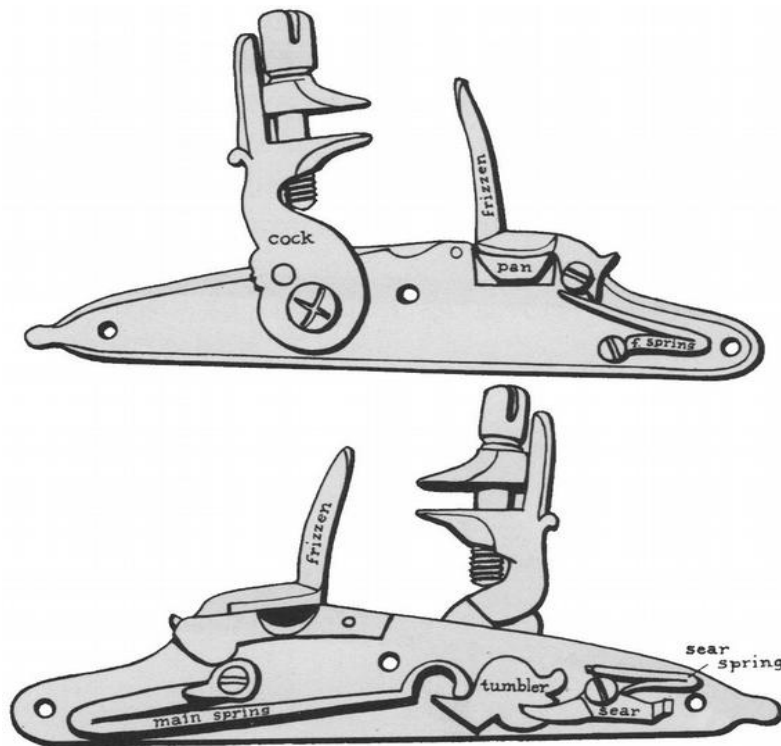


Figure 6. Flintlock Mechanism, c.1660-1670 (Reproduced from Peterson 1956:32)

The Specializing of Flintlocks

With the growing adoption of flintlock firearms through the middle of the seventeenth century, efforts toward improving firearms began to shift from ignition systems to the creation of types of guns designed to meet specific needs. The armories of the European powers began to fill with muskets and pistols specialized for particular military units, such as “Marine,” “Sea Service,” and “Cavalry.” By the start of the eighteenth century, weapons had diversified to a point such that countries, armies, and militias felt the need to set clear standards, or patterns, for the weapons supplied to their troops. The two military forces with the most influence on the North American fur trade were France and England, both of which had distinct patterns for their firearms.

French Military Arms

In addition to making many developments in flintlock technology through the seventeenth and early eighteenth centuries, France also made some of the earliest regulations and gun patterns for the firearms of their armies. In the early 1710’s, France began a process to centralize weapons production (Neumann 1998:17). In 1717 France introduced the first standard firearm to be used by European militaries, and began overseeing their production at three designated royal armories (Peterson 1956:172; Brown 1980:182; Neumann 1998:17). This series of basic infantry musket, or “fusil ordinaire,” used iron furniture. This basic pattern persisted for nearly a century with only periodic, minor updates. For example, the barrel was shortened by 1.5 inches in the middle of the century, external bridles were added, removed, and added again, and various changes to gun furniture were made (Brown 1980:182; Neumann 1998:19; Peterson 1956:172). For French marine, naval, cavalry, officer’s versions of firearms, similar trends followed with minor alterations, such as the substitution of iron furniture with brass furniture or the addition of engraving on officer’s fusils (Brown 1980:184).

Several changes throughout the period are particularly notable. In the 1770's, French infantry muskets switched from a flat faced lock to a rounded lock (Neumann 1998:95). In 1728, the design of the external bridle changed before being removed entirely in 1746, and later returned in 1754 (Peterson 1956:172). The basic French musket originally had a flat goose neck cock which was reinforced in 1763 and then became convex in the 1770s (Peterson 1956:174-176; Brown 1980:184). In 1777, a more resilient brass flashpan was introduced (Neumann 1998:18) Overall, trends were toward shorter, lighter weapons and a lock with a straighter bottom edge.

English Military Arms

De Witt Bailey (1997) provides a thorough overview of pattern attributes for English military flintlocks. He describes a breadth of weapon types and categories, such as muskets, pistols, wallpieces, carbines, and marine styles. Of particular use in this work are descriptions of archaeologically observable attributes which are temporally sensitive. The number of patterns covered ranges from 1718 to 1783, providing a valuable reference for the dating of firearms during this timeframe.

In the early eighteenth century, the English military began the process of standardizing its firearms. In 1714, the Tower Armory began a system of acquiring and testing semi-standard musket parts to be issued and assembled as needed (Brown 1980:235; Bailey 1997:xi; Neumann 1998:16). This system, known as the “Ordinance System,” proved logistically and economically superior to the earlier system which allowed colonels to control their regiments weapons procurement (Brown 1980:235). In 1718, a standard musket pattern, the “Pattern of the 10,000,” was created to standardize English military units (Neumann 1998:16). This standardization continued with the creation of the “King’s Pattern” of 1722, the first in the line of weapons that, like the French military arms, would see use throughout the 1700s with only minor updates

(Brown 1980:227; Bailey 1997; Neumann 1998:17). These “Long Land” muskets, colloquially referred to as the “Brown Bess,” were fitted with brass furniture. As with French military weapons, variations existed for the standard. These varieties include marine or militia, sea service, carbines, and officer’s muskets among others. These patterns followed similar trends to the standard Long Land Pattern, with alterations including features such as reinforced cocks on sea service muskets and engraving on officer’s weapons (Brown 1980:232; Neumann 1998:70,71).

Though English military muskets underwent less drastic changes than French muskets, there are several significant modifications that occurred to the Land Pattern over its lifetime. While the 1718 pattern had iron furniture, the standard musket was mounted in brass starting with the 1722 King’s Pattern (Neumann 1998:17). Sideplates and trigger guards on 1742 and 1756 pattern muskets were simplified from the 1730 pattern musket (Bailey 1997:31). As with French muskets, the lower edge of English locks became straighter over time. Lock plates were convex faced, though English sea service muskets had flat faced locks (Neumann 1998:17). Sea service muskets also differed by having reinforced flat faced cocks, rather than the convex goose-necked cocks of the Long Land Pattern (Bailey 1997:59).

Civilian Arms

In addition to promoting diversification of military weapons, the fur trade was a great stimulus for the diversification of civilian arms. This diversification and evolution in firearm design was driven by both Native and European forces. Increasing Native reliance on firearms for subsistence, warfare, and economic livelihood ensured a high level of competition between manufactures and traders in order to provide the most desirable weapons to indigenous hunters who, in turn, provided the furs that Europeans demanded (Gale 2010:9). Given that civilian arms

are less regulated than military arms, researchers have had to work hard to develop classifications and chronologies for these weapons.

Though outdated in some respects, T. M. Hamilton's work on civilian and trade muskets still provides a wealth of knowledge regarding the forms of fur trade firearms (Hamilton 1976, 1980, 1982). Hamilton identifies two basic types of French trade guns found archaeologically in New France from approximately 1680 through 1763, the type C (c. 1680-1730) and the type D (c. 1730-1763) (Hamilton 1976:5). He distinguishes these types by a number of features, such as the size and shape of trigger guard tangs and finials, or the shape of sideplates. For example, Hamilton notes that while type C sideplates were often complex castings, many type D sideplates took the form of simple flat, triangular plates covered in engravings (Hamilton 1976:6).

For English trade guns, Hamilton identifies the type G (c. 1730-1760), which he states were made to compete with contemporary French trade guns (Hamilton 1980:45). The flat serpent sideplates with distinctive loops are diagnostic of these type G weapons. While later works supersede Hamilton for dating flintlock components (e.g., Gladysz 2011), his works are still of great value when trying to establish the origins of weapons.

Like Hamilton, Kevin Gladysz has developed a typology which divides the history of French flintlock muskets into chronological types differentiated by their forms (Gladysz 2011). However, unlike the typology developed by Hamilton, Gladysz provides more artifact types thus, allowing for a finer grained chronological placement of French flintlock muskets. Gladysz makes use of a typology which is divided into four stages of flintlock development from 1699 to 1760 (Gladysz 2011:121). Gladysz' four stages are the Berain Style (1699-1708), Early Regency (1708-1725), Regency-Rococo (1730-1740s), and Rococo-Louis XV (1740s-1760) (Gladysz 2011:123, 127, 133, 137). Like Hamilton, Gladysz uses changing attributes to establish these stages. For example, Gladysz notes that one of the differences between stage two and stage three

are the incorporation of Rococo decorative designs (i.e. scroll lines and “sea shell” like designs), which were first introduced to French flintlocks in the 1730s (Gladysz 2011:133). This and further distinctions noted by Gladysz allow for the identification and approximate temporal ordering of French flintlocks. When compared, Gladysz’ Berain Style roughly correlates to Hamilton’s type C, and his Early Regency and Regency-Rococo styles correlate to Hamilton’s type D.

A Technology on the Frontier

All firearms, military or civilian, eventually require maintenance. On the frontier of the fur trade, finding such services could be difficult. Due to the importance of their indigenous allies to their economic and political efforts in North America, the French and English governments commonly offered repair services for their weapons (Gale 2010:7). While the European militaries retained their own blacksmiths, civilians could typically find these services offered at forts and trading posts. When such services were provided to Native allies, the smiths who provided them were often later compensated by their governments. While specific services offered would vary based on the skills of the individual gunsmith (or frequently a blacksmith), they could include various tasks from mending a trigger to straightening an entire barrel (Gale 2010:7).

In addition to classifying weapons, Hamilton also discusses weapon maintenance and repair, noting that guns in the pays d'en haut were “used severely and then cannibalized to keep other guns in operation,” and blacksmiths and gunsmiths were tasked with repairing weapons with a mix of replacement parts and repaired or recycled parts (Hamilton 1976:2). Describing the activities of gunsmithing, Hamilton notes the various methods of filing, fitting, sawing, punching, and riveting needed to replace a broken cock with a used, replacement cock (Hamilton

1976:28). Such a task was a time consuming and skilled endeavor in a time pre-dating interchangeable parts.

One study that has looked at the activity of fur trade blacksmithing and gunsmithing is Roache-Fedchenko's research at Fort Michilimackinac, an eighteenth century French and later English militarized trading post in northern Michigan (Roache-Fedchenko 2013:5). Among a number of goals, this study sought to identify the spatial arrangements of blacksmith and gunsmith workshops at Fort Michilimackinac, to uncover some of the techniques used by fur trade blacksmiths, and to examine technological adaptations in frontier blacksmithing (Roache-Fedchenko 2013:5). Roache-Fedchenko approached these questions by examining historical documentation, analyzing the physical characteristics of artifacts for signs of repair, and performing pXRF (compositional) analysis of artifacts thought to have been repaired or modified (Roache-Fedchenko 2013:141-42).

Roache-Fedchenko identified three blacksmith workshop areas and noted that their positions and orientations within the fort “reinforce the importance of the blacksmith to the community and allude to the complex social nature of the blacksmith” (Roache-Fedchenko 2013:198-99). Roache-Fedchenko also highlighted the various skills and tools required by frontier blacksmiths and gunsmiths, and found the majority of the repairs she examined employed “methods of welding, brazing, or riveting” (Roache-Fedchenko 2013:200). These techniques would have required the tools common to a blacksmith; those for “shaping (hammers, fuller and swages), cutting (chisels, files), creasing or hole punching (punches, reamers), and stabilizing tools (tongs, leg or table vices)” (Roache-Fedchenko 2013:80). Noting the crossover between the skills of blacksmiths and gunsmiths, Roache-Fedchenko states that it was necessary for smiths to have skills other than gun repair in order to meet the needs of frontier society

(2013:152). In fact, flintlock repairs may well have made up the bulk of a frontier blacksmith's work during the eighteenth century (Roache-Fedchenko 2013:152).

Forts and Muskets

Forts established during the fur trade served both economic and military functions. This multi-purpose usage of forts and outposts made these sites important hubs of colonial activity in general (Nassaney 2015:43). In particular, the fact that many flintlock related activities took place at forts and outposts makes such sites logical choices for archaeologists interested in studying flintlock use and repair.

As these forts and outposts are rediscovered by historical archaeologists, new sources of data become available for study. While historical documentation provides valuable insight into the daily lives of the people who lived, worked at, and visited these sites, archaeological research is able to provide data which documents can not. For example, documents that record weapon repairs at forts do not note what types of guns were worked on, how old they were, or where they originated from.

One fort which has recently provided a wealth of archaeological materials, particularly flintlock components, is Fort St. Joseph (20BE23), located near present day Niles, Michigan, along the St. Joseph River, approximately 40 miles by river from Lake Michigan (Nassaney 2015:164).

Fort St. Joseph (20BE23), Niles, Michigan

Fort St. Joseph was occupied from 1691 to 1781. Established initially as a mission, it was well situated near the portage between the St. Joseph and Kankakee rivers (Nassaney 2002; Brandão and Nassaney 2006). During the course of occupation at Fort St. Joseph, the fort was put to use by French, English, and Native peoples, particularly the Potawatomi and Miami. The French occupied the fort for the large majority of its use (1691-1761), and it was during this time

that a gunsmith named Antoine Dehaître lived and worked at the fort. Documentation shows that from at least 1739 to 1752, Dehaître repaired flintlocks, provided supplies, and conducted various other services at the behest of both native and French individuals (Giordano 2005:37; Hulse 1977:214; Nassaney 2015:182; Peyser 1978:99, 121, 123, 141). Translations of French manuscripts by Joseph Peyser (1978) provide a look into some of these activities. Within these translations are a number of vouchers which record services provided by Antoine Dehaître, and a gunsmith named Durivage (Peyser 1978:99). These records indicate that nearly every part of a flintlock musket could frequently be repaired or replaced by gunsmiths. Figure 7 illustrates the frequency of specified gunsmithing activities (in black) and the types of gun parts worked on by these smiths (in grey), as recorded in these vouchers (Data from Peyser 1978:99, 992, 121, 1213, 141).

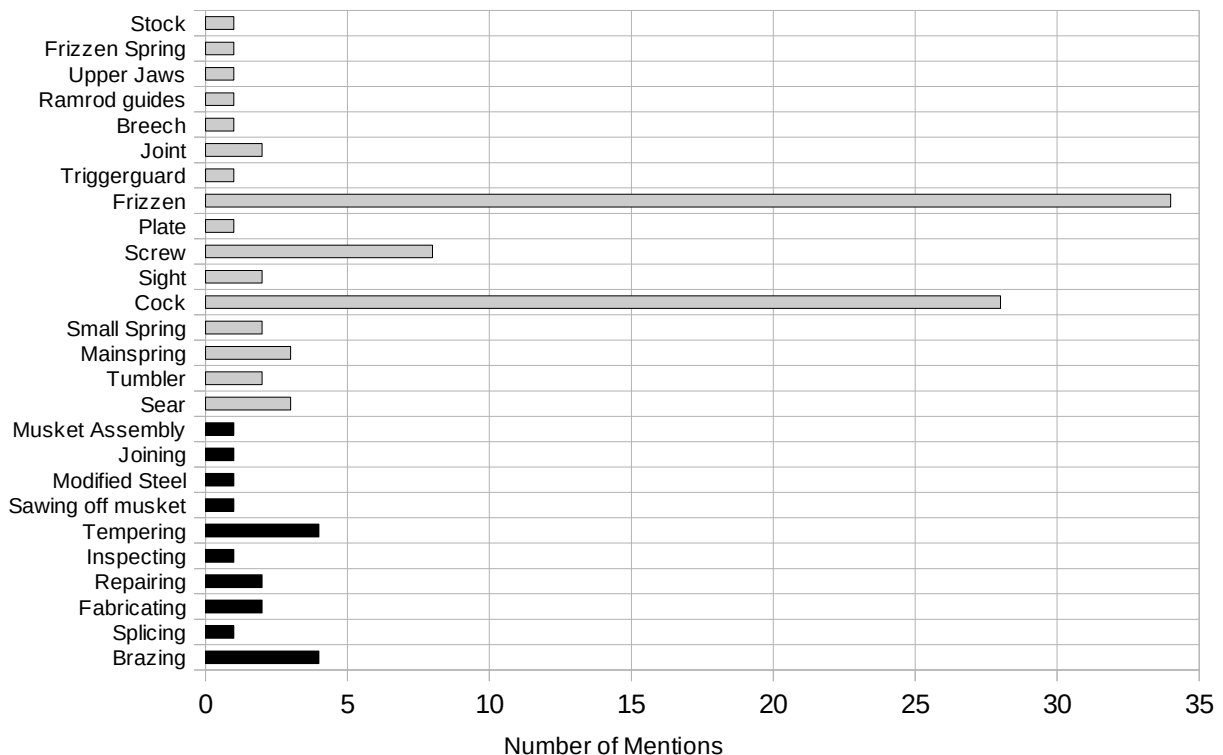


Figure 7. Frequency of Gunsmithing Repairs Mentioned in Translated Vouchers (Peyser 1978)

This historical context demonstrates that these smiths worked on flintlocks at Fort St. Joseph, and also that certain parts of guns (e.g., frizzens and cocks) appear to have had greater maintenance requirements.

Additionally, archaeological investigations of Fort St. Joseph have been carried out regularly since 2002 by Western Michigan University archaeologists (2015:164). The diversity of artifacts recovered from surface collection and excavations of Fort St. Joseph has provided, and continues to provide, rich potential for many types of research (Nassaney et al. 2003; Nassaney et al. 2007; Nassaney and Brandão 2009). Excavations since 2002 have recovered “more than 200,000 eighteenth-century artifacts, samples, and associated plant and animal remains” (Nassaney 2015:178). These collections have provided the raw material for various archaeological analyses (e.g., Giordano 2005). Among the artifacts recovered at Fort St. Joseph is a collection of over 250 flintlock components. Over 125 of these artifacts were recovered from one context, Feature 4, interpreted to be a French gunsmith’s cache (Nassaney 2015:181). Given the breadth of historical documentation, and the availability of ample archaeological materials, Fort St. Joseph is an ideal case study to examine the significance of flintlock firearms.

Untapped Potential

Woven into the fabric of the North American fur trade and the actual trading of furs was the flintlock musket as a technology, economic commodity, diplomatic tool, and subsistence provider. While European settlers, traders, and soldiers used their flintlocks in their colonial endeavors, Native consumers were driving the trade of firearms tailored to their desires and used to further their own economic and political endeavors. It is this importance to trade, diplomacy, and technological development which make the flintlock musket such a promising topic of study for fur trade historians and archaeologists (Bodoh 2004; Hamilton 1976:25; Peyser 1978:99,

121). Past studies of flintlock weaponry have clearly shown that the flintlock musket has played roles in many spheres of fur trade society.

Building upon previous works, similar methods can be applied to the archaeological materials recovered at Fort St. Joseph. For this study, the focus is on characterizing the components which, thus far, have received little scrutiny. Of importance are determining the types of parts present, their physical conditions, their chronological placement, and their country of origin. Such data contribute to a more detailed understanding of the firearms present at Fort St. Joseph. Analyzing Fort St. Joseph's flintlock artifacts also adds the growing body of fur trade narratives – particularly as they relate to the topics of flintlock trade, blacksmithing and gunsmithing labor, and technological adaptation.

Fundamentally, analysis of the flintlock components that have been found thus far will help to reveal the types of weapons used, traded, and repaired at the fort. However, more specific inquiries become available when these basic questions are answered. For examples, knowing whether or not the contents of Feature 4 correlate with historical documents could further strengthen its interpretation as a gunsmith's cache. Knowing what artifact types are present in this cache can further lead to inferences regarding how flintlocks were used and the type of work done by gun smiths who lived and worked at Fort St. Joseph.

Furthermore, Fort St. Joseph represents just one fort among a constellation of forts and outposts that formed the network of the North American fur trade. Knowing what is present at Fort St. Joseph can lead to a better understanding of this network. For instance, identifying diversity in the origins of the flintlocks at Fort St. Joseph could inform about the flexibility of trade networks or the nature of secondary networks of exchange. While Europeans sought to outfit their Native allies with their own country's weapons, it is hard to imagine that their allies would limit themselves only to the weapons they had been offered. Thus, secondary trade in

weapons by Native groups themselves could lead to weapons of one type or origin ending up in locations that may be otherwise unexpected.

CHAPTER III

RESEARCH DESIGN AND METHODOLOGY

As noted, archaeological work at Fort St. Joseph has continued steadily since its discovery in 2002. All of the artifacts—numbering in excess of 300,000 objects (Michael Nassaney, personal communication, 2019) have been inventoried before being curated in the Fort St. Joseph Museum in Niles, Michigan. These, artifact inventories identify over 250 objects as flintlock components. These artifacts were recovered during a series of field school excavations which took place from 2002-2015, though several artifacts (n=15) were finds from shovel-test pits in 1998 (Nassaney 2015:174). More than 125 of these flintlock components originated from a single contexts, Feature 4 (Nassaney 2015:181). This feature, interpreted as a blacksmith's cache from the French period of occupation, is of particular importance (Nassaney et al. 2012:67-68). Examining the types, conditions, and numbers of specific parts in this group of artifacts could be useful in interpreting the activities of a gunsmith on the frontier, especially in conjunction with existing documentary evidence (e.g., Peyser 1978). Ultimately, this study examined a sample of 176 flintlock artifacts recovered from Fort St. Joseph.

T. M. Hamilton (1982:199) aptly stated, “If the recovery of gun parts is to have any meaning, two questions must be answered: (1) what was the approximate date of manufacture and (2) where was it made?” As has been seen, these questions can be answered by careful examination of the basic components of the flintlock, primarily the lock plate, sideplate, butt plate, and cock. Certain attributes of these components can prove to be diagnostic, such as the shape of butt plates and trigger guards or the forms of various etchings and decorative motifs. By examining these features and comparing them to known flintlock patterns, design plates made by

historical craftsmen, and the existing archaeological record, it is possible to determine when parts were made, where they were crafted, and what kind of gun they came from. This research relies on typologies created by Hamilton (1987, 1976) and Gladysz (2011), as well as other sources of known flintlock patterns to identify the flintlock artifacts from Fort St. Joseph.

The most basic classification that is given to flintlock components in this study is the “artifact type.” Some of the artifact types used in this study are illustrated in Figure 8. The artifact types include: lock plate, pan, cock (including upper jaw and jaw screw), escutcheon, butt plate, sideplate, ramrod pipes, frizzen (including external bridle), frizzen spring, mainspring, sear spring, sear (including internal bridle), tumbler, trigger, trigger guard, trigger plate, and barrel (including breech plug). Since the objective of this study is to analyze flintlock components for the purpose of identifying origin and age, only components which can be confidently classed into one of these artifact types were used.

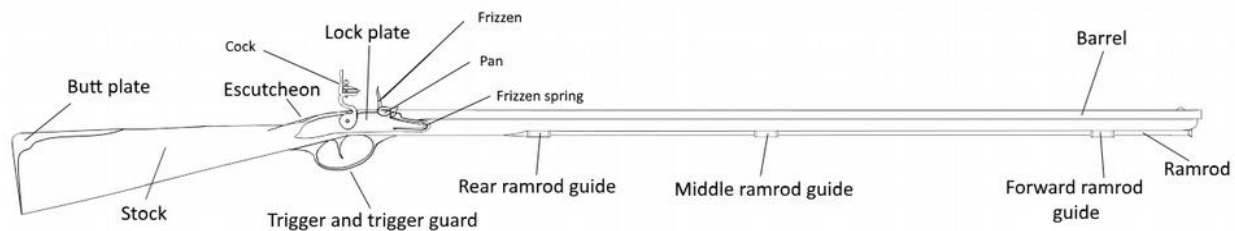


Figure 8. The Components of a Flintlock Musket

In this study, artifact types are relatively standardized parts that serve specific functional purposes in the flintlock. For example, objects that can be identified as a trigger may vary slightly in size or shape, but will nonetheless serve the core function of “triggering” the firing process of the gun. In a similar example, various types of ramrod pipes may vary in décor or material, but will serve the primary function of securely stowing the weapon’s ramrod when not needed. The purpose of first dividing flintlock components into types is that it allows focus on

the most relevant aspects of the parts that fit into that group. Using the two above examples, size and shape may be more important in determining age and origin for triggers, however, style of décor and material may be more important in determining the age and origin of ramrod pipes. In such a way, checklists of relevant features common within those artifact types can allow for ease of record keeping and within-group comparisons.

To organize the analysis of the specific features of each of these artifact types, this project utilizes a datasheet querying each of these features. For example, all components, regardless of artifact type, were recorded by raw material (e.g., iron, copper, copper alloy). Artifact types have their own unique characteristics as well, such as the shape of comb of a cock or whether or not a ramrod pipe is constructed of cast or sheet metal. Notable features such as signs of repair, damage, and modification were also recorded.

Not all of the components on a flintlock musket are diagnostic of age or origin. Some components are more temporally sensitive than others. Components that can provide the most information relevant to identification by age or origin tend to include the lock plate, pan, cock, escutcheon, butt plate, sideplate, trigger guard, and the breech end of the barrel. Less diagnostic components include the ramrod pipes, trigger, trigger plate, frizzen, and frizzen spring. Components with little diagnostic value include internal components such as the mainspring, sear, sear spring, and tumbler, as well as the middle and forward sections of the barrel. Figure 9 illustrates a number of these components.

Stylistic variation is the prime factor by which age and origin are determined. As per H. Martin Wobst (1977:330), “those artifacts are more appropriate for stylistic messages [...] which are more visible, which enter more information exchanges, and which are potentially encountered by more individuals.” Thus, for components such as the lock plate or sideplate, there may be many informative features diagnostic of age or origin. Conversely, mainsprings or

sears, for example, will have many fewer informative features to examine and note. Of course, no features are diagnostic in and of themselves, and it requires a number of congruent features in order to make an adequate determination of the age and/or origin of a component.

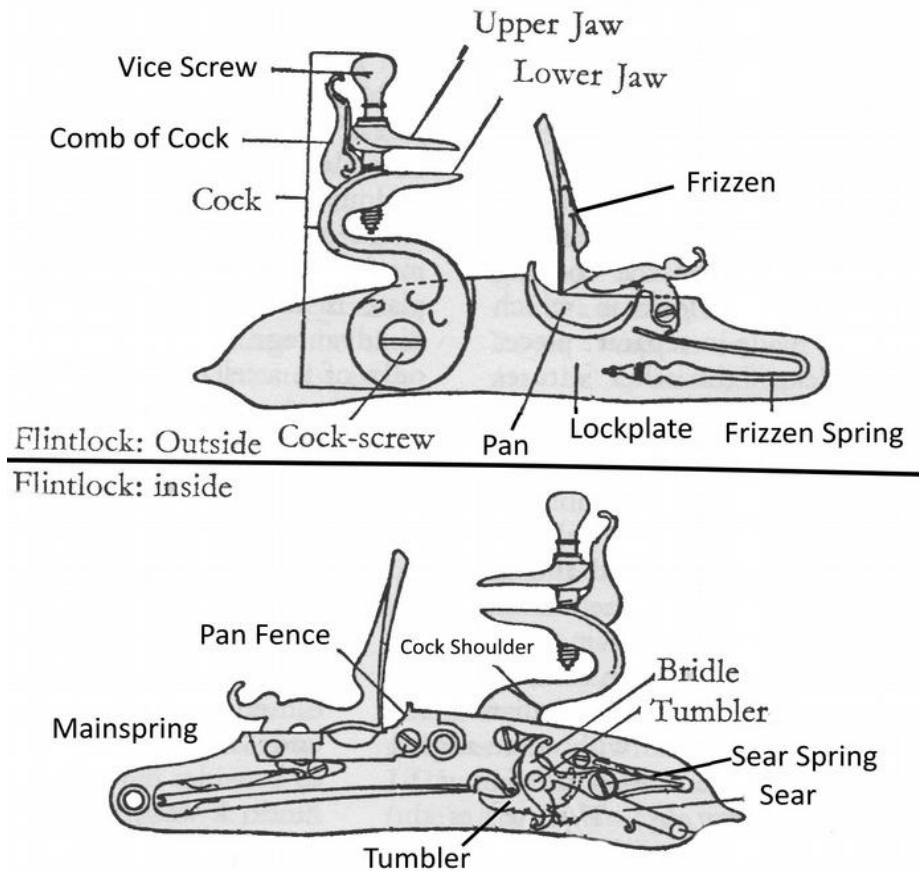


Figure 9. The External and Internal Components of a Flintlock

(Reproduced from Lenk 1965:9)

Among the most diagnostic components on a flintlock is the lock plate itself. First, there are dimensional features, such as the overall length and width (or rather height) of the plate. These measurements are readily comparable to known weapon patterns (e.g. the “Brown Bess”) and can serve to quickly narrow the field of possibilities. Another set of attributes relates to the general shape of the lock plate, such as a beveled or curved edge profile, a downward curving lower edge, or the positions of screw holes.

These attributes can also be compared to known weapon patterns. However, they also allow a typological analysis that looks at the trends followed through time or in various countries. For example, through the eighteenth century, lock plate designs of all origins, French or English, tended to trend towards a straighter lower edge which drooped downward less dramatically, as seen in Figure 10. The change from so-called “banana locks” is noted, for instance, among British arms (Peterson 1956:34).

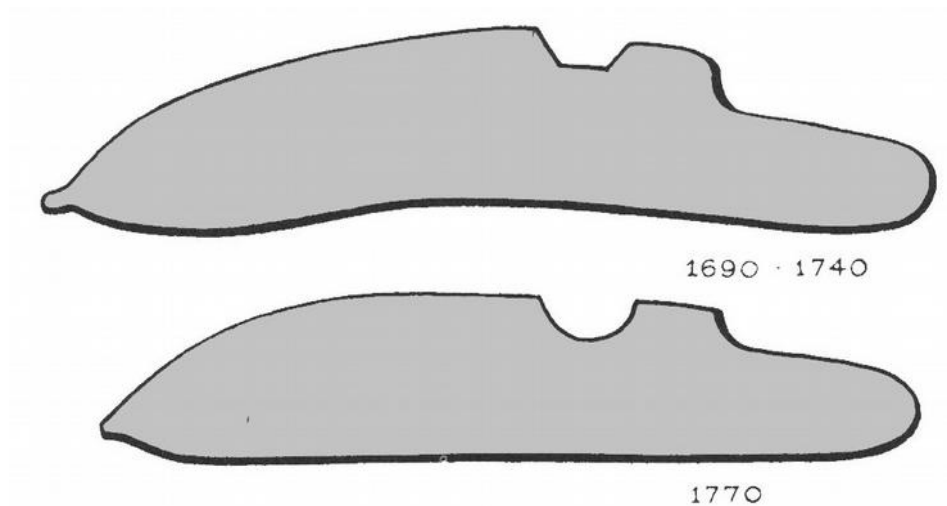


Figure 10. The Evolution of the Flintlock Lock Plate (Reproduced from Peterson 1956:34)

Flashpans are also temporally and culturally diagnostic. For example, flashpans themselves can be either integral with the lock plate or removable, which can help in identifying the type of weapon it belonged to. Flashpans can also have a bridle, such as the flashpan of British Brown Bess muskets that post-date 1742. Some pans have a raised lip at their rear called a fence, and the size and shape of this fence varies. Additionally, the shape of a pan can be informative. Some pans have a rounded underside, whereas others have faceted shapes. The rounded pan of a Brown Bess differs greatly from the gently faceted pans of many French weapons.

Cocks are another common component which can provide valuable information. Like lock plates, the physical dimensions of a gun cock can help in narrowing down the type of gun it likely came from. Also, the general shape and form of a cock can aid in identification. Some cocks, like those on Brown Bess muskets, have a rounded body, whereas others, such as the British Sea Service cock, are flat. Flat cocks may have straight edges or beveled edges. Some cocks, like on British Sea Service weapons, have reinforced or “double” neck. The shape of the post or “comb” at the top of a cock is also diagnostic. Some combs are broad and flat with a groove down the middle in which a tenon on the back of the upper jaw would slide up and down. Other cocks had combs that were narrow, and instead, the upper jaw would fit around the comb. Even the jaw screw that holds the upper jaw to the cock can provide useful information. Jaw screws may have horizontal holes through them, slots on the top, or both.

Another group of components which provides a large amount of useful information is musket furniture, including the escutcheon (sometimes called “thumbplate”), butt plate, sideplate, and trigger guard. These components are often decorated, and may have etchings or ornate tangs and finials. These decorations typically vary based on the type of weapon, the country of origin, or the age. Due to this, these components can often be identified with some degree of confidence. For example, a type of sideplate popular on French trade weapons during the first half of the eighteenth century took the form of a flat triangular plate. Often, this type of sideplate was etched with scenes of hunting dogs and stags. This is particularly true of such triangular shaped sideplates of the 1710s through 1730. For butt plates and trigger guards, tangs exhibit a great variety of stylistic detail, and many of their shapes are diagnostic of age and/or origin. For example, the distinctive pin secured, stepped butt plate tang of an English Long Land Pattern musket is unmistakable next to a shorter, screw fastened butt plate from an English Militia Pattern musket.

For frizzens, the shape of the face surface can be rectangular, hexagonal, rounded, or pointed arch to name a few variations, and the striking surface can be straight or curved. Frizzens may also have an external bridle, which serves as a support for the frizzen by bridging the gap between either the pan and frizzen screw or the frizzen screw and frizzen spring screw. Either bridle type requires a frizzen in which the pivot hole pierces all the way through, but which one is used varies from one gun pattern to another. For example, the French model 1717 featured a bridle between the frizzen and frizzen spring, the French model 1728 had a bridle integrated to the pan, and the French model 1746 omitted an external bridle all together (this was backtracked to a pan-frizzen bridle for the 1754 model). Thus, even with one line of French military guns, small variations in components such as the frizzen and frizzen spring can inform analyses of age and origin.

Based on the length of occupation and activity, the majority of artifacts are expected to be French in origin, and fall into a range of ages roughly contemporaneous with French occupation. This is particularly true in regards to Feature 4, which has been previously interpreted as a French occupation gunsmith's cache (Nassaney 2015:181). Comparisons between the cached parts and those found in other areas of the site will also likely show differences in the types and conditions of artifacts. Given the historical documentation that shows work done by blacksmiths at Fort St. Joseph (Peyser 1978), it is expected that the types of artifacts found in Feature 4 will match closely with those described in the documents (Figure 7).

CHAPTER IV

DATA ANALYSIS AND RESULTS

This chapter analyzes the data gleaned from utilizing the methodologies above. This chapter begins by looking at the basic characteristics of the sample as a whole: the numbers of artifacts, the conditions and physical characteristics of those artifacts, and their countries of origin, ages, and weapon types for those artifacts. The chapter then focuses on Feature 4, analyzing the same characteristics (numbers, artifact types, conditions, etc.) for artifacts found within that feature specifically. Finally, the chapter examines a pair of additional artifacts – screwdrivers or turn screws – which, while not being flintlock components themselves, are likely related to flintlock maintenance.

Description of the Sample

Since identifying each specific artifact is of importance to this study, artifacts grouped under the same accession number were assigned additional “suffixes” to distinguish them from one another. A hypothetical example would be “artifact 01-2-345.67a,” where “01” indicates the year 2001, “2” indicates the second site investigated that year, “345” indicates a provenience, “67” indicates a grouping of artifacts, and “a” is an individual identifier. All 176 artifacts were categorized, at a minimum, as one of the above types of flintlock components. Table 1 shows a concise tally of the artifacts within each artifact type.

While an initial review of artifact inventories indicated over 250 flintlock artifacts, the final sample consists of 176 artifacts. Some flintlock artifacts that have been found at Fort St. Joseph were not included in this study because I was unable to locate them in the artifact collections or displays. Additionally, several artifacts identified in site documents as flintlock

components were not actually flintlock parts, and were removed from the study. However, the predominant reason for excluding artifacts from this study was degradation beyond identification. The conditions of the Fort St. Joseph site have contributed significantly to the deterioration of ferrous artifacts. The soil of the site is typically saturated, if not entirely flooded, leading many of the artifacts recovered to be little more than unidentifiable fragments or rust concretions. Approximately 15% of the artifacts I could locate fell into this category. Such artifacts were excluded from the study.

As can be seen from Table 1, the most numerous types of artifacts were cocks (19.9%), breech plugs (18.2%), and frizzens (17.6%). These three artifact types made up over half (55.7%) of the artifacts studied. The remaining artifact types appeared at rates of 6.8% or less each, with the least common types – barrels and escutcheons – both having only one example each (0.6%).

Artifact Attributes

Among other variables, artifacts were assessed by raw material. All of the 176 artifacts fell into two material groups; ferrous and copper alloy metals. Copper alloy artifacts were limited to flintlock furniture such as; butt plates, escutcheons, finials, ramrod guides, sideplates, and trigger guards. These artifact types are notably decorative in nature. No artifact types were found in both ferrous and copper alloy forms. Twenty-five (14.2%) of the studied artifacts were copper alloy, while 151 (85.8%) of all studied artifacts were ferrous (Table 1).

Nearly 60% of the artifacts included in the study were damaged or broken in some way. Table 1 shows the proportions of broken artifacts in each artifact group. For the purposes of this study, a “damaged” artifact implies one which would not, without extensive repairs, be usable for its intended purpose. Examples include breech plugs that lack their plug or tang, pans which have burned through, or cocks with broken jaws or necks.

Table 1. Summary of Artifacts by Type, Damage, and Raw Material

	Number of Artifacts	Frequency	Number Damaged	Frequency Damaged	CU Alloy	Ferrous
Cocks	35	19.9%	21	60.0%	0	35
Breech Plugs	32	18.2%	18	56.3%	0	32
Frizzens	31	17.6%	17	54.8%	0	31
Mainsprings	12	6.8%	11	91.7%	0	12
Pans	11	6.3%	4	36.4%	0	11
Butt Plates	7	4.0%	5	71.4%	7	0
Trigger Guards	7	4.0%	7	100.0%	7	0
Side Plates	5	2.8%	5	100.0%	5	0
Vice Screws	5	2.8%	1	20.0%	0	5
Bridles	3	1.7%	2	66.7%	0	3
Frizzen Springs	3	1.7%	2	66.7%	0	3
Gun Worms	3	1.7%	3	100.0%	0	3
Lock Plates	3	1.7%	0	0.0%	0	3
Ramrod Guides	3	1.7%	1	33.3%	3	0
Sears	3	1.7%	1	33.3%	0	3
Tumblers	3	1.7%	0	0.0%	0	3
Finials	2	1.1%	2	100.0%	2	0
Screws	2	1.1%	1	50.0%	0	2
Triggers	2	1.1%	0	0.0%	0	2
Upper Jaws	2	1.1%	0	0.0%	0	2
Barrel	1	0.6%	1	100.0%	0	1
Escutcheon	1	0.6%	1	100.0%	1	0
Totals	176	100.0%	103	58.5%	25	151

The three most common artifact types – breech plugs, cocks, and frizzens – were all damaged at similar rates of just over half (56.3%, 60.0%, and 54.8% respectively). Similar rates are common to bridles (66.7%) and frizzen springs (66.7%). Greater percentages of butt plates (71.4%) and mainsprings (91.7%) were damaged, while all barrels, escutcheons, finials, gun worms, sideplates, and trigger guards were damaged. Only half of screws were damaged (50.0%), while less than half of the pans (36.4%), ramrod guides (33.3%), sears (33.3%), and vice screws (20.0%) were damaged. None of the lock plates, triggers, tumblers, or upper cock jaws were damaged beyond usability. At least one artifact, a butt plate (04-1-115.01), is known to have been damaged during excavation, with the finial being snapped off. It was however, complete at deposition and is not counted among the damaged artifacts.

Regardless of the source of this damage (pre- or post-deposition), determining the country of origin and age of such artifacts becomes more difficult since attributes and details on artifacts are absent or obscured. For instance, one lock plate (10-2-148.01) appears to have etchings beneath the pan. However, heavy surface pitting obscures these details. As another example, several cocks were recovered as only the body or the neck/jaw/comb section. Recovering only half of a cock eliminates the ability to compare the relative sizes of their body, neck, and jaws to one another, which is an important distinguishing characteristic. Other artifacts are remarkably well preserved however, particularly those made of copper alloy. In fact, several copper alloy butt plates retain essentially all the detail of their etchings.

Artifact Details

The following section examines the artifacts within each artifact type. Artifact types are presented alphabetically, and each is accompanied by an illustration of the artifacts within those artifact types, showing all artifacts of that type recovered and identified. Additional information is provided regarding important attributes of those artifacts, and particular attention is given to highlight artifacts for which age and/or origin were able to be determined.

Barrel

One barrel was found, which was highly corroded and fragmented (Figure 11). There is little that can be learned from this fragment except that it is approximately 6 cm in length, and the bore of the weapon was at least 22-gauge (approximately .60 inch bore). Due to the buildup of corrosion, it is likely the original size of the bore was slightly larger than this. Unfortunately for the purposes of identification, such a bore size could come from French or English weapons.

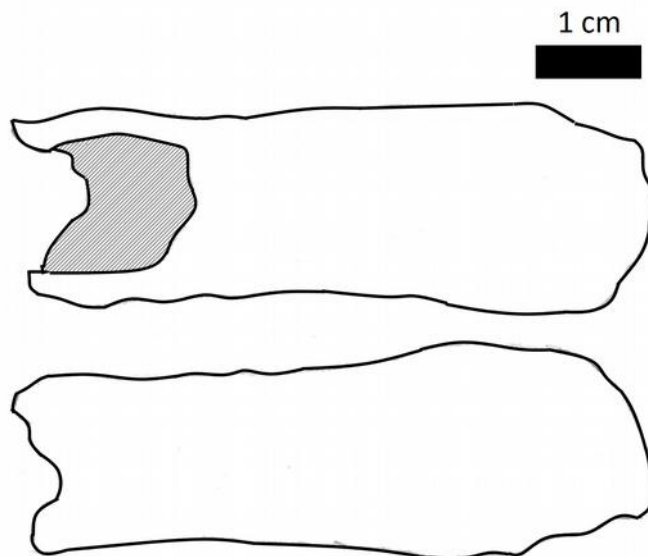


Figure 11. Barrel Fragment

Breech Plugs

A total of thirty-two breech plugs were included in this study. Unlike artifact types such as butt plates or sideplates, breech plugs are difficult to assign ages or countries of origin. Thus, none of the breech plugs in this study were identified by age or origin. However, characteristics were identified that show that there are a number of variations to be seen in breech plugs. Some of the breech plugs had bodies that had few or no distinguishing attributes, which I call the “blank style.” Two other types of breech plugs had distinguishing attributes, being either of the “pierced style” or the “notched style.” The pierced style of breech plug has a hole through the body of the plug immediately behind the threads of the plug. The notched style instead has a notch in the body of the plug, located behind the threads of the plug. Overall, these styles of breech plugs match those found at other sites, showing a range of diversity in size and shape (see Hamilton 1980:121, examples from Michilimackinac). Figure 12 and Figure 13 show the breech plugs included in this study divided by these distinctions. Of the thirty-two breech plugs, 56.3% (n=18) were damaged beyond use, including one pierced, six blank, and seven notched.

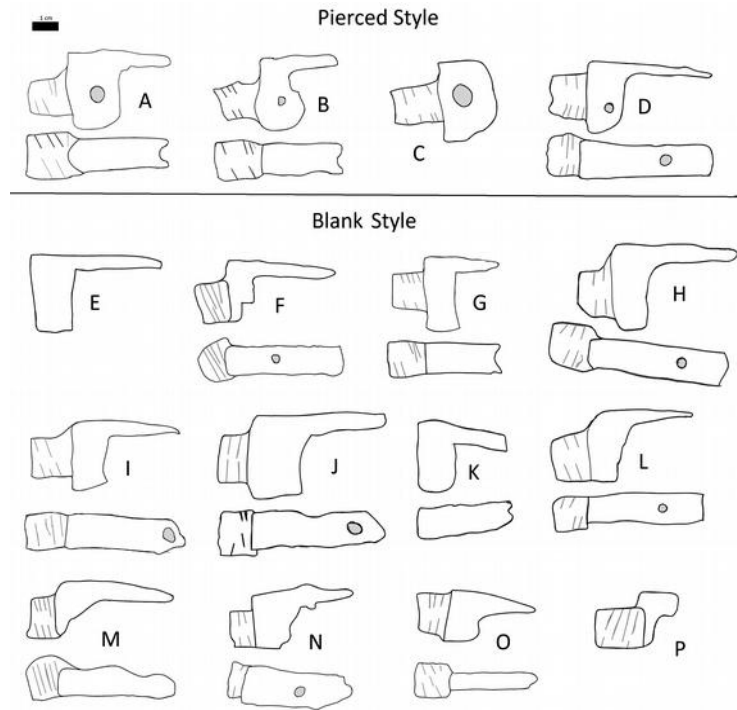


Figure 12. Pierced and Blank Style Breech Plugs

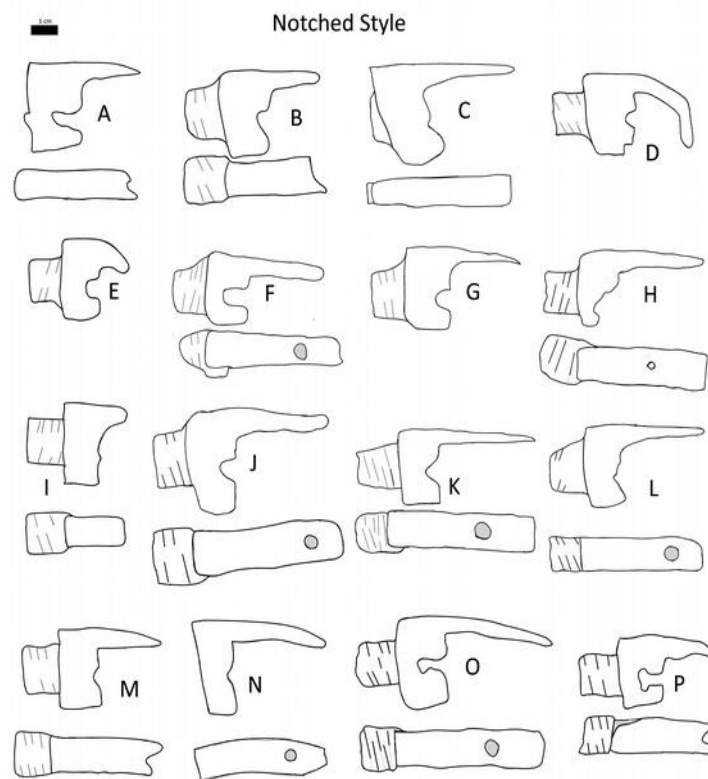


Figure 13. Notched Style Breech Plugs

Bridles, Mainsprings, Screws, Sears, and Tumblers

This study identified three bridles, twelve mainsprings, two screws, three sears, and three tumblers. These artifact types offer little in terms of details regarding age or origin. However, some attributes do provide valuable information. For example, one of the tumblers in the study was unbridled, typically indicating it originated from an older or lower quality weapon. Of these artifacts, 66.7% (n=2) of bridles, 91.7% (n=11) of mainsprings, 50.0% (n=1) of screws, 33.3% (n=1) of sears and none (0.0%) of the tumblers were damaged beyond use (Figure 14)

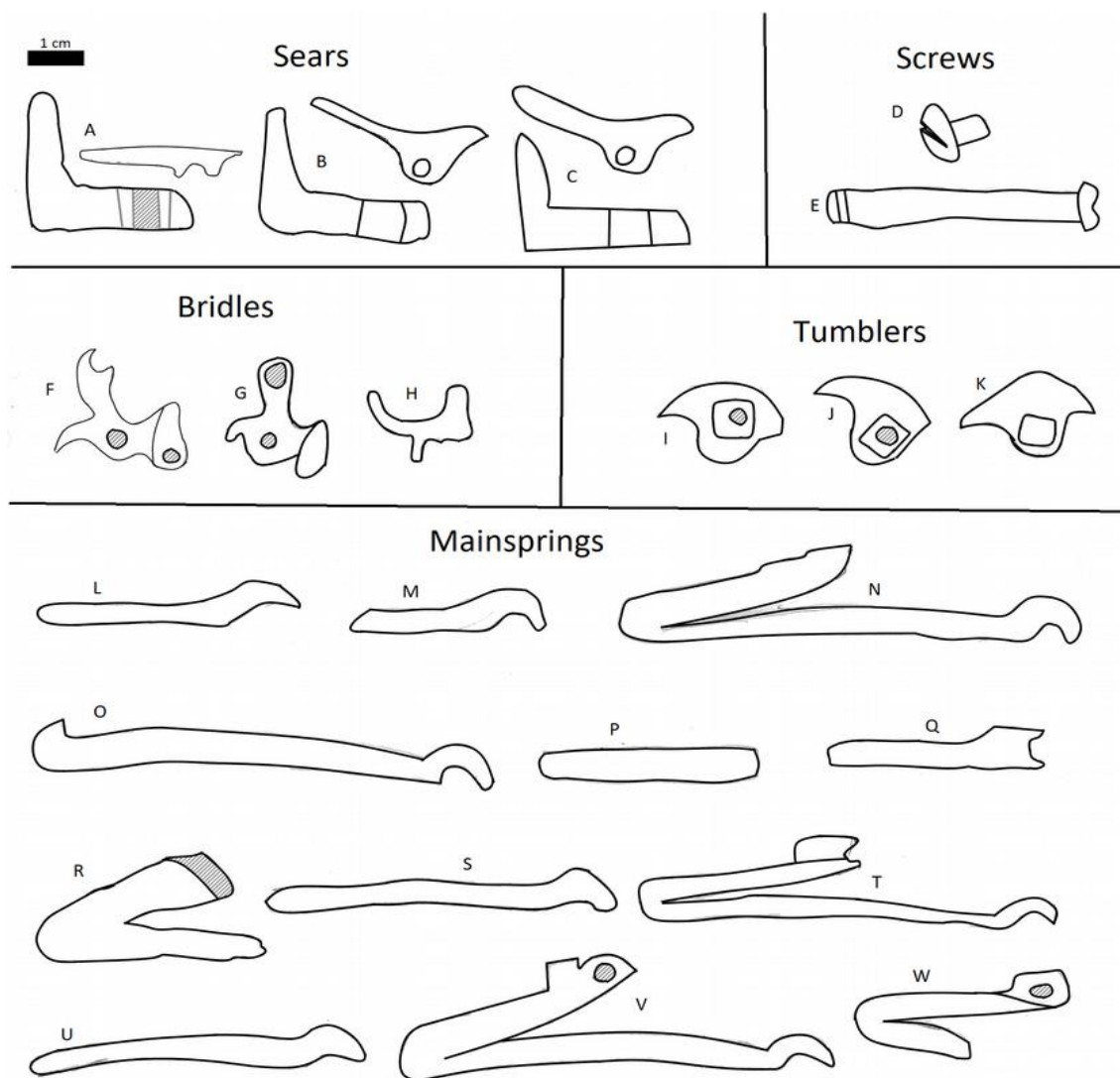


Figure 14. Bridles, Mainsprings, Screws, Sears, and Tumblers

Butt Plates

Among the most culturally and chronologically diagnostic artifacts are butt plates. All seven of the butt plates were assigned ages and/or origins (Figure 15).

Artifact 98-3-0.35a (Figure 15b) is an English Long Land musket military butt plate (Bailey 1997:31). The butt plate is copper alloy with a long, stepped tang terminating in a round finial. On the interior portion of the butt plate is a stamped broad arrow, denoting English origin. The butt plate of the Long Land pattern musket changed little over time from 1730s to the 1780s (Bailey 1997:55).

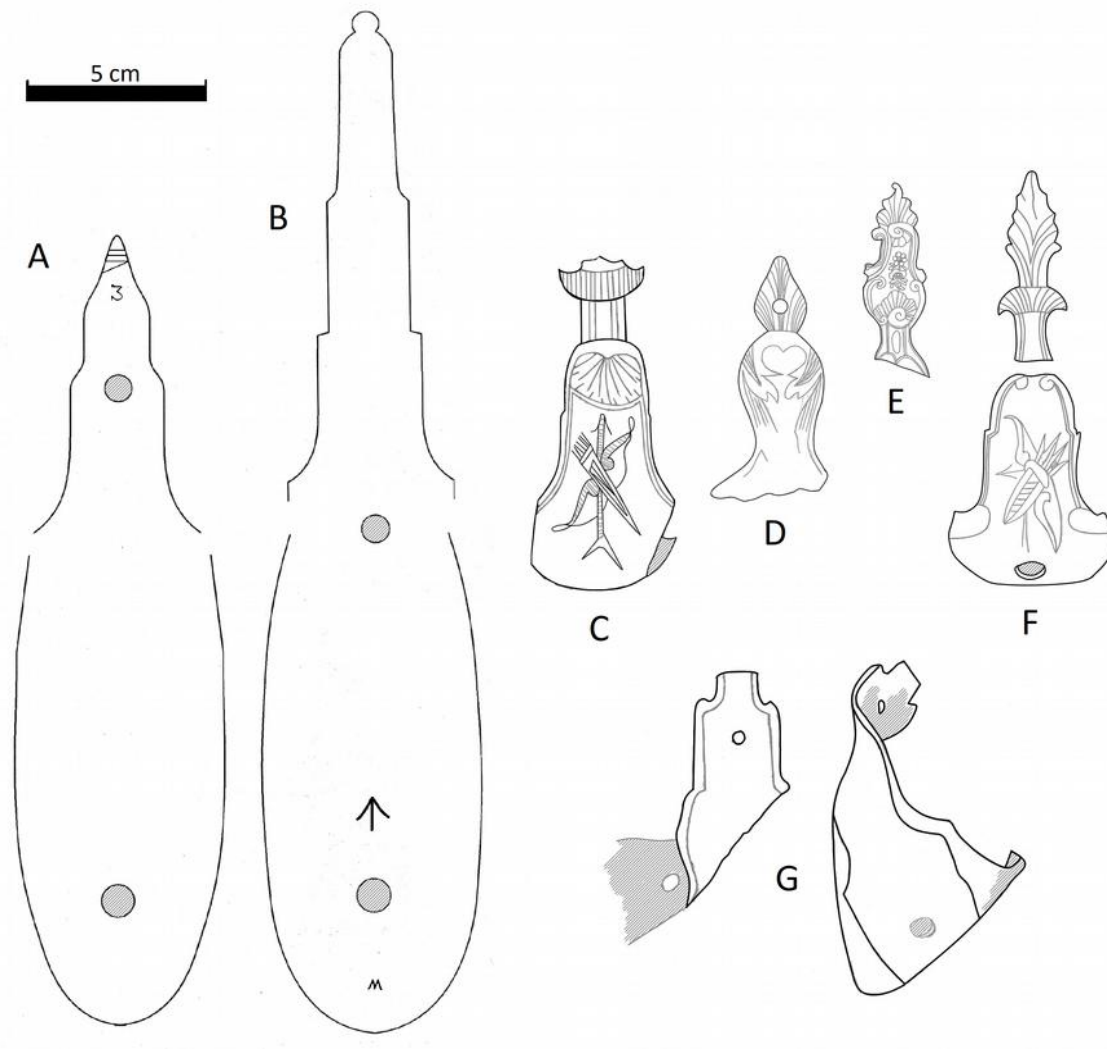


Figure 15. Butt plates

Artifact 98-3-0-35b (Figure 15a) is an English marine or militia military butt plate (Bailey 1997:34). The butt plate is copper alloy with a short, pointed tang and a simple, pointed finial. There is a screw hole near the end of the tang. The interior portion of the butt plate is marked “3” and “VII,” in a fashion similar to how English weapons were marked during manufacture. English marine muskets of this type date to about 1740-1760 (Bailey 1997:58).

Artifact 10-2-146.01 (Figure 15c) is a copper alloy butt plate which appears to be from an English trading gun. The tang of the butt plate depicts a crossed bow, arrow, and quiver. Leading up to the missing finial, the tang narrows and straightens before flaring into two prongs. The butt plate is very similar to one described by Hamilton as a high grade English trade weapon (Hamilton 1980:73, 78). An age for this artifact could not be determined.

Artifact 98-3-0.57 (Figure 15d) is a copper alloy butt plate tang that is likely from an English trade musket. The design of the butt plate is a bulbous rounded tang terminating in a leaf or flame finial with a screw hole. The butt plate is etched in a symmetrical fashion. Hamilton (1980:91) identifies these butt plates as associated with English trade muskets. The age of this piece is undetermined. However, similar butt plates have been found in archaeological contexts dating to 1736-1743 (Hamilton 1980:91).

Artifact 98-3-0.42 (Figure 15e) is a copper alloy tang and finial from a French trade musket butt plate (Gladysz 2011:151). The design shows clear engraved Rococo styling including sea shells and scroll-like shapes with an asymmetrical profile. The age of this artifact can be placed between about 1740 and 1760.

Artifact 04-1-115.01 (Figure 15f) is a copper alloy butt plate which is likely from an English trade musket. The butt plate is very similar to several others highlighted in a number of texts, which indicate its origin as being English (Gale 2010:135; Hamilton 1980:93). The rearward facing “hooks” near the end of the tang form the base of a torch or leaf finial. The rear

of the tang contains the common motif of bow, arrow, and quiver. The design is reminiscent of French trade muskets, however, this pattern was imitated by the English. The butt plate also appears to have been modified after its creation, having had the periphery of the butt plate body scored with hash marks likely produced by a file. A total of 119 hash marks alternate from short to long in groups of ten, perhaps indicating a tally (Nassaney 2019). This piece likely dates from 1750 to 1770.

Artifact 08-2-107.01 (Figure 15g) is a copper alloy butt plate with a raised “lip” around the periphery of the tang which follows the steps and curves of the shape of the tang. The tang narrows, straightening as it does, to two small “horns” that divide the missing finial from the rest of the butt plate body. The butt plate is twisted and, in addition to missing the finial, is missing a large portion of the butt plate toe. There are screwholes at both the bend of the butt plate as well as near the “horns” that begin the finial. According to Larry Horrigan (personal communication, October 15, 2017), this butt plate is an example of a “fusil facon de maître; Made in the manner of the master, a Paris made gun.” Horrigan provides a date of approximately 1680-1690 for this weapon.

Cocks

Cocks present a greater challenge to identification and dating. Thirty-five cocks were included in the study, but only eight cocks were assigned ages and/or origins. Such determinations are based on a number of factors and the predominance of evidence. (Hamilton 1980:97). Of particular importance is the overall proportions of the cock and the shape of the comb of the cock. Some cocks have an upper jaw with a tenon that fits into a groove on the comb, along which the upper jaw may be adjusted up and down. Another type of cock had narrow, post-like combs which fit into a groove on the back of the upper jaw itself.

Overall, earlier cocks tend towards being short, squat with a heavier body in proportion to the head and neck of the cock. The body and neck of cocks began to get lighter over time. Cocks also fall into two additional categories; those with rounded profiles and those with flattened profiles. Figure 16 illustrates the cocks included in this study, dividing them by comb type and profile. Cocks with rounded profiles have their letters circled, those with flat profiles are inside squares, and plain lettered cocks are too damaged or incomplete to determine their profile shape.

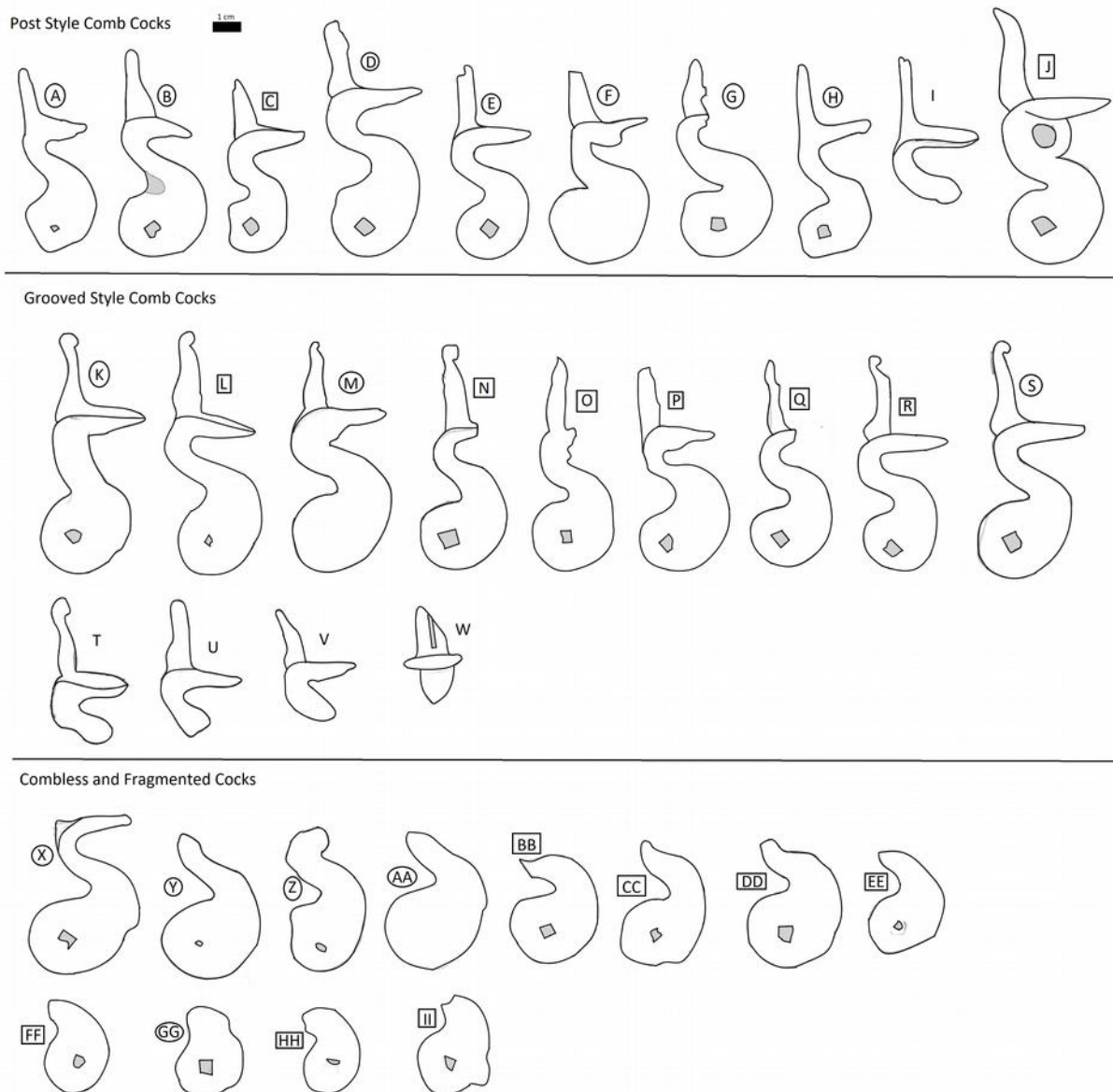


Figure 16. Cocks

Artifact 98-3-0.31 (Figure 16, N) is an iron cock with no upper jaw or vice screw and a broken lower jaw. Based on the relation of body to neck and head size, the grooved comb, and the overall proportions of the piece, it likely dates to the second quarter of the eighteenth century (Hamilton 1987:97-99). This cock is also quite similar to artifacts 02-1-203.05 (Figure 16, L) and 10-2-113.01 (Figure 16, R), both with similar attributes, dating to a similar time period (1725-1750).

Artifacts 02-1-115.09m (Figure 16, S) and 13-2-123.01 (Figure 16, D) are similar in their proportions to the previous three cocks, though both are rounded in profile, and artifact 13-2-123.01 has a post style comb. Though differing in style, they are likely of a similar time period (1725-1750).

Artifact 02-1-182.07d (Figure 16, J) is an iron cock with no upper jaw or vice screw. The cock is flat profiled and has a reinforcing ring beneath the lower jaw. These attributes combined make it likely an early English cock, perhaps 1690 to 1715. While later designs of cocks had reinforcing rings, the overall form of this cock most closely resembles early cocks with reinforcing rings. It is possible this is an English sea service cock, as the proportions of body to neck and overall style are most similar to cocks from those weapons. This is evident when comparing different reinforced cocks (Bailey 1997:13, 22, 72; Neumann 1998:77, 78: cf. Neumann 1998:92, 93)

Artifact 02-1-202.07f (Figure 16, E) appears to be an iron cock of English origin with a round profile and a post style comb. The proportions of the artifact give it an appearance of an earlier cock, perhaps of the first quarter of the 1700s (Neumann 1998:55).

Artifact 10-2-109.01 (Figure 16, P) is also likely an early cock. However, this cock appears to be a French grooved comb style cock. The large, flat-beveled body size relative to the rest of the cock helps to indicate its earlier age, perhaps 1720-1740 (Neumann 1998: 84, 85).

Escutcheon

One escutcheon was identified. Artifact 08-2-63.11 (Figure 17) is a copper alloy French escutcheon. While it is broken, it can be seen to be very similar to other French escutcheons with a “lion's mask” appearance (Gladysz 2011:144; Hamilton 1980:87). The design dates from 1705 to around 1720, and was used on French trade muskets. The straight, broken edge of this artifact would have continued in the form of the upper half of a lion’s face (Illustrated with dashed lines in Figure 17). In this way, the escutcheon would form a complete lions face, in which the oval medallion would form the lion’s mouth, while the scroll-like finial on the bottom would be positioned at the lion’s chin (e.g., Hamilton 1980:33,87). The rear tab of the escutcheon is not drilled out, possibly indicating it was never attached to a stock with a screw, or perhaps had a different method of attachment.



Figure 17. French Escutcheon: Obverse
(Left) and Reverse (Right)

Finials

Two finials were identified by age and/or origin. Artifact 06-2-93w.22 (Figure 18, A) is a French copper alloy trigger guard or butt plate finial. The finial likely originates from a trade

musket, circa 1740 to 1760 (Gladysz 2011:152). Artifact 08-2-45w.15 (Figure 18, B) is a copper alloy finial with a flame or leaf motif. The finial is likely from a French trade weapon dating to 1740 to 1760 (Gladysz 2011:152).

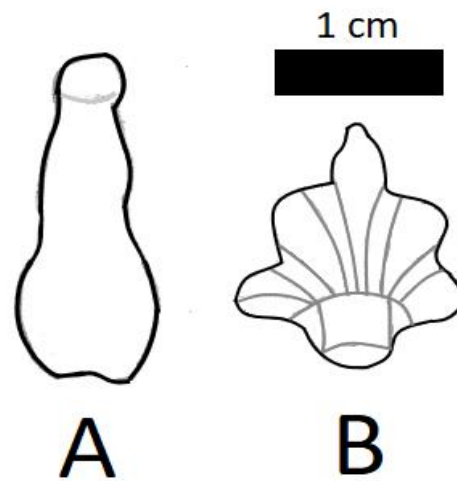


Figure 18. French Finials

Frizzens

Frizzens are another artifact type for which it is difficult to assign age or origin. They are also frequently worn or damaged, further hindering identification. This study was unable to develop a sensible framework from which to further organize the thirty-one frizzens analyzed. Seventeen (54.8%) of the frizzens in this study were damaged beyond use. Most commonly, frizzens were damaged around the hole for the frizzen screw, this damage could be pre- or post-deposition damage. Figure 19 illustrates all thirty-one frizzens (showing face and profile views where applicable). Among the artifacts in this type was a frizzen face (Figure 19, V), a sheet which is attached to the striking surface of the frizzen in order to mend a heavily worn frizzen. Much like a boot heel plate, the sheet would cover the scarred striking surface, allowing the frizzen's lifespan to be extended. In particular, this frizzen face was likely attached to a frizzen via rivets. This artifact is of particular interest due to its clear indication of flintlock repairs.

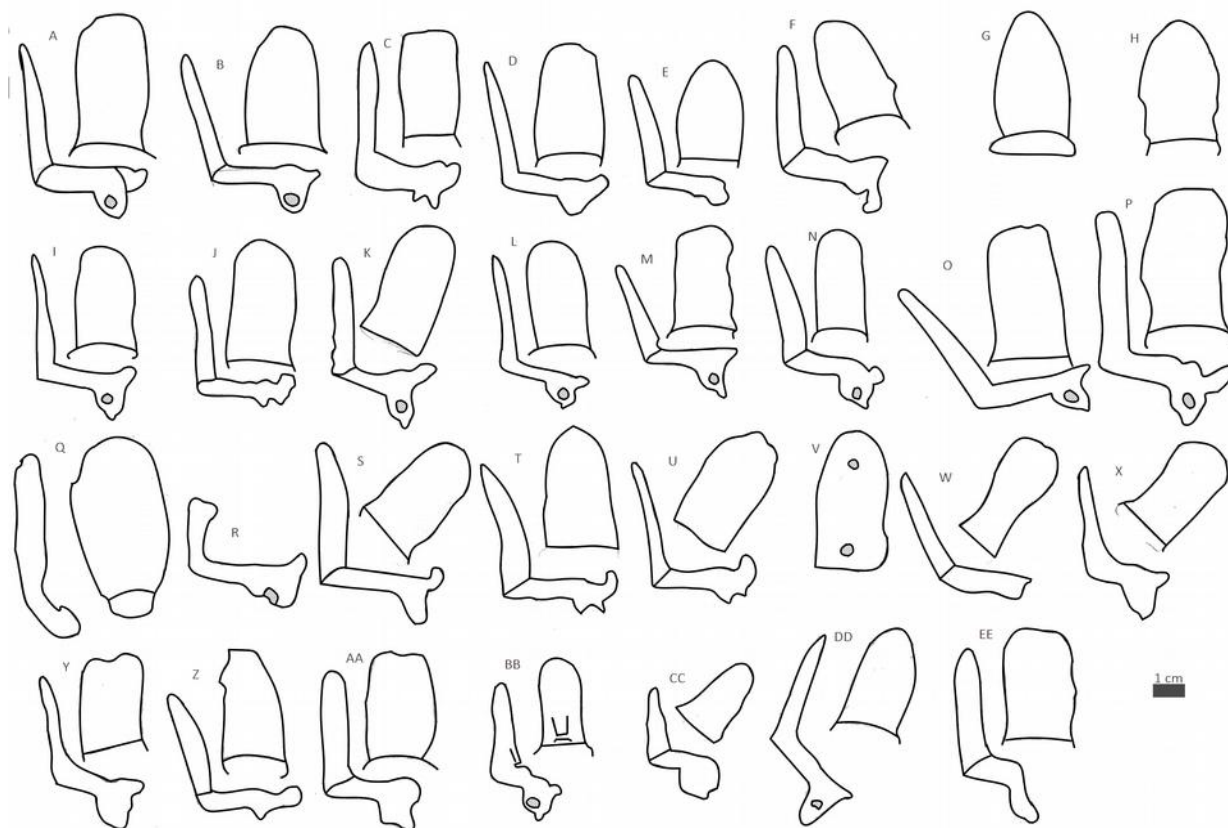


Figure 19. Frizzens

Frizzen Springs

Three frizzen springs were included in this study, and two frizzen springs were identifiable (Figure 20). Artifact 02-1-202.09b (Figure 20, A) is a frizzen spring with a hidden screw and trefoil style finial. This style closely resembles frizzen springs from English flintlocks (Neumann 1998:58-64). An age, however, is difficult to determine for this artifact. Artifact 06-2-087.14 (Figure 20, C) is broken, but is of a similar trefoil style. It has an exposed screw attachment, and is also likely of English origin. Age is also undetermined.

Gun Worms

Three gun worms were included in this study (Figure 21). All three of these artifacts are heavily corroded, fragmented, and encased in concretions. Aside from indicating the presence of weapons, little can be gleaned from them, and are included simply for completeness.

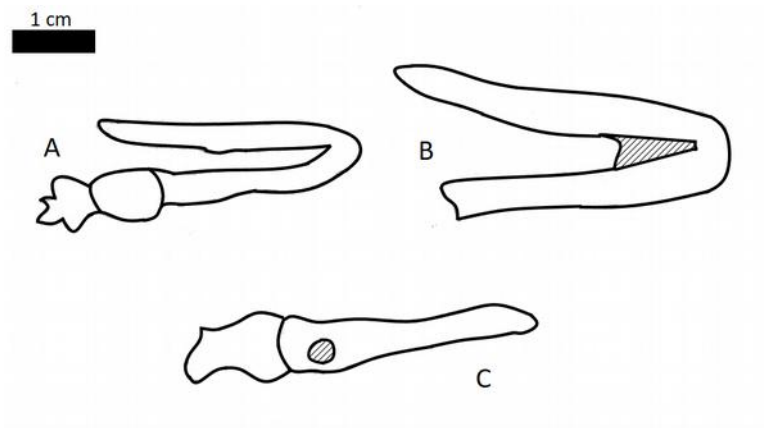


Figure 20. Frizzen Springs

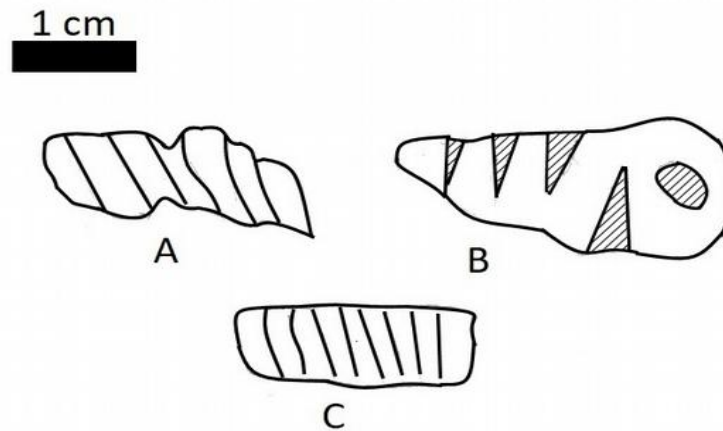


Figure 21. Gun Worms

Lock Plates

Three lock plates were identifiable by both age and origin (Figure 22). Lock plates provide a number of valuable details that can allow for identification including their forms and decorations such as etchings.

Artifact 02-1-203.08 (Figure 22, A) is a relatively small lock plate, possibly from a pistol. The lock has an attached pan with a curved bottom. The length of the lock plate curves downward slightly. The lock plate is corroded, however the profile is similar to that of a French weapon from the first quarter of the 1700s (Neumann 1998: 250, 251).

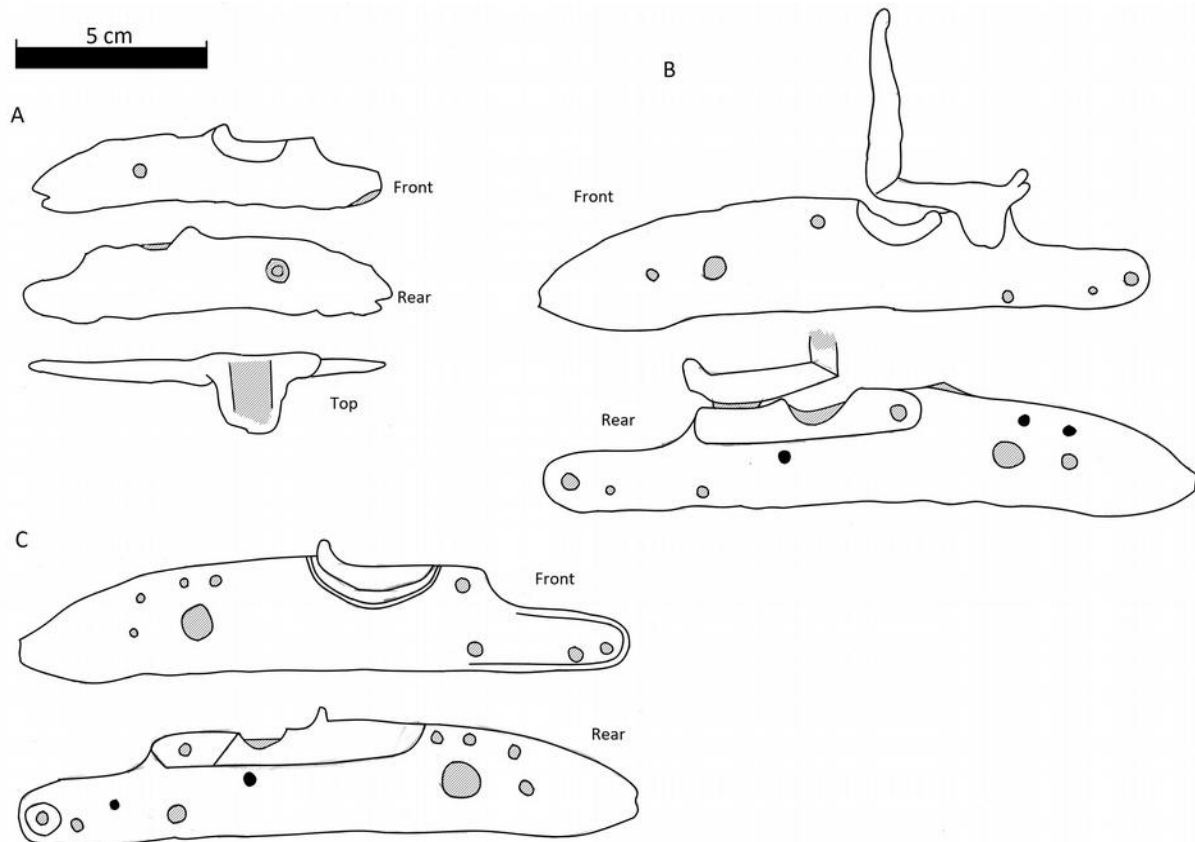


Figure 22. Lock Plates

Artifact 02-1-182.06 (Figure 22, B) is a lock plate with attached frizzen. The lock plate has a curved face and a “banana shaped” figure in length. The pan is attached with a curved bottom. The general appearance of the lock plate indicates an English origin. The significant curve of the lower edge of the lock plate indicates that the age of the lock plate likely falls within a range of 1690 to 1720 (see Neumann 1998:55).

Artifact 10-2-148.01 (Figure 22, C) is a lock plate and pan of French origin. The lock is flat faced and has a minor amount of curve downward along the length. The pan is faceted on its bottom. The periphery of the lock plate is engraved with a line that follows the edge. The tail of the lock plate has a single vertical groove. Beneath the pan appears to be some engraving,

however I was unable to discern it. The lock plate dates to around 1715 to 1740 and very likely comes from a trade musket (Gladysz 2011:97).

Pans

Pans present another artifact type that is difficult to identify by age or origin. Eleven pans were analyzed in this study (Figure 23). All of the pans analyzed had rounded bottoms, as opposed to the faceted angular, or even square, pans that were alternative styles. One artifact, 02-1-202.11b (Figure 23, B), is a possible makeshift pan, or perhaps not a pan at all. Either way, this artifact appears heavily damaged, and warped.

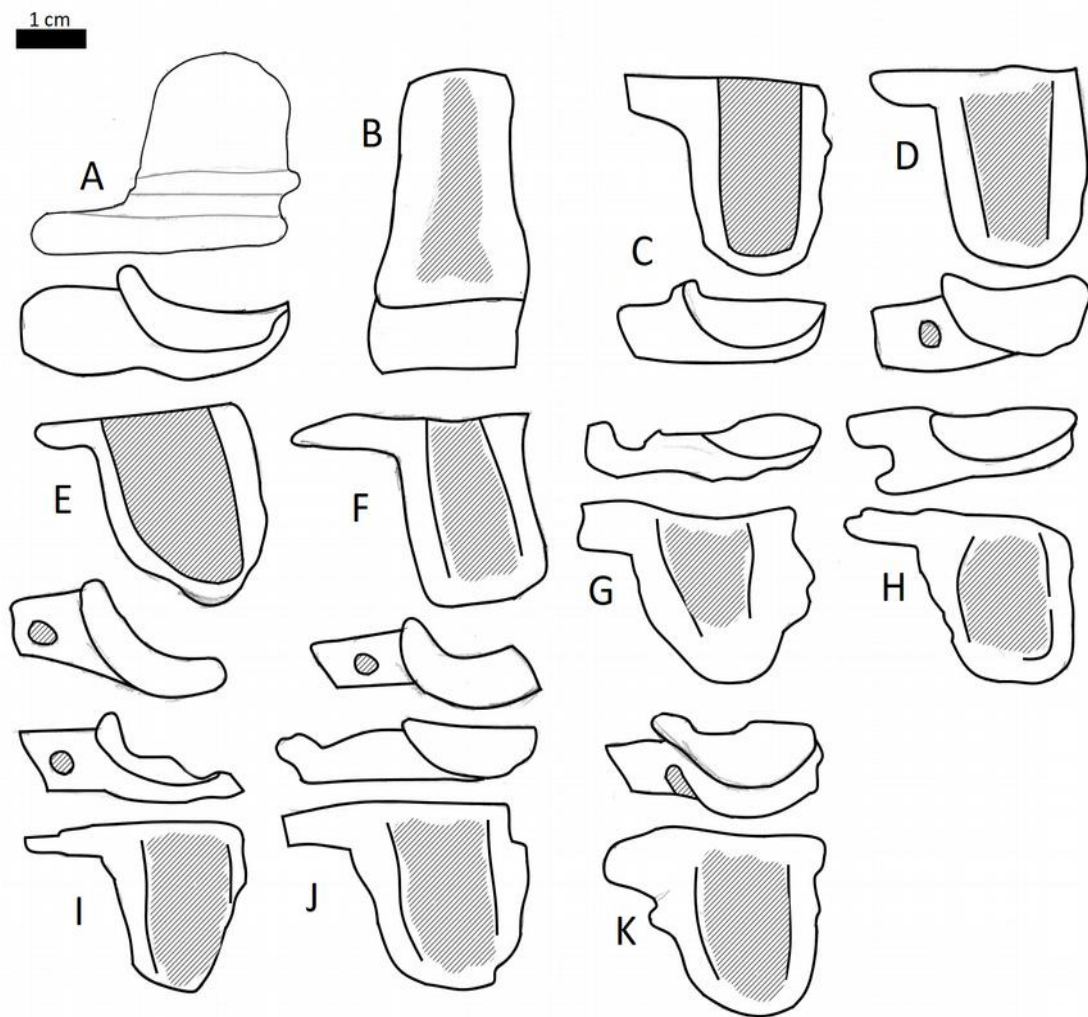


Figure 23. Pans

Ramrod Guides

Of three ramrod guides examined by this study, one was identified by origin. Figure 24 illustrates all three ramrod guides. The one ramrod guide that was identified by origin appears to be English. Artifact 98-3-0.40 (Figure 24, C) is a Brown Bess ramrod pipe. The ramrod has a single attachment lug, and the surface near the lug is scratched with “XXIII”, appearing to be English manufacture marks. The age of this artifact is undetermined.

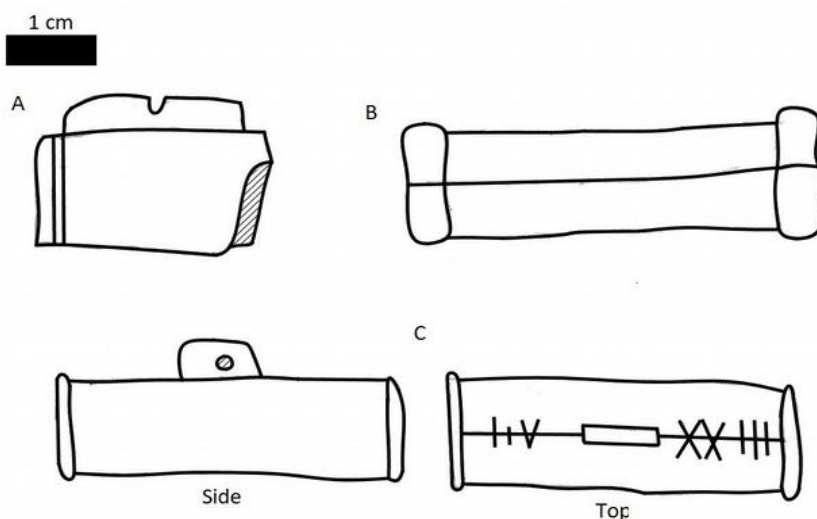


Figure 24. Ramrod Guides

Sideplates

All five sideplates included in the study were identifiable by both age and origin (Figure 25). This is largely because sideplates include design elements which allow much easier identification relative to other artifact types. Additionally, these artifacts were all made of copper alloy and experienced little corrosion, thereby allowing for easier identification.

Artifact 04-1-074.18 (Figure 25, A) is a French trade musket sideplate. This sideplate fragment likely came from a flintlock with a sideplate similar to the serpentine sideplate (02-1-128.17) mentioned above. The scroll-like etchings and cutouts likely adjoined an oval medallion,

opposite a serpent's head. This fragment is similar to several illustrated examples, and likely dates to 1700 to 1725 (Gladysz 2011:143).

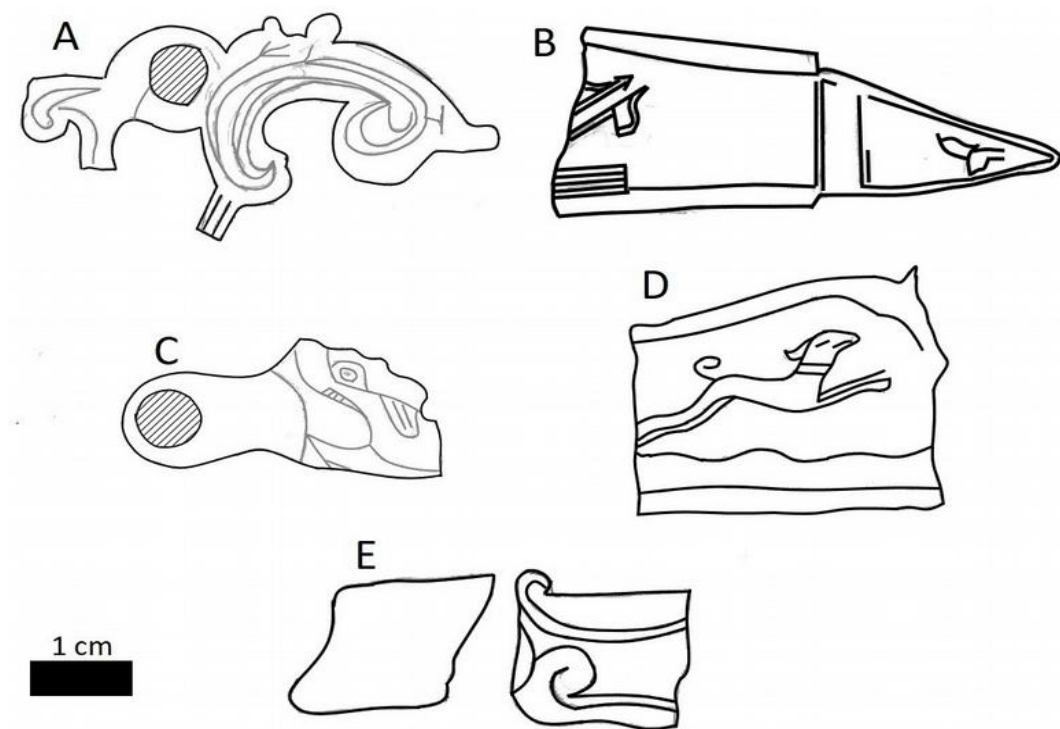


Figure 25. French Sideplates

Artifact 98-3-0.38 (Figure 25, B) is a fragment of a French trade musket sideplate. The fragment incorporates several motifs useful in narrowing down its age and origin. The artifact includes an engraving with a flag standard or quiver/bow/arrow design. The periphery of the sideplate is lined with triangular indentations, and the tail end narrows slightly into a triangular point with a scroll-like design. All the features of the artifact point towards an age of 1730 to 1750, falling somewhere in the transition from Gladysz's Regency period and Rococo period (Gladysz 2011:148-154).

Artifact 02-1-128.17 (Figure 25, C) is the head fragment of a dragon or serpentine sideplate. The design of the dragon head is etched into the surface of the sideplate terminating in a screw hole. This sideplate is French, from a trade flintlock, and is most likely early, 1700-1725.

This artifact matches artifacts identified as serpentine sideplates from French trade weapons (Gladysz 2011:142-143). In particular, it is of similar origin to artifact 04-1-074.18, another serpentine sideplate fragment mentioned below.

Artifact 15-2-015 (Figure 25, D) is a French sideplate from a trade musket. The fragment comes from a triangular sideplate, and depicts a hunting dog. This style of sideplate and hunting dog motif was popular from around 1710 to 1730 (Gladysz 2011:147).

Artifact 04-1-54.18 (Figure 25, E) is a French trade musket sideplate. The scroll-like lines and curved form of the sideplate fragment matches well to those of the later Rococo style, dating to probably 1745 to 1760 (Gladysz 2011:154).

Triggers

As with several other artifact types, triggers provide few clues as to age or origin. This study identified two triggers (Figure 26), neither of which was assigned an age or origin. The triggers are of two distinct designs, however, I have identified no typologies thus far that explain these differences.

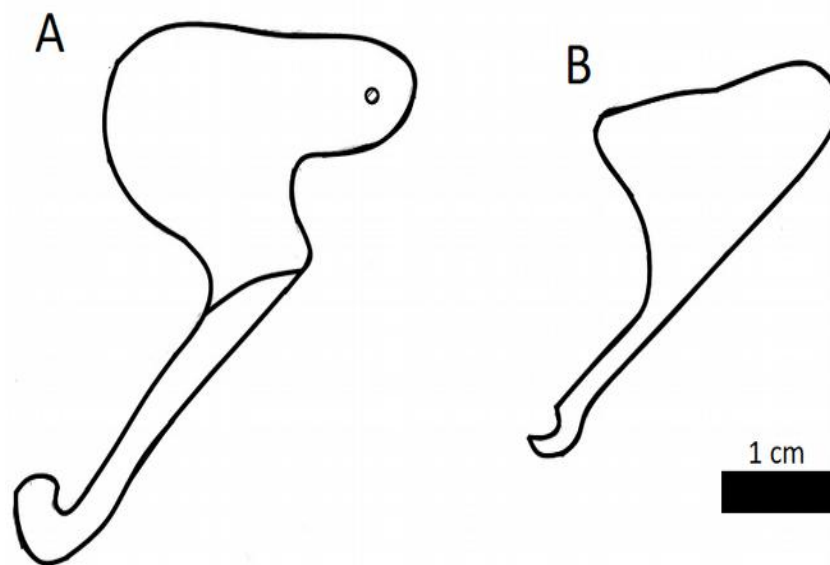


Figure 26. Triggers

Trigger Guards

As with the sideplates, all seven of the trigger guard fragments were identifiable by origin, though three artifacts could not be dated (Figure 27).

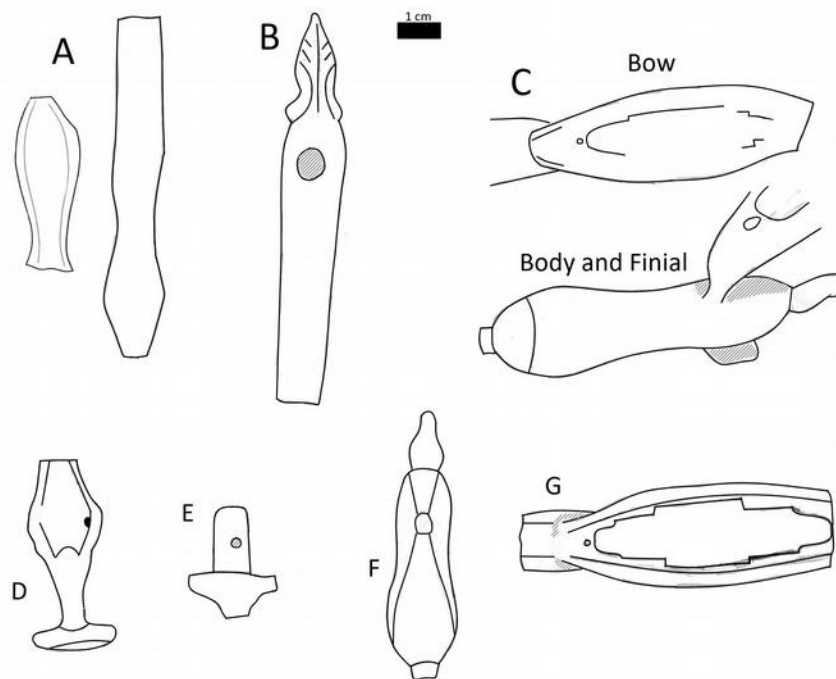


Figure 27. Trigger Guards

Artifacts 98-3-0.41a (Figure 27, A), 98-3-0.41b (Figure 27, B), and 02-1-61.22 (Figure 27, E) are fragments of French trade gun trigger guards. However, due to their size and the specific portion each fragment represents, it is difficult to determine their ages. Artifacts 98-3-0.41a and 98-3-0.41b are the front and rear portion of French trade musket trigger guards, but due to the general shapes shared throughout 1700 to 1760 French trade muskets, it is not possible to provide a reliable date for either (Gladysz 2011). Artifact 2-1-61.22 is the pin tang portion of the same style of French trade musket trigger guard, however its small size provides little information beyond that.

Artifacts 98-3-0.36a (Figure 27, C) and 98.3.0.36b (Figure 27, G) are French trade musket trigger guard bows. These artifacts are very similar, having geometric panel designs with

points on either end of the panels. These designs, particularly simplistic ones like these two artifacts exhibit, were popular from about 1700 to 1715 (Gladysz 2011:144).

Artifact 98-3-178.15 (Figure 27, D) is the front portion of a French trade musket trigger guard. The design of this fragment includes a flattened “urn-like” segment that would have been topped by a flame or leaf finial. The other end of the fragment widens into an etched diamond form. This fragment resembles sections of French trade musket trigger guards from about 1750 to 1760 (Gladysz 2011:152-153).

Artifact 02-1-115.17 (Figure 27, F) is a fragment of another French trade musket trigger guard. This fragment is a portion of the bow base and the bow interior finial. The finial on this fragment would point at the trigger itself. This fragment resembles those on French trade muskets dating to the first quarter of the 1700s (Gladysz 2011:144).

Upper Jaws and Vice Screws

Being small artifacts with few details, it is difficult to determine age or origin from upper cock jaws or vice screws. None of the five vice screws (02-1-61.20, 02-1-100.10, 02-1-115.12, 06-2-22w.15, and 06-2-38w.18) or two upper jaws (12-2-035.05 and 13-2-037.09) were identified by age or origin by this study (Figure 28).

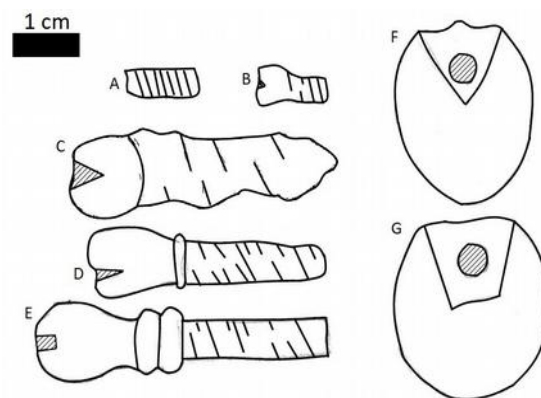


Figure 28. Upper Jaws and Vice Screws

Artifact Chronology

Determinations of age were made for twenty-seven artifacts, representing 15.3% of the overall sample (Table 2). These determinations ranged from c. 1680 to c. 1770, coinciding nicely with the occupation range of the fort itself. Sixteen of these artifacts (59.3%) were copper alloy and eleven artifacts (40.7%) were ferrous. Five of these artifacts (18.5%) were determined to be English in origin, seventeen (63.0%) were determined to be of French origin, and five (18.5%) were of undetermined origin. Table 3 is a timeline illustrating the chronological placement of these artifacts.

Table 2. Artifacts by Determined Age

Artifact Number	Artifact Type	Country of Origin	Date Range
08-1-107.01	Butt Plate	French	1680-1690
02-1-182.07d	Cock	English	1690-1715
02-1-182.06	Lock Plate	English	1690-1720
98-3-0.36a	Trigger Guard	French	1700-1715
98.3.0.36b	Trigger Guard	French	1700-1715
02-1-115.17	Trigger Guard	French	1700-1725
02-1-128.17	Sideplate	French	1700-1725
02-1-202.07f	Cock	English	1700-1725
02-1-203.08	Lock Plate	French	1700-1725
04-1-074.18	Sideplate	French	1700-1725
08-2-63.11	Escutcheon	French	1705-1720
15-2-015	Sideplate	French	1710-1730
10-2-148.01	Lock Plate	French	1715-1740
10-2-109.01	Cock	French	1720-1740
98-3-0.31	Cock	Unknown	1725-1750
02-1-115.09m	Cock	Unknown	1725-1750
02-1-203.05	Cock	Unknown	1725-1750
10-2-113.01	Cock	Unknown	1725-1750
13-2-123.01	Cock	Unknown	1725-1750
98-3-0.38	Sideplate	French	1730-1750
98-3-0-35b	Butt Plate	English	1740-1760
98-3-0.42	Butt Plate	French	1740-1760
06-2-93w.22	Finial	French	1740-1760
08-2-45w.15	Finial	French	1740-1760
04-1-54.18	Sideplate	French	1745-1760
98-3-178.15	Trigger Guard	French	1750-1760
04-1-115.01	Butt Plate	English	1750-1770

Artifact Number	Artifact Type	1680	1685	1690	1695	1700	1705	1710	1715	1720	1725	1730	1735	1740	1745	1750	1755	1760	1765
08-1-107.01	Butt Plate	Blue	Blue																
02-1-182.07d	Cock			Red	Red	Red	Red	Red											
02-1-182.06	Lock Plate			Red	Red	Red	Red	Red	Red										
98-3-0.36a	Trigger Guard					Blue	Blue	Blue	Blue										
98.3.0.36b	Trigger Guard					Blue	Blue	Blue	Blue										
02-1-115.17	Trigger Guard					Blue	Blue	Blue	Blue	Blue									
02-1-128.17	Sideplate					Blue	Blue	Blue	Blue	Blue									
02-1-202.07f	Cock					Red	Red	Red	Red	Red									
02-1-203.08	Lock Plate					Blue	Blue	Blue	Blue	Blue									
04-1-074.18	Sideplate					Blue	Blue	Blue	Blue	Blue									
08-2-63.11	Escutcheon						Blue	Blue	Blue	Blue									
15-2-015	Sideplate							Blue	Blue	Blue	Blue								
10-2-148.01	Lock Plate								Blue	Blue	Blue	Blue	Blue						
10-2-109.01	Cock									Blue	Blue	Blue	Blue						
98-3-0.31	Cock										Grey	Grey	Grey	Grey	Grey				
02-1-115.09m	Cock										Grey	Grey	Grey	Grey	Grey				
02-1-203.05	Cock										Grey	Grey	Grey	Grey	Grey				
10-2-113.01	Cock										Grey	Grey	Grey	Grey	Grey				
13-2-123.01	Cock										Grey	Grey	Grey	Grey	Grey				
98-3-0.38	Sideplate											Blue	Blue	Blue	Blue				
98-3-0-35b	Butt Plate													Red	Red	Red	Red		
98-3-0.42	Butt Plate													Blue	Blue	Blue	Blue		
06-2-93w.22	Finial													Blue	Blue	Blue	Blue		
08-2-45w.15	Finial													Blue	Blue	Blue	Blue		
04-1-54.18	Sideplate														Blue	Blue	Blue		
98-3-178.15	Trigger Guard															Blue	Blue		
04-1-115.01	Butt Plate															Red	Red	Red	Red

Countries of Origin of Artifacts

Of the total 176 sampled artifacts, I was able to establish a country of origin for 17.6% (n=31) of the sample. Twenty of the identified artifacts (64.5%) were determined to be of a probable French origin, while eleven artifacts (35.5%) were determined to be of probable English origin. Of the artifacts for which origin could be determined, copper alloy artifacts were over-represented, with 74.2% (n=23) being copper alloy and 25.8% (n=8) being ferrous, compared to only 14.2% (n=25) of the overall 176 sampled artifacts being copper alloy. Of the thirty-one artifacts for which country of origin could be determined, 67.8% (n=21) were damaged beyond usability.

There were twenty artifacts determined to be of French origin (Table 4). Artifact types included butt plates, cocks, escutcheons, finials, lock plates, sideplates, and trigger guards. Of

these artifacts, 85.0% (n=17) were copper alloy and 15.0% (n=3) were ferrous. Of all twenty French artifacts, 85.0% (n=17) were damaged beyond usability.

Table 4. Artifacts Identified as French in Origin

	Artifact Type	Damaged	Cu Alloy
98-3-0.36a	Trigger Guard	✓	✓
98-3-0.36b	Trigger Guard	✓	✓
98-3-0.38	Sideplate	✓	✓
98-3-0.41a	Trigger Guard	✓	✓
98-3-0.41b	Trigger Guard	✓	✓
98-3-0.42	Butt Plate	✓	✓
98-3-178.15	Trigger Guard	✓	✓
02-1-61.22	Trigger Guard	✓	✓
02-1-115.17	Trigger Guard	✓	✓
02-1-128.17	Sideplate	✓	✓
02-1-203.08	Lock Plate	×	×
04-1-54.18	Sideplate	✓	✓
04-1-074.18	Sideplate	✓	✓
06-2-93w.22	Finial	✓	✓
08-2-45w.15	Finial	✓	✓
08-2-63.11	Escutcheon	✓	✓
08-2-107.01	Butt Plate	✓	✓
10-2-109.01	Cock	×	×
10-2-148.01	Lock Plate	×	×
15-2-015	Sideplate	✓	✓
Total	-	17	17

Table 5. Artifacts Identified as English in Origin

	Artifact Type	Damaged	Cu Alloy	Ferrous
98-3-0.35a	Butt Plate	×	✓	×
98-3-0.35b	Butt Plate	✓	✓	×
98-3-0.40	Ramrod Guide	×	✓	×
98-3-0.57	Buttplate	✓	✓	×
02-1-182.06	Lock Plate	×	×	✓
02-1-182.07d	Cock	×	×	✓
02-1-202.07f	Cock	×	×	✓
02-1-202.09b	Frizzen Spring	×	×	✓
04-1-115.01	Butt Plate	×	✓	×
06-2-087.14	Frizzen Spring	✓	×	✓
10-2-146.01	Butt Plate	✓	✓	×
Total	-	4	6	5

Eleven artifacts are of English origin (Table 5). Artifact types included butt plates, cocks, frizzen springs, lock plates, and ramrod guides. Six (54.5%) of these artifacts were copper alloy, while five (45.5%) were ferrous. Only four (36.4%) of the English artifacts were damaged beyond usability.

Summary of Artifact Ages and Origins

Artifacts that could be assigned ages or origins were biased towards copper alloy flintlock furniture. This is in part due to the better preservation of copper alloy artifacts compared to ferrous artifacts, allowing for more details of the artifacts to be observed. However, copper alloy flintlock furniture encompasses the most visible and information rich components of a flintlock musket, and thus provide ample details with which to make these determinations. Due to these factors, the artifacts which can be assigned ages or origins are biased towards copper alloy over ferrous and flintlock furniture over internal components.

The number of artifacts that could be assigned age or origin is also small compared to the size of the overall sample (15.3%). This low number of determinations limits the strength of inferences which can be made based on the data. As with the bias towards copper alloy artifacts, some artifact types (e.g., breech plugs) had no examples which could be assigned an age or origin.

One interesting observation is the presence of three early English artifacts. Two cocks (02-1-182.07d and 02-1-202.07f) and a lock plate (02-1-182.06) were dated to between approximately 1690 and 1725. Given that the fort was occupied by the French at that time and for several decades after, these artifacts are surprising. One possible explanation is that these artifacts came to the fort by way of a civilian; a trader, trapper, or Native individual. These individuals would be unlikely to limit themselves to the arms of any particular country. Alternatively, these components could have been deposited later in the history of the fort from

older weapons still in use at that time. This is unlikely, as all three of these artifacts originate from Feature 4, the gunsmith's cache, which mostly likely originated during the French occupation of the fort. Finally, these artifacts could be misidentified, either by age or origin.

Types of Weapons

Within the sample of artifacts, there were examples of both military and civilian or trade flintlock components. Of the thirty-six artifacts for which age and/or origin were determined, 58.3% (n=21) were from trade or civilian muskets, 11.1% (n=4) were from military weapons, and 30.6% (n=11) were undetermined. Table 6 shows a detailed breakdown of artifacts of identified age or origin and the type of weapon they originated from.

Of the twenty-one trade musket artifacts, 95.2% (n=20) were copper alloy and 4.8% (n=1) were ferrous. Eighteen trade musket artifacts (85.7%) were of French origin and three (14.3%) artifacts were of English origin. Of the French trade musket artifacts, 44.4% (n=8) dated to 1725 or earlier, 16.7% (n=3) dated to 1725-1750, and 22.2% (n=4) dated to 1750 or later. Of the English trade musket artifacts, 33.3% (n=1) dated to 1750 or later. Of the military musket artifacts, 75.0% (n=3) were copper alloy 25.0% (n=1) were ferrous. All four military musket artifacts were of English origin, three of which (75.0%) appear to be from Land Pattern muskets. Most likely, these three artifacts date to around the same period, approximately 1740 to 1760. All eleven artifacts of undetermined weapon type were ferrous. Four of these artifacts (36.4%) were English in origin, two (18.2%) were of French origin, and five (45.5%) were of undetermined origins.

These findings correlate well to the known occupation history of the fort, with French artifacts dominating the early period of occupation and English artifacts being dated to the last periods of occupation. Additionally, the types of weapons display a further pattern, with French artifacts being overwhelmingly trade musket components while English artifacts are

predominately military musket components which show up late in the fort's archaeological record.

Table 6. Types of Weapons

	Artifact Type	Cu Alloy	Ferrous	Weapon Type
98-3-0.35a	Butt Plate	✓	×	Military
98-3-0.35b	Butt Plate	✓	×	Military
98-3-0.40	Ramrod Guide	✓	×	Military
98-3-0.57	Butt Plate	✓	×	Trade
02-1-182.06	Lock Plate	×	✓	Unknown
02-1-182.07d	Cock	×	✓	Military
02-1-202.07f	Cock	×	✓	Unknown
02-1-202.09b	Frizzen Spring	×	✓	Unknown
04-1-115.01	Butt Plate	✓	×	Trade
06-2-087.14	Frizzen Spring	×	✓	Unknown
10-2-146.01	Butt Plate	✓	×	Trade
English Total	-	6	5	-
98-3-0.36a	Trigger Guard	✓	×	Trade
98.3.0.36b	Trigger Guard	✓	×	Trade
98-3-0.38	Sideplate	✓	×	Trade
98-3-0.41a	Trigger Guard	✓	×	Trade
98-3-0.41b	Trigger Guard	✓	×	Trade
98-3-0.42	Butt Plate	✓	×	Trade
98-3-178.15	Trigger Guard	✓	×	Trade
02-1-61.22	Trigger Guard	✓	×	Trade
02-1-115.17	Trigger Guard	✓	×	Trade
02-1-128.17	Sideplate	✓	×	Trade
02-1-203.08	Lock Plate	×	✓	Unknown
04-1-54.18	Sideplate	✓	×	Trade
04-1-074.18	Sideplate	✓	×	Trade
06-2-93w.22	Finial	✓	×	Trade
08-2-45w.15	Finial	✓	×	Trade
08-2-63.11	Escutcheon	✓	×	Trade
08-2-107.01	Butt Plate	✓	×	Trade
10-2-109.01	Cock	×	✓	Unknown
10-2-148.01	Lock Plate	×	✓	Trade
15-2-015	Sideplate	✓	×	Trade
French Total	-	17	3	-
98-3-0.31	Cock	×	✓	Unknown
02-1-115.09m	Cock	×	✓	Unknown
02-1-203.05	Cock	×	✓	Unknown
10-2-113.01	Cock	×	✓	Unknown
13-2-123.01	Cock	×	✓	Unknown

Feature 4

Feature 4 has been interpreted as a blacksmith's cache based on the quantity of gun parts in a concentrated area (Nassaney 2015:181). Of the 176 artifacts analyzed, 54.5% (n=96) came from Feature 4. Figure 29 shows the number of each artifact type that came from inside or outside of Feature 4, while figure 30 illustrates the proportions of each.

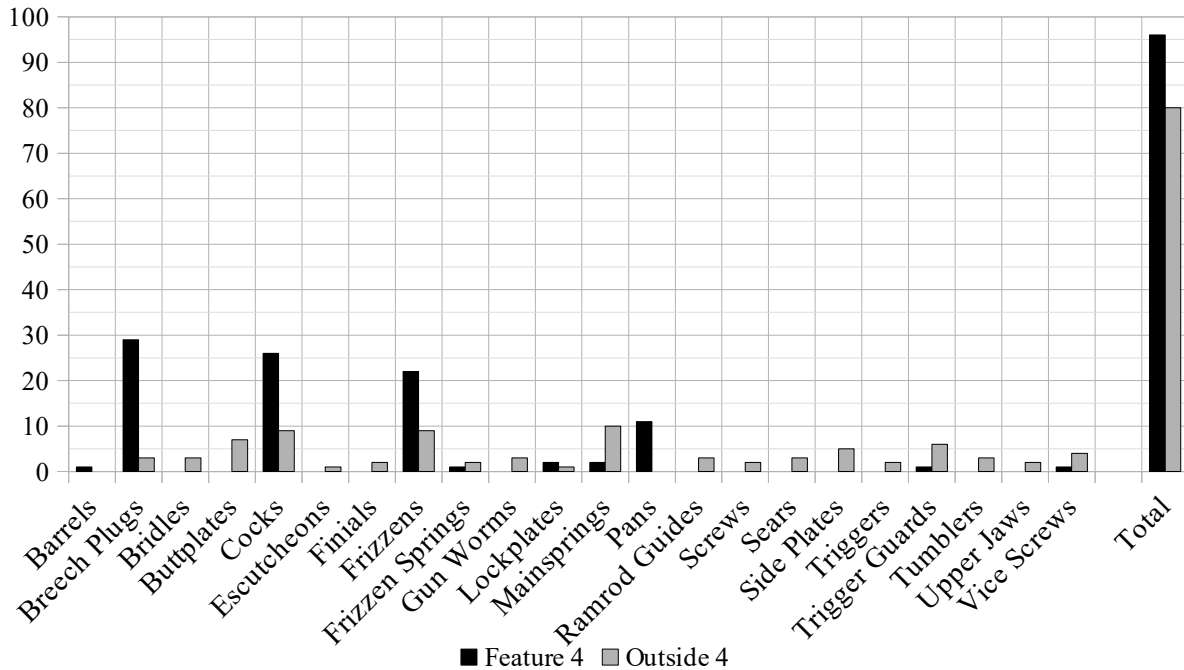


Figure 29. Number of Artifacts by Artifact Type Within and Outside Feature 4

As with the overall study sample, the most numerous flintlock artifact types found in Feature 4 were breech plugs, cocks, and frizzens. All three of these artifact types made up a larger percentage of the artifacts in Feature 4 than they did in the overall sample. The majority of these artifact types (greater than 70.0% of each) were found in Feature 4. Feature 4 contained 90.6% of all breech plugs, as well as 74.3% of cocks and 71.0% of frizzens. Breech plugs, cocks, and frizzens made up 30.2%, 27.1%, and 22.9% of Feature 4, respectively. This represents 80.2% of flintlock artifacts in this study taken from Feature 4. In the overall study sample, these three artifact types were only 55.7% of the total. All pans (n=11) and the only barrel in this study

originated from Feature 4, and made up 11.5% of the artifacts in Feature 4. Lock plates made up 2.1% of artifacts from Feature 4, while all other artifact types (barrel, frizzen spring, mainspring, trigger guard, and vice screw) had only one artifact in Feature 4 (1.0%).

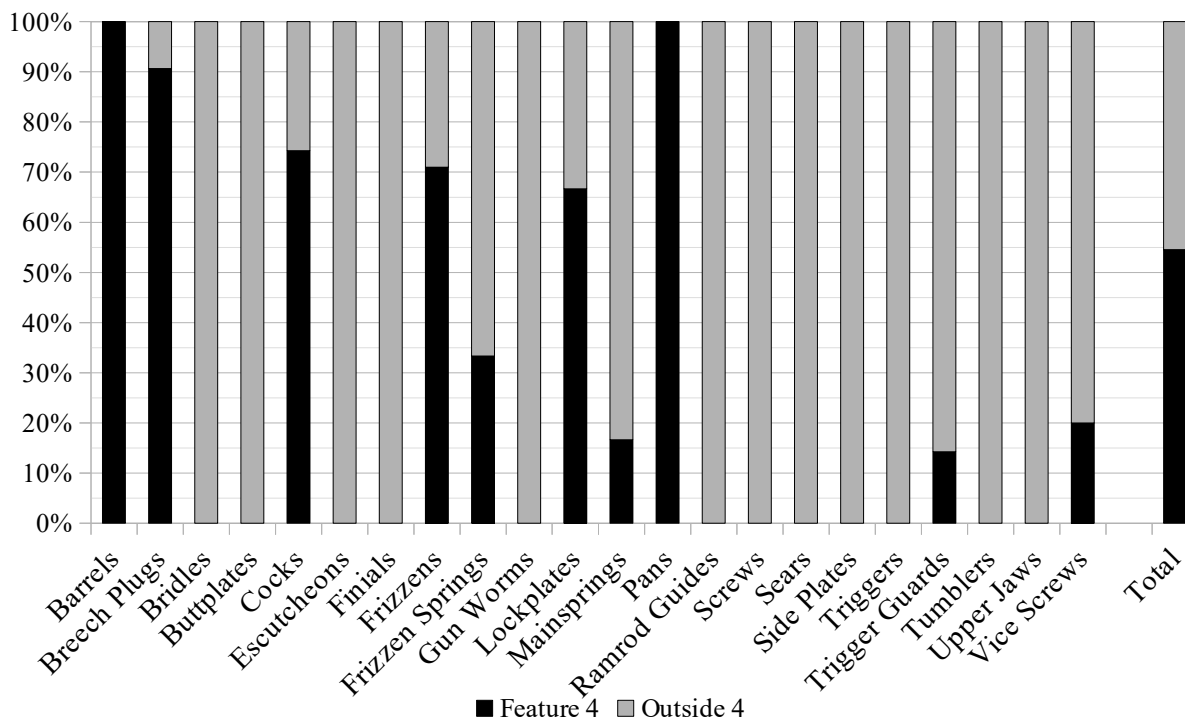


Figure 30. Proportions of Artifacts by Artifact Type Within and Outside Feature 4

Table 7 shows the detailed tally of Feature 4 artifacts by material type. Copper alloy artifacts were much less common in Feature 4, representing only 1.0%, while the overall study sample was 14.2% copper alloy artifacts.

Table 7. Feature 4, Summary of Artifacts by Type and Damage

	Artifacts	Frequency (F4)	Percentage of Total	Damaged	Damaged (Feature 4)	Damaged Total	CU Alloy	Ferrous
Barrel	1	1.0%	100.0%	1	100.0%	100.0%	0	1
Breech Plugs	29	30.2%	90.6%	16	55.2%	56.3%	0	29
Cocks	26	27.1%	74.3%	16	61.5%	60.0%	0	26
Frizzens	22	22.9%	71.0%	9	40.9%	54.8%	0	22
Frizzen Springs	1	1.0%	33.3%	0	0.0%	66.7%	0	1
Lock Plates	2	2.1%	66.7%	0	0.0%	0.0%	0	2
Mainsprings	2	2.1%	16.7%	2	100.0%	91.7%	0	2
Pans	11	11.5%	100.0%	4	36.4%	36.4%	0	11
Trigger Guards	1	1.0%	14.3%	1	100.0%	100.0%	1	0
Vice Screws	1	1.0%	20.0%	0	0.0%	20.0%	0	1
Totals	96	100.0%	54.5%	49	51.0%	58.5%	1	95

Compared to the study sample as a whole, the artifacts in Feature 4 were only marginally less damaged or broken. Only 51.0% of Feature 4 artifacts were damaged, whereas 58.5% of artifacts in the overall sample were damaged. Table 7 shows the proportions of broken artifacts in Feature 4 by artifact group and overall.

All of the barrels, mainsprings, and trigger guards from Feature 4 were damaged. Cocks, breech plugs, and frizzens, the three most common artifact types in Feature 4, were damaged at rates of 61.5%, 55.2%, and 40.9% respectively. Pans from Feature 4 were damaged at a rate of 36.4%. None of the frizzen springs, lock plates, or vice screws recovered from Feature 4 were damaged. Rates of damage were lower in Feature 4 than the overall study sample for breech plugs, frizzens, frizzen springs, and vice screws. The rates of damage were higher for cocks and mainsprings. For barrels, lock plates, pans, and trigger guards, rates of damage for Feature 4 artifacts was identical to the rates of damage in the overall study sample. These rates would seem to indicate that Feature 4 differed little from the overall sample in terms of damage.

Determinations of age could only be made for 7.3% (n=7) of Feature 4 artifacts (Table 8). The ages of these artifacts ranged from c. 1690-1745, coinciding with the early to middle occupation range of the fort itself. Six of these artifacts (85.7%) were ferrous artifacts and only one artifact (14.2%) was copper alloy. Three of these artifacts (42.9%) were determined to be English, two artifacts (28.6%) were determined to be French, and two artifacts (28.6%) were of undetermined origins. Table 9 is a timeline illustrating the chronological placement of Feature 4 artifacts with determined ages.

Of the ninety-six artifacts in Feature 4, I was able to determine the country of origin for 6.3% (n=6) artifacts. Four of these artifacts (66.7%) were determined to be English, and two artifacts (33.3%) were determined to be French. Of the artifacts from Feature 4 for which origin could be determined, ferrous artifacts predominated, making up 83.3% (n=5) of the sample, with

copper alloy artifacts making up only 16.7% (n=1). This compares to ferrous artifacts making up 85.8% of the artifacts overall with copper alloy artifacts comprising the remaining 14.2%. Of the Feature 4 artifacts for which origin was determined, only one (16.7%) was damaged beyond usability.

Table 8. Feature 4, Artifacts of Determine Ages

Artifact Number	Artifact Type	Country of Origin	Date Range
02-1-182.07d	Cock	English	1690-1715
02-1-182.06	Lock Plate	English	1690-1720
02-1-115.17	Trigger Guard	French	1700-1725
02-1-202.07f	Cock	English	1700-1725
02-1-203.08	Lock Plate	French	1700-1725
02-1-115.09m	Cock	Unknown	1725-1750
02-1-203.05	Cock	Unknown	1725-1750

Table 9. Feature 4, Timeline of Artifacts (Blue-French, Red-English, Grey-Unknown)

Artifact Number	Artifact Type	1690	1695	1700	1705	1710	1715	1720	1725	1730	1735	1740	1745
02-1-182.07d	Cock												
02-1-182.06	Lock Plate												
02-1-115.17	Trigger Guard												
02-1-202.07f	Cock												
02-1-203.08	Lock Plate												
02-1-115.09m	Cock												
02-1-203.05	Cock												

Two artifacts in Feature 4 were determined to be French. Table 10 presents a detailed breakdown of these artifacts. Artifacts included a trigger guard and a lock plate. The lock plate was ferrous, while the trigger guard was copper alloy. The trigger guard was damaged beyond use, however the lock plate appears to have been usable.

Table 10. Feature 4, Artifacts Identified as French in Origin

	Artifact Type	Damaged	Cu Alloy	Ferrous
02-1-115.17	Trigger Guard	✓	✓	×
02-1-203.08	Lock Plate	×	×	✓
Total	-	1	1	1

Four artifacts in Feature 4 were determined to be English. Table 11 shows a detailed overview of these artifacts. Artifact types included a lock plate, two cocks, and a frizzen spring. All of these artifacts were ferrous, and none of these artifacts were damaged beyond usability.

Table 11. Feature 4, Artifacts Identified as English in Origin

	Artifact Type	Damaged	Cu Alloy	Ferrous
02-1-182.06	Lock Plate	×	×	✓
02-1-182.07d	Cock	×	×	✓
02-1-202.07f	Cock	×	×	✓
02-1-202.09b	Frizzen Spring	×	×	✓
Total	-	0	0	4

Within Feature 4, there were example of both military and civilian or trade flintlock components. Of the eight Feature 4 artifacts for which age and/or origin were determined, 12.5% (n=1) were from a trade weapons, 12.5% (n=1) were from a military weapons, and the remaining 75.0% (n=6) were from undetermined types of firearms. Table 12 shows a detailed overview of artifacts of identified age or origin and the type of weapon they originated from.

Table 12. Feature 4, Types of Weapons

	Artifact Type	Cu Alloy	Ferrous	Weapon Type
02-1-182.06	Lock Plate	×	✓	Unknown
02-1-182.07d	Cock	×	✓	Military
02-1-202.07f	Cock	×	✓	Unknown
02-1-202.09b	Frizzen Spring	×	✓	Unknown
English Total	-	0	4	-
02-1-115.17	Trigger Guard	✓	×	Trade
02-1-203.08	Lock Plate	×	✓	Unknown
French Total	-	1	1	-
02-1-115.09m	Cock	×	✓	Unknown
02-1-203.05	Cock	×	✓	Unknown
Unidentified Total	-	0	2	-

Feature 4, Additional Artifact Types

Along with the flintlock components recovered from Feature 4 were two artifacts that are likely makeshift screwdrivers or “turnscrews” (Figure 31). These artifacts (02-1-202.10a and 02-1-202.10b) take the form of shafts terminating in rounded loops or eyelets. The other end of the shafts are shaped into flattened heads. Initially, it was thought that these two objects may be vice screws in a style similar to Spanish miquelet locks. However, there is no evidence on the shaft of the objects for any threading, and the overall size of the artifacts appears too large to have been vice screws. The shafts also appear to have pronounced flattening along their length, and in general, are too large to have likely been vice screws.

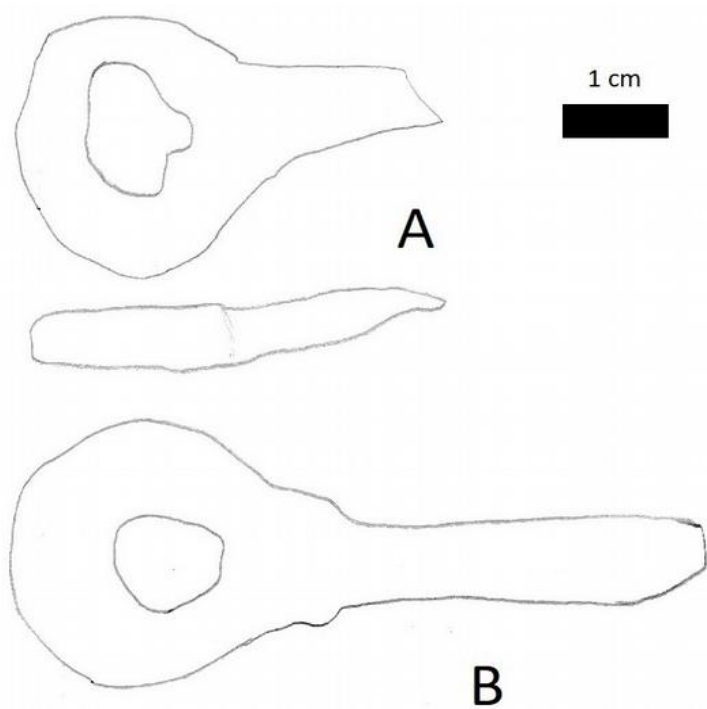


Figure 31. Feature 4 Turnscrews

However, when compared to known turnscrews, these objects share a number of striking similarities. The shape and design of these artifacts share outward appearances with examples of turnscrews (Hamilton 1980:123; Mullins 2008:48). Further, the lack of threads, overall size,

length, and flattened form of the artifacts lend more support to their being turnscrews rather than vice screws. As noted, these two artifacts were recovered from Feature 4, which was interpreted as a gunsmith's cache.

Summary

The data presented above highlight several important aspects of the study sample. First, there is the anomalous presence of English artifacts in the sample, both temporally and frequency. Second, there are clear differences in the frequency of artifacts types between Feature 4 and non-Feature 4 contexts. Finally, there are several artifacts that appear to be clear indications of repair or maintenance of flintlock weapons. The following discussion will attempt to explain and expand on these aspects identified in the data, as well as summarize the data as a whole.

CHAPTER V

DISCUSSION AND CONCLUSIONS

The primary goals of this project were to assess the overall nature of Fort St. Joseph's flintlock by determining what types of artifacts are present, finding any evidence of damage or repair that could be observed, and the similarities and differences between artifacts from Feature 4 and non-Feature 4 contexts. While the previous chapter presents the data acquired and highlights quantitative trends, this chapter aims to summarize and explain these patterns.

Overall Observations

Determinations of age for the overall sample ranged from c. 1680 to c. 1770, coinciding with the documented French occupation of the fort. Many of these ages clustered around the 1710s and the 1740s. The second of these clusters, the 1740s, coincides with the approximate age of Feature 4. These findings fit with the expectation that the ages of artifacts would be roughly contemporaneous with Fort St. Joseph's occupation.

However, in determining origins, I found almost as many English artifacts as I did French. This was unexpected. Furthermore, some of these English artifacts date to as early as c. 1690, and with some being recovered from Feature 4. Given that the French occupied the fort until 1780, and Feature 4 was interpreted to be a French gunsmith's cache, the presence of these English flintlock artifacts raises some questions.

It is possible that the earlier English artifacts were outliers traded or brought by civilians (i.e., traders, trappers, and Native individuals) that were then deposited during the French occupation of the fort. Such an explanation leaves several questions. First, while it may be easier to dismiss a few outlying English artifacts, it is harder to account for nearly half of the artifacts

of identified origin as being English. Second is the presence of English military flintlock parts, which are more difficult to explain than civilian and trade parts.

While it is possible that this represents a mistake on my part in the process of identifying artifacts, this is an unsatisfying answer, particularly as several artifacts are most certainly English (see Figure 15 A and B; Figure 24 C). First, it is important to note that these components could have been procured by smiths in locations other than Fort St. Joseph, including from civilians and Natives far removed from the fort and less inclined to discriminate in their weapon choices. With this caveat in mind, I believe the answer for this is related to the designs of these weapons. Four military weapon components were found, and all four of these artifacts were English in origin. No French military artifacts were identified. As noted previously, English military weapons were outfitted with copper alloy furniture, whereas French military weapons were outfitted with iron furniture. Due to this, English military components were preserved much better than their French military counterparts. Thus, material choice in design of these weapons presents a bias which may be responsible for the higher than expected frequency of English artifacts at Fort St. Joseph. There are undoubtedly many more flintlock artifacts that have not been recovered from Fort St. Joseph, and future excavations may provide data which serve to diminish the importance of the English artifacts identified in this study.

Feature 4

Over half of the artifacts in this study originated in Feature 4. The most common types of flintlock components in Feature 4 were breech plugs, cocks, frizzens, and pans. Together, these four artifact types accounted for over 90% of the artifacts in Feature 4. This distribution across artifact types is interesting, as it could indicate that there was a greater need for these parts, whether to be repaired or as replacement parts. Vouchers for work done by the smiths Dehaître and Durivage, indicates that repairs were common on these parts (Figure 7).

Comparing this list to a similar list of repairs mentioned in historical documents from Fort Michilimackinac shows a number of similarities (Roache-Fedchenko 2013:143). Breech plugs, cocks, and frizzens are common to both lists, as could be expected from the number of these components found in the gunsmith's cache. However, both lists show that repairs to components such as mainsprings, sears, and tumblers were also performed, though few, if any, of these artifacts were found in the gunsmith's cache. As noted, this could indicate that these parts required a different strategy from parts common in the gunsmith's cache. Parts common in the cache may have been those that were easiest to salvage and refit to new weapons. Less common parts may have been those that were difficult to reuse and repair, and thus, were simple rebuilt from scratch. This possibility seems even more likely when examining the process of replacing a cock (Hamilton 1976:28). Due to the lack of uniformity inherent in handmade components, it was with difficulty and luck that a smith was able to find an appropriate replacement (a new blank or a spare scavenged from another weapon) and make the necessary modifications to fit it to a new weapon. It is possible that these difficulties were simply too great for certain components, and thus few if any spares were kept on hand by a smith. In light of these facts, the distribution of artifact types observed in Feature 4 would be consistent with a gunsmith's cache.

Another observation regarding the artifacts in Feature 4 is the near complete absence of copper alloy artifacts. Given that copper alloy flintlock artifacts are nearly exclusively musket furniture (e.g., butt plates, sideplates, etc.), this suggests that frontier gunsmiths may not have frequently bothered with repairs to these components. This could be due to musket furniture not being essential for the basic operation of the weapon. A musket missing a butt plate, sideplate, or even ramrod guides could still be fired, however a musket missing a cock, frizzen, breech plug, or pan was unusable as a firearm. Thus, decorative or non-functional components (butt plates, escutcheons, sideplates) were not as great a priority for repair. In fact, examples of "stop-gap"

repairs or substitutions for non-decorative components can be seen in surviving examples (e.g. Hamilton 1980:100; Mullins 2008:172), but core components are typically repaired or replaced with more standard solutions. It therefore makes sense that the majority of components found in a gunsmithing context would be breech plugs, cocks, frizzens, or even pans – parts which were necessary for the weapons operation, and types such as escutcheons, butt plates, or sideplates are conspicuously absent. As such, the pattern of flintlock artifacts in Feature 4 likely reflects such practical considerations.

Of the artifacts sampled from Feature 4, probable age ranges were assigned to seven artifacts. The ranges for these artifacts are consistent with those of the overall sample, c. 1690 to c. 1750. This trend would seem to indicate a timeframe for the deposition of these artifacts as being near the end of the French period of Fort St. Joseph. This timeframe is also consistent with what is known from historical records, which show Dehaître working at the fort from at least 1739-1752 (Peyser 1978:99, 121, 123 141).

For the artifacts from Feature 4, I was able to assign probable countries of origin for six artifacts. Of these artifacts, four appeared to be of English origin and two appeared to be of French origin. This higher proportion of English artifacts to French is unexpected. However, the very small sample size for artifacts of determined origins means conclusions based on these data are tenuous. Furthermore, this may simply illustrate that gunsmiths were not picky about where they took their spare parts from.

Finally, two additional artifacts were recovered in Feature 4 that were likely makeshift screwdrivers. This is certainly of interest when considering Feature 4 is interpreted as a gunsmith's cache. If these are in fact turnscrews, they would further bolster earlier conclusions that Feature 4 was a gunsmith's cache (Nassaney 2015:181).

As with flintlock artifacts from the site as a whole, it is likely that these artifacts represent only a portion of what is present at Fort St. Joseph. The gunsmith(s) of Fort St. Joseph may have made other caches that remain hidden. If these caches are found, they may better answer questions regarding the high proportion of English flintlock parts or the absence of certain artifact types from the Feature 4 cache.

Summary of Contributions

Several contributions were made by this study. First, all 176 artifacts were analyzed to verify what they were – a task which had not been done previously. Second, all artifacts were studied for clues as to their age and origin, leading to twenty-seven artifacts being dated and thirty-one artifacts being assigned a country of origin. Of these, twenty-five artifacts were further determined to be civilian (n=21) or military (n=4) in design. Finally, this study compared data for the artifacts in Feature 4 to the artifacts from other areas of the site. Doing so revealed a disproportionate number of certain artifact types in Feature 4 which are consistent with what would be expected in a gunsmith's cache.

Regarding broader perspectives, the data from Fort St. Joseph reveals several things. Data from this study seem to indicate that limited and extended supply chains of the frontier forced consolutions in terms of weapon repairs. Smiths were often required to make due with the recycled parts they had access to. This entails the stockpiling of spare parts with little regard to factors other than their serviceability. This, in part, may explain seemingly anomalous frequencies of certain artifact types and the prevalence of English artifacts. It further indicates that secondary, or unofficial, lines of trade were an essential part of life on the frontier. The mix of artifacts found in the caches and other areas of the site are emblematic of mix of peoples found on the frontier. A weapon gifted by the English to a Native ally may end up in the spoils taken by Native allies of France. In turn, these weapons or their parts may be acquired by French

smiths, compensated by their king to repair the weapons of soldiers and their Native allies. On this colonial frontier, conflict played out in much the same way as in modern proxy wars; a logistical patchwork where alternate means of acquisition develop organically to supplement gaps in intermittent chains of supply.

Limitations of this Research

There are a number of issues that limit the conclusions of this study. One is the condition of the artifacts in the sample. As mentioned, many of the artifacts are heavily corroded, such as to completely preclude analysis beyond material and artifact type. This heavy corrosion further limits the possibilities of determining whether many of the artifacts were damaged before or after deposition. Finally, details that provide valuable data, such as etchings and symbols are often completely obscured by this corrosion. The end result is that the number of artifacts for which determinations of age and origin could be made dwindles significantly from the overall 176 artifact sample. While it is likely these artifacts could reveal more information through techniques and methods which are discussed below, these techniques were beyond the scope of this study.

Future Research

Based on my work and observations, I find there are a number of potential research avenues to gain a better insight into both Feature 4 and Fort St. Joseph as a whole. First and foremost, a broader analysis of artifacts from in and around Feature 4 is warranted. Doing so could provide additional information from sources not approached in this study, particularly alternative classes of artifacts, such as musket balls or gunflints. For example, a study of musket balls and related artifact types, such as ball molds, could provide evidence needed to clear up some of the answers raised by this study. This would help to answer whether or not English weapons were commonly found at Fort St. Joseph. If such weapons were used at the fort, it

would follow that musket balls and molds appropriate to the bore sizes of those weapons would be found in the vicinity. Since French and English military muskets used different standards for bore size, this is one possible avenue for clearing up this question.

Additionally, cursory comparisons of data in this study to data from Michilimackinac indicate strong similarities in the types of components identified in association with smithing contexts (Roache-Fedchenko 2013). Further studies of flintlock parts from a number of sites of similar age (such as Fort Ouiatenon) could provide insight into whether such trends found in this study are common to fur trade posts. This is particularly important for studying damage and repair. A larger study of sites similar to Fort St. Joseph would provide a larger pool of data regarding what types of damage was common to frontier flintlock components, and how such damages were dealt with, either through repair or replacement of those parts. The presence of similar caches with similar artifact frequencies at other sites would strengthen the conclusions of this study.

There is still much to learn from the artifacts analyzed in this study. The methodological constraints of this study greatly simplified the types of conclusions and trends that could be gleaned from these artifacts. For example, studies utilizing techniques such as pXRF could vastly increase the granularity of material composition as assessed in this study. Rather than classing artifacts as copper alloy or ferrous, a much greater array of compositional classifications would be available. Such detail could potentially lead to assigning origins and sources for artifacts based on the compositional characteristics they exhibit. X-ray techniques could also be useful for analysis of heavily corroded objects, allowing for better identification.

Further potential lies in how artifacts are cleaned and preserved. Techniques such as electrolysis could allow for some obscured details to be rediscovered, particularly on artifacts

such as lock plates, sideplates, or barrels. These details could provide evidence that allows more detailed dating and sourcing of artifacts.

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APPENDIX

Gun Parts by Artifact Types

Barrels – 1

02-1-203.09

Breech Plugs – 32

02-1-68.07, 02-1-107.09a, 02-1-107.09b, 02-1-107.09c, 02-1-115.10b, 02-1-115.10c

02-1-115.10d, 02-1-115.10e, 02-1-115.10f, 02-1-115.10g, 02-1-119.01, 02-1-182.09a

02-1-182.09b, 02-1-182.09c, 02-1-182.09d, 02-1-182.09e, 02-1-196.11, 02-1-202.08a

02-1-202.08b, 02-1-202.08c, 02-1-202.08d, 02-1-202.08e, 02-1-202.08f, 02-1-202.08g

02-1-202.08h, 02-1-202.08i, 02-1-202.08j, 02-1-202.08k, 02-1-202.08l, 02-1-202.08m

02-1-203.10, 13-2-026.05

Bridles – 3

98-3-0.30, 08-2-83w.16, 10-2-25w.10

Butt plates – 7

98-3-0.35a, 98-3-0.35b, 98-3-0.42, 98-3-0.57, 04-1-115.01, 08-2-107.01, 10-2-146.01

Cocks – 35

98-3-0.31, 02-1-107.07a, 02-1-107.07b, 02-1-115.09a, 02-1-115.09b, 02-1-115.09c

02-1-115.09d, 02-1-115.09e, 02-1-115.09f, 02-1-115.09g, 02-1-115.09h, 02-1-115.09i

02-1-115.09j, 02-1-115.09k, 02-1-115.09l, 02-1-115.09m, 02-1-153.17, 02-1-153.18

02-1-182.07a, 02-1-182.07b, 02-1-182.07c, 02-1-182.07d, 02-1-202.07a, 02-1-202.07b

02-1-202.07c, 02-1-202.07d, 02-1-202.07e, 02-1-202.07f, 02-1-203.05, 09-2-091.13

10-2-109.01, 10-2-113.01, 12-2-010.06, 13-2-118.01, 13-2-123.01

Escutcheons – 1

08-2-063.11

Finials – 2

06-2-93w.22, 08-2-45w.15

Frizzens – 31

98-3-0.29, 02-1-115.11a, 02-1-115.11b, 02-1-115.11c, 02-1-115.11d, 02-1-115.11e

02-1-115.11f, 02-1-153.16, 02-1-182.06†, 02-1-182.10a, 02-1-182.10b, 02-1-202.06a

02-1-202.06b, 02-1-202.06c, 02-1-202.06d, 02-1-202.06e, 02-1-202.06f, 02-1-202.06g

02-1-202.06h, 02-1-202.06i, 02-1-202.06j, 02-1-202.06k, 02-1-202.06l, 02-1-203.06

04-1-126.10, 06-2-030.16, 09-2-109.02, 13-2-037.02, 13-2-105w.23, 13-2-109.01

13-2-157.01

Frizzen Springs – 3

02-1-202.09b, 04-1-039.16, 06-2-087.14

Gun Worms – 3

12-2-069.07, 12-2-069w.03, 15-2-044w

Lock Plates – 3

02-1-182.06†, 02-1-203.08, 10-2-148.01

Mainsprings – 12

98-3-0.28, 02-1-18.11, 02-1-128.14, 02-1-173.13a, 02-1-173.13b, 02-1-182.08

02-1-202.09a, 13-2-022w.05, 13-2-038w.13, 13-2-105w.24, 13-2-154.01

15-2-037

Pans – 11

02-1-107.08a, 02-1-107.08b, 02-1-107.08c, 02-1-115.13a, 02-1-115.13b, 02-1-115.13c

02-1-115.13d, 02-1-160.03, 02-1-202.11a, 02-1-202.11b, 02-1-203.07

Ramrod Guides – 3

98-3-0.40, 06-2-045.15, 07-3-060.04

Screws- 2

10-2-022.15, 15-2-021w.06

Sears – 3

04-1-039.10, 08-2-33w.18, 08-2-54w.15

Sideplates – 5

98-3-0.38, 02-1-128.17, 04-1-054.18, 04-1-074.18, 15-2-015

Triggers – 2

10-2-114.09, 15-2-016w.12

Trigger Guards – 7

98-3-0.36a, 98-3-0.36b, 98-3-0.41a, 98-3-0.41b, 98-3-178.15, 02-1-61.22, 02-1-115.17

Tumblers – 3

09-2-56w.15, 10-2-048.12, 11-2-60.08

Upper Jaws – 2

12-2-035.05, 13-2-037.09

Vice Screws – 5

02-1-61.20, 02-1-100.10, 02-1-115.12, 06-2-22w.16, 06-2-38w.18

† Attached lock plate and frizzen both listed as 02-1-182.06, counted twice