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**Alcohol Bottles at Fort Snelling: A Study of American
Military Culture in the 19th Century**

by

Katherine “Rin” Gaubatz

A Thesis

Submitted to the Graduate Faculty of

St. Cloud State University

in Partial Fulfillment of the Requirements

for the Degree

Master of Science

in Cultural Resources Management Archaeology

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Thesis Committee:
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Abstract

The goal of this research was to explore the theme of alcohol as a social status marker within the realm of the American military frontier in the early to mid-1800s. The study was done as a comparison between the drinking habits of the officers and the enlisted men throughout the occupancy of the selected fort during the 1800s. While glass bottles and alcohol are both extensively studied subjects in anthropology and archaeology, there is a gap in the shape of alcohol's use as a social status marker within the American military. This thesis hopes to start to fill in that gap.

The fort studied was Fort Snelling, a 19th century era military installation in St. Paul, Minnesota. The fort had been previously excavated and its collection curated, but very little research has been done on its contents.

The chosen artifacts for this study were the remains of alcohol bottles, including bottle styles that had multiple uses so long as alcohol were among them. The study revealed variations in choice of drink between officers and enlisted men.

Acknowledgements

To my parents for all their incredible support.

“Wine is the most healthful and most hygienic of beverages.”

— **Louis Pasteur**

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Chapter I: Background and Literature Review

Introduction

This study was done due to my own interest in bottles, both in how they are made and their typology. I focused on alcohol as they had some of the more varied bottle types and were extremely prevalent in various fort artifact assemblages. While I am not personally a fan of alcohol myself I do find it interesting how alcohol has been used and is still used in social situations as both a form of bonding but also as a social status marker-such as the eponymous “wine/whiskey/scotch snob” or simply owning a “good/expensive” bottle of the above. I wanted to know how much of that concept may be a modern invention and if not, how the concept may have been applied in the past. The social lives of 18th- and 19th-century English military officers that social standing played a significant part of the station (Eichelberger 2019). Part of that was the ability to be a proper host, which included fine wines. I was curious to see if that held true with early American installations, and Fort Snelling was available to me as a student at St Cloud State University and added the element of isolation, at least initially, as extra impetus for either intensifying or diminishing established social hierarchies between officers and enlisted men. Fort Snelling is a 19th-century frontier fort located at the convergence of the Mississippi and Minnesota Rivers in what is now Minneapolis-St Paul and serves as the basis for this thesis.

Precolonial Background

Human occupation of Minnesota begins in the Paleoindian Period, approximately 12,000 to 10,000 BC. One of the earliest identified cultures in the Minnesota region were the Clovis people. Although long believed by scholars to have been the earliest human habitation in North America, evidence of cultures dating prior to Clovis culture has emerged, although very few sites of that age are currently known in the Midwest (Minnesota Department of Administration State

Archaeologist 2020). Clovis culture is estimated to have begun in 11,500 BC and lasted until 10,700 BC. This culture is identified through the eponymous Clovis Point, a large fluted stone projectile point. Clovis was followed by the Folsom people, again identified via the Folsom point, which was smaller than the large Clovis points and had a flute that ran the entire length of the projectile, as opposed to the partial fluting of the Clovis Point. The Paleoindian Period is followed by the Archaic Period, a time of cultural diversification beginning in Minnesota in 7,000 BC and eventually making way to the Woodland Period (1000 BC-1000 AD). The Woodland Period is one of population and culture expansion, including agriculture, construction of massive mound complexes, textile creation and the like. This period is generally considered to end with European contact, particularly on the east coast (Minnesota Department of Administration State Archaeologist 2020).

Prior to American presence in the west, the territory that would become the state of Minnesota was a trade mecca, due to the great rivers and lakes that cover the region. Initial European contact with the local Dakota people was through French missionaries and traders as the French began to enter the Great Lakes. The French first heard of the Dakota through the Ojibwe, with whom they had already established contact. In 1659-60 the first direct contact between the two occurred when two Frenchmen were wintering with an Ojibwe group and the Dakota came to trade (DeCarlo 2016:15). As the fur trade picked up so did trade and intermingling between the French and the Dakota. “The Dakota system of kinship and reciprocity was integral to the fur trade. Family bonds created trust and required people to share resources” (DeCarlo 2016:17). Many of the fur traders married into Natives cultures, each availing themselves to the fruits born of the resulting kinship ties. While the French, being the

first contacts, began this trend, later British fur traders and the like followed suit, resulting in a multicultural civilization in this place so far flung from European power centers.

Geology of the Mississippi River Gorge. The Mississippi River Gorge was formed by the glacial River Warren's massive waterfalls. The waters of what would eventually become the Mississippi River began to gradually carve the gorge near what is now downtown Saint Paul. Some form of waterfall is believed to have been at the location of Fort Snelling, the confluence of the St. Peter (Minnesota) River and the Mississippi around 10,000 years ago. Over the next 10,000 years, this action eroded upstream at a rate of 4 feet per year, moving 10 miles upstream to reach the modern-day location of the Falls of Saint Anthony (Anfinson and Madigan 2003; Friends of the Mississippi River 2016).

Fort Snelling historic background. Perched on a bluff overlooking the Mississippi River in the heart of St. Paul, Minnesota sits the restored pale stone of Fort Snelling. The history of the fort itself began with the Louisiana Purchase, and the eventual acquisition of the land the fort rests on.

Prior to American acquisition of the region, the initial European contact with the local Dakota people was through French missionaries and traders as the French began to enter the Great Lakes. The French first heard of the Dakota through the Ojibwe. In 1659-60 the first direct contact between the two occurred when two Frenchmen were wintering with an Ojibwe group and the Dakota came to trade (DeCarlo 2016:15). As the fur trade picked up so did trade and intermingling between the French and the Dakota. In the early 18th century the Upper Mississippi and the western Great Lakes were far out of any European empire despite what maps may have said, however European traders and trappers still made their way into these territories.

The north country was not a site of conquest. Rather, it had become a meeting ground of civilizations, a place where geographic and cultural borders were blurred and unfixed.

The mutually beneficial exchange of furs food European goods required a cultural exchange was well, a process of interaction that left no one-Indian or European-unchanged (Wingerd 2010:Loc623).

The meeting ground engendered by the fur trade in this region made for the longest lasting and most fully developed sort of hybrid society in North America (Wingerd 2010:Loc630). In the more southern regions of the country as white settlement spread and ownership of land became “a premium commodity” (Wingerd 2010:Loc630) Native Americans became a problem instead of a people. The Upper Mississippi River valley remained a border region due to the continuing French and British fur trade, which depended on a lack of white farmer settlers and resulting destruction of forest trapping depended upon (Wingerd 2010:Loc630).

By the time the United States acquired the territory through the Louisiana Purchase in 1803, settlements were well established throughout the southern portions of the Mississippi River basin, but the northern region remained rather sparsely settled. In 1805, the US Army sent Zebulon Pike to explore the newly American lands. Soon thereafter, the Army established Fort Snelling on a bluff overlooking the Mississippi and Minnesota Rivers in what is now Minneapolis, Minnesota. In 1823, the first steamboat reached the Twin Cities of Minneapolis and St. Paul [Moore 2001].

Lt. Zebulon M. Pike first laid eyes on the future site of Fort Snelling on a day in late September 1805 (Wingerd 2010:Loc1634). The tall bluff with its crown of fall leafed trees would have been quite the sight, one that would later be included in descriptions of the future fort by travelers as they rounded the bend to see it for the first time. Pike was originally

commissioned to find the source of the Mississippi River, which would define the boundary of the new American territory (Wingerd 2010:Loc1660). His secondary mission, charged by Louisiana Territory Governor and General, James Wilkinson, was to obtain permission from the local Dakota to build military and trade posts where the Mississippi and Minnesota Rivers meet (Wingerd 2010:Loc1660).

The Dakota, eager to obtain what they saw as an opportunity to create an established trade and increase competition, were willing to allow the Americans to build their post. The treaty allowed the Dakota to “pass, repass, hunt or to make other uses of the said districts as they have formerly done” (Wingerd 2010:Loc1678). The Dakota viewed the negotiations as concluding with nothing given away, with money, and a steady source of trade. The Americans viewed it as the “first land cession in Minnesota” (Wingerd 2010:Loc1678). Pike would continue his quest for the headwaters of the Mississippi, having provided a weak show of American might in its new territory.

In 1817, Major Stephen Harriman Long led an expedition up the Mississippi River from St. Louis to the Falls of St. Anthony. His journal, originally published in 1860, primarily describes the features of the river and the surrounding terrain, with some passages noting the provisions they carried (Kane et al. 1978). One passage notes a “Contractor” hired to deliver supplies to three forts (Forts Edwards, Armstrong, and Crawford) for nine months. These forts, like Fort Snelling, were intended to serve as early outposts for trade and peace-keeping with Native American tribes extending up the Mississippi River after the War of 1812 and the Treaty of Ghent (1814) restored the pre-war border between the United States and British Canada.

Fort Edwards was located on the east bank of the Mississippi near the mouth of the Des Moines River around current day Warsaw, Illinois. It was a log-constructed fort that had been

abandoned by 1824 (Whittaker 2010). Given the brief history of this fort and its proximity to St. Louis, it seems doubtful it had much of a role in provisioning the contents of Fort Snelling. Fort Armstrong was located at the foot of Rock Island, Illinois. This stone and timber fort was established in May of 1816 and served until it was abandoned in 1836 (Whittaker 2010). The first Fort Crawford was built in 1816 at Prairie du Chien, Wisconsin to replace the earlier Fort Shelby. When the British left after the Treaty of Ghent they burned the existing fort, which they had renamed to Fort McKay, rather than give it back to the Americans. The fort had been constructed of wood and built at too low an elevation, and therefore in 1826, after a major flood, the troops were ordered to leave and reinforce Fort Snelling (Whittaker 2010). The troops would eventually return, and a second Fort Crawford was built on higher ground. This construction, built mostly of quarried limestone, began in 1829 under the direction of future president Col. Zachary Taylor. Construction continued until completion in 1832. Fort Crawford was occupied through 1856 (Whittaker 2010).

During the life of both iterations of Fort Crawford, Prairie du Chien played a significant role in the history of both trade regulation and relations with Native American tribes (Twine 1999). At one point in 1825 it was the site of one of the largest Indian councils in U.S. history. The location also played a key role in the major lead mining commerce, with many mines located to the south of the Wisconsin River. Later, during the American Civil War, the fort served as a hospital for Union Soldiers.

Upon arriving at the confluence of the St. Peters (now Minnesota) River and the Mississippi, Major Stephen Harriman Long suggested,

A military work of considerable magnitude might be constructed on this point, and might be rendered sufficiently secure by occupying the commanding height in the rear in a

suitable manner, as the latter would control not only the point, but all the neighboring heights, to the full extent of a twelve pounder's range. The work on the point would be necessary to control the navigation of the two rivers. (Kane et al. 1978)

The two rivers being St. Peter's and Mississippi.

But without the commanding work in the rear, would be liable to be greatly annoyed from a height situated directly opposite on the other side of the Mississippi, which is here no more than about two hundred and fifty yards wide. This latter height, however, would not be eligible for a permanent post, on account of the numerous ridges and ravines situated immediately at its rear. (Kane et al. 1978)

It would not be until 1819 that the promised post would begin construction. Two hundred soldiers, who were "raw eastern recruits without experience on the frontier" (Wingerd 2010:Loc1789), arrived to a friendly reception from the Dakota, who expected a trading relationship. In some ways, that was the American intention too. Granted it was to keep British trade away from their territory and keep the Dakota and Ojibwe from warring and therefore damaging trade (Wingerd 2010:Loc1798).

The first attempt at the creation of the fort in 1819 went poorly, as underprepared troops fell ill to scurvy and ran out of supplies in the face of a harsh Minnesotan winter (Wingerd 2010:Loc1951). The besieged Colonel Henry Leavenworth was relieved by Colonel Josiah Snelling in the summer of 1820. Colonel Snelling, whom the fort was subsequently named after, rallied the troops and completed construction in 1824.

Fridley describes Fort Snelling is described as being:

...laid out in the shape of a diamond, outlined by a wall made of limestone quarried from the banks of the river. Two blockhouses, hexagonal and pentagonal

in shape, overlooked the Minnesota and Mississippi rivers. At the point of the bluff above the junction of the two rivers stood a round watchtower. Opposite it at the point of the diamond exposed to the open prairie stood a lookout, the structure we know as the Round Tower. Within the walls were barracks, quarters, and storehouses. [Fridley 1956:179]

The barracks and the officers' quarters face each other across the parade ground, with the Commanding Officers' quarters sitting at one corner of the "diamond", opposite the end with the Round Tower (Figure 1).

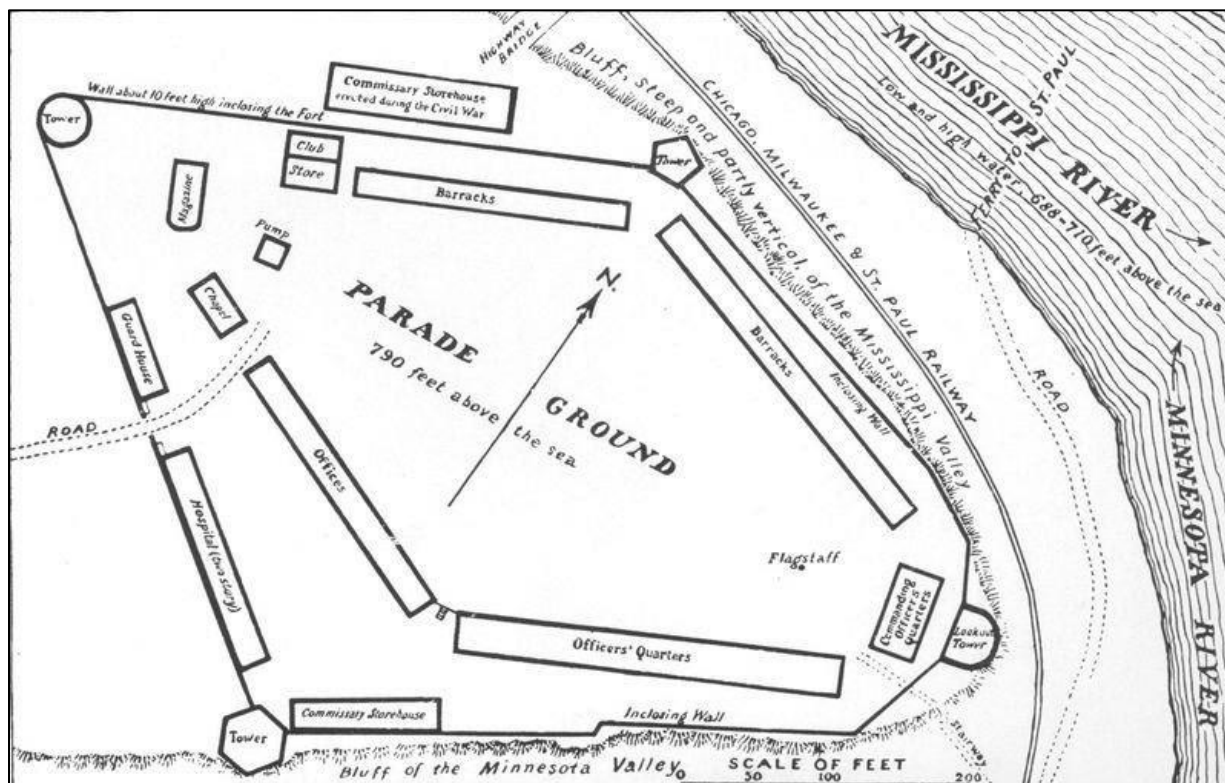


Figure 1: 1898 Map by Captain Arthur Williams (Hansen 2007).

The fort made an opposing sight, looming on the bluff over the river. However a sight was all it was, as “they were forbidden to intervene in tribal disputes” (Wingerd 2010:Loc1951).

Practically, this left the men with very little to do, apart from the daily upkeep of the fort and patrols.

The diversions available to allay boredom are where the divide between the lives of officers and the lives of the enlisted soldiers shows most clearly. The officers' wives, as most of them were married, proved to be part of the cultural force that resulted in the differing drinking habits of the men of the fort.

The women, finding themselves far and away from their familiar society, set out to replicate it to the best of their resources. Their husbands, following the trend of officers from elite families (Skelton 1994:262), would have followed suit. Officers, following the establishment of a formal army after the Revolutionary War, were often political postings and many had little to no actual combat experience (Skelton 1994:257). Their notions of civilization included an attempt to replicate the social divide between officer and soldier. Being an officer was not a job, but a lifestyle with very specific requirements and trappings of the upper class; with actions that ranged from drinking tea to attending church to courting the 'right' women, all done with an abundance of gentlemanly manners (Wingerd 2010:91).

Some settlers with families chose to stay near Fort Snelling, allowed to do so by the post commanders who saw opportunity in what they could provide the fort. This included "small-scale farming, [working] as artisans, or...as petty traders" (Wingerd 2010:Loc2609). These mostly Swiss immigrants were the first non-fur trade settlers in the area, and the beginning of what would become St. Paul.

By 1825 it was the hub of the upper-Mississippi—a center of trade and an instrument of U.S. policy and administration. Traders stopped at the fort while their goods were inspected. American-controlled fur companies built headquarters within a mile of its

walls, and the employees settled nearby. (Military Historical Society of Minnesota, Forts on the Minnesota Frontier)

The fort was also a startlingly popular tourist attraction during the pre-Civil War era, particularly with its scenic views and the nearby St. Anthony Falls. During the 1850s the fort was well known for the depictions of aforementioned scenic views by visitors, both the ones the fort overlooked as well as images of the actual fort.

Fort Snelling's purpose as a frontier fortification diminished as the frontier moved past it and by 1857 Congress ordered troops withdrawn. Prior to this period fifty-three officers had served in command of Fort Snelling, between 1819 to 1858 (Diesen 2020:62). The land was then sold to Franklin Steele after the troops were withdrawn (Fridley 1956). The fort was put back into service only a few years later during 1861 as a Civil War induction and training center, after which it was re-established as a military outpost.

Little over a year later the incident that sparked what would be called the U.S.–Dakota War of 1862 occurred. Like the Civil War the rest of the nation was embroiled in, the U.S.–Dakota War of 1862 was a result of years of tensions that just needed one full incident to snap into something much larger. The Dakota there had suffered from a long series of misfortunes and grievances as their way of life was impacted, and influenced, by the European Americans. The winter of 1861 had led to crop failures and near starvation (DeCarlo 2016). Promised shipments and annuities were delayed by the Civil War, and tensions eventually lead to conflict in August of 1862.

Accounts vary of the details of the confrontation, but the end result was four young Wahpeton young men killing seven white settlers (Wingerd 2010:Loc6501). Many, many more would be dead by the end of it. During the six-week period groups of Dakota men, mostly

traditionalists, attacked various Euro-American settlements, farmsteads and military installations (Wingerd 2010:Loc6350). Little Crow, one of the chiefs, found himself trapped between the blame of the peaceful faction for his part in starting the war and the potential derision of the war faction if he wavered in continuing it. By the time the war ended with the decisive Battle of Wood Lake on September 23, 1812, only some three hundred Dakota still “retained any zeal to fight, and they approached the battle with fatalistic stoicism” (Wingerd 2010:Loc6639). It was considered a “resounding victory” by the American troops (Wingerd 2010:Loc6646). The few remaining Dakota combatants fled west and north, but many with families could not escape quickly enough, and surrendered. Those taken into custody by the US military ended up in temporary camps and many were put on trial. Measles broke out in these camps infecting both troops and the Dakota. Winter was approaching and food was scarce.

While Fort Snelling itself saw no combat, the fort as the site of a concentration camp on the banks of the river below. Brigadier General Henry Sibley, who had been in charge of quelling the conflict, had planned mass executions of the men, whether or not they had harmed civilians. While President Lincoln and his cabinet, whom General Pope, Sibley’s superior, “belatedly realized” (Wingerd 2010:Loc6732) was needed to actually carry out the executions, reviewed the case Sibley sent the rest in custody to Fort Snelling. While the majority of the men were saved from summary execution, 38 men were still hung in the largest mass execution in U.S. history. The remaining 1,700 Dakotas in custody, “some 250 guiltless full-and mixed-blood men, the rest women, children and elders” (Wingerd 2010:Loc6803), were sent to an internment camp at Fort Snelling. The journey from Fort Ridgely to Fort Snelling exposed the captives to enraged whites, resulting in death and injury, including an infant that was pulled from its mother’s

arms and “dashe[d] it violently on the ground” (Wingerd 2010:Loc6818). The reprieve of arriving at Fort Snelling proved to be false, and due to horrific conditions and a harsh winter “nearly 300 died from diseases that swept through the camp” (Wingerd 2010:Loc6832). It is entirely possible not all the deaths were of natural causes.



Figure 2: Interior view of reconstructed Fort Snelling, Round Tower behind viewer, courtesy fortwiki, photo by John Stanton 8 Sep 2013. Public domain.

Eventually those in the concentration camp were sent away to “a reservation on the Missouri River, some eighty miles above Fort Randall in Dakota Territory” (Wingerd 2010: Loc7090). White settlers put the “Indian Problem” behind them, “all trace of the multicultural world of the Upper Mississippi had vanished, along with any visible Indian presence” (Wingerd 2010:Loc7359).

Fort Snelling was made the headquarters of the newly created Department of Dakota, which included Minnesota, Dakota Territory, and most of Montana Territory, in 1866 (DeCarlo 2016). More forts were to be constructed through these territories, expanding the reach of the

U.S. government and military (DeCarlo 2016). Several years later in 1871, Franklin Steele, who had briefly owned the fort before it was reinstated during the Civil War, filed a claim against the government in an attempt to be paid for the U.S. Army's use of the fort during the war. As Steele still owed the government part of the original purchase a "deal was struck" (DeCarlo 2016:61), leaving the army with fifteen hundred acres of the military reservation and the remaining sixty-four hundred going to Steele. The Department of the Dakota headquarters would briefly relocate to St. Paul before moving back to Fort Snelling in 1876. "In the 1880s the old fort barracks and frame buildings were still being used, but they began to deteriorate and the walls were demolished" (DeCarlo 2016:61). Minneapolis and St. Paul would continue to grow around the fort. Fort Snelling was also the regimental headquarters of the African American Twenty-Fifth Infantry, also known as the Buffalo Soldiers, until 1888. Fridley (1956:185) notes that from 1879 to 1881 new officers' quarters were erected west of the old post and in 1889 additional barracks were added. Soldiers from Fort Snelling were also a part of one of the last battles with Indigenous people, the Battle of Sugar Point, which was precipitated by General John A. Bacon and seventy-seven men from the Third Infantry converged on Sugar Point with the goal of capturing Bagone-giizhig, an Ojibwe man who had been arrested on bootlegging charges and freed on lack of evidence and then fled when charged again, and on capturing those who had aided him. "Accounts differ on how the battle began, but the troops came under fire from Ojibwe who believed their people were under attack" (DeCarlo 2016:67), with the result being one Ojibwe policeman being killed, four civilian casualties, and on the U.S. side six were killed and ten wounded. Bagone-giizhig was not a part of the fighting and was never captured (DeCarlo 2016). Fort Snelling served as a mobilization point for "National Guard units sent to protect the border with Mexico during the Mexican Revolution" (DeCarlo 2016:67), and would become an

induction and processing center for new recruits at the advent of the U.S. entering World War I in April of 1917 (DeCarlo 2016). The post was renovated for this service, building a “temporary cantonment of several wooden buildings at the present location of the Minneapolis-St. Paul International Airport” (DeCarlo 2016:67). Fort Snelling would be designated General Hospital 29 under the Medical Department of the U.S. Army in September 1918, and would tend both to the victims of the 1918 influenza pandemic and then later the returning soldiers of World War I. In the decades in between the World Wars Fort Snelling was of a much easier atmosphere, with “tennis courts, a golf course, and a swimming pool” (DeCarlo 2016:70) added to the fort.

World War II would see Fort Snelling become a training center once again. It would also serve as a training center for harsh winter training, the headquarters of the Military Railway Service, and as the Military Intelligence Service Language School (MISLS). MISLS trained second generation Japanese American citizens, called Nisei, in Japanese linguistics and intelligence work in preparation of war with Japan. Many students of these schools were recruited out of the concentration camps ordered by President Franklin D. Roosevelt. The school eventually “graduated over six thousand linguists” (DeCarlo 2016:75). Many of these students would server in the Pacific or China-Burma-India theaters, and their work would not be declassified until the 1970s.

In October of 1946 Fort Snelling was discontinued as a military base, and its remains were given to the Veterans Administration (DeCarlo 2016). By that time the original buildings of 1820s Fort Snelling had been either demolished or had been heavily renovated (DeCarlo 2016:76).

Archaeology of Fort Snelling. The fort was vacant until interest in the fort was rekindled after a narrow miss in 1956 when the Minnesota Highway Department proposed a

freeway that would circle the Round Tower, damaging the rest of the site. The Minnesota Historical Society (MHS) successfully argued against this placement of the road and it was re-routed through a 450-foot tunnel (Johnsen 1970). Twenty years later in 1965 the restoration and reconstruction of Old Fort Snelling began. “With the approach of the state’s one hundredth birthday in 1958, the Statehood Centennial Commission granted the MHS \$25,000 to undertake the archaeological investigation of the old fort” (Johnsen 1970:84).

Archaeology was central to the development of Historic Fort Snelling as an interpreted historic site. The Fort has been the focus of archaeological investigations for over 50 years, with the first excavations occurring in 1957-58. During this time staff of the Minnesota Historical Society (MHS) carried out what might be the largest archaeological excavation of a military installation ever conducted in the United States. [Minnesota Historical Society 2020]

The focus of the original excavations was to reveal the foundations of the structures to create an accurate reconstruction. When Fort Snelling was originally constructed in the 1820s the fort included batteries (towers housing artillery) at each corner of the diamond created by the local limestone walls (DeCarlo 2016:29). One of the towers included a hexagonal tower located on the section of fort facing the river landing. Buildings within the walls included the commandants house, two barracks for enlisted men, the Long and Short barracks previously discussed, the officers’ barracks, a schoolhouse, commissary, guardhouse, powder magazine, trade shops and sutler’s store (DeCarlo 2016:29). A hospital would be added in 1840 (Clouse 1996:76). The Long Barracks and Officers’ Quarters would be rebuilt in 1845-1846, and little evidence of the original 1820s structures remain (Clouse 1996:161). The excavation was to be carried out by the late John M. Callender, who was the head of the project. His goal was to

ascertain whether significant archaeological features still remained of the fort, which was proved in spades. Callender uncovered all five of the original fort structures as well as two later built facilities during the excavation (Clouse 1996:183). His method did not include excavating at stratigraphic levels, and heavy machinery was used. Very few artifacts were ever accessioned or collected as part of this project, as few of the pits were sifted for artifacts (Clouse 1996:187).

At the completion of his excavations, “fill” over the area north and west of Pike Road was removed by machinery to the level of the upper surface of the recovered footings, to Callendar’s interpreted “original parade ground surface level.” Spaces archaeologically excavated within building foundations below this surface were refilled and the entire area sodded over. [Clouse 1996:187]

The project began in September of 1957 and lasted sixteen months. Callender never filed full field notes with the Minnesota Historical Society. The only source published involving the original excavation is “An Archaeologist Explores the Site of Old Fort Snelling” written by Callender and published in December of 1957, barely midway through the project. It was submitted to the Minnesota Historical Society Press. The focus of the article is on the structures and a handful of “notable” artifacts such as a Civil War era cavalry sabre and an English penny. The only glass mentioned are shards, with no further description.

As a result of the missing field notes, a second season of archaeological excavations were undertaken in 1966-67; mostly to re-excavate the previously excavated areas, as part of a continuing goal to restore and reconstruct the main buildings of Fort Snelling. Work would continue into the 1970s, primarily to supplement the historic record or to determine the specifics of various buildings, focusing on the 1820s-period Fort Snelling. Due to the level of detailed historical documentation later structures were not excavated to the same degree (Clouse

1996:181). The Fort Snelling archaeological site would be revisited every year between 1965 and 1975, concentrating on removing the Callendar backfill and recording the remaining features as an ongoing part of the reconstruction process. It would not be until 1977 that archaeological work would begin to cover areas that were not to be included in the restoration, and would focus more on creating a better understanding of the full scope of life at the fort (Clouse 1996:181). The fort was excavated intermittently through the 1980s as part of these restoration efforts. The following is a description of the excavation efforts:

Archaeology at Fort Snelling resumed in the 1960s, after the Federal government agreed to transfer most of the property to the State of Minnesota. For the next 18 years, archaeologists spent the spring, summer and fall excavating the footprints of every building that had stood inside the walls at Fort Snelling, as well as stables, root cellars and other structures outside the walls. At the same time, researchers combed the National Archives for documents and maps related to the early years of the Fort. [Minnesota Historical Society 2020]

In 2020 Charles O. Diesen published a study on the officers' latrine at Fort Snelling, concerning field excavations done in 1972. A significant portion of the latrine (60%) was "removed due to a breakdown in communication with the backhoe operator" (Diesen 2020:36), but the remaining portion was excavated. The latrine is presumed to have been established in 1824, as that is the same year the officers' quarters were finished (Diesen 2020:38). Artifacts recovered from the latrine that are relevant to this thesis included glass bottles and glass tableware such as decanters, tumblers and stemware, as well as medicine bottles. While Diesen did not identify probable use of the glass storage bottles, the presence of tumblers and stemware likely indicates the use of alcohol, and Diesen notes that the "drinking glasses of the latrine

appear to be of fairly good quality” (Diesen 2020:60). The various bottle shards discovered within the actual buildings during the Callender and 1970s excavations were likely deposited either during the life of the buildings through gaps in the floorboards or during the various renovations and eventual demolition.

The excavations were successful in gathering enough information to create the reconstructions of the historic fort. Today Fort Snelling is a historical landmark, and part of the Minnesota Historical Society. The fort hosts research, archives, tours, demonstrations, and more.

Theoretical perspective. While Wurst and Fitts (1999) propose a relational conception of class in opposition to the gradational approach employed by most historical archaeologists, I have chosen to adopt the latter for the purposes of this thesis. For the purposes of this thesis, class will be defined by “status” attributes as described here. Spencer-Wood and Heberling (1987:59) define status as “the location of the behavior of individuals or the social position of individuals themselves in the structure of any group. It is a defined social position labeled in a defined social universe” (Spencer-Wood and Heberling 1987:59). The social universe in this case being both the frontier fort of Fort Snelling and the social universes back east that the officers endeavored to recreate within the fort. Wurst and Fitts (1999:8) present the theory of internal relations, in which class as a concept exists as a system of internal relations. Class positions cannot exist in a vacuum, and each person’s class position is determined by one’s social status (usually determined by wealth and/or occupation) along a horizontally oriented gradation (e.g., the “lower class,” “middle class,” or “upper class”) . The inherent social hierarchy of the military structured the relative class positions of officers and enlisted men. This both informed and reinforced the lines between the two classes, despite the fact there was some possibility of upward or downward class mobility due to promotions or demotions. Those

enlisted men promoted to the officer ranks were likely to mimic the behaviors of previous officers, keeping the boundaries of the social mores (along with their behavioral and material makers) of the two classes relatively distinct.

In Michael Dietler's (2006) *Alcohol: Anthropological/Archaeological Perspectives* he provides updates and insights into new at the time perspectives on the study and views of alcohol within the field of archaeology. Relevant to this thesis is the segment on "Alcohol as Embodied Material Culture." Alcohol, he notes, is in of itself a culturally specific term, encompassing a broad and occasionally disparate category of drinks that contain the chemical ethanol. Past that the line begins to blur, as the concept of linking these different drinks as containing alcohol came about during the nineteenth century temperance movement, and that this is not a universal category, as other cultures may not consider drinks containing ethanol as "alcoholic" drinks. Ethanol itself can be produced in a variety of ways and through a variety of sugary and starchy foods, from grapes to corn to potatoes. Nutritional value varies from essentially none to providing a substantial portion of some cultures' diets.

Dietler (2006:232) notes that like many other foods, alcohol is a form of material culture that exists solely to be destroyed, "but through the transformative process of ingestion into the human body." As a result, it has an exceptionally close association with a person and their concepts of identity, and the addition of most alcohol's psychoactive components means there is often an association with ritual contexts. Therefore, the consumption of alcohol, even when removed from explicitly ritual contexts, becomes emotionally and culturally charged as an act. And as it is an inherently consumptive process, there must be a continual replenishment via both agricultural production and creation of the various types of alcohol in culinary contexts. "These features also assure that the **consumption of embodied material culture constitutes a prime**

arena for the negotiation, projection, and contestation of power, or what may be called commensal politics” (Dietler 2006:232, emphasis mine). Therefore, the material culture found in the officers’ quarters would display wealth in the form of more expensive alcohol types used in events such as parties. The bottles and shards of Fort Snelling are examined here from a post-processural perspective that assumes an active role for material culture, and these material objects stand in as proxies for the material consumed from them, that alcohol.

Literature Review

The complexity of alcohol and alcohol containers as a material culture is echoed by the sheer volume and variety of alcohol types and creation processes, serving styles, as well as social and cultural contexts. “They form a versatile and highly charged symbolic medium and social tool that are operative in the playing out of ritual and politics, and in the construction of social and economic relations, in crucial ways” (Dietler 2006:232).

Justin E. Eichelberger’s study on two Oregon forts (2019), *Officers: The Negotiation of Class and Rank at Fort Yamhill and Fort Hoskins, Oregon, 1856-1866* provides an in-depth study into the lives of officers at a nineteenth century United States Army post. Eichelberger discusses the forts as microcosms of both the eastern metropolitan cities and as a rigidly stratified “caste-like” environment reinforced by the structure of the 19th-century United States Army (Eichelberger 2019).

Nineteenth-century U.S. Army officers understood themselves and their surroundings in terms of military rank and social class. The first paragraph of the first article of the United States Army Regulations (United States War Department 1861) defined military discipline and stipulated that “[a]ll inferiors are required to obey strictly, and to execute with alacrity and good faith, the lawful order of the superiors appointed over them,” and

the first paragraph of the second article provided the structure for this social and military inequality through the hierarchy of rank and command. This created a system of institutional inequality between the grades that exacerbated the already existing social inequalities the officers brought with them from the civilian world. [Eichelberger 2019:105-106]

Eichelberger goes on to discuss ritualized behavior, notably “conspicuous consumption” (Eichelberger 2019:106) used during dinner parties, where rare or expensive goods were used as an indication of status and wealth. Included in these displays were types of alcohol. Artifacts at the two forts included “a variety of alcoholic and nonalcoholic beverages, including champagne, wine, brandy, whiskey, ale/porter, seltzer, non-alcoholic carbonated beverages, and several alcohol bottles with indeterminate contents” (Eichelberger 2019:120). Champagne and wine specifically were more common in the officer’s quarters and were more expensive at the time, whereas “ales and porters tended to be cheaper and, during the 19th century, were alcoholic beverages typically associated with the working class” (Eichelberger 2019:120; Hooker 1981:132). The type of artifacts distributed among the officers of various ranks in this study implied that “higher-ranking officers were expressing their higher social status through the consumption of more expensive and higher-status alcoholic beverages” (Eichelberger 2019:120). Mark Axel Tveskov and Chelsea Rose (2019) also examined the liminality of the frontier fort and the ways that the identities of officers and enlisted men interacted with these spaces, specifically within the Oregon territory. They note that the officers attempt to “approach the ideals of emerging Victorian gentility and military formality more closely” (Tveskov and Rose 2019), despite circumstances of the relatively isolated forts forcing some changes.

Alcohol, specifically personalized alcohol bottles via seal or crest, is also discussed as a symbol of status is discussed in Veit and Huey's "New Bottles Made with My Crest": Colonial Bottle Seals from Eastern North America, a Gazetteer and Interpretation (2014). Blobs seals, discussed in the results section of this paper, were used as identifiers, bearing dates, initials, shields and the like. Veit and Huey note that "[s]ealed bottles have often been interpreted as status markers [Horna 2005; A. Smith 2007] and are also associated with mannerly behavior [Goodwin 1999:133-140] and personal identity [White and Beaudry 2009: 218-219]" (Veit and Huey 2014:55). While the personal seal faded from popularity sometime in the end of the eighteenth century, commercial usage was still ongoing, specifically for wineries and some bottlers, "[t]hey were used for Madeira and other specialty wines" (Veit and Huey 2014:58). An example of this type of commercial seal will be discussed in the results section of this thesis.

Primary sources were an invaluable part of this research. Letters archived at the Minnesota Historical Society reveal glimpses into the daily lives of the letter writers, even if just one of many orders to the sutler's store. Lawrence Taliaferro, Fort Snelling's Indian Agent, had a well-documented battle with fur traders over barrels of whiskey that were being transported, presumably, to trade with the local tribes. Correspondence from the inhabitants of the fort lend a first-hand perspective on the function of drinks and the like in social settings, such as the champagne and oysters that so impressed Mrs. Emily Ayers, whose letter (1856) is described later in the discussion section of this thesis.

In *Digging West Oakland: What Archaeologists found under the Cypress Freeway* by Adrian Praetzellis (2005) at Sonoma State University, Praetzellis discusses the findings of an archaeological excavation of Oakland's historic area prior to the construction of a freeway. The resulting report published by Sonoma State University discussed various themes of the findings,

including the presence and social implications of alcohol. While Oakland was not a fort, it is a glimpse at the enduring nature of using specific types of alcohol as a marker of social status.

“As for a man, an Oaklander’s status affected his drinking habits. Middle-class people...bought larger quantities of wine and champagne than their working-class neighbors...For a respectable family...it would have been important to entertain in the appropriate style. Serving champagne, wine, spirits, and cordials...” (Praetzellis 2005:20) and the like helped maintain social status even when the monetary wealth of a family may have diminished.

Historical archaeology contains many studies (e.g., Eichelberger 2019, Tveskov and Rose 2019, Veit and Huey 2014) involving status and the use of certain dinnerware and crockery, so it only makes sense that the foodstuff in said dinnerware or served during those times would also be a status marker. In Douglas Scott’s (1989) *An Officer’s Latrine at Fort Larned and Inferences on Status* he discusses artifacts found at Fort Larned in Kansas and how they function as an active form of material culture and the resulting suggestions about military social status and hierarchy. Scott notes:

Historians have observed that the military is a microcosm of the culture it supports. The military tends to be more visibly ranked, stratified, and structured than the rest of society. This is necessarily so, due to the job of the military, the making or prevention of war (Scott 1989:24).

Scott divides the glass from the assemblage into several different classes, including a bottle class. “Within the bottle class, seventy percent are identified as medicinal, patent remedies, and liquor bottles...” (Scott 1989:25). Well over half the glass bottles recovered at Fort Larned belonged to the medicinal or liquor category, which, while noted by Scott, is not a fact

further expanded upon in his report. Fort Larned was active from 1859 to 1878 and is mostly post-Civil War in period for the assemblage.

In *The Archaeology of Alcohol and Drinking* by Frederick H. Smith the endurance of alcohol as a social status marker is established. The book notes that glass bottles began to outpace ceramic as containers for drink in the sixteenth and seventeenth centuries, which continues to today. While not specific to the military, Smith does strive to point out the accomplishments and failings of historical archaeology's study of alcohol and drinking:

The cultural anthropological study of alcohol consumption has generated a sizable body of scholarly literature that has largely been focused on distinguishing the drinking patterns of different social groups, interpreting drunken comportment, identifying ways in which specific alcoholic beverages create social boundaries, and exploring the various functions of drunkenness. [Smith 2008:59]

What Smith considers one of the main failings is the tendency to sort alcohol into foodstuffs and leave it there. The author speaks about the various locations, such as saloons and taverns, which have been the focus of archaeological study. Such studies include the wreck of the steamboat Bertrand and its excessive number of alcohol bottles on its way to a gold mining town in Montana (Petsche 1974; Switzer 1974).

The River Basin Surveys, conducted and published in the 1940s to the 1960s, are a series of archaeological studies of frontier forts active during the 1800s. One survey paper in particular is especially relevant to this thesis. This is Paper No.17: The Excavation and Investigation of Fort Lookout Trading Post II (39LM57) in the Fort Randall Reservoir, South Dakota by C. F. Miller (1960). This particular fort was established in 1831 and occupied until 1850 by the French

Fur Trading Co. Very little glass was found during the excavation, however identifiable glass included wine bottle shards, and contained glass of the following description:

“One bears a series of curvilinear interlocking scrolls adjacent to the base of the container, while the other has a number of undulating parallel ridges running at right angle to the base, (fig. 9)” (Miller 1960:67). This description, along with the accompanying illustration, matches a violin or scroll flask, a glass type found at Fort Snelling and discussed in the results.

The prevalence of alcohol bottles remains found in fort artifact assemblages can be at least partially attributed to the fact that liquor was actually part of a soldier’s rations for years. Starting in 1785 one “gill” of rum was added to the ration. A “gill” is 4 oz. and today is used almost exclusively to refer to a measurement of alcoholic spirits. According to the Army Quartermaster Foundation in 1812 the standard soldier’s ration included the following (Army Quartermaster Foundation 1949):

20 oz. beef	.64 oz. salt
18 oz. flour	.64 oz. soap
1 gill rum	.24 oz. candle
1 gill vinegar	

After 1832 the rum ration was eliminated and coffee and sugar was substituted. Allowance of spirits was not eliminated in its entirety, as The Army Quartermaster Foundation notes that “[the] Congressional Act of 1846 allowed commutation in money for the extra spirit ration, which was allowed to enlisted men engaged in the construction of fortifications or the execution of surveys.” This refers back to an act of 1799, which authorized the issue of spirits “in case of fatigue service, or other extra occasions”. In 1865 this was abolished as well. The fondness for and association of armies and alcohol, however, continued.

Within Fort Snelling. As previously discussed, frontier forts were not always shows of force but also a form of expanding Western influence. The following correspondence is included as examples of Fort Snelling's function as not only a show of force but also as a "civilizing influence," which may have factored into the emphasis the officers and their families put on replicating high society as best as they were able. This replication only seemed to apply to the officers, as the fort had very little to do with actual military operations. This meant that "[in] practical terms, this left the common soldiers almost nothing to do, especially over the long winters" (Wingerd 2010:90).

The following letter was written by a visiting civil engineer, George F. Fuller. In 1853 he assisted in a topographical survey of the Fort Snelling area. All of the following quotations come from his letter dated "Fort Snelling, Sunday, May 30th 1853" (Minnesota Historical Society).

I am very comfortably situated have quarters in the barracks, and mess with Lt.

Magruder, who is about the only officer permanently at the post, a real good fellow.

There are two or three other officers, who have been stationed here for some time but are about removing 100 miles farther up to establish a new post.

By the 1850s Fort Snelling was no longer the northernmost frontier, which Fuller comments on:

I am going to send you a view of St Pauls, the approach to which as you come up the river is exceedingly beautiful. I find I was very much mistaken when I supposed that I was coming to the outskirts of civilization. The country is thickly settled, and the city of St Pauls has 5000 inhabitants. 5 years ago, It had one house, or rather a log cabin.

As noted earlier, Douglas Scott (1989) explores themes of status expressed at frontier forts. The theme of recreating "civilization" as a way of establishing power dynamics in a "non-

civilized” area applies to this thesis. Liquor, particularly expensive or difficult to obtain liquor, has been and is still used as a status symbol. Douglas notes that “[it] is suggested that those who were physically separated from the mainstream society, particularly in a hostile environment, tended to acquire objects that functioned on an ideo-technic level to reinforce societal association.” Ideo-technic being similar to socio-technic, but specifically relating to the properties of an artifact that definitively reflect the mental, cognitive component of culture.

The Society for Historical Archaeology (SHA) notes on their website that champagne style bottles are “one of the more common alcoholic beverage bottles found on mid-19th to early 20th century historic sites” (Lindsey 2020). They also note that they are especially common in Western Army fort excavations despite presumably being a relatively expensive drink (Eichelberger 2019; Lindsey 2020; Wilson 1981).

Champagne bottles were also used for beer bottling, with nineteenth century green champagne style bottles being used for "Clausen's Champagne Lager Beer," depicted in trading cards (Lindsey 2020). This may be an explanation for the sheer number of champagne bottle finishes seen even in the cursory initial examination of the Fort Snelling collection. Residue analysis would be ideal, but the glass has been cleaned and may have been otherwise contaminated in this particular collection.

In *Second Time around: A Look at Bottle Reuse* Jane Busch (1987) notes that not only were bottles still fairly expensive in the early 1800s, as few American glass houses existed, “[s]econdhand bottle dealers distributed used European wine and champagne bottles to American wineries and to the fruit juice and gaseous water industries in upstate New York”(Busch 1987). In Robert M. Herskovitz’s (1978) examination of material culture from southwestern Fort Bowie

beer bottles proved to be more numerous. However, champagne bottles still made up the third most popular alcoholic bottle type (beaten out only by hard liquor bottles such as whiskey).

A brief history of alcohol types. The oldest verifiable brewery was found in a prehistoric burial site in a cave near Haifa in Israel. Residue of a 13,000-year-old beer that might have been used for ritual feasts to honor the dead was discovered, with traces of a wheat-and-barley-based alcohol were found in stone mortars carved into the cave floor. (Liu et al. 2018) Alcoholic drinks have been part of human culture for thousands of years and have generated various cultural meanings as a result.

Whiskey. Whiskey is a type of distilled alcohol made from fermented grain mash (including barley, corn, rye, and wheat) and usually aged in wooden casks. Whiskey at the time was not aged, which was part of the evolution into the drink familiar to people today (Theobald 2008). In America it was actually used as a form of currency, as well as rations, during the American Revolution, with George Washington owning a large distillery. Whiskey was a readily and easily made drink, often created by any excess grain farmed and distilled at home. A single bushel of corn yielded about three gallons of whiskey and was worth far more that way. The drink would outpace rum after the American Revolution in popularity as the British cut off access to the molasses used to make rum (Theobald 2008). Whiskey as a quintessentially American drink, as opposed to mostly imported Madeira wines and British rums, was a concept that gained popularity after the Revolution. The drink soared in popularity. Treasury Secretary Alexander Hamilton moved in 1791 to tax domestically produced spirits in hopes of alleviating debts from the Revolution, much to the dismay of the producers of said domestic spirits, who argued that the tax fell disproportionately on the poor farmers who were the primary producers

of the drink. After a petition to repeal the tax failed the Whiskey Rebellion occurred in 1794 (Theobald 2008).

A group calling themselves the “whiskey boys” went on a rampage, burning tax collectors’ homes, tarring and feathering excise officers, and destroying property of any who complied with the tax. Thousands of whiskey boys marched on and occupied Pittsburgh. Reluctantly, President George Washington called out the militia. The rebellion collapsed. A few rebels were captured, convicted of treason, and sentenced to death. Washington pardoned them. [Theobald 2008]

The resistance to the tax would continue and prove to be so economically unviable that the tax was dropped in 1802. The popularity of whiskey would only be dented by the Temperance movement, and even then, whiskey remained fairly popular, and would slowly specialize and age into the drink we know today.

Bourbon is a specific type of American whiskey, made from corn mash and originated in what is now Kentucky. Bourbon as a specific type of drink distinct from general whiskey would begin to emerge in 1813, as corn steadily overtook the preference of mash from the previously popular rye (Minnick 2016).

Wine. Wine is one of the oldest forms of alcohol in civilization. The drink has been around about as long as beer, dating back to approximately 6,000 BCE. It appears that wine played a distinct role in the overall consumption of alcohol in the early 1800s. The sources of the wine itself, like so many other commodities around that time, were represented in two starkly different forms. These would be the imported wines, mature in both their lineage and quality, or domestic wines which were the result of many varied and sporadic early efforts of an American winegrowing industry in its infancy.

The availability of imported wine in North America and on to the frontier settlements was in step with evolving modes transportation and the duration of cross-Atlantic journeys. Wine is organic, so it is at the mercy of nature and time (Malin 2014). Most wines had a shelf-life in the barrel of less than a year, and until the development of merchant steamships in the mid to late 1800s, transit across the Atlantic still ranged around three months. Heat also destroys regular wine, adding to the list of transport difficulties. The speed and regularity of imported goods both before and after the war of 1812 were also impacted by the range of tariffs and embargoes enacted by the young confederacy and the English.

To extend shelf-life and durability, as early as the 1600s merchants began adding brandy to wine to increase its alcohol content. Fortified wines such as Madeira, Sherry and Port likewise had extended shelf lives. Due to this durability, these fortified wines could have also arrived in frontier regions even under more difficult transport circumstances. With the advent of steam travel, both cross-continent and along the Mississippi river, more conventional wines, both still and sparkling, could have arrived with frequency in bottles.

In the 1860s the great Phylloxera blight destroyed many of the vineyards across Europe. In the ultimate irony, the American vines that had been brought back to Europe by their winegrowers carrying the microscopic insects proved to also be the remedy. There is no cure for Phylloxera, so the primary means of successfully containing it was to graft the native American root sock to the European vines (Pinney 1989).

Early efforts of winegrowing and production began in the colonies almost immediately upon Europeans arrival in the new land. The English had hopes and expectations that their colonies could provide their own source for wine as an alternative to the necessity of buying wine from the rival French and Spanish. The colonists also had winemaking ambitions of their

own. Many notable figures in American history who had spent extended periods of in Europe such as Ben Franklin and Thomas Jefferson endorsed domestic winemaking efforts. This is seen through publications such as Poor Richard's Almanac and commercial ventures such as the Pennsylvania Vine Company. Often the endorsements for success were exaggerated and resulting endeavors failed due to every manner of hardship as well as the simple lack of scientific plant study. Vines imported from Europe simply did not thrive, and wine made from native grapes rarely produced drinkable, let alone marketable wine. But the demand remained strong, the financing was willing, and so the market continued (Pinney 1989).

Some of the first commercial successes of winemaking were the result of the discovery of the Alexander grape hybrid around 1740 by James Alexander, gardener to the son of William Penn. These grapes were included in the plantings by winemaking settlers along the Ohio River in Kentucky, where a congressional land grant (during Thomas Jefferson's administration) had been secured by Jean Jacques Dufour in 1802 (Pinney 1989). Though his efforts also eventually failed, it spawned the later success of others such as Nicolas Longworth, hailed as the "Father of American Sparkling Wine" by Wine Spectator magazine, who is credited for his creation of "Sparkling Catawba" which found significant commercial viability (Pinney 1989).

Longworth was a supporter of the Temperance Movement, seeing the effects of whiskey, the predominant local alcohol, on the population. His goal was a dry table wine with much lower alcohol levels. His first success was a still white wine he called "pure Catawba," but later produced a sparkling version. By 1850, Longworth was making 60,000 bottles a year from his cellar near Cincinnati, Ohio. The method he used for his sparkling wine was the traditional French method, where a second fermentation happens in the bottle. This requires tediously turning the bottles by hand, with the contents under the high pressure of fermentation. Losses

from bottles bursting in one season were 42,000 of 50,000. Longworth admitted to distilling the spilled spirits into Catawba Brandy. He also later partnered with Caspar Zimmermann to produce “Catawba Wine Bitters” (Pinney 1989).

By 1850, according to John F. von Daacke in his *Grape-Growing and Wine-making in Cincinnati, 1800-1870*, “The number of vineyards within a twenty-mile radius of Cincinnati had increased to 300 and covered 900 acres, half of which were bearing. From these, 120,000 gallons of wine were pressed” (Daacke (1967:204).

Around this same time Southern California’s wine production was transitioning from the wines made largely by and from Spanish missions, to commercial viability. The heart of the wine growing and winemaking was in Los Angeles, where by 1861, 130,000 gallons were shipped from Los Angeles to San Francisco (California State Board of Agriculture 1911:184). Northern California’s wine boom was propelled by the gold rush and the development that followed. The state as a whole, more than doubled plantings in just two years.

One problem with trade was the availability of bottles. With no large California glass maker and the cost to import empty bottles somewhat prohibitive, bottles from imported wines were re-used over and over again. As domestic wine production increased, imports decreased, and the price of bottles climbed. The founding of Pacific Glass Works in 1862, which delivered a stable supply of bottles, also aided the industry’s evolution (Carosso 1951:35). After the Civil War, wine production in California outgrew the eastern states and Ohio, a trend that continues to today.

Beer. Beer is one of the oldest and most popular alcoholic drinks in the world, and has been made for thousands of years, dating back to at least the 5th century, and potentially further back than that. The current oldest archaeological evidence of beer is the remnants of a gruel like

fermented drink in Raqefet Cave in the Carmel Mountains near Haifa in Israel (Liu et al. 2018.) It has been a staple of civilization ever since, with some arguing that beer was one of the factors that lead to the increase in sedentarization and agriculture (Mirsky 2007)

Beer is primarily made from cereal grains, such as barely, oats, and wheat. Barely is the most common, and hops are often added as both a stabilizing agent and as a bitterant. Prior to the Industrial Revolution beer was produced on a domestic scale, usually in monasteries or in homes. Post Industrial Revolution beer brewing became commercial due to the improved efficiency of steam engines and the introduction of the thermometer and hydrometer into the brewing process. A hydrometer is a tool used to measure the density of liquids and allowed better efficiency and attenuation in making beer. Popularity of beer in the United States increased after the decline of whiskey's popularity (Theobald 2008).

Schnapps. Schnapps is a type of alcohol that may take several forms, including fruit brandies, herbal liqueurs, and other flavored liqueurs (usually made by adding fruit syrups or spices to grain spirits). Originally from Germany, this cordial like liquor became popular for its purported medicinal qualities, which are discussed in the results below. For all of schnapps' enduring popularity, general histories of the drink, rather than individual companies, is difficult to find. Specifics regarding bottle types of these various alcohols will be discussed in the results section, as will specific brands found during this study.

Patent medicines. Patent medicines were a commonly used remedy up until the early twentieth century. The exact ingredients in these remedies, particularly prior to the Food and Drug Act of 1906, which required such things to be listed, were often kept secret, exoticized or fully lied about. In reality these touted "miracle cures" usually contained alcohol, morphine, cocaine, or opium (Adams 1905). Due to the percentage of alcohol, usually grain alcohols, in

patent medicines they were included in this study. Bitters in particular could be up to 25% alcohol (Clouse 1996:580). Some, notably Lash's Bitters (Torbenson and Erlen 2003), would make the shift from medicine to liquor via a shift advertising and minimal change to the actual contents. Despite the name, patent medicines were rarely actually patented, the term dating back to seventeenth century England, a patent being an issued royal favor instead of a patented product (Young 1961). A common type of patent medicine known as "bitters" apparently "originated during the 18th century in England as way to avoid the heavy taxes on liquor by adding various harsh tasting herbs to gin, claiming medicinal qualities, and calling it "bitters" (Heetderks 2002). The "cures" followed Europeans to America, where they reigned until the first American patent appeared, issued to Samuel Lee Jr. for his "bilious pills" in 1796 (Fike 1987; Young 1961). Patent medicines grew in popularity, with the era of patent medicines considered to be between 1830 and 1920, "[t]he popularity of these products in the U.S. was also boosted by taxation, including the Revenue Act of 1862 which taxed the alcohol in liquor more onerously than medicines" (Heetderks 2002). Patent medicine's heyday in America lasted through the Civil War and into the early 1900s, when the Food and Drug Act was created. One of the best-known references for patent medicines is *The Bottle Book* by Richard E. Fike (1987), divides the bottles by use instead of shape, and focuses on embossed bottles. There are still over 40 categories listed in the book, ranging from hair tonics to oils to sarsaparillas. The Society of Historical Archaeology took a more general example, with five main categories displayed on their website. One bottle style in particular, the tall square short-necked spirits bottles, also known as case bottles, are noted to have also been commonly used for both medicine and alcohol (Lindsey 2020). In fact, they were used more for high alcohol medicines like bitters and sarsaparillas over pure spirits (Lindsey 2020).

Chapter II: Collections and Methodology

Research Questions

The following research questions are based on the fact that alcohol bottles (or portions thereof) were recovered from distinct contexts associated with either the officers' quarters or enlisted men's barracks in previous excavations at Fort Snelling. The main theme of questioning is focused on discerning differences between the types and quantities of alcohol bottles recovered from these two archaeological contexts. The temporal focus of the artifacts will be between 1819, the establishment of Fort Snelling, and 1946, when the fort was decommissioned.

- Is there a distinct difference in the types of alcohol being consumed (as indicated by archaeologically recovered glass bottles), between the officers' and enlisted men's quarters/barracks? If so, what does this suggest about patterns of alcohol consumption at the fort?
- If there is a distinct difference in the types of alcohol being consumed between the officers' and enlisted men's quarters/barracks then the types of alcohol found will vary between the two (for example, champagne and wine might be more prevalent in the officers' quarters).
- Do the kinds of alcohol consumed at the officers' quarters versus the enlisted men's quarters/barracks vary in the percentage or strength of the alcohol? Such as brandy or whiskey versus champagne and wine.
- If so, I expect that the stronger alcohols would be recovered from the men's quarters/barracks, whereas the more "refined" alcohols would be recovered from the officers' quarters.

- If so, what do the differences between alcohol types imply about drinking culture and social status at a frontier fort?
- If there is a difference between alcohol types, do they reflect social status differences between officers and enlisted men? For example, are the kinds of alcohol found with the officers generally more expensive, uncommon, or difficult to procure?

Research Design and Methodology

The MHS cataloged the full Fort Snelling glass assemblage, including individual accession numbers for each intact bottle, portions of broken bottles (e.g., bases, lips, and finishes) as well as shards of bottle glass. The catalog included descriptions of each specimen, noting color, portion of bottle the shard was from (e.g., rim, body, shoulder, etc.), any distinctive markings (embossed letters, “unidentified raised pattern”, etc.), and occasionally other notes such as a date range of bottle type. The latter two are rare. The glass assemblage was sorted by provenience according to buildings. Colors used in the MHS catalog included clear, aqua, brown, amber, green, olive, light green, blue-green, dark olive, and cobalt blue. Few of the catalog notes include identification of the glass bottle type unless clearly obvious from embossing. Most of the catalog consisted of descriptions such as “amber glass bottle fragment.” Which, while excellent for a museum collection catalog, was not especially useful in this study.

I examined the collection at MHS Archaeology Department Laboratory, located at Historic Fort Snelling in St. Paul, Hennepin County, Minnesota. The glass assemblage was originally sorted by the building the artifacts were associated with and given an accession number for the building. The second number in the catalog represents more specific provenience, such as a bag number tied to an excavation square or trench. According to Pat Emerson at Historic Fort Snelling the standard excavation size for Fort Snelling were squares that were 5 or

10 feet on one side, or trenches 5 or 10 feet wide. When the original electronic records were being created the catalogers did not include all the provenience data. This step is being done now by the Minnesota Historical Society Archaeology Department. I sorted through the boxes for the following buildings:

- Short Barracks
- Long Barracks
- Officers' Quarters
- Commandant's House

My study sample included a total of 49 boxes and approximately 9,200 glass shards, and under ten whole bottles. The first two barracks belonged to enlisted men, the Officers' Quarters and Commandant's House housed officers. Glass associated with latrines were dismissed due to potential for cross-contamination, as were the areas along the walls of the fort. The examined boxes mostly contained bags of glass, but many of the boxes had other artifacts mixed in, so each individual artifact collection bag had to be sorted through to determine the contents. Bags found in any of the boxes that were marked "Laundress's Quarters" were not included in this study, as the artifacts within were not owned by the soldiers of either type.

All bags sorted for diagnostic bottle pieces; bottle bases, finishes, necks/shoulders and any embossed shards. Shards large enough that body shape could be determined were used in a case by case basis, depending on how readily identifiable the shape was (e.g., the side of a flask versus the body shard of a standard cylindrical bottle). The bottles that have been reconstructed by MHS curators were used as part of the study as well. References such as Olive Jones and Catherine Sullivan (1989) *Canada Glass Glossary*, *The Bottle Book* by Richard E. Fike (1987), Wilson's (1981) *Bottles of the Western Frontier*, the Society for Historical Archaeology's

Historic Glass Bottle Identification & Information Website (Lindsey 2020), Switzer's (1974) *The Bertrand Bottles*, and others were used to identify distinct types of wine and champagne bottles, as well as the styles for whiskey, rum, brandy, beer, etc. while at the MHS laboratory and curation facility.

Fort Snelling provided me with the spreadsheet catalogs of the glass of the Short Barracks, Long Barracks, Officers' Quarters, and Commandants House (see Appendix A). The glass shard counts are shown in Table 1.

Table 1: Glass bottle and shard count.

Accession Number	Bldg.	Complete Bottles	Shards	Boxes
317	Short Barracks	2	2475	5
343	Long Barracks	18	2874	7
377	OQ	7	3658	19
384	COH	0	192	18
	TOTAL	27	9199	49

With the latrines removed the total number of shards came to ($n = 9,199$). Intact bottles were extremely rare, ($n = 6$). The full catalogs provided by Fort Snelling are located in the appendix, as is the catalog I created with alcohol related glass shards (see Appendix B).

The glass shards ranged in size from less than a centimeter to complete bottles. Shards less than 3 centimeters were discarded from the study, as were any pieces that were completely unidentifiable, such as body pieces, bases that were less than the size of a quarter unless incredibly distinct (e.g., heel section of a champagne or wine bottle.)

Shards that were identifiable as either belonging to alcohol type bottles or bottles not easily identified in the lab were recorded. Each shard kept had its Catalog Number, type (body, base, and finish), color to the Munsell Bead Color Book specifications, and description written down. Each shard noted and used for this study was photographed at multiple angles, with at

least one photo including a scale comparison. Between two and seven photographs were taken of each shard. Particularly distinctive or first seen type shards were sketched (not to scale). The photos were taken with a small Sony digital camera on a white paper background against a wooden ruler for scale. Only one photograph would contain the scale, the rest were taken too closely to have a readable scale and were mostly created as reference as the collection could only be accessed once. The Commandant's House photographs were taken with an iPhone 5 due to complications with the camera on the last day. All research and photographs but the Commandant's House were done in the basement research lab in Fort Snelling itself. The Commandant's House was done in a MHS lab at the Minnesota History Center building, as the glass in the Commandant's House assemblage were scattered through some twenty boxes and had very little glass overall, and it was determined to be simpler to access it within the MHS itself rather than transporting the boxes to the Fort Snelling lab.

During cataloging in the lab initial identifications were determined through the use of the Society of Historical Archaeology's Bottle website, as well as consulting Rex Wilson's (1981) *Bottles on the Western Front*. Further specifics were determined later offsite through the created catalog and through the multiple close ups and angles photographed. The Fort Snelling collection was accessed through May 19th to June 21st, 2017, beginning with the Short Barracks and finishing with the Commandant's House.

The shape of glass bottles prior to the early seventeenth century tended to be globular and lopsided, due to the freehand blowing technique (Lorrain 1968). In the years between 1650 and 1800 bottles changed "from a globular base with a tall shaft to a squat or mallet form, and finally to a more nearly cylindrical, taller form [McKearin and Wilson 1978:186-189; Hancock 2009: 367]" (Veit and Huey 2014:58). Cylindrical bottles made for easier storage, as they were both

easier to handle and could be stored in their sides, keeping the corks wet. The first English glasshouse in America was located in Jamestown, Virginia and established in 1608 (National Parks Service 2020). It was a short-lived enterprise, but the industry would eventually find success. In the United States the glassworks industry saw a boom in the nineteenth century in both the amount and variety of glass being produced (Lorrain 1968). While the techniques used during that era, such as “freehand blowing, blowing into molds, pressing, drawing, and casting - and the coloring and decorating methods” (Lorrain 1968:35), were already well known, the impetus to the growth was due to improvements to techniques related to mass manufacture. This included the simplification and speed of make, and ease of transportation due to increased railroad lines and the invention of the steamboat opening new markets (Lorrain 1968).

There are several ways to date the glass assemblage from Fort Snelling. “The nineteenth century saw the development of several technological changes that provide excellent terminus post-quems. The first is the development of the clamp on lipping tool, which is generally dated around 1820” (Sutton and Arkush 2008). Clamp on lipping tools would finish the bottle by forming the shape of the mouth and lip of the bottle with no additional glass being added as part of a tooled finish. The clamping referred to the two prong of jaws that could open for the center plug to be inserted into the bore (opening) of the bottle, and then clamped to proper position to finish the bottle (Lindsey 2020). The three-part mold, specifically the Ricketts mold, was invented in England in 1821. This mold consisted of “one large body piece from base to shoulder, and two shoulder portions that folded out to allow the bottle to be removed after blowing” (Sutton and Arkush 2008:177). This type of mold became popular in the U.S. shortly after. The adoption of snap case, also called a hinge mold, instead of use of pontil rod generally indicates a time frame in the 1860s. Snap cases were a two-piece mold with no separate base

plate, with a resulting mold seam on the bottle “continuing around the heel of the bottle, bisecting the base, and continuing up the opposite side of the bottle as the other side mold seam” (Lindsey 2020). While attempts were made to date the bottles as an identification tool, the missing data from the field notes means that provenience past building location is not particularly useful in this study.

In the fifth edition of *Archaeological Laboratory Methods* Mark Q Sutton and Brooke S. Arkush (2008:187) mention that the “[d]evelopment of the Ricketts mold standardized the size of most categories of wine and liquor bottles in the first half of the nineteenth century,” along with this is the fact that “[b]etween about 1830 and 1850, bottle shapes had become somewhat standardized. Shapes associated with labels defined products in the mind of consumers” (Sutton and Arkush 2008:187). As a result of this trend the shapes of bottles were fairly distinct as to type within the Fort Snelling glass assemblage.

According to Sutton and Arkush (2008:187), bottles have six basic sections: finish, neck, shoulder, body, insweep or heel, and base (Figure 3).

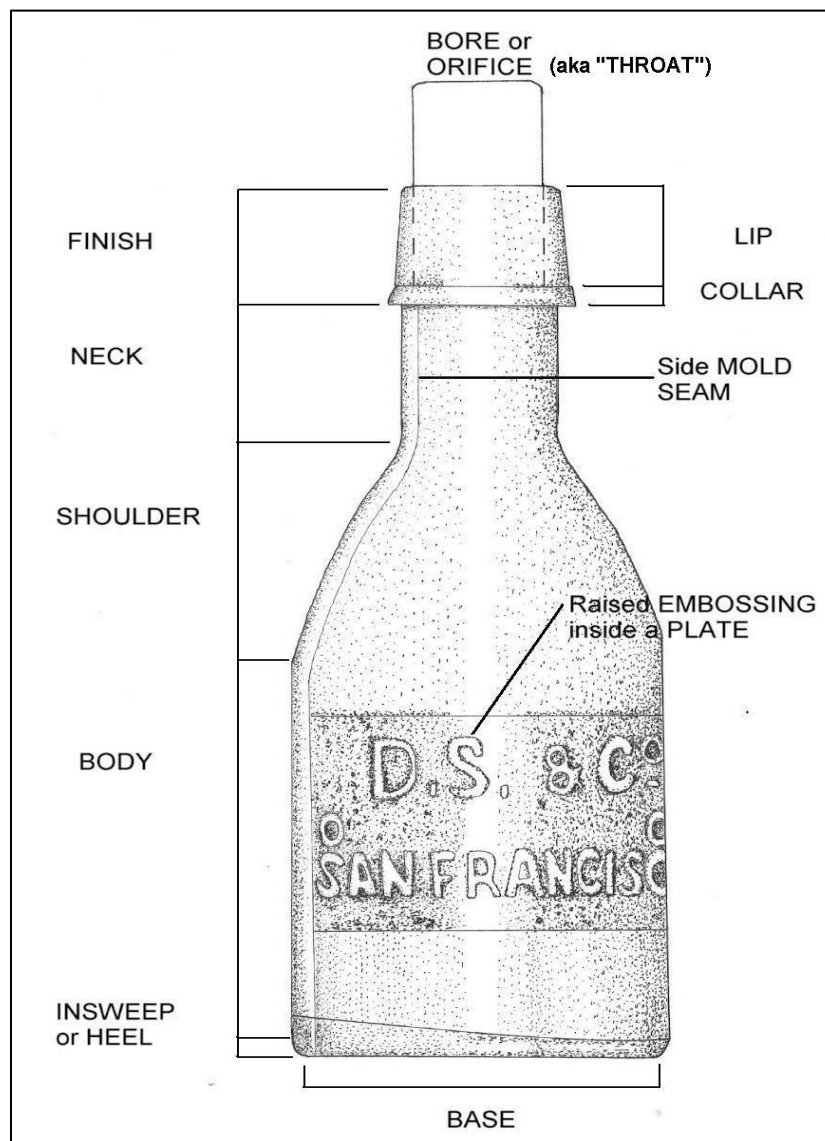


Figure 3: Diagram of bottle (Lindsey 2020).

The finish is “the top section of the bottle attached to the neck from which the bottle contents are obtained and to which a closure is applied to secure the bottle’s contents from spoilage or spilling” (Sutton and Arkush 2008). The bore is the diameter of the opening of the bottle. The collar is the ring of glass attached to finish to secure the closure. A bottle’s neck is usually an “extension of the finish that connects the finish to the shoulder” (Sutton and Arkush 2008), with the shoulder connecting the neck to the body. The shoulder serves as a way of

reducing the diameter from the wider body to the neck. The body is the main part of the bottle that is not the neck and finish. The insweep or heel attaches the body to the base. The base is the under section the bottle rests on when not in use. The base of a bottle has what is known as a “push-up” if the base is slightly concave. A “kick-up” is a much deeper push up, found on wine and champagne bottles.

I attempted to determine the Minimum Number of Individuals (MNI) of each bottle type. MNIs were determined by either finishes or bases, depending on which number is higher for a given type. MNIs are the fewest possible number of bottles of a given type., Embossed body shards indicated a potentially much higher number but were inconclusive for definitive MNI counts. Bottle types defined for this study were -alcoholic, medicine, non-alcoholic, and undetermined. Subcategories were created when possible (e.g., “champagne,” “beer,” etc.). Bottle types that were in the non-alcoholic or undetermined categories were not recorded in the catalog created for this study. Non-alcoholic bottles or glass included items such as food or condiment bottles, glass tumblers, inkwells, candle holders, bleach bottles, window glass, etc.

Two versions of my catalog were created. The initial catalog, which was created during the sorting and recording done while at Fort Snelling, included anything that looked like it might be an applicable bottle glass shard, as well as any bottles that looked like they might have contained alcohol or a patent medicine but I was not able to identify with a cursory search. This was done to ensure that no bottle glass was potentially missed due to the short time period in which I could access the collection. All other readily identified glass types such as window glass, condiment bottles, canning, inkwells, lanterns and the like were not included in either version of the catalog. The final catalog was created after further in-depth research, using the photos and notes taken during the first catalog.

After further research offsite a number of artifacts, such as the embossed 'cathedral style' food container bottles, were not included in the final catalog. The reason behind the creation of the new catalogs instead of simply editing or adding notes to the catalog created by MHS for Fort Snelling was that the catalog rarely identified types of bottles in any way and the bottles were mixed in with all the other glass. It made more sense to create a fully new catalog instead of editing the old and potentially creating confusion.

Chapter III: Results

Of the four buildings, the Long Barracks and the Officers' Quarters offered the highest number of identifiable artifacts. Bottles and glass that were readily identified as non-alcoholic (such as inkwells, tumblers, and canning jars) were not included in the data set. Neither were finishes, bases or body shards that were too small to be identified or, in the case of several base styles, too generic to be identified, as they were used for a wide variety of bottles. Glass shards that have been refitted into a full bottle are included as a single bottle instead of the individual shards. The grand total of usable artifacts for this study across all buildings was ($n = 403$), which are described in Table 2 below.

The remaining finishes and bases were identified as specifically as possible. There are several types of both listed that were unable to be positively identified either to a specific alcohol, or was a finish or base type which had uses that include alcohol. This is due to the fact that many finishes and bases were used for different types of beverages, which, while including alcohol, was not the sole use (Figure 4). Slashes (i.e., schnapps/bitters/tonic/gin) are meant to indicate a finish or base style that is commonly used between those bottle types, and impossible to discern further without the rest of the bottle or its contents. A number of shards were only confidently identified as finish or base style (Table 3), and further identification was tentative and will be elaborated on further later.

Table 2: Full number of glass shard types for each identified bottle type; finishes, bases and body not distinguished.

Categories	Short Barracks	Long Barracks	Officers' Quarters	Commandant's House
Hard Liquor				
schnapps	10	30	12	
schnapps/bitters/tonic/gin	2	3	1	
whiskey	1		2	
bourbon		1		
cognac				1
liquor		2	1	
Beer/Ale				
ale/stout/porter		3	13	
brandy/beer	4	7	1	
beer	4	3	9	1
export beer	2	3		
Champagne/Wine				
champagne/wine	9	10	34	1
benedictine			1	
Flask				
Shoo-Fly Flask	8	5	2	1
Scroll/Violin flask	5	1	6	
flask undetermined	2	3	7	
flask/medicine	2		2	1
Coffin flask	3			
figured/historical flask		1	2	
Alcohol (general)				
beer/wine		1		
soda/ale/beer		1		
Medicine				
medicine	9	8	16	2
bitters	2	4	1	

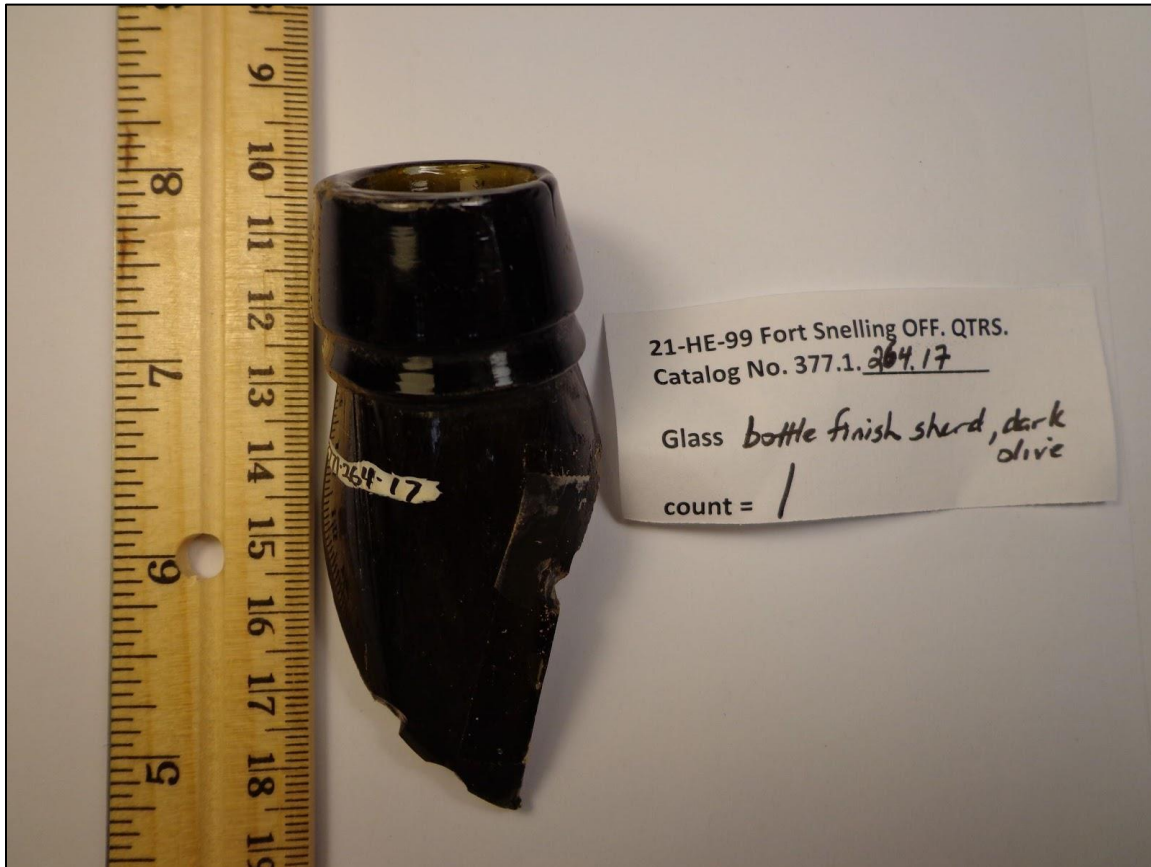


Figure 4. Example of mineral finish from Officers' Quarters, identified as mineral/ale.

The analysis of the Fort Snelling alcohol bottle types is discussed here. The three most common alcohol bottles found throughout Fort Snelling were schnapps, wine/champagne, and flasks, both by number of shards identified as such and by the determined MNI (Tables 3, 4, and 5). Medicinal bottles were the third most popular and are included in this study both due to the similarity to flasks and the tendency for medicine of the era to contain a high percentage of alcohol (up to 40%). The popularity of wine/champagne at the fort was not a surprise, but the sheer volume of schnapps bottle remains in the enlisted men's quarters was.

Table 3: Shards identified only by base, finish, or embossing on the body.

Categories	Short Barracks	Long Barracks	Officers' Quarters	Commandant's House
Bases				
turn mold with mamelon/dot		5	4	
key mold		4	3	
3 part mold	1			
conical base	1			
glass pontil			2	
valve eject	1			
turn mold		1	1	
cup mold			1	
Finish				
mineral finish	1	6	11	1
crown			10	
packer finish			4	
oil finish		3	2	1
double head	1	2		
tapered finish	2	2	2	
string			1	
bead lip			1	
sheared			1	
soda mineral	3	2	3	1
Identified By Embossing				
St Paul Bottling Works	3			
St Paul BR'G Co 1898-1900			9	
1870s Pitts McCull		1		
Angus co 1854	1			

Table 4: Minimum number of individuals based off finishes, base, or full bottle. (Body shards not included).

Categories	Short Barracks	Long Barracks	Officers' Quarters	Commandant's House
Hard Liquor				
schnapps	2	5	10	
schnapps/bitters/tonic/gin	1	1	1	
whiskey	1			
bourbon		1		
cognac				1
liquor		2	1	
Beer/Ale				
ale/stout/porter		3	13	
brandy/beer	4	7	1	
beer	4	3	9	1
export beer	2	3		
Champagne/Wine				
champagne/wine	6	8	21	1
benedictine			1	
Flask				
Shoo-Fly Flask	7	1	2	1
Scroll/Violin flask	3		1	
flask undetermined	1		4	
flask/medicine	5			1
Coffin flask	2			
figured/historical flask				
Alcohol (general)				
beer/wine		1		
soda/ale/beer		1		
Medicine				
medicine		8	15	1
bitters	1	1		

Table 5: Minimum number of individuals based off finishes and base, type unidentifiable.

Categories	Short Barracks	Long Barracks	Officers' Quarters	Commandant's House
Bases, multi-purpose				
turn mold with mamelon/dot		5	4	
key mold		4	3	
3 part mold	1			
conical base	1			
glass pontil			2	
valve eject	1			
turn mold		1	1	
cup mold			1	
Finish, multi-purpose				
mineral finish	1	6	11	1
crown			10	
packer finish			4	
oil finish		3	2	1
double head	1	2		
tapered finish	2	2	2	
string			1	
bead lip			1	
sheared			1	
soda mineral	3	2	3	1

Alcohol Types

Schnapps and gin. The shards labeled “schnapps” on the Table 2 were identified as such by the embossing or by finish, as several bottles were partial refits and had a distinctive mineral finish and deep olive color. The embossed brand of schnapps was “UDOLPHO WOLFE’S SCHEIDAM AROMATIC SCHNAPPS” (Figure 5). Schnapps bottles were most common in the Long and Short Barracks and were the most common identifiable bottle type in both those buildings. Colors included Munsell Glass Bead Book “olive” (10.0 Y 4/4), “olive yellow” (10.0 Y 5/6), “mustard tan” (5.0 Y 4/4), and “moss green” 7.5 GY 4/6. General color descriptions included olive, dark olive, emerald green and rarely an amber brown. All were square gin style

bottles, identified in Table 2 as schnapps when identified via embossing (Figure 5), and as schnapps/bitters/tonic/gin when identified by body shape. All had wide mineral or oil finishes, described in the finishes section, and square bases with a kick-up with an iron pontil mark. Bottles that were identified as schnapps via embossing often had intact bases, which were, as previously mentioned, square with a round kick-up and an iron-tipped pontil scar (Figure 6) on the base. This along with the glass color allowed for schnapps bottles to be identified by their base.

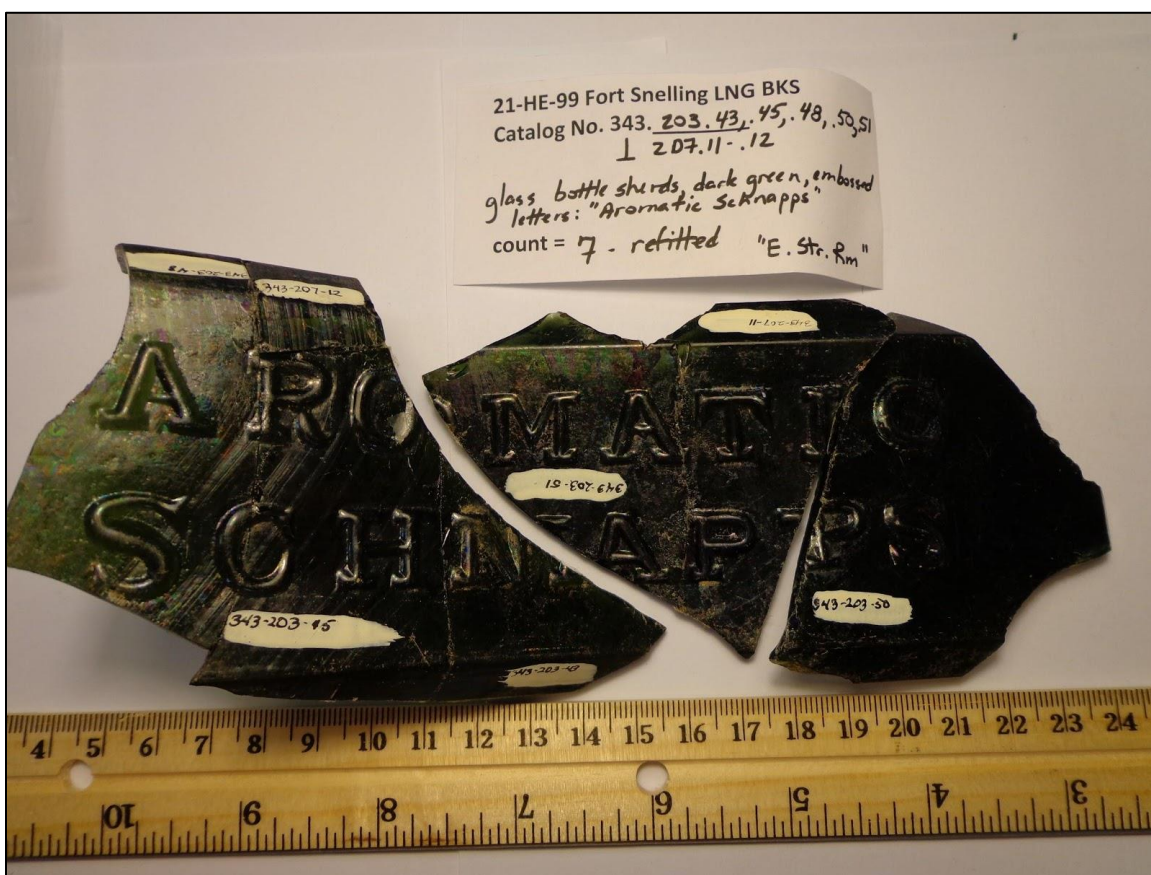


Figure 5: An Aromatic Schnapps bottle refit from the Long Barracks (Cat Nos. 343.203.43, .45, .48, .50, .51; 343.207.11-12).



Figure 6: Square case gin bottle base, iron-tipped pontil scar visible. Long Barracks (Cat No 343.201.16).

Wine/champagne. The most numerous glass type in the Officers' Quarters belonged to wine or champagne bottles. All shards were slightly varying shades of dark olive in the "olive" (10.0 Y 4/4) and "olive yellow" (10.0 Y 5/6) range. Several appear to have hand applied collars. Champagne/wine bases are very distinctive (Figure 7), from the Officers' Quarters. The Fort Snelling bottles were uniformly a near black olive (10.0 Y 4/4, 10.0 Y 5/6), although the exact shade of olive varied slightly. The thick wall of the heel and body, along with the high kick-up diagnostic of wine and champagne bottles made even partial bases readily identifiable. The equally distinctive champagne finish was common and ranged from clearly machine tooled to what appeared to be hand finished (Figure 8). The later was significantly rarer than the former,

but were still fairly easily found in the assemblage. Given the tendency to age wine, finding older bottles of this type is to be expected. The thick glass of these bottles fared fairly well, resulting in many whole or nearly whole bases such as the one pictured above. Glass-tipped and iron-tipped pontil marks were common where the kick-up was still intact.

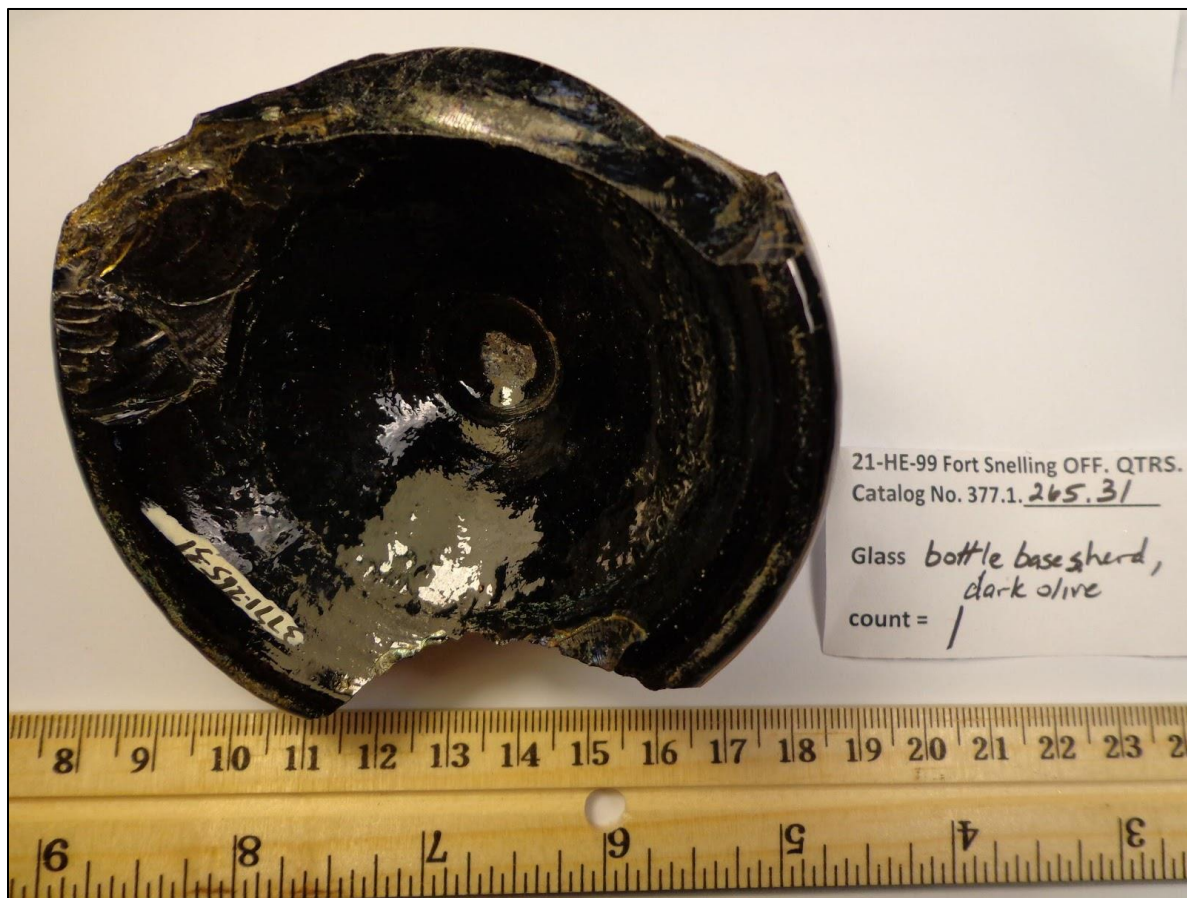


Figure 7: Champagne/wine base, glass-tipped pontil scar (Cat No 377.1.265.31).



Figure 8: Close up of champagne finish from Officers’ Quarters (Cat No 377.5.139.5).

One interesting find among the collection of the Officers’ Quarters was a detached glass embossed blob bottle seal with “...ien/ Médoc” embossed on it (Figure 9). Blob seals were typically oval or round pads or disks of glass found on the body or shoulder (rarely ever on the base or neck) of a bottle and impressed with a stamp (Lindsey 2020). They were used to denote the winery or maker of the bottle, or the owner of the bottle in some older instances. They were typically seen on mid-17th through mid-19th century wine bottles (Lindsey 2020) but did appear on other bottle types as well. This particular seal seems to have belonged to a bottle of French wine. Médoc is a wine region in France, a subset of the Bordeaux region in southern France. The best estimate of the previous word is ‘Saint-Julien’, an AOC for the Médoc region and AOC is “*appellation d’origine contrôlée*”, a protected region of wine in France.

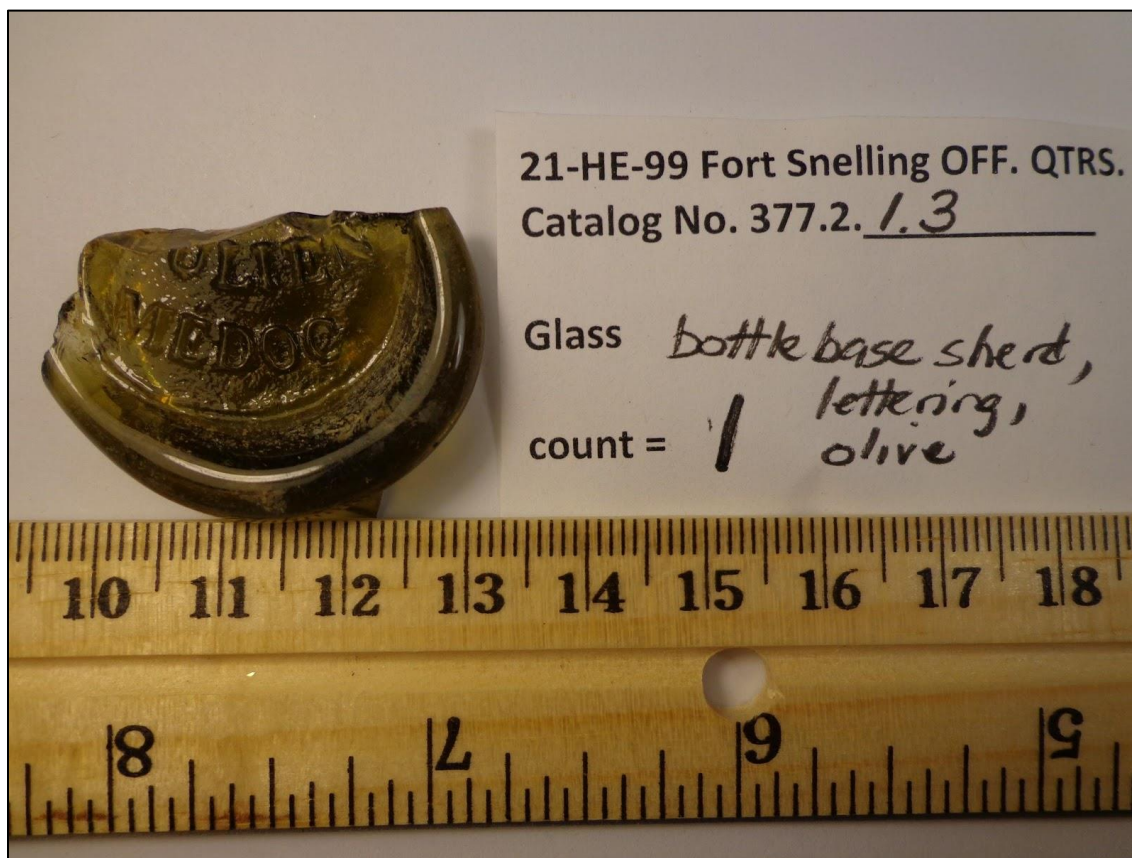


Figure 9: Blob seal from wine bottle, Officers' Quarters. (Cat No 377.2.1.3).

Another notable artifact in the assemblage was a fully intact bottle of cognac from the Commandant's House (Figure 10). The label appears to have been painted or printed directly onto the glass and denotes the liquor grade as "Very Special" on the front with V.S. above it with laurels and three stars. The mark "Very Special" denotes cognac that has been stored for at least two years in a cask and is the youngest variety of cognac. This grade is according to the Bureau National Interprofessionnel du Cognac of France. On the opposite back shoulder of the bottle "LIQUOR BOTTLE" is embossed. On the base of the bottle, which is a kick up, has this embossed around the edges: "MODELE DESPOSE SG AD K".

The "SG" is set in a square that is offset by another square behind it. In the point of the kick up is a "US". The Minnesota Historical Society identified the bottle as belonging to the

brand Bisquit Dubouché, which is embossed on the side along the heel and very easy to miss when examining the bottle. The brand, according to the Bisquit Dubouché website, began in 1819 (Bisquit Dubouché 2019).



Figure 10: Construction misc. Cognac from the Commandant's House (Cat No.384).

Flasks. Flasks were common in the enlisted men's quarters, particularly shoo-fly flasks. Shoo-fly flasks were common in the mid to late 1800s and were predominantly clear. Most of the shards of shoo-fly flasks found at Fort Snelling were finishes and all were clear. They would have contained hard alcohols such as whiskey and the like, as such drinks usually came in casks. The shoo-fly flasks were identified through Rex Wilson's (1981) *Bottles on the Western Frontier*. Shoo-fly flasks were most common in the Short Barracks. The finish of this style of flask was readily identifiable and appeared more often than the bases of the flasks in the assemblage. There were several flasks, as seen below in Figure 11 that were either still whole or were refits.

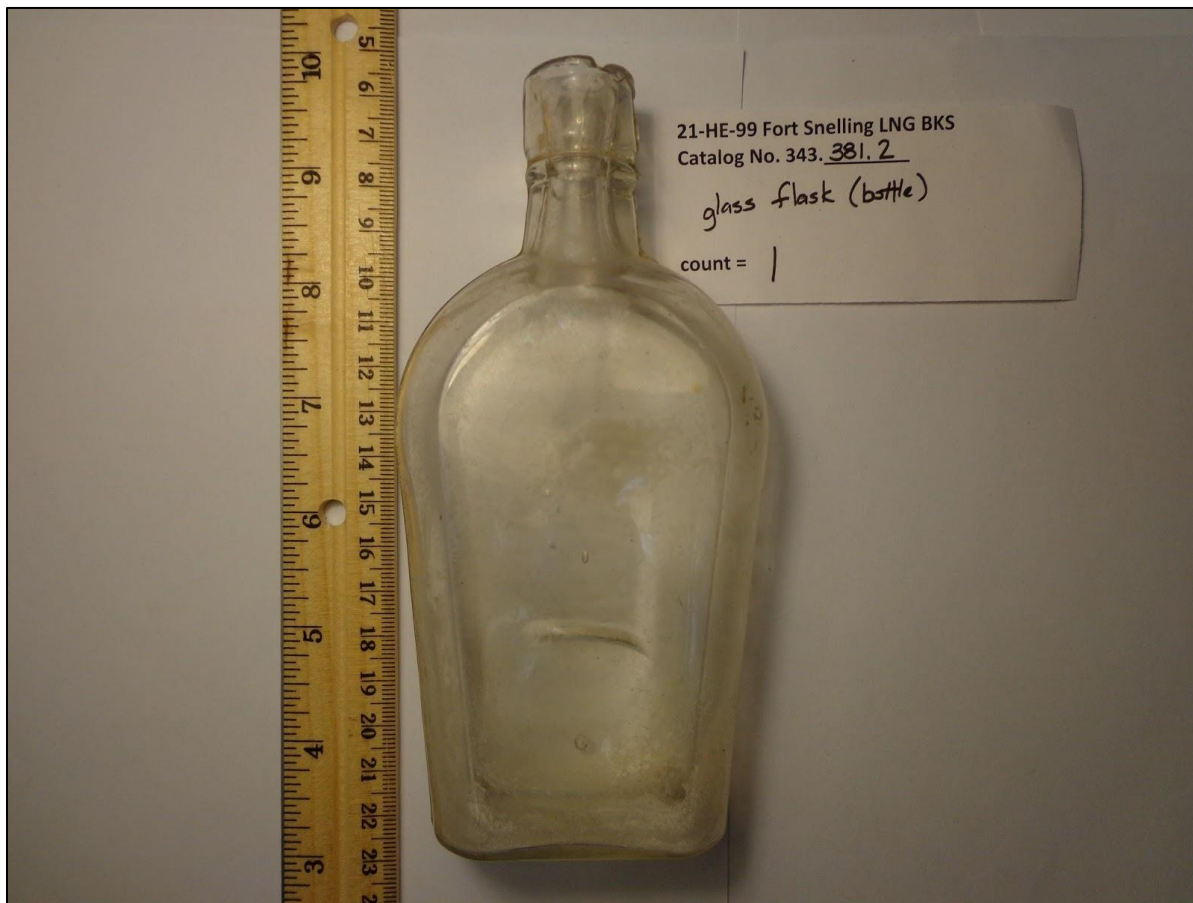


Figure 11: Complete shoo-fly flask from Long Barracks (Cat No. 343.381.2).

Another distinct variety of flask present in Fort Snelling was a violin or scroll flask. This flask is shaped similarly to an upside-down heart, with a bulge in the body toward the neck and with a wide base. The flasks are marked with a distinctive “scroll” patterned embossing—two curls near the base and another set midway up the bottle. They were generally made in a two-piece mold and were introduced in the 1830s and popular until the 1860s (Lindsey 2020). Colors were not noted to have been restricted for the creation of these bottles, but they did tend to be in the aqua range, which the pieces at Fort Snelling exhibit. No full bottles were found but sections of the eponymous scroll pattern were distinctive enough that they were able to be identified (Figure 12). Most of the violin flask pieces found were from the body of the bottle, with the occasional body with a small section of base. This flask type was found in the enlisted men’s quarters.



Figure 12: Violin flask body shard. Short Barracks (Cat No. 317.392.1).

A third distinctive type of flask present in the assemblage included Coffin flasks and historical or figured flasks. Coffin flasks are very similar in shape and finish to shoo-fly flasks, but instead of the shoo-fly's rounded edges on the short ends of the base, a coffin flask comes to points. When the flask is viewed from the base it appears to be very much like the shape of a coffin, hence the name (Lindsey 2020). The historical figured flasks were seen via body shards with the remains of embossed eagle shields, very similar to the examples shown on the Society for Historical Archaeology's Historic Glass Bottle Identification & Information Website. The date range on historical figured flasks range from 1815 to about 1870. They were primarily located in the enlisted men's quarters. Unfortunately, specific dates may not be able to be

determined for the Fort Snelling historical flasks due to the limited size and number of the bottle remains.

Finish Types

Mineral. Mineral finishes, also known as a double oil finish, were one of the most common finishes recovered from the site following champagne/wine finishes. This finish was common on bottles containing drinks such as varieties of beer and gin. This is a two-part finish, with a taller, sloping collar making up the upper section and a shorter, generally flared lower part, also called a string rim (Lindsey 2020) (Figure 13). The height and degree of tapering of the upper section varies and is very similar to the brandy finish. The mineral finishes at Fort Snelling consisted of olive and amber colors, with the majority being dark olive, nearly black as depicted above (Munsell color 10.0 Y 4/4). As seen in Table 2, many mineral finishes were able to be specifically identified as brandy, beer, ale or schnapps/bitters/tonic/gin finishes, while others were not positively identified past being a mineral finish. Mineral finishes were also used on soda and mineral water bottles. Due to their common use on alcohol and liquor bottles (Lindsey 2020) the general category was kept. The mineral finish likely originated in the 1820s but was most popular during the 1840s until the 1880s, therefore covering the majority of the period wherein the fort was active (Lindsey 2020). Bottles that were able to be fully cataloged as schnapps and tonic/gin bottles were the most common finds with mineral finishes, followed by various beer styles.



Figure 13: Long Barracks. Mineral finish (Cat No 343.95.4, .99.12).

One of the more distinct variations of the mineral finish was the “Export Beer” finish, as noted by the Society for Historical Archaeology’s Historic Glass Bottle Identification & Information Website. An example of said finish can be seen in Figure 14 below. It has the same two-part finish as the standard mineral finish, however instead of the sloping upper part it is rounded. The neck of export beer bottles tended to have a bulge, and the start of said bulge could be seen even in pieces like the above, where very little of the neck remains. The export beer finishes were all very dark olive amber glass. This finish is known as an “export” beer finish due to the bulk of the beers being exports.



Figure 14: Export beer style mineral finish (Cat No 377.281.8).

Beer and ale bottle varieties were common across all four buildings. They displayed either a mineral finish, brandy finish, or oil finish. Beer bottles ranged in color from the dark olive of the export beer bottles mentioned above to amber brown to the occasional translucent aqua. The most notable clear beer bottle came from the Commandant's House and was an embossed Anheuser-Busch bottle. The bottle, labeled "ANHEUSER-BUSCH/BRW'G ASS'N/ST LOUIS", dates after 1879, which is when the company assumed that name. The bottle has an oil finish. Further descriptions of the individual glass shards are available in the Catalog in the Appendix A.

One of the more frustrating aspects of this study was the potential for both bottle reuse as well as the number of bottle shapes that served multiple purposes. Flasks are especially noticeable out of this collection because their purpose is intended for reuse and may have contained effectively anything despite the cultural stamp of liquor on such bottles. For this study the commonality of shoo-fly flasks and the like indicates that the soldiers were indeed using these bottles more than once, but most likely using them for whiskey, rum, or other cask stored liquors given the availability of said drink at the sutler's store and as part of their rations. Further investigation into the contents of these bottles might be achieved using chemical analysis, such as the work done at San Jose, California by Barbara Voss et al. (2015). However due to potential contamination and cleaning I do not believe this would be an effective technique for this collection.

Chapter IV: Discussions and Conclusions

Discussions

For the purposes of analysis, the Commandant's House and the Officers' Quarters are combined into one class, the officers, and the Barracks into a second, the enlisted men. According to the Records of the War Department Military Post Records, Fort Snelling, Minnesota in 1866 to 1867 (Minnesota Historical Society, 1866-1967) had approximately twenty officers to five hundred men, and in the 1820s, per a memorandum titled The Enlisted Men (Minnesota Historical Society, n.d.) in the Fort Snelling papers, there were ten officers to thirty-nine enlisted men. The numbers fluctuated over the years, but the ratio skews toward one officer per twenty-five men, or one officer per ten men at the lowest in the earlier years of the fort (1820s). This would mean that there are fewer officers to account for the amount of alcohol bottles found in the officers' quarters compared to the enlisted men.

The glass bottle analysis at Fort Snelling revealed that there was a difference in the types of alcohol consumed by officers versus the enlisted men. However, the difference was displayed more through number than type, as all but a handful of bottle types were present in both classes of quarters. I believe that the variations can be explained by the social status differences between the backgrounds of the officers and the enlisted men, as well as the differences in daily life and societal expectations at the fort. To reiterate, the research questions driving this thesis project were:

- Is there a distinct difference in the types of alcohol being consumed (as indicated by archaeologically recovered glass bottles), between officers and enlisted men's quarters/barracks? If so, what does this suggest about patterns of alcohol consumption at the fort?

- Do the kinds of alcohol consumed at the officers' quarters versus the enlisted vary in the percentage or strength of the alcohol? Such as brandy or whiskey versus champagne and wine.
- If so, what do the differences between alcohol types imply about drinking culture and social status at a frontier fort?
- If there is a difference between alcohol types, do they reflect class differences between officers and enlisted men? For example, are the kinds of alcohol found with the officers generally more expensive, uncommon, or difficult to procure?

There is a distinct difference in types of alcohol drunk by the officers as opposed to the enlisted in several ways. The officers were drinking more wine or champagne than the enlisted men. Beer/ale might have been more popular in the Officers' quarters but were fairly common overall. Shoo-fly and violin or scroll flasks were common finds as well, the former particularly in the enlisted men's quarters. This may have been because flasks were re-usable, and often contained whiskey (as per Rex Wilson's [1981] identification of shoo-fly flasks, which include 'whiskey' in the title). Whiskey was easy to obtain in the area, especially given the sheer number of times barrels of the liquor were confiscated from enterprising fur traders. One particularly famous local and first inhabitant of what would be St. Paul, Pig's Eye Parrant, made a living selling distilled liquor to the locals, including the local soldiers. The man built and ran a tavern out of Fountain Cave, which provided both spring water for his distillery and easy access to the river boat crews, local residents, and the men of Fort Snelling (Breining 2006).

Alcohol strength does not seem to be a major factor between the choices of the enlisted men and officers in drink choice. While the officers were drinking more wine or champagne, it is incredibly difficult to ascertain actual alcohol strength given the popularity of "fortified" wine,

which was wine that had distilled spirits, usually brandy, added to it. This may be better suited for studies wherein chemical analyses could be performed.

Enlisted men were previously mentioned as having very little to do in practical purposes, restricted mostly to daily patrols and the tasks that are meant to keep the fort running as part of a soldier's duty. Even this was not particularly heavy duty, as tasks such as laundry and cooking were done by the women of the fort or slaves. Drinking was likely something just to do, and a form of social bonding. The officers, however, had parties to host. As part of an officers' status came from throwing parties, the more impressive the better. While the men certainly got drunk, it was more part of festivities and a form of displaying wealth—i.e., the sheer amount of wine and champagne that was available. Some of that wine might have been fortified—having had distilled spirits added to it. Such combinations result in drinks such as vermouth, sherry, port, etc. Drunkenness was effectively guaranteed. The parties were enthusiastically described by one Emily Ayers, wife of the then Lieutenant (later General) Romeyn Beck Ayres. The letter describes a party hosted by Captain and Mrs. Napoleon J. T. Dana. While this particular party does not take place within the fort, it is an indication that such events were hosted with some regularity and with implied attempts at outdoing each other.

As strange as it must seem to people living in the east, and who [st...k?] what a new country this is was one of the handsomest, if not the handsomest party I have ever attended anywhere. (Emily Ayres to Annette Dearborn, letter, February 3, 1856)

The volume of champagne and wine glass one site, and the abundance of such in the Officers' Quarters, may well indicate displays of wealth or higher social status as part of the parties/hospitality shown to guests. Emily Ayers goes on to describe the food and sheer expense the party must have cost the host. Champagne and coffee were the only mentioned beverages.

Two of the more diagnostic pieces (i.e., the blob seal from the Médoc region and the cognac from the Commandant's House) from the officers' living areas support the idea that alcohol played a role in the social structure of the fort. Both of these bottles are French in origin. However, whether this is a sign of the ability to finance that sort of shipping expense or if it was just a good trade connection with the local French fur traders is difficult to discern and may in fact be both.

One census indicated that most of the officers came from the east coast of the United States, while the enlisted men came from all over, with a number from Ireland and various Midwestern states. Per the memoranda, "The Enlisted Men", in the Fort Snelling papers archive, in the 1820s the officers "considered themselves to be from a most select and aristocratic class" (Minnesota Historical Society, n.d.) and strove to recreate and maintain the life that would have been expected back East. This disparity between backgrounds would reinforce the social strata via military hierarchy discussed by Eichelberger (2019), and discussed specifically with regards to Fort Snelling by Clouse:

Social values in the early-nineteenth century emphasized making one's place in the world by hard work. The army was interpreted as a place for a man who had given up his individuality in exchange for food and clothing, while having no responsibilities. Furthermore, the peace-time regular army was not representative of the society as a whole. The army regulars were often those with few opportunities or were immigrants unable to find jobs. Immigrant soldiers, primarily of Irish, English, Scottish, German and Scandinavian origin, may have comprised as much as 40% of the army in 1830 (Grossman 1977). [Clouse 1996:116-117]

The data from the analysis of the artifact catalog from Fort Snelling reveals several things. The first being that there is a difference in what the officers and enlisted men were drinking in some aspects. The most notable being the sheer volume of wine or champagne consumed by officers of the fort in comparison to the enlisted men. As previously noted, wine or champagne bottles are one of the most common bottles found in military forts. This held true here, although the wine or champagne bottles were closely followed by schnapps and beer bottles. Schnapps, specifically Udolpho Wolfe's Aromatic Scheidam Schnapps, were a common find in the enlisted men's quarters, particularly the Long Barracks.

Mineral finishes made up the bulk of the identifiable finishes. Most were either identifiable as part of a Scheidam Schnapps bottle, or as some form of beer. Those that were unable to be specifically identified were still very similar to both schnapps and beer finishes, but without the rest of the bottle I was unable to be completely positive about their identification.

The export beer bottle finishes were incredibly similar to the one noted on the SHA's Historic Glass Bottle Identification & Information Website describing variations of mineral finishes. The two-part finish is distinctly rounded on the upper part and flared on the bottom part. It was dated to the mid-1800s (1850-70), and was described like this:

This applied finish is on a beer (ale, stout, porter) bottle that dates to late 1863 or early 1864 as it was excavated out of a firmly dated latrine at the Johnson's Island Civil War Prison, located on an island in Lake Erie near Sandusky, OH. [Lindsey 2020]

Beer is still a very popular drink to this day. However, prior to the modern industrial complex and recent surge of microbreweries, beer was often made in the home, even up until the late 1800s (Harbster 2014). While beer was most likely not brewed on site on the fort, it may have been a possibility during the fort's early days prior to 1833. Before then, part of making

fortifications as self-sufficient as possible required the enlisted men to farm nearly 400 acres of corn, wheat, hay and vegetables. However, the sheer difficulty wreaked by weather and pests, along with the difficulties of frontier farming, lead to a cessation of this practice (Harbster 2014). The vegetable gardens were allowed to stay, as were whatever gardens the officers decided to keep. Both eventually fell out of use.

Conclusions

This study resulted in the identification of many of the alcoholic glass bottles of Fort Snelling and gave an insight into the daily lives of the people of the fort. The prevalence of champagne and wine bottles lends credence to the theory that as part of the officers' 'job' of civilizing the area officers partook in drinking as part of hosting visitors and social events at the fort.

The main difference between the officers and enlisted men emerged mostly between the drinking of hard liquors such as rum or whiskey (assumed contents of the flasks), schnapps, and champagne/wine. The first two were more present in the enlisted men's quarters, while the third was more common in the officers' quarters. What this might mean for the enlisted men, who had very little to do, was that they concentrated on drinks with a higher alcohol content, as the goal was more likely to become intoxicated than to display social status.

The officers, potentially exactly as bored as the rest of the men, however, did have the responsibility and social obligations of providing a "civilizing" influence on the frontier and to act as a gentleman. This, and the desire to bring the trappings of home with them, resulted in an attempt to replicate of elite society, as best they were able. So, parties and dinners with guests were fairly common, both among the officers themselves and with visitors to the fort.

The soldiers and officers came from very different class backgrounds. The alcohol bottles in the fort display the sort of class disparities you would expect between enlisted men and officers of the US Army in the 1800s. Officers appear to have used alcohol as part of social material markers, as part of the actions (such as throwing parties) and goods (more expensive drinks) that pertain to the societal expectations of an officer of the US Army at the time. Whatever individual foibles and preferences, there was the “gentlemanly” standard of officers as discussed earlier in this thesis and the men of this fort appear to have adhered to it enough for it to be visible in the archaeological record. The importance of social gatherings as status markers may have carried more impact due to the isolated nature of the frontier fort in its earlier years. While those in the fort did have access to the local trade networks in the form of fur traders and the like it was still a show to have a party in the middle of Minnesota with oysters or to have one’s own bottle of cognac. These same things would have less impact on the East Coast where, while still expensive, they were easier to procure.

Enlisted men, in contrast, appear to have had a much more practical relationship with alcohol. While there may have been some degree of it as use as a social marker it appears to have been what it says on the label—a drink. Flasks, among the most popular of the artifacts in the barracks, would have been used for any number of hard alcohols. While artifacts such as the violin or scroll flasks would have been aesthetically pleasing, along with other decorated flasks, the actual content of the bottles were unlikely to have had much in the way of social currency or actual currency. What is far more interesting is the sheer volume of Wolfram Scheidam Schnapps bottles and what are identifiable as gin or schnapps bottles (if not to the brand).

Alcohol does have a long and inglorious history of being touted as a form of medicine. Before patent medicine’s slow death in the early twentieth century, alcohol was a common

ingredient in many of these elixirs. Some, such as bitters, contained up to 25% alcohol (Clouse 1996:580). While one bottle body shard embossed with “BITTERS” does exist on site, a potentially more interesting trend emerges.

As previously mentioned, a common find in the Short and Long Barracks were parts of Udolpho Wolfe’s Aromatic Scheidam Schnapps bottles. Various sections of the long title were found embossed on the side of the four paneled, olive green bottle. There was some variation in color, ranging from a near black (very dark olive green) to a near amber-green to a brighter olive green. The exact font of the embossed company brand on the bottles shifts slightly, but the stylization of the letters was distinct enough that partial words were readily identifiable.

The reason the schnapps bottles were included in this section can be found in an ad in the *New York Times*, run on February 23, 1860. The ad claims that the schnapps is “a medicinal drink of eminently salutary qualities manufactured by himself (Udolpho Wolfe) exclusively at his factory at Schiedam, in Holland.” (*New York Times*, 23 February 1860:1). It continues on to proclaim:

In gravel, gout and rheumatism, in obstructions of the bladder and kidneys, and in general debility, its effects are prompt, decided and invariably reliable. And it is not only a remedy for these maladies, but in all cases in which they are produced by drinking bad water, which is almost universally the cause of them, it operates as a sure preventive. The distressing effect upon the stomach, bowels and bladder of travelers or new residents, and all persons unaccustomed to them, produced by the waters of nearly all our great inland rivers, like the Ohio, Mississippi and Alabama..... [New York Times, 23 February 1860:1]

The schnapps was marketed as a diuretic—a kind of substance that, effectively, increases the production of urine to help purge the body. Which is somewhat ironic, given that too much alcohol functions very well as an anti-diuretic and induces dehydration. At this time in history however, the full effects of alcohol on the body and indeed its use as a medicine was still in debate. There is an exchange in the *British Medical Journal* (Tibbits 1877:244) on this topic, debating the use of alcohol for the treatment of fevers and the like. While debates on the actual use of alcohol in medicine were debated, Udolpho Wolfe's *Aromatic Scheidam Schnapps* firmly stuck to the definition of their product as a diuretic, tonic, and “invigorating cordial” for years. In *Bryant v. United States* in 1901, the company appealed the liquor as a proprietary preparation rather than as a drink. The court found the schnapps were alcoholic and therefore dutiable under paragraph 312 of the tariff act of March 3, 1883 (wherein anything containing distilled spirits were dutiable).

The company began in 1848, and with the tariff case in 1901 means that Udolpho Wolfe's continued their advertising claims for at least fifty years. Very few medical professionals agreed with the company's stance, an entry in the *New Hampshire Journal of Medicine* (1854) viscosly shredding the claim. The article mentions that Wolfe claimed that various doctors and medical professionals had given “unsolicited” commendations—while the commendations were merely iterations to the effect of “this would be interesting to study” and accompanied by free samples. Were the enlisted men using schnapps for a medicinal purpose or just because it tasted good? The answer is probably both, and likely as a workaround for any potential restrictions on drink. If nothing else you would be feeling no pain after a few bottles, no matter your issue.

Something I found interesting about the disparity between the use of schnapps between enlisted men and officers was that not only was the number of schnapps bottles much lower in the officers' quarters, but the officers' quarters had a proportionally higher number of medicine bottles. The numbers between the enlisted men's barracks and the officers' quarters came out about the same, but given the significantly fewer number of officers, one to twenty or so enlisted men, this means that the officers had more medicine bottles. Given the properties of medicines at the time this did not necessarily mean they were any less liquored up.

As a result of this study the majority of the bottle types fell along relatively expected lines-i.e. wine and such for the officers, harder alcohol for the men. As previously stated, the surprise was the schnapps, and further study of the discrepancies of access to medicine in frontier forts and the relation to alcohol would be a fascinating opportunity for further study.

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Appendix A: Fort Snelling Glass Catalog Created During Thesis

Fort Snelling Glass Catalog as created during thesis (Short Cat No. 317, Long Cat No. 343, Officers' Cat No. 377, Commandant's Cat No. 384)

Cat. No.	Shard Type (base/body/finish)	Bottle Type	Color Descriptive (word)	Color (Munsell)	Description
317.128.8	finish	violin task	clear		small barleyany lip
317.384.14	finish and neck	medicine	clear		small no seams visible
317.392.1	body	violin task		5.0BG	embossed shape translucent
317.374.7	finish	medicine	clear		cork stopper
317.384.13	finish/neck/shoulder	shoo fy flask	clear		piece mold?date1880-1900
317.260.88	base		clear		push up, push up pitted, heavy patina
317.248.1	neck/shoulder, no finish	violin task		7.5BG 8/4	translucent light aqua green
317.308.1	finish/neck	shoo fy task	patina clear,		very dirty, swirls in glass visible weirdly gold patina
317.35.9	finish		clear		weird swirly patina SKIPPED
317.54.5	base		clear		push up SKIPPED
317.46.10	neck/finish	shoo fy flask	clear		panel design
317.211.22	body	violin task		7.5BG 6/6	embossed aqua
317.236.31	body			2.5G 9/2	embossed SKIPPED
317.208.16	base	conical base		5.0BG 4/8	turquoise, very high kick up, glass portil mark
317.175.1	finish	shoo fy flask	clear		
317.189.7	finish		clear		screw top, 3 part mold
317.14.17	body		clear		body embossed, very thin, "M.S" "18..." "49 HL." "1INNE..." SKIPPED
317.29.15	body	condiments		5.0BG 6/3	impressed pattern, diamonds panel, very pale green
317.26.2	finish	medicine?	2.5G 7/10		green frosted, other parts of bottle square/rectangular, bright chartreuse
317 no#	body	export beer bottle	amber		Mississippi Glass Co. reil 5 count "MG.C" "2"
317.382.4	full bottle	medicine	clear		mold seams all the way down to heel
no#	full bottle w/cork	medicine	clear		Na?), embossed writing on the inside circle indent, key mold, mold seams to
304.5.7	base and half bottle	medicine or flask	clear		rectangular w rounded sides 3 pieces re fill
317.111.2	base	coffin task		5.0BG 8/2	key mold
317.315.8	neck/shard	shoo fy flask	clear		sheared lip no finish
317.100.1	finish/neck/shoulder	wine finish		5.0BG 8/2	finish added
317.135.7	neck/finish		clear		???????
317.92.14	finish/neck	whiskey	clear		decorated neck 1898-1917
317.249.8	finish/neck		clear		???????
317.283.2	body	beer	clear		"BRE." "St Paul Brewery bottle
317.249.7	finish neck	beer	clear		neck does bulge slightly
317.185.4	neck/finish/shoulder	shoo fy flask	clear		seam visible on shoulder part of neck
317.185.2	base/body	flask		7.5BG 6/6	oval shape, aqua, cup mold
317.31.8	base	coffin task	clear		seams visible on side
317.85.11	base/bottle	medicine	clear		design patented/Pat aug 9 1898
317.36.2	body	scroll flask		5.0BG 8/2	embossed patina
317.60.2	finish	beer		5.0G 5/4	green tapered finish 1840-1850's
317.31.7	neck/finish	flask	clear		
317.73.1	finish/neck	shoo fy flask	clear		seam visible up to finish
317.73.2	finish/neck		clear		seam not very visible ????????????
317.384.16-17	body/base	beer			embossed "BONOT T./BE SOLD" probably at paul brewery
317.243.21, .25	finish	beer	brown/amber		
317.304.3-4	finish/neck/shoulder		clear		appears to be paneled front seam visible on two sides
317.341.11	finish/neck	beer or soda		2.5G 9/2	frosted, tapered finish
317.318.2	base/body	flask/medicine	clear		
317.132.3	base/body	shoo fy flask	clear		
317.384.12	finish/neck/shoulder	medicine	clear		
317.358.11	finish/neck		clear		might have been panel ??????????
317.358.16-17	body		clear		embossed "...ot to ..." "sold" no photo ??????????
317.358.24	body		clear		embossed "...AB ST" "...WING C..."
317.384.25	body	flask/medicine	clear		embossed "PINT./ASUR..."
317.243.3	base	schnapps/bitters		2.5G 4/4	very dark olive green square
317.260.15	base	schnapps/bitters	dark olive green		dark olive green, high kick up square
317.257.12	body	schnapps/bitters	dark olive green		embossed "...ES"
317.241.46-54	body	schnapps (udolph wolf)	dark olive green		embossed Scheitan Aromatic schnapps
317.257.11	base	wine	dark olive green		tum mold, mameion 1880s onward, high kick up
317.241.44	body	schnapps	olive green		embossed "SCHIED..."
317.257.15	body	schnapps	dark olive green		embossed "... WOLF..."
317.257.22,21,27	body		amber		(10.04R 5/10) same as 343.233.31,34 ??????
317.254.13,14,15	body/base	schnapps	dark olive green		embossed udolpho aromatic schnapps .13"WOLF" .15".ATIC." .14 base
317.246.6	base		dark olive green		?????????????
317.251.30,32	finish/body	bitters	amber		embossed "BIT..."
317.261.6	finish/neck	beer	amber		
317.300.1	base	wine	dark olive green		
317.260.38,40,39,37	body/base		amber	10.0YR 5/10	high kick up
317.107.4	body		olive green		"DW." "39" "RIDGE/..." "40 "1866" "37 base
317.87.6	finish/neck	champagne	translucent	10.04 5/6	embossed "...DERV...Y)ICATEDY"
317.110.1	finish/neck	beer	very dark	5.0Y 4/4	laid on string very wide style
317.128.3	finish/neck	brandy/beer	very dark	5.0 4/4	
317.107.2	finish/neck	brandy/liquor	olive green dark		
317.23.3, 221.28	body		amber		heavy seams
317.214.13	base		amber		embossed "L DEXT..." "WA..."
317.251.15, 311A.13, .16	body	schnapps	olive green		square "ASCO" Agnew & Company 1854
317.151.4	finish/neck	wine/brandy	dark olive green		embossed "AROMA"
317.134.3,303.1	base	champagne/wine	dark olive green		high kick up
317.341.3-4	base	champagne/wine	dark olive green		high kick up
317.170.2	finish/neck	brandy	green	7.5GY 4/6	mineral finish
317.170.3	body		green	7.5GY 4/6	embossed "PPS..."
317.423.1-16	bottle re fit	coffin task	clear		shape Wilson pg 16 fig.26 (whiskey bottle)
317.396.9	finish	shoo fy flask	clear		
317.#5	body/shard	bitters	mustard gold	2.5Y 6/8	embossed "VERIDGE" "...0 BITTERS"
317.174.2 (paper 317.226.1.2)	base		amber	10.0YR 5/10	valve eject
317.334.2	base	wine/champagne	olive	2.5GY 4/4	
317.1.1	body		amber	10.0YR 5/10	embossed "...OSTE." "...MACH..."
317.85.3	base	wine/champagne	nearly black olive green		very high kick up
317.54.5 *should be 317.55.5	finish/neck	champagne	olive green		
317.38.1	finish		very dark olive green, almost black		finish ad visible double head
317.14.6	finish/neck	brandy schnapps?	green	7.5GY 4/6	

Cat. No.	Shard Type (base/body/finish)	Bottle Type	Color Descriptive (word)	Color (Munsell)	Description
343.201.38,106.13	body	schnapps	olive	5.OY 4/4	embossed "...OLPHOW..." UDOLPHO WOLFS
343.169.20	body	schnapps	olive	5.OY 4/4	embossed "SCHL."
343.169.23	body	schnapps	olive	5.OY 4/4	embossed "...E DAM"
343.207.16	body	schnapps	olive	10.OY 4/4	embossed "...DOLPHO..."
343.169.24, 2000.27	base (.27)	schnapps/bitters	olive	10.OY 4/4	embossed "...M" base has no ponytail mark, square base
343.203.36	body	schnapps	olive	10.OY 4/4	embossed "SCHL..."
343.203.43, 45, 48, 50, 51, 207.11, 12	body shards	schnapps	green	7.5GY 4.6	"AROMATIC SCHNAPPS"
343.169.22	body	schnapps	olive	5.OY 4/4	"...ROMA..." "...HNA..."
343.211.63	finish	schnapps	olive	10.OY 4/4	double head
343.203.41, 42, 207.7, 8, 14	body	schnapps	green	7.5GY 4/6	embossed "...CH DAM"
343.166.21, 201.37, 207.19	body	schnapps	olive green	5.OY 4/4	embossed "...ROMATE>>7" "...CHNAPP"
343.200.30, 332	body	schnapps	olive green	5.OY 4/4	embossed "...LFE..."
343.198.47, 203.44, 49	body	schnapps	green	7.5GY 4/6	embossed "...HOWOLF"
343.161.2, 203.37, 38, 40	base/body	schnapps	green	7.5GY 4/6	embossed "...ES"
343.201.16	base	schnapps/tonic/gin	olive green	5.OY 4/4	high push up, iron?
343.169.10, 11, 13	base	wine/champagne	olive green almost black		very high kick up, body of bottle much thinner on one side
343.211.60-61	finishes	liquor?	dark olive green	5.OY 4/4 10.OY 4/4	double head
343.203.19	finish	liquor?	dark olive green	10.OY 4/4	
343.203.21	finish	wine/champagne	green olive	10.OY 5/6	heavy patina
343.203.20	finish	brandy	olive green	10.OY 4/4	
343.203.52	finish/neck	export beer	dark green	7.5GY 4/6	mineral
343.191.16	base	schnapps/tonic/gin	olive green	10.OY 4/4	square
343.189.6	finish/neck	export beer	olive btw	5.OY 4/4 10.OY 4/4	
343.182.13	base/body	schnapps/gin/tonic	olive green	10.OY 4/4	square embossed "...M"
343.189.7	body	schnapps	olive green	10.OY 4/4	embossed "...S"
343.190.1	body	schnapps	olive green	10.OY 7/5	embossed "...OMAT..." "...NAP..."
343.191.13	base	mamelon	olive green	5.OY 4/4	push up
343.67.26, 69.2, 184.8, 193.21	refit base/body	beer?	olive green	10.OY 4/4	high kick up embossed with crooked "O"
343.92.3, 92.6	base	mamelon	olive green	10.OY 4/4	push up "nipple"
343.70.7, 135.14, 184.10, 190.2, 190.5, 193.13, 194.14	body	schnapps	olive	10.OY 4/4	embossed "...DOLPHO WOLFES"
343.95.4, 99.12	finish	mineral	mineral	5.OY 4/4	
343.107.8	body	schnapps	olive green	5.OY 4/4	embossed " TIC? " "...PS."
343.107.9	body	schnapps	green	7.5GY 4/6	"...LPH..."
343.125.7	body	schnapps	olive green	10.OY 4/4	"...EDA..."
343.129.10	body	schnapps	olive green	10.OY 4/4	embossed "...AR..." "...SCHL..."
343.99.10	base	wine/champagne	nearly black olive green	10.OY 4/4	high push up, faint glass pontil mark?
343.92.2	finish	champagne	olive green	10.OY 4/4	
343.94.5	base		olive green	5.OY 4/4	embossed "...Co PITTS PA. WM." McCULL..."
343.44.1	finish/neck/shoulder	beer export	olive green	10.OY 4/4	seams visible on shoulder
343.320.42	finish	mineral	olive green almost black		
343.319.8	base		olive green	10.OY 4/4	patina
343.26.5	finish/neck	champagne	olive green	10.OY 5/6 (or 4/4)	heavy patina
343.198.46	finish	mineral	olive green almost black	5.OY 4/4	
343.169.21	body	schnapps	olive green	5.OY 4/4	embossed "...OLFF..."
343.157.3	base		olive green	10.OY 4/4	????
343.200.20	base		olive green	10.OY 4/4	
343.120.9	finish	mineral	nearly black olive green	10.OY 4/4	
343.233.31, 33.41	body		amber		embossed bird with arrow skipped
343.233.29(1), 233 (2)	base refit	bitters	amber	10.OY 5/10	embossed "...ERIDGE" / "...ERS" same as opposite side
343.225.49, 51, 54, 55A, 233.48	base/body	mamelon/beer	amber	10.OY 5/10	(ringed base)
343.174.13	finish/neck	medicine		5.0BG 6/3	nearly see through
343.202.1	full bottle	shoo fly flask	clear		finish slightly crooked
343.218.1	full bottle	shoo fly flask	clear		(shoo fly smaller)
343.381.2	full bottle	shoo fly flask	clear		tapered down
343.381.27	finish/neck/shoulder	soda/ale/liquor	olive green	10.OY 4/4 5.OY 4/4	very high kick up, glass pontil mark
343.382.4	base	wine/champagne	nearly black olive green	5.OY 4/4	embossed "...HIE..."
343.363.7	body	schnapps	olive green	10.OY 4/4	
343.226.42, 48, 49	finish/neck refit	beer/brandy	nearly black olive green	5.OY 4/4	crooked finish, indents (seams?) visible partway up neck
343.248.42, 52, 53, 55, 58, 59	finish/neck	beer/mineral	olive green	5.OY 4/4	
343.49.12	base		olive green	10.OY 4/4	very high kick up, heavy patina
343.132(3), 137.29, 138.18	finish/neck	champagne	olive green	10.OY 4/4	heavy patina, no seam visible
343.49.12	finish/neck	champagne	olive green	10.OY 4/4	heavy patina, no seam visible
343.143.16	base	champagne/wine	olive green	10.OY 5/6, 10.OY 4/4	very high kick up, very clear glass (translucent) kick up bulges back down
343.47.5	base	brandy	olive green	5.OY 4/4	finish slightly wobbly
343.248.60	finish/neck	brandy	olive green	10.OY 4/4	very translucent ???? embossed "...OLFE..."
343.215.66	base		olive green	10.OY 4/4	
343.57.4	body	schnapps	olive green	10.OY 4/4	
343.117.1	finish	brandy/beer	olive green	5.OY 4/4	
343.49.13, 50.14, 133.5, 140.12	base refit	beer/wine	nearly black olive green	5.OY 4/4	crooked push up, very thick glass
343.140.11	finish	soda/ale/beer	olive green	10.OY 4/4	
343.50.7, 132.19, 128.27	finish/neck	liquor	olive green	5.OY 4/4	
343.98.12, 140.16	finish/neck	brandy	olive green	10.OY 4/4	
343.50.11, 122.24, 138.6-7	base refit	schnapps	olive green	10.OY 4/4	iron on push up?
343.55.18, 56.9, 182.28	body	schnapps	olive green	10.OY 4/4	embossed "...OLPHOW..."
343.128.39, 137.16-17	body	schnapps	olive green	10.OY 4/4	embossed "...ROMA..." / "...NAPP..."
343.57.4, 123.21, 132.17, 132.23, 132.25, 138.8	body	schnapps	olive green	10.OY 4/4	embossed "...HIE" / "DAM"
343.137.14	finish/neck	mineral/beer	olive green	10.OY 5/6	
343.123.24	finish	brandy	nearly black olive green	10.OY 4/4	
343.122.28	finish	brandy	olive green	5.OY 4/4	
343.244.45	body	schnapps	olive green	10.OY 4/4	embossed "...CHL..."
343.249.36	body	schnapps	olive green	10.OY 4/4	embossed "...IC..." / "...PS" O or C
343.164.2	base	mamelon	olive green	5.OY 4/4	dot in push up
343.32.38, 40	bottle refit	medicine	aqua	7.5BG 6/6	
343.227.41	finish/neck	medicine	aqua	7.5BG 6/6	"TALLMAN&COLLINS"
343.233.57	finish/neck	medicine	aqua	7.5BG 6/6	
343.248.118	finish/neck/shoulder	medicine	aqua	7.5BG 6/6	with seam
343.240.161	finish/neck	medicine	aqua	5.0BG 6/3 or 2.5G 9/2	
343.248.97, 116	base/body	flask		7.5BG 6/6	M&C (sideways &) Co. W
343.240.130, 160	finish/neck	medicine		10.0BG 7/4	
343.199.8	finish/neck/shoulder	beer		5.0 BG 6/3 5.0BG 4/8	no seam visible, bulged neck
343.195.36	base	schnapps/tonic/gin		10.OG 4/5	
343.95.16	finish/neck/shoulder	historical flask		5.0BG 4/8, 5.0BG 6/3	emblem, eagle head visible (Eagle Historical figured flask)
343.92.8	body	scroll flask		5.0BG 4/8	embossed scrollwork
343.92.7	body	flask		5.0BG 4/8, 7.5BG 6/8	seams visible on side, no lip
343.6.4	base	?		7.5BG 6/8 12.5BG 6/7	small push up, no visible seams
343.215.71	finish/neck/shoulder	medicine/liquor		5.0BG 6/3	oil finish
343.226.62-63	finish/neck/body	sauce/picnic flask		7.5BG 6/8	
343.226.70	base		nearly clear	10.0BG 4/8	patina, key mold base 1840-1900
343.226.60	base			10.0BG 4/8	patina, seam line, key mold
343.202.30	finish	shoo fly flask	clear		very clear seam, goes up into finish, high seam visible on body shards, ring not
343.25.1	finish/neck	champagne	clear		
343.258.20	finish/neck/shoulder	flask	clear		seam visible
343.258.21	base	shoo fly flask	clear		possibly same bottle as above
343.225.97	finish/neck/shoulder	patent medicine	clear		seam visible up to finish
343.26.4	base	beer/ale	amber	7.5YR 5/10	seam visible
343.379.3-4	finish/neck	beer/ale	amber	7.5YR 5/10	
343.410.2	finish	medicine	aqua	5.0BG 6/3	
343.46.14, 50.25, 27	body	bitters		10YR 7/10	patina, embossed "...MACH..." / "...TERS"
343.123.51	finish/neck	porter	amber	7.5YR 5/10	
343.123.50	finish	ale/porter/soda	amber	10.OYR 5/10	patina
343.70.8	body	bitters	amber	10.OYR 5/10	embossed "BITT..."
343.82.8	finish	amber	amber	10.OYR 5/10	tapered collar
343.67.21, 70.9, 119.4, 179.6	body	bourbon		10.OYR 5/10	embossed "BOURBON"
343.67.19 (3) 70.12, 119.11	finish/neck	liquor		10.OYR 5/10	
343.233.25	body	bitters	amber	2.OY 6/8	embossed "BITTERS"
343.233.30	finish	gin/tillar	amber	10.OYR 5/10	oil finish
343.233.37	finish	amber	amber	7.5YR 5/10 or 10.OYR 5/10	oil finish
343.232.34, 35	base/body	amber	amber	7.5YR 5/10	key mold?
343.215.53	body	bitters	amber/black	7.5YR 5/10	embossed "...ITTERS" / "...RS"
343.227.29	base	amber	amber	7.5YR 5/10	embossed "D SL Co" / "14"
343.247 incomplete, 248.26, 25, 32, 249.45	base	amber	amber	5.OYR 2/4	push up turn mold

Cat. No.	Shard Type (base/body/finish)	Bottle Type	Color Descriptive (word)	Color (Munsell)	Description
377.3.107.3	finish	ale	olive	2.5G 6/4	
377.3.101.3-4	finish	beer/ale	olive	10.OY 4/4	mineral variation 1850-70
377.3.252.13-14	base refit		olive	10.OY 4/4	very thick, lum mold
377.3.182.2	finish/neck	champagne	olive	10.OY 7/5	hand applied
377.2.153.2	finish/neck/shoulder	gin/ale/soda	olive	5.OY 4/4	square, seam visible
377.2.145A.13	finish/neck/	champagne	olive	10.OY 4/4	hand applied, lots of scratches
377.2.116.15-16	base	wine	olive nearly black		push up only
377.2.115.14-15	base		green	10.OG 4/5	glass pontil mark, dusty clear
377.2.115.12-13	base		green	10.OG 4/5	patina - glass pontil mark, dusty clear
377.2.116.14	base	wine	olive nearly black		
377.2.13	finish	wine	olive	10.OY 4/4	Bordeaux-St-Julien Medoc embossed medallion "ULIEN"/"MEDOC"
377.2.88.30	finish	patent medicine	aqua	10.OBG 7/4	
377.2.107.8	base	wine	olive nearly black		
377.2.90.7	base	wine	olive nearly black		
377.2.105.62	finish/neck	beer/ale/porter		10.OY 4/4	
377.2.105.50-51	finish/neck/body	ale/stout	amber	7.5YR 5/10	very heavy patina
377.2.81.33	base/body	wine	olive nearly black		very thick glass
377.2.105.52-53	base	mamelon	brown nearly black		push up
377.2.105.101-122, 124-133	full bottle refit	medicines	clear		embossed "DONNELLY" "3...ABASHA ST./"SIPaul Minn" base"WT&Co."/"C"
377.2.215.2	finish/neck	mineral/ale		10.OY 4/4	finish uneven
377.2.273.47	finish/neck		clear		?????
377.2.166.7	finish	brandy/flask	clear		
377.2.153.9-13	base	schnapps/gin	olive	5.OY 4/4	iron pontil square
377.1.166.69	base	wine/ale	olive nearly black		
377.1.145.72	base	wine/ale	olive nearly black	10.OY 4/4	
377.1.145.64	body	ale	olive	5.OY 4/4	embossed "ALE..."
377.1.200.44	base	wine/ale	olive nearly black		
377.1.64	base	wine	olive		kick up, heavy patina, hard to determine shade
377.1.187.65	base	wine	olive		incredibly heavy patina
377.1.266.1	finish/neck	mineral/ale	olive	5.OY 4/4	indented seams on neck
377.1.281.8	finish/neck	beer/ale/stout/porter	olive	10.OY 4/4	
377.1.281.8	base/body	mamelon/beer	olive	10.OY 4/4	push up
377.1.285.31	base	wine	olive nearly black	10.OY 4/4	iron pontil mark
377.1.263.14-15	base	beer	olive	5.OY 4/4	
377.1.264.17	finish/neck	mineral/ale		10.OY 4/4	
377.1.173.2	base/body	wine		10.OY 5/6	high kick up/ glass pontil mark
377.1.166.66-67	base	wine/ale	olive nearly black	10.OY 4/4	
377.1.231.4	finish	beer/ale	olive	10.OY 4/4	
377.1.183.11-12	finish	mineral/beer/ale	nearly black olive	10.OY 4/4	
377.1.148.6	finish		nearly black olive		
377.1.124.12	finish/neck	mineral	olive	10.OY 4/4	
377.1.138.18	finish/neck	beer/ale/stout	olive	10.OY 4/4	
377.1.3.8	finish/neck	soda/ale			tapered collar: 1840's-1850's
377.1.137.12	finish/neck	ale/stout/porter	nearly black olive	10.OY 4/4	wire wrapped around neck
377.1.264.55	finish/neck		clear		packer finish?
377.1.216.9-10	base	flask	clear		oval
377.1.261.25	finish/neck		clear		packer finish?
377.1.216.12	finish/neck	flask	clear		packer finish?
377.1.166.112, .113(2), .114(2), .115(2)	base/body			7.5G 5/6	iron or glass pontil mark
377.1.224.26	finish/neck			5.0G 5/4	crooked looks hand looked /flattened string rim???
377.1.166.117, 182.55, 183.33	finish/neck	champagne		7.5G 5/6	patina, applied lip, hand done
377.1.104.3	finish/neck		clear		seam visible on neck
377.1.118.16	finish/neck	medicines	clear		seam visible
377.1.104.4	base/body	flask/med	clear		embossed "FULL" seams visible
377.1.126.27	base		colorless		cup mold
377.5.30.4	full bottle	beer	aqua	7.5BG 8/4	embossed "JAL SCHMIDT'S/BREWERY/ST PAUL front "BOTTLE/NOT TO BE SOLD" back "SB&C CO"
377.5.13.5	base/body	beer	light green	7.5BG 8/4	1898-1900 "ST PAUL BRG CO/trade mark/ST PAUL MINN" "BOTTLE/NOT TO BE SOLD" back, base SB&C
377.5.3.20	base/body	beer		7.5BG 8/4 or 5.OBG 8/2	part of ST PAUL BRG CO star visible as is bottle not to be sold
377.5.14.2	base/body	beer		5.OBG 8/2	ST PAUL BRG CO partial 1898-1900
377.5.13.6	body		clear	5.OBG 8/2	embossed "JAC" 1900-1954
377.5.8.1	finish/neck	patent/med	clear		seam visible
377.5.7.14	finish/neck	liquor	clear		indented / seam goes up into finish
377.5.13.2	finish	ale/stout/porter	olive	10.OY 4/4	heavy patina
377.5.7.3	body	schnapps	olive	10.OY 4/4	SCHMIDT SCHNAPPS / embossed "...IED." "M"
377.5.4.1	finish/neck	gin/schnapps/mineral	olive	10.OY 4/4, 10.OY 5/6	
377.5.13.1	finish/neck	beer/ale/porter	nearly black/olive	10.OY 4/4	wire on neck
377.5.67.5	base/body	beer/ale/porter	aqua	7.5BG 8/4	embossed "Bottle not to be sold" / "19" / "SB&C CO" 1889-1900
377.5.69.5	finish/neck	patent	clear		seam visible
377.5.67.8	base		slight green tint	7.5BG 8/4	embossed "SB&C CO" 1889-1900
377.5.67.14-15	finish/neck		nearly clear		crowns
377.5.67.8-9	body		nearly clear	7.5BG 8/4, 5.OBG 8/2	1889-1900 "...S" / "...WERY" / "...T PAUL" / "...TTLE"
377.5.64.25	body		clear		1889-1900 embossed "BRG CU..."
377.5.67.19	body	whiskey	clear		embossed "...DAYTON"/"ST LOUIS" HAYWER DISTILLING CO
377.5.72.48	body			5.0G 5/4	embossed "RRIN..."
377.5.72.41	finish		light green	5.OBG 6/3	
377.5.72.44	base		aqua	10.OG 6/6	high kick up/ glass pontil mark
377.5.72.10	base	wine	olive	10.OY 5/6	high kick up
377.5.71.5	finish/neck	mineral	olive	10.OY 4/4	
377.5.98.5	body	schnapps	olive	10.OY 4/4	"FROM..." / "H..."
377.5.96.3	body			5.OBG 8/2	embossed "TO" / "LD" 1889-1954 (likely ST PAUL/JAL bottle)
377.5.73.2	body			5.OBG 8/2	1889-1954 (likely ST PAUL/JAL) "BOTTLE" / "...TO..."
377.5.102.2	finish			5.OBG 3/6	oil finish
377.5.100.14	finish	flask/patent med		5.OBG 8/2	(double ring)
377.5.110.10-11	base	mamelon	aqua	7.5BG 6/8	
377.5.21.2	finish/neck/shoulder	schnapps/gin/mineral	olive	10.4/4	finish added
377.5.32.3	finish/neck		clear		crowns?
377.5.37.3	body	beer	clear		embossed "ST PAU" 1889-1954
377.5.28.3-4	body		clear	5.OBG 8/2	"TR..." / "ST.P..." / "JAC..." / "B..."
377.5.25.2	body		clear		embossed "BOT..." / "NOT..." / "SOL..." no photo, 1889-1954
377.5.29.4	body		clear	5.OBG 8/2	"L. BRG.C..." / "...star symbol" 1900-1954
377.5.18.5	finish/neck	crowns	clear / slight green tint		
377.5.21.5	finish	flask / shoe-fly	clear		seam next to cat. no. raised line on interior lip (brandy finish)
377.5.28.2	finish/neck	crowns	nearly clear	2.5G 9/2	
377.5.58.4	finish/neck	club sauce		5.0G 5/4	(darker) indent seam
377.5.131.27	finish/neck/shoulder			5.OBG 4/8	tapered finish
377.5.138.12	body	schnapps	olive	10.OY 4/4	embossed "...ATIC..."
377.5.131.4	base	schnapps	olive		square
377.5.116.9	base	wine	olive	10.OY 4/4	push-up only, heavy patina, glass pontil?
377.5.132.3	body	schnapps	olive	10.OY 4/4 or 10.OY 5/6	embossed "...PS"
377.5.131.5	finish/neck	mineral/schnapps/gin	olive	10.OY 4/4 or 10.OY 5/6	
377.5.126-29	body			5.OBG 8/2	embossed "...B & C CO" / "IDTS" / "...ERY" / "...BE..." / "...OLL"
377.5.2.22	finish	crowns	clear, slight mint green tint		
377.5.2.8	base/body		green	5.OBG 6/3	1889-1954 embossed "...CO" / "...AUL MINN" / "BE"
377.5.1.11	body	schnapps	olive	10.OY 4/4	embossed "...AM N..."
377.5.2.2-6	body	schnapps	olive	10.OY 4/4 or 10.OY 5/6	embossed "...VOL.F..." / "DO..." / "A..." / "C" seam visible
377.4.186.48	base	patent/flask	clear		
377.4.186.47	base	patent	clear		embossed "DESIGN PATENT AUG 8, 18(6.8.07)8"
377.4.186.46	finish	patent/pensor	clear		seam visible up neck up to lip
377.4.186.47B	base		aqua	5.OBG 6/3	believed, can barely read "D S G Co". in REX WILSON p.115
377.4.156.8	finish		clear		(discoloration visible), looks like mold in crack in glass
377.4.70.50 - 57	body	scroll/violin flask	aqua	7.5BG 6/8	
377.4.65.36	body/base	scroll/violin flask		7.5BG 6/8	base embossed
377.4.72.55 - 58	body/base	scroll/violin flask		7.5BG 6/8	base embossed
377.4.66.17 - 18	base		olive	17: 10.OY 5/6	embossed "...McClully..."
				18: nearly black olive	embossed "...Jully..."
377.4.70.29	finish	mineral/schnapps/beer	olive	5.OY 4/4	
377.4.44.19	finish	perscription	brown	2.5 YR 4/10	seam part way up neck
377.4.60.19	base		olive	10.OY 4/4	embossed "...W..."
377.4.40.11	finish/neck shard	beer/ale/porter	olive	10.OY 4/4	
377.4.179.26 - 27	body	beer		7.5BG 6/8	26 - embossed "BREWING..." / "ST PA..." / "MINN"
					27 - embossed "...AN..." / "...REWING CO..." / "...T PAU..."
377.4.95.9	body	historical flask	olive	10.OY 4/4	embossed eagle shield
377.4.96.43	finish		aqua	7.5BG 6/6	no lip seam visible, sheared? 1800-1870

Column1	Column2	Column3	Column4	Column5	Column6
377.4.81.31..33	body	scroll flask	aqua	7.5BG 6/6	embossed
377.4.80.32	body	scroll flask	aqua	7.5BG 6/6	embossed
377.4.81.29	base/body	scroll flask	aqua	7.5BG 6/6 - 6/8	
377.4.96.45	finish	flask	aqua	7.5BG 6/3	broken lip, tapered, very translucent
377.4.89.12	body		aqua	7.5BG 6/6	no photo, embossed, "...RADE..."
377.4.89.11	base/body	key mold	aqua	5.0BG 4/8	no pontil mark
377.5.67.4	bottle		light green		"ST PAUL BRF Co" 1889-1900
377.5.115.21	base	champagne/wine	olive	10.OY 4/4	high kick-up
377.5.115.22	base	wine	olive	10.OY 4/4	high kick-up
377.5.115.23	base	wine	nearly black olive		high kick-up
377.5.139.9	base	wine/mamelon	olive	10.OY 4/4	low push-up
377.5.139.6	finish	mineral/schnapps	olive		too much patina to specify color
377.5.172.12	finish/neck	patent	aqua	7.5BG 6/3	
377.5.139.7	finish	beer	olive nearly black		
377.5.139.10	body	schnapps	olive	10.OY 4/4	embossed looks like RUDOLPH
377.5.115.24	finish/neck	benedictine	olive		patina too heavy, turn mold marks? applied collar
377.5.139.5	finish/neck	champagne	olive	10.OY 5/6	
377.5.168.17-18, 20-21	base/body	patent/flask	clear		embossed "PINT"/"FULL MEASURE", "DESIGN PATENTED"/ "PAT ____ 1898"
377.5.80.5	finish/neck	crowm	light green	2.5 G 9/2	
377.5.80.4	finish/neck	crowm	light green	5.0 BG 8/2	
377.5.67.7	finish/neck	crowm	light green	5.0 BG 8/2 or 2.5 G 9/2	
377.5.213.6	finish/neck	figured flask	light green	7.5 BG 6/8	no collar - rolled?
377.5.205.1	base		olive	10.OY 4/4	machine made ?
377.5.210.12	base	wine			
377.5.204.1	finish	champagne	olive	10.OY 4/4	
377.5.241.12	finish	patent / perscription	clear		
377.5.241.19	body		clear		embossed "CALIF..." / "SAN FRANC..."
377.5.241.15	finish/neck	patent	clear		
377.5.241.13	finish/neck	shoo-fly flask	clear		
377.5.241.18	base/body	flask	clear		embossed ".../2 PIN..."
377.5.67.2	base	schnapps	olive	10.OY 5/6	square base, embossed "...E.S."
377.5.272.40-41	base	wine	olive	2.5 GY 4/4	high kick-up
377.5. (no #)	finish/neck/body	flask	clear		seam visible, weird finish
377.5.64.15	finish/neck	crowm	light green	2.5G 9/2 / 5.0BG 8/2	seam faintly visible
377.5.1.29	body		clear		embossed "ATLANTA" / "ST. PAUL" / "DISTILLERS" / "CO" (Hayner Distilling Co?)
377.5.64.24	finish/neck	soda / mineral / beer	light green	2.5G 9/2	
377.5.64.14	body		aqua	7.5BG 6/4	embossed "SCHMIDT'S" / "...ERY" (no photo) 1900-1954
377.5.259.13	finish/neck	patent	brown	10.OYR 5/10	
377.5.260.14	finish	champagne	olive		patina too heavy to determine color, collar applied
377.5.259.9	finish/neck	beer/ale/stout	brown		heavy patina
377.5.255.6	finish/neck/shoulder	patent	clear		seam goes part way up neck
377.5.250.3	finish/neck		aqua	5.OG 5/4	turn mold marks (skipped?)
377.5.265.25	base		olive	10.OY 4/4	base kick-up (skipped?)
377.5.264.22	finish/neck	club sauce	green	5.OG 5/4	applied finish
377.5.264.27	body		aqua	7.5BG 6/8	embossed "UTTLIN..." / "ST PAUL..." / "MINN" (??)
377.5.264.1	finish	brandy finish liquor	brown	10.OYR 5/10	1860-1920
377.5.265.10	base		brown	7.5YR 5/10	embossed "...ONU WU (?) (?) NE" (skipped?)
377.5.264.4	base		brown / amber	7.5YR 5/10	embossed "...RKS GLASS" (skipped?)
377.5.264.3	shoulder	bitter/liquor		10.OYR 5/10	embossed "BEN..."
377.5.264.5	body/base	spirits bottle	brown / amber	7.5YR 5/10	embossed "...NUJE" - base: "AU (W?)..."; key mold, square
377.5.267.6	body	red jacket bitters	brown	10.OYR 5/10	embossed Bennet "PIETERS & CO"
377.5.267.15	finish	champagne	olive	10.OY 4/4	
377.5.267.16	base	wine	olive	10.OY 5/6	
377.5.267.9	body			2.5Y 6/8	embossed "CHIC (O?)..." (skipped)
377.8.24.157	finish/neck	patent	clear		seam barely visible, goes part way up neck
377.6.31.20-21	finish	mineral ale/stout	olive, nearly black		
377.6.33.1	finish	mineral ale/stout	olive, nearly black		
377.6.24.144	base	key mold	aqua		embossed: base: "SB&CC" Rex Wilson p. 123
377.6.24.147	finish/neck	soda	aqua	5.0BG 6/3	
377.6.29.1.8	body	patent/med	clear		embossed "MA" / "DR P. FA..." / "CHICAG..."
377.6.78.1	finish	beer/ale/stout	olive, nearly black		mineral
377.6.80.6	finish	ale/stout	olive, nearly black		mineral
377.6.81.7	finish	ale/stout	olive, nearly black	10.OY 4/4	mineral
377.6.77.19	finish	liquor	brown	7.5YR 5/10	mineral
377.6.81.9-12	base		olive, nearly black		embossed: -9 - "...McCU..." embossed: -10 - "...W. McCU..." embossed: -11 - "...BU..." embossed: -12 - "...CH"
377.6.95.2	finish/neck	soda	blue opalized	5.OB 4/6	
377.6.91.27	finish	mineral	olive, nearly black		
377.6.105.10-11	base		olive, nearly black		embossed: -10 - "W McCUL..." embossed: -11 - "P..." embossed: -24 "PITT..." (W. McCully)
377.6.91.24-25	base		olive, nearly black		
377.6.11.76	finish/neck	beer	brown	10.OYR 5/10	mineral
377.6.11.84	body		clear		embossed "...ETERS" / "...URIRO" (skipped)
377.6.11.74	base		amber	10.OYR 5/10	skipped
377.6.11.50	base	wine	olive	10.OY 4/4	
377.6.16.10	finish	mineral	olive	10.OY 4/4	
377.6.14.12	base	wine	olive	10.OY 5/6	
377.6.24.102	finish/neck	champagne	olive opalescent		fogged ?????
377.6.16.11	base		olive opalescent		oil finish
377.6.24.46	finish/neck		aqua	10.OG 6/6	
377.6.74.51-56	base-refit	wine	olive	10.OY 5/6	
377.6.75.11	finish	champagne	olive	10.OY 5/6	

Cat. No.	Shard Type (base/body/finish)	Bottle Type	Color Descriptive (word)	Color (Munsell)	Description
384.111.3	base		brown	2.5YR 4/10	???
384.162.5	finish	mineral	aqua	5.0BG 4/8	
384.223.6	bottle/full	beer	aqua	7.5BG 6/6	embossed "ANHEUSER-BUSCH" / "BRWG ASSN" / "ST.LOUIS"
384.214.2	finish/neck	ale	light green	2.5G 9/2	embossed on base "A.B.G.M Co"
384.436.3-32	bottle refit, finish/neck	medicine	clear		finish applied
384. construction misc.	full bottle	cognac	green	2.5G 6/4	embossed "LIQUOR BOTTLE"
384.510.7					embossed base "MODELE DEPOSE SG(SC?) (in box) AD K"
384.510.10	finish	champagne	olive	10.OY 4/4	print "U.S." / "VERY SPECIAL"
384.510.10	finish		clear		???
384.403.22	finish		olive	10.OY 4/4	oil finish, slightly uneven
384.595.34	full bottle	shoo-fly flask	clear		crooked neck
384.595.30	base	mamelon	olive, nearly black	10.OY 4/4	suction base?, barely push-up
384.413.20	base	medicine	olive		

Appendix B: Fort Snelling Glass Catalog as given by Pat Emerson at Historic Fort Snelling

Appendix B can be found in the repository as a supporting document to this thesis.