

Queen Anne's Revenge
Shipwreck Project



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**Preliminary Glassware and Bottle
Analysis from Shipwreck 31CR314,
Queen Anne's Revenge Site**

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Introduction

Glass as a malleable composite has been shaped into hollow forms for over 3500 years. The art of glass blowing, by use of a blowpipe, was developed sometime around 40-50 BC and flourished during the Roman Empire, throughout its geographic domain. After the fall of the empire, common use and manufacture of glass declined and the styles became more simplified. It was well into the seventeenth century before utilization of glass containers began to increase as vessels diversified into many new forms. Prior to that most bottles used to store liquids (e.g. beverages, oils, medicines, and water) were made of earthenware, leather, metal or wood (Frank 1982:131–133). Throughout the seventeenth and eighteenth centuries' glass bottles were relatively expensive to manufacture, thus the majority of goods being packaged were put into ceramic and wooden containers. Eventually, however, bottles became universal containers and were used; both new and second-hand, for a great variety of goods that carried trade and property value (Busch 2000:175).

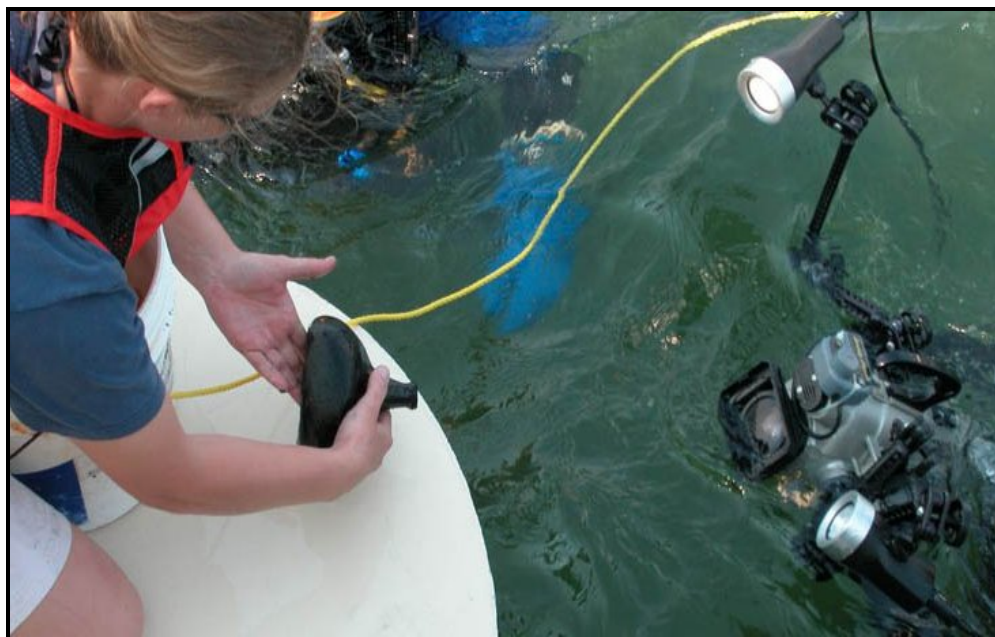


Figure 1. Recovery of a squat wine bottle from the *QAR* site.

A total of 514 glass artifacts were recovered from shipwreck site 31CR314, the *Queen Anne's Revenge (QAR)*, from 1996 to 2004. With the exception of five glass beads (Carnes-McNaughton and Myers 2008), glass artifacts consisted of bottle fragments, three intact wine/rum bottles, and several partial bottles. Also reported here are two newly discovered glass stemware fragments. Most measured less than .5 in. (1.3 cm) on at least one side. Initial sorting of 509 individual glass fragments was completed to facilitate further analysis. Overall nearly all glass fragments were found in what represents the area within the *QAR* site that lies aft of the main mast, scant evidence found forward

of this point. Using a uniform light source all shards were sorted by glass color, reflective of individual containers. The collection was remarkably consistent and predominated by various shades of blue-greens. Body fragments were matched to diagnostic elements (e.g. necks, bases, rims, etc) of the same color. A Munsell color chart was used to provide standard color values to each of the glass groupings. Bottle elements contained within these color groups were examined for production features to determine the method of manufacture and datable attributes such as applied lip rings, pontil scars, and mold seams. The three intact wine/rum bottles were all hand-blown dark green glass, often referred to as “black glass”. The two stemware fragments appear to be made of clear, leaded glass and manufactured with integral stems; one is a molded, four-sided stem, and the other is a blown baluster type.

The majority of bottle glass from this wreck site can be grouped into two dominant types based on color variables and morphological attributes of the base and necks. These types are blue-green, square-based *flacon* bottles and dark green/olive colored, round base, squat wine bottles. Other bottles represented in the assemblage were a square-based “gin” case bottle and fragments of a dark green flask. A few shards represented two types as yet unidentifiable. Completing the collection of bottle glass were several pieces of intrusive nineteenth and twentieth century bottles and a few shards that were too small to classify.

Flacon Glass Bottle Group

Three lip and neck pieces, one base fragment, and 402 side panel and shoulder fragments fall into Harris (2000:239-241) Type I short-necked square “case” *flacons*. Based on the lip and neckpieces a minimum of three of these blue-green glass containers have been recovered thus far. *Flacon*-type bottles represent 83 percent of the total number of shards. This may, however, be somewhat misleading because compared to other types of bottles, *flacons* are relatively thin and fragile and more susceptible to breakage. With the exception of a few of the larger pieces, the majority of *flacon* bottle glass was recovered from within concretions and most shards were extremely small in size. A total of 73 percent of the *flacon* fragments were less than .5 in. (1.27 cm). Slightly larger shards, between .5 in. (1.27 cm) and one inch (2.54 cm), represented 20 percent and only seven percent of the glass pieces were greater than one inch (2.54 cm) in size. With the exception of two fragments from the northern end of the site, blue-green glass representing *flacons* was found only in the southern half of the site with most fragments coming from the stern or aft zones (54 percent and 36 percent, respectively).



Figure 2. Flacon lip/mouth/neck/shoulder (*QAR* 009.002)



Figure 3. Flacon base (*QAR* 347.001)

Description

Lip characteristics: cracked off and fire-polished
Lip Diameter: 1.11 in. (2.8 cm); .94 in. (2.4 cm); 1.13 in. (2.9 cm)
Bore Diameter: .98 in. (2.5cm); .87 in. (2.2 cm); .73 in. (1.9 cm)
Neck characteristics: short, tubular, straight and slightly flared; plain without applied rims.
Neck height: 1.43 in. (3.6 cm); 1.43 in. (3.6 cm); 1.36 in. (3.5 cm)
Shoulder characteristics: Horizontal
Shoulder width: Insufficient information
Shoulder and panel thickness: .04 in. (.11 cm) to .18 in. (.46 cm)
Base characteristics: Square shape, slightly arched with faint glass pontil mark
Base width: 3.0 in. (7.6 cm)
Base thickness: .12 in. (.31 cm) to 0.28 in. (.71 cm)
Glass color: 2.5G Munsell
Closure: Two of the three neckpieces hold plain cork stoppers pushed into the throat and even with the lip.

Discussion

Considered to be of French manufacturing origin, *flacons* have been found in large numbers in archaeological collections from Louisbourg, Nova Scotia (Harris 2000:233-258), and also reported from French frontier sites such as the Trudeau site in Louisiana (Brain et al 1979:92-93), Sawanogi Town (Burke and Burke 1937:15), Fort Michilimackinac in Michigan (Brown 1971:144) and Fort Charlotte (Wheeler et al. 1975:88). In North Carolina, extensive excavations at the colonial river-port town of Brunswick Town (ca. 1726-1780s) yielded several examples of *flacons*, or *flacon*-type bottles, from the ruins of Russellborough, a former governors' estate (South 1962-1968).

Evidence from New World archaeological sites where *flacon* bottle glass has been found, place their use throughout the eighteenth century, beginning as early as the 1710s. At the Fortress of Louisbourg these bottle types are found in contexts from two French occupation periods (1713-1745 and 1749-1750) with no apparent stylistic differences pertaining to manufacture (Harris 2000:233). Brain et al, (1979) provides other colonial sites where *flacon* bottles occur ranging from 1715-1763 at Fort Toulouse in central Alabama, to early 1700s in Sawanogi Town, also in Alabama, and at Fort Michilimackinac in Michigan from 1715 to 1781. Also, further inland, French case bottles were recovered and reported from the village of Kaskaskia, 1703-1719, also known as the Guebert Site located in the Illinois River valley (Good 1972). The *Machault* shipwreck lost in 1760 on the Restigouche River, Canada, reported *flacon* bottles found amongst the galley remains (Sullivan 1986). Noel Hume (1969:69) argues that these unique blue-green case (or square) bottles have been incorrectly referred to in various accounts as "Dutch Gin" bottles, but in fact are found in such large quantities on French archaeological sites and should be attribute to France and not Holland as their manufacturing source. The appearance and use of *flacons* on many English settlements appears to be most prevalent during the mid-eighteenth century, at sites such as Williamsburg, Virginia (Noel

Hume 1969:70) and Russellborough in North Carolina (1720s-1780s) (South 1962-1968), and thus documents inter-continental colonial period trade.

Morphologically, *flacons* were blue-green, bubbled glass bottles of various sizes and shapes, all of which were mouth-blown into dip-molds (Harris 2000:236; Jones 1985:25). During the dip-mold process, hot globes of glass on the blowpipe are placed in the open-ended mold, blown to full size, then removed and finished. Historical evidence indicates that the use of the dip-molded process was in operation prior to the eighteenth century. However, it did not come into heavy use until the 1730s in England when it was mainly used for the manufacture of dark green/olive wine bottle production. Jones (1985:26) reveals that glass houses in France were using this technique prior to the 1730s. It is also noted that since the shoulders and neck portions of dip-molded bottles were essentially free form and variation of these features is often the only distinction between particular types (Harris 2000:236). The sand pontil technique, which uses a shaped glob of glass on the end of pontil then dipped in sand prior to attachment onto the bottom, was commonly used in *flacon* production. The pontil technique results in, “a thin line of glass that encircles the push up”, which is also known as a sand scar (Jones 2000: 94). During the production of *flacons*, this technique was “applied in a manner that left the least amount of glass on the base” (Harris 2000:240).

By comparison the dimensions and projected shape of the bottles from the *QAR* site match both Harris’ (2000:240-241) larger Type I *flacon* and two examples from the French settlement of the Trudeau collection as described below:

“These bottles belong to a general class known as ‘case’ bottles in references to the fact that they were usually shipped in cases of twelve. They are also sometimes referred to, incorrectly, as ‘Dutch gin’ bottles. Although they most probably did contain distilled liquor, it need not have been gin nor the origins have been Holland.” (Brain et al. 1979:90)

With regard to *flacons*, Noel Hume (1969:62) states that “the large numbers found on French colonial sites strongly point to France as their origin.” Brown (1971:101) also points to additional circumstantial evidence of their origin in that the liquid capacity or volume of these bottles is equivalent to one French *pinte*. Their unique blue-green glass color results from a mixture of sand, calcium and an alkali flux along with the lack of a decolorizing agent. Bottles of this “common green” glass or *verre vert* were produced in small glasshouses, *petites verreries*, in France during the eighteenth century. This notable bluish tint from *flacon* pieces found at the *QAR* wreck site strongly indicates production in wood-fired furnaces from the forested areas of Gresigne in Languedoc, a province in southern France (Barrelet 1953:103). Well-established during the sixteenth and seventeenth centuries, the *petites verreries* (or small glasshouses) were able to stay in operation through the eighteenth century (when demand for heavy dark green/olive wine bottles was increasing) by

continuing to provide their traditional blue-green bottles, as well as a wide variety of useful, common glass pieces (Harris 2000:233-234).

Probate inventories from Louisbourg indicate that the most common size wooden case, or *canvettes*, held twelve *flacons* (Harris 2000:241). The number of empty vessels listed in these records and other estate listings infer their chattel value (Busch 2000:175). The Louisbourg inventories record *flacons*, which were not empty, as most often containing oil (*huile*), perhaps, reflecting their original use. An examination of bottle contents and legible labels recovered during Louisbourg excavations, indicate that other than oil, *flacons* held a variety of liquids representing laboratory, apothecary, and household products, as well as toilet water, perfumes, and occasionally, spirits (Harris 2000:241). The Louisbourg collection also reveals the consumer value of blue-green bottles since historical records show a great variety and quantity were held by the middle and upper class members of colonial society and little or none by commoners. By contrast, during this same period, everyone in France commonly used blue-green bottles for a wide variety of purposes and products contained within. Harris suggests that the cost of transatlantic shipment of these containers and their contents must have put them out of reach for the New World colonial lower class (2000: 256-257).

Similar to many of the square *flacons* from the Louisbourg archaeological collection, two of the bottlenecks from the *QAR* site retained intact, plain cork closures, or *bouchons de bouteilles* (Harris 2000:241). Stoppers made from cork bark were not used widely until the eighteenth century and were primarily developed for the wine bottles, which required aging. The breakthrough came prior to 1686 with the introduction of the corkscrew, which permitted the use of tightly fitting corks (Frank 1982:136). Beginning in the early seventeenth century, Spain provided the best cork for use as bottle stoppers (Davis 1972:17).

Squat Wine Bottle Group

Three whole “squat” wine bottles and 56 base and body shards, collectively representing at least one more vessel, have been recovered from the *QAR* site at the time of analysis. All of these specimens represent hand-blown, dark green/olive glass bottles, English in origin and dating to the first quarter of the eighteenth century. The two intact bottles were recovered in close proximity at the stern end of the shipwreck, surrounded by 6-pound cannon. Of the other wine bottle glass fragments 85 percent also came from the stern zone area. The mid-ship zone contained the remainder of wine bottle glass shards, with the exception of a single piece recovered from the aft area. No wine bottle glass was found in the forward or bow sections of the site. Within this group, intact bottles and bottle base fragments were usually recovered as single units while smaller shards came from within concretions and were mostly less than .5 in. (1.27 cm) in size.



Figure 4. Wine bottles (QAR 334.001 / 335.001 / 557.000)

Description (Average)

Overall height: 5.75 in. (14.6 cm) and 5.5 in. (14 cm)
 Overall shape: “Queen Anne’s” style
 Estimated capacity: 500 ml
 Lip characteristics: applied lip [.84 in. (2.13 cm) thick] with “v” shaped string rim
 Mouth diameter: .98 in. (2.4 cm)
 Bore diameter: .7 in. (1.8 cm)
 Rim thickness: .22 in. (.6 cm)
 Neck characteristics: tapered
 Neck height: 1.75 in. (4.5 cm)
 Shoulder characteristics: sloped down and rounded
 Shoulder width: 2.18 (5.54 cm)
 Body characteristics: globular form; tapered up profile
 Maximum body width: 6.0 in. (15.24 cm)
 Basal characteristics: Circular; domed kick; sand pontil mark/scar
 Basal diameter (resting point): 4.85 in. (12.34 cm)
 Height of kick: 1.25 in. (3.18 cm)
 Glass Color: Dark olive green (5Y 6/6 Munsell)

Discussion

The term ‘wine bottle’ is commonly used to describe a variety of bottle shapes that originally held that particular beverage. Some of the earliest wine bottles found at houses and tavern locations in colonial Williamsburg, Virginia were four-sided containers with threaded pewter caps. Sometime around 1650 the more common type became stronger, less molded, and more or less cylindrical in shape (Noel Hume 1970:33-34). Collectively known as squat wine bottles, they were made in England from about 1600 to 1730 and distinguished from the similarly shaped but comparatively longer-necked, Dutch version. Another characteristic difference was the apparent English preference for an applied, laid-on rim, rather than the Dutch “flat wrap-around wafer-shaped rims” (Munsey 1970:58). English ‘wine’ bottles also had a pronounced kick-up on the base, which commonly exhibited sand pontil marks (Jones 2000:156). Glass for wine bottles, in general, was dark olive green,

commonly known as “black glass”. This dark glass was specifically selected and manufactured because bottlers believed that restricting sunlight would offer greater protection for the delicately aged contents. While these bottles were most commonly used to store wine, “rum was, no doubt, most popular” and often stored in these bottles (Munsey 1970:60).

Given their great value during the seventeenth and eighteenth centuries, these bottles would have seen a high level of re-usage or recycling, as the owner saw fit. At colonial Williamsburg ‘wine’ bottles were also found containing beer, ale, brandy, spirits, whale oil, paint, fruit, and in one instance, lead shot (Noel Hume 1970:32-32). On French colonial settlements such as Mobile (Alabama), Waselkov points out that:

“Brandy (*eau de vie*) and wine, shipped in *barrisques* (of 60 gallons) and *tonneaux* casks (of 239 gallons), were considered essential provisions for troops and colonists alike. In an era when drinking water from shallow wells posed a serious health risk, mixing water with brandy or wine (or vinegar) purified the former while prolonging enjoyment of the latter” (Waselkov 1999:28).

English wine bottles, which were mouth-blown without the use of a mold prior to the second quarter of the eighteenth century, exhibited characteristic changes in shape. In the mid-seventeenth century, longer necks characterized bottles. After a few decades necks were shortened and the vessel bodies became more angular. Another major shift in shape occurred around 1700, when wine bottles exhibited a “body sagging down on itself and the base spreading, a profile ungallantly known...as the *Queen Anne* shape” (Noel Hume 1970:33). This general style of bottle was prevalent until the mid-1730s when dip-molds were introduced to create wine bottles that were straight-sided and angled inward to thus enhance packing and storage (Jones 1985:26). By the second half of the eighteenth century wine bottles were predominantly cylindrical. A chronological typology chart of bottle shapes for English wine bottles based on the extensive Williamsburg archaeological collection places the overall shape of the three whole bottles recovered from *QAR* in a manufacturing date period of 1708 to 1714 as represented by *QAR557.000* (Noel Hume 1969:68)

Case Gin Bottle Group

A single square bottle base and two small shards recovered from *QAR* fell into the type generally known as “case gin” bottles. This artifact group was differentiated from the *flacon* group due to the olive green color and distinctive blowpipe pontil scar exhibited on the base, which reflects a different manufacturing technique. The partial bottom of this bottle was found in the central portion of the site while the two small shards came out of separate concretions recovered in the stern. With such a small representation little else can be said about the distribution and archaeological association of the case gin bottle collection, other than noting the singular presence among the shipwreck artifacts.

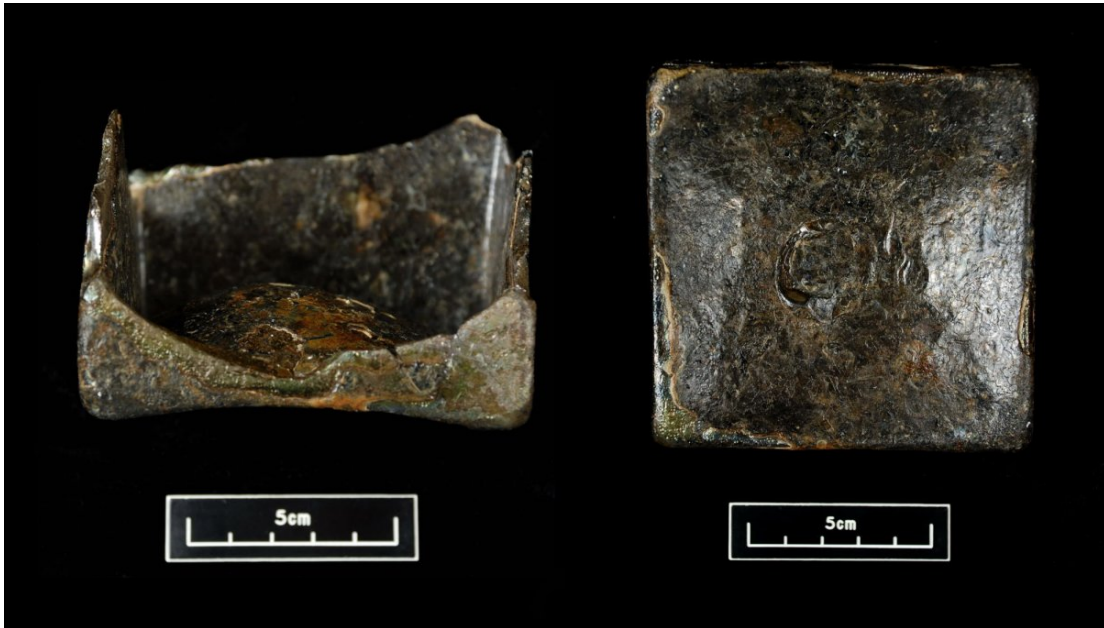


Figure 5. Case gin bottle (Side profile view and bottom view QAR 406.000)

Description

Overall shape: square base with parallel sides

Base characteristics: square with pronounced kick and rough blowpipe pontil mark scar.

Base shape: square with rounded corners; corners serve as a four-point resting surface; slightly arched heel.

Base width: 3.85 in. (9.6 cm)

Base thickness: .12 in. (.31 cm) to .28 in. (.71 cm)

Kick height: .25 in. (64 cm)

Pontil diameter: 1.0 in. (2.54 cm)

Glass color: Olive green, 7.5YG 8/4 Munsell

Glass thickness (base): .16 in. (.4 cm) – .18 in. (0.46 cm)

Discussion

Gin was discovered by accident in the mid-seventeenth century by Professor Francisco de la Boe, a Dutch scientist, who was experimenting with natural solutions in an attempt to develop a diuretic to promote kidney function. It was first dispensed as a medicine but quickly became so popular that individual apothecaries began distilling it full time. Distilled from malt, barley, or rye and flavored with juniper berries, coriander, or angelica root, gin was inexpensive to make and required no aging. Because of its relatively low cost it became a favorite of English soldiers, who soon took it home to England where its popularity rose quickly and soon was accepted by all social classes including the nobility (Munsey 1970:84-85). By the close of the nineteenth century, gin had become the single most popular beverage in all of Europe, with the Dutch producing over 14 millions gallons annually (Munsey 1970:84). The name gin is apparently derived from the Dutch alterations *geneva* or *genever* of

the French word *genievre*, meaning juniper. The English shortened the word to gin, which was promoted by kings, nobility and mariners throughout the eighteenth century as the medicinal beverage of choice. In his novels of nineteenth-century England, novelist Charles Dickens describes frequent consumption of gin among the poorer classes, particularly children, living in squalid urban areas where healthy drinking water was a scarcity.

Square case bottles were traditionally used by druggists at the time of gin's rise in popularity and therefore, this shape became linked to this alcoholic beverage, a tradition that survives today. Case bottles, which come in a variety of sizes and volumes but with their classic square shape, saw little change throughout the seventeenth and eighteenth centuries. One modification was a move from the earlier straight-sided version towards a more tapered-sided shape (Munsey 1970:84-86). Distinctions between English and Dutch manufactured case gin bottles are difficult to determine. Without the need for aging, glass seals on gin bottles are not dated, thus hampering the development of a more refined chronology of styles. Glass colors for case gin bottles range from light green to very dark green or black, but most often used is the olive-amber spectrum. Ring-shaped marks, created by the residue of glass left by the blowpipe doubling as a pontil, were common on blown case bottles (Jones 1985:158).

One very early example recovered from Denbigh plantation on the James River is referred to as an early 'wine' bottle. It is described by Ivor Noel-Hume (1969:69) as, "...a square-bodied bottle with the remains of a threaded pewter collar and cap attached to the lip, a type common in Virginia in the second quarter of the seventeenth century." In North Carolina, case gin bottles have been recovered from numerous archaeological excavations at several colonial period port towns and contexts including Brunswick Town (1720s-1780s) and Russellborough ruins; beneath Edenton's 1769 courthouse (midden dates 1722-1769), various house sites and a jail privy in Halifax, the Palmer-Marsh House yard feature (ca. 1744-1751) in Bath, and Tryon's Palace in New Bern (ca. 1770s) (Carnes-McNaughton, personal communication 2005). Outside of colonial North Carolina, other whole examples of case gin bottles have been found during archaeological work at the Guebert Site, in Illinois (ca. 1760s) (Good 1972:180-182); the Willtown Site in South Carolina (ca. 1720s-1770s) (Zierden et al. 1999); the site of French immigrant, John de la Howe also in South Carolina (ca. 1760s-1810s) (Steen 1993:50-51); and the Overhill Cherokee site (in Tennessee) of Tomotley, ca. 1750s (Carnes 1983:196-197), to name a few.

Flask

Three bottle glass shards were recovered from a single vessel and removed from a concretion found in the aft zone of the shipwreck. These thin [.052 in. (.13 cm) - .06 in. (.15 cm)], green (5Y 5/6 Munsell) glass shards are from the shoulder of a flask and retain the body mold seam.



Figure 6. QAR 230.002

The fragments of this unique vessel are intriguing for two reasons; first, the remnant mold seam suggests this bottle was blown in a mold and could therefore date from the 1700s to late 1800s, and second, these fragments represent a single, unique form typically associated with personal or private consumption, i.e. kept in a pocket. Personalized spirits bottles appear in the first quarter of the seventeenth century but are undecorated, flattened forms with extended necks, sometimes referred to as “pumpkin seed” flasks, suitable for carrying in one’s pocket or sack (as seen in examples on the Museum of London on-line catalog, dating from the early 1600s to 1800s (http://www.museumoflondon.org.uk/ceramics/pages/subcategory.asp?subcat_id=951&subcat_name=Miscellaneous+small+bottles+or+flasks)). Blown in the mold flasks, also known as historical and pictorial flasks became popular in America by the early 1800s, being produced in glass houses of colonial settlements. Munsey (1970:87) points out that these unique beverage containers began to reflect decorative expressions of nationalistic traditions (embossed with busts of politicians, eagles, or kings) and whimsical forms (such as violins, scrolls, or sunburst patterns). The peak of production for these flasks was generally the mid-nineteenth century, though documentation reveals earlier and later production and forms.

Morphologically, these bottles held about a pint or half-pint in volume, were flattened on the sides, sometimes featured a footed base, and had a sheared rim or lip, suitable for a cork closure. Given their broad period of production and the lack of more diagnostic attributes associated with these three fragments of a single bottle, there remains uncertainty as to the exact period of

manufacture for this item and its source. Its association with the passengers of the shipwreck remains uncertain since some intrusive artifacts from the nineteenth and twentieth centuries have been found.

Minor Bottle Glass Group

A small number of bottle fragments do not conform to the major groups identified for 31CR314. Minor types are distinct in color and therefore represent additional bottles. Those fragments representing Minor Type A and Type B may or may not be contemporaneous with the majority of the eighteenth century bottle collection. Two clearly intrusive bottles have been recovered. The neck of one was a liquor bottle from the mid to late nineteenth century, and the other was an embossed “Anheuser Busch” beer bottle shard, dating to the nineteenth and twentieth century (Wilde-Ramsing and Welsh 2007). Two shards were simply too small to be classified and were deemed indeterminate.

Minor Type ‘A’

Within this unidentified minor type are two flat green shards exhibiting the same color (5 GY 6/4 Munsell) and slightly different thickness ranging from .05 in. (.13 cm) to .19 in. (.48cm). Both fragments came from the stern zone and were taken out of their respective concretions.

Minor Type ‘B’

Four small shards were recovered out of a single concretion from the stern zone. They are extremely thin .02 in. (0.05cm) and have a yellow hue (5Y 8/2).

Glass Stemware Group

Two fragments of stemware were recovered during the 2005 and 2006 fieldwork. At the time of this analysis, QAR906.000 (found in 2006) was still locked in a concretion and only visible through x-radiography images. Both stemware fragments appear to be made of leaded glass and manufactured by a combination of blown and molded. Each glass consists of three parts, the bowl, the stem and the foot, of which the stem is the most diagnostic element for dating purposes.

Specimen QAR638.000, discovered in May 2005, was found encrusted with a small concretion, but the visible portion revealed it to be a molded stem variety, as opposed to a baluster type (Figure 7). This small wine glass consisted of a conical bowl attached to a four-sided stem, which was embellished with tiny molded crowns and diamonds at the upper joint. The stem tapers down to the simple flattened foot. Attributed to the period of George I of Hanover, this style of early drinking glass can be dated to ca. 1714. A few examples of this unique type are also embossed with the coronation slogan “GOD SAVE KING GEORGE” positioned on the stem. A tear or bubble is also

visible in the upper portion of the molded stem section. The four-sided stem of this style evolved into a six-sided variety during the 1760s, and is often referred to as a “Silesian stem” from its association with the Hanoverian empire (Bickerton 1971:29).



Figure 7. QAR638.000 molded stemware

The second stemware fragment, QAR906.00, is locked in concretion and seen through radiography (Figure 8). It appears to be a true baluster type with an integral stem and bowl referred to as a funnel or conical shape. The baluster type of stemware is one in which the stem is drawn in one piece from the bowl while in molten glass, and then formed. The stem also exhibits a pronounced rounded protuberance or “knop” located just below the bowl/stem joint. The stem further tapers slightly towards the footed pedestal, which is missing. This small wine glass, sometimes called a toastmaster’s glass based on its size and function, dates to the early 1700s, as seen in examples from the Museum of London Glass on-line collection (see examples 34.139/217, ca. 1700, and 34.139/379, 1701-1710). Further analysis and dating will wait until the artifact is removed from concretion and subject to closer inspection.

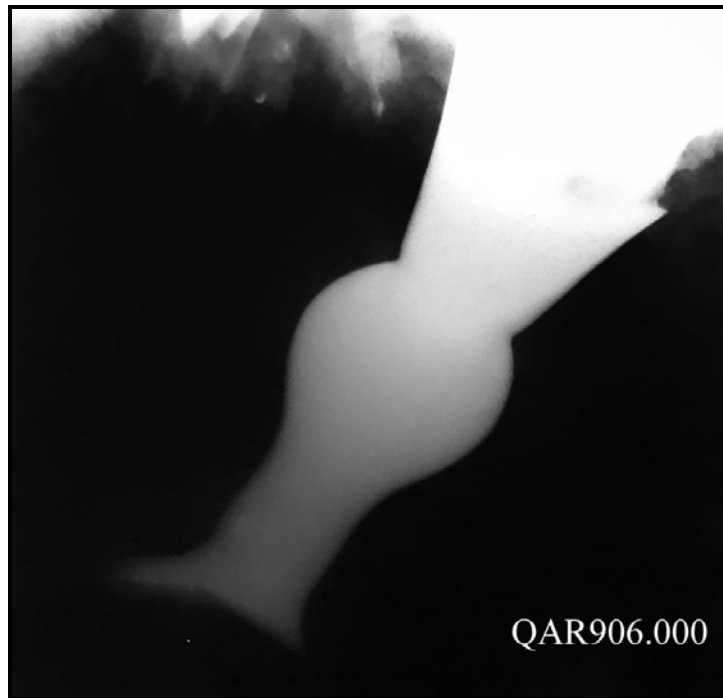


Figure 8. Radiographic image of QAR 906.000

Both leaded glass stemware artifacts were likely made in the glasshouses of England, and represent items from the galleyware category, which are associated with the distribution of liquids for consumption. Their presence among the artifacts found at this shipwreck site testify to a period of political change of power, access to delicate and expensive products, as well as a certain refinement or civility of drinking alcoholic beverages from such containers. Whether these items originally belonged to the gentlemen pirates or the French surgeons held on-board, we may only assume they enjoyed their spirits equally.

Summary

The storage and serving of liquids onboard ships at sea, was often accomplished by use of leather, wooden, ceramic, and glass containers. Artifacts made of glass recovered from the *Queen Anne's Revenge* shipwreck site, reveal a limited array of bottle types and some tableware. As a testament to their durability, three whole squat bottles survived transport by sea, life onboard the ship, the wrecking of the vessel, and subsequent years of storms and scouring by nature's forces. These bottles may have been used to serve and store wine or some other liquid and as such, most likely served as part of a mariner's mess, or may have been on board as cargo. Their presence provides further clues as to when the consumers were using these containers for wine, spirits or

mineral water, as these bottles date to the first decade of the eighteenth century based on their style/shape. Made in England, they were used by merchants as commercial containers to sell various liquids, and by private consumers to store, decant, and serve individual portions of their beverage of choice (Sullivan 1986:59). Larger quantities of beverage and other liquids were often carried onboard ships in wooden containers such as casks, kegs, or barrels in varying volumes. The dark color of these special wine bottles was thought to protect the sensitive contents from the harmful effects of sunlight.

The presence of the blue-green, specialized *flacons* found on this wreck site also offers intriguing insight into the consumer patterns and preferences of the passengers during the early 1700s period. Identified as French in origin, these bottles may have served as containers for a wide variety of liquid substances, from oils, to toilet waters, to beverages for drinking. The popular consumption of wine, brandy, gin and other spirits could have been canted into these bottles, as recycling was also a common occurrence when other containers of pottery, leather or wood were not available. The practice of consuming alcoholic beverages took on many ramifications, whether it was under the guise of medicinal or health reasons, for religious purposes (as in communion rituals), for pure enjoyment, taste and entertainment, or simply for thirst when other liquids were scarce. Human behavior may never be truly determined from this assemblage, but the inferences are reasonable to consider.

The same considerations given consumer behavior for English wine bottles and French manufactured *flacons* should be applied to the English or Dutch case gin bottles. Because of their packing characteristics, sea merchants most likely preferred these square, flat-bottomed containers as more durable items of cargo, as opposed to the rounded, more awkwardly-shaped squatty wine bottles.

It has been noted that reuse was common for eighteenth-century bottle use, mostly for an assortment of liquid contents. The following account of Blackbeard's final battle by Marine Lieutenant Maynard provides a further possibility for case bottles, particularly the pint size *flacons* carried aboard his flagship:

“When the lieutenant's sloop boarded the other, Captain Teach's men threw in several new-fashioned sort of grenadoes, *viz.*, case bottles filled with powder and small shot, slugs, and pieces of lead or iron, with a quick match at the end of it, which, being lighted outside, presently runs into the bottle to the powder. As it is instantly thrown on board, it generally does great execution, besides putting all the crew into a confusion...” (Johnson 1725: 56)

The personalized size of the single flask also suggests the presence of someone of status who may have owned such a specialized container to keep his or her own “stash” of the good stuff on the

person (in a pocket or hank). More of this vessel is needed to provide an accurate date of manufacture and use.

Aside from the three whole bottles, this preliminary analysis found that most of the glass fragments were relatively small in size. There are a variety of plausible explanations for this including impacts from the energetic environment of the wreck site, sampling bias, conservation treatment and perhaps their secondary use as ingredients in explosives. On a whole, glass artifacts were largely found in the southern or stern portion of the wreck with some concentration in the mid-ship region of the ruins. This likely represents an activity focus associated with consumption or storage of liquors, or perhaps as related to munitions. Glass by its very nature is fragile and mostly lightweight when shattered, so post-depositional migration of some shards would not be unexpected and their provenience within the debris field is cautiously presented. Underwater currents can easily displace these lighter-weight fragments and cause them to move across the site until blocked by cannon or other large obstacles where they may become attached and held in place during the encrustation processes. It does appear, however, that glass artifacts by and large are absent from the forward section of the ship despite prevailing seabed currents in that direction (McNinch 2001: 22).

This preliminary examination of glassware from the *QAR* site provides insight into the nature of these artifacts. As a collection, glass containers and fragments within the *QAR* artifact assemblage holds high promise for continued research related to manufacture, consumption, illicit trade and perhaps military practices aboard an early eighteenth-century sailing ship.

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