

New Insights from the Bottles Excavated at the Fort Riley Hospital Privy



by

The Bottle Research Group

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New Insights from the Bottles Excavated at the Fort Riley Hospital Privy

Bill Lockhart, Beau Schriever, Carol Serr, and Bill Lindsey

On July 11-12, 2011, Bill Lockhart and Bill Lindsey – members of the Bottle Research Group (BRG) – assisted by Wanda Wakkinen and Kathy Lindsey, examined bottles excavated from the hospital privy at Fort Riley, Kansas. The privy excavations had been conducted by Kansas State University (KSU) during the period between 1984 and 1986. The BRG recorded aspects of some of the bottles and photographed specific examples. The group had earlier examined some of the Fort Riley hospital bottles that were stored at Fort Larned – on July 9, 2011.

The BRG was founded to study historic bottles, their manufacturers, and their users. In that capacity, we have examined archaeological collections at various locations, especially military posts. We have recorded collections at Fort Laramie, Wyoming, Fort Bowie, Arizona, Fort Bliss, Texas, Fort Stanton, New Mexico, and now Fort Riley, Kansas. In addition, we analyzed the report from Fort Selden, New Mexico, and recorded bottles from the Tucson Urban Renewal collection (Tucson, Arizona) and San Elizario, Texas.¹

Lockhart (2011) used the latest available information on manufacturer's marks and production techniques for export beer bottles to date ten discreet dump sites at Fort Stanton, New Mexico, and presented a paper on the study at the Society for Historic Archaeology conference in 2008 (Lockhart 2008). The main focus of the study was to test the efficacy of dating via manufacturer's logos versus dating using production techniques. The two methods placed the ten sites into the same reliable order. However, the research had an unanticipated side effect.

Although it *sounds* tautological, dating the sites using production techniques along with accurate and reliable manufacturing mark data provided a scale that the BRG has since been able to use to identify and date marks that were previously unidentified and/or undated. As a notable example, some of the key issues that resulted in the identification of the Massillon Glass Works (Reed & Co.) as the user of the "MGW" logo and dating the use of the mark (Lockhart et al. 2011) derived from the Fort Stanton study. With this current project, using data from the Fort

¹ See Ayers et al. (1980); Herskowitz (1978); Lockhart & Olszewski (1994); Wilson & Caperton (1994); Wilson (1981).

Riley hospital privy excavation, we have applied the same principles – including the latest in dating knowledge – to date the excavation levels. This, in turn, has provided data that allowed us to distinguish additional previously unidentified basemarks and dates on bottles in this assemblage.

Background

Fort Riley

A party of dragoons established Camp Center on the Kansas River in the fall of 1852, naming the camp in the erroneous belief that the location was the center of the United States. The name was changed to Fort Riley on June 27 of the following year. The fort was established to protect travelers along the Oregon-California and Santa Fe trails. In 1855, cholera almost wiped out the post, although Major W.R. Montgomery extended the boundaries of the fort during the year (My Base Guide 2011).

During the pre-Civil War hostilities, the fort acted as a “police” force, but the Army withdrew the regular troops when war was actually declared (My Base Guide 2011). The post was then garrisoned by Kansas militia units. The fort went on to become the U.S. Army Cavalry School and is still active in 2012.

Construction of the permanent facilities at Fort Riley, Kansas, began during the summer of 1855. The building of the two-story hospital structure had certainly started at that time, and it is likely that the stone-vaulted privy was also erected to serve the hospital during that period. The hospital was remodeled during 1872 and 1873 and continued to be used in that capacity until the late 1880s. The building was then used for administration and later became the Cavalry Museum (O’Brien n.d.).

The privy appeared on an 1867 map but was no longer shown on a map made in 1887. The privy was thus sealed at some point between those dates. The 1887 map showed sewer lines, suggesting that the new hospital had indoor plumbing by that time, and the older building may have also been converted (O’Brien n.d.). A lavatory and bath *may* have been installed in the hospital as early as the 1872/1873 renovation and was certainly in place by 1880. This resulted in either the elimination or certainly a reduction in the use of the privy (O’Brien et al. n.d.:3)

On May 1, 1974, the Main Post area of Fort Riley was declared a historic site and entered on the National Register of Historic Places. To facilitate greater understanding of the main cantonment area, Fort Riley determined that the hospital privy would be a good site for archaeological investigation. The post selected Dr. Patricia J. O'Brien, a faculty member of the Department of Sociology, Anthropology and Social Work at Kansas State University, to supervise the excavations conducted by her students.

The privy excavation began on September 8, 1984, and continued until November 3 of that year. The excavators dug in levels of 12 inches, using careful measurements beginning at 60 inches or 5 feet below the surface. The privy vault was divided into four quadrants (NE, NW, SW, SE), with a central pillar left as a control and excavated later. Approximately 4 feet below the surface, the excavators discovered "three clay plugs" that sealed the vault. O'Brien (n.d.) noted that they "found a bottle fragment with a date of 1878 on it [at the 4-foot level]. . . . This suggests the vault was not capped before that date." The "1878" date was on a colorless prescription bottle embossed "BAILEY & BOWERS / EST'D / 1878 / ...CE DRUG STORE" found at the 72-84 inch level.

O'Brien (n.d.) described the subsequent stratigraphy:

Beginning at about five feet we encountered ash in first the NE and then the NW quads. The ash spread into the SW quad at just above seven feet while brownish soft soil was still found in the SE quad. At nine feet ash covered the whole vault floor. At about ten feet the ash layer gave way to a highly calcareous layer with rubbish. That layer continued to about 13 feet 6 inches where stratified sediments were found. Below them, c. 14 feet, we found sand, and at 15 feet the sand had evidence of shovel marks. The shovel marks indicated the privy vault was cleaned out at least once.

The ash fill "was loaded with bottles, wood, brick and numerous other artifacts—it was as if the lid of the toilet seat had been opened and the ash and contents poured in the NE corner." O'Brien (n.d.) further noted that the excavators believed that "the ash layer belongs to the 1872-73 remodeling of the hospital done by Surgeon Irwin and we suspect the ash came from the double fireplace that was removed." See O'Brien (n.d.) for a general description of other artifacts discovered at the privy.

Bottle Dating

Since its publication, *Bottle Makers and Their Marks*, by Julian Harrison Toulouse (1971), has been the standard used by archaeologists for dating bottles with manufacturer's marks. While Toulouse did an excellent job using methods available at the time, researchers have increasingly questioned his results – and those of other early bottle authors – during the last two decades (see especially Lockhart 2004). Recently, studies conducted by the BRG, other archaeologists (e.g., a massive project on Illinois bottles by Farnsworth & Walthall [2011]), and bottle collectors have dramatically increased our knowledge of the identification of manufacturer's marks, dating of marks and codes, dating and identifying manufacturing techniques, and other aspects of bottle production. Online resources (e.g., Google and other search engines, eBay and other online auctions, etc.) and websites (e.g. Lindsey 2012; von Mechow 2012; Whitten 2012) have provided invaluable tools to tighten bottle dating for archaeologists.

In addition, the BRG and its individual members regularly publish articles on manufacturer's marks and manufacturing techniques in collectors' magazines, local/regional journals, and online venues. We also have a vast set of computer files addressing manufacturer's marks, various types of bottles, bottle and jar attributes, and other bottle-related characteristics. These were accumulated from our research in archives; glass industry journals; interviews and interactions with personnel in the bottle industry and bottle collectors; and data from our own fieldwork. We have drawn on these resources in the analysis of the Fort Riley hospital privy bottles.

Methods

Armed with our own observations of the excavated bottles, photos, and the glass artifact spreadsheet from the KSU analysis of the excavation, we assessed the finer aspects for dating the bottles and the levels of the excavation. We needed to test the hypothesis that the ash layer was created during the 1872-1873 period and needed some approximate dates for the levels of excavation.

From the surface, the privy had been excavated in 12" levels (recorded in inches from top to bottom – e.g., 60-72"). Our first step was to convert the excavation levels to numbers. The

spreadsheet disclosed eight levels excavated below the five foot mark (60"). Because none of the bottles listed on the spreadsheet were found above the five foot mark, we have combined all levels above 72" into a single category. We numbered these Levels 1-8 for convenience and to create a quantitative tool (Table 1).

Table 1– Conversion of Levels to Simplified Codes and Approximate Dates

Depth (inches)	Code	Approx. Dates
0-72	1	post-1890
72-84	2	1885-1890s
84-96	3	1880-1887
96-108	4	1875-1884
108-120	5	1870-1878
120-132	6	1865-1875
132-144	7	1860-1868
144-156	8	pre-1860

Next, we compiled all of the manufacturer's marks (and other initials), the type of bottle upon which each logo appeared, and the levels for each example. When an example was reported in a larger context – e.g. 96-108" (Level 4) and 108-120" (Level 5) – we used the average (Level 4.5). We then compiled an average level for bottles or bases with each mark.

As an example, the spreadsheet included 13 examples of the C&I logo on export beer bottles found at various levels:

3, 3, 4, 4, 4, 4, 4, 4, 4, 4.5, 5, 5, 5, for an average of Level 4.1.

With each mark, we also looked up the date range for its use *on that type of bottle*. These ranges came from published data whenever the best dates had been published and from our research files when we had better information. To continue the C&I logo example, the firm of Cunningham & Ihmsen was in business between 1866 and 1878. The dates have been carefully

researched by Lockhart et al. (2005a; 2005b) and Hawkins (2009:144). Since all of these marks (in the Fort Riley collection) are on export beer bottles, the earliest possible date of manufacture was 1873, the year in which bottles of this shape were invented. Although we used that date, it is unlikely that these bottles were made during the first year. Therefore, we assigned a range of 1873-1878 for export beer bottles with the C&I logo.

Using carefully researched date ranges (e.g., those for C&I, LGCo, MGCo, and DSGCo logos), we devised approximate date ranges for each level (Table 1). Although this *sounds* tautological, we then used the date ranges for the levels to compare and/or confirm less thoroughly researched marks. Read more in the Discussion and Conclusions section.

Results

Results are shown in Tables 2 and 3. To be included in Table 2, at least two bottles and/or bases of the same type and with the same logo had to be present in the assemblage. The greater the number in the sample, of course, the more likely we would expect accuracy between the expected result (published dates for the mark) and the realized result (dates for the levels). As can be seen in Table 2, the approximate dates for the use of marks as shown in current research very closely match the date ranges assigned to the various levels. Of notable interest, the table sets a date range for medicinal/chemical bottles with an embossed “C” on their bases and the “U.S.A. Hosp. Dept.” bottles embossed on their bases with the “SDS” initials. See the Discussion and Conclusions sections for more on both marks. The table also shows a distinct difference in placement/dates for two variations of bottles embossed “MGCo.” Again, see the Discussion and Conclusion sections.

Table 3 is similar to Table 2, except that it includes marks where only a single bottle/logo was found. Because one bottle is an incredibly small sample, we would expect a less accurate match between the expected and actual results. However, as in Table 2, the matches were again close.

Table 2 – Manufacturer’s Marks, Dates, and Average Levels*

Mark (container type) [number]	Approx. Dates	Avg. Level	Level Dates
ACBCo (sauce) [2]	ca. 1860-late 1870s	5	1870-1878
A&DHC (beer) [5]	1873-1889	4.6	1870-1880
C (med) [4]**	unkn.	3.7	1878-1887
C&I (beer) [13]**	1873-1878	4.1	1875-1884
C&W [2]	unkn.	3	1880-1887
DSGCo (beer) [5]**	ca. 1878-ca. 1884	3.3	1878-1885
GW (flask) [5]**	ca. 1874-1882	3.5	1878-1885
GW (chem) [5]**	ca. 1874-1882	2.8	1882-1890
IGCo (beer) [2]	ca. 1880-ca. 1915	4.3	1873-1881
IGCo (chem) [9]**	ca. 1880-ca. 1915	3.1	1879-1886
LGCo (beer) [9]**	1874-1892	4.5	1870-1880
LGCo (flask) [2]	1874-1892	4.5	1870-1880
W M°C & Co (flask) [2]	mid-1860s-late 1870s	4.5	1875-1884
W. M°CULLY & Co. PITTSBURGH PA (whiskey) [3]	ca. 1858-1860s	5.8	1865-1880
A / MGCo / (beer) [2]	ca. 1878-1884	3	1880-1887
MGCo / (beer) [6]**	ca. 1878-1884	4	1875-1884
MGCo (chem or food) [3]	ca. 1878-1884	5.3	1870-1878
O (chem) [2]	unkn	5	1870-1878
SDS (U.S. Hosp.) [4]	unkn.	5	1870-1878
T (flask) [2]†	ca. 1880s-ca.1914	2	1885-1890s
Single-letter-number beers [25]††	Hypothesis 1874-1878	4.1	1874-1883

* Two or more examples of each mark

** Five or more examples

† Dates are for the Tibby Brothers – probable users of the mark.

†† There were 26 export beer bottles or bases with a single letter or number (in one case IX or XI) embossed on the bases.

Table 3 – Bottle Marks with only One Entry

Mark (container type)	Approx. Dates	Avg. Level	Level Dates
A&DHC (flask)	ca. 1852-1889	3	1880-1887
A&DHC (soda)	ca. 1852-1889	4	1875-1884
ARBOGAST & CO. PITTSBURGH PA (Whiskey)	1861-1863	6.5	1860-1875
C (flask)	unknown	unknown	unknown
CB / K / 1782	1857-1873	3	1880-1887
IGCo (med)	ca. 1880-ca. 1915	2	1887-1890s
IGCoL	1878-1896	3	1880-1887
LGCo (med)	unkn	4	1875-1884
L&W (flask)	1863-1873	6	1865-1875
MCS&S (ink)	unkn.	6	1865-1875
McC (flask)	mid-1870s-ca. 1896	3	1880-1887
W M ^c C & Co (flask)	Mid-1860s-late 1870s	4.5	1871-1881
W ^M M ^c C & Co (chem)	ca. 1859-early 1870s	4	1875-1884
RPCo (food)	unkn	2	1885-1890s
SGCo (Louisville)	1877-ca. 1879	3	1880-1887
SHEETS & DUFFY'S GLASS W[ORKS]/[P]HIL (whiskey)	ca. 1860s	7	1860-1868
T (chem/med)*	ca. 1880s-ca.1914	2	1885-1890s
Whitney Glass Works (flask)	ca. 1860s-1880s	6	1865-1875

* Dates are for the Tibby Brothers – probable users of the mark.

Discussion

As noted previously, the vault of the privy was divided into four quadrants (NE, NW, SW, and SE), with a central area left as a control (later also excavated).

The Ash Layer

Our dating of the stratigraphy allowed us to test some of O'Brien's conclusions. O'Brien (n.d.) suggested that the ash layer that began at the five foot level (Level 1 on our scale) was observed "first the NE and then the NW quads." This suggests that most or all of the NE and NW quads should have been covered by ash in Level 2. "The ash spread into the SW quad at just above seven feet [our Level 3] while brownish soft soil was still found in the SE quad." This should now include NE, NW, the central "control" area, and at least part of the SW quad, probably filling all of those by the top of Level 4. "At nine feet ash covered the whole vault floor. At about ten feet the ash layer gave way to a highly calcareous layer with rubbish."

As noted in the Background section, O'Brien (n.d.) explained that the ash layer "was loaded with bottles, wood, brick and numerous other artifacts—it was as if the lid of the toilet seat had been opened and the ash and contents poured in the NE corner." She stated that the researchers at that time

believe the ash layer belongs to the 1872-73 remodeling of the hospital done by Surgeon Irwin and we suspect the ash came from the double fireplace that was removed. In fact the ash layer was so loaded with materials it was as if Irwin walked into the hospital and told the orderlies to clear out everything in the rooms to be dismantled before the workman arrived.

To test this hypothesis, we controlled for the ash layer, anticipating that, if the artifact-laden ash had all been poured in at one time, there would be no significant stratigraphy – as to dating distribution – within the ash layer. However, the temporal distribution of artifacts in the ash layer was virtually identical with the overall distribution – with the older bottles at the bottom as would be expected in the typical privy deposition. For example, all six of the beer bottles (all whole) with bases embossed "MGCo" were found in Level 4. Three were in the ash layer, but the other three were not.

A second issue is the presence of bottles with logos that postdate 1873. The Lindell Glass Co. opened in 1874, yet nine bottles bearing the LGCo mark were found in Levels 4 and 5 of the ash layer. The bottles bearing the DSGCo logo of the De Steiger Glass Co. – opened in 1878 – were also in the layer. Finally, the export beer bottle was not invented until some point in 1873, yet a total of 38 export beer bottles – 69.1% of total number (55) found in the privy – were in the ash layer.

Logic also fails to support the single deposition of the ash layer. Logically, most people – military or civilian – clean or are forced to clean their fireplaces on some kind of regular basis. Unless the two fireplaces were gigantic, they would have been unlikely to accumulate a huge quantity of ash and trash. The bottles we examined also show no sign of fire damage. It seems more logical that ash and trash were poured into the privy at regular intervals. Again, logically, the ash/trash would have been poured repeatedly at the same spot – probably the hole closest to the door. It is possible that the ash was poured in during 1872/1873, and the trash was deposited at intervals into it. Alternatively, the ash may have been poured in from the fireplaces periodically in an attempt to alleviate some of the odor from the privy.

Shovel Marks

O'Brien (n.d.) stated that, "at 15 feet the sand had evidence of shovel marks. The shovel marks indicated the privy vault was cleaned out at least once." This is unlikely. At least one artifact, a whiskey bottle embossed "ARBOGAST & CO. PITTSBURGH PA" – found in Levels 6 or 7 (10-12 feet) – could only have been made during the 1861-1863 period (see Hawkins 2009:34-36). A base embossed "SHEETS & DUFFY'S GLASS W[ORKS]" – also of probable 1860s manufacture (McKearin and Wilson 1978:131-132) – and several other bottles were likely made during the early period of the privy's use. It is unlikely that the privy was cleaned during the first decade of use (ca. 1855-1865), and a later cleaning would probably have removed the early artifacts. The shovel marks more likely were made during the original excavation of the pit.

Bottles

The bottles in this study may be divided into four main categories: liquor flasks, medicinal/chemical bottles, other containers, and export beer bottles. Each of these categories included several marks or logos worth discussing, although some of our most interesting findings center around export beer bottles. However, a few generalizations are in order.²

Virtually any bottle may have been used *after* its typically dated (i.e., manufactured) period. Entire articles have been written about deposition lag (e.g., Adams and Gaw 1977; Hill 1982; Newman 1970) and are beyond the scope of this study, but a few specific types of deposition lag are relevant to this location. First, there is the possibility that many bottles, especially from the medicinal/chemical category, were stored at a military repository prior to being shipped to Fort Riley. Second, many medicines, foods, and some liquors may have been either stored at the fort for a period of time or used over an extended span. Third, returnable beer bottles may have made several or even many round trips *prior* to their arrival at the post. Finally, some of the bottles may have been reused for similar or entirely different purposes prior to deposition in the privy.

Although manufacturer's marks were the primary dating characteristics used in this study, we did note other production indications where appropriate. For example, the older style of finish (applied finish) consisted of a gob of glass that was applied to the end of the bottle and then tooled into shape. This was replaced by the "tooled" finish, where the finish was tooled directly onto the end of the bottle neck. In general, the switch took place on smaller bottles at an earlier date (as early as the 1870s in medicinal bottles) and much later in larger bottles (e.g., ca. 1896-1900 on export beer bottles). Lindsey (2012) discussed this manufacturing transition in greater detail.

² We have not included all examples found in the privy in this study – only those we photographed. We made no attempt to photograph most examples of the beer bottles embossed "LGCo" because the logo is ubiquitous on beer bottles found at most military sites west of the Mississippi. Some other logos were too ephemeral to show up in photographs, or the bottle was so patinated that the mark would not have been visible in the picture.

Although the KSU spreadsheet of the original excavation results contains numerous references to pontil marks, we examined the entire collection and found very few. Mostly, the use of pontil rods to hold the bottles while the finish was formed had been replaced by snap cases ca. 1860. The privy collection contained few, if any, pre-1860 bottles.

There are two main reasons for the misidentification. First, the study of bottles in most archaeological analyses is conducted by one of the lab staff (or a student) – usually someone with no previous experience with glass artifacts. This, of course, includes a learning curve – one that is *much* steeper than most people (including archaeologists) realize. Second – and related to the first reason – looking at printed or online sources and applying those to actual bottles simply does not work well.³ To understand bottles, one must learn from examining actual bottles.

Pontils are a case in point. To recognize pontils – especially the “improved” pontils that are often ephemeral or indistinct – requires experience with pontils, coaching by someone who already knows bottles, and/or a thorough understanding of glass manufacturing techniques. It is possible that the analyst or analysts mistook the post-bottom mold lines for outlines of a pontil scar. As we learn more about various artifact classes – and this is certainly the case with glass – archaeologists also need additional training to fully understand or even to correctly record the artifacts.

A special characteristic of export beer bottles was the shift in two-part finishes (for corks) from using sharp lower rings to rounded lower rings. Sharp lower rings were used between 1873 and ca. 1883. The use of rounded lower rings began ca. 1878 and became the norm by 1880. Although several other types of closures gained popularity, corks continued in use until at least 1914 (Lockhart 2007). Not surprisingly, given the early date of the privy, all but two export beer bottles in the collection had two-part finishes with sharp lower rings.

³ Choice of sources also plays a part. One of the early bottle researchers, Grace Kendrick (1963:28), for example, illustrated a bottle base with a dot or mamelon in the center that she claimed had an “improved pontil mark.” She was incorrect. The process that forms the dot (or mamelon) could *not* coexist with the improved pontil process. However, Farnsworth and Walthall (2011:11) have some of the most useful photos of later (i.e., post 1840) pontil scars in publication.

Flasks

Although they are technically bottles, the glass manufacturing industry always considered flasks as a separate category. Flasks were made in numerous shapes, but the defining characteristic was a shape that was long and narrow (generally oval) in cross-section. Although there were “druggists” flasks and liquor flasks, we only encountered the latter variety in the privy collection.

The flasks in the collection fell into three different categories by style. One of the oldest was the union oval. From the side view, the union oval had a gentle curve to its sides flaring upward to the shoulders that then became more rounded. From the side view, the flasks are oval with a flat base and have raised straps or bands along the edges. Although original catalogs noted the straps, flasks of this general shape – without the bands – are also classified today as “union ovals.” The base, too, was oval in shape, usually clearly showing the bands. Figures FR1 and FR2 show the flask styles in comparison. Union oval flasks were made as early as 1861 and continued in production until the very early 1920s (Lindsey 2012).



Figure FR1 – Flask Bases: A – union oval; B – shoo-fly; C – coffin



Figure FR2 – Flask Sides: A – union oval; B – shoo-fly; C – coffin

extended well into the 20th century (Lindsey 2012).

A second style prevalent in the collection was the shoo-fly flask. Viewed from the side, the flasks were narrower at the base than the union ovals, flaring out more by the shoulder before rounding to the neck. Although they were flat-based ovals from the side view, all of the edges were much more angular. The base of these flasks was shaped like an elongated hexagon, with all faces flat (see Figures FR1 & FR2). These were first made during the early 1870s, but production

The final style found in the privy was the coffin flask. These were similar to the shoo-fly in every aspect but were more rounded, especially on the two edges (Lindsey 2012). Coffin flasks shared the same general date range as the shoo-fly group, although the ones in the Fort Riley collection tended to be later than the shoo-flies (Figures FR1 & FR2).



Figure FR3 – Key base with unusual cross mark

Some of these flasks share another important manufacturing characteristic – key molds. Initially, molds were hinged at the bottom, creating a mold seam that extended directly across the base, usually diagonally. A variation found on some flasks in the collection had a “key” – a semi-circular protrusion on one side of the base that fit into a matching hollow on the other side to ensure that the mold halves fit together correctly (Figure FR3).



Figure FR5 – Strap-sided flask with cross on “key” base

C

The collection only contains a single example of a coffin flask with a “C” logo embossed on the base (Figure FR4). The letter had a serif at the top and an embellishment on the curve. Unfortunately, we could not find a provenience for this bottle. We have discussed the “C” logo in the Medicinal/Chemical Bottles section.



Figure FR4 – “C” logo on flask base

Cross

We noted and photographed two strap-sided (union oval) flasks, each with an applied, single-ring finish (Figure FR5). Each was embossed with an unusual cross that had two pointed ends, one squared end, and one rounded end (see Figure FR3). Bottles with this type of “key” base were typically made prior to the late 1870s (Lindsey 2012). One of the bottles was found in Level 5 (1870-1878), although we could not find the other in the spreadsheet. We have not recorded a cross of this type before.

GW



Figure FR6 – GW logo on “shoo-fly” flask base

The collection contains four shoo-fly flasks embossed “GW” on their bases (Figure FR6). Although the serif varied (see discussion in IGCOL, export beer bottle section below), each “G” was unusually round in shape (typically, the “G” in a logo was much more oval).

The flasks were colorless, and the complete ones had an unusual tooled finish that was essentially a short tapered collar (Figure FR7). The GW logo was almost certain used by the Great Western Glass Co., a factory known to have made flasks and prescription bottles. Great Western operated at St. Louis from 1874 to at least 1882. Although one flask was unprovenienced, the others had an average level of 3.5 – for an approximate date of 1878-1885 (also note GW entry under medicinal bottles below).



Figure FR7 – “Shoo-fly” flask with GW logo

L&W

Liquor flasks were some of the earliest marked bottles in the assemblage. One of these was a strap-sided (union oval) flask made in a bottom-hinge mold of the “key” type with an applied finish in the shape of a ring. Embossed “L&W / X” on the base (Figure FR8), this flask unfortunately came from an unknown provenience. The L&W logo was used by Lorenz & Wightman of Pittsburgh from 1863-1873 (Hawkins 2009:322).

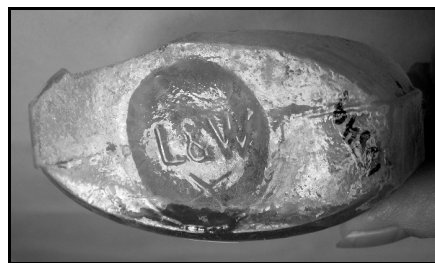


Figure FR8 – L&W logo on strap-sided flask

LGCo

Another flask of interest is probably from the early to mid-1870s. This one was a coffin flask with an applied, one-part ring finish and LGCo embossed on the “key” base. Typically, flasks with LGCo logos have a capital “O” in “CO” and have the mark embossed in a circle



Figure FR9 – Bases of Lyndeborough flasks (eBay)

around a concave post bottom or an alternative – “LG” above the post-bottom scar and “CO” (upside down relative to the “LG”) below it. Flasks with these two logos were made by the Lyndeborough Glass Co., Lindborough, New Hampshire (1866-1886). The Lyndeborough flasks were also oval in cross-section (Figure FR9). Coffin flasks had slightly more angular ends.



Figure FR10 – L.G.Co “coffin” flask base



Figure FR11 – L.G.Co “coffin” flask

The flask from the privy, however, was almost certainly made by the Lindell Glass Co. of St. Louis. As noted, the flask was “coffin” style – a type unknown from Lyndeborough. Second, the L.G.Co logo had a lower-case “o” and was embossed horizontally across the base of the flask – characteristics of Lindell (Figures FR10-FR12). Although the firm made various types of bottles, this is the first flask we have seen that is very likely of Lindell manufacture (see Lockhart et al. 2009).



Figure FR12 – Detail of applied finish on L.G.Co flask

T

Most of the flasks in the assemblage – with glass house logos – appear to have been from the mid-1870s-1880s period. However, one mark on later flasks is of particular interest. Two identical flasks were each made with a two-part tapered finish and the single letter “T” – without serifs descending from the top bar – embossed in the center of a cup bottom base (Figures FR13 & FR14). Along with the two flasks, the privy collection contained a medicinal bottle with a “T” on the base (see below) – all found in Level 2 (1885-1890s).



Figure FR13 – “T” logo on flask base

The BRG has recorded and/or photographed numerous examples of these “T” marks – with or without serifs – on colorless, generic oval, round, or rectangular bottles and flasks. In all cases, the container has been mouth blown with a tooled finish. In addition to our research, Herskovitz (1978:25)

listed four Philadelphia Oval medicinal bottles with prescription finishes, all colorless – each with a “T” basemark – in a pre-1896 context at Fort Bowie, Arizona. Wilson and Caperton (1994:79-80) illustrated an oval panel bottle found at Fort Selden – open from 1865 to 1888.



Figure FR14 – Flask with “T” logo

Lockhart & Olszewski (1993; 1995) recorded four bottles with “T” logos in the El Paso Coliseum collection, that was mostly deposited between ca. 1910 and 1942 (although some earlier bottles were found in the dump). Clint (1976:139-140) illustrated a large aqua beer bottle embossed on the base with a large “T” and on the shoulder with “NEEF’S” on the shoulder. He dated the bottle ca. 1909-1912. Ayres et al. (1980) also illustrated a beer bottle with a medium-sized “T” in the lower half of the base, although they failed to guess at a date.

We conclude that these “T” logos were used by a glass house in business between ca. 1880 and ca. 1914 that made mostly generic bottles using hand methods. A minimal time period would have been at least 1888 to at least 1909. The factory must have produced a large number of bottles for these to remain common in deposits and spread geographically.

Fortunately for our search, there were few major factories whose names began with the letter “T.” Most of these either specialized in certain bottle types, had their own distinctive logos, were in business too late, or some combination of the three. For example, the Thatcher Mfg. Co. specialized in milk bottles until well into the 20th century – and had its own distinctive set of logos. The Tygart’s Valley Glass Co. made *some* of the right bottle types, but the firm did not begin container production until 1910 – and it always used its T-in-V mark. Other “T” manufacturers were too small or made the wrong products.

The Tibby Brothers were the only real contenders for the use of the various “T” marks on generic bottles. The original Tibby Brothers plant was located at Pittsburgh from 1866 to 1880, but the firm opened a new factory at Sharpsburg, Pennsylvania, in 1872, and that soon became the primary location.⁴ The Tibby Brothers made a variety of flint (colorless) bottles, apparently only by hand, until they closed the factory in late 1903 or early 1904 (Hawkins 2009:486-487; Roller 1997).

In 1904, the second generation incorporated the business as the Tibby Brothers Glass Co. The firm now listed beer and soda bottles in addition to the more generic items. By the early teens, however, the firm was in trouble. The rest of the glass industry was rapidly converting to machine manufacture, but the Sharpsburg plant still used the older, obsolete methods. The factory closed its doors, probably in 1915 (*American Glass Review* 1934:171; *Journal of Industrial and Engineering Chemistry* 1913:954; Mathues 1904:886).

In bottle research, we rarely ever find a “smoking gun” – absolute evidence. However, the circumstantial evidence in this case is virtually ideal; literally everything fits. The Tibby Brothers were open during the correct period; they made all the types of bottles we find; and they only made mouth-blown bottles. No other “T” glass house even comes close to fulfilling the necessary criteria. The Tibby Brothers used the “T” logo.

WM°C

A colorless flask was embossed “WM°C” on the base (Figure FR15). This logo was used by Wm. McCully & Co., a firm that operated several factories in Pittsburgh from 1836 to 1909. The flask was found in Level 3 (1880-1887), and we have dated the mark in other contexts as being used by McCully from the mid-1870s to ca. 1896.



Figure FR15 – M°C logo on flask base

⁴ Sharpsburg is located directly on the Allegheny River in what is now northern Pittsburgh. It would have been in an ideal place to ship bottles down the Allegheny to the Ohio River and onto the Mississippi.

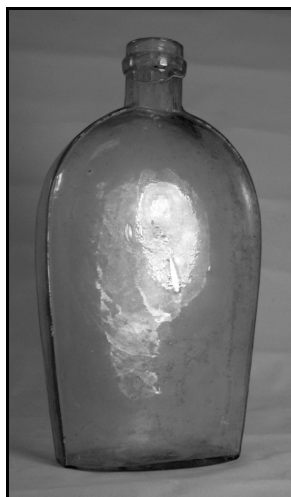


Figure FR16 – Strap-sided flask made by Wm. McCully & Co.

W.M^CC&Co.

The excavation uncovered two aqua, strap-sided flasks, each with an applied single-ring finish (Figure FR16). Each base was embossed “W.M^CC&Co.” in a circle in a concave, post-bottom base (Figure FR17). According to our research, Wm. McCully & Co. used this logo from the mid-1860s to the late 1870s. The flasks were located in Levels 4 and 5, for an average level of 4.5 (1875-1884).



Figure FR17 – W.M^CC&Co. logo on strap-sided flask bases

Medicinal/Chemical Bottles

We have lumped these two categories together because the differences between the two during most of the 19th century were often moot. In fact, these cylindrical bottles could have been used for an incredible variety of substances, including glue, bluing, various liquid culinary items, other household ingredients – almost anything you could put in bottles of these sizes. Although it is pretty certain that medicines and chemicals formed the most important categories stored in these bottles at the Fort Riley hospital, almost any of the other uses could also have been applied in the military and/or hospital setting.

C

As noted in the section on flasks, a mark of interest was a lone “C” on the base of several round and oval medicinal/chemical bottles (Figure 1 FR18). Each of these had tooled prescription finishes and cup-bottom bases. A few “C” marks were sans serif (Figure FR19), but most had a serif at the upper termination and an embellishment at the center of the left, curved side (Figure FR20). We have observed this logo before but never in any kind of datable context. Most bottles with these initials were found in Level 4 (with one in Level 5 and three in Level 3). The average was Level 3.75 for a probable date range of 1878-1887.



Figure FR18 – Oval bottle with “C” basemark



Figure FR19 – San serif “C” logo

Wilson and Caperton (1994:61, 76, 84) reported the excavation of Fort Selden, New Mexico, and included a description and illustration of a square bottle with a “patent lip” that contained a black residue, possibly shoe polish. The base was embossed with a “C” surrounded by a circle (Figure FR21).⁵ The “C” had a serif at the top termination and an embellishment at the left center;

their drawing was virtually

identical to the marks in the Fort Riley collection. They also noted a similar “C” on a shoo-fly flask. Fort Selden was first opened in 1867 but closed a decade later. The fort reopened in 1880, about

the time the railroad arrived at nearby Las Cruces, and most glass artifacts probably date from this period. The main detachment was withdrawn in 1888, and the post was completely closed in 1891. Unfortunately, Wilson and Caperton did not provide individual provenience dating.

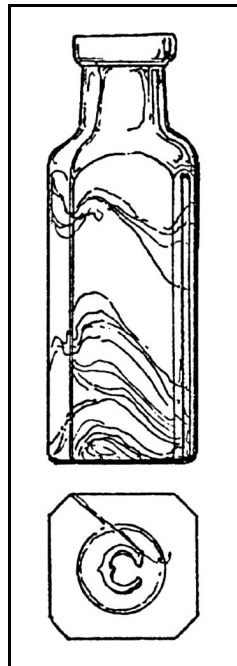


Figure FR21 – “C” logo on square bottle (Wilson and Caperton 1994:61, 76, 84)

Knittle (1927:441) identified the lone “C” mark as “probably Cunningham” – although she included no details about container type, shape, or serifs. Toulouse (1971:99), also noted that this lone initial may have been used by Cunningham & Co. from 1879 to 1909, although he admitted that the mark had “not been documented.” He noted the mark on “general line ware” and may have based his identification on Knittle.

We have only discovered three glass houses – whose names began with the letter “C” – that were large enough to have produced bottles on a national scale, were open during the ca. 1878-1887 period, and made packer, medicinal, and chemical bottles:



Figure FR20 – “C” logo with serif and embellishment

⁵ The “circle” may well have been a post bottom on the base. This was certainly true on some of the Fort Riley examples.

Clyde Glass Works, Clyde, New York (1827-1886; 1895-1912) – bottles; best known for fruit jars

Cohansey Glass Mfg. Co., Bridgeton, New Jersey (1870-1901) – all types of bottles

Cunningham & Co. (1878 to 1882) or Cunninghams & Co., Pittsburgh (1882 to 1886) – all bottle types, including packers

Neither Clyde nor Cohansey was known to have used any type of logo consistently, although both embossed the factory name on fruit jars. Clyde may have used a CGW logo on some flasks. Although both Knittle and Toulouse undoubtedly guessed at many of their mark identifications (often incorrectly!), they were probably accurate this time. The Cunningham family had used logos to identify its products since at least the mid-1860s. The lone “C” was probably chosen for use on small bottles – rather than the C&Co mark more typically used by the firm.⁶

GW

Five examples of medicinal bottles were excavated from the privy – with the same GW logo discussed in the Flasks section above. There were, however, a few notable differences between the flasks and the medicinal bottles. Medicinal bottles were round in cross-section with one-part, squared “packer” finishes. They were very similar in shape to the U.S. Hospital Dept. containers, except that these were much smaller than the typical U.S. Hospital bottles found in the privy (Figure FR22).



Figure FR22 – Round medicinal bottle with “GW” basemark

⁶ It should be noted however, that Jay Hawkins – extensive collector and author of the definitive history of Pittsburgh glass houses (Hawkins 2009) – stated that he was unaware of any bottles with the “C” markings that had been dug by collectors at Pittsburgh (personal communication, 12/2//2011). However, most collectors ignore generic or “slick sided” bottles, so these may have been overlooked. The mark also may have been used exclusively on bottles made for military use. Finally, of course, Hawkins may be correct. This mark may have been used by a firm we have simply not discovered.

Each bottle had “GW” embossed in the center of the base. Although most had the typical “G,” one had a “G” with a serif pointing to the right (Figure FR23). We discuss the differences in the “G” serifs below, but they were typically used between ca. 1878 and ca. 1882. An additional characteristic is the rounded “G” also discussed in the Flasks section. All but one of these bottles was found in Level 3, with the exception located in Level 2. The average was Level 2.8 for a date range of 1882-1890. These were probably made during the last years of the Great Western Glass Co., St. Louis, 1874-ca. 1882.



Figure FR23 – “GW” logo on medicinal base

IGCo



Figure FR24 – IGC^o arched logo on round medicine base

One mark of interest was “IGC^o (arch) / 16 (horizontal)” on the base of a round bottle with a tooled packer finish. Because of the shape of the “6,” this specific mold has been cited (including in the spreadsheet for Fort Riley) as “1G” or “IG.” It is even possible that the “IG” logo that Toulouse (1971:264) ascribed to the Illinois Glass Co. as used “before 1890” was a mis-reading of this “16” code (Figures FR24 & FR25).

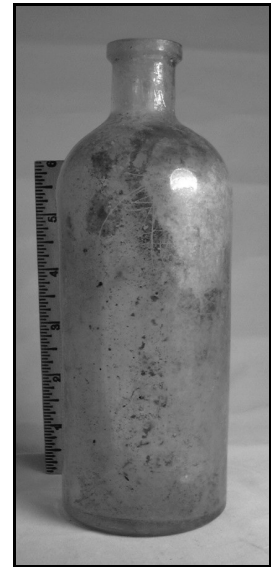


Figure FR25 – Round medicine bottle with IGC^o logo



Figure FR26 – IGC^o horizontal logo on round medicine base

The arched configuration is one of the few examples of its kind we have seen. In addition, the “o” in “Co” was an underlined superscript – “IGC^o” – instead of the normal, lower placement. Unlike this example, the IGC^o logo typically had no accompanying base number. Finally, the “16” was double stamped. Double stamps almost always occurred during the ca. 1895-1914 period. The bottle was found in Level 2 (72-84"), a level we dated 1887-1890s.

Typically, the IGC^o mark was used by the Illinois Glass Co. Despite the entry in Toulouse (1971:261), the logo was rarely (probably never) used by the Ihmsen Glass Co. This arched example was an atypical mark. Two other very similar bottles in the assemblage were embossed “IGCo” in the more common horizontal format. One of these (Figure FR26) was found in Level 2 (72-84”) and had the more usual “o” in “Co.” The other – unfortunately unprovenienced – had the “o” in “Co” underlined in superscript (Figure FR27).



Figure FR27 – IGC^o arched logo on round medicine base



Figure FR28 – Shouldered vial embossed “L&W” on base

L&W

The collection included a single, 2.5” tall, small, shouldered bottle with a one-part “packer” finish (Figure FR28). The base was embossed “L&W” in a “key” format (Figure FR29). The bottle was excavated from Level 6 (1865-1875). As noted in the Flask section (above), the L&W logo was used by Lorenz & Wightman of Pittsburgh from 1863-1873 (Hawkins 2009:322) – a perfect match for the level.



Figure FR29 – L&W logo on base of vial

SDS

Another mark of interest in the medical/chemical bottle category is “SDS” embossed on the bases of a few of the medicinal bottles used by the U.S. Army Hospital Dept. These bottles were embossed “U.S.A. / HOSP. DEPT.” on the upper front body (Figure FR30). We have been unable to discover the meaning of the “SDS” initials, and Sternad (2010:48) stated that “the exact meaning of these letters remains a mystery.”

Dalessandro (2011) cited Civil War bottle authority Mike Russell that documentary evidence places the manufacture of Hospital Department bottles primarily at Pittsburgh, with Baltimore as a notable second. He further suggested that archaeological evidence also pointed at

St. Louis as a location for the production of some of the bottles. Dalessandro (2011) added some important manufacturing characteristics:

Examples blown at the Pittsburgh factory exhibit concave, slightly recessed, bases with a star design, initials, or a simple dot. Occasionally, some bottles from this firm are seen with an iron pontil scar (a result of an older glassmaking technique that used a rod dipped in iron oxide to hold the bottle base during the manufacturing process). Baltimore Glassworks examples are flat based and exhibit weak embossing.

Civil War period bottle embossing styles fall into several major types: (1) Two Straight Lines; the top line is “U.S.A.” printed in raised letters. The second line reads, “Hosp. Dept.” (2) “U.S.A Hosp. Dept.” embossed in an oval. In this pattern, the “U.S.A” curves along the top of the oval and “Hosp. Dept.” curves below (3) “United States Army Hospital Department” spelled out in a straight line (4) “U.S.A” arching over “Med’l Dept.” (This is the only style incorporating the abbreviation for USA Medical Department dating from the Civil War era).⁷

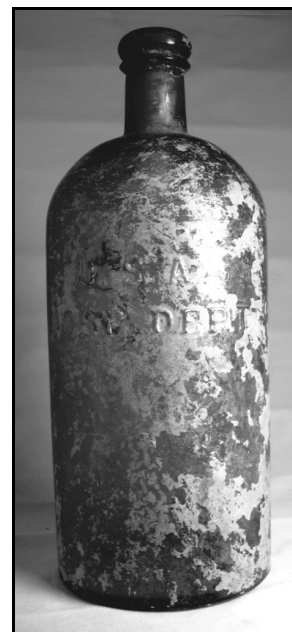


Figure FR30 – U.S. Hospital Dept. bottle

The “initials” on “slightly recessed bases” almost certainly referred to the “SDS” basemark. Assuming that the Pittsburgh identification for the main production center and the characteristics assigned to the Pittsburgh bottles are correct, then the SDS initials are probably related in some way to a Pittsburgh glass factory. Of course, the initials may indicate a military surgeon or political figure of the period. The most likely explanation, however, is that these initials were a mold maker’s “signature.” Such signatures were frequently used during the 1870s and into the 1880s.

⁷ In addition, we recorded a variation embossed “U.S. ARMY / HOSP. DEPT.”



Figure FR31 – SDS – inverted arch – on Hospital bottle base

Siri (2009) approached the study of the Hospital Department bottles from a unique perspective. Siri looked at individual engraving characteristics on the bottles – including size, shape, and spacing of letters, punctuation or lack thereof, and differences in fonts. He discovered the SDS initials on bases of four different molds, including one with “very faint SDS in middle of dished



Figure FR32 – SDS – horizontal – on Hospital bottle base

base.” The examples from Fort Riley all had the SDS embossed at the side of the shallow concave central area of the bases (i.e., dished base). However, we noted two slight variations: 1) SDS in an inverted arch (Figure FR 31); and 2) SDS horizontal (Figure FR32).

SGCo



Figure FR33 – SGCo base on Louisville tonic bottle

A round medicinal or chemical bottle was embossed “S.G.Co / 4” on the base and “JOHN. J. SMITH / LOUISVILLE. KY” on the body (read with the finish pointing left). The bottle had a one-part, tapered “oil” finish that was tooled (Figures FR33 & FR34). Whitten (2005:70-71) dated the Southern Glass Co., Louisville, Kentucky, as being in business from 1877 to 1879. He noted this exact bottle as a “tonic bottle” (medicinal



Figure FR34 – Louisville tonic bottle

“tonic” – not hair tonic) and stated that such bottles were made for Smith by three different Louisville glass houses. The Louisville SGCo mark was also found on chemical bottles, wax-sealer fruit jars, and ginger ovals.⁸

The Fort Riley example was found in Level 3 (1880-1887). The bottle was probably made slightly earlier than the date for the level due to curation or some other delay in deposition.

⁸ It should be noted that at least three other glass houses used the SGCo logo. Louisville examples are generally identified by bottles that are found predominantly in the Louisville area. David Whitten is the top researcher for Louisville bottles.

T



Figure FR35 – “T” logo on medicine bottle base

One chemical/medicinal bottle had a tooled prescription finish and a “T” – without serifs – on a cup bottom base (Figures FR35 & FR36). We have tentatively identified the Tibby Brothers as the user of this and the “T” logos on flasks (see above) made between the 1880s and ca.1914.⁹ Like the flasks, this bottle was excavated from Level 2 (72-84”), a depth we have dated at 1885-1890s.



Figure FR36 – Medicine bottle with “T” logo

Other Containers

ACBCo

Two Lea & Perrins Worcestershire Sauce bottles were found in Level 5 (1870-1878). Both were embossed with “ACBCo” spaced equidistantly around a post-bottom on the bases, with “Co” being treated as a single letter (Figure FR37). Lea & Perrins bottles were originally made and filled in Britain prior to being shipped to various parts of the world. By at least 1865, the bottles were embossed on their bases with the “ACBCo” logo. Lunn (1981:8) identified the manufacturer as the Aire & Calder Bottle Co., Yorkshire, England.



Figure FR37 – ACBGo base – Lea & Perrins

John Duncan & Sons, of New York City, began distributing Lea & Perrins in 1840 but continued to use the British bottles. Ca. 1877, Duncan commissioned a currently unknown glass house to produce bottles embossed on their bases with “JD / S” along with a number in the center. Some of the bottles with the “ACBCo” logo continued to be used in the U.S. until ca. 1880, and the “ACBCo” mark was used in Canada until ca. 1920 (Lunn 1981). The ca. 1870-1878 dating of Level 5 fits well with the U.S. use of bottles with the mark.

⁹ In other contexts, we have discovered the single “T” with and without serifs on similar bottles and flasks.

A&DHC – LARGE KANSAS

We photographed an aqua blob-top soda bottle embossed “LARGE (arch) / KANSAS (inverted arch)” on the front, with “A&D.H.C.” on the back just above the heel (Figures FR38 & FR39). The neck had rust stains from the wire used to tie down the cork. Fletcher (1994:320) illustrated and discussed the bottle in the “Unidentified Bottles” section of his Kansas bottle book. Fletcher noted that he

found an 1876 ad for A. LARGE & CO. who were manufacturers of soda water in Pueblo, West Las Animas & Trinidad, Colorado. Possibly the Large/Kansas bottle was used by the same company. It would be interesting to see if the Large bottle from Colorado is similar to the Kansas bottle, but no Colorado bottles are known.



Figure FR38 –
LARGE KANSAS
soda bottle

None of the major Colorado researchers (Clint 1976; Oppelt 2005; Preble 1987) listed any “Large” bottles from Pueblo, West Animas, or Trinidad. According to von Mechow (2012) A. Large might be Alfred Large. Alfred Large and others filed to incorporate the town of Stevens, Kansas, with the Secretary of State on February 23, 1874, in the county of Labette. By 1890, Stevens had been absorbed into the larger city of Chetopa (Case 1893:14). Chetopa is located in southeast Kansas – about as far from Colorado as possible.

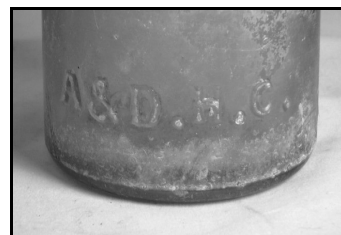


Figure FR39 – A&D.H.C.
logo on soda bottle base

The manufacturer’s mark, however, is much clearer. Located at Pittsburgh, Alexander and David H. Chambers used the A&DHC logo (with or without punctuation) from ca. 1859 to 1889. The “Large” bottle was found in Level 4 – which we dated 1875-1884. Lindsey independently dated the bottle as being made in the 1870s – based on manufacturing characteristics – and Schriever has found examples in Pueblo, Colorado, antique stores.

All of these bits of data fit together temporally and lead to some speculation. Alfred Large was certainly involved in Stevens (Chetopa), Kansas, during the early 1870s and apparently initiated a soda bottling concern in the town. Since Stevens incorporated in 1874, and Large was advertising in Colorado by 1876, he likely had closed the Kansas plant by then and moved his entire operation to south-central Colorado. He almost certainly still had bottles left over and moved those to his new locations in Colorado. The availability of bottle embossed “LARGE KANSAS” at Pueblo – along with the lack of bottles with both “Large” and “Colorado” embossing – suggests that his business did not last long after the move.¹⁰

One final observation is in order. Fletcher (1994:320) also illustrated and described a virtually identical bottle embossed “HARRIS (arch) / KANSAS (inverted arch)” on the front, with the A&DHC logo on the back side just above the heel. He noted that the “bottle may have belonged to Geo. E. Harris. He was listed in an 1878 Wichita business directory as the proprietor of the Wichita Soda Factory.” Harris served as the mayor of Wichita in 1875 and started the first bottling works in the city (probably about that time). He served as a City Commissioner several times between 1879 and 1895 and was the co-owner – with Billy Polk – of the Harris & Polk Ice Co. (City of Wichita 2012).

Although Wichita was located ca. 120 miles east of Stevens (Chetopa), the configuration of the slightly arched personal name above a state name with a slight inverted arch is *not* a typical one for blob-top soda bottles – nor common for any style of bottles made by the Chambers brothers. In addition, an owner’s last name and a state name with no city/town designation is highly unusual. This very atypical configuration *may* indicate some kind of relationship between Harris and Large – although the connection may be entirely spurious.

CB

The excavation discovered a culinary bottle embossed “CB / K / 1782” on the base in Level 3 (1880-1887). These were made during the 1863-1905 period by the Kilner Brothers at the Conisbrough factory in England. The mark was very common on food bottles and fruit jars

¹⁰ When soda bottlers went out of business fairly suddenly, their embossed bottles became useless to most other bottlers. These tend to be much more common than other bottles used during the same time period (e.g., see Lockhart 2010, Chapter 5a and Chapter 5b).

(see Creswick 1987:27, 94, 303). The four-digit code (1782) was not a date; it was the model number of the jar. These model numbers range from at least 1263 to at least 2667 – far too low and high to be date codes.

C&H

A colorless perfume bottle was embossed “C&H” on the base. The bottle was in the shape of a female boot and was found in Level 2 (1885-1890). We have no other information about this bottle. Both Knittle (1927:441) and Toulouse (1971:130) assigned the C.&H. mark to Coffin & Hay. Since the firm was in business from ca. 1838 to 1842, it was in business far too early for this perfume bottle. The initials on this bottle probably belonged to a perfume manufacturer rather than a glass house.

C&W

A C&W logo was embossed on the base of what was probably a food jar. We have not found the initials listed as a manufacturer’s mark in any of the literature, so the initials were probably those of a food packing firm. Currently, the best source for information on food bottles is Zumwalt (1980), but she provided no reference for this logo. Since the fragment was found in Level 3, the jar was probably made between ca. 1880 and ca. 1887.

H

The collection included what may have been a bluing or “ginger oval” bottle that was oval in cross-section with a one-part packer finish (Figure FR40). The base had a circular, concave post-bottom, embossed “• H •” – with no serifs on the letter (Figure FR41). The flask was excavated from Level 4 – 1875-1884.

The bottle is virtually identical to a bottle illustrated in Wilson (1981:80), found at Fort Laramie, Wyoming (1866-1890). Wilson’s bottle had a paper label noting that it was a scalp treatment made by Ruben P. Hall and was embossed on the base with an “H.” We have also observed two other examples – although neither was in a datable context or had a



Figure FR40 – Medicinal flask embossed “H” on base

label. One had a serif “H” on the base, the other sans serif. It is very likely that the “H” indicated Reuben P. Hall in each of these cases.

The lone “H” was certainly used by several glass houses, including W.H. Hamilton & Co. of Charleroi, Pennsylvania (ca. 1898 to 1918); H.J. Heinz Co. (Glass Factory), Sharpsburg, Pennsylvania (1892-1946); Hemingray Glass Co., Muncie, Indiana (ca. 1924-ca. 1935); and Toulouse (1971:231-232) attributed the mark incorrectly to the Holt Glass Co., Berkeley, California.¹¹ The single “H” was probably used by others as well.



Figure FR41 – “H” basal embossing on medicinal flask

IGC^o

There were numerous ink bottles in the excavation, although most had no identifying marks. An exception was embossed “IGC^o” on the base, with a superscript, underlined “o” in “Co” (Figure FR42). The logo was also double-stamped on the base – a phenomenon typically found on bottles made between ca. 1895 and ca. 1914, although we have found at least one exception that was made earlier. The bottle was square in cross-section, with a flattened shoulder, round neck, and a one-part finish (Figure FR43). This mark was used by the Illinois Glass Co. from 1880 to ca. 1915 (Lockhart et al. 2005c). Unfortunately, we could not find this bottle in the database.



Figure FR42 – IGC^o logo in ink bottle base



Figure FR43 – Ink bottle with IGC^o basemark

¹¹ The Bottle Research Group will eventually publish an article on the actual history of William Holt and his experiences in the glass business – along with the likely user of “H” mark long misattributed to Holt.

J.J. BUTLER / CIN. OHIO

A square ink bottle was embossed “J.J. BUTLER / CIN. OHIO” on one side (Figure FR44). This was one of the oldest bottles in the assemblage – with an open pontil scar on the base (Figure FR45). Also called a blowpipe pontil scar, these were made by either breaking off the blowpipe and attaching it to the base to hold the bottle while the finish was completed, or another separate blowpipe was used on the base for the same purpose. Some of the molten glass adhering to the blowpipe remained on the bottle base when the blowpipe/pontil was broken off. The use of pontils had been virtually discontinued by the late 1860s (Lindsey 2012).



Figure FR44 –
J.L.BUTLER / CIN.
OHIO ink bottle



Figure FR45 – Blowpipe
pontil base

The bottle was essentially a cube with chamfered corners and a flattened shoulder, leading up to a cylindrical neck with a one-part applied finish. O'Dell (2003a) dated this specific bottle ca. 1954-1860. Unfortunately, we could not find this bottle in the spreadsheet.

Although Thomas S. and James J. Butler had earlier run a druggist firm, by ca. 1841, they were Butler & Brother, paper dealers. Brother James apparently specialized in ink, and they opened the Butler Ink Works in 1849. By 1854, the brothers parted company, and James went into the ink business on his own. James died in 1878, bringing an end to the business (O'Dell 2003b).

M°C&S

Another bottle in this category was an aqua-colored, conical ink bottle, embossed “M°C&S” in a slight arch on the base. The bottle had a squared, applied finish similar to a packer finish (Figures FR46 & FR47). This was an early bottle, found in Level 6 (1865-1875). We have discovered no additional information about this container. There was a Robert McCoy who sold ink at Pittsburgh, but we could find no record of a McCoy & Son or a partner whose name began with “S.” Although these “umbrella” ink bottles are fairly common online, no one seems to have traced the name of the firm.



Figure FR46 – M°C&S
on an ink bottle base



Figure FR47 – Ink
bottle with M°C&S
basemark

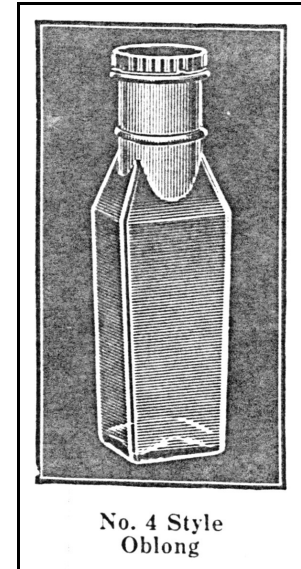


Figure FR48 – No. 4
Style Oblong (Kearns-
Gorsuch 1916:12)

R.P.Co.



Figure FR49 –
Cathedral pickle
bottle with “R.P.Co.”
initials

The R.P.Co. mark appeared on the base of a food bottle that the 1916 Kearns-Gorsuch Bottle Co. catalog (1916:12) called a “No. 4 Style Oblong” (Figure FR48). The bottle was square in cross-section, with flattened shoulders and a one-part, tooled “packer” finish (Figure FR49). The bottle was made of colorless glass, and the initials were embossed horizontally across the center of the cup-bottom base (Figure FR50). The bottle was found in Level 2 (1885-1890s). Lindsey (2012) noted that bottles of this type were generally used for horseradish and small pickles between possibly the late 1880s and the 1910s.

Zumwalt (1980:360) illustrated a different type of bottle that was embossed “RICHMOND PICKLE CO.” on the side. She noted that Richmond (presumably Virginia) directories first listed the business, owned by Arthur G.

Dribbrell, L. Dribbrell, and Wilbur J. Young, in 1892. We have been unable to discover any further information on this firm. Several different bottle styles had the full company name embossed on the sides, and the initials are a good fit. The firm was also in business at the right time to fit with the level in the privy, and Richmond was a direct east-west rail transport away.



Figure FR50 – R.P.Co.
basemark

U.S. PATENT JULY 16, 1869

We discovered two unusual colorless mucilage bottles in the assemblage that had the reservoir on one side and the opening for the applicator brush on the other. One bottle was embossed “U.S. PATENT” on one side and “JULY 16, 1867” on the other (Figure FR51). The second bottle was identical, except that the patent information was in a plate around the base, embossed: “MORGANS PATENT / JULY 16, 1867” (Figure FR52).



Figure FR51 – Side views of one mucilage bottle



Figure FR52 – Base view of a similar mucilage bottle

Elisha Morgan received Patent No. 66,868 for an “Improved Mucilage-Stand” on July 16, 1867.

He described the bottle as “a fountain or reservoir, connect[ed] by the neck” to “the well” with a “cap covering the mouth, with brush attached, extending through the mouth into the well.” The purpose of the invention was to provide a “constant supply of mucilage at a given level, thereby

avoiding the necessity of adjusting the brush to the varying level of the mucilage, as in the common bottle” (Figure FR53).

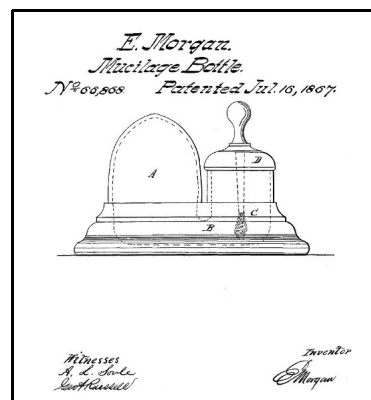


Figure FR53 – Morgan’s July 16, 1867, patent for a mucilage bottle

W M^cCULLY & Co PITTSBURGH PA

The privy yielded three amber cylinder whiskey bottles that were each embossed “W M^cCULLY & Co PITTSBURGH PA” in a circle on a Rickett’s type mold on the base (Figure FR54). Each base also had a concave area with a fairly large embossed dot in the center. The



Figure FR54 – W
M^cCULLY & Co on
Rickett's type mold

bottle was made in a four-piece mold and was embossed “PATENT” on the shoulders (Figure FR55). The two-part finish was applied – an upwardly-tapered “collar” at the top, with a single ring below.

The bottles were found at an average level of 5.8 for a date range of 1865-1880. Wm. McCully & Co. was in business from 1832 to 1909 at several factories in Pittsburgh (Hawkins 2009:344-357). Our research suggests that McCully used this logo from ca. 1858 to the 1860s.

Beer Bottles

Fort Riley was uniquely situated – in both time and space – for the study of early export beer bottles. Most serious looks at export beer bottles (e.g. Wilson [1981] at Fort Union, New Mexico and Fort Laramie, Wyoming) have been centered on military posts in the western U.S. This has created a post-1880 bias in the research. As one of his last acts as President, Rutherford B. Hayes decreed a ban on liquor for use by enlisted personnel at military installations in 1881 (Hoagland 2004:116; Wilson 1981:3). Since beer was *not* excluded, this created a major market for beer at frontier Army posts during the period beginning in late 1881.

A condensed look at the history of bottled lager beer will put this timing into perspective. Prior to the 1840s, dark beers, porters, and ales dominated U.S. beer sales. These were dark, “heavy,” and non-carbonated. Thus, they posed no bottling and shipping problems. During the 1840s, however, light, effervescent, lager beer began to be popular. The major problem with lager beer was that it tended to turn sour and spoil when bottled.

In 1872, Adolphus Busch adapted the Pasteurization process to the bottling of lager beer, allowing Anheuser-Busch to “export” its St. Louis Lager Beer to points in the American West as well as Mexico, Central and South America, and other locations in the world. However, existing “beer” bottles (actually for ale and porter) would not withstand the pressure created by the



Figure FR55 – W
M^cCULLY & Co
cylinder whiskey
bottle

carbonation in lager beer, so Busch bottled the initial product in Apollinaris bottles – containers that had been manufactured to hold high-pressure sparkling water (Lockhart 2007).

Valentine Blatz designed what became known as the “export” beer bottle in 1873 and had the first six gross (72-dozen) bottles made at one of William McCully’s factories at Pittsburgh, although McCully apparently stopped making export beer bottles. By no later than 1875, the export beer bottle had become the standard for distant shipping. These bottles were strong, relatively cheap, and used paper labels – all cost effective. In addition, the bottles were intended to be returnable – a characteristic that further enhanced their value. Unlike bottled beer that was locally sold, however, there was little chance of having most of the “exported” bottles returned for refilling (Lockhart 2007).

Bottled beer sales expanded throughout the 1870s and really boomed during the 1880-1882 period. Part of that dramatic increase, of course, was spurred by the liquor ban for enlisted personnel at military posts in 1881. Another important factor was the expansion of the railroads. It was not until the late 1870s and early 1880s that eastern Arizona, all of New Mexico, and western Texas had rail access to the brewing centers at St. Louis and the Midwest. With the arrival of the railroads, western military installations *could* be served with export beer (Lockhart 2001).

Fort Riley, however, was positioned in an ideal location to receive export beer prior to 1880. Construction of the Pacific Railroad began at St. Louis on July 4, 1851. After a delay because of the Civil War, the tracks reached Kansas City in 1865, allowing access to the fort by a comparatively short wagon road. The operating firm was reorganized as the Missouri Pacific Railway in 1872 (Wikipedia 2011). The Union Pacific Railway arrived at Fort Riley in 1866, providing full access to goods – including bottled products.

Fort Riley was thus in a position to receive the earliest export beer bottles, and these should appear in Levels 5 and 4, which we have dated 1870-1878 and 1875-1884, respectively. Only a few glass factories made the early export beer bottles (see Table 4). Export beer bottles with manufacturer’s marks for the earliest four consistent manufacturers – Cunningham & Ihmsen (C&I – 1873-1878); A. & D.H. Chambers (A&DHC – 1873-1889); Mississippi Glass Co.

(MGCo – 1873-1885); and Lindell Glass Co. (LGCo – 1874-1892)¹² – were, indeed, primarily discovered in Levels 4 and 5. Bottles from the DeSteiger Glass Co. (1878-1883) were just late enough to be primarily found in Level 3 (1880-1887).

Table 4 – Manufacturers of Lager Beer Bottles – 1872-1882

Start Date*	Manufacturer	City	Mark	End Date
1872	None			
1873	William McCully	Pittsburgh	unk	ca. 1874
ca. 1873	Cunningham & Ihmsen	Pittsburgh	C&I	1878
ca. 1873	A. & D.H. Chambers	Pittsburgh	A&DHC	1889
1873	Mississippi Glass Co.	St. Louis	MGCo	1895
1874	Lindell Glass Co.	St. Louis	LGCo	1892
1878	DeSteiger Glass Co.	La Salle, IL	DSCGo	1883
ca. 1878	Cunningham & Co.	Pittsburgh	C&Co	1886
1880	D.O. Cunningham	Pittsburgh	DOC	1931
1880	Chase Valley Glass Co.	Milwaukee	CVCo	1881
1881	Wisconsin Glass Co.	Milwaukee	WIS GLASS Co WIS G Co WGCo	1885
1881	Reed & Co.	Massillon, OH	MGW Reed & Co	1904
1881	Streator Bottle & Glass Co.	Streator, IL	SB&GCo.	1905
1882	Belleville Glass Co.	Belleville, IL	BGCo	1886
1882	Frederick Heitz Glass Works	St. Louis	FHW	1896

* Both start and end dates are for the production of export beer bottles – *not* for the duration of the companies – although the two ranges are identical in many cases. In some cases, we know the date a glass house opened but not a certain date for the start of beer bottle production (e.g., Cunningham & Ihmsen, A&DH Chambers, DeSteiger, and Cunningham & Co.).

¹² All of these marks and firms are well researched. See Hawkins (2009); Lockhart et al. (2005a); Lockhart et al. (2007); and Lockhart et al. (2009) for details and discussion.

Finishes on Export Beer Bottles

From the invention of the export beer bottle in 1873, the finish was in two parts. The upper part was originally sharp-cornered and upwardly tapered with a sharp lower ring (Figure FR56). Eventually, the upper part became more rounded, especially at the edges. The sharp edge on the lower part of the finish could be at the end of a downward flare or could be wedge shaped. Currently, we have hypothesized that the downwardly flared lower ring was used earlier than the wedge-shaped one – based on the discussion below – but we have discovered no way to separate the two in a temporal context. Although the more angular upper part of the finish was used first, we have been unable to ascertain when the change to a more rounded upper segment occurred.

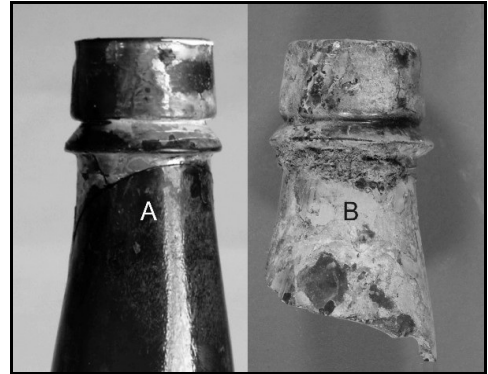


Figure FR56 – A) two-part beer finish with sharp upper “collar” and flared lower ring (Fort Riley); B) two-part finish with rounded upper “collar” and wedge-shaped lower ring (San Elizario)

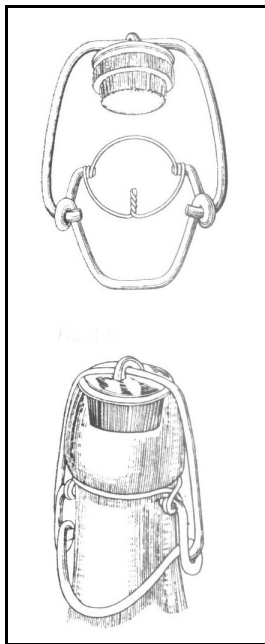


Figure FR57 – De Quillfeldt's Lightning Stopper (Lief 1965:16)

The finish situation soon became more complex. Although Henry W. Putnam patented the Putnam Stopper on March 15, 1859, it was mostly used on fruit jars. The stopper was not adapted to beer bottles until Charles De Quillfeldt received Patent No. 158,406 for the Lightning Stopper on January 5, 1875 (Figure FR57).

Although the Lightning Stopper *could* be applied to a two-part finish, beer bottles soon appeared with a single-part finish that eliminated the lower ring. Like their counterparts described above, these were made in two formats – upwardly tapered with sharp edges or rounded (Figure FR58), with the latter probably used later. One-part finishes are found alongside those with two parts in virtually every late-19th century excavation that has a large number of beer bottles



Figure FR58 – A) one-part finish, tapered collar (San Elizario); B) one-part finish, rounded collar (San Elizario)

or fragments, and both were used until the crown finish replaced them ca. 1914. In addition, several other finish types appeared, but none of them achieved the popularity of the two-part “cork” finish and the one-part finish for Lightning stoppers (Lockhart 2007).

As noted above, there was a major shift in the manufacture of two-part finishes on beer bottles during the period between ca. 1878 and ca. 1882. The new finish had a rounded lower ring (Figure FR59). Although the date is certainly not absolute, very few glass houses made bottles with sharp lower rings after 1882.



Figure FR59 – Two-part beer finish with rounded lower ring

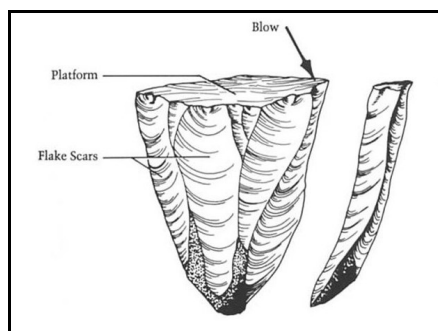


Figure FR60 – Fracture angle for flaking stone (Whittaker 1994:15)

Prior to this publication, however, no one seems to have addressed *why* the industry adopted the rounded lower rings. We would like to propose that the change from sharp to rounded lower rings was likely a function of the physics of fracture initiation. Bottle glass fractures in exactly the same way as flint, chert, obsidian, or other types of siliceous material used to make flaked-stone tools. In fact, Apache warriors – as well as other Native American groups – used the broken bases of export beer bottles and other types to make arrow points and other “stone” tools, such as scrapers.

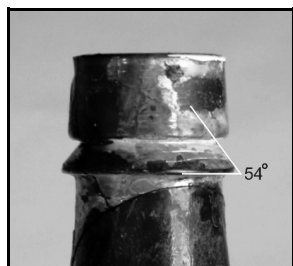


Figure FR61 – Angle of tapered lower ring

Flintknappers are well aware that an angle of less than 90 degrees is optimal for fracture initiation to detach flakes from a core (Figure FR60). At best, angles greater than 90 degrees are difficult to fracture. At typical angles of 50-65 degrees, the downwardly flared, sharp lower rings on the bottle finishes would have chipped quite easily (Figure

FR61). Wedge-shaped rings would have been somewhat more fracture resistant, but they still maintained angles of 70-75 degrees – an easily breakable arc (Figure FR62). The rounding of the lower ring virtually removed this angular effect, making the lower part of the ring highly chip resistant (see Figure FR59).

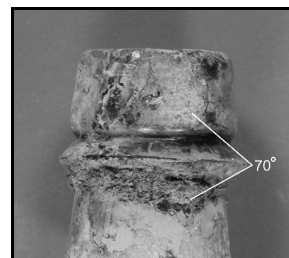


Figure FR62 – Angle of wedge-shaped lower ring

While the chipping of the ring, itself, could have created cuts and damage to other objects, future empirical research should be conducted to determine the exact effects. It is possible that a chip at the ring could have created a longer fracture that would have broken away the entire finish. In a bottle pit at San Elizario, Texas, Lockhart and Olszewski (1994) discovered numerous finish and neck/finish fragments from export beer bottles, many of which were broken at the finish. Unfortunately, the collection is no longer available to test exactly how those were broken.

It is probable that the sharp lower ring held the wire better than a rounded one. The sharp lower ring was certainly the traditional favorite dating back to at least 1815 (von Mechow 2012b). Never before, however, had bottles been made in these quantities; thus, speed of production increased. It is virtually certain that the rate of breakage became more important. Some form of pliers or similar tool must have been used to apply the tie-down wires, further increasing the probability of fracture during the closure assembly process. As a means to reduce the breakage, the industry apparently first switched from the flared lower rings to the wedge shape. Eventually, someone caught on, and rounded lower rings became the industry standard between ca. 1878 and ca. 1882.

Tod von Mechow (2012b) noted a similar change between what he called the “tapered lip, circ: 1844-1855” and the “rounded taper lip, circ: 1847-1920.” He noted that the latter:

is often called a “blob” top by collectors. It was first used on soda shaped bottles and later on various shapes of beer bottles. Its rounded shape prevented chipping and provided the strength needed to mount various closures. It was used almost exclusively on pony and champagne beer shaped bottles. It was by far the most common type of lip used on pre-crown soda and beer bottles.

Of final interest, some of the neck/finish fractures may have been intentional. It seems that people realized the problems associated with sharp rings and took advantage of the situation to theatrically open bottles. Informants, who have performed in “Mountain Man” rendezvous in the west, tell stories of observing participants striking a crown finish with Bowie knives or axes to break off the finish and cap.

Purportedly, this practice is historical in nature and could account for some of the bottles found in archaeological sites where the finish is separated from the neck. In many historic examples, the break is diagonal, beginning below the finish on one side of the bottle and tapering up, often to include a portion of the lower part of the finish on the other side – in keeping with such a removal. This practice was also a part of the historical showmanship of Sam Arnold, whose Fort Restaurant in Morrison Colorado is world renowned for its attention to detail in recreating dishes and atmosphere from the frontier days of the American West. Arnold took pleasure in using a tomahawk to remove the tops of champagne for the edification of his customers.

A&DHC

Of the five early export beer bottle manufacturers, A. & D.H. Chambers is the only firm where the BRG has not yet published a report or article. However, we have compiled an extensive file on the factory, its bottles, and its manufacturer's marks. The Chambers brothers embossed "A&DHC" on bottle bases and heels by at least 1860, possibly a couple of years earlier. The firm potentially made export beer bottles from 1873 to 1889, although Wilson and Caperton (1994:70) only recorded beer bottle advertising for the Chambers in the *Western Brewer* from ca. 1879 to mid-1884. All five examples of A&DHC marks from the privy were found in the ash layer in levels 4 and 5. The average depth was Level 4.6 for a ca. 1870-1880 deposition.

C&I

The privy contained 12 whole export beer bottles and one fragment, each embossed on the base with "C&I" – the logo of Cunningham & Ihmsen of Pittsburgh (Figure FR63). As noted above, this was one of the earliest manufacturers of export beer bottles. Open in 1866, the plant probably began making export beer bottles as early as late 1873 and continued until 1878, when Ihmsen sold his share to the Cunningham family. Levels 4 and 5 contained 84.6% of the C&I bottles, while 76.9% were in the ash layer. The average level was 4.1, for a date range at the fort of 1875-1884. At least one C&I bottle had the remnants of a paper label for St. Louis Lager Beer, bottled by Anheuser-Busch (Figure FR64 & FR65).



Figure FR63 – C&I logo on export beer bottle base



Figure FR64 –
Anheuser-Busch St.
Louis Lager Beer label
on C&I bottle

DSGCo

Only five beer bottles in the assemblage were made by the De Steiger Glass Co. The firm used a DSGCo logo on bottle bases (Figure FR66). De Steiger (1878-1883) was in business just slightly later than Cunningham & Ihmsen, and only 40% of the De Steiger bottles were in Levels 4 and 5. The remainder came from the next two higher levels (2 & 3). The ash layer contained 60% of the DSGCo bottles. The average level was 3.3, for a date range of 1878-1885.



Figure FR65 –
Entire bottle
with C&I base

LGCo



Figure FR66 – DSGCo
logo on export beer
bottle base

Export beer bottles with the LGCo logo made up the second largest group of marked beer bottles, although there were only nine of them. These were made by the Lindell Glass Co. from 1874 to 1892. A total of 77.9% of the LGCo bottles were in the ash layer, with an identical percentage (77.9%) in Levels 4 and 5. The average level for LGCo bottles was 4.5, for a range of 1870-1880.

IGCo and IGCOL

The only other two beer bottle manufacturer's marks found in the excavation were IGCo and IGCOL. Lockhart et al (2005c) identified the IGCo mark as being used by the Illinois Glass Co. between ca. 1880 and ca. 1915. Although Toulouse (1971:261) also attributed the logo to the Ihmsen Glass Co. (Pittsburgh), he was in error. Two of these bottles were found in Levels 4 and 5 (average of 4.3). The date range for that average (1873-1881) suggests that at least this group of IGCo beer bottles was made during the very early part of the 1880-1915 period.¹³

¹³ Two medicine bottles embossed with IGCo were found in Level 2, suggesting that they were used slightly later. Another example was unprovenanced.

A single export beer bottle with an IGC_oL basemark was excavated from Level 3 (1880-1887). Lockhart et al. (2005b) suggested that the logo was used by the Ihmsen Glass Co., Ltd., with a date range of 1878-1896 for the use of the mark. The Fort Riley example had two interesting characteristics (Figures FR67). First, the bottle had a sharp lower ring on the two-part finish.



Figure FR68 – IGC_oL basemark on export beer base



Figure FR69 – Typical IGC_oL basemark (Fort Laramie, Wyoming)

Second, the “G” in “IGC_oL” had a serif that extended to the right (Figure FR68). Typically, the “G” embossed on bottle bases (from at least five different glass

houses) had a serif extending to the left – although there were several other variations. With the

exception of the IGC_oL logo, all examples of the right-serif “G” we have found were on bottles made by glass houses located at or very near St. Louis (Lockhart 2011:39-40; Lockhart et al. 2011:40-41). Compare, for example, Figure FR68 with Figure FR70.

Most of the IGC_oL marks that we have found had both more traditional “Gs” and rounded lower rings on the two-part finishes (Figure FR69). This set of characteristics suggests that the IGC_oL bottles were produced during the ca. 1880-1890 (or later period) – fitting even closer with the dated level.



Figure FR67 – Bottle with IGC_oL on base



Figure FR70 – MGCo – earlier style

MGCo

The MGCo logos in the assemblage are broadly divided into two styles. One style of the logo was either embossed alone or had a one- or two-digit number below it (Figure FR70). The second always had an “A” above “MGCo” and a one- or two-digit number below the logo (Figure 71). Data



Figure FR71 – A / MGCo – later style (San Elizario, Texas)

from other sites (see Lockhart et al. 2007), suggest that the variation with the “A” above the logo was used later than the one without the letter. All six Fort Riley privy examples of the plain logo were found in Level 4 (1875-1884), half of them in the ash layer, half outside it. The two “A” variations were both in Level 3 (1880-1887). This supports the findings at other locations (e.g., Fort Bowie, Fort Stanton, etc.). All of these bottles were made by the Mississippi Glass Co. from its inception in 1873 to the major revision in 1885, when the plant ceased all bottle production and converted to flat glass manufacture.

Single-Letter or Single-Number Basemarks

One of the most interesting aspects of early export beer bottles (and a major focus in this venture for Lockhart) is the phenomenon of single letters or numbers (or occasional Roman numerals) embossed on the bases of export beer bottles – with no other manufacturer’s marks. The letters range from A to Z or numbers only into the double digits. Occasionally, these bottles had either Roman numerals or symbols (Figure FR72). Thus far, the BRG has *only* recorded such marks on export beer bottles with two-part finishes and sharp lower rings. In other words, these were made prior to 1882. We had earlier hypothesized that bottles – with only single letter or number basemarks – were made between ca. 1874 and ca. 1878.

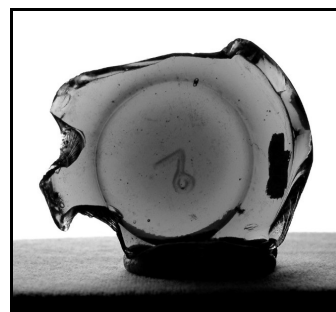


Figure FR72 – Symbol on export beer bottle base (San Elizario, Texas)



Figure FR73 – Export beer bottle base – 9

One of the biggest issues in determining how to place these bottles in a chronology has been the lack of a controlled provenience – until now. A total of 25 bottles with eight single letters (A, B, E, F, G, O, Y, and Z), one with a Roman numeral (IX or XI), and four with numbers (5, 6 or 9, 8, and 15) were excavated from the privy, with an average depth of Level 4.4 or a date range of 1872-1880 (Figures FR73-FR76). This supports the 1874-1878 hypothesis. It is also worth noting that 80% of these bottles were found in Levels 4 and 5, and 84% were in the ash layer.

Since we know from historical sources that only four glass houses were manufacturing export beer bottles during the 1874-1878 period, these bottles must have been made by one of



Figure FR74 – Two-part finish of “9” base with sharp lower ring

them.¹⁴ Both the Chambers brothers and Cunningham & Ihmsen are unlikely choices as the maker, because both firms had been using their same logos for a half-dozen years or more prior to the beginning of the period. Equally unlikely was the Lindell Glass Co. We find numerous LGCo bottles with two-part finishes and sharp lower rings (as well as other early characteristics – such as the letter “G” with a serif extending to the right and an underlined, superscript “o” in “Co”).

The MGCo logo of the Mississippi Glass Co., however, is found predominantly

on export beer bottles with rounded lower rings on the two-part finishes, the “o” in “Co” in a normal position, and standard types of the letter “G.” The very few exceptions (sharp lower rings; superscript “o” in “Co”; right-extended-serif “G”) we have found are scarce to say the least. Lockhart et al. (2009) dated the MGCo mark ca. 1878-1884, based on export beer bottle data. The Mississippi Glass Co. is therefore the most likely candidate as the user of these single-letter, single-number, and symbol marks on export beer bottles.



Figure FR75 – Export beer bottle base – B (note poor fit of post-bottom)



Figure FR76 – Export beer bottle base – G (note right-extended serif)

There is, however, one small caution with this identification. We cannot entirely eliminate the William McCully factories as candidates for these early marks. An old glass blower told the story of the invention of the export beer bottle in an interview with the *National Glass Budget* (1909:4). According to the anonymous worker, the first bottles were blown at one of the McCully plants by John Nolan and Sebastian “Bostie” Urban in 1873. Although this report was given 36 years after the fact, the timing is correct, and it is the best identification we have.

¹⁴ While it is possible that an unknown glass house was manufacturing export beer bottles during this early period, it is highly unlikely that a firm large enough to produce the sample found at Fort Riley has escaped our notice in the huge assortment of historic sources we have examined.

It is possible, of course, that the unnamed blower mis-remembered the plant – which could have been Cunningham & Ihmsen. It is equally possible that the blower was correct, and McCully – who was doing quite well with other types of bottles – may simply have chosen not to follow up on the beer bottle trade. A more important reason to discount the McCully identification is that McCully used a series of marks as early as 1858 – all based on the full name of the firm or the “McC” initials. It seems unlikely that he would have used letters on beer bottles rather than one of his logos. Although McCully may not be entirely eliminated as a possibility, we consider the Mississippi Glass Co. to be a much more likely candidate.

The Railroad Connection

As noted above, the railroad reached Kansas City in 1895 and arrived at Fort Union the following year. We would thus expect the proximity of St. Louis to be reflected in the glass artifacts found in the privy – and this was, indeed, the case. In addition, during most of the period of the privy deposition, Pittsburgh was the capital of the glass container industry. We would, therefore, also expect a large percentage of bottles from this source – as was again correct.

We assessed these ideas in two ways. In the text above, we have made arguments that both the “C” and “T” logos were made by Pittsburgh factories and that single letter/single number export beer bottles were manufactured at a St. Louis plant (Mississippi Glass Co.). In our initial appraisal, we included both of the single-letter logos (C and T) with Pittsburgh and the beer bottles with St. Louis. The results went beyond our expectations. The St. Louis factories accounted for 65.8% of all the bottles in the sample, with 32.5% manufactured in Pittsburgh. Only two bottles (1.7%) were made elsewhere (Table 5).

To control for our assumptions, we revised the data to place both the “C” and “T” bottles and the single-letter/number export beer bottles in the “Other” category (Table 6). That increased the unknown or other group to 29.2% of the total assemblage. Even with this increase, however, 45.0% of the bottles were made in St. Louis, with 25.8% coming from Pittsburgh.

In both cases, we counted the five bottles made by the De Steiger Glass Co. (DSGCo) in with the St. Louis containers. Although not adjacent to St. Louis, La Salle was only ca. 200 miles northeast of the larger city; however, La Salle is located along the south bank of the Illinois

River – a tributary that flows into the Mississippi River just above St. Louis. The river provided fast and easy down-stream access to the St. Louis markets – especially the Anheuser-Busch brewery. Since De Steiger was a supplier for Anheuser-Busch, the beer bottles embossed “DSGCo” were almost certainly shipped to Fort Riley from St. Louis.

Using either method, there is clearly a bias in favor of the local market. It is logical that local bottlers of all types would have preferred the convenience of local containers. There is no question that such logic applies wholeheartedly to Anheuser-Busch. Adolphus Busch purchased bottles from the St. Louis glass houses until the brewery’s needs completely overran the local ability to produce. Even in the worst-case scenario posited above, almost half of all the Fort Riley containers were made in or near St. Louis.

Similarly, our results show that Pittsburgh was, indeed, the hub of U.S. bottle production – at least for containers used in Kansas. At least a one-quarter of the bottles found in the privy had Pittsburgh origins. The beer bottles (roughly half of the privy collection), of course, probably cycled their way through St. Louis via Anheuser-Busch. Nonetheless, Pittsburgh bottles comprise the second largest and only other significant bottle group – by location.

Conclusion

This study has provided a great deal of useful data for the identification and dating of several manufacturer’s marks on bottles. For example, this is the first time we have recorded the “LGCo” mark of the Lindell Glass Co. on flasks. Although the logo was used extensively on other container types, this expands our product knowledge of the firm.

We had previously hypothesized that the “T” logo was used by the Tibby Brothers, and the dates assigned to the privy level in which flasks and a bottle with the “T” logo were found fit the manufacturing period. This excavation also provided some of the few early variations of logos used by the Illinois Glass Co. Although the mark, itself, has been well documented, little has been previously discovered about these early variations.

For several years, the Bottle Research Group has been attempting to discover more about dates and identification of bottles and flasks embossed with the letter “C.” Although these containers have been reported in late 19th century contexts, this study provided a closer dating

Table 5 – Location of Firms and Number of Containers from the Privy

Manufacturer's Mark	Glass House Name	Location	N [%]
GW	Great Western Glass Co.	St. Louis	10
DSGCo*	De Steiger Glass Co.	La Salle, IL	5
IGCo**	Illinois Glass Co.	Alton, IL	13
LGCo	Lindell Glass Co.	St. Louis	15
MGCo	Mississippi Glass Co.	St. Louis	11
Single-letter-number beers	Mississippi Glass Co.	St. Louis	25
Total St. Louis			79 [65.8]
A&DHC (beer) [5]	A&DHChambers	Pittsburgh	7
ARBOGAST & CO.	Arbogast & Co.	Pittsburgh	1
C	Cunningham & Co.(?)	Pittsburgh	5
C&I	Cunningham & Ihmsen	Pittsburgh	13
IGCoL	Ihmsen Glass Co.	Pittsburgh	1
L&W	Lorenz & Wightman	Pittsburgh	1
W M°C & Co (or other marks)	Wm McCully & Co.	Pittsburgh	8
T	Tibby Brothers Glass Co.	Pittsburgh	3
Total Pittsburgh			39 [32.5]
SGCo	Southern Glass Co.	Louisville, KY	1
WHITNEY GLASS WORKS	Whitney Glass Works	Glassboro, NJ	1
Total Other Locations			2 [1.7]
Total of All Containers			120 [100.0]

* Although the De Steiger Glass Co. was somewhat northeast of St. Louis, it was comparatively close, and it was a beer bottle supplier for Anheuser-Busch at St. Louis. Thus, for practical purposes, the bottles originated at St. Louis.

** Alton was just across the Illinois border from St. Louis.

Table 6 – Location of Firms and Number of Containers from the Privy – Revised

Manufacturer's Mark	Glass House Name	Location	N [%]
GW	Great Western Glass Co.	St. Louis	10
DSGCo*	De Steiger Glass Co.	La Salle, IL	5
IGCo**	Illinois Glass Co.	Alton, IL	13
LGCo	Lindell Glass Co.	St. Louis	15
MGCo	Mississippi Glass Co.	St. Louis	11
Total St. Louis			54 [45.0]
A&DHC (beer) [5]	A&DHChambers	Pittsburgh	7
ARBOGAST & CO.	Arbogast & Co.	Pittsburgh	1
C&I	Cunningham & Ihmsen	Pittsburgh	13
IGCoL	Ihmsen Glass Co.	Pittsburgh	1
L&W	Lorenz & Wightman	Pittsburgh	1
W M ^c C & Co (or other marks)	Wm McCully & Co.	Pittsburgh	8
Total Pittsburgh			31 [25.8]
C	unknown	unknown	5
SGCo	Southern Glass Co.	Louisville, KY	1
Single-letter-number beers	unknown	unknown	25
T	unknown	unknown	3
WHITNEY GLASS WORKS	Whitney Glass Works	Glassboro, NJ	1
Total Other Locations			35 [29.2]
Total of All Containers			120 [100.0]

* Although the De Steiger Glass Co. was somewhat northeast of St. Louis, it was comparatively close, and it was a beer bottle supplier for Anheuser-Busch at St. Louis. Thus, for practical purposes, the bottles originated at St. Louis.

** Alton was just across the Illinois border from St. Louis.

range, leading to the first hypothesis for the maker of these bottles and flasks. Although we could not make a positive identification, we have discovered more about the “SDS” logo on the bases of U.S. Army Hospital Corp. bottles. We at least have a reasonable date range for future research.

The correspondence between dates for the use of manufacturer’s logos and projected level dates of the privy are very strong and consistent (see Tables 2 and 3). In most cases, the date range we have discovered for the logos fits entirely or mostly within the date range for the levels. In most others, there was a sufficient overlap to note that the logo dates were again good fits. In only a few cases were the logo dates just slightly outside the range of the level dates. In each of these exceptions, the bottles were just slightly older than the levels – probably because of curation of the ingredients within the bottles at the fort. In no case were the differences intuitively significant.

The method of using identified, carefully researched manufacturer’s marks to tightly date either discreet dumping episodes, excavation levels, or other archeological categories requires three conditions to work well. First, reliable date ranges for at least some of the logos *must* be available. Many dates from typical sources (e.g., Toulouse 1971) are unreliable and should be considered as approximates. Approximate date ranges are poor choices for establishing level dates. Only the latest and most well researched data should be employed (e.g., Lindsey 2012; von Mechow 2012; Whitten 2012).

Second, the greater the quantity of any specific mark, the more reliable the date range for a given level or discreet episode. Because of deposition lag or possible turbation, the use of a single example of a logo on a bottle is risky. A dozen bottles or base fragments with the same logo becomes much more reliable. Setting a scale of ranges for a series of levels also requires a fairly large number of bottles and/or bases. This method is thus more useable on privies and dumps than on sites with a limited number of bottles.

Finally, setting this type of scale requires a high level of knowledge about bottles and/or other glass artifacts. In the past, the assumption that a researcher could learn about bottle dating during a project was the norm. While this *can* be correct, the learning curve is very steep and requires dedication to detail. The less the personal knowledge of the researcher, the less likely the final scale is to be reasonably correct. Consult knowledgeable sources.

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