

The Origins and Life of the Export Beer Bottle

By Bill Lockhart

Virtually everyone is familiar with the export beer bottle, although most people who are not a part of either the collecting world or historical archaeologists may not know it by name. The familiar bottle is cylindrical, usually amber in color (although it may come in aqua or colorless forms), with straight sides and a “swelled” neck. The style has become so pervasive in American culture that even many of the non-returnable bottle styles are in export shape. But beer bottles have followed a long and varied path from their early development.

The Earliest Beer Bottles

British merchants shipped bottled beers, porters and ales to India (and certainly other colonies including those in North America) by the late 17th century. These companies also routinely exported the same items to the United States in the 18th and 19th centuries, as shown by American advertisements (Jones 1986a:18-19).

Ales, porters and non-carbonated beer were all probably bottled as soon as a good stopper (the cork) was discovered. The bubbles that we equate with beer were conspicuously absent in these brews, so they could be bottled and stored in thin-walled containers without the danger of gas leakage, explosion or breakage from internal pressure, or spoilage. In the earliest bottles, there was no specialization of shapes, so virtually any liquid may have been bottled in virtually any adequately sized container.

English “wine” bottles developed distinctive characteristics ca. 1740, and both “beer” and “wine” bottles were virtually identical, “squat” with a “square” body when viewed from the side. It is important to note, however, that these bottles could have contained practically any form of liquid that was inert (i.e., did not create a great deal of pressure, like carbonation), both alcoholic and non-alcoholic. These bottles were thin-walled and not made to withstand internal pressure. Beer and wine bottles began to assume distinctive individual shapes during the 1760s. Wine bottles became taller and more narrow, while beer bottles retained their squat, wide bodies (Jones 1986b: 13-14).

The initial size for beer bottles was the quart, but smaller sizes soon began to emerge. By the 1790s, the bottles became taller, but they were still noticeably shorter and squatter than contemporary wine bottles [Figure 1]. During this period, ales and porters were the standard in North America (Jones 1896a:74-79). Although many of these bottles were free blown, more and more were made with the dip mold process, where an open wooden mold was used to form the body shape, but the shoulder, neck and finish were completed by hand. This was followed by the Rickett’s mold that added two hinged sections at the top to form the shoulders and some of the neck (Jones 1986a:87-89). Jones (1986:131) also observes that “bottles were getting progressively taller and narrower; the necks shorter and wider.” By the 1835-1855 period, the type of finish used on later beer bottles was developing (cf. Jones 1986:69-71). But three more developments were necessary before the stage could be set for the invention of the export beer bottle.

Two-Piece Molds

The earliest two-piece mold was hinged at the base to allow the preformed shape on the end of the gaffer’s blowpipe to fit within the two halves [Figure 2]. The bottle was then blown into the mold, the mold opened and the bottle, complete except for the finish, was removed. Although the process was used in the U.S. by about 1810, by the mid-19th century, post bottoms were inserted at the base of the mold to make a third piece. The molds became hinged at the sides for easier working, and bottle-makers’ initials or entire names could easily be embossed on the post bottom (Jones & Sullivan 1989:26-28). A cup bottom was also developed but was used much earlier in small bottles. Large bottles, such as beer bottles were usually blown into post-bottom molds until the last decade of the 19th century.

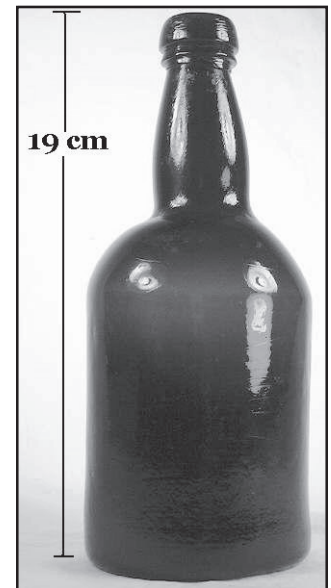
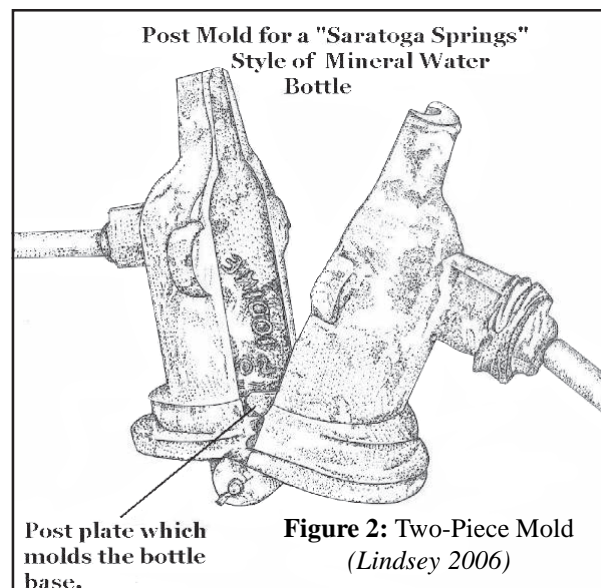


Figure 1: English “Beer” Bottle
(Lindsey 2006)

Turn-Molds or Paste-Molds

In this process, a two-piece mold, usually with a post or cup bottom, was smeared with a special “paste” that coated the entire inside. A bottle was blown into the mold and turned around to eliminate all mold lines. According to Jones and Sullivan (1989:31) and Toulouse (1969:532), the technique was introduced to the U.S. “in the 1880s,” although patents were made in the 1870s. French champagne bottles, however, were made by the turn-mold method at least as early as 1865 (Switzer 1974:23-25). Although this process was not commonly used on beer bottles (much more common on wine, champagne, and some whiskey bottles), some were made with turn-molds.

Some turn-mold bottles, however, have embossed bases. Toulouse (1971:153) and Ayres and his associates (1980:47) note that this was apparently accomplished by blowing the glass into the



mold, turning the mold to remove the lines, then re-inserting the bottle into a mold (possibly a dip mold) to create the embossing. The Bottle Research Group recorded a single turn-mold bottle made by the Hermann Heye Glasfabrik in the collection excavated at Fort Bowie, Arizona.

Champagne Bottles

Jones (1986a:11-13) demonstrated that “champagne” bottles were made by at least 1762 (and almost certainly earlier), but she cautioned that “there is absolutely no evidence to suggest that the ‘champagne’ bottles were intended exclusively for champagne or that they had the long sloping shoulder and high bell-shaped pushups so characteristic of the 19th century champagne-type bottles” [Figure 3].

Ceramic Ale and Porter Bottles

Ale and Porter were bottled in the United States from at least 1844, usually in cork-stoppered, ceramic bottles. These bottles were generally discontinued after 1895 (Graci 1995:14), but some were still in use as soft drink bottles until at least the mid-1920s (cf. Lockhart 2000). For practical purposes, however, the ceramic containers became a dead end before the turn of the century.

Early Effervescent Beer Bottles

The Advent of Lager Beer

In the 1840s, John Wagner introduced lager beer to the U.S. in Philadelphia. Unlike the earlier brews, lager beer was “an effervescent malt beverage...brewed by using bottom-fermentation.” The beer is characterized by such terms as “light” and “sparkling” (Downard 1980:106). By 1860, half the beer made in America was lager, and it had become the country’s unsurpassed favorite by the Civil War (Yenne 1995:27-28). Unfortunately, this lighter, sparkling beer had negative side – unlike its darker and heavier predecessors, it quickly turned sour and spoiled (Wilson 1881:1).

As a result, prior to the application of pasteurization, the production of carbonated beer in the U.S. was a local industry. Beer could be shipped in kegs and barrels, but bottled beer tended to spoil in short order. Locally, most people just took their beer home in a bucket. This bucket eventually was called a “growler,” although the reason for that name seems to be lost to history. The act of taking the beer home in this manner was called “rushing the growler” (Quinion 2003). Shipping beer for long distances remained impractical.

Plavchan (1969:71) captured the essence of the situation:

Selling beer in bottles was not a novelty of the nineteenth century. Bottles were in use by brewers as far back as the eighteenth century, but their bottled beers and ales either were non-sparkling as well as possessing a thick consistency or were prepared for immediate consumption. Prior to 1872 no one had ever successfully bottled a sparkling lager beer that could keep its full quality through different climatic changes and the hazards of long-distant shipment.

But that was about to change.

Pasteurization and Bottling

Louis Pasteur discovered that a sufficient amount of heat could destroy harmful bacteria in liquids. He applied his discovery to beer in 1870. Although he did not publish his findings until 1877, some brewers learned of his method and began to utilize it (Plavchan 1969:67-69). The most important of those brewers in the United States was Anheuser-Busch.

Anheuser-Busch was successful in part because of a willingness to innovate. One of the company’s most important innovations was the adaptation of the pasteurization process to beer in 1872, when the company shipped bottled beer to several Texas towns (Hernon & Ganey 1991:30-31; Plavchan 1969:70; Wilson 1981:1).¹ Once beer was pasteurized, it could be stored for a long time and shipped in bottles for a great distance. This meant that the local brewery with its reliance on keg-contained, draught beer was to become less important.

Of more interest in bottle dating, this marks the beginning of available, nation-wide bottled beer. The *Year Book* (1882:92) noted that Anheuser-Busch was:

the first . . . to introduce bottled beer into the United States, and which, unknown a dozen years ago, is now kept in every grocery store, hotel and liquor house, and in nearly every family in the country. The creation of the trade has practically destroyed the importation of English and German bottled beer and ales, it has certainly reduced it by fully seventy-five per cent.

Anheuser-Busch’s First Beer Bottle

Adolphus Busch, the driving force behind Anheuser-Busch by 1872, had a problem. He had successfully adapted the Pasteurization process to brewing and he could now ship his beer virtually anywhere. For the first time in history, bottled lager beer, with its effervescence, could be bottled. But what container could he use?

The older, English beer bottles described above were too thin-walled to withstand the pressure of the carbonation in lager beer. The ceramic bottles used for centuries to contain ale and porter were too porous – the gas would leak through the walls of the container. Glass was the obvious answer, but there was no time to create a new bottle. Busch needed a source of cheap, available containers.

Only three types of bottles were made in 1872 that would withstand the pressure of carbonation. Bottles for carbonated soda had been used for decades, and these could certainly have contained beer. A variety of glass factories in the U.S. made the bottles, but they were relatively small, holding six or seven ounces. Although we may never know for sure, we can guess that Busch, a heavy beer drinker himself, wanted a larger size.

Another possibility was champagne bottles. Made to contain sparkling wine, the bottles had thick walls and a deep kick-up to withstand strong internal pressure. There is no evidence that Busch ever used champagne bottles, although they were eventually used by other breweries [Figure 4]. One final possibility existed: bottles made for naturally

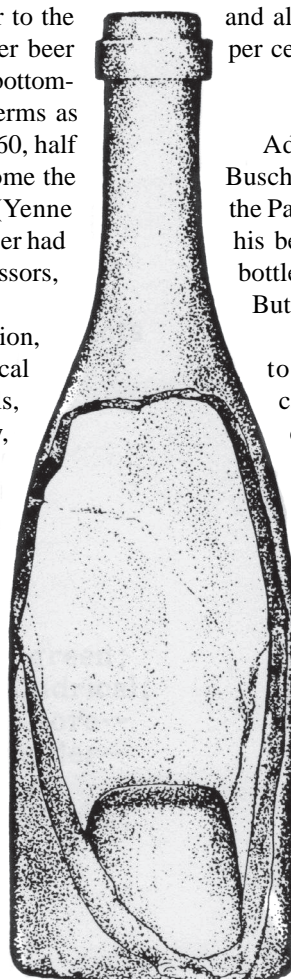


Figure 3: Champagne Bottle Showing Kick-Up (Berge 1980:91)

carbonated spring water. Since most mineral water was inert, choices within this realm were also few.

Apollinaris Bottles

Unfortunately, we have no documentary evidence for Busch's choice. However, a great deal of empirical data (see below) indicate that he selected Apollinaris bottles for his earliest bottling. These bottles were usually a light green (champagne green) in color, had steeply sloping shoulders, and were topped with "blob" finishes. These were generally made with the turn-mold process and, although they came in numerous sizes, the ones used for beer had a capacity of ca. 26 ounces [Figure 5]. As their name implies, they were developed to contain the naturally sparkling water from the Apollinaris Spring in Germany. The bottles were originally made in Germany, but American companies soon carried their own version of the style.

Because of their size, color and gently sloping shoulders, these are easily mistaken for champagne bottles. The manufacture of both styles by the turn-mold method adds to the confusion. Two characteristics, however, clearly define the two styles. First is the finish. The finish of a champagne bottle is made by rounding the lip (i.e., the very top of the finish), often with a distinct chamfer, then wrapping a bead of glass around the neck slightly below the top and squaring the bead. The Apollinaris bottle, on the other hand, has a "blob" of glass applied to the top [Figure 6].

The remaining characteristic is on the other end. Champagne bottles have a very deep kick-up in the center of the base. Originally, these may have been produced to create a level resting point when the bottles were free blown. Kick-ups also serve to reduce the internal capacity of the bottle – while giving the appearance that the bottle holds considerably more. The base of an Apollinaris bottle, however, is flat with a small "dot" in the center. The dot is created by the turning of the bottle within the mold [Figure 7].

We can speculate that Busch found a cheap, available source for Apollinaris bottles in 1872. As was common during that era, they may have arrived in one of the Eastern ports as ballast on a ship. Transportation via railroad would have brought them easily into St. Louis, where Anheuser-Busch bottled beer in them and shipped them to remote sites such as the Southwest, South America, and other distant locations.

Wilson (1981:2), unfortunately, called the bottles "lager beer bottles" almost certainly because of labels he found on the bottles [Figure 8]. Wilson (1981:3) noted that "no labels other than ST. LOUIS LAGER BEER, made by the Anheuser-Busch Brewing Association and dating between 1879 and 1883, were found on bottles of this style at either Fort Union or Fort Laramie." When the Bottle Research Group examined the bottles excavated at Fort Bowie, we also found Apollinaris bottles with partial labels for St. Louis Beer – but no other labels on that style bottle.

Wilson's choice of terminology was unfortunate and misleading. According to Lindsey (2006), "lager," "champagne," and "select" were all names used by various manufacturers for essentially the same style of beer bottles. However, there was an extremely wide range of variation within each style. Lindsey dates the bottles "from at least the late 1870s continuously up to the



Figure 4: Champagne bottle used in a beer ad. (Bill Lindsey Collection)

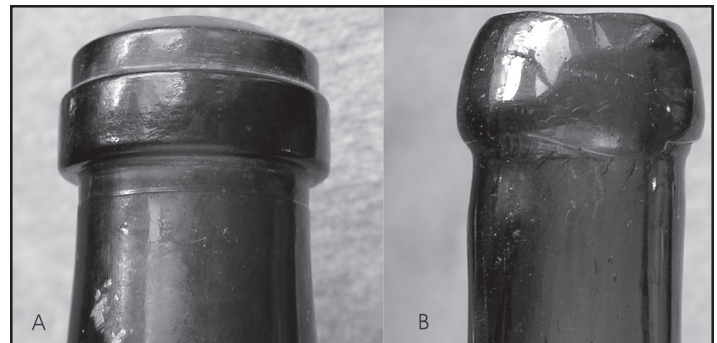


Figure 6: Champagne (a) and Apollinaris (b) finishes.

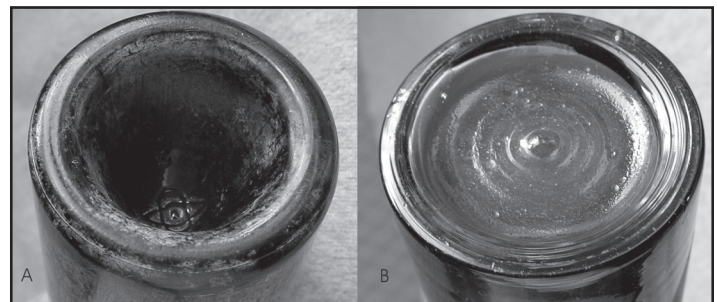


Figure 7: Champagne (a) and Apollinaris (b) bases.



Figure 8: Apollinaris bottle with Anheuser-Busch St. Louis beer label (Wilson 1981:3)

present day." Ayers et al (1980:25) noted that the "'champagne beer' form" is similar to soda and Apollinaris-style bottles pictured in glass house catalogs and thus could have held soda or mineral water instead of beer. They also measured the capacity of "champagne beer" bottles as ranging from 16 to 26 ounces. The Lindsey and Ayres discussions, however, do not refer to the same style named by Wilson [Figure 9].

In addition to the presence of St. Louis beer labels on Apollinaris bottles, the bottles, themselves, are typically found in association with export beer bottles in the Southwest. Lockhart and Olszewski (1994) found fragments with export bottles in San Elizario, Texas, in ca. 1881-1886 contexts; the Bottle Research Group observed complete Apollinaris bottles, ones with St. Louis Beer labels, and fragments in both

752 ILLINOIS GLASS COMPANY

QUART CHAMPAGNE BEERS.
GREEN, AMBER OR FLINT.
MOULD No. 1.
ROUND NAME PLATE.
Lettered on Back, "This Bottle Not to be Sold."
Height about 11 3/4 inches.
Width " 7 1/2 "
Capacity " 26 ounces.
Weight " 36 "

Any Finish Desired.


QUART CHAMPAGNE BEER.
MOULD No. 1.
ROUND NAME PLATE.
PLAIN BACK.
Height about 12 1/4 inches.
Width " 7 1/2 "
Capacity " 26 ounces.
Weight " 36 "

QUART CHAMPAGNE BEER.
MOULD No. 14.
ROUND NAME PLATE.
Lettered on Back as per cut.
Height about 12 3/4 inches.
Width " 7 1/2 "
Capacity " 28 ounces.
Weight " 38 "


QUART CHAMPAGNE BEER.
MOULD No. 14 1/2.
ROUND NAME PLATE.
PLAIN BACK.
Lettered below Name Plate as per cut.
Height about 11 3/4 inches.
Width " 7 1/2 "
Capacity " 30 ounces.
Weight " 38 "

All bottles listed on this page finished for Cork, Baltimore Seal, Crown Seal, or Lightning Stopper.


NET PRICES ON APPLICATION.




Mould No. 12.



Mould No. 13.



Mould No. 14.



No. 14 1/2.

N.B. ALL DIMENSIONS GIVEN ON THIS PAGE ARE APPROXIMATE ONLY. GET SAMPLE FOR ACCURACY.

250 ILLINOIS GLASS COMPANY

EXPORT BEERS.
GREEN OR AMBER GLASS.
Mould No. 57 1/2, Two Finishes. Capacity Sample Beer.

PINTS, No. 75.	
Height	about 9 1/2 inches.
Width	" 7 1/2 "
Capacity	" 17 ounces.
Weight	" 15 "
Round Name Plate. Plain Back.	
PINTS, No. 75A.	
Height	about 9 inches.
Width	" 7 1/2 "
Capacity	" 11 ounces.
Weight	" 18 "
Round Name Plate. Plain Back.	
PINTS, No. 75B.	
Height	about 9 1/2 inches.
Width	" 7 1/2 "
Capacity	" 11 ounces.
Weight	" 18 "
Round Name Plate. Plain Back.	
MOULD No. 75 1/2.	
HALF PINT, PLAIN BACK.	
Height	about 7 1/2 inches.
Width	" 5 1/2 "
Capacity	" 8 1/2 ounces.
Weight	" 12 "
Long Vertical Plate. Plain Back.	
FULL PINTS, No. 76 1/2.	
Height	about 9 1/2 inches.
Width	" 7 1/2 "
Capacity	" 16 ounces.
Weight	" 18 "
Round Name Plate. Plain Back.	

No. List Plates on Report Beers. Sold on net prices only, according to size, weight and plate of delivery which will be gladly furnished on application.

All sizes listed on this page possess the general style of cut above with vari- ations too slight to be shown in an engraving of this cut.

N.B. ALL DIMENSIONS GIVEN ON THIS PAGE ARE APPROXIMATE ONLY. GET SAMPLE FOR ACCURACY.

ILLINOIS GLASS COMPANY, CHICAGO, ILL.

QUARTS, No. 78.
TURN MOULD.
Height about 11 1/2 inches.
Width " 7 1/2 "
Capacity " 20 ounces.
Weight " 28 "

QUARTS, No. 78 1/2.
TURN MOULD.
Height about 11 1/2 inches.
Width " 7 1/2 "
Capacity " 20 ounces.
Weight " 28 "

Round Name Plate. Plain Back.

QUARTS, No. 78 1/2.
TURN MOULD.
Height about 11 1/2 inches.
Width " 7 1/2 "
Capacity " 20 ounces.
Weight " 28 "


Round Name Plate. Plain Back.

All Sizes of Report Beers can be Finished for Cork, Baltimore Seal, Crown Cork or Lightning Stoppers. Engraved Colors can be Furnished on special Order.

ILLINOIS GLASS COMPANY

APOLLINARIS BOTTLES.
PLAIN TURN MOULD.
PINTS, MOULD No. 25.

Height	about 12 1/4 inches.
Width	" 7 1/2 "
Capacity	" 16 ounces.
Weight	" 16 "
QUARTS, MOULD No. 21.	
Height	about 11 3/4 inches.
Width	" 7 1/2 "
Capacity	" 12 ounces.
Weight	" 12 "
FULL MEASURE QUARTS, MOULD No. 21 1/2.	
Height	about 11 3/4 inches.
Width	" 7 1/2 "
Capacity	" 12 ounces.
Weight	" 12 "
FULL MEASURE QUARTS, MOULD No. 21A.	
Height	about 11 3/4 inches.
Width	" 7 1/2 "
Capacity	" 12 ounces.
Weight	" 12 "
Round Name Plate. Plain Back.	



Apollinaris.

LETTERED PINTS, MOULD No. 25 1/2.
ROUND PLATE. PLAIN BACK.
Height about 11 3/4 inches.
Width " 7 1/2 "
Capacity " 12 ounces.
Weight " 12 "

LETTERED QUARTS, MOULD No. 21.
ROUND PLATE. PLAIN BACK.
Height about 11 3/4 inches.
Width " 7 1/2 "
Capacity " 12 ounces.
Weight " 12 "


HALF GALLONS, PLAIN TURN MOULD No. 24.
HALF GALLONS, ROUND NAME PLATE No. 24A.
Height about 15 1/2 inches.
Width " 8 1/2 "
Capacity " 41 ounces.
Weight " 36 "

GALLONS, TURN MOULD No. 23 1/2.
Height about 17 1/2 inches.
Width " 8 1/2 "
Capacity " 82 ounces.
Weight " 40 "

Made in Green, Amber, Flint or Imperial Color of special net prices. All Apollinaris Bottles finished for Cork, Baltimore Seal, Crown Cork or Lightning Stoppers, as directed.

QUART CHAMPAGNE BEER. MOULD No. 8.
ROUND NAME PLATE. PLAIN BACK.
Height 11 3/4 inches. Width 7 1/2 inches.
Capacity 28 ounces. Weight 38 ounces.

Green, Amber or Flint Glass. Any finish desired.



No. 8.

ILLINOIS GLASS COMPANY, CHICAGO, ILL.

Figure 9: "Champagne" Beer Bottles (Illinois Glass Co. 1906:253)

Figure 10: Apollinaris Bottles Advertised in Beer Section (Illinois Glass Co. 1906:250-251)

the collection from Fort Bowie and at the main dump at the fort, itself, (1862-1894); Wilson (1981) reported and illustrated Apollinaris bottles with St. Louis beer labels at Fort Union and Fort Laramie (1863-1891); Lockhart (2007) discovered fragments at the beer dumps at Fort Stanton, almost all in early 1880s contexts; and Dello-Ruso (1998) excavated fragments in the area around the Illinois Brewery in Socorro, New Mexico (ca. 1882-1918). Normally, Apollinaris bottles comprise a tiny percentage of the identified beer bottles in these assemblages. For example, the San Elizario beer bottle pit only contained 2.7% of Apollinaris finishes (6 of 225 finishes). As a final piece of evidence, the Illinois Glass Co (1906:250-251) listed Apollinaris bottles in its beer bottle section – not in the section for soda and mineral waters [Figure 10].

The above evidence suggests two conclusions. First, Apollinaris bottles were used by Anheuser-Busch for St. Louis Lager Beer, and these were the initial bottles used for beer after the initiation of the Pasteurization process in 1872. It should also be noted in this connection that no champagne or soda bottles or fragments from those bottles were found at Socorro, San Elizario or the beer bottle dumps at Fort Stanton, although Apollinaris bottle fragments were found alongside export beer bottle fragments in all three places. Second, the very small percentages of Apollinaris bottles found on these sites indicate that

Anheuser-Busch was phasing out the use of that style. It is clear from labeled bottles in collections and those offered on eBay that Anheuser-Busch adopted the export beer bottle very early, probably soon after its invention in 1873. Busch probably continued to use the supply (see returnable bottle section below) until all the Apollinaris bottles were broken or worn beyond reuse.

Returnable Beer Bottles and Transportation

In general, beer bottle development followed two different regional patterns in the United States. The Midwest, South and East Coast states tended toward three major beer bottle styles: Weiss Beer, Champagne Beer, and Select. Although these styles received *some* use in the West, the typical styles west of the Mississippi were export and Apollinaris bottles, mostly the export style. Another major difference between the two regions was the method of labeling. The eastern region maintained a heavy reliance on embossed bottles, while the West preferred paper labels. There were, of course, notable exceptions in both areas.

This regional split developed, in part, as a result of the need for returnable bottles. Paul & Parmelee (1973:25) demonstrated the importance of returnable bottles for the soda bottling industry. The same situation applied with beer bottles. Because thick-walled bottles were so expensive to produce, returnable bottles were the best answer. A

bottle could now be reused at least a dozen times, often many more. The problem, of course, was collecting the bottles, and the process that led to the adoption of the deposit system has already been addressed.

The majority of the differences in labeling (and style to a certain extent) were caused by transportation difficulties (or lack thereof). The Eastern half of the country was generally easy to reach via the railroad and various forms of transportation connected with water (canals, lakes, rivers, and the ocean). Much of the West, however, was remote with no rail connection. Even though local breweries continued to supply the West, Anheuser-Busch and other central brewers exported their products to the Western territories as much as was practical.

Essentially, however, returnable bottles in remote areas became one-way containers. The sheer quantity of beer bottles excavated at Western military posts, for example, clearly shows that the bottles were not returned (e.g, Wilson 1981) although this segment of history (at least in connection with beer bottles) is virtually unexplored in print. Because of the vast distances involved, remoteness of both towns and mining camps, and a general lack of understanding among beer drinkers, many (possibly most) beer bottles were discarded (or sometimes returned to local breweries) rather than returned to the St. Louis and Milwaukee brewers. Breweries were more inclined to risk the more-or-less certain loss

of generic bottles with paper labels than the more expensive embossed bottles. The export beer bottle became ubiquitous in the West.

The Export Beer Bottle

The export beer bottle was designed by Valentine Blatz, Milwaukee, Wisconsin, in 1873. The William McCully factory² produced six gross (72-dozen) bottles the first year for Blatz. The bottles were made from “green glass” (i.e., aqua) with “Valentine Blatz Brewery, Milwaukee, Wis.” embossed diagonally across the body. Two gaffers, John Nolan and Sebastian “Bostie” Urban, actually blew all of the first order of bottles (*National Glass Budget* 1909:4).

In “less than three years” (i.e., by 1875 or 1876), export-style bottles were popular in the West. The bottles were next adopted by the Philip Best brewery and then by Anheuser Busch. Schlitz and Lemp soon joined the trend, followed by virtually every major brewery. By 1874, the Lindell Glass Co. and the Mississippi Glass Co. (both in St. Louis) had been built and were exclusively making export-style beer bottles. The DeSteiger Glass Co., La Salle, Illinois, followed suit in 1878, and the Streator Bottle & Glass Co., Streator, Illinois, began in 1881. All initially only made beer bottles (*National Glass Budget* 1909:4). The bottle style continued to gain popularity, and the export beer remains the most popular style in the 21st century.

The name, export, probably derived from the major exporting business conducted by the St. Louis breweries after the Pasteurization process was perfected for brewery use by Anheuser Busch in 1872. According to the *Year Book* (1882:90), “the product was shipped for consumption all over the West and South, from Northern Colorado through Kansas, Texas, Arkansas, and the South generally.” The *Year Book* (1882:91) further noted:

there is a large export bottling business done...St. Louis bottled beer of the Anheuser-Busch Brewing Association, W. J. Lemp, and others, going to all the Eastern States, to Brazil, Chili, Peru, Mexico, the Cape of Good Hope, China, Japan, Sandwich Islands, Australia, Spain, France, England, Canada, and the West Indies.”

In discussing the bottling department of the Western Brewery (W. J. Lemp), the *Year Book* (1882:93) noted that “the amount they ship to the West and Southwest is enormous.” Since most of the Western states were still territories at that time, they were probably included as “exports.” That would explain the propensity toward the export-style bottles in the West and the selection of the name for the bottle style.

The original exports were the classic quart beer bottles (actually measuring a surprisingly consistent 26 ounces). Although the bottles were available in other sizes, the “quart” is by far the most common size found in the West. The base of the bottle was flat (or slightly concave) and the body had vertical sides and a rounded shoulder topped by a swelled neck (often claimed as a way to deal with foam). Finishes varied and are described below. This was the most common beer bottle style in the West from the mid-1870s until 8- and 12-ounce bottles became popular about 1910 [Figure 11]. The 26-ounce size was gradually discontinued, but such bottles were used until at least 1913.

These bottles were usually amber in color, although some were made in green or a light blue. The earliest ones were produced in a post-bottom, two-piece mold, but some were made by the turn-mold process. By the mid-1870s, a few companies had begun



Figure 11: Examples of classic export beer bottles.



Figure 12: Wine bottle evolution (McKearin & McKearin 1941:423-425)

embossing manufacturer’s marks on the bases of the export bottles, but the practice did not become common until ca. 1880.

Although we have found no documentary evidence, the export beer bottles were probably the stylistic descendant of both the English beer bottle described above and the classic wine bottle. George and Helen McKearin (1941:423-425) traced the evolution of “Wine or Spirit Bottles Showing Gradual Developments in Form or Shape From About 1650 to About 1865-1875, When Form Became Almost Identical With That of Modern Bottles” [Figure 12]. Their final style is remarkably similar to the export-style beer bottle even to the two-part “brandy” finish (although the swelled neck is absent).

Ivor Noël Hume (1970:63-68) presented a similar study based on bottles excavated at Williamsburg, Virginia. His study extended

from 1652 to 1834 and did not include date ranges as did the McKearins. His final bottle again showed a close resemblance to the export-style container (again including the finish) but had a higher kick-up and lacked the swelling of the neck [Figure 13]. In both studies, the finish developed into a close resemblance of the early export beer finish. The swelled neck was an expanded variation on a slightly swelled neck of the old English beer bottle, but the overall shape of the export bottles more closely resembled the thinner, taller wine container.

Datable Changes

As with all things made by humans, the export beer bottle evolved over time. In more recent times, the evolution has been more refined to include such things as improved glass formulas (e.g., the Duraglas process developed by the Owens-Illinois Glass Co. and first used on returnable bottles in 1940). The style even intruded into the development of the non-returnable beer bottle. Early changes, however, took fairly notable forms.

Manufacturing Techniques

Although not specifically noted above, the first export beer bottles were made by the two-piece mold technique (described earlier) in 1873. Bottles continued to be produced this way until Prohibition, when most manufacture of bottles for alcohol ceased. By ca. 1913, however, virtually all the major glass factories had adopted either semiautomatic or fully automatic machines. The turn-mold technology was only used by American factories for a short time – on export bottles. However, Hermann Heye, the Germany manufacturer, made turn-mold export bottles at least into the 1880s. Another infrequent style was the dip mold (discussed above). Like the turn mold, the few dip-mold bottles were probably only made during the first few years of export beer bottle manufacture.

The final stage of manufacture was the machine-made bottle. These fall into roughly two categories: the Owens Automatic Bottle Machine and the semiautomatic. The Owens story had been told many times, but the important date for beer bottles is 1905, when the American Bottle Co. began production using the Owens machine. American had the exclusive license from the Owens Bottle Machine Co. and dominated the market (Lockhart et al., 2007:47, 49). However, other companies were developing semiautomatic machines to make small-mouth bottles, and most beer bottle manufacturers had made the switch by ca. 1913. By 1917, gob feeders had made virtually all semiautomatic machines fully automatic. All beer bottles made after the repeal of Prohibition (1933) were manufactured by fully automatic machines.

Stoppers and Finishes

The export beer bottle went through a varied evolution from its invention in 1872, mostly revolving around finishes. Two relatively datable characteristics about finishes were the types of finishes and the manufacturing techniques required to make them. The finish types, of course, were designated by the type of stopper used to seal the bottles.

Cork Stoppers

Initially, virtually all beer bottles were stoppered with corks. Corks were chosen because they were pliable and sealed effectively. However, there were two problems with using cork stoppers for

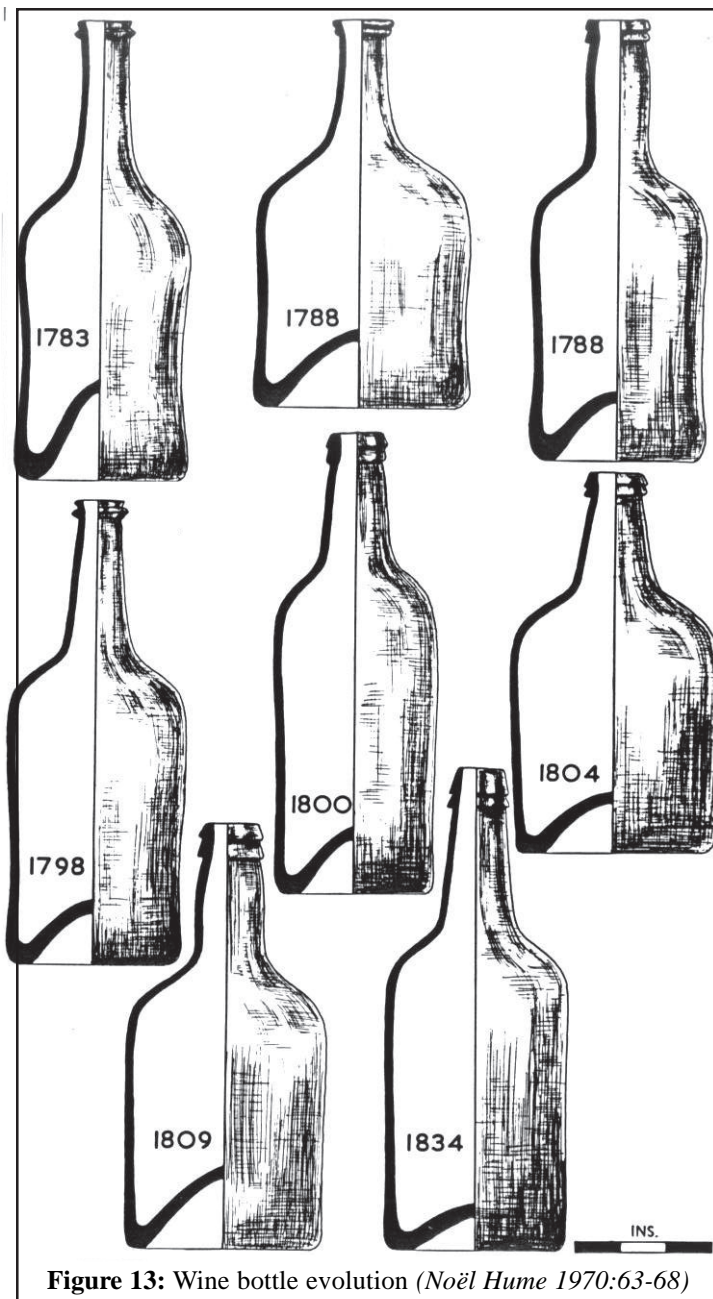


Figure 13: Wine bottle evolution (Noël Hume 1970:63-68)

carbonated beverages such as beer. First, corks only sealed reliably when they were damp. Dry corks would allow carbonation to escape, creating flat beer. Because beer was not generally aged in the bottle, however, this did not usually present a major problem. Second, corks had a tendency to work loose under pressure. Because carbonation created fairly extreme pressure, corks used in beer bottles had to be firmly held in place (Paul & Parmalee 1973:10; von Meechow 2002). Several finishes were devised as foundations to tie in the corks. In contrast to soda bottle finishes, usually one part, these were two part finishes, generally with an applied (or tooled) ring below an upwardly-tapered section. The one-part beer finish was actually devised and intended for the Lightning Stopper (see below). Corks, of course, could be applied to virtually any finish type, including crowns and similar finishes (e.g., see Jones & Sullivan 1989:149).

Two-part finishes designed for corks went through two datable stages, although there was a great deal of non-datable variety. The important differences were sharp lower rings and rounded lower rings. Although sharp lower rings could either be

downwardly flared or wedge shaped, the Bottle Research Group has found no temporal distinctions between them. However, all bottles with sharp lower rings appear to have been made during the first decade that the export beer bottle existed [Figure 14]. Manufacturers seem to have rather sharply dropped the sharp lower ring ca. 1880, although some were made and used for a few years afterward. Although we are less certain about a starting date for the use of rounded lower rings [Figure 15], the date is probably not earlier than ca. 1878. The end date is equally unsure, but they were almost entirely replaced by crown finishes by 1913.

Lightning Stoppers

One of the earliest alternatives to the cork, the Putnam Stopper, was patented by Henry W. Putnam on March 15, 1859, and was mostly used on fruit and other jars prior to the need for a good beer closure. Sometimes referred to as “swing” stoppers, these use a plug to seal the bore of the bottle (or jar). The plug is held in place by a wire device that swings the stopper up and to one side when the wire triggering device is pushed upward. Charles De Quillfeldt’s Lightning Stopper [Figure 16], patented on January 5, 1875, adapted the principle to beer bottles (Graci 2003:58-59; Paul & Parmalee 1973:14; von Meechow 2002).

Another aspect of the Lightning stopper that has been generally ignored in the literature is the shape of the finish. Although a few finishes were made with holes for the insertion of wire ends, most used a circular wire arrangement under the finish to hold the entire device in place. An examination of ads and photos of bottles still containing the stoppers shows the finishes were one part, either rounded [Figure 17] or upwardly tapered in shape (e.g., see Graci 2003:56, 59, plates following p. 61; Martin & Martin 1973). Although they did not specifically illustrate the difference, the 1903 Illinois Glass Co. catalog made a clear distinction between Lightning and cork finishes. Lightning stoppers would work on the two-part cork finishes and even crown finishes (see below), but the finish actually designed for the Lightning stopper was one part. These finishes appeared on beer bottles from 1875 to ca. 1913, although some are still used.

Porcelain Stoppers

Known as the Hutter Stopper, after its inventor, Karl Hutter (patented February 7, 1893), the porcelain adaptation of the original Lightning Stopper became fairly popular with beer bottlers [Figure 18]. Along with the same advantages of the Lightning Stopper, the porcelain stopper allowed for printed advertising appearing on the very top of the bottle (von Meechow 2002). Hutter stoppers were used on the same one-part finishes made for Lightning stoppers.

Hutchinson Stoppers

Although Hutchinson stoppers [Figure 19] were more popular when applied to soft drinks than with beer, they were used by brewers from about 1880 to the early 20th century. Patented by William H. Hutchinson on April 4, 1879, they were not in use until the following year. They were generally replaced by crown-capped bottles ca. 1903, although they continued to appear in glass house catalogs until at least 1920. It is doubtful, however, that many brewers continued to use Hutchinson stoppers for long after crown caps became popular. The main disadvantage to these and all internal stoppers was difficulty in washing the bottles since a brush could not be inserted. The main advantage was that the



Figure 14: Two-Part cork finish, sharp lower ring (eBay)



Figure 15: Two-part cork finish, rounded lower ring

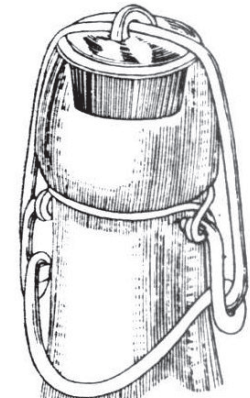
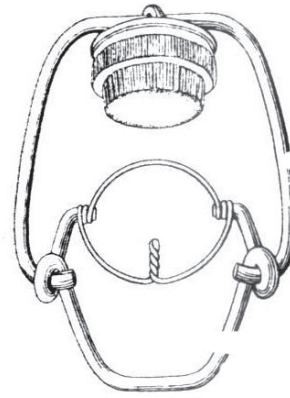


Figure 16: Lightning stopper (Lief 1965:16)



Figure 17: One-part finish for Lightning stopper



Figure 18: Hutter stopper (Graci 2003)

bottle could easily be re-sealed and re-opened as often as necessary. (Lief 1965:14; Paul & Parmalee 1973:12-13, 16-17; von Meechow)

Other Stoppers

Although a bewildering variety of stoppers were patented in the late 19th century, few others became popular among either brewers or soda bottlers. For more information on these alternatives, see Graci (2003:11-47), Lief (1965:15-16), Paul & Parmalee (1973:10-12), and von Meechow (2002).



Figure 19: Hutchinson stopper
(Lynn Loomis Collection)



Figure 20: Crown finish

Crown Cap

Patented by William Painter on February 2, 1892, the crown cap and accompanying finish [Figure 20] was to revolutionize the returnable bottle industry. Both soda bottlers and breweries adopted the crown as the major stopper, although the soft

drink industry began using the new form as early as 1895, and most had switched by 1905. Some brewers switched before the 20th century, but most of the beer industry did not generally adopt the crown as the standard until the early 1900s, and many of the largest only made the switch about 1910 (the date of the earliest Budwieser ad that I have found that offered both cork and crown bottles).³ The transition continued until at least 1913 (Ayers et al 1980:53; Berge 1980:115; Graci 2003:50-54).

Finish Technology⁴

Applied finishes were created by applying a separate gob of glass to the bottle's neck and shaping it into the desired form. This technique was used from the early 1800s until about 1895, although most glass houses had stopped using the process by ca. 1885. Glass makers switched to the newer technique (see below) at different times for different bottle types. Glass houses making export beer bottles tended to retain the technique until sometime between 1896 and 1900 (Lindsey 2006; Lockhart 2007).

Often, it is easy to recognize these finishes because some of the added glass is not completely used in the form and is not blended into the rest of the bottle (see Figure 15). Often, however, a visual determination is inadequate, but you can perform a simple test. Simply insert one of your smaller fingers inside the bore and feel. Usually, there is a noticeable separation where the finish and neck are joined [Figure 21]. Warning: feel carefully, tiny bits of jagged glass that dropped off as a result of the procedure often adhere to the inner surfaces of the neck.

Later, tools were designed to create the finish from the glass already present in the bottleneck. Called tooled or "wiped" finishes, often, these can be recognized by striations where the tool was turned or, in some cases, a "bending" of the vertical mold line where it ends at or near the base of the finish (see striations in Figure 20). Use of tooled finishes began during the mid-1870s and was still practiced until the mid-1920s, although its use on beer and soda bottles declined sharply with the increased popularity and availability of semiautomatic machines for making small-mouth bottles about 1910.

With the introduction of semiautomatic and fully automatic machines for the manufacture of small-mouth bottles, finishes were the first part of the operation. These are recognizable by horizontal seams encircling the base of the finish and usually the rim, as well as side seams that extend to and usually over the top of the lip [Figure 22]. These became more common after 1905 when the process was applied to beer and soda bottles made on the Owens Automatic Bottle Machine. As semiautomatic machines became more readily

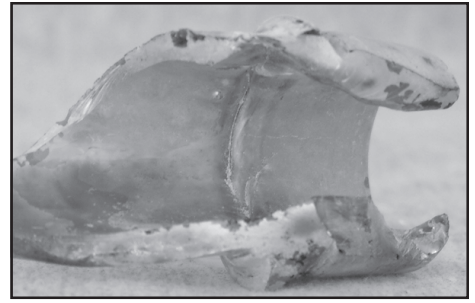


Figure 21: Applied finish – inside view



Figure 22: Machine-made finish

available between 1910 and 1913, machine-made finishes dominated the beer and soft drink bottle industry.

Post-Prohibition Export Bottles

Although other beer bottle styles continued to be produced, export bottles completely dominated the brewing industry after the repeal of Prohibition in 1933. The most common size became the 12-ounce bottle, although some were made as small as seven ounces, and quart sizes became common. Export beers made and used on the West Coast, however, were mostly 11-ounces. The dominant color remained amber. Even when non-returnable bottles were introduced, the second configuration, the Steinie, retained the swelled neck to remind drinkers of the export bottle [Figure 23]. Eventually, some forms of non-returnable bottles returned to a shape almost identical to the exports. A trip to the grocery store, today, will reveal the export beer bottle, now 134 years old, still sitting on the shelf.

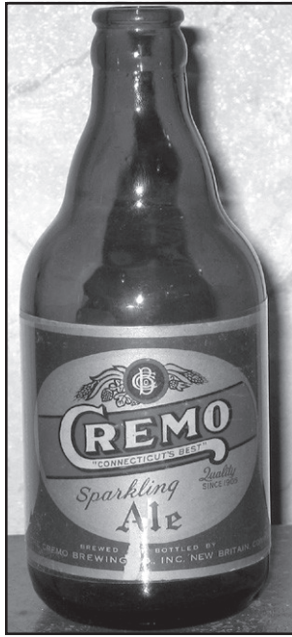


Figure 23: The Steinie – patterned after the export beer bottle (eBay)

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Sources

Ayres, James E., William Liesenbien, Lee Fratt, and Linda Eure

1980 "Beer Bottles from the Tucson Urban Renewal Project, Tucson, AZ." Unpublished manuscript, Arizona State Museum Archives, RG5, Sg3, Series 2, Subseries 1, Folder 220.

Berge, Dale L.

1980 *Simpson Springs Station: Historical Archaeology in Western Utah*. Cultural Resource Series No. 6. Bureau of Land Management, Utah.

Dello-Russo, Robert D.

1998 *Limited Testing and Artifact Analysis at Archaeological Site LA 118235 a Bottle Dump Associated with the Historic Illinois Brewery, Socorro, NM*. Escondida Research Group Report No, 1998-4. Socorro, New Mexico.

Downard, William L.

1980 *Dictionary of the History of the American Brewing and Distilling Industries*.

Greenwood Press, Westport, Connecticut.

Graci, David

1995 *American Stoneware Bottles: A History and Study*. Calem Publishing, South Hadley, Massachusetts.

2003 *Soda and Beer Bottle Closures, 1850-1910*. Privately published.

Hernon, Peter and Terry Ganey

1991 *Under the Influence: The Unauthorized Story of the Anheuser-Busch Dynasty*. Simon & Schuster, New York.

Illinois Glass Company

1906 *Illustrated Catalogue and Price List Illinois Glass Company: Manufacturers of Bottles and Glass Containers of Every Kind*. Illinois Glass Company, St. Louis. {Bill Lindsey Collection}

Jones, Olive R.

1986a *Cylindrical English Wine & Beer Bottles, 1735-1850*. National Parks and Sites Branch, Parks Canada, Ottawa, Ontario.

1986b *Glass of the British Military, ca. 1755-1820*. National Parks and Sites Branch, Parks Canada, Ottawa, Ontario.

Jones, Olive and Catherine Sullivan

1989 *The Parks Canada Glass Glossary for the Description of Containers, Tableware, Flat Glass, and Closures*. Parks Canada, Ottawa.

Lief, Alfred

1965 *A Close-Up of Closures: History and Progress*. Glass Container Manufacturers Institute, New York.

Lindsey, Bill

2006 "Bottle Typing/Diagnostic Shapes: Beer & Ale Bottles." www.blm.gov/historic_bottles/beer.htm

Lockhart, Bill

2000 *Bottles on the Border: The History and Bottles of the Soft Drink Industry in El Paso, Texas, 1881-2000*. Townsend Library, New Mexico State University at Alamogordo. <http://alamo.nmsu.edu/~lockhart/EPSodas/>

2007 "The Bottles of Fort Stanton." In Fort Stanton report; in press.

Lockhart, Bill and Wanda Olszewski

1994 "Excavation and Analysis of a Nineteenth Century Bottle Pit in San Elizario, Texas." *The Artifact* 32(1):29-49.

Lockhart, Bill, Pete Schulz, Bill Lindsey, Carol Serr, and David Whitten

2007 "The Dating Game: The American Bottle Co., A Study in Contracts and Contradictions." *Bottles and Extras* 18(1):47-56.

Martin, Byron and Vicky Martin

1973 *Here's to Beers: Blob Top Beer Bottles 1880-1910*. Privately printed, Northridge,

California.

McKearin, Helen and George McKearin

1941 *American Glass*. Crown Publishers, New York.

National Glass Budget

1909 "The Export Beer Bottle." *National Glass Budget* 25(7):4.

Noël Hume, Ivor

1970 *A Guide to Artifacts of Colonial America*. Knopf, New York.

Paul, John R. and Paul W. Parmalee

1973 *Soft Drink Bottling: A History with Special Reference to Illinois*. Illinois State Museum Society, Springfield, Illinois.

Plavchan, Ronald J.

1969 "A History of Anheuser-Busch, 1852-1933." Doctoral dissertation, St. Louis University.

Quinion, Michael

2003 "World Wide Words: Rushing the Growler." www.worldwidewords.org/qa/qa-rus1.htm

Switzer, Ronald R.

1974 *The Bertrand Bottles: A Study of 19th-Century Glass and Ceramic Containers*. U. S. Dept. of Interior, National Park Service, Washington.

Toulouse, Julian Harrison

1969 *Fruit Jars*. Thomas Nelson & Sons, Camden, New Jersey.

1971 *Bottle Makers and Their Marks*. Thomas Nelson, New York.

von Meechow, Tod

2002 "Antique Soda & Beer Bottles: Bottle Closures." www.worldlynx.net/sodasandbeers/closures.htm

Wilson, Rex

1981 *Bottles on the Western Frontier*. University of Arizona Press, Tucson.

Year Book of the Commercial, Banking, and Manufacturing Interests of St. Louis

1882 *Year Book of the Commercial, Banking, and Manufacturing Interests of St. Louis, with a General Review of its Transportation Facilities and Business Progress*. S. Ferd. Howe & Co., St. Louis.

Yenne, Bill

1995 *Beers of North America*. Cartwell Books, Greenwich, Connecticut.

Endnotes:

¹ Hernon and Ganey (1991) are a bit unclear about the date. On p. 31, they state, "Four years before Pasteur's book came out [in 1877], Adolphus had already become the first brewer in the United States to pasteurize his bottled beer." That would

make the year 1873. However, on p. 31, they note that “Anheuser’s was the first to reach a national market. He started by shipping his bottled beer to Texas in 1872.” The beer had to have been pasteurized in order to ship it that far. Wilson (1981:1) supports the latter date (1873). Plavchan (1969:70) supports 1872, citing a letter written by Adolphus Busch to W. C. Merry, September 3, 1894.

² This was the McCully plant at 16th & Liberty in Pittsburgh.

³ This is similar to the transition from Hutchinson to crown finishes in the soft drink industry. Many companies offered both types of closures for several years, often with bottles containing identical markings. Budweiser (and probably other breweries) advertised both cork and crown finishes from at least 1910 to 1913.

⁴ For a more through discussion about all the technological changes, see the “Historic Glass Bottle Identification & Information Website” (Lindsey 2006).