

Breweries
and
Beer Bottles
at
El Paso, Texas



Bill Lockhart
2012

Chapter 2
The History of the Export Beer Bottle

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The History of the Export Beer Bottle

[Much of this chapter originated in “The Origins and Life of the Export Beer Bottle,” published in *Bottles and Extras* magazine (Lockhart 2007).]

Virtually everyone is familiar with the export beer bottle, although most people 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 slightly “swelled” neck (Figure 2-1). 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 effervescence that we equate with beer was 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



Figure 2-1 –
Modern export
beer bottle

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 2-2). During this period, ales and porters were the standard in North America (Jones 1896a:74-79).



Figure 2-2 – English “beer” bottles (Lindsey 2012)

Dip Molds and Ricketts Molds

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, while the shoulder, neck, and finish were completed by hand. This was followed by the Rickett’s mold (Figure 2-3) – a three-piece 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 observed 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 1986b:69-71). But three more developments were necessary before the stage could be set for the invention of the export beer bottle.

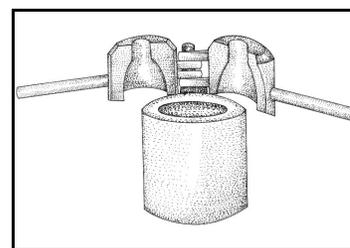


Figure 2-3 – Three-piece mold (Lindsey 2012)

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 be blown within the two halves (Figure 2-4). 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. (mostly on medicine – not beer – bottles) by about 1810. By the mid-19th century, post bottoms were inserted at the base of the mold to

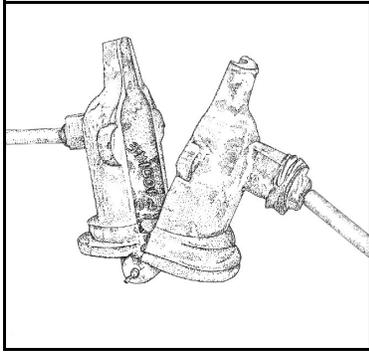


Figure 2-4 – Bottom-hinge two-piece mold (Lindsey 2012)

make a third piece. The molds became hinged at the sides for easier working (Figure 2-5), and bottle-makers' initials or entire names could easily be embossed on the post bottom (Jones & Sullivan 1989:26-28). A cup

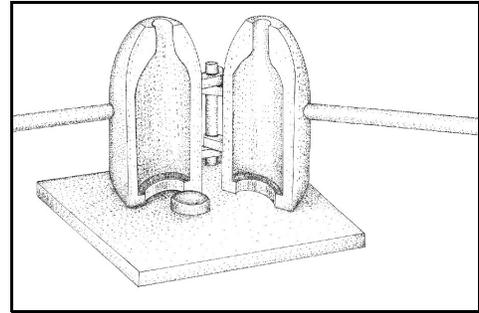


Figure 2-5 – Side-hinge two-piece mold (Lindsey 2012)

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.

Turn-Molds or Paste-Molds

In the turn-mold or paste-mold process, a two- or three-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. The process leaves faint horizontal striations on part or most of the bottle’s surface (Figure 2-6). The fresher the paste, the lighter the striations. Although I have found no documentation for this assertion, the striations are likely caused by impurities in the paste that may even have eventually scarred the molds. It is thus probable that bottles blown into relatively new molds – with freshly applied paste – will show no striations.

Using “twister blowers” imported from Germany and Sweden, the De Steiger Glass Co. introduced the turn-mold process to the U.S. in 1880 (Lockhart et al. 2007a). 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 much more commonly used to produce wine, champagne, and whiskey bottles, some export beer bottles were made by “twister blowers.”

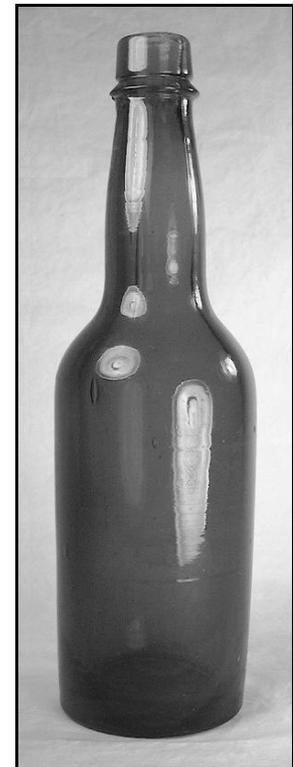


Figure 2-6 – Turn-mold beer bottle with faint striations (Lindsey 2012)

A few turn-mold bottles, however, have embossed bases. Toulouse (1971:153) suggested that this was apparently accomplished by blowing the glass into the mold, turning the mold to remove the side seams, then re-inserting the bottle into a mold (possibly a dip mold) to create the embossing. Ayres and his associates (1980:47) agreed, citing Toulouse. The Bottle Research Group recorded several turn-mold bottles embossed on their bases with marks used by the Hermann Heye Glasfabrik (Figure 2-7).



Figure 2-7 – HH basemark on Hermann Heye turn-mold bottle

On January 31, 1887, Modes applied for a patent for a “mold for blowing turned bottles.” He received Patent No. 364,840 on June 14 of the same year. Modes stated that his invention consisted of

a rotary bottom which has formed in relief on its top portion the characters of marks which are to be imprinted in the bottom of the bottle which is to be turned in the mold to give it an exterior finish. It is old to turn bottles in molds for polishing purposes, and it is old to imprint characters on the bottom of bottles which are not turned in the mold; but I claim to be the first one to employ a rotary bottom in the mold.

Despite the Modes patent, we have only discovered a single bottle with both turn-mold characteristics *and* basemarks made by an American glass house. At the time, Modes was the superintendent of the Streator Bottle & Glass Co., the primary successor to the De Steiger Glass Co. (where Modes has also been superintendent) in the production of turn-mold bottles. Streator’s SB&GCo logo would have been the most logical mark to expect on the base of a turn-mold beer bottle, but our only example had a “BOC” logo (discussed below).

Champagne Bottles

Champagne bottles were a type of wine bottle that was made of heavy glass to withstand the pressure caused by the effervescence of the contents. The bottles were tall, generally about quart size, and were

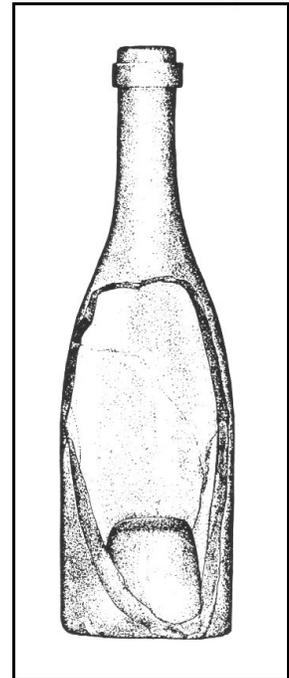


Figure 2-8 – Champagne bottle – Showing Kick-Up (Berge 1980:91)

usually made by the turn-mold process (Figure 2-8). The bases had extremely high kick-ups or push-ups, generally with a mamelon at the apex. The finish was initially a laid-on ring with squared edges. Although this was eventually molded by machine, the shape remained the same. The lip was eventually chamfered. Essentially the same finish remained in use for at least 200 years – almost certainly a record in bottle lore.



Figure 2-9 – Champagne bottle used on a brewery trade card (Bill Lindsey Collection)

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.” There is no question that “champagne” bottles were occasionally used for beer (Figure 2-9). However, it is also quite

clear that champagne was the main beverage bottled in this type of containers.

Ceramic Ale and Porter Bottles

Ale and Porter were bottled in the United States from at least 1844, usually in cork-stoppered, ceramic bottles (Figure 2-10). 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 2010). For practical purposes, however, the ceramic containers became a dead end before the end of the century.

Glass Ale and Porter Bottles

On his website, von Mechow (2012) listed and illustrated three shapes for porter and ale bottles. By far the most common (over 2,000 examples on his site) was the “Porter shape, circ: 1760-1918 Used to bottle various heavy beers such as porter, ale, and stout.” The “Early ale



Figure 2-10 – Stoneware ale bottle (eBay)

shape, circ: 1847-1851” was only used for ale, as was the “Late ale or lager shape, circ: 1851-1910.” Farnsworth and Walthall (2011:15-16) included similar classifications.

Lindsey (2012), on the other hand, lumped ale, stout, and porter bottles together as a single, albeit varied, category. He described the general style as “short and squat with a moderate length neck.” As with other bottle styles, minor changes evolved over time, often tied to technological changes within the industry and/or by individual glass houses. The bottles typically had two-part finishes with an upwardly tapered upper section that had sharp edges above a downwardly flared lower ring with a sharp edge (Figure 2-11). Although straight necks were the most common, some necks had a slight bulge.



Figure 2-11 – Porter bottle (Lindsey 2012)

Shipping Ale

The export of Hodgson’s India Pale Ale from England to India began during the 1790s. Although Ale and the English beers were very different from the later lager beers, they still had their problems with shipping. Initial attempts at bottling failed because the corks tended to pop out. At some point, the breweries discovered that beer must be left in barrels for 8-12 months prior to bottling and transportation. Even then, the corks had to be wired down. Bottles were usually shipped long distances in barrels packed with straw (Callaghan et al. 2007:34-35).

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 end of 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 1981:1).

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 drank their beer in the saloon or took it 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 brewer to discover Pasteurization 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). Once beer was Pasteurized, it could be stored for a long time and shipped in bottles for a great distance without the spoilage that had been reported in pre-pasteurized beer. This meant that the local brewery with its reliance on keg-contained, draught

beer was to become less important.¹

Of more interest in bottle dating, this marks the beginning of available, nation-wide bottled beer. In 1877, the *St. Louis Republican* (“St. Louis Business and Industry” 1960:158-159) crowed that:

the trade in bottled beer is only about four years old, and its expansion is most extraordinary. The Anheuser association having been the first to introduce bottled beer in this country, may justly claim credit for the great benefit this trade has conferred upon the glass manufacturing interest.

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, lager beer, with its effervescence, could be bottled. But what container could he use?

¹ Hernon and Ganey (1991) are a bit unclear about the date. On p. 31, they stated, “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) used the latter date (1873). Plavchan (1969:70-71), however, specifically entered the date as 1872 in three different instances, citing a letter written by Adolphus Busch to W.C. Merry, September 3, 1894. This is currently our best reference for the Anheuser-Busch entry date – and it fits with subsequent evidence.

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 almost three decades (Lindsey 2012), and these could certainly have contained beer (and were later used by some breweries). A variety of glass factories in the U.S. made the bottles, but most 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.

Champagne bottles offered another possibility. Made to contain sparkling white wine, the bottles had thick walls and a deep kick-up to withstand strong internal pressure. However, they were not made or intended for reuse. There is no evidence that Busch ever used champagne bottles, although they were occasionally used by other breweries (see Figure 2-9). One final possibility existed: bottles made for naturally 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 of Apollinaris bottles. 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 2-12). 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 versions of the style.



Figure 2-12 –
Apollinaris bottle

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, had a “blob” of glass applied to the top (Figure 2-13).

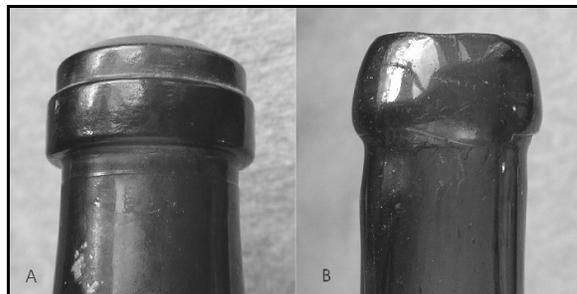


Figure 2-13 – Champagne (A) and Apollinaris (B) finishes

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 relatively flat with a small “dot” in the center. The dot is created by the turning of the bottle within the mold (Figure 2-14).



Figure 2-14 – Champagne (A) and Apollinaris (B) bases

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 2-15). 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 recorded no other types of labels on that style bottle.

Wilson’s choice of terminology was unfortunate and misleading. According to Lindsey (2012), “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 dated the bottles “from at least the late 1870’s continuously up to the 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.

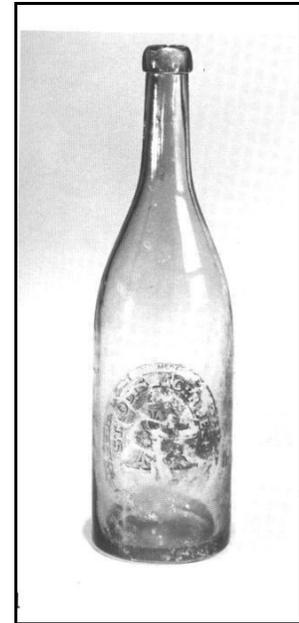


Figure 2-15 – Apollinaris bottle with Anheuser-Busch St. Louis Beer label (Wilson 1981:3)

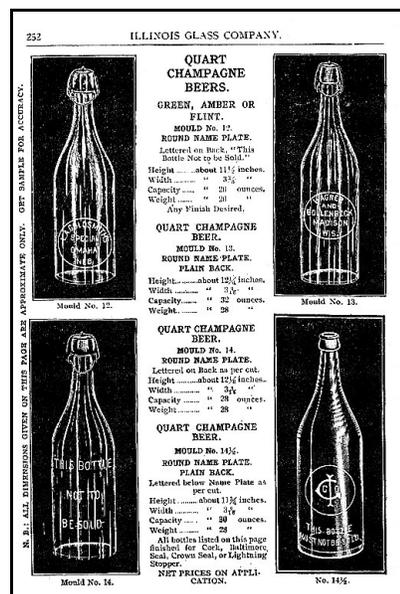


Figure 2-16 – “Champagne” beer bottles (Illinois Glass Co. 1906:253)

In fact, a comparison of drawings from the 1906 Illinois Glass Co. catalog shows that one style of “champagne” beer bottle was almost identical to the Apollinaris bottles – with the exception of the finish (Figure 2-16). In some cases, then, only the distinctive blob finish is the defining feature between champagne beer and Apollinaris bottles. Although the one-part finishes found on beer bottles vary considerably, all are different from the blob finishes on Apollinaris bottles.

A second generally defining feature is manufacturing technique. With very few exceptions, Apollinaris bottles were made using the turn-mold technique, where bottles were twisted in the molds to remove the mold lines. Since this technique also removes any embossing (including company identification marks), it was rarely used on champagne beer bottles, many of which (maybe even most) were embossed with the name or initials of the brewery. Finally, Apollinaris bottles were generally olive green in color, where champagne beers were usually aqua, amber, or colorless.

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 Apollinaris fragments along 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 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). In addition, Lockhart (2007) discovered fragments at the beer dumps at Fort Stanton, almost all in early 1880s contexts, and Dello-Russo (1998) excavated fragments in the area around the Illinois Brewery in Socorro, New Mexico (ca. 1882-1918).

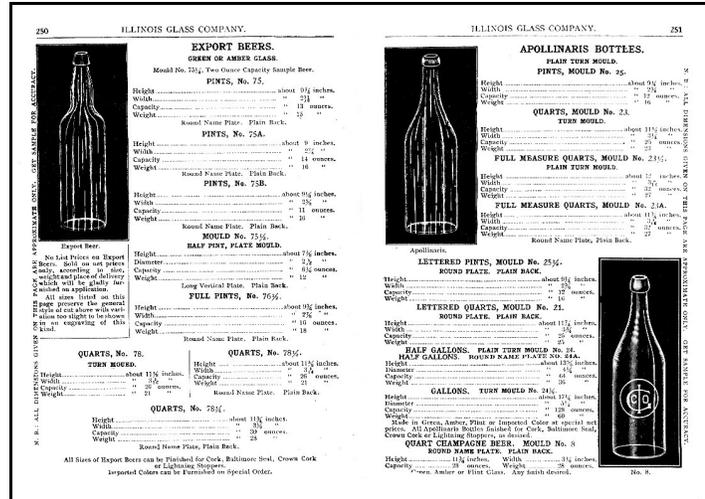


Figure 2-17 – Apollinaris bottles advertised in beer section (Illinois Glass Co. 1906:250-251)

Normally, Apollinaris bottles comprise a tiny percentage of the identified beer bottles in these assemblages. For example, only 2.7% (6 of 225 finishes) of the finishes from the San Elizario beer bottle pit were from Apollinaris bottles. 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 2-17).



Figure 2-18 – Apollinaris-style bottle with Baltimore Loop Finish (eBay)

An unusual bottle was offered for sale on eBay. The amber color is so light that the seller described the bottle as “yellow.” In shape, base, and finish, it resembles a thin Apollinaris bottle. Although the seller noted that it was made in a turn-mold, the base was embossed “PAT / BOC / 85.” The term” PAT 85” is embossed on numerous export beer bottles and almost certainly equates to the Baltimore Loop Seal that



Figure 2-19 – Base of the Bottle shown in 10a (eBay)

William Painter patented in 1885. The seal was a rubber stopper that fit into a groove debossed into the throat of the bottle. Otherwise, the finish resembled a typical one-part “blob” finish (Figures 2-18, 2-19 & 2-20).

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 Pasteruization process in 1872. It should also be noted in this connection that no champagne or soda bottles or fragments therefrom were found at Socorro, San Eizario, or the beer bottle dumps at Fort Stanton, although Apollinaris bottle fragments were found alongside export beer bottle fragments in all three places.

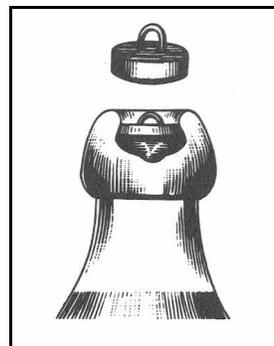


Figure 2-20 –
Baltimore loop seal
(Lief 1965:17)

Second, the very small percentages of Apollinaris bottles found on these sites indicate that Anheuser-Busch was phasing out the use of that style by the early 1880s. It is clear from labeled bottles in collections and offered on eBay that Anheuser-Busch adopted the export beer bottle fairly early, probably no later than the mid-1870s. Busch almost certainly continued to use the supply of Apollinaris bottles until all had been broken or worn beyond reuse – probably until the mid-1880s.

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. Many brewers in the eastern region maintained a heavy reliance on embossed bottles, while the western breweries preferred paper labels, mostly on bottles made in the Midwest and West Coast. 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 & Parmalee (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 been addressed elsewhere (e.g., Busch 1991).

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 railroad and water. 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 most 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 taken to local breweries) rather than being 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 generic export beer bottle became ubiquitous in the West.



Figure 2-21 – Champagne beer bottle (Farnsworth & Walthall 2011:694)

Variation in Bottles for Lager Beer

Champagne of Lager Beer Bottles

Lindsey (2012) lumped champagne, select, and lager bottle styles into a single category because the the styles were so similar in characteristics that they were virtually impossible to separate (Figures 2-21 & 2-22).

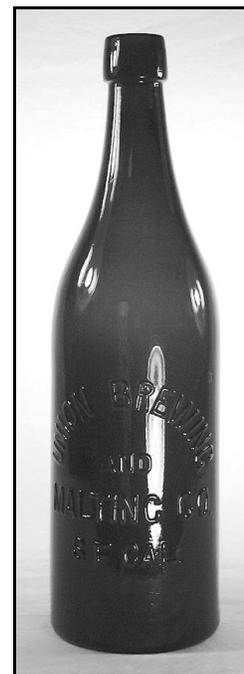


Figure 2-22 – Champagne beer bottle (Lindsey 2012)

In addition, each style in catalogs (e.g., Illinois Glass Co. 1903) was so varied that some “champagne” listings were virtually identical to some “lager” ones. However, this leaves a wide range of variation in “champagne” styles. Similarly, von Mechow (2012) categorized these bottles into the “champagne” style. Farnsworth & Walthall (2011:11) used the term “lager” for the same group of bottles.

Weiss Beer Bottles



Figure 2-23 – Weiss beer bottle – wide (Lindsey 2012)

Weiss beer, made from barley and wheat, was less popular in the U.S., although it was bottled in containers that were slightly different from the champagne or lager styles. The main characteristic of these bottles was their steep but gently sloped shoulders. Lindsey (2012) divided these into wide and narrow variations (Figures 2-23 & 2-24), although von Mechow (2012) treated them as a single unit.

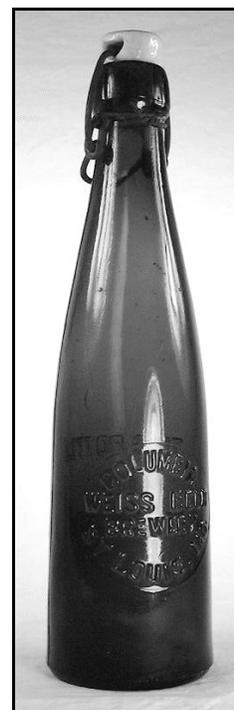


Figure 2-24 – Weiss beer bottle – narrow (Lindsey 2012)

Export Beer Bottles

The main defining characteristic of the export beer bottle is its swelled neck. These were originally aqua in color, although that quickly shifted to amber. Some, of course, were colorless, and specialty colors – such as cobalt blue – were made for specific users. The bottles used a variety of finishes that changed through time. See Table 2-1 for a chronology of export beer bottles.

Table 2-1 – Chronology of Export Beer Bottles

Dates	Event or Process
1872-ca. 1885	Anheuser-Busch used Apollinaris bottles for beer
1873	invention of the export beer bottle
1873-ca. 1896	applied finishes on export beer bottles
1873-ca. 1882	two-part finishes with sharp lower rings
ca. 1877-ca. 1915	one part finishes for use with Lightning fasteners
ca. 1876	Carl Conrad & Co. first embossed monogram on bases
ca. 1878-ca. 1915	use of rounded lower rings on two-part finishes
1879-ca. 1929	Hutchinson stoppered bottles (mostly discontinued by ca. 1912)
1885-ca. 1899	Baltimore Loop Seal – PAT 85 on some beer bottle bases
ca. 1890-ca. 1915	tooled finishes on export beer bottles
1892	invention of the crown cap
1892-ca. 1915	Hutter porcelain swing stopper (used on one-part finishes)
ca. 1897-present	crown finishes on export and other beer bottles
ca. 1912-present	machine-made export beer bottles with manufacturer’s marks

Invention and Early Manufacturers

The export beer bottle was designed by Valentine Blatz of 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).

² It is highly likely that Nolan and Urban blew the bottles at McCully’s Phoenix Glass Works at 16th & Liberty in Pittsburgh (Knittle 1927:320). McCully had several other factories, most of which produced window glass.

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. In “less than three years” (i.e., by 1875 or 1876), export-style bottles were popular in the West. By 1874, the Lindell Glass Co. and the Mississippi Glass Co. (both in St. Louis) had been built and were major producers of 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 export beer remains the most popular style in the 21st century.

By far the largest brewer of beer “exported” to the western territories, Anheuser-Busch, initially purchased its *export* beer bottles (in contrast to the Apollinaris bottles described above) from the two major St. Louis producers: Lindell Glass Co. and Mississippi Glass Co. Farnsworth and Walthall (2011:35) quoted an 1878 source as stating that Mississippi and Lindell “manufacture almost all the glass consumed in these bottling operations [i.e., those of the Anheuser brewery].”³

The Bottle Research Group devised a table of the earliest export beer bottle manufacturers based on our research into beer bottles excavated at Fort Riley Kansas and other published sources (Table 2-2).

Manufacturer’s Marks and Other Codes

At some point ca. 1876, manufacturers began embossing the initials of their glass houses on the bases of export beer bottles. This may have been inspired the use of an embossed monogram on the bases of bottles used by Carl Conrad & Co., initiated in 1876. It is certain that Pittsburgh glass houses, such as William McCully & Co., Cunningham & Co., and others embossed their full names on some soda bottles as early as 1869, but the logos on beer bottle bases may be the earliest use of *initials* to identify manufacturers.

³ Farnsworth and Walthall (2011:35) cited J.A. Dacus and James W. Buel, *A Tour of St. Louis, or the Inside Life or a Great City*, Western Publishing Co, Jones & Griffin, St. Louis, 1878.

Table 2-2 – 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, and Cunningham & Co.).

I have currently not discovered any evidence as to whether the use of manufacturer’s marks began at the request of breweries (most likely the Anheuser-Busch brewery), or if the process had been initiated by the glass houses, themselves. However, most export beer bottle makers were using company initials to mark their bottles by at least 1878. The process gradually spread until the entire glass industry used some form of manufacturer’s mark by the mid-20th century.

The examination of a collection of bottles excavated from the hospital privy at Fort Riley, Kansas, suggested that the use of mold codes – at least on export beer bottles – began ca. 1875 on bottles made by the Mississippi Glass Co. (Lockhart et al. 2012). These early codes were fairly large letters or numbers embossed on the bases of export beer bottles. When Mississippi Glass began using its “MGCo” logo ca. 1878, it ceased the use of mold codes temporarily but soon returned to their use.

Probably as a means of quality control, virtually all export beer bottle manufacturers were using mold codes – generally in the form of single letters or numbers – by at least 1880. Baseplates with these codes were almost certainly ordered sequentially, but that fails to tell the full story. For example, Glass House A may have ordered six molds (with sequentially lettered baseplates – A, B, C, D, E, and F) at the beginning of its export beer bottle production in 1880. Mold C was discovered to be defective in 1881 and was replaced by Mold G. Molds A, B, and D were used most often and wore out by 1883 to be replaced by Molds H, I, and J. Without going further, I think it is clear that these cannot be used as any form of absolute dating guide.

Of course, codes evolved over time and became much more complex. Although a few breweries had dates embossed on their bottles by the early 1890s, manufacturers did not use date codes until the American Bottle Co. initiated heelcodes that identified two of its factories along with single-digit codes for the date of manufacture. For example, the “6-B” heelcode indicated that the bottle was made in 1906 at the Belleville, Illinois, factory. By the mid-20th century, codes identified molds, models, factories, dates, and occasional other information.

Why “Export?”

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 Adolphus 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 – with some variation due to hand manufacture). Although the bottles were available in other sizes, the “quart” is by far the most common size found in the West (Figure 2-25). The base of the bottle was flat (or slightly concave) and the body had vertical sides and a rounded shoulder topped by a slightly 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. The 26-ounce size was gradually discontinued, but such bottles were used until at least 1913.



Figure 2-25 – Classic export beer bottles

These bottles were usually amber in color, although some were made in aqua, greens, or a light blues. Some were even made in cobalt blue for “Liquid Bread” (see Figure 2-6a; Lockhart et al. 2007b). The earliest ones were either produced in a post-bottom, two-piece mold, but some were made by the turn-mold process. By the mid-1870s, companies had begun embossing manufacturer’s marks on the bases of the export bottles, and the practice became virtually universal by 1880.

Possible Developmental Sequences

Although we have found no documentary evidence, the export beer bottle was probably the stylistic descendant of both the English beer bottle described above and the typical wine bottle of the 1860s. 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 2-26). 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).

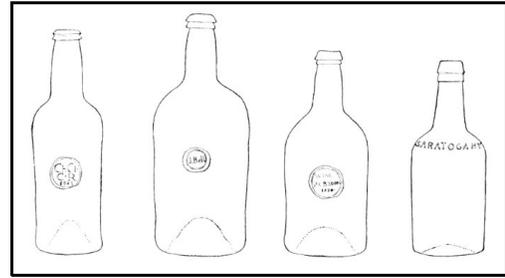


Figure 2-26 – Wine bottle evolution (McKearin & McKearin 1941:423-425)

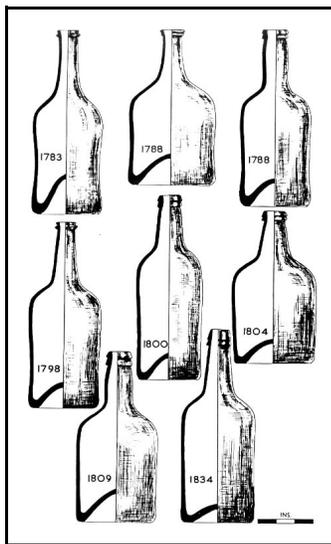


Figure 2-27 – Wine bottle evolution (Noël Hume 1970:63-68)

Ivor Noël Hume (1970:63-68) presented a similar study based on bottles excavated at Williamsburg, Virginia. His study extended from 1652 to 1834. 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 2-27). In both studies, the finish developed into a close resemblance of the early export beer finish. The swelled neck was an expanded variation on the slightly bulged neck of the old English beer bottle, but the overall shape of the export bottles more closely resembled the thinner, taller wine container. Also see the Export Bottle page on Lindsey (2012) for a more involved discussion.

Datable Changes

As with all things made by humans, the export beer bottle evolved over time. In more recent times, the evolution has been 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 notable forms.

Manufacturing Techniques

Although not specifically noted above, the first export beer bottles were blown into two-piece molds (i.e., two side halves and a post bottom) in 1873. During the 1880s, the base gradually evolved from the post to the cup bottom, although this was an uneven process. Bottles continued to be mouth-blown into molds until Prohibition, when the manufacture of beer bottles greatly decreased. Although common on wine bottles until the 1920s, the turn-mold technology was only used for sporadically on export beer bottles – by U.S. factories. However, Hermann Heye, a German manufacturer, made turn-mold export bottles for American use during the 1880s.

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 has 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., although virtually all of the machine-made beer bottles were sold south of the Rio Grande prior to at least 1914 (Lockhart et al., 2007b:47, 49). Almost all of the side-embossed bottles made by the American Bottle Co. were mouth blown.



Figure 2-28 – Early Owens machine scar on Thatcher Mfg. Co. base

An important characteristic of the Owens machine was the Owens scar on the base. With very few exceptions, all machines – where semi- or fully automatic – leave an off-center, roughly circular scar on the base of each bottle. The Owens machine used a suction process to draw the glass into the mold, then cut the glass off with a “knife” that then formed the bottom of the first

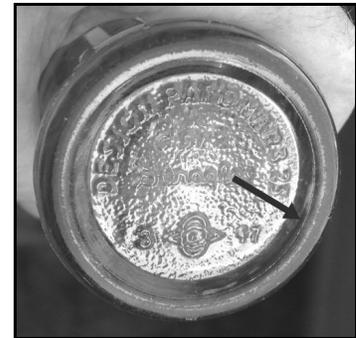


Figure 2-29 – Non-Owens machine or later Owens machine scar on base

production stage. Unless the mold and knife were brand new, the resulting scar was “feathered” – with various different forms of ragged edges (Figure 2-28). These early scars were quite distinctive; however, by ca. 1925, the Owens machines had evolved to the point where the scars looked like those of other automatic machines.

By 1905, 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. These (and the later Owens machines) left much neater basal scars (Figure 2-29).

Stoppers and Finishes

After its invention in 1873, the export beer bottle went through a varied evolution, mostly revolving around finishes – the top section of the bottles, so named because that was the last stage of the process. Two relatively datable characteristics about finishes were: 1) the types of finishes; and 2) the manufacturing techniques required to make them. The types, of course, were designated according to the form of stopper used to seal the bottles.

Two-Part Finishes for 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 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 internal stress, corks used in beer bottles had to be firmly held in place (Paul & Parmalee 1973:10; von Meechow 2012). Several finishes were devised as foundations to tie in the corks. In contrast to soda bottle finishes, usually designed with 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, but the two-part beer finishes were specifically designed for them (e.g., see Jones & Sullivan 1989:149).

The upper and lower parts of the finish went through similar evolutions, although at different times. The original finishes appear to have inherited sharp edges on both the lower rings

and at least the lower edge of the upper ring or collar. The upper part, however, became rounded very early, perhaps by 1874, certainly by 1876, when the rounded upper part was used on the C. Conrad & Co. bottles.

The lower ring followed a different trajectory. Initially, these appear to have had sharp edges and were downwardly flared in profile view. At some point, possibly by 1877 or even earlier, the lower ring became wedge shaped, still with a sharp edge (Figure 2-30). The Bottle Research Group (Lockhart et al. 2012) has hypothesized that these changes were connected with breakage. The sharp edges created a “platform” similar to the ones intentionally created by prehistoric people to facilitate flaking stone into tools and projectile points (such as arrowheads). This platform also increased the chances of breakage, especially during handling in quantity at glass houses and bottling plants.



Figure 2-30 – Two-part finishes with sharp lower rings: A – flared; B – wedge

The final stage of development for the two-part finishes arrived ca. 1878, when the industry began to adopt rounded lower rings (Figure 2-31). Since a rounded lower ring created almost no platform at all, it should have greatly reduced breakage. Although much of the industry appears to have made the change by 1880, some glass houses – notably the Belleville Glass Co. – held out until ca. 1882. Two-part finishes with rounded lower rings on beer bottles continued in use until they were completely replaced by ca. 1914. Until then, Anheuser-Busch continued to advertise Budweiser in both cork and crown styles.



Figure 2-31 – Two-part finish with rounded lower ring

Lightning Stoppers and One-Part Finishes

One of the earliest alternatives to the cork, the Putnam Stopper, was patented by Henry W. Putnam, who received Patent No. 23,263 for an “Improvement in Bottle-Stopper Fastenings” on March 15, 1859 (Figure 2-32). Putnam also received Reissue No. 1,606 for the same patent on January 19, 1864. The only difference in the reissue was a better explanation and a slightly

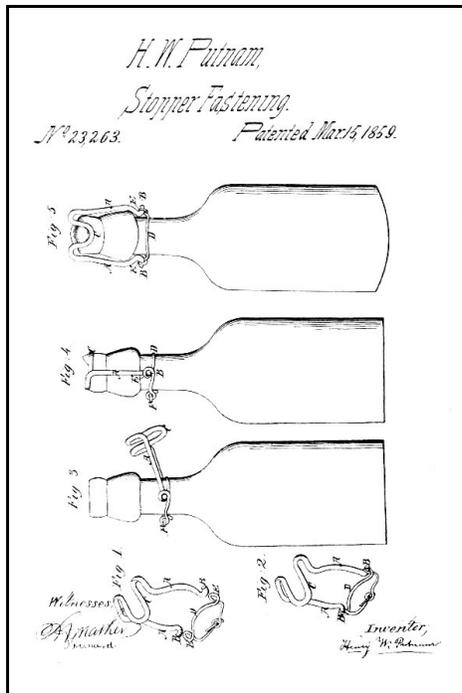


Figure 2-32 – Putnam patent for a swing stopper – 1859

rearranged drawing. Putnam’s design was the original “swing” stopper and was intended as a means to hold down the cork. These were used on ale, porter, and some beer bottles as late as 1905 (von Meechow 2012). Although this created a reusable fastener, it still relied on a cork.

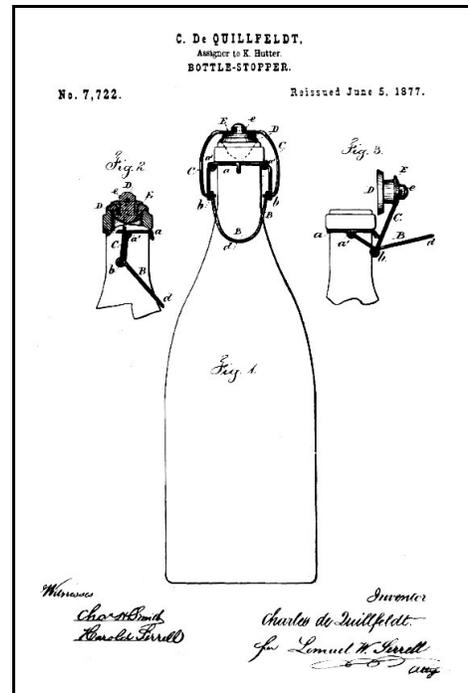


Figure 2-33 – De Quillfeldt patent for a swing stopper – 1875

The attachment to the cork vanished when Charles De Quillfeldt applied for a patent on November 30, 1874. He received Patent No. 158,406 for an “Improvement in Bottle-Stoppers” on January 5, 1875. De Quillfeldt added a much more complete description (more than twice as long) as Reissue No. 7,722 on June 5, 1877, and assigned the patent to Karl Hutter, a New York jobber in bottles and soda bottling apparatus. If the patent drawings (identical in both the 1875 patent and the 1877 reissue) are any indication, De Quillfeldt intended his closure for champagne bottles (Figure 2-33).

These later “swing” stoppers used a plug to seal the throat of the bottle and also became one of the most popular fruit jar closures – as well as the basis for the early “tin-top” milk bottles.. The plug was held in place by a wire device that swung the stopper up and to one side when the wire triggering device was pushed upward (Figure 2-34). Although the main sources for closure information (e.g., Graci 2003:58-59; Lindsey 2012; Paul & Parmalee 1973:14; von Meechow 2012) use 1875 as the initial date for use of the stopper, that may not tell the full story. Although we may never discover documentary confirmation, De



Figure 2-34 – Lightning stopper (eBay)

Quillfeldt may not have marketed the device or may have only attempted to sell the idea to wine and/or champagne vintners. Hutter was probably the one responsible for introducing the idea into the beer bottle market. Thus, the initial use date – at least for practical purposes – was likely 1877. Since this is only a two year difference, however, the point is probably moot.

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



Figure 2-35 – Lightning stopper on a crown finish



Figure 2-36 – Finishing tool used to make one-part finishes in open and closed positions (Lindsey 2012)

place. An examination of ads and photos of bottles still containing the stoppers shows the finishes were one part (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 (Figure 2-35), but the finish actually designed for the Lightning stopper was one part.

These went through a single stylistic change, probably very early. A very few of these finishes were upwardly tapered “collars” with fairly sharp edges, although these edges were not as sharp as those found on the upper collars of early two-part finishes. This rounding of the edges may have initially been unintentional. As shown in Figures 2-36 and 2-37 (from Lindsey 2012), the sharp “corners” of the finishing tool could become a repository for dirt, rust, or other debris that would round the edges. However, the entire finish soon assumed a more rounded shape and retained that look for more than two decades (Figure 2-38). One-part finishes probably appeared on beer bottles from ca. 1877 to ca. 1914, although some Lightning finishes are still used in the 21st century on “specialty” beer bottles.



Figure 2-37 – Finish made by a tool similar to the one in Figure 36 (Lindsey 2012)



Figure 2-38 – One-part finishes for Lightning stoppers



Figure 2-39 – Hutter stopper – closed (eBay)



Figure 2-40 – Hutter stopper – open (eBay)

Porcelain Stoppers

Karl Hutter, already the owner of the rights to the Lightning stopper, invented a porcelain adaptation of the original Lightning Stopper that became popular with beer bottlers and was also used on distilled water, mineral water, and some other containers (Figure 2-39 & 2-40). Hutter applied for a patent for a “Bottle-Stopper” on April 6, 1892, and received Patent No. 491,113 on February 7 of the following year (Figure 2-41). 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 Mechow 2012). Hutter stoppers were used on the same one-part finishes made for Lightning stoppers.

Hutter described his original (1892) patent as “a tapering plug with a substantially triangular or heart-shaped slot, through which the inwardly bent ends of the wire bail can

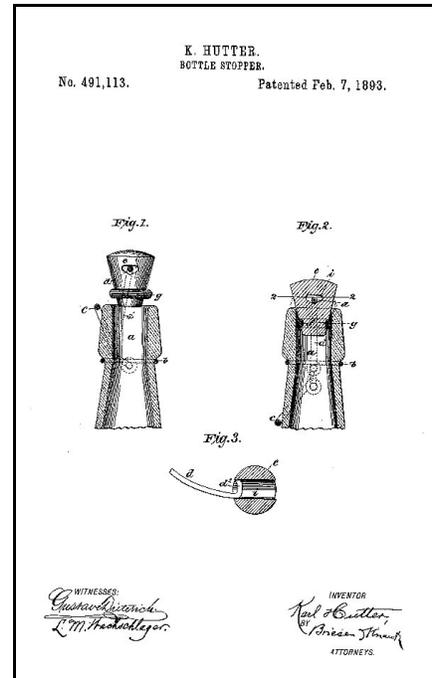


Figure 2-41 – Hutter’s 1893 stopper patent

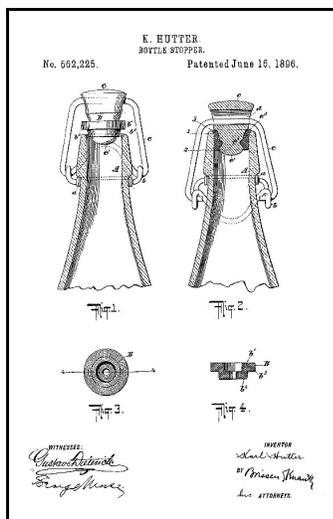


Figure 2-42 – Hutter’s 1896 stopper patent

be inserted.” Hutter’s drawing, however, showed a very elongated “triangle.” The seal was affected by an “elastic ring” that fit into a groove around the lower section of the conical plug. A few years later, he had rethought his idea. His conical plug now had a rounded “knob” at the lower end and a “stepped elastic stopper” (rubber) that “double sealed” the closure. He applied for the improvement on February 18, 1896, and received Patent No. 562,225 on

June 16 of that year (Figure 2-42).

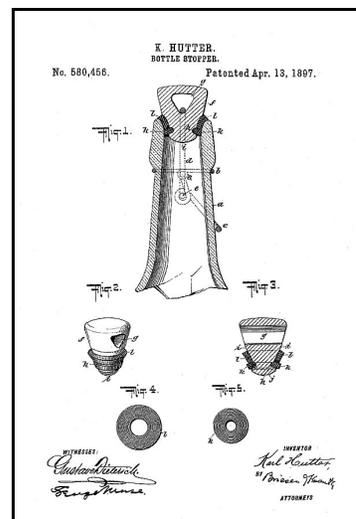


Figure 2-43 – Hutter’s 1897 stopper patent

Apparently, the double seal was still not to Hutter’s liking. On January 13, 1896, before he had even received the patent described above, Hutter applied for yet another improvement on his stopper. He did not receive Patent No. 580,456 for his latest venture until April 13, 1897 – 15 months after he had applied (Figure 2-43). This final patent enlarged the slot to a much bigger inverted triangle and utilized two rubber “elastic rings” that sealed both within the throat and at the rim or lip of the bottle. Although this hypothesis has yet to be tested, this probably means that Hutter stoppers with large, inverted-triangle slots were used no earlier than 1896. The knob end of the stopper may also have only been available after February 1896.

Hutchinson Stoppers

[Much of the Hutchinson section was originally published in Lockhart et al. 2011.]

Although typically used for bottling soda or soft drinks (Figure 2-44), Hutchinson bottles were also used for beer. They were unique in shape, with shoulders that could be gently sloped or almost squared, but

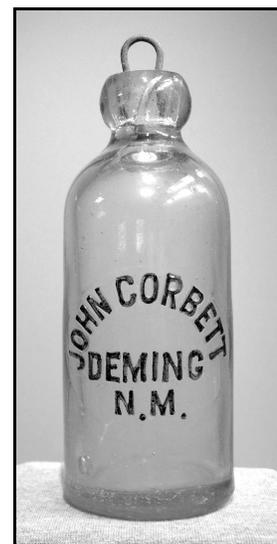


Figure 2-44 – Hutchinson-style bottle (Lynn Loomis collection)

receive Patent No. 285,488 until September 25, 1883. The design this time looked like an inverted harp and would have been more difficult to manufacture. Although Hutchinson bottles continued to be made until at least 1929, their popularity declined rapidly after crown caps became popular about the turn of the century (see Fowler 2012 for much more on Hutchinson bottles).

Other Stoppers

Baltimore Loop Seal

Although a bewildering variety of stoppers were patented in the late 19th century, few others became popular among either brewers or soda bottlers. Two minor ones are worth mentioning. As noted earlier, William Painter patented the Baltimore Loop Seal, a rubber stopper that fit into a groove inside the throat of the bottle (see Figure 2-20). Painter applied on June 5, 1885, and received Patent No. 327,099 for a “Bottle-Stopper” on September 29 of that year (Figure 2-46). The grooves could be added to different bottle styles, so these were made for Hutchinson, export, and champagne beer bottles – and probably others.

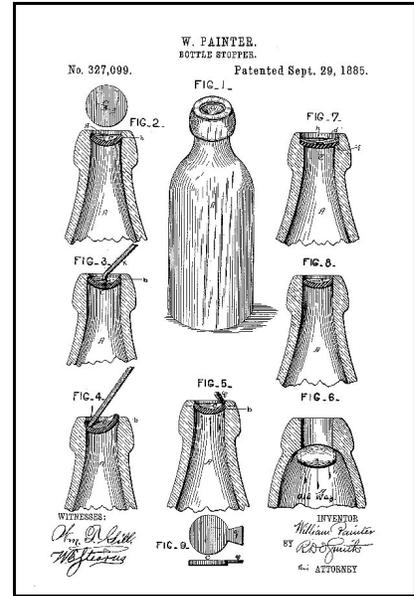


Figure 2-46 – Painter’s Baltimore Loop patent – 1885

Phoenix Cap

Another very unusual closure was the Phoenix Cap. Although the main secondary sources for closure information (Graci 2003:11-47; Lief 1965:20-21; Paul & Parmalee 1973:10-12; and von Meechow 2012) claimed dates of 1889 or 1892 for the invention, Achille Weissenhanner, in his earliest U.S. patent stated that his Hermetic Seal was “patented in France January 9, 1891, No. 210,636.” Weissenhanner applied for an American patent on December 17, 1891, and received Patent No. 483,033 for a “Jar” on September 20, 1892 (Figure 2-47).

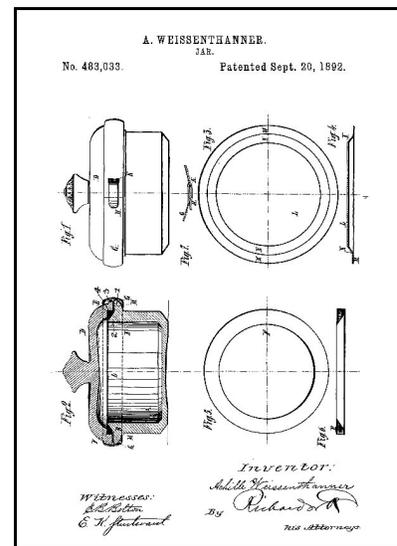


Figure 2-47 – Weissenhanner 1892 patent

The invention was intended for “flasks, pots, and all receptacles containing preserves or other substances that have to be kept from the air.” The jar and lid in this drawing appear to both be made of glass with a “gasket” to affect the seal, although Weissenhanner did not discuss the material for the lid or jar in the text. The lid was held in place by a “concave collar” (i.e., a metal band) “secured in place by the tongue . . . on one end passing through the opening . . . on the other end of the collar.”

Almost a year later, on September 22, 1893, Alfred L. Weissenhanner applied for a patent for “Hermetically Sealing Vessels” and received Patent No. 509,834 on November 28 of the same year (Figure 2-48). Alfred had received Patent No. 210,638 in France on December 19, 1892, and Patent No. 7,597 in England on April 13, 1893, for the same invention – obviously an improvement on the Achille Weissenhanner patent of the previous year. This was the patent drawing illustrated by Lief (1965:20). Alfred assigned the patent to Achille.

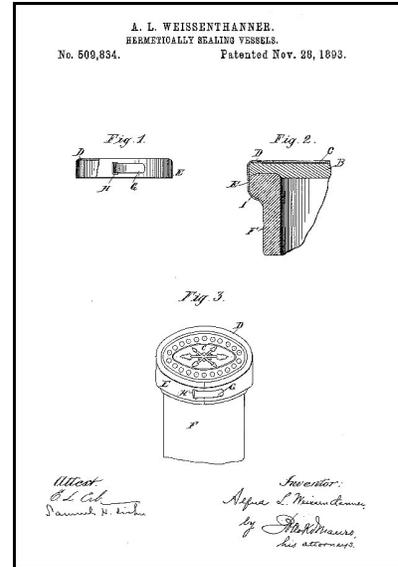


Figure 2-48 – Weissenhanner 1893 patent



Figure 2-49 – Phoenix finish

Achille was probably Alfred’s father. Achille only filed for one additional patent (1893), and Alfred only assigned his 1893 patent to Achille. By at least 1899, Alfred Weissenhanner had moved to New York and was associated with the Phoenix Cap Co. He filed two other patents for improvements that year (Patents No. 620,623 and 637,981) and continued to patent caps for the Phoenix Cap Co. until at least 1903. By 1905, Alfred’s patents – for a variety of caps and capping machinery were not assigned to anyone until his last patent, assigned to the Phoenix-Hermetic Co. in 1915.

The cap was very popular on food/packer jars and bottles, although it was also used on some beer bottles. The actual finish is very distinctive, consisting of a squared ring at the very top of the bottle or jar with a slight indentation around the neck just below it (Figure 2-49). According to Jay Hawkins (personal communication, 8/2/2011), the Phoenix finish/closure was only used on beer bottles made at Pittsburgh.

Crown Cap

William Painter applied for a patent on May 19, 1891, for a “Bottle Sealing Device” that would become known as the crown cap. On February 2, of the following year, Painter received Patent No. 468,226 that would revolutionize the returnable bottle industry (Figure 2-50). No stranger to either closures or inventions, Painter received his first patent for a Lightning-type of “Bottle-Stopper Fastener” in 1885 and patented at least nine closures or tools between then and 1897. The finish for the crown was made with two parts. The upper ring was called the sealing ring, with the reinforcing ring below it.

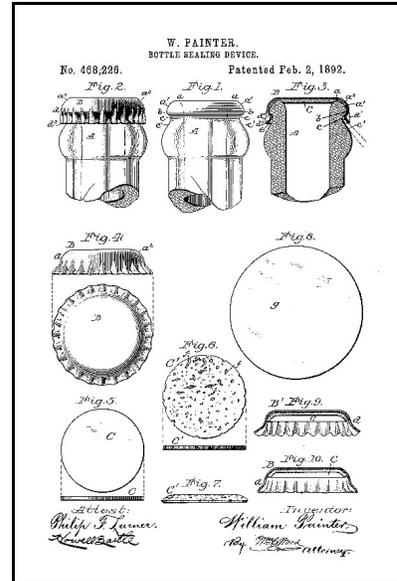


Figure 2-50 – Painter’s 1892 crown patent

Some brewers switched to crowns before the 20th century, but most of the beer industry did not adopt the crown 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).⁴ The transition continued until at least 1913 (Ayers et al 1980:53; Berge 1980:115; Graci 2003:50-54).

Finish Technology⁵

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 the late 1890s, 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).

⁴ 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 identically marked bottles. Budwieser (and probably other breweries) advertised both cork and crown finishes from at least 1910 to 1913.

⁵ For a more thorough discussion about all the technological changes, see(Lindsey 2012).



Figure 2-51 – Extreme example of slop-over in an applied finish

Often, it is easy to recognize these finishes because some of the added glass sloped out from under the finishing tool and was not blended into the rest of the bottle (Figure 2-51).

Often, however, a visual determination is inadequate, but you can perform a simple test. Simply insert one of your smaller fingers inside the throat of the bottle and

feel. Usually, there is a noticeable separation where the finish and neck are joined (Figure 2-52). 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.

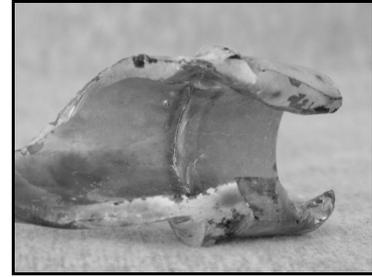


Figure 2-52 – Exposed “seam” inside an applied finish (San Elizario, Texas, collection)

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 – either on the finish or on the neck just below it – 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 2-53). Use of tooled finishes began during the mid-1870s and continued until the mid-1920s. On beer bottles, occasional tooled finishes appear as early as



Figure 2-53 – Tooled crown finish – note faint horizontal striations



Figure 2-54 – Machine-made finish – note both horizontal and vertical seams

the late 1880s, almost always on bottles with the brewery name embossed on the side. These started becoming more common ca. 1890, and the popularity of this technique increased until it became the norm by 1900. The use of tooled finishes 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 became the first part of the operation. These are recognizable by horizontal

seams encircling the base of the finish, as well as side seams that extend to and usually over the top of the lip (Figure 2-54). Although the Owens Automatic Bottle Machine is credited as being the first to make small-mouth bottles, the actual history is more complex. The Ohio Bottle Co. received the exclusive Owens license to make beer and soda bottles using the new machine in 1904, but the firm and its successor – the American Bottle Co. – continued hand production of bottles sold in the U.S. American Bottle sold virtually all of the Owens machine-made bottles in Mexico and farther south. As *semiautomatic* machines became more readily available between 1910 and 1913, machine-made finishes dominated the beer and soft drink bottle industry.

Prohibition



Figure 2-55 – Ad for Bevo – a Near-Ber (*Deming Graphic* September 21, 1917)

One of the defining moments of the 20th century was the advent of national Prohibition in 1920. However, the transition to Prohibition was much more complex. Some states adopted Prohibition much earlier, and some allowed jurisdictional restrictions according to county and/or city. New Mexico, for example, voted in state Prohibition in 1917. The situation in Texas became incredibly complex – as discussed in Chapters 4 & 5.

Anheuser-Busch, as usual, led the industry in introducing Bevo (pronounced Beevo), the first national cereal beverage or near-beer, in response to the 1916 order prohibiting alcoholic beverages to US troops. Bevo ads frequently targeted the military (Figure 2-55). Although Bevo bottles were amber in color, they were more “squat” than the typical beer bottle, although they retained the swelled neck.

The name “Bevo” was an Americanization of “pivo” – a Bohemian word meaning beer. Bevo was made from barley malt, rice, hops, yeast, and water. The drink had the tart taste of beer without the alcohol. Although sales initially skyrocketed, they dropped dramatically by 1923 – reflecting the deteriorating market for near-

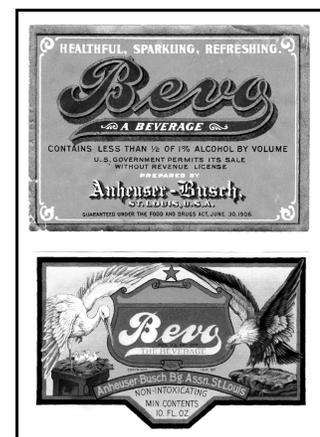


Figure 2-56 – Early (top) and later Bevo labels (Courtesy of Bob Kay)

beers in general (Figure 2-56). Anheuser-Busch may have hurt its Bevo sales by converting Budweiser into a near-beer in 1920 – in response to National Prohibition. Despite the low sales, the firm continued to produce Bevo until 1929 (Krebs & Orthwein 1953:96-103).

The threat of Prohibition also spurred other brewers to alter their formulas as a means of survival. In the early 1920s, most breweries came up with cute names for their near-beers (Figure 2-57), such as Graino, Famo, Brovo, Barmaor NIB (Non Intoxicating Beverage), but many later reverted to the original names with basically the same label – minus the word “beer.” Brewers also became soda bottlers, malt producers, and basically bottled and/or sold anything they could to remain solvent until Repeal in 1933.



Figure 2-57 – Ad for NIB (El Paso Herald-Post 7/13/1820)

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 and became known as the standard beer bottle. 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, although some were colorless. Even when non-returnable bottles were introduced (see Chapter 7e), the second configuration, the Steinie, retained the swelled neck to remind drinkers of the export bottle. Eventually, some forms of non-returnable bottles returned to a shape almost identical to the returnable exports. A trip to the grocery store, today, will reveal the export beer bottle, now almost 140 years old, still occupying the shelf.

Conclusion

To sum up this chapter, we know an incredible amount about beer bottles – especially export beer bottles – compared to what we knew as recently as a decade ago. Table 2-1 shows a chronology of export beer bottles. Finer points about dating and understanding embossed markings on beer bottles are beyond the scope of this chapter, although Lindsey (2012) listed most

of the articles and books created by the Bottle Research Group and individual members.

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