

Root Glass Co.

Bill Lockhart, Beau Schriever, Bill Lindsey, and Carol Serr
with contributions by Bill Porter, David Whitten, and Tod von Mechow

Beginning business in 1901, the Root Glass Co. is most remembered for the design and production of the hobble-skirt Coca-Cola bottles that remain in use in 2018. The Roots developed their own bottle machine (the Red Devil) between 1905 and 1912 and became one of the major soda bottle producers in the United States. In addition, the plant made beer bottles from 1901 to ca. 1914 and produced fruit jars during two periods – 1906-1909 and again in 1932. The firm sold to the Owens-Illinois Glass Co. in 1932.

History

Chapman Jay Root, president of the Root Glass Co., was born on November 22, 1867, in Wayne County, Pennsylvania. Prior to founding the Root Glass Co., Root had a notable history in the glass industry as the vice-president and treasurer of the Ravenna Glass Co., 1890-1891, manager of the Cream City Glass Co., 1894-1899, and secretary of the North Baltimore Bottle Glass Co., 1899-1901. Along with being a member of the Masons and the Elks, he sat on the board of directors for the Coca-Cola Co., Owens-Illinois Glass Co., Continental Gin Co., New York Coca-Cola Bottling Co., Philadelphia Coca-Cola Bottling Co., St. Louis Coca-Cola Bottling Co., Kansas City Coca-Cola Bottling Co., and the Rose Polytechnic Institute (Prabook 2018).

Root Glass Co., Terre Haute, Indiana (1901-1934)

The Root Glass Co. was incorporated on May 10, 1901, with a capital of \$50,000 and C.J. Root, Crawford Fairbanks, D.P. Irwin, and Albert Lieber as directors. The purpose of the new company was to manufacture soda and beer bottles. Chapman J. Root was president with Daniel P. Erwin as vice president, Lewis P. Bannister as secretary, and Crawford Fairbanks as treasurer. The firm began construction of a factory at Third and Voorhies Streets almost immediately and blew its first glass in November (Roller 1998).

In an expansion, Root bought Harry W. Streeter's idle Terre Haute Glass Mfg. Co. at 17th St. and Maple Ave. in October 1905 and entered fruit jar manufacture early the following year with seven machines in operation. A group headed by Streeter had incorporated the Terre Haute Glass Mfg. Co. on January 20, 1900, and made the first fruit jar, the only product made at the plant, on July 16 of the same year (Roller 1994:106). Although Root later developed its own soda bottle machine, the plant used Miller machines for making fruit jars. The fruit jar operation was short lived. The Ball Brothers bought the factory on November 9, 1909, and made jars there until the company closed the operation in 1914 (Brantley 1975:26; First National Bank 2001; Jones 1964:[25]; 1965:[24]; *National Glass Budget* 1909:1; Robbins 2007; Roller 1994:104, 106; 1998; Toulouse 1971:445-447).

The Root Glass Co. is best remembered by most people for its development of the original "hobble-skirt" Coca-Cola bottle in 1915. The bottle was designed by Earl Dean, foreman of the mold shop (First National Bank 2001; Jones 1964:[25]; 1965:[24] Bristow 1917:13). For a complete story of the design, see Hobson (2002:4), partly reprinted in Lockhart & Miller 2008:101).

However, the company is important for a lesser-known invention as well. According to Toulouse (1971:445-446), "Beverage bottles were . . . handmade until about 1912," the year the company began to produce all its soft drink bottles on its own semi-automatic bottle machines. The plant began work on the machines in 1905 and used the developing models to make some bottles. In 1910, a correspondent informed the *Commoner and Glassworker* that "the United machine at the Root plant is said to be doing well on beer bottles." (Idlewild 1910:16). Apparently, however, full implementation of the new machine, known as the "Root Machine" or the "Red Devil," was not affected until ca. 1912.

By 1913, the company used both semiautomatic machines and mouth-blown production¹ to make "beer and water [i.e., soda]" bottles on three continuous tanks with 26 rings (*Journal of*

¹ This statement contradicts the Toulouse claim that "all" bottles were made by machine by 1912. Because of the sheer volume of orders, it is almost certain that the transition period existed. During this time, machines handled the bulk of production, but overload orders, especially small ones, were mouth blown. This transition period probably extended from ca. 1906 or 1907 to ca. 1914 or later.

Industrial and Engineering Chemistry 1913:952). Bill Porter (personal correspondence 12/1/2010) reported a mouth-blown, straight-sided Coke bottle with a ROOT logo and date code for 1914, so hand methods were in use at least that late. The entire complex was flattened by a tornado on March 23, 1913, but Root soon rebuilt (First National Bank 2001; *Glass Industry* 1925:136).

The Root Glass Co. was listed from 1907 to 1921 as making “Beer, Soda, [and] Liquor” bottles (Thomas Publishing Co. 1907:158; 1917:730; 1918:809; 1920:826; 1921:780). This is the only reference to liquor bottles we have found in the literature, and we have yet to discover a single liquor bottle bearing the ROOT mark. We can speculate that Root intended to make a line of liquor bottles fairly early in its production sequence, but the total orders for beer and soft drink bottles eliminated the need. We have frequently documented continued listings by the Thomas Registers for several years after products were discontinued or even after factories were closed.

In 1917, the plant operated three tanks. No. 1 tank was “worked with six one-man O’Neill machines.” Tank No. 2 used “four United machines, one one-man Teeple machine and two one-man O’Neill machines.” The final tank operated “five one-man Teeple, two one-man Miller and one one-man O’Neill machines.” The plant made beer and Coca-Cola bottles (Bristow 1917:13). Root may have only added colorless glass in 1919. An October 1918 article stated that “new lines of ware [for Root] for 1919 include flint bottles and jars.” This also suggests that Root wanted to reenter the jar field in that year (*Glass Worker* 1918:13).

By 1921, Root offered bottles in “light green, flint, or amber” colors until November 1925 when the plant added emerald green – the color of Seven-Up bottles, also called Forest Green in some studies (*Glass Container* 1925:32). The plant only made bottles to order, rather than storing up generic styles. Beer bottle production may have been discontinued as early as 1914 (see ROOT discussion below) but was certainly gone with the advent of Prohibition in 1920. A March 1926 ad (*Glass Container* 1926:28) noted:

Three furnaces, 22 bottle making machines and a greatly increased force of men are “going it” day and night at the Root plant to give you the “rush” service. Almost any size order can be made up and shipped within 48 hours of its receipt, if necessary. Nothing sidetracks your order—we make Beverage Bottles *exclusively*. . . . *Licensed Mfrs. of all Patented Design Beverage Bottles.*

The term Patented Design Beverage Bottles refers to the specialty or proprietary soda bottles that were popular with many of the national soda brands during mid-1920s to late 1930s. Most local bottlers used generic, paper-labeled bottles until ca. 1925, when they joined the specialty bottle craze of the national brands. Root was a pioneer in the specialty bottle field. A November 1921 Root ad showed 13 specialty styles, including the well-known hobble-skirt Coca-Cola bottles and those from Whistle, Orange Crush, Chero-Cola, and a particularly elaborate design for Blutwine. By the late 1930s to early 1940s, these styles were mostly replaced by Applied Color Label bottles.

The *Glass Industry* (1925:136) noted that Root operated three plants at Terre Haute by 1925, although this may have referred to the three furnaces noted earlier. On May 15, 1925, plant No. 2 was destroyed by fire. Although plant No. 3 had been similarly burned in November 1924, it had been rebuilt. By 1927, the company made “flint, green, amber and emerald green beers, beverage bottles, minerals, packers and preservers” by machine at three continuous tanks with 16 feeders (indicating that plant No. 2 had been rebuilt). The listing remained the same until 1933, when the plant was “now Owens-Illinois Glass Co.” (*American Glass Review* 1927:143; 1933:71).

Apparently, Root reestablished fruit jar manufacture during its final year of independent operation (1932). The Hollianna Mason was embossed “ROOT” on its base. An identical jar was made by Owens-Illinois (with the Diamond OI logo above a ghosted ROOT logo on the base) from ca. 1933 to ca. 1939 (Caniff 2008:7-8; Roller 1983:157). Creswick (1987:63) also illustrated the Hollianna MASON with ROOT / 32 embossed on the base.

Root became Plant No. 25 of the Owens-Illinois Glass Co. in 1932. Although Toulouse (1971:447) maintained that the company retained the Root name for the next two years, empirical evidence questions that period. Date codes to “32” are reported in association with ROOT heelmarks, but we have not seen any past that date. At least one Hollianna Mason jar (see section below) was made with “ROOT” peened out on the base and the Owens-Illinois logo and a “3” (1933) date code added. This suggests that the Root name was phased out by the year following the purchase. Some bottles may have been embossed with “ROOT 33” to fill existing contracts or to wear out existing molds, although we have not yet found an example.

The factory continued to produce glass until 1938 when Owens-Illinois shut it down. It was reactivated in 1942 but was again idled in 1948 and used as a warehouse when not active (Ayres et al. 1980:37; Roller 1994:104; Toulouse 1971:445-447). After the sale to Owens-Illinois, the Root company became an investment concern (Hopson 2003:7; Jones 1965:[24]).

The American-Wheaton Glass Co. purchased property in 1960, then destroyed the former plant to build a new factory. The American Can Company acquired the Wheaton Plant in 1962, and created a subsidiary called A-W Glass. The Midland Glass Company purchased the complex in January of 1968, and the Anchor Glass Container Corp. finally acquired the factory then closed it in 1984. A decade later, Anchor razed the buildings (First National Bank 2001; Hopson 2003:7).

Containers and Marks

RGCO (1901-ca. 1907 – possibly as late as 1912)

The “RGCO” logo appears on the bases or heels of a large number of soda bottles made during the 1901-1910 period (Figure 1). The very few examples we have seen always have a capital “O” in “CO” and no punctuations. In descriptions from researchers, however, the mark was described with either a capital or lower-case “O” as well as with or without punctuation.



Figure 1 – RGCo (Bill Porter)

Various researchers have proposed a total of four possible glass houses as the user of the “RGCo” mark on beer and soda bottles, as well as a single packers’ bottle used by W.H. Hutchinson & Son, Chicago, Illinois. Toulouse (1971:440) claimed that the RGCo mark was used by the Renton Glass Co., Renton, Washington, from 1907-1911 – almost certainly zeroing in on the only glass house he knew about with the correct letters. Peters (1996:9) and Whitten (personal correspondence 8/11/2004) both vehemently opposed the Renton hypothesis, noting that the bottlers using “RGCO” and “ROOT” bottles were mostly in the Midwest, extending into the East and Southeast – *very* unlikely venues for a Washington state glass house. In addition, Renton was a small plant that could not have produced the sheer quantity of bottles with the “RGCo” mark.

Kroll (1972:3) noted that the R.G.Co. mark was “most likely associated with Reed [i.e. Eugene P. Reed Co.], but could have been the Root Glass Co. Since the various Reed glass house incarnations have a well-defined sequence of marks (see F.E. Reed section), no other researchers have seriously considered Reed as a possibility.

In the late 1990s, the Bottle Research Group discovered the Randall Glass Co. at Morgantown, West Virginia, open from 1903 to 1907 – virtually the perfect time period for the logo. However, like Renton, the factory was small, an unlikely venue for the huge number of bottles with the “RGCo” mark. The major problem, however, is that some soda bottlers enumerated by Peters (1996) did not begin production until 1908, 1909, and 1912, respectively. Since each of these companies used bottles with RGCo marks, those could not have been made by Randall, since Randall had to have been closed for one, two, or five years prior to the opening of these plants. Unless Peters’ dates are completely out of sync (which is unlikely), this sounds the death knell for the Randall Glass Co. as a possibility.

The final proposal – almost certainly the correct one – was the Root Glass Co. Peters (1996:9) more solidly supported the Root hypothesis, noting that “R.G.CO. bottles made for Wisconsin bottlers are identical to (later) ROOT bottles used by the same bottler. Examples are numerous. . . . R.G.CO. Hutchinson soda bottles used by these bottlers were blown in the same molds as ROOT marked sodas.”

In a personal communication (10/28/2004), Peters further justified his claim:

There was a change in how Root marked their soda water bottles about 1909. At that time they went from using RGCO to ROOT. The ROOT bottles are blown in the same molds as the RGCO bottles. Aside from RGCO vs. ROOT the bottles are identical in every respect. There are other more subtle similarities among RGCO and ROOT bottles, such as similarities in colors, finishes (Root had “flared” Hutchinson blobs), bottle design, and emboss[ed] lettering size and style. (The emboss[ed] lettering size and style is a dead giveaway on many Root bottles - you can pick out a Root bottle without knowing it’s actually from Root.)

Whitten (2018a) and van Mechow (2018) both also credited the Root Glass Co. with the use of the mark and further pressed the regional perspective. Root ads as late as 1924 showed a

logo that had “R-G-Co” in an elongated diamond, often incorporated into the double “o” in Root (e.g., *Glass Container* 1924:46). While this diamond logo was never embossed on bottles, the use of the initials shows that the company *did* consider the initials significant (Figure 2).

There are some interesting generalities that fit both RGC_o and ROOT bottles. Both were embossed on bases during the early period (not including Hutch bottles). Both occasionally had a single-digit code (so far no higher than 6 for RGC_o; 5 for ROOT), also on the bases. Multiple-digit numbers (almost certainly mold codes) for both were embossed on the heels.

In conclusion, RGC_o was used by the Root Glass Co. from the beginning of the company in 1901 to ca. 1906 or 1907. Because virtually all glass houses continued to use molds until they wore out, some bottles with the RGC_o mark were probably made as late as 1912.

RGCO on Coca-Cola Bottles

The famous hobble-skirt Coca-Cola bottle, patented in 1915, almost certainly the parent of a generation of bottles called specialty bottles by the industry and often now referred to as proprietary bottles by archaeologists and deco bottles by collectors. The earliest specialty bottles we have discovered were used about the turn of the century, although the trend really followed the invention of the Coke bottle. Some brands adopted specialty bottles ca. 1920, although most used generic bottles with paper labels until the mid-1920s or later. Specialty bottle use did not become general until ca. 1925. Coca-Cola and Dr Pepper were notable hold outs at the end of the period, continuing to use specialty bottles into the 1960s. Coke even retained the hobble-skirt bottle style and added ACL lettering.

Taking a different tack from other researchers, Porter (2012) hypothesized that the three-digit numbers accompanying the “RGCO” marks on Coke bottles (and others) were mold, model, or proprietary numbers and were used in sequential order, forming an ordinal scale that could be used as a rough dating formula. Although most of the “RGCO” logos were applied to the bases,



Figure 2 – RGC_o ad (*Glass Container* 1924:46)

the mold codes are found on the heels. Porter further noted that when Coca-Cola bottling franchises used both Hutchinson-finished and crown-finished bottles, they were sequentially numbered, consistently with the crown-finished bottle first. For example, the crown bottle for the Birmingham, Georgia, franchise was numbered “404,” while the Hutchinson bottle bore “405.” Dennis Smith (see Whitten 2018b) continued Porter’s research into the numbers, and both hope to create dating guides for Root bottles based on the mold codes.

Although Porter’s reasoning is not pertinent to this study, he determined that the earliest Coke bottles made by Root appeared on “straight-sided” examples in 1905, and these carried mold numbers in the 300s (as low as 315). He noted that Fowler (2018) showed numerous Hutchinson soda bottles with much lower numbers and suggested that most of these were made prior to the 300-series Coke bottles. By the time Root began using date-coded heelmarks in 1909, the numbers were into the 1100s. The “RGCo” initials were phased out as early as three years before the date code system began (Porter 2012).

Hutchbook (Fowler 2018) provided a list of 515 Hutchinson soda bottles, almost all marked on the heels (a few on the bases) with either “RGCO” or “ROOT.” Mold numbers ranged from a low of 10 to a high of 801, although the vast majority fell between the 60s and 350s. Two interesting marks were “RGCo No.7” and “No. 8.” Although this is uncertain, these *could* be date codes for 1907 and 1908. If so, Root dropped the “No.” in 1909. Two oddities were “RGCo 63 11” and “RGCo S-7.” See below for data on “ROOT” logos on Hutchinson bottles.

Although the system is not perfect, it is clear that bottles with the lower mold numbers are older than those with higher ones – and this continues into the date code era (1909-1932). Some use of older numbers occur on newer bottles, probably because some firms continued to use the same model of bottle, so Root maintained the molds until they completely wore out. In addition, a replacement mold may have sported the same number as the older one it replaced.

ROOT (ca. 1906-1932)

Virtually all researchers of 20th century bottles identified the ROOT mark as belonging to the Root Glass Co. from 1901 to the early 1930s. After the transition from the RGCo mark, all

bottles made by the Root Glass Co. seem to have been marked with ROOT embossed on either the base or heel, and jars had either basemarks or cursive embossing on the front body. The use of the cursive “Root” on fruit jars began in 1906, and it is likely that block “ROOT” was first used on bottles during that same year. Our findings are limited to fruit jars, soft drink and beer bottles – the only types of containers we have found with Root marks.

Toulouse (1971:445) maintained that the plant made “a general line of ware” that included “drugs, chemicals, sodas, waters, and beers,” although ads and listings fail to support this claim until very late in the life of the company. A single source asserted that Root made liquor bottles, but we have found no evidence to support such manufacture. Each of the three major container types requires its own discussion.

Fruit Jars (1906-1909)

According to Toulouse (1971:445), the company marked its fruit jars with a slight upwardly slanted, cursive “Root” underlined by an extension from the base of the “t” (Figure 3). He dated the mark 1901 to 1909 despite the fact that the fruit jar factory did not open until 1906.

Roller (1983:308; 2011:451) showed the slanting cursive Root mark on Mason jars made of yellow green or light blue glass and noted a variation with a “1” high R in center of base.” He dated the jars ca. 1906-1909. The jars were accompanied by zinc lids embossed “ROOT GLASS COMPANY” in a circular format on the inner section of the top (Figure 4). Creswick (1987:113) noted two variations of the ROOT MASON (one with curls in each “o” and one with no curls) and included an illustration of the GENUINE ZINC CAP.

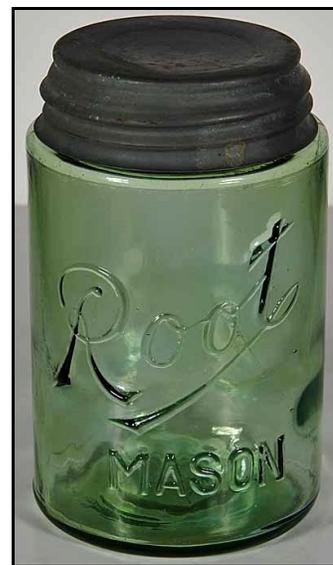


Figure 3 – Root (North American Glass)

Toulouse (1969:263-264) had earlier noted a finer distinction than either Roller or Creswick, which added another dichotomy. The first of these was mouth blown, and he dated those 1902-1909. The second, however, was “crudely machine-made.” He noted that Root had devised a semi-automatic bottle machine just before selling out to Ball Brothers. The last jars

were made on the machine from 1908 to 1909. In addition, the machine-made jars were manufactured with and without the word MASON below “Root.”

According to Roller (1994:106), however, the plant was “being overhauled and equipped with machines” during February 1906. As of March 24, the plant had seven machines, three making half-gallon jars, three for quarts, and one for pints. In 1909, the plant used Miller machines with Miller’s Automatic Patent Attachment. Creswick (1987:63, 113) also showed the cursive Root MASON in two variations. Long-time jar collector and researcher Tom Caniff stated that he had never seen a mouth-blown Root jar, although he added, “of course, you never know . . .”

(personal communication 11/24/2008). It seems *very* unlikely that mouth-blown jars of this type exist.

After the Ball Brothers acquired the fruit jar plant in 1909, they altered the older Root molds to form the word “Ball” in cursive. The quality of the altered molds varies, but most clearly show a “B” where the “foot” of the letter “R” has been turned back toward the front of the letter (i.e., to the left). Collectors frequently call these “Rall” Mason jars (Figures 5 & 6). They were made at the former Root plant from 1909 to 1913, when Ball closed the factory. In 1910, however, Ball shipped some of the



Figure 4 – Zinc lid (North American Glass; Roller 1983:308)



Figure 5 – “Rall” Mason (North American Glass)



Figure 6 – “Rall” Mason (Creswick 1987:20)

altered molds to the Coffeyville, Kansas, plant, and these were made in colors ranging from light yellow green through bright olive green. Although the vast majority of these jars had the older shoulder-seal finish, at least one mold was further modified to form a bead-seal finish (Brantley 1975:24; Creswick 1987:20; Kath 1998:43; Roller 1983:38).

Hollieanna Mason Jars (1932)

Root made the Hollieanna Mason jars for Hollie and Anna Oakley, owners of the Oakley grocery chain in 1932.



Figure 8 – Hollieanna base

The chain began ca. 1910 and grew until 1939, when the Oakleys sold their stores to the Kroeger chain. The jars were embossed “HOLLIEANNA (cursive, slight arch) / MASON (block, horizontal)” on the side and “ROOT / 32” on the base (Figure 7). Owens-Illinois continued making the jars, peening out the “ROOT / 32” and embossing “25 {Owens-Illinois logo} 3 / 8” above the old mark (Caniff 2008:7-8; Creswick 1987:63-64 – Figure 8). Roller (1983:157) suggested that the jars continued to be manufactured by Owens-Illinois until ca. 1939.



Figure 7 – Hollieanna Mason (Creswick 1987:63)

Soft Drinks Bottles (1906-1932)

The ROOT mark, embossed on the bases, was likely first used in 1906, the year that Root adopted the cursive Root on fruit jars. The early marks fell into two patterns. The first was a heelmark followed by a 2- to 4-digit mold code (Figure 9). This placement was initially only placed on Hutchinson-style bottles. Although Hutchinson bottles were sometimes used for beer, they were mostly considered soda bottles.



Figure 9 – Early heelmark (Bill Porter)

We presented a brief study of data from Hutchbook (Fowler 2018) in the “RGCO” section above, and it is also appropriate to this discussion. As with “RGCO,” the “ROOT” logo

was almost always placed on the heel, and the accompanying mold numbers ranged from a low of 199 to a high of 1287 – although the vast majority was in the 360-600 range. A single bottle was embossed “ROOT 232 08,” and two were embossed “ROOT 604 09,” suggesting that these were date codes for 1908 and 1909. Others had date codes ranging from “1199 ROOT 10” to “1199 ROOT 13”



Figure 10 – Basemark (eBay)

(1910-1913), suggesting that the use of Hutchinson soda bottles was phasing out during the 1910-1913 period (note the oddity that both of these had the same mold code). A single outlier was embossed “ROOT 33 18” – showing that Root used a very old mold number on a Hutchinson bottle produced in 1918 – long after the “accepted” date for the Hutchinson phase-out date of 1912.

The second placement of marks was on the bases of crown-topped soda bottles. These included “ROOT” with no numerical codes (Figure 10) and those with single-digit numbers below the mark (e.g., ROOT / 2). At some point (probably 1909), the mark shifted entirely to the heel. These heelmarks had two sets of numerical codes. One set of numbers, almost certainly a mold code, ranged from two to four digits (Figure 11). As may be expected with codes representing available models, the earlier ones comprised lower numbers. For example, the highest code we have seen on Hutchinson bottles is 1287, although typical numbers for those bottles are in 300-600 range or lower. Numbers in the 3000s (in our sample) do not appear until the 1920s.



Figure 11 – Later heelmark (Bill Porter)

Prior to the introduction of date codes, the mark (ROOT) preceded the mold number on heelcodes. With the advent of date codes, however, the codes and manufacturer’s mark could appear in any order on the heel, e.g.:

- 1116 ROOT 9 (mold ROOT date)
- 711 13 ROOT (mold date ROOT)
- 14 670 ROOT (date mold ROOT)

Our sample does not include any examples where “ROOT” precedes the mold number, when the date code is present. By ca. 1920 (possibly a bit earlier), Root had adopted a steady pattern with the mold code was to the left of “ROOT” and the date code was to the right (e.g., 1430A ROOT 20).

Porter (1996:3) noted that dating began on Root bottles in 1909. An El Paso example supports Porter’s claim that the “9” is a date code. The El Paso bottle is the second style used by the Magnolia Bottling Co. The company was founded in late 1907 or early 1908 and used a tall bottle with a very rounded heel for its first drinks. The second style came in five variations, each mouth blown. All used plates except the first one marked 1116 ROOT 9.² The date of 1909 fits perfectly in the sequence of bottles used by Magnolia (Lockhart 2000). The use of heelmarks on soda bottles, therefore, likely extended from 1909 to the purchase of the company by Owens-Illinois in 1932.

Toulouse (1971:446) noted that Owens-Illinois retained the Root company name until 1932, and that is the latest date code we have found. This suggests that although Owens-Illinois may have maintained the name for advertising, bottles were probably all marked with the Diamond-Oval-I mark used by all Owens-Illinois factories. The No. 25 plant code to the left of the Owens-Illinois mark, however, continued to identify the factory.

The Root Glass Co. invented the hobble-skirt Coke bottle, and the first ones were almost certainly made by Root (Figure 12). However, the earliest date codes on Root hobble-skirt bottles (or those made any other glass house) is “17” (1917). It is likely that the lag between the patent date and the initial production at least 13 months later was because the various franchises were using up their older,



Figure 12 – Hobble-skirt Coke bottle

² When the Bottle Research Group examined the collection at Fort Bliss, we found another of the Magnolia bottles, with “1116 / 10” embossed on the heel. We found no indication of the word “ROOT” on the heel or base. The placement of the date code below the mold number is atypical (as is the missing manufacturer’s mark), but the bottle fits as a follow-up to the 1909 bottle by Root.

straight-sided bottles. Some franchises, probably with larger supplies of the older bottles, failed to adopt the hobble-skirt bottle until 1920 (Lockhart & Porter 2010).

To assure that other beverage companies could not use their bottles, the Coca-Cola Co. patented their design and marked the initial bottles “PAT’D NOV. 16, 1915.” The patent was renewed twice, then the bottle was registered as a trade mark. Bottles under the second patent were embossed “PAT’D DEC. 25, 1923.” Some glass houses changed their production at the end of a year. Chattanooga Glass Co. and Laurens Glass Co., for example, made 1915 bottles until 1927 then switched to the 1923 patent in 1928 (Lockhart & Porter 2010; Porter 2012).

The Root transition was much more erratic. There was always some lag between the changes required by the home office and their actual adoption by the franchises. Root may have given each franchise the option to choose when to switch or may have wanted to wear out old molds. Because of this long transition time, both styles (1915 and 1923) were made from 1928 to 1930, although 1923s were the predominant style during that period. Only the 1923 style had date codes for 1931 and 1932.

As mentioned above, Root had perfected its “Red Devil” semi-automatic machine by 1912. It is probable, however, that machine production actually began earlier. Likely, sometime ca. 1909 or so, machine production started in a limited way. A transition period (ca. 1909-1912) probably existed when the company produced both mouth-blown and machine-made soft drink bottles. By 1912, however, all bottles were probably manufactured by machine. The date code system is found on both mouth-blown and machine-made bottles.

One possible exception to these categories is a green, unembossed soft drink bottle with RoXoT / 31 embossed on the base (Figure 13). The “X” is by far the largest letter. The 31 fits with the last year Root existed as a separate entity from Owens-Illinois, but all other bottles we have found were embossed on the heel by that time. Similar bottles without the date code have been reported by Hull-Walski and Ayres 1989:80) and Jill Heilman (personal communication, 7/15/2008). Currently, we have no explanation for this “X” mark, although Owens-Illinois sometimes



Figure 13 – RoXoT

used an “X” for experimental bottles. A similar bottle was embossed on the base with a large “X” along with A. B. Co. and had an apparent date code for 1930. We have no evidence that these “X” bottles were related, but the similarity of the “X” marks and the proximity of the dates suggests *some* kind of relationship.

Beer Bottles (1906-ca. 1914)

Most of the beer bottles in our sample have “ROOT” embossed horizontally across the base. A few amber bottles (presumably beer) were marked “ROOT / 4,” “ROOT / 5,” and “ROOT 5” on their bases, but we have only found single-digit numbers in this position. These were some sort of mold number, not date codes. Beer bottles illustrated and/or described in Ayres et al. (1980:37), Mobley (2008), and eBay demonstrated that the ROOT mark was almost always embossed on the bases of beer bottles. In a sample of 22, only two beer bottles had “ROOT” heelmarks. One of the heelmarked bottles had the brewery name embossed on the base. Most of these bottles, however, were accompanied by a 2- to 4-digit mold code placed on the heel.

Also on the heel but separate from the mold number was a one- or two-digit number between 9 and 14, although most of the bottles in our sample lacked any of these codes. As discussed in the section on soda bottles, the “9” is almost certainly the earliest date code, used by Root in 1909. It is also apparent that Root slowed or ceased production of beer bottles after 1914. Even though we have not found date codes higher than 14 on beer bottles, some may exist. However, Root became more and more associated with soda bottles from a fairly early date, possibly as early as 1910. It appears that this shift in focus is the cause for the cessation of beer bottle production, rather than the advent of Prohibition in 1920.

A final aspect of bottle production and dating is the use of machinery. Documentary evidence (see history section above) indicated that Root continued to produce some bottles by hand in 1913. When the Bottle Research Group examined the Tucson Urban Renewal collection in 2006, we discovered that all three beer bottles with the “ROOT” basemark, described by Ayres and his associates (1980:37), were on export bottles with tooled crown finishes – indicating hand production. These bottles all had heelmarks indicating a manufacture in 1913.

Combining these observations, it is likely that Root adopted the “ROOT” mark on beer bottle bases (and occasional heelmarks) ca. 1906. These marks were accompanied by mold numbers from the beginning, but date codes were not applied until 1909. The volume of beer bottles made by Root may have decreased over time (probably because of an inverse increase in soda bottle production – noted in the documentary evidence) until they were either eliminated or production was severely restricted by ca. 1914.

Discussion and Conclusions

During its 30-year tenure in the glass-making business, Root only used three marks. The earliest, RGCo, was embossed on the heels of Hutchinson bottles and the bases of crown-top and other bottles from the inception of the company in 1901 to as late as ca. 1912. A cursive “Root” was used on the front body of fruit jars from 1906 to 1909 but was never used on glass in any other capacity.

ROOT (block letters) was adopted ca. 1906 and continued in use until the Owens-Illinois Glass Co. gained control of the company in 1932. The logo appeared as a basemark on beer bottles from ca. 1906 to ca. 1914. Apparently beer bottle production slowed or ceased about that time. On crown-topped soda bottles, however, the basemarks virtually disappeared by 1909, replaced by heelmarks, although heelmarks had been the standard for Hutchinson-style bottles from the beginning (both RGCo and ROOT logos). Although mold codes had appeared almost from the start, date codes were first used in 1909 and continued to be embossed on bottle heels until 1932.

A couple of avenues of future research would be helpful in clarifying and supporting many of the above hypotheses. First, we need to find a large sample of soda and beer bottles embossed with the ROOT logos. We hypothesized: 1) beer bottle production ceased after 1914; b) beer bottles were mouth blown; and c) that all production of mouth-blown bottles ceased after 1914. A sufficiently large sample would enable us to test those hypotheses and to discover the distribution of mouth-blown and machine-made bottles with early date codes and in undated examples.

Second, there is a strong need for more local research on bottles used by soda bottlers, breweries, drug stores, and other bottle fillers. These works need to include dates in business for local bottlers, chronologies for the bottles they used, and bottle details. The details need to include manufacturer's marks, date and other codes, type of manufacture (mouth-blown or machine), finish details, and very fine descriptions. Works by Clint (1976), Peters (1996), Fowler (1998), Lockhart (2000), Lockhart & Miller (2008), and Miller (2008) are very helpful, but we need a great deal more local research.

Future research should also be focused on a large sample of bottles with "RGCO" and "ROOT" logos. A good sample could possibly separate the bottles based on manufacturing characteristics to discover which bottles were made by each of the three machine types described in the history section. While the Bottle Research Group has information on the O'Neill machines, no study has yet been undertaken to discern whether other early narrow-mouth production units – notably United or Teeple machines – left any identifying marks.

Acknowledgments

As usual, we would like to thank Doug Leybourne for allowing us to copy the drawings from the Alice Creswick books and Greg Spurgeon for letting us use photos from North American Glass. Gratitude also to Wanda Wakkinen for her consistent proofreading of these works. Bill Lockhart would also like extend personal thanks to David Whitten for patiently and persistently putting evidence in front of my face until I gave up trying to demonstrate that the Randall Glass Co. used the "RGCO" logo.

Sources

American Glass Review

1927 "Glass Factory Yearbook and Directory." *American Glass Review*, Pittsburgh, Pennsylvania.

1933 "Glass Factory Yearbook and Directory." *American Glass Review*, Pittsburgh, Pennsylvania.

- 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.
- Brantley, William F.
1975 *A Collector's Guide to Ball Jars*. Rosemary Humbert Martin, Muncie, Indiana.
- Bristow, A. E.
1917 "Operating to Capacity." *Glassworker* 36(8):1, 13.
- Caniff, Tom
2008 "Fruit Jar Rambles: Golden State Jars in the East." *Bottles and Extras* 24(9):6-8.
- Clint, David K
1976 *Colorado Historical Bottles & Etc., 1859-1915*. Antique Bottle Collectors of Colorado, Inc., Boulder.
- Creswick, Alice
1987 *The Fruit Jar Works, Volume II, Listing Jars Made Circa 1900 to Modern*. Privately printed, Grand Rapids, Michigan.
- First National Bank
2001 "Wabash Valley Profiles: A Series of Tributes to Hometown Heroes Who have made a Difference: The Root Glass Co." First National Bank, Terre Haute, Indiana.
<http://web.indstate.edu/community/vchs/wvp/rootglass.pdf>
- Fowler, Ron
1998 *Ice-Cold Soda Pop 5¢: An Illustrated History of Oregon Soda Pop Bottling*. Privately published, Seattle, Washington. [Revised version of the 1986 edition]

2018 "Hutchinson Bottle Directory." Seattle History Co., Hutchbook.com.
<http://www.hutchbook.com/Bottle%20Directory/>

Glass Container

1924 Advertisement: "Be Sure They're Root and Then Go Ahead." *Glass Container* 4(1):46.

1925 Advertisement: "Root." *Glass Container* 5(1):32

1926 Advertisement: "Root Beverage Bottles." *Glass Container* 5(5):28.

Glass Industry

1925 "Trade Activities." *Glass Industry* 6(6):135-136.

Glass Worker

1918 "Gas Producers and New Automatic Machinery." *Glass Worker* 37(2):1, 12-13.

Hopson, Kathy

2002 "Chapman J. Root, the Root Glass Company." *Soda Pop Dreams Magazine* 5(3):4.

2003 "Chapman J. Root, the Root Glass Company and the Coca-Cola Contour Bottle." *The Soda Spectrum Series* 1(1):6-7.

Hull-Walski, Deborah and James E. Ayres

1989 *The Historical Archaeology of Dam Construction Camps in Central Arizona., Volume 3: Laboratory Methods and Data Computerization.* Dames & Moore, Phoenix.

Idlewild

1910 "Bottle Items from Terre Haute." *Commoner and Glassworker* 23(22):16.

Jones, May

1964 *The Bottle Trail, Volume 4.* Nara Vista, New Mexico.

1965 *The Bottle Trail, Volume 5.* Nara Vista, New Mexico.

Journal of Industrial and Engineering Chemistry

1913 "The Present Status of the Glass Bottle and Hollow Ware Industries in the United States." *Journal of Industrial and Engineering Chemistry* 5(11):951-954.

Kath, Vivian S.

1998 "Granny Kath's Kitchen." *Antique Glass & Bottle Collector* 15(3):40-45.

Kroll, Wayne, L.

1972 *Wisconsin Breweries and Their Bottles*. Privately Published, Jefferson, Wisconsin.

Lockhart, Bill

2010 *Bottles on the Border: The History and Bottles of the Soft Drink Industry in El Paso, Texas, 1881-2000*. Historic Glass Bottle Identification & Information Website: Reference Sources/Bibliography. <http://www.sha.org/bottle/References.htm>

Lockhart, Bill and Michael R. Miller

2008 *The Bottles, Marks, and History of the Southwestern Coca-Cola Bottling Co., New Mexico and Arizona, 1917-1947*. Privately Published, Alamogordo, New Mexico.

Lockhart, Bill and Bill Porter

2010 "The Dating Game: Tracking the Hobble-Skirt Coca-Cola Bottle." *Bottles and Extras* 21(5):46-61.

Miller, Michael R.

2008 *A Collector's Guide to Arizona Bottles & Stoneware: A History of Merchant Containers in Arizona*. 2nd ed. Privately Printed, Peoria, Arizona. [Note: this is a major revision on his 1999 book with numerous additions.]

Mobley, Bruce

2004 Dictionary of Embossed Beers.

<http://www.one-mans-junk.com/beerbottlelibrary/1.htm>

National Glass Budget

1909 "Miller Machines at Terre Haute." *National Glass Budget* 25(12):1.

Prabook

2018 “Chapman Jay Root.” https://prabook.com/web/chapman_jay.root/1088342

Peters, Roger

1996 *Wisconsin Soda Water Bottles, 1845-1910*. Wild Goose Press, Madison, Wisconsin.

Porter, Bill

1996 *Coke Bottle Checklist*. Privately printed, n. p.

2012 “Dating and Identifying Early Coca-Cola Bottles: Focusing (Mainly) on Florida and Georgia Bottles.” *Bottles and Extras* 23(4):14-15, 54-63.

Robbins, Rob

2007 “Other Places of Interest in the Wabash Valley: Root Glass Company.”
<http://www.angelfire.com/tn/southportcavers/other.html>

Roller, Dick

1983 *Standard Fruit Jar Reference*. Privately published.

1994 *Indiana Glass Factories Notes*. Acorn Press, Paris, Illinois.

1998 “Terre Haute, IN History Notes.” Roller files.

2011 *Standard Fruit Jar Reference: 2011 Update*. Edited by Jerome McCann and Barry Bernas. Fruit Jar Annual/Phoenix Press, Chicago.

Thomas Register of American Manufacturers

1907-1908 *Thomas' Register of American Manufacturers and First Hands in all Lines: The Buyers Guide*. Thomas Publishing Co., New York.

1909 *Thomas' Register of American Manufacturers and First Hands in All Lines: A Classified Reference Book for Buyer and Sellers*. Thomas Publishing, New York.

1912 *Thomas' Register of American Manufacturers and First Hands in All Lines: A Classified Reference Book for Buyer and Sellers*. Thomas Publishing, New York.

1917 *Thomas Register of American Manufacturers and First Hands in All Lines*. 9th ed. Thomas Publishing Co., New York.

1918 *Thomas Register of American Manufacturers and First Hands in All Lines*. Thomas Publishing Co., New York.

1920 *Thomas Register of American Manufacturers and First Hands in All Lines*. Thomas Publishing Co., New York.

1921 *Thomas Register of American Manufacturers and First Hands in All Lines*. Thomas Publishing Co., New York.

Toulouse, Julian Harrison

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

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

von Mechow, Tod

2018 "Soda & Beer Bottles of North America: Bottle Attributes - Beer & Soda Bottle Manufacturers." <http://www.sodasandbeers.com/SABBottleManufBeerSoda.htm#57572>

Whitten, David

2018a "Glass Factory Marks on Glass."

<http://www.myinsulators.com/glass-factories/bottlemarks.html>

2018b "Root Glass Company."

<https://www.glassbottlemarks.com/root-glass-company-terre-haute-indiana/>

Last updated 12/25/2018