

The Dating Game - The Owens Bottle Co.

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The Owens Bottle Co. (1919-1929) was part of a series of companies that began with the Toledo Glass Co. (1895-1920), the firm that developed the Owens Automatic Bottle Machine. The principal investors in the Toledo company then created the Owens Bottle Machine Co. (1903-1919) to manufacture and lease the Owens Machine, and the latter company in turn created a series of subsidiaries to make bottles, before renaming itself the Owens Bottle Co. Much of the confusion that still surrounds the early history of the Owens machine, in fact, derives from the seemingly compulsive tendency of the machine's backers for creating new corporations to deal with new opportunities or new functions.

The story of the Owens Automatic Bottle Machine has been retold in numerous publications (e.g., Scoville 1948:101-174; Skrabec 2007:183-268; Walbridge 1920). The dates given, however, are often confusing. It is correct that the first fully automatic bottle machine was patented by Michael J. Owens in 1903. However, bottles were not first produced on the machine until the following year (1904), the year credited by almost all the early articles (e.g., *Journal of Industrial and Engineering Chemistry* 1914:864). Although some production began in October 1904, the best *practical* date for the use of the machine would be 1905 when serious commercial production actually began (Miller & McNichols 2002:2).

Even that fails to tell the full story. As noted by Jones and Sullivan (1989:35-39), there is no way to tell whether a bottle was produced on a semiautomatic or fully automatic machine, aside from the Owens scar visible on early Owens-machine-made bottles. By 1896, machines were used to make wide-mouth bottles and fruit jars in the U.S. Semiautomatic machines were making narrow-mouth bottles by 1901 (*Journal of Industrial and Engineering Chemistry* 1914:864). Thus, narrow-mouth bottles with automatic machine characteristics were available (albeit not

in large quantities) two years prior to the generally accepted date for automatic machine-made bottles (1903), while Owens-made bottles were not *generally* available for two years after (1905).

Early semiautomatic machines only automated a small part of the process; the rest was accomplished by hand. This entailed a two-part process. For narrow-mouth bottles, a gob of glass was dropped into a blank or parison mold, where a puff of air formed the upper end of the bottle (known as the "finish" from the early days when that was the final operation in bottle making) and created a small opening in the throat of the blank or parison. The parison was then transferred to a second mold, often called the "blow" mold, where another puff of air blew the bottle into its final shape. As time passed, more and more of these operations became automated, until only the gathering and application of the initial gob of glass continued to be accomplished by hand. The Owens machine used suction to introduce the glass to the parison mold, automating the only stage that was still only accomplished by hand. The machine was now fully automatic.

The Owens Bottle Machine Co. initially offered exclusive licenses for specific types of bottles. For example, the American Bottle Co. completely controlled the manufacture of soda and beer bottles by the Owens machine from 1905 to 1929, and the Thatcher Mfg. Co. was the sole licensee for milk bottles during a similar period. Corporations owned by Owens controlled grape juice and catsup bottle manufacture. By ca. 1909, the company woke up to the idea that it was cutting itself out of the bottle making business and ceased the exclusive license practice, while still restricting the number of companies allowed to manufacture certain types of bottles. For example, liquor bottles were licensed to the Charles Boldt Glass Co., the Illinois Glass Co., and Owens-controlled plants. Thus, different types of bottles began to be made by Owens machines at different times (see Miller & McNichols 2002:3, 6-8).

History – Overview

As with many of the larger companies, a historical assessment needs to be approached on two levels: the overview and the local view. The company underwent two phases in its development: the Owens Bottle Machine Co. and the Owens Bottle Co. Within each of these phases, the company owned or controlled several different plants, and the relationship between the company and the plants changed over time.

Owens Bottle Machine Co., Toledo, Ohio (1903-1919)

The Owens Bottle Machine Co. was incorporated in New Jersey on September 3, 1903, with a capital of \$3,000,000 and reorganized as an Ohio corporation on December 16, 1907. The main purpose of the company was to manufacture and license the use of the Owens Automatic Bottle Machine, but it also maintained the right to manufacture and deal in glass and to hold stock in other companies. The new company took control of the Toledo Glass Co. plant at Toledo, Ohio (Moody's 1932:2209; Scoville 1948:101-102; Toulouse 1971:393; Walbridge 1920:67).

The Toledo Glass Co. had been formed as an offshoot of the Libbey Glass Co. in 1895. The company built a factory at Toledo with a 14-pot furnace and several tumbler machines. Through a series of negotiations, Toledo Glass ceased tumbler manufacture by 1900 and became devoted to the development of an automatic machine for bottles. There, Michael Owens invented his initial machine (Scoville 1948:96-98; Miller & McNichol 2002:1).

Skrabec (2002:207) stated that:

Owens pushed for the need for an "experimental" plant to promote his machine and help machine sales. Under this initial guise, he got the approval for a plant. Construction was started immediately near the old shed on Libbey Street (known today as Wall Street).

Skrabec's positioning of this statement immediately after discussing the founding of the Owens Bottle Machine Co. in 1903 makes it sound like the Owens company built the plant *after* it was founded.

But this was not the case. A glass trade account in May, 1903, indicates that the "model plant" was "built and about to be operated" (*National Glass Budget* 1903), more than five months before the creation of the Owens Bottle Machine Co. Walbridge (1920:67), one of the officers of the Toledo and Owens companies, stated that "the newly formed company [i.e., the Owens Bottle-Machine Co.] took over the plant of the Toledo Glass Company . . ." Scoville (1948:102) agreed, stating that "Toledo Glass . . . handed over its experimental plant which had been built on Libbey Street in Toledo." Toulouse (1971:393) confirmed that "another plant for the Toledo Glass Co. was built on Libbey Street . . . and . . . became part of the Owens Bottle Machine Co." once that firm was created. It is thus clear that the initial "experimental" factory of the Owens Bottle-Machine Co. was the older Toledo Glass plant on Libbey St.

The company quickly realized that it was losing a tremendous profit-making opportunity by not manufacturing bottles, itself. The firm created three other corporations (in 1904, 1909, and 1912 – see below) to make bottles and issued them licenses, although it retained the license for vinegar, grape juice, and narrow-mouth food (notably catsup) bottles in the name of the Owens Bottle Machine Co. in 1908 (Miller & McNichol 2002:7; Toulouse 1971:394). This retention by the parent company was probably so that they could allow *any* companies under the Owens umbrella to make such bottles. In 1909, the firm similarly retained the license for prescription bottles (Miller & McNichol 2002:7; Scoville 1948:110), although it also licensed the Whitney Glass Works and Illinois Glass Co. to make prescription ware.

Initially, the Owens operation issued exclusive licenses for the use of its machines to produce particular categories of ware, e.g., beer, soda and porter bottles to the Ohio Bottle Co. (later American

Bottle Co.); milk bottles to Baldwin-Travis (later the Thatcher Mfg. Co.). Soon, licenses became less exclusive; the Illinois Glass Co., Charles Boldt Glass Co., and the Owens West Virginia Bottle Co. all received licenses to make liquor bottles (Miller & McNichol 2002:2; Scoville 1948:104-105, 107).

Originally, Owens only leased the machines to its licensees. Because of the threat of the Sherman Anti-Trust Act, Owens changed its tactics and vested the ownership of the machines in each of the licensees in January 1912 (Scoville 1948:108). In 1913 and 1914, the Owens management begged its exclusive license holders to sub-license Owens to manufacture bottles on its own machines – with little success. Thatcher was the only one who granted that option – in return for a reduction of the royalties from 40 cents to 10-15 cents per gross. Owens was granted permission to make 50,000 to 150,000 gross of milk bottles per year for Thatcher at the Clarksburg plant (Scoville 1948:104-107). The original plant (No. 1) retained its experimental machines but did not expand its production. By November 1916, the plant still only had a single 10-arm experimental machine (Palmer 1917:212).

During the teens, Owens began to expand by acquiring the controlling stock of some of its rivals. Owens gained control of the Whitney Glass Works, Glassboro, New Jersey, in 1915, but the company retained its own identity until 1918. In 1916, Owens gained complete control of both the American Bottle Co. and the Graham Glass Co., although both retained their identities. The following year, the firm purchased the former Greenfield Fruit Jar & Bottle Co., Greenfield, Indiana, from its owner at the time, the Ball Brothers Glass Mfg. Co. (Owens Bottle Machine Co. 1917; Toulouse 1971:396; Scoville 1948:110, 113; Walbridge 1920:106).

The firm also began production at the new factory in Charleston, West Virginia, by the end of 1918 and abandoned the old Whitney plant in 1919 (Toulouse 1971:397; Walbridge 1920:107). This was followed by a similar takeover of the Charles Boldt Glass Co., also in 1919 (see 1 and individual plant discussions below).

Between 1911 and 1919, the Owens Bottle Machine Co. controlled a total of 17 plants, although four had closed by 1920. The Owens Bottle Machine Co. was renamed the Owens Bottle Co. in 1919.

Owens Bottle Co., Toledo, Ohio (1919-1929)

On May 1, 1919, the Owens Bottle Machine Co. adopted the name that would make it famous as a bottle manufacturer: The Owens Bottle Co. (Moody's 1932:2209; Scoville 1948:101; Walbridge 1920:111-112). The company had previously been known primarily as maker of machines with bottles as a sideline. By this time, Owens had acquired or built all the factories that it would own (see Table 1). We have been unable to find a record of any acquisitions between 1920 and the merger with the Illinois Glass Co. in 1929.

In 1927, the combined plants operated 18 continuous tanks that made "prescriptions, patent, proprietary, packers and preservers, catsup, vinegar, salad dressing, fruit juices, narrow neck, etc." (*American Glass Review* 1927:141-143). This listing continued until 1929, when the Owens Bottle Co. and the Illinois Glass Co. merged to form the Owens-Illinois Glass Co.

History – Individual Plants

This section is organized by plant numbers, where available, and otherwise by dates. The divided organization is necessary to address acquisitions that did not fall under the Owens numbering system. The numbering system was apparently developed fairly early, probably by 1911, when the Owens Bottle-Machine Co. officially acquired the second factory in Toledo and the one in Fairmont, West Virginia. It was certainly in place by at least 1913 (Owens Bottle-Machine Co. 1913). The system was complicated because Owens gained control of several companies (Whitney Glass Works, 1915; American Bottle Co., 1916; Graham Glass Co., 1916; Charles Boldt Glass Co., 1919), some of which had several plants. These were *not* given Owens numbers but continued to operate under their former names.

Table 1 – Owens Bottle Co. – Factory Numbers, Locations, and Dates*

No.**	Location	Former Name	Dates of Operation
1	Libbey St., Toledo, OH	Toledo Glass Co.	1903-[1919] 1929†
2	W. Toledo, OH	Northwestern Ohio Bottle Co.	1904-[1911] 1918
3	Fairmont, WV	Owens West Virginia Bottle Co.	1909-[1911] 1929†
4	Westlake St., Toledo, OH	Libbey Glass Co.	1913-1915
4***	Clarksburg, WV	Owens Eastern Bottle Co.	1912-[1915] 1929†
–	Evansville, IN	Graham Glass Co.	1916-1929
–	Loogootee, IN	Graham Glass Co.	1916-1926
–	Okmulgee, OK	Graham Glass Co.	1916-1929
–	Chekotah, OK	Graham Glass Co.	1916-1923
–	Newark, OH	American Bottle Co.	1916-1929
–	Streator, IL	American Bottle Co.	1916-1929
5	Greenfield, IN	Greenfield Fruit Jar & Bottle Co.	1917††-1921
6	Charleston, WV	Owens Bottle Machine Co.	1918-1929
7	Glassboro, NJ #1	Whitney Glass Works	1918†††-1919
8	Glassboro NJ #2	Owens Bottle Machine Co.	1918-1929
5 ‡	Cincinnati, OH	Charles Boldt Glass Mfg. Co.	1919-1926
2 ‡‡	Huntington, WV	Charles Boldt Glass Mfg. Co.	1919-1929

* Most of the information in this table was taken from a Table 11, Scoville (1948:113). Dates, however, are also from elsewhere in the book, Toulouse (1971:393-397), Miller & McNichol (2002:6-8), or the Owens annual reports.

** Since the companies purchased (as opposed to factories built) retained their former identities, they were not numbered like the ones originating with Owens and bearing the Owens name.

*** The Clarksburg plant received No. 4, when the Westlake plant closed in 1915.

† These factories remained in business until at least the end of the Owens era; the number in brackets reflects the date they were absorbed into either the Owen Bottle Machine Co. or the Owens Bottle Co.

†† Owens may have owned the Greenfield plant by November 14, 1916 (Roller 1994:41).

††† Owens gained control in 1915 but did not own all the stock until 1918. The plant continued to operate under the Whitney name until the 1918 acquisition.

‡ The Cincinnati factory became Plant No. 5 after the Greenfield factory closed in 1921.

‡‡ The Huntington factory became Plant No. 2 after the W. Toledo factory closed in 1918.

To add further complexity, the Whitney and Boldt plants were later given Owens numbers. Thus, in the following section (and in Table 1), the factories are addressed in numerical order from Plant No. 1 to Plant No. 4, followed by the controlled companies that never received numbers, followed by the remaining numbered plants, even though the Owens company gained control of some of those earlier.

The system was adopted and expanded in 1929 to include all the glass plants of the newly-formed Owens-Illinois Glass Co. Eventually, the plant codes were used to mark the bottles that each factory produced, and this has inspired considerable interest in determining which numbers designated which factories. Strangely, although the system was used systematically within the company, external references (newspaper

accounts, directory listings) almost never mention the numerical designation of a factory. Absent research in corporate archives, the best sources for the early codes seem to be the Annual Reports prepared for the stockholders. Some of these were published verbatim in the trade literature, while we have obtained a few others from company sources.

Plant No. 1⁵ – Owens Bottle-Machine Co. (1903-1919)

Plant No. 1 – Owens Bottle Co. (1919-1929)

This was the experimental and demonstration factory, located on Libbey St. in Toledo. As noted above, the original Owens machine was developed at the Toledo Glass Co. factory. The company built the new experimental plant in 1903. With its single machine, the experimental

factory produced bottles, initially perhaps for demonstration purposes. Beginning in October 1904, however, machine operation at the plant fell under the control of the Northwestern Ohio Glass Co., which (pending construction of its own plant) began making beer bottles. All bottles made at the plant were sold through the Ohio Bottle Co., although the original output went to Mexico. Sales in the U.S. probably did not begin until 1905 (Scoville 1948:109; Skrabec 2002:230; Toulouse 1971:393). See the next section on the Northwestern Ohio Bottle Co. and Lockhart et al. (2007a) for a more thorough discussion.

The American Bottle Co., successor to the Ohio Bottle Co. continued the same policy. On January 18, 1906, however, American Bottle, now secure in its own production, instructed Owens to cease making bottles for its account. In April 1906, the plant began making catsup bottles for local firms and added pharmaceutical and proprietary medicine bottles in 1912 (Scoville 1948:109; Skrabec 2002:230; Toulouse 1971:393). In 1912, the plant burned. The company rebuilt the factory, still using the No. 1 designation (Smith 1976:1; Walbridge 1920:93). Although sources are unclear, it is likely that pharmaceutical and proprietary medicine bottles were added when the new plant was opened.

The new plant housed the company's machine designing department, construction department, and the principal mold department. By 1916, two machines in the factory made catsup bottles, gallon packers, and siphon bottles. Prior to this addition, virtually all siphon bottles were imported. The following year, the plant received a new furnace, fueled by oil (Owens Bottle-Machine Co. 1916; 1917). The plant remained in business long enough to become Plant No.1 for the Owens-Illinois Glass Co., after the 1929 merger (Scovill 1948:113; Toulouse 1971:395).

Northwestern Ohio Bottle Co., Toledo, Ohio (1904-1911)

Plant No. 2 – Owens Bottle-Machine Co. (1911-1918)

Formed by the owners of the Owens

Bottle Machine Co., the Northwestern Ohio Bottle Co. was an Ohio corporation, established in June 1904 to make bottles with the Owens machine. In August 1904 the Ohio Bottle Co. (which had recently formed and been licensed to make beer and soda bottles on Owens machines, which had not yet been installed) became the selling agent for beer bottles made by Northwestern. But Northwestern at that time had no factory and no machines. Consequently, it was allowed to use the Libbey Street experimental factory for commercial production beginning in October 1904. All of the beer bottles were to be sold by Ohio Bottle, and all were destined—at least initially—for markets in Mexico so as not to compete with home production (*National Glass Budget* 1904e:10; 1904f:1; Skrabec 2007:209).

Northwestern was licensed to make wine, brandy, and some “branded” medicine bottles on November 1, 1904 (Miller & McNichol 2002:6; Scoville 1948:103, 106, 145-146; Skrabec 2007:209; Toulouse 1971:394; Walbridge 1920:72). The actual Northwestern plant in West Toledo was presumably completed in 1905. The plant originally used two Owens “A” machines and had 50 workers (Skrabec 2007:209). In January 1908, the Owens Bottle Machine Co. purchased all the stock in Northwestern. The plant operated “two machines making 8-oz. catsups and whisky bottles” during that year (Hayes 1909:1; Owens-Illinois 1943; Scoville 1948:109). In 1911, Owens consolidated Northwestern into the larger company as part of its expansion into bottle production. The installation became Plant No. 2 (Miller & McNichol 2002:6; Owens Bottle-Machine Co. 1916; Scoville 1948:103, 106, 110, 145-146; Toulouse 1971:394). Although the 1913 Owens Annual Report noted that “the factory operated in a satisfactory manner,” it was described as “the least modern of your company’s factories” the following year (*National Glass Budget* 1913b:1; 1915a:1). In 1914, Plant No. 2 still had two machines making “catsup and brandy bottles” (*Journal of Industrial and Engineering Chemistry* 1914:864). When the Westlake branch (Plant No. 4) was abandoned in 1915, two older machines at Plant No. 2 were

removed, and the company installed the “newly constructed carboy machine” and operated it experimentally. The 1915 report described the bottles produced as being “of a very superior quality” (*National Glass Budget* 1915:1).

The Annual Report for 1916, stated that “some years ago your directors decided to abandon [Plant No. 2], but increasing business necessitated a change in plans and modern equipment has been installed in order to fill orders and maintain dependable service” (Owens Bottle-Machine Co. 1916). In November 1916, the plant was listed as having one 6-arm and one 10-arm Owens machine, making “miscellaneous bottles” (Palmer 1917:212).

The Annual Report for 1917 noted that the installation was only used because “abnormal demand for [the] Company’s product necessitated the use of every facility in order to meet, as nearly as possible, the urgent requirements of customers.” The report described the plant as “the least modern of Company’s factories and will probably become a reserve plant as soon as new factories are in operation and its productive capacity can be spared” (Owens Bottle-Machine Co. 1917). That plan apparently changed. According to Toulouse (1971:394), Owens closed the plant, when it opened the Charleston factory in 1918.

**Owens West Virginia Bottle Co., Fairmont, West Virginia (1909-1911)
Plant No. 3 – Owens Bottle-Machine Co. (1911-1919)
Plant No. 3 – Owens Bottle Co. (1919-1929)**

The Owens Bottle Machine Co. created the Owens West Virginia Bottle Co. in 1909 to receive a license on December 27 for “certain kinds of beverage bottles” – actually grape juice bottles – to be made on Owens automatic bottle machines (Scoville 1948:105). The corporation was capitalized at \$100,000, and the new firm immediately built a “modern three-furnace, six-machine plant at Fairmont, West Virginia” (Scoville 1948:110) that was formally opened on October 1, 1910 (Toulouse 1971:394). The site near Fairmont, West Virginia, was chosen

because of its proximity to the natural gas and coal fields, a steady supply of fuel (Walbridge 1920:80).

In 1910, plans were in place to install six 10-arm Owens machines at Fairmont (*National Glass Budget* 1910:1; Walbridge 1920:80). As noted above, the factory was sub-licensed by both the Illinois Glass Co. and the Charles Boldt Glass Mfg. Co. to make liquor bottles on July 10, 1910 (Owens-Illinois 1943). The Owens Bottle Machine Co. consolidated the Owens West Virginia Bottle Co. into the larger firm during the last quarter of 1911 as part of its plan to increase bottle production (Scoville 1948:110), soon designating the installation as Plant No. 3. In 1914, twelve machines were in production at the Fairmont factory, making “liquor, catsup, and grape juice bottles.” The factory made grape juice bottles in 4- and 16-ounce sizes along with 9-ounce catsup bottles (*Journal of Industrial and Engineering Chemistry* 1914:864).

During 1912 and 1913, the plant added three additional furnaces equipped with AN and AR machines. Over the next few years, the factory replaced the older AE machines with more 10-arm AN and AR machines (Toulouse 1971:394). During 1913, the factory was expanded to six furnaces with an even dozen ten-arm machines. The plant was described as “the largest of your company’s factories” that was “maintained at the highest standard of efficiency” in the 1915 Annual Report. By November 1916, the Fairmont factory still made “liquors, bottles, preserves, and miscellaneous” ware at same twelve 10-arm machines (*National Glass Budget* 1913b:1; 1915b:1; Owens Bottle-Machine Co. 1916; Palmer 1917:212).

The location, however, was a poor choice. Owens built the factory in a narrow river valley. The topography caused gusty winds and spring flooding to disrupt production. Despite repeated warnings from advisors, Owens expanded the plant two years after its inception (Fones-Wolf 2007:165). The plant was still in operation in 1929, when the company merged with the Illinois Glass Co. (Scoville 1948:146) and it continued to operate under the same plant number within that corporation.

Libbey Glass Co. and Westlake Machine Co., Westlake St., Toledo, Ohio (1908-1914)

Plant No. 4 – Owens Bottle-Machine Co. (1913-1915)

The history of this plant is somewhat confusing. Libbey, Owens, and several others with interests in both the Libbey Glass Co. and Owens Bottle-Machine Co. incorporated the Westlake Machine Co. on November 6, 1907. The new corporation built a factory on Westlake St. in Toledo at some point during 1908. It was established to develop a new machine that incorporated and combined the operating principles of the Toledo Glass Co. semiautomatic light bulb machine and the Owens (fully) Automatic Bottle Machine. The plant actually operated as a joint enterprise between Westlake, Libbey Glass, and the Owens Bottle-Machine Co. (Scoville 1948:113, 130, 165; Skrabec 2007:220, 275).

The Owens company became concerned that the experimental operations would conflict with commercial production in the newly rebuilt Plant No. 1 on Libbey St., constructed in 1912. To alleviate the concerns, the firm leased the Westlake St. plant and transferred experimental operations from Libbey St. to Westlake St. in 1913. This new experimental plant (Plant No. 4) was the focus of development work on furnaces and machines as well as chemical investigations regarding glass composition. It suffered a destructive fire in 1915 and was abandoned (*National Glass Budget* 1913b:1; 1915a:1; 1915b:1; Scoville 1948:113; Toulouse 1971:396). So far as we are aware, the Westlake St. factory in Toledo, was the only plant in the history of the system that was never used for commercial bottle production.

Owens Eastern Bottle Co., Clarksburg, West Virginia (1912-1914)

Plant No. 4 – Owens Bottle Machine Co. (1914-1919)

Plant No. 4 – Owens Bottle Co. (1919-1929)

The Owens Eastern Bottle Company, Clarksburg, West Virginia, was created specifically to use the Owens automatic bottle machines at its new factory. The corporation was capitalized at \$1,000,000

and received a license on June 11, 1912, to make prescription, proprietary, and druggists' ware. Although the Owens Bottle Machine Co. owned 51% of the stock, four other glass houses (Whitney Glass Works, Fidelity Glass Co., Cumberland Glass Mfg. Co., and Bellaire Bottle Co.) each were stockholders (Griffenhagen and Bogard 1999:103; Miller & McNichol 2002; Moody's 1932:2209; Scoville 1948:106, 110, 146; Toulouse 1971:394-396; Walbridge 1920:101).

Although the actual consummation was still more than two years away, plans were already in place to install three machines at Clarksburg in 1910 (*National Glass Budget* 1910:1). Production did not begin until 1913, when the factory made medicine bottles and pharmaceutical ware on six Owens machines at three furnaces (*National Glass Budget* 1913a; *Journal of Industrial and Engineering Chemistry* 1913:953). The plant operated five machines making "oval, round, square, and flat prescription bottles, panels and other small ware" the following year (*Journal of Industrial and Engineering Chemistry* 1914:864). In addition, the factory made milk bottles for the Thatcher Mfg. Co. (Toulouse 1971:396).

The first two years were not very profitable, and most of the original stockholders began to regret their decisions to invest. During December 1914, the Owens Bottle Machine Co. bought out all the other stockholders and consolidated Owens Eastern into the larger company (*National Glass Budget* 1915b:1). The newly absorbed plant used six 10-arm machines to make prescription and proprietary ware and that arrangement continued through 1917. The 1916 Annual Report stated that a second factory was being built and should be operational by May 1917, doubling the capacity at that location. Those plans, however, were dropped, and the plant remained in operation with six machines (*National Glass Budget* 1915b:1; Owens Bottle-Machine Co. 1916; 1917; Palmer 1917:212). The Clarksburg factory remained in production and became a plant of the Owens-Illinois Glass Co., retaining its distinction as Plant No. 4 in the new company.

American Bottle Co., headquarters in Newark, Ohio (1905-1916) American Bottle Co. (Owens management), Newark and Streator, Ohio (1916-1929)

The American Bottle Co. grew out of the Ohio Bottle Co., established in 1904 to make soda and beer bottles with the Owens machines. The company became the American Bottle Co. in 1905 and rapidly became one of the largest beer and soft drink manufacturers in the United States. The Owens Bottle-Machine Co. gained control of the American Bottle stock in 1916.

The Newark plant had been the flagship factory for American Bottle, but that began to shift after the second plant was built in Streator. The Annual Reports for 1916 and 1917 still listed Newark first, but, by 1920, the factories had been numbered, and American Bottle Co. No. 1 and No. 2 were located at Streator. The Newark plant was American Bottle Co. No. 3 (Owens Bottle-Machine Co. 1916; 1917; Owens Bottle Co. 1920). One Streator plant and the Newark operation survived to become part of the Owens-Illinois Glass Co. in 1929.

Graham Glass Co., Evansville, Indiana, and other locations (1907-1916)

Graham Glass Co. (Owens management), Evansville and Loogootee, Indiana; Okmulgee and Checotah, Oklahoma (1916-1929)

The Graham Glass Co. began in 1907. The Owens Bottle-Machine Co. purchased the entire stock of the Graham plants at Evansville and Loogootee, Indiana, in 1916 and acquired 50% of the stock of the factories at Okmulgee and Checotah, Oklahoma. Thus, the Owens company gained control of the Graham machine rights and feeder patents. This event led to legal battles between the Owens firm, Harford-Empire (the other major bottle machine manufacturer), and the federal government over who had what rights to what invention. These disputes lasted for the next quarter century (Owens-Illinois 1943).

Like American Bottle, the Graham plants continued to operate under the Graham name. Owens sold the Checotah plant to the Illinois Glass Co. in 1923 and

closed the Loogootee plant in 1926. The Owens-Illinois Glass Co. shut down the Okmulgee branch in 1929 (Keller 1998:27; Toulouse 1971:216).

**Greenfield Fruit Jar & Bottle Co.,
Greenfield, Indiana (ca. 1902-1915)
Plant No. 5 – Owens Bottle-Machine
Co. (1916-1919)**

Plant No. 5 – Owens Bottle Co. (1919-1921)

The story of the exclusive Owens license for fruit jars is very convoluted. James A. Chambers (likely the son of David H. Chambers of A&DH Chambers, the long-lived Pittsburgh glass house) first obtained the license in 1906. Chambers allowed his option to expire, and it was picked up by Frank C. Ball the following year. Ball, too, allowed the option to lapse, and Louis Hollweg acquired the license on January 2, 1909. He assigned the rights to the Greenfield Fruit Jar & Bottle Co. in November of that year. A week later, Greenfield sold the rights (and the factory) to the Ball Brothers. By 1910, the Ball Brothers had paid more than four times the amount stipulated in Frank Ball's original option (Miller & McNichol 2002:7; Scoville 1948:105).

The Greenfield Fruit Jar & Bottle Co. grew out of Hollweg & Reese at Greenfield, Indiana, and began operations ca. 1902 with seven press-and-blow machines. For undisclosed reasons, Hollweg closed the plant between August 1905 and June 1906. The reopened factory continued to produce fruit jars, packers, and other jar types. Hollweg apparently installed the Owens machines at Greenfield between January and November 1909. They were almost certainly in place when the Ball Brothers purchased the factory (Roller 1994:38-40).

The Ball Brothers Glass Mfg. Co. officially bought the Greenfield company on November 20, 1909. They continued to operate under the Greenfield Fruit Jar & Bottle Co. name and leased the Ball Factory No. 2, at Muncie, Indiana, to Greenfield to install three Owens AD (nine-arm) machines in late 1910. The Ball Brothers gradually transferred Owens machine operations entirely to Muncie and closed the Greenfield plant in May 1915

(Roller 1994:40-41).

The Owens Bottle-Machine Co. acquired the operation in late 1916 or 1917, and it became Plant No. 5. The factory was completely overhauled and equipped with three Owens machines, commencing operations in May of the same year. The plant was intended to make catsup bottles for the Frazier Packing Co. Owens closed the plant in 1921 (Owens Bottle Machine Co. 1917; Roller 1994:41; Toulouse 1971:396; Walbridge 1920:106).

**Plant No. 6 – Owens Bottle-Machine
Co., Charleston, West Virginia (1918-1919)**

Plant No. 6 – Owens Bottle Co. (1919-1929)

The Owens Bottle-Machine Co. began construction of Plant No. 6 at Charleston, West Virginia, in 1917. The plant was projected to have a "productive capacity . . . more than 50% greater than that of the Clarksburg factory" (Owens Bottle-Machine Co. 1917). The factory produced pharmaceutical and proprietary medicine bottles as well as milk bottles for the Thatcher Mfg. Co. Thatcher held the exclusive license to make milk containers with the Owens machines, but the Charleston plant manufactured milk bottles for Thatcher until Thatcher acquired sufficient facilities to fill all of its own orders (Toulouse 1971:396)

The new plant drew visitors from throughout the industry. It was the first fully automated factory, where the bottle manufacture from mixing of the batch for the glass to the final inspection at the cold end of the Lehr was untouched by a single human hand. The plant opened with a single furnace but quickly added three others, all in 1918. The company added a fifth furnace the following year. The factory made prescription, proprietary, pharmaceutical, household, chemical, toiletry, and cosmetic bottles, as well as food containers of all types (Toulouse 1971:396-397).

In 1923, the Owens company completed an enlargement of the Charleston factory. The new unit contained "the largest furnace your company has yet built" for two new CA machines, "a new type designed to operate with multiple molds." The 1923

Owens Annual Report noted that "the completion and installation of the first CA machine is the most important step taken during the past year" (*National Glass Budget* 1924:9). The plant remained in production into the Owens-Illinois era (Toulouse 1971:397).

**Whitney Glass Works, Glassboro, New
Jersey (1835-1915)**

**Whitney Glass Works (Owens
management) (1915-1918)**

**Plant No. 7 – Owens Bottle-Machine
Co. (1918-1919)**

Although the company traced its origins to 1775, Thomas H. Whitney did not join the firm until 1835, and the company became the Whitney Brothers in 1839 (Toulouse 1971:519-522; Tyson 1971:35-36). Whitney received a license for the Owens machines (to make pharmacy bottles) in 1909. This required a significant rebuilding of the plant, with smaller tanks replacing the three larger ones. Owens shipped the first AE machine to Whitney on February 12, 1910, and the plant had seven Owens AE machines in place by the end of 1911 (Miller & McNichol 2002:7; Scoville 1948:110; Toulouse 1971:523).

The plant was a successful operation, but the Owens Bottle-Machine Co. bought the controlling stock in 1915. Lohman (1972:5) explained the sale:

Primarily it was because the Whitney family associated with the enterprise was dying out. . . . The administrators of Dudley Whitney's estate asked Owens Bottle Machine Company to take up Whitney's personal notes in order to prevent the immediate and ill-advised sale of 1,954 shares of Whitney stock. The company complied and three years later Owens Bottle bought the remaining shares and dissolved the Whitney Glass Works on July 1, 1918.

Whitney retained its own identity from 1915 until 1918, when it still boasted seven Owens machines (Owens Bottle-Machine Co. 1917; Scoville 1948:110, 113). Owens began construction of a new plant at Glassboro in 1917 and opened the factory in 1918, the same year Owens acquired the remaining assets of Whitney

and dissolved the Whitney Glass Works on July 1 (Lohmann 1972:5-6; Scoville 1948:110). The firm abandoned the old Whitney plant in 1919. The old and new plants apparently coexisted for at least some time, resulting in the name “Glassboro #2” for the second factory. Although we have not discovered documentary evidence to substantiate this claim, it is very likely that the “Glassboro #1” factory became Plant No. 7 in the Owens lexicon during its brief life as a part of the Owens Bottle-Machine Co. (rather than its old identity as the factory of Whitney).

Plant No. 8 – Owens Bottle-Machine Co., Glassboro, New Jersey (1918-1919)

Plant No. 8 – Owens Bottle Co. (1919-1929)

As noted in the section above, Owens began construction of its new, six-machine plant at Glassboro in 1917. The plant opened in 1918, just in time for the dissolution of the Whitney Glass Works (see above). At that point, the new factory became Plant No. 8 of the Owens Bottle-Machine Co. It made prescription, proprietary, household, chemical, toiletry, and cosmetic bottles (Lohmann 1972:5-6; Toulouse 1971:397; Walbridge 1920:107). The plant remained open and became part of the Owens-Illinois Glass Co. in the 1929 merger.

Charles Boldt Glass Co., Cincinnati, Ohio (1900-1919)

Charles Boldt Glass Co. (Owens management) (1919-ca. 1921)

Plant No. 5 – Owens Bottle Co. (ca. 1921-1926)

In 1900, Charles Boldt reorganized the Muncie Glass Co., Muncie, Indiana, to form the Charles Boldt Glass Co. The same year, he built a new plant at Cincinnati, Ohio. In 1908, the Muncie plant was sold to a newly organized Muncie Glass Co. In the July 10, 1910, Boldt acquired the right to manufacture liquor bottles on the Owens automatic machine (Lockhart et al. 2007b; Owens-Illinois 1943).

Due to Prohibition, the liquor industry collapsed in 1919, and the Cincinnati factory apparently closed. The Owens Bottle Co. purchased the majority stock and took control of the Boldt factories

(including the one at Huntington – see below) as a subsidiary, refurbishing the plants and converting the machinery to produce a general line of glass products. On November 19, 1922, Boldt offered to sell his remaining stock to the Owens company. Although the date has not been discovered, the Owens firm may have acquired the stock soon after the offer. At some point, probably in early 1923 (but certainly prior to 1925), the Cincinnati factory became Plant No. 5 of the Owens Bottle Co. (the Greenfield plant – formerly Plant No. 5 – had closed in 1921). Owens had certainly acquired the remaining stock by January 1926, when it apparently closed the factory (Lockhart et al. 2007b; Owens Bottle Co. 1920; 1925; Owens-Illinois 1943).

Charles Boldt Glass Co. Huntington, West Virginia (1913-1919)

Charles Boldt Glass Co. (Owens Management) (1919)

Plant No. 2 – Owens Bottle Co. (ca. 1919-1929)

Boldt opened the Huntington, West Virginia plant in 1913. Until the Owens Bottle Co. captured the majority stock in 1919, the history of the Huntington factory paralleled that of the Cincinnati plant described above. Probably about 1921 (certainly by 1925), Plant No. 2 – formerly, the identification of the West Toledo factory – had been reassigned to the Huntington factory. Huntington remained a part of the Owens Bottle Co., retaining the Plant No. 2 designation with the Owens-Illinois Glass Co. after the 1929 merger (Lockhart et al. 2007b; Owens Bottle Co. 1920; 1925).

Containers and Marks

Owens allowed some companies it purchased to use non-Owens logos and codes. The former Graham plants retained the original Graham marks and code system that included date and factory identifications (see Lockhart 2004; 2006; Porter 1995:4). However, the new management created new marks (but not the Box O) for the American Bottle plants at Streator and Newark (Lockhart et al. 2007a:51-52; Toulouse 1971:454-455).

As more and more feeders were

developed to make semiautomatic machines fully automatic, the Owens machines fell into disuse. The newer machines were easier to use and easier to change molds on. The last Owens machine, a 1914 “AQ” Diphead, was retired from Gas City, Indiana, in 1982 (Skrabec 2002:223).

Box O (1919-1929)

Toulouse (1971:393) claimed that the Owens Bottle Co. only used a single mark, the Box O (O inside a square) from 1911 (the date he incorrectly claimed the company was renamed) until the merger with the Illinois Glass Co. in 1929 (**Figure 1**). Jones (1966:17) dated the mark as



Figure 1: The Box-O mark (El Paso Coliseum collection)

beginning in 1915. She also included an O.B.G. mark that she attributed to “Owens Bottle Glass 1904-05.” She certainly mixed the mark up with the OBCo logo used by the Ohio Bottle Co. during the 1904-1905 period. Giarde (1980:76-77) reviewed the company information but never specifically discussed the application of the mark to milk bottles (the subject of his book). Peterson (1968:48) noted the mark and the beginning date of 1919 but added no other information. The Box O mark was consistently embossed on the bases of bottles, and all bottles with the mark were accompanied by Owens scars (**Figure 2**).



Figure 2: The Owens Scar (Lindsey)

Citing the U.S. Patent Office, however, Ayres et al. (1980:32-33) noted that the Box O mark, trademark #130,000, was registered on March 16, 1920. The company claimed that the mark had been used since April 4, 1919. This indicates that the mark was used for only about 11 years. When Owens allowed other glass houses exclusive licenses for beer, soda, and milk bottles, it blocked its own path into producing them.

Despite the Owens blockage of its own ability to produce milk bottles, we have seen a single example of a *chocolate* milk bottle offered on eBay. The bottle was embossed “2 {Box-O} 8.” The bottle is in the typical milk bottle shape, with one of the early Dacro finishes. It is possible that Owens was allowed to make the bottle because of the chocolate designation. In addition to the Box-O mark, the bottle had the typical feathered Owens scar.

Walbridge (1920:111-112) noted that “it was considered advisable to change the corporate name from The Owens Bottle-Machine Company to The Owens Bottle Company, for the manufacturer of bottles, in addition to being a licensor of bottle-blowing machines. The principle business in the future would be that of manufacturing bottles. This change was effective May 1, 1919.” It is notable that this date is only a month after the company began the use of the Box O trademark.

Box (no “O”)

Jill Heilman (personal communication, 7/15/2008) reported several bottles with the Box-O mark and the number “62” beside the logo. In addition, in the same deposit, she found several of the same type of bottles marked with the box (with no discernable “O”) along with the “62” designation. All had Owens scars. Thus, it is possible to find some boxes without an enclosed “O” that were made by Owens. Unless other information was embossed on the base (e.g., the H.J. Heinz name on bottles made by Owens for that company), the Box-O logo was almost always placed in the center of the base. These box logos with no discernible “O” were also centrally placed. Thus, an empty box, accompanied by an Owens scar, is also an indication of Owens manufacture.

F, G, L, or N (1910-1919)

There is evidence that the Owens companies used other marks prior to the adoption of the Box O logo. A good example is provided by Royal Purple grape juice bottles. We have found little data about Royal Purple, but the drink was advertised and bottled by the J. Hungerford Smith Grape Juice Co. in at least 1915 and 1916 (Hull-Walski & Ayers 1989:97; Zumwalt 1980:381). The tiny, four-ounce containers are fairly common throughout the Southwest and possibly elsewhere. These are colorless bottles with crown finishes, and most (probably all) solarize to a distinct amethyst color.

The bottles appear in two variations, both originally with paper labels. The most common has “Royal Purple” embossed around the shoulder of the bottle and an “F” on the base. A second, illustrated by Hull-Walski and Ayres (1989:97) is embossed “Royal Purple (arch) / F / GRAPE JUICE (inverted arch)” on the base. Each example we have found had an Owens scar on the base, indicating a manufacture by the Owens Automatic Bottle Machine. The Owens Bottle Machine Co. retained the license to manufacture grape juice bottles at the Toledo plant in 1909 (Miller & McNichol 2000:7; Toulouse 1971:394). Thus, the timing (1915-1916) and marking (Owens scar) indicate that the bottles could only have been made by Owens. Colcleaser (1965:69) showed the same “F” mark on a solarized amethyst Welch’s grape juice bottle. Unfortunately, Colcleaser did not include Owens scars in his illustrations.

Thus far, we have found four small letters embossed in the center of the bases of Royal Purple bottles: “F,” “G,” “L,” and “N.” Although the original grape juice bottle license was issued to the Toledo plant in 1909, the Fairmont factory also made grape juice bottles when it began production in 1909, and Owens may have shifted manufacture to other factories prior to 1919.

Thus, it is probable that the “L” indicates the Libbey St. factory (No. 1) after it was rebuilt in 1912 (it was mostly used as an experimental plant prior to that time). The time period suggests that the Greenfield plant (1917-1921) would have



Figure 3: G surrounded by an Owens scar (TUR collection)

been the likely user of the “G” (Figure 3), although it could represent one of the Glassboro operations (acquired in 1915 and 1917). The “F” pretty certainly indicates for the Owens plant at Fairmont, West Virginia. We have observed the letter “N” beneath a “6” (or above a “9”) on a machine-made, colorless, 10-sided catsup bottle (Figure 4). Aside from an Owens



Figure 4: N surrounded by an Owens scar (TUR collection)

scar, the bottle had no other markings. The mark was probably used by the Northwestern Ohio Bottle Co. during the early period of manufacture, 1909-ca. 1912. The plant made catsups by 1909.

Even though the original Owens machines were set up to make beer bottles, one of the earliest adaptations was for catsup containers. The experimental plant



Figure 5: F in an Owens scar on a catsup bottle base (Lockhart)

at Toledo made catsup bottles for local use prior to 1909 (Skrabec 2007:208, 230). The Fairmont plant received a license for “certain kinds of beverage bottles” in 1909 and was cited as making “liquor, catsup and grape juice bottles” in 1914 (*Journal of Industrial and Engineering Chemistry* 1914) The small “F” is also found on the bases of catsup bottles (**Figure 5**), and these, too, frequently solarize to an amethyst color and bear the distinctive Owens scars. Owens retained the license for making catsup bottles beginning in 1906 (Miller & McNichol 2002:6; Scoville 1948:109; Toulouse 1971:393). At this point, we have not seen other letters on similarly-marked catsup bases, so these may have only been made in the Fairmont plant.

F, S, and W in a circle of dots or stars (ca. 1916-1919)

The “F” mark was noted by Ayres et al (1980) with an 8 at the top of the circle of dots. The researchers attribute the mark to the Fairmount Glass Works or “an unidentified glass maker, user or merchant or even mold designations.” They added that all the bottles they found with the mark contained “suction machine cut-off scars.”

A search though Miller and McNichol (2002:6-8), however, showed that no Owens license was issued to the Fairmount Glass Works. By the time Owens machines became available generally, the scars were neater in appearance and were indistinguishable from other types of machine marks. Miller & McNichol (2002:7) noted, however, that only the Owens plants were licensed to make both catsup and grape juice bottles with the Owens machines.



Figure 6: F in a circle of dots (TUR collection)



Figure 7: W in a circle of dots (TUR collection)

Our examination of the Tucson Urban Renewal collection (the bottles reported by Ayers and his associates) showed that the “F” surrounded by a circle of 12 dots (with an “8” at the top of the circle) was a colorless grape juice bottle with a crown finish and an Owens scar on the base (**Figure 6**). We also found a similar, colorless bottle embossed on the base with “W” surrounded by 12 dots with an “8” at the top and an “I” at the bottom of the circle (**Figure 7**). A final bottle, also colorless, had a basal marking of “S” in a circle of ten dots with a “7” above the circle of dots and a “20” below the circle (**Figure 8**). The base included an Owens scar.



Figure 8: S in a circle of dots (TUR collection)

We have seen a single example of the “F” surrounded by 11 tiny stars in a personal collection. The bottle was machine made with an Owens scar. It was a colorless, patent medicine bottle, embossed “CALIFORNIA FIG SYRUP CO./WHEELING W. VA.” The mark had no accompanying numbers. According to Fike (1987:225) California Fig Syrup was introduced in 1878 and was made until the 1970s. The early Owens plants began

making “branded” (including proprietary medicine) bottles in 1905 (Miller & McNichol 2002:6; Scoville 1948:104, 109; Toulouse 1971:329; Walbridge 1920:72). The “star” variation may only have been used on medicine bottles.

With the exception of the California Fig Syrup bottle, these marks all appear on either catsup or grape juice bottles (in our small sample). All bottles we have examined are either clearly surrounded by dots or are indistinct – with the single exception of the California Fig Syrup bottle.

Thus, it is virtually certain that catsup and/or grape juice bottles with recognizable Owens scars were made by a branch of the Owens company. It is also reasonably certain that the “F” surrounded by a circle of dots was used by the Fairmont plant, probably later than the lone “F” mark. Since the famous Box-O trademark was not used until 1919 (Ayres et al. 1980:32-33), the Owens Fairmont plant was the most likely user of the circle-of-dots (or stars) mark from ca. 1916 to 1919.

We have only seen the “W” mark surrounded by a circle of dots on the base of a single bottle – with an Owens scar. The mark may have been used by the Westlake St. branch in Toledo, Ohio (1913-1915), although the Westlake plant (No. 4) was used as an experimental factory. There is also a chance that the “W” could indicate either the West Toledo branch or the former T. C. Whitney plant (W for Whitney) at Glassboro, New Jersey, controlled by Owens since 1915, wholly owned in 1918. Whitney had obtained an Owens license while it was still separate from the Owens company and, thus, already had the technology in place.

More problematical is another mark, “S” surrounded by a circle of dots. Although the “S” could indicate the Streator, Ohio, plant (controlled by the Owens company by 1916), the plant was noted for making soft drink and beer bottles marked on the heel with the 16 S 3 or similar marks (the 16 being a date code for 1916).

All of these marks – with the circle of dots or stars – appear to be from the later “teens.” The “F” and other single letter marks without the encircling dots or stars were probably used during the ca. 1906-

ca. 1917 period. Because the individual letters with dots or stars appear on bottles with less feathering on the Owens scars, no purple solarization (at least none reported or observed), are much more scarce than the letter-only marks, and include letters that only correspond to later plants, the dot/star marks were probably only used during the ca. 1916-1919 period prior to the April 1919 change to the Box-O mark.

OWENS with the “O” in a box (1919-1929)

In 1919, Owens offered a prescription bottle that was half-oval in cross section, with the other half divided into five sides or panels. The panel opposite the half-oval was the largest flat surface, flanked on each side by thinner panels that were graduated. Graduations on the left were in fluid ounces, with cubic centimeters to the right. The next two panels on both right and left connected to the half-oval at the side seams of the bottle.

The largest flat panel between the graduations was marked at the base of the shoulder with the ounce symbol (looks like a “3” with an extra flat hook on top) followed by the number of ounces in the bottle expressed as lower-case Roman numerals. The shoulder of the bottle was lightly fluted. Bases, of course, had Owens scars.

The term “Owens Ovals” for these bottles was registered (Trade Mark 166,961) in 1923, the application claiming that “the trade-mark has been continuously in use in the business of said corporation since January 1st, 1919.”

A 1928 “Want Book” for druggists (Owens 1928) illustrated the bottle several times and called it the Owens Prescription Oval. The bottle was available in two finish options: cork and threaded. One, called the Handy Service, was a two-part finish for corks. The upper part of the finish consisted of a bead of glass ringing the very top of the finish reinforced with a vertical collar below it. The other finish had continuous threads and was topped by an “attractive white and green lacquered cap.” Both finish types were offered capped (or corked) and sterilized.

The base of each bottle was embossed “OWENS” with the “O” surrounded by



Figure 9: Box-O creating the first letter of “OWENS” on a drug store bottle base (Lockhart)

a box, creating the Box-O mark at the beginning of the word (Figure 9). After the 1929 merger with Illinois Glass, the Owens Prescription Oval continued in use until at least 1947, although the bottles were marked with Diamond-OI marks from 1930. The cork finish was also used by the successor company until at least 1937. The Box-O mark, of course, was discontinued after the 1929 merger, although existing molds may have been used for a year or so – until they wore out.

Codes

The general trend toward the inclusion of date codes seems to have begun in the early 20th century (as early as 1906 by the American Bottle Co.) but did not achieve popularity among glass makers until the mid- to late teens or later. Many companies did not adopt the idea until the mid-1920s (e.g., Southern Glass Co.), and some holdouts did not use date codes until the 1970s. The concept may have only caught on gradually *within* the Owens Bottle Co.

We hypothesized that the numbers to the left and right of the Box O mark followed the pattern later used by the Owens-Illinois Glass Co. (i.e., the numbers to the left were indicative of factories; those to the right represented date codes). To test the possibility, we searched available sources and found numbers accompanying the Box O mark in Colcleaser (1965; 1966), Eastin (1965), and Lockhart and Olszewski’s database from the El Paso Coliseum as well as databases provided by Carol Serr and a few other bottles from David Whitten’s collection. Altogether, we recorded 51 Box O marks that were accompanied by numbers, although there were numerous marks without numbers in

Table 2

Patterns and Date Ranges for Owens Codes

Plant #	Pattern	Range	Dates
2	$x \square x$	$2 \square 3-2 \square 8$	1923-1928
3	$\square xx^*$	30-35	1920-1925
3	$x \square x$	$3 \square 3-3 \square 4$	1923-1924
5	$x \square x$	$5 \square 3$	1923
6	$\square xx^*$	60-66	1920-1926
6	$x \square x$	$6 \square 3-6 \square 7$	1923-1927
8	$\square xx$	80	1920
8	$x \square x$	$8 \square 1-8 \square 8$	1921-1928

* These may occasionally be to the left or below the mark. association. See Table 2 for a summary of the patterns we have found.

The search revealed two patterns with a few slight variations:

#1 – a single-digit number to the left of the mark and a single-digit number to the right. Left numbers ranged between 2 and 8 (2, 3, 5, 6, 8); right, 1 to 9, inclusive [N=28].

#2 – a double-digit number to the right of the mark (none to the left) ranging from 30 to 35 and 60 to 64 (30, 31, 32, 33, 34, 35, 60, 61, 62, 63, and 64) [N=12] These also occasionally appeared to the left of the mark or even below it (08, 32, 62, 66) [N=6].

Five specimens showed only one single-digit number, variously located to the left, above, or below the mark.

As the patterns show, the actual codes are more complex than we originally thought and require a revised hypothesis. Pattern #1 followed the original hypothesis, with the plant code to the left of the mark and the date code to the right. Pattern #2 can be explained with the left digit indicating the plant and the right number showing the date. Instead of surrounding the logo, the two numbers were embossed together.

Actually, the Box O with no associated numbers is a separate pattern and deserves its own discussion. The mark with no accompanying numbers may have only been used during the earliest years, 1919-1921. It is more likely, however, that some plants did not use the system, and our data confirm the likelihood that Plants No. 1 and 4 never used the mark, and Plants No.

2 and 5 rarely used the system. This would explain why there are numerous examples of the Box-O mark with no accompanying numbers.

Based on our admittedly small sample, only three plants appear to have regularly used the plant/date codes we have hypothesized. These were plants 3, 6, and 8. Our sample turned up one example for Plant No. 2 and two for Plant No. 5 (both the same year). Each plant number deserves its own discussion.

Plant No. 1

By 1919, the plant was in commercial production, but we have not found an example with an embossed "1" in the plant position.

Plant No. 2

The West Toledo factory was closed before the adoption of the Box-O mark, but the number was recycled to the former Boldt plant at Huntington, West Virginia, ca. 1921. The only examples we have seen have "3," "6," and "8" (for 1923, 1926, and 1628) in the date position.

Plant No. 3

The Fairmont plant was the largest factory in company. It was open during the entire tenure of the Box-O mark. Our sample shows the $x \square x$ format with "3" and "4" date codes (1923 and 1924) but has dates from 1920 to 1925 in the $\square xx$ pattern.

Plant No. 4

The Clarksburg plant received the No. 4 designation upon the closing of the Westlake factory in 1915 and remained in operation until the 1929 merger with the Illinois Glass Co. We have seen no examples of "4" in the factory position.

Plant No. 5

The former Boldt plant at Cincinnati received the No. 5 designation shortly after the Greenfield factory closed in 1921. The only examples we have seen each had a "3" date code for 1923.

Plant No. 6

Like Plant No. 3, the Charleston factory

was active during the entire tenure of the Box-O mark and used both formats. Our sample with the "6" plant code, however, shows a temporal difference between the formats. The $\square xx$ format only has date codes from 0-4 (1920-1923), and the $x \square x$ format is associated with codes 3-7 (1923-1927).

Plant No. 7

This was the original factory of the T.C. Whitney Glass Co. at Glassboro and was only an Owens designate between 1918 and 1919 – not long enough to use the code system or even the Box-O mark.

Plant No. 8

This second plant at Glassboro was completed in 1918 and remained part of the company into the Owens-Illinois era. It is possible that the factory used the $\square xx$ format (i.e., Box-O 80) in 1920, but the only example we have seen was on a Heinz bottle, so the code may have been connected with Heinz instead of Owens. The $x \square x$ format (**Figure 10**), however, was in place from 1921 to 1928 (codes from 1 to 8).



Figure 10: Owens codes for Factory No. 8 and 1921 (Lockhart)

Discussion and Conclusions

Available evidence (e.g., Owens scars on bottles where only Owens held the license, such as catsup and grape juice; amethyst glass color; letters matching plant locations or names) indicates that the various single letter marks, either alone or circled by dots or stars, were made by factories of the Owens Bottle Machine Co. Some of these molds may have continued in use during the first couple of years of the Owens Bottle Co. (1919-1920), until the molds wore out.

It is possible that some other early Owens marks or patterns will be

discovered. Although the Owens plants did not seem to mark most of their bottles prior to the adoption of the Box-O mark, the factories seem to have used single-initial logos on grape juice and catsup bottles. Catsup bottles in general were marked with manufacturer's logos earlier than other food bottles and were sometimes the only bottles made by a company with an embossed logo. Companies like Curtice Brothers, a major catsup concern, may have required glass houses to emboss some sort of logo on the base. We have found logos on bases of Curtice Brothers' catsup bottles that we have not seen on any other bottle types.

The Box-O marks are more historically confirmed than the earlier ones and were certainly used from 1919 to 1929. Many of these were embossed by themselves, but many also contained numerical codes associated with the mark. Although this has never been confirmed by documentary evidence, the apparent date codes accompanying the apparent plant codes all fit into the ranges when each individual factory was in business. Although this date/plant code hypothesis could be more clearly demonstrated with a larger sample, we have been unable to locate suitable collection of these bottles as of the time of this writing.

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Footnotes:

¹ Ohio Bottle obtained an exclusive license in 1904 for production of beer and soda bottles on the Owens machine. The first machine, however, did not arrive until the following year, and it was installed in a new factory owned by the Newark Machine Bottle Co. – a corporation controlled by the Toledo capitalists at Owens. This company received a sub-license from Ohio Bottle (continued by its successor, American Bottle), which sold the bottles made by Newark Machine, an arrangement that lasted at least until 1907. It eventually consolidated with American Bottle (*Newark Advocate* 1905a; 1905b; 1907; Scoville 1948:104, 146).

² The first machine was actually installed at Baldwin-Travis, Kane, Pennsylvania, on December 16, 1903. The firm had recurring problems and was unable to make the machine operational. By October of the following year (1904), Baldwin-Travis had ceased making payments to the Owens Bottle Machine Co., which almost caused the Owens company to become insolvent. The Thatcher Mfg. Co., successor to Baldwin-Travis, signed a new lease on September 16, 1904, but continued having difficulties with the machinery, although production commenced in 1905. By 1908, Thatcher wanted to return machines to the Owens firm and stop paying royalties (Lockhart et al. 2007; Owens-Illinois 1943).

³ Oddly, the Owens-Illinois legal history (1943) indicate that the Owens West Virginia plant was actually sub-licensed by the Illinois Glass Co. and the Charles Boldt Glass Mfg. Co., both holders of Owens licenses, to make liquor bottles.

⁴ According to the Owens-Illinois legal history, the official date for the name change was April 19, 1919 (Owens-Illinois 1943). May 1 must have been the date that the change was released to the press.

⁵ This designation is slightly misleading. Although Toulouse (1971:393) claimed that the factory became Plant No. 1 on September 3, 1903, it was the *only* factory at that time an needed no numerical designation until 1911, when both Northwestern Ohio Bottle Co. and Owens West Virginia Bottle Co. became officially attached to the Owens Bottle-Machine Co.

⁶ The 1904 scheme to restrict Owens machine beer bottles to Mexican markets was probably intended to avoid labor

difficulties and to allay concerns from hand manufacturers, including E.H. Everett, the driving force in the creation of Ohio Bottle, who was then operating a huge bottle plant at Newark based entirely on hand production.

⁷ Although Scoville (1948:109) placed the stock purchase in 1909, the Owens-Illinois legal history (1948) indicates that the deal took place a year earlier. Toulouse (1971:394) added that the machines were AD models, and the plant also made vinegar, grape juice, and “other narrow-neck bottles.”

⁸ Moody’s (1932:2209) claimed a 1912 date for the absorption of both Northwestern and Owens West Virginia, and the Owens-Illinois legal history (1943) agrees with that date.

⁹ Giarde (1980:76) noted that Owens Eastern made milk bottles but mistakenly thought that they might have been embossed with the Box-O mark.

¹⁰ Scoville (1948:110) placed the date at January 11, 1915, but we have accepted the December 1914 date from the 1915 Owens Annual Report.

¹¹ Although the Owens Annual Report did not mention the purchase until 1917, an article in the *National Glass Budget* in August 25, 1917, listed the plant as owned by the Owens company by November 14, 1916 (cited in Roller 1994:41).

¹² Roller (1994:41) noted that the plant was last listed in a 1923 directory. Since directory listings often continued for several years after a factory closed, we have accepted the Toulouse (1971:396) date of 1921.

¹³ The plant was located outside Charleston in the then-unincorporated area of Kanawha City. Consequently it is sometimes called the Kanawha Plant in the trade literature.

¹⁴ A single radical exception was marked 14 Box-O 4, but this may have been a mis-recording or an engraver’s error.

¹⁵ The “08” or “80” may not have been a real part of the Owens mark. This was reported on the base of a Heinz bottle. Heinz had its own codes that were used in conjunction with manufacturer’s marks from other glass houses, including Owens.