

## **The Long & Bumpy Road: American Glass History**

RMDGS Show

By Tom Cotter, April 27, 2014

How did I start being interested in American Glass and its history? I've always been a collector, starting with baseball and football cards in the 50s. My mother and father gave me their Cambridge Rose Point crystal along with their Havilland china (made in America during World War II) when I was old enough to appreciate it in the late 1970s. I was hooked, gathered Rose Point, then other Cambridge glass, then about any other glass I found interesting. Oh, and lots of books... I like artistry, I like history, and I like reading; from these enjoyments came collecting and this talk, which will be about glass made in what is now the United States.

The first attempts to produce glass in America occurred at Captain John Smith's Jamestown, Va., in 1607 and 1622. Great Britain's glass factories then operated on a decreasing supply of wood fuel, so the forests of the Colonies seemed a natural power source. Starvation, disease, fire, and Indian attacks combined with the British conversion to coal in glassmaking to eliminate the need for Colonial production. Other companies operated in the early 1700's in Massachusetts, Philadelphia, and New Amsterdam until probably shut down by the Brits to limit industry in the Colonies and increase exports from the Homeland.

Beginning in 1739 with Caspar Wistar, German immigrants began to defy British restrictions, making glass for Colonial consumption in south New Jersey, east Pennsylvania (Henry Stiegel, 1763), and Maryland (John Amelung, 1784). After the Revolutionary War, more companies opened, such as Pitkin in Connecticut, New Kensington near Philadelphia, several around Glassboro, N.J., and Boston Crown in Massachusetts. Some of the Glassboro companies still operated in the twentieth century. In the Far West of Pennsylvania, Pittsburgh Glass and Gallatin started. After the Revolutionary War and the War of 1812, British governments subsidized exports to the new U.S., dumping glass on the new country. In response and started by Thomas Jefferson, high U.S. tariffs encouraged new glass houses, but many failed. These tariffs continued through the 1920s, discouraging foreign government subsidies on exports.

Access to lots of good sand, clay for pots, and fuel was critical, as well as markets. Now known as eastern Ohio and western Pennsylvania, the Far Western frontier grew quickly after the Revolutionary War and the War of 1812. The area along the Ohio Valley around Pittsburgh and Wheeling formed a logical starting point for many glass ventures. Glass houses initially formed near population centers and where resources (sand, wood, workers, and transportation) were available. As transportation improved, first by water, then by land, glass companies expanded. By 1825, Pittsburgh and Wheeling were joined to New York and the Eastern Seaboard by the Erie and other canals. Development of the steam engine brought paddle wheel boats to join factory cities with markets downstream and upstream, shipping glassware to New Orleans and beyond. Salesmen often traveled with their shipments of products, setting up shop in river towns as they went. Major factories appeared in the Ohio Valley area during the first half of the nineteenth century (Union, Ft. Pitt, Bakewell & Pears, McKee, Adams, and Gray & Hemingray), in New England (Boston and Sandwich, Mt. Washington, New England Glass), while local business for windows and bottles grew in the New Hampshire, northern New York, and the Ohio River corridor.

In the early days, the main products were window panes and bottles. These were hand blown at first, window panes being either cylinder or crown glass. Cylinder was formed into a long sausage shape, cut along a side, then flattened and cut to size, while crown was blown into a large ball, scored with an "X", spun to flatten, and then cut. While poured plate glass production started in the mid-1800s, hand blowing most window glass continued. In the early 20th century machine production that gathered and rolled continuous glass replaced blowing of window glass. Bottles and containers such as jars were originally free blown. By about 1790, Pitkin was using partial molds. Later bottles were blown into partial or full molds, with lips hand applied, standardizing size and shape. Liquor and patriotism brought together the bottle and alcohol industries with a variety of shapes, sizes, and patriotic or historical themes. John Mason

invented the “Mason” wide-mouthed food preservative jar in 1858. In the latter half of the 19th century, the Temperance movement helped lead to a rush on “medicinal” bitters, a concoction of herbs and alcohol. During the Civil War, bitters were sold to Union soldiers as protections from “swamp” diseases encountered in the South, including Dr. Hostetter’s. With an assortment of sealing devices (corks, Codd 1873, Lightning 1875, Hutchinson 1879), over time bottles and jars evolved to basically what we know today, with the metal “crown” cap patented in 1892.

Other technological changes aided the glass industry. Introduction of railroads improved transportation from about 1830 on, with transcontinental service beginning in 1869. Blown Three Mold lead or “flint” glass pieces were made about 1820 made to imitate European cut glass at lower costs. Following the first patents for furniture knobs in 1825, hand-operated glass presses began to dominate by offering huge labor reduction advantages and transferring artistry from blowers, cutters, and engravers to metal mold makers. Starting with lead glass knobs, lacy plates (including cup plates), salts and bowls with lots of stippling to hide defects and create refraction flourished. The process evolved to smooth finished pieces in flint glass as well as whale oil lamps, candleholders, tableware, and so on. Even before 1830, some Eastern glass houses like Pitkin ran out of trees, while in the West (Ohio/Monongahela River Valleys), abundant coal became the main fuel. Telegraph and later telephone lines needed insulators. In homes and cities, whale oil lamps and candlesticks gave way to kerosene and natural gas in the middle of the nineteenth century. But even that was temporary, as electric lights were introduced about 1880. And, of course, these light bulbs were hand blown at first.

Wars impacted supplies and demand, as noted earlier by the ebb and flow of English glass imports before, during, and after wars with Great Britain. The Civil War largely removed lead from the glass makers’ use, so by 1864 Hobbs, Brockunier & Co. chemist William Leighton, Sr., used bicarbonate of soda to formulate a clear, lighter weight, much cheaper, non-lead crystal for pressing. Whether borrowed from European glass makers already using a similar formula or created independently, Wheeling’s Hobbs and Leighton changed the industry. Less expensive crystal patterns became available to most levels of income. Glass production and designs expanded greatly. Using hydrofluoric acid to etch glass began in the 1870s, mainly by Gillinder, while production of crackle glass started at about the same time. The following decades of peace with improved communication and transportation and amazing population growth fueled more and more production, always led by window making.

The Victorian, American Brilliant, and EAPG eras brought beautiful products to all America; some lead, but much non-lead. More experimentation began with colors and finishes, including acid etching, deep cutting, engraving, flashing, and staining. Even as Ruby or Gold Stained (non-glass added & fired) imitated Flashed/Cut to Clear, the designs of the mid to late EAPG period mimicked finer cut glass with numerous flutes, diamonds, prisms, hobnails and the “Strawberry-Diamond”. Thus the famous Russian cut pattern became pressed Daisy and Button. Companies experimented with colors, creating new “flavors” like Burmese, Peach Blow and its variants, Amberina, Rubena Verde, and Bluerina. As the most recognized U.S. purveyor of Art Nouveau, Louis Comfort Tiffany started with stained glass, producing decorations for mansions in a naturalistic style. Tiffany “imported” British Glass man Arthur J. Nash and they developed Favrite, with its iridescence in the glass. In 1903, Steuben brought in their own British ace, Frederick Carder. All he did for the next 56 years was to develop colors and finishes including Aurene, Selenium Red, Green Jade, Calcite, and on and on and on. Favrite and Aurene copied the effect of Roman glass buried underground and pitted, creating color shifts through refraction and reflection changes. Soon the Fentons burst on the scene with pressed glass and sprayed-on metallic salts named “Iridill”, the beginning of “Carnival glass” in 1907.

Natural gas began to replace coal as fuel in the latter 1800s, being cheaper, cleaner and easier for heat control. This encouraged new factory locations from Ohio across the midlands to Indiana and beyond. In the early 1900s, a full infrastructure of supplies, labor, transportation, and burgeoning markets mixed with technological innovations to revolutionize the industry. During the 1890s, Michael Owens had invented the first automated machine to blow light bulbs, a later one for tumblers, then one for lamp chimneys, then a bottle blowing machine, reducing employment from 7 specialists including a blower to 1 operator. By the 1920s, nearly all bulb, tumbler, bottle, and jar production was

automated. Labor costs and jobs plummeted. Large tank production began to replace pots, with continuous flow of glass batch into the tank and molten “metal” out the other end into pressing molds. While finer glass still involved hand blowing or pressing, the depression era method came into full swing, with cheaper glass mass-produced by watchers rather than artisans. There essentially became 3 levels of glass making: Leaded & Art, “Elegant”, and “Depression”. The “Elegant” pieces replaced EAPG styles with thinner mold-blown styles made by many of the same companies. Hydrofluoric acid etching became more popular, as Cambridge, Duncan & Miller, Fostoria, Heisey, Morgantown, and others began to make more fine mold-blown wares. Introduction of the automobile opened vast new markets for windshields and windows, lights, and, of course, flower vases. Art Deco and its geometric forms of the 1920s and 1930s brought a wave of unique designs. New colors flourished in that period as companies tried to outdo each other to gain market. And in 1915, Corning patented a low-thermal-expansion borosilicate glass that has found its way into most homes, laboratories, and many telescopes (including the Hubble Space Telescope and the Subaru Telescope in Hawaii) as “Pyrex.” Also from Corning came Vycor, a very specialized porous, thermal shock-resistant glass.

World War II saw a decline in glass production and colors for decorative use. Fire-King, including Jadeite, was introduced by Anchor Hocking in the 1940s. Yet, the 1940s beheld the inventions of Melmac and Tupperware. Plastic replaced glass in many phases of American life. Mass produced glasses dominated in kitchenware. Many of the Elegant and Depression glass companies merged or simply went out of business. What had been a country of three million people in 1775 had grown to 281 million by 2000. But while the market population expanded dramatically, glass became used less in everyday life, except in automobiles. Plastic, plastic and more plastic evolved, from sodas to beer to dishes to containers of nearly every type. Corning, still the leader in glass innovation, patented Corningware in 1958. Developed in the 1960’s for the military by RCA, Liquid Crystal Display technology uses glass. Others improved the process subsequently for commercial use. Corning invented fiber optic glass under a contract from the U.S. Army Signal Corps in 1970. Corelle, a light-weight, tempered laminate glassware, came out in 1970. At this point, glass is still a multi-billion dollar industry, encompassing windows for buildings and vehicles, mass-produced tableware and containers, and artistic pieces from people like Dale Chihuly.