Industrial Waste from the Whitney Glass Works, Circa 1900: The Approaching End of Mouth-Blown Hollowware at Glassboro

By Michael Bernstein

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In 1920, The Owens Bottle Company stated that the Whitney Glass Works of Glassboro was "the oldest glass establishment in the United States still doing business."[1] In 1981 and 1982, the author collected artifacts from a deposit of waste attributed to the Whitney Glass Works, circa 1900. The waste was exposed during recutting of a drainage ditch along a railroad that had served the glassworks. The waste might have been used as fill, or the railroad might have been a convenient location for disposal. The collection includes defective mouth-blown bottles for products such as the famous Tabasco® sauce, vials, solid-glass bottles, stoppers, and lengths of a glass walking stick or punch-bowl stirring rod. Although the deposit contained cullet (glass residuum usually segregated for recycling), the presence of foreign objects (tools, wire mesh, and gloves) rendered the material a waste. These artifacts represent some of the last of the Whitney glassblowers' production, shortly before the installation of bottle-blowing machines. The artifacts yield information regarding manufacturing processes, date of manufacture, customer identities and products, the geographic breadth of Whitney's market, and the glassblowers' artistry. The collection was donated to Rowan University in 2012.[2]

[1] William S. Walbridge, *American Bottles Old and New* (Toledo, Ohio: The Owens Bottle Company, 1920), 13 and 14.

[2] "Glassworks artifacts donated to Rowan University, Glassboro, N.J.," *Society for Industrial Archeology Newsletter*, 42, no. 2 (2013): 6-7 and 16. Published at Michigan Technological University in Houghton, Michigan.

Introduction

Industrial solid wastes generally consist of process wastes, such as smelter slag, mill scale, and spent foundry sand. Although such wastes may be revealing of manufacturing processes, they are only secondary reflections of the actual product. Probably of greater interest to the archeologist and the historian are wastes that contain or consist of specimens of the product itself, particularly a product manufactured during the last years of a skilled manual technology whose mechanization was on the horizon.

In 1980, the author discovered a deposit of solid waste exposed in a drainage ditch along Conrail railroad tracks that originally served the Whitney Glass Works as the West Jersey Railroad. The glass artifacts recovered by the author in 1981 and 1982 include press-molded bottle stoppers and fragments of their production forms, small mouth-blown bottles finished by use of the snap tool, "mold warmers," and portions of a walking stick or stirring rod. Iron tools, pieces of insulated wire mesh, and work gloves were also found. The artifacts occurred in the context of fine flakes of glass. Most of the bottles had been discarded due to defects; they represent the last of the glassblowers' trials and errors, from shortly before the Whitney Glass Works' conversion to bottle-blowing machines circa 1910. The mold warmers are solid glass castings used to preheat molds.[3] The walking stick or stirrer represents the tradition of glassblowers who made fanciful pieces on their own time and initiative, as a relief from the monotony of blowing bottles and to demonstrate that their skills were more than utilitarian. The geographic scope of Whitney's business at the time is best illustrated by the discovery of bottles for the famous McIlhenny Tabasco® sauce of Louisiana, in addition to bottles for nostrums and proprietary remedies prepared by druggists located in Illinois, Michigan, Vermont, New York,

[3] Ed Pfeiffer, Pitman, NJ, verbal communications with the author in 1981.

and Quebec. Other bottles are identifiable with pharmaceutical manufacturers Parke, Davis & Company, and Eli Lilly & Company. Vials made from tubes were also recovered. The iron tools consisted of a pair of tongs, a wedge that was likely used to steady and/or open molds, and a plate against which residual glass was scraped off the end of the blowpipe (the fine flakes of glass). Various sources date the material to circa 1900.

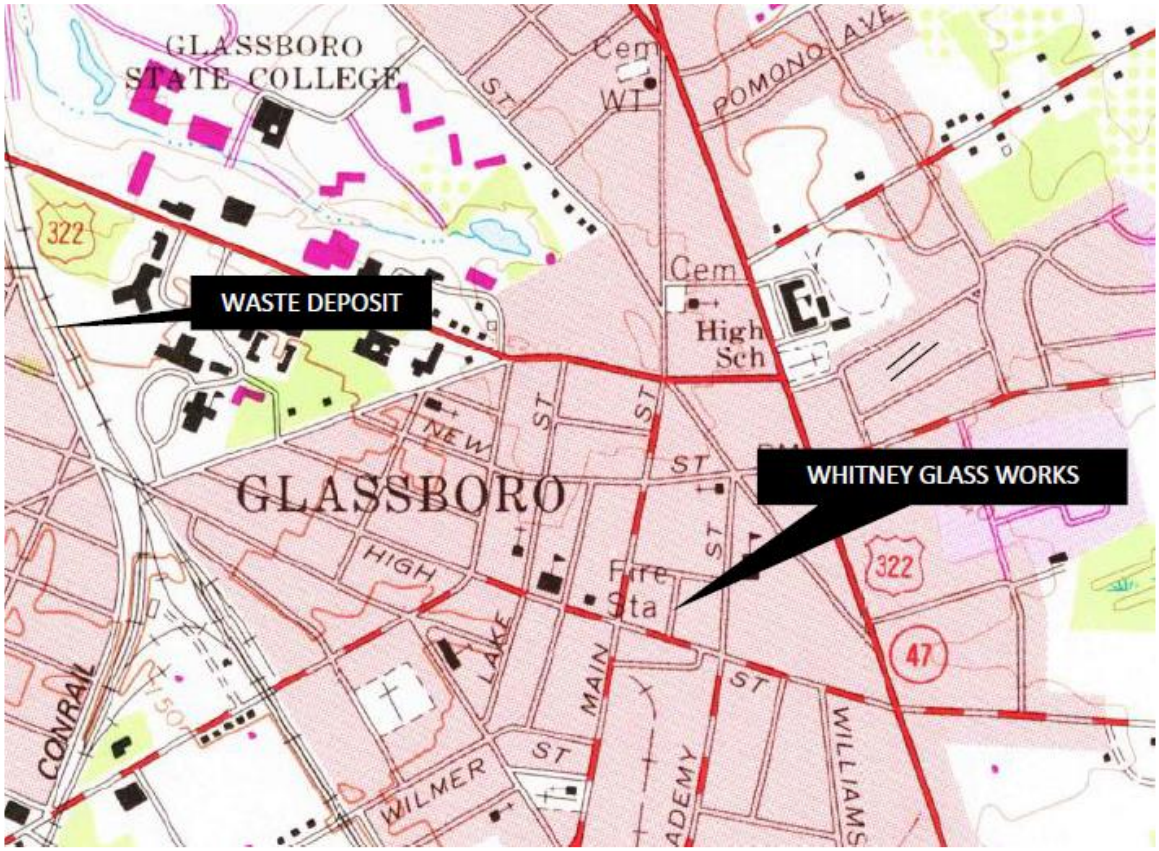
The artifacts can be analyzed from technical and cultural perspectives: 1) the manufacturing processes they represent; 2) the geographic range of Whitney's market, and the products and customers the bottles were made for; 3) when the artifacts were produced; 4) determination of which of two local glassworks was the source of the artifacts; and 5) the glassblowers' manufacture of artistic pieces.

Discovery

In 1980, while attending Glassboro State College (now Rowan University), the author observed a trackhoe removing accumulated sediment and debris from a drainage ditch that paralleled the railroad tracks across the street from his apartment building on Pennsylvania Road, very near the old Glassboro railroad station on Oakwood Avenue. Vaguely aware of Glassboro's history as a glassmaking center and always attracted to openings in the ground, the author at first explored the outwash area at the south end of the ditch (near University Boulevard). Fragments of glass, small misshapen bottles, and glass stoppers were strewn about. Northerly exploration of the ditch revealed a thin layer of glassy waste exposed in the track side of the ditch (the wall of the ditch closest to the railroad tracks).

Location, Composition, and Deposition of the Waste

Extending south-southeastward from U.S. Route 322, Girard Road North parallels the railroad tracks that border the southwest side of the original Glassboro State College campus. During the early 1980s, these tracks were an occasionally active Conrail freight line. The drainage ditch lies between Girard Road North and the railroad tracks, at the toe of the slope that descends from Girard Road North. The body of waste was exposed between Swarthmore Road and Villanova Road, approximately 0.7 mile west-northwest of the site of the Whitney Glass Works.



Locations of the waste deposit and the Whitney Glass Works.[4]

[4] U.S. Department of the Interior, Geological Survey, Pitman West 7.5-minute quadrangle. Edition of 1966, photo revised in 1981 on the basis of aerial photographs taken in 1975.

The ditch ranged as deep as approximately 6 feet, and as wide as approximately 4 feet. The waste occurred as a discontinuous layer approximately 4 inches in thickness, overlain by approximately 1 foot of soil, for approximately 40 feet. The author appeared to have exhausted the deposit during excavations in 1981 and 1982.

The artifacts occurred within a mass of mica-like flecks of glass and fragments of broken bottles. The flecks were the fine residue (moil or moyle) that remained on the end of the blowpipe after a bottle had been blown and the blowpipe drawn away.

This waste might have been purposefully employed as fill, or the railroad right-of-way might have served as an innocuous and convenient location for waste disposal.

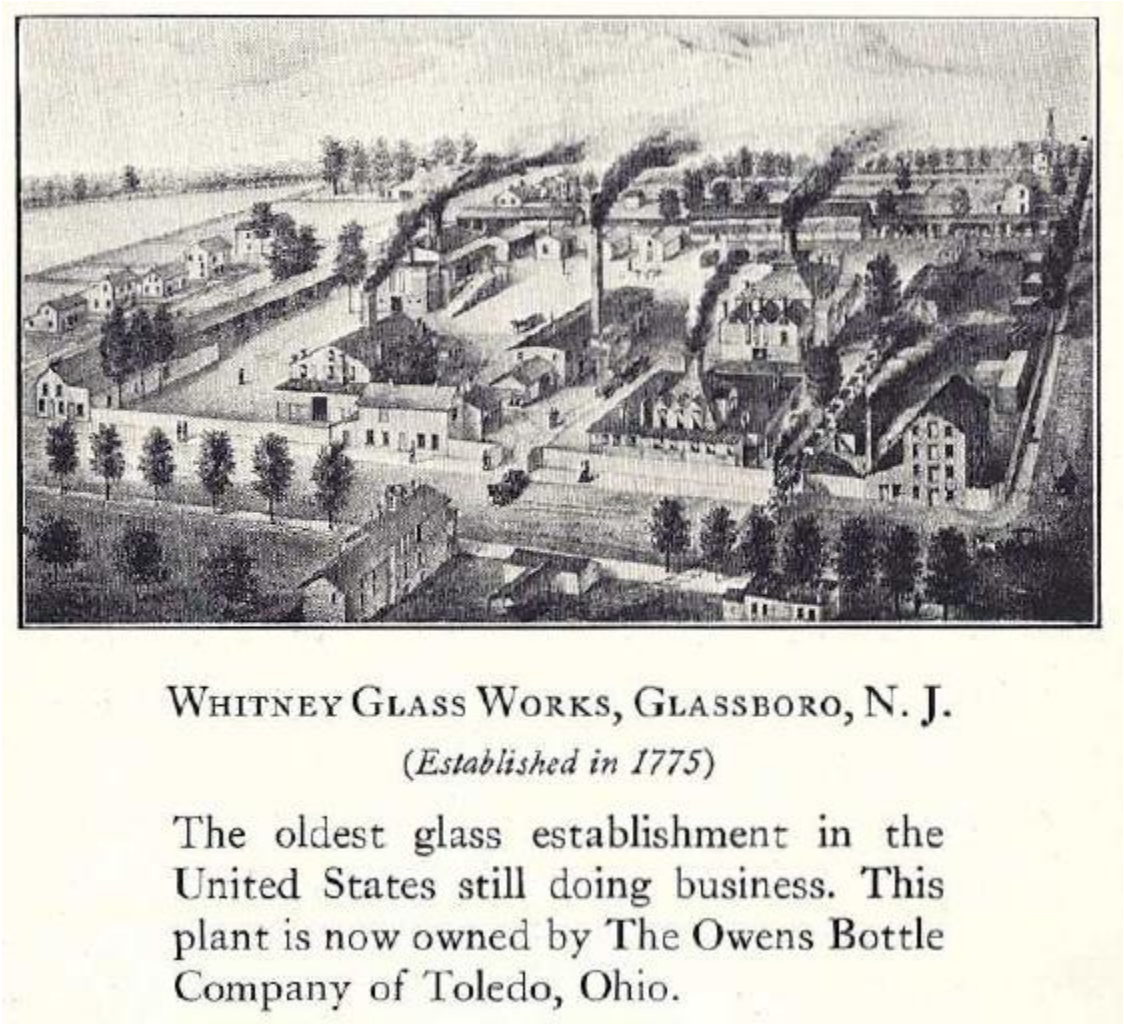
The Sanborn fire insurance map of 1905 depicts "Bins for broken glass" at the West Jersey Railroad sidings located in the northwest corner of the glassworks site.[5] The bins were used for the storage of bottles recovered from domestic rubbish and sold to Whitney to augment cullet (glass residuum) generated at the site.[6] *Webster* defines cullet as "broken or refuse glass usually added to new material to facilitate melting in making glass." In this case, the mixture of clear and amber glass, and the presence of incompatible (non-glass) objects, rendered the subject deposit an outright waste. The material as a whole was not cullet, although it contained cullet.

Genesis and Lineage of the Whitney Glass Works

With its vast deposits of excellent glass sand, wood for charcoal, and proximity to Philadelphia, southern New Jersey was an early center of glassmaking in America.

[5] Sanborn fire insurance map of Glassboro, New Jersey (New York: The Sanborn Map Company, 1905), Sheet 3.
[6] Watson M. Lohmann, *Whitney Glass Works Illustrated Catalog and Price List with Historical Notes* (Pitman, New Jersey: Watson M. Lohmann, 1972).

Accounts of 1876[7] and 1883[8] state that the first glassworks at Glassboro was built in 1775 by the Stanger brothers and began producing bottles that year. The New Jersey Tercentenary Commission stated that the works was not operational until 1781.[9]



The Whitney Glass Works, circa 1876, as cited in 1920.

[7] *Combination Atlas Map of Salem & Gloucester Counties, New Jersey* (Philadelphia: Everts & Stewart, 1876), 97.
[8] Thomas Cushing and Charles E. Sheppard, *History of the Counties of Gloucester, Salem, and Cumberland, New Jersey* (Philadelphia: Everts & Peck, 1883), 229.
[9] Margaret White, *The Decorative Arts of Early New Jersey* (Princeton, New Jersey: D. Van Nostrand Company, Inc., 1964), 9.

The Stangers had quit Wistar's Glass Works in Salem County, which was the first glassworks in New Jersey (1740),[10] the first glassworks in America to survive for more than a decade,[11] and the first successful glass factory town in America (Wistarburg).[12] The Stanger brothers' enterprise at Glassboro—the second glassworks built in New Jersey—failed in 1780, due to depreciation of the Continental currency the Stangers had accepted as payment for their product. In 1781, the Olive Glass Works was sold under sheriff's sale to Thomas Heston and Thomas Carpenter. The establishment was renamed Heston's Glass Works, because Heston remained in Glassboro to supervise its operations while Carpenter managed the shipping of product to Philadelphia from a remote wharf. After Heston died in 1802, his widow and Edward Carpenter (Thomas Carpenter's son) continued the business as Edward Carpenter & Company. Various parties bought and sold interests in the business between 1816 and 1824. In 1824, the Stangers' original glassworks was abandoned, and Edward Carpenter & Company merged with the business of Rink, Stanger & Company, which had erected a new glassworks approximately 1,200 feet south of the Stanger brothers' original glassworks. This second glassworks had been operating since 1813, and was known as the Harmony Glass Works. In 1835, Thomas Whitney purchased an interest in the Harmony Glass Works, and later purchased complete control. In 1842, Thomas Whitney, with his brother Samuel, renamed the facility the Whitney Glass Works. Thomas and Samuel Whitney were Heston's grandsons. The glassworks remained in the ownership of Whitney and Heston descendants until 1917. The Whitney name survived until 1918.

[10] Ibid., 9.
[11] Thomas Cushing and Charles E. Sheppard, *History of the Counties of Gloucester, Salem, and Cumberland, New Jersey* (Philadelphia: Everts & Peck, 1883).
[12] William McMahon, *South Jersey Towns* (New Brunswick, New Jersey: Rutgers University, 1973), 67.

The Whitney Glass Works was acquired by the Owens Bottle Company of Toledo, Ohio, in 1918, one year after the completion of a new plant to house six Owens bottle-blowing machines. The Owens-Illinois Glass Company declared the Whitney Glass Works redundant, and discontinued the manufacture of glass in Glassboro in 1929.

The Harmony Glass Works corresponds to the latter-day Whitney Glass Works, which is the source of the artifacts collected and preserved by the author.

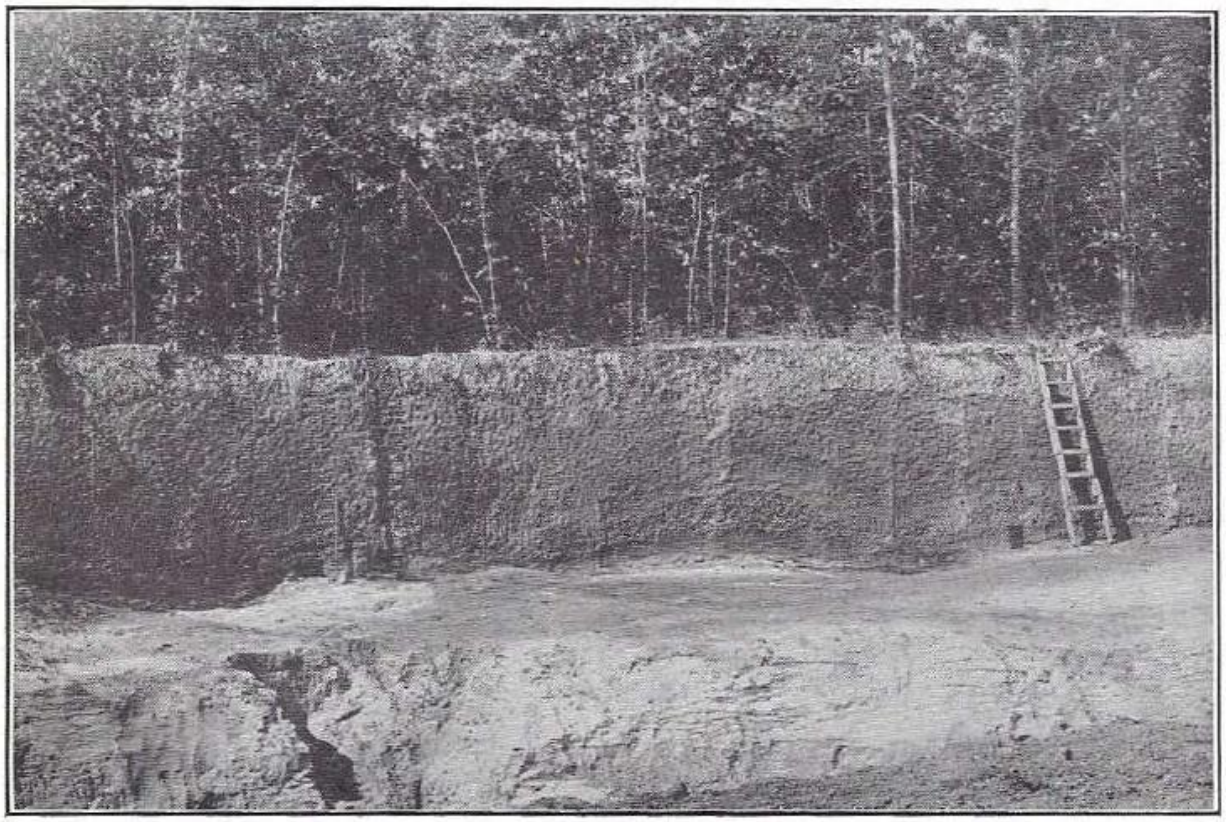
South Jersey Glass Sand and Its Sources

Sand for the South Jersey glass industry was obtained from the Cohansey Formation, an inexhaustible source of sand that comprises most of the outer coastal plain of New Jersey. In 1868, the State Geologist described the glass sand as follows:

> The bed of white sand, which is marked as *glass-sand*, appears to be a uniform layer underlying the surface gravel throughout the whole of the southern end of the state . . . This layer is composed of a beautifully white, pure, quartzose sand; it is fine, angular and even-grained, and admirably adapted to its use in glass-making. This sand is generally fine, angular, even-grained and so pure that at many of the glass-houses it is used for making window-glass without any preparatory washing.[13]

At the turn of the century, the Whitney Glass Works was served by the West Jersey Railroad and the Williamstown & Delaware River Railroad. The West Jersey Railroad's on-line customers included pits located in South Vineland, more than 20 miles away, where the glass sand was 7 to 12 feet in thickness. The Williamstown & Delaware River Railroad offered the Whitney Glass Works a source of glass sand much closer than South Vineland, specifically in the area of Downer.

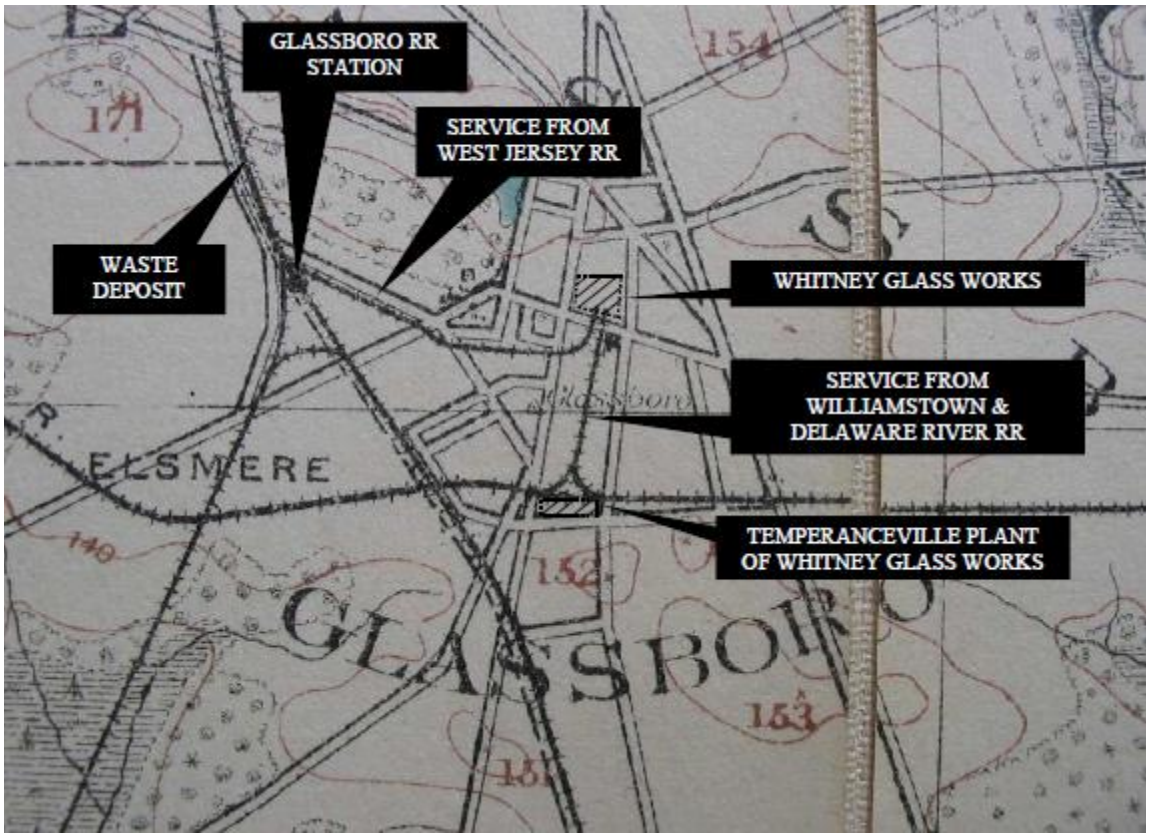
[13] George H. Cook, *Geology of New Jersey* (Trenton, New Jersey: Geological Survey of New Jersey, 1868), 293.



White glass sand of the Cohansey Formation underlying the Bridgeton Formation in a pit near Downer. Downer station on the Williamstown & Delaware River Railroad was 3.4 miles from the railroad's entrance to the Whitney Glass Works. Henry B. Kummel and R. B. Gage, *The Glass-Sand Industry of New Jersey,* Annual Report of the State Geologist for 1906, Geological Survey of New Jersey.

Location of the Whitney Glass Works

The Whitney Glass Works site is approximately 2.8 acres in area. It is bordered by College Avenue to the north, High Street East to the south, Academy Street North to the east, and North Main Street to the west. It is bisected north to south by Center Street. The property has been divided into 21 lots. One lot is occupied by the Heritage Glass Museum. Two other lots are occupied by the Glassboro Fire Department, where artifacts were found in 1981, when the fire station was being constructed (unknown to the author at the time).



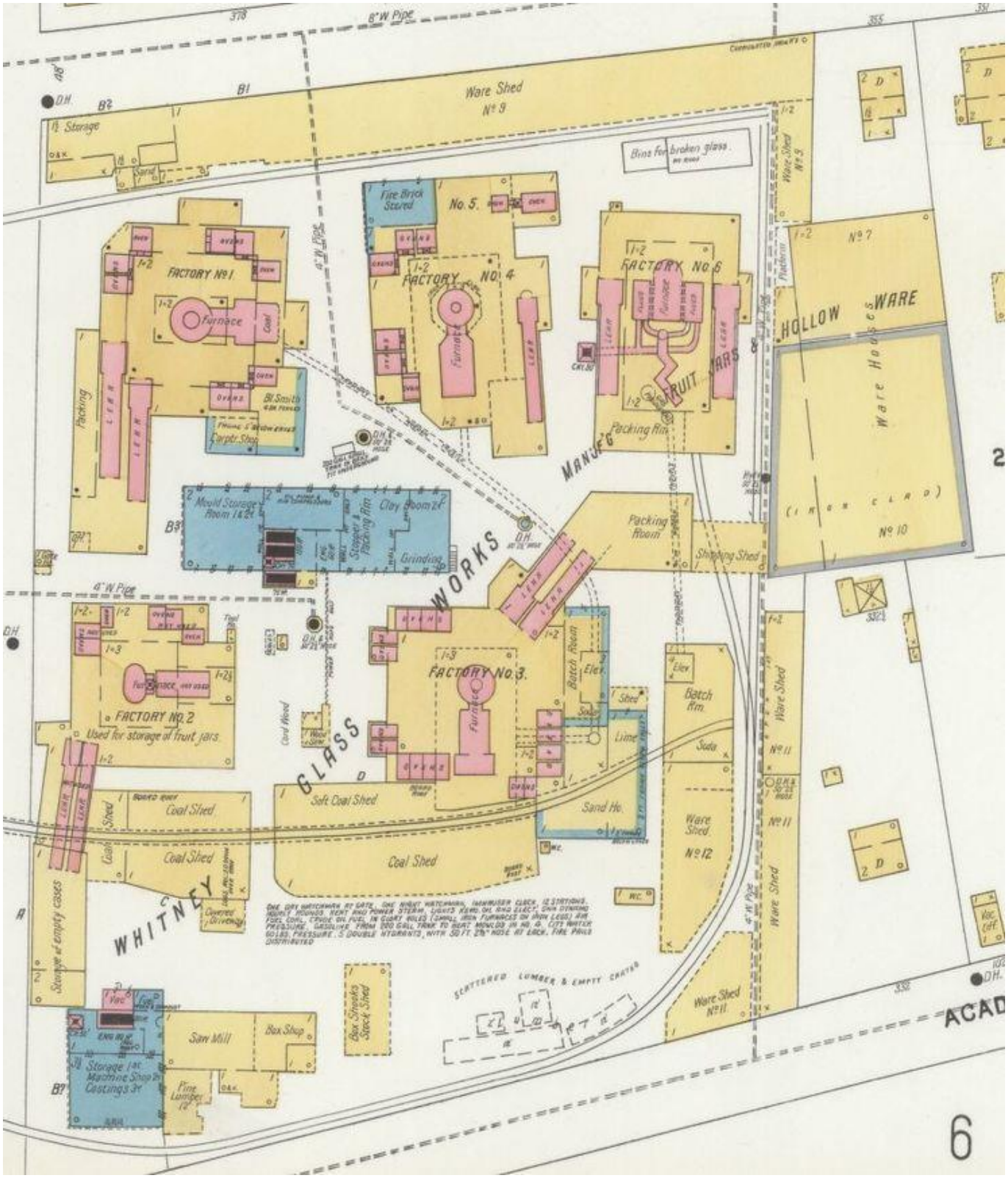
Locations of the Whitney Glass Works, the Temperanceville Glass Works, the waste deposit, and railroad service to the two works. Geological Survey of New Jersey, *Atlas Sheet No. 3*, original survey 1886, principal features revised in 1903, edition of 1913.

The Physical Plant

Per the Sanborn Map of 1905, the Whitney Glass Works included six "factories" with coal-fired furnaces and cooling "lehrs." Associated buildings included a sawmill and box shop; warehouses; clay storage rooms (for making the pots that contained the molten glass); machine, blacksmith, and carpentry shops; and other structures.

Manufacturing Processes Represented by the Artifacts

Three manufacturing processes are represented by the artifacts collected from the ditch in Glassboro: press molding, mouth blowing, and tube cutting, each of which had its favored products.



Whitney Glass Works on the Sanborn map of 1905. A manufacturer of fruit jars and hollowware. North is to the right.

Press Molding of Bottle Stoppers

In press molding, to produce solid glass objects, molten glass was forced into a mold by the use of a lever-operated plunger. In the case of the subject stoppers, the forms are approximately 5 inches long, 2 inches wide, and 1 inch deep. The depth represents the depression that received the plunger. Each form bears one row of five or six stoppers, which were extruded from the bottom of the forms. Before the glass had solidified, the stoppers were cut free by the use of shears.

Top: Fragments of production forms with round scars where press-molded stoppers were sheared off. Bottom: Stoppers still attached to fragments of production forms.

Mouth Blowing of Hollowware

In mouth blowing, a glassblower inflated a bottle by forcing his breath through a blowpipe into a mold in which a gather of glass had been placed. All of the bottles collected from the ditch are blown-molded pieces finished by use of the snap, which was an iron rod or pipe with fingerlike appendages that held the bottle. Prior to the widespread use of the snap during the 1860s, the mouths of bottles were finished by use of a pontil. The pontil was an iron rod or pipe. A dab of molten glass was placed on one end of the pontil. The bottle was stuck to the pontil on this dab of glass and exposed to the heat of the "glory hole" for finishing. When finished, the bottle was tapped off, and an adhering ring of glass (a pontil mark or scar) usually remained on the bottom.

Accumulation of cullet (defective and broken bottles, and possibly mold warmers) at the Cumberland Glass Works in Bridgeton, 1909. Likely comparable to the Whitney Glass Works at that time. Library of Congress, Lewis Hine collection, Reproduction No. LC-DIG-nclc-01176.

Tube Cutting

Tube cutting involved the production of vials from glass tubes. The vials found in the ditch were apparently manufactured from tubes, which may or may not have been produced at the Whitney Glass Works. Tubes were a specialty item at the time; the Vineland Flint Glass Tube Company (circa 1911) made this item exclusively.

Vials, likely for opium or morphine according to Ed Pfeiffer. Height, 0.8 inch.

Mold Warmers

In 1981, many of the artifacts were examined by Ed Pfeiffer (1906–1983),[14] an expert on South Jersey glass and glassworks, whose papers are preserved in the New Jersey State Archives.[15] Lohmann cites interviews he had with Pfeiffer. The author was probably one of the last persons to benefit from Pfeiffer's knowledge.

[14] "Batsto Library Aided by J.E. Pfeiffer Bequest," *Batsto Citizens Gazette*, XVIII, no. 1, 1984.

[15] Accession No. 2002.078, Records of Historic Batsto Village received from the Department of Environmental Protection, Division of Parks and Forestry, State Park Services, December 2002, Boxes K–1 to K–6.

The most curious artifacts from the ditch are solid, uninflated bottles. Pfeiffer explained to the author that blowing glass in a cold iron mold could result in the bottle adhering to the mold or bursting due to the temperature differential. Preheating the molds alleviated this problem. The simplest way to heat a mold was to drop a gather of molten glass into the mold and let it rest until the mold had heated. This solid glass casting, which Pfeiffer called a "mold warmer," was usually placed with the cullet to be recycled. Mold warmers make excellent artifacts, especially when embossed with devices and lettering.

A notation on the fire insurance map of 1905 states that a 200-gallon underground storage tank located between Factory No. 1 and Factory No. 4 contained gasoline "to heat moulds in No. 4," which concurs with Pfeiffer's statement that molds were preheated.

Annealing

A vital step in the manufacture of bottles was the process of annealing. In order to avoid uneven stress that could result in breakage during rapid cooling, bottles were placed within a heated containment and allowed to cool slowly and uniformly. The Sanborn map shows two types of annealing ovens at the Whitney Glass Works: periodical ovens and continuous ovens. Periodical ovens were relatively small units and embodied earlier technology. Annealing in a periodical oven proceeded by allowing the oven and its contents to cool over several days. Continuous ovens ("lehrs" on the Sanborn map) were tunnel-like units. They were heated at one end, with the temperature gradually decreasing toward the opposite end. The bottles were advanced by means of a chain-driven device.

Because the artifacts found in the ditch had been discarded immediately after being blown, they were not annealed and are, therefore, sensitive to temperate change. Several burst upon removal from the cool ground into the warm air. A richly embossed medicine bottle—the only one of its kind found—shattered with a loud pop before it could be read.

Blown-molded bottle whose wilted neck and collapsed body suggest it was overexposed to the glory hole during finishing. Same logo as winged mold warmer (see below). Height, 3.5 inches.

Changing Technology and the Fate of the Whitney Glassblowers

In 1910, Whitney was the site of the first attempt to simultaneously produce a variety of bottles on a single bottle-blowing machine. The machine was a six-arm Owens unit. The first trial involved five shapes, representing three weights, three heights, and three capacities. The next test

involved four weights, heights, and capacities. The last test involved two weights and capacities in six specialty molds. The experiment was a success, rendering the glassblowers' skills obsolete.

By the end of 1911, seven 10-arm Owens machines had been installed at the Whitney Glass Works. In 1911 and 1912, 140 glassblowers and their families abandoned Glassboro. The last mouth-blown bottles made at the Whitney Glass Works were manufactured in 1913.

Mold warmer of George G. Steketee's Haarlem Oil of Grand Rapids, Michigan. Length, 3.3 inches.

Lettered-ribbon device on mold warmer of "The Economical Drug Co. Chicago," located at 122 N. State Street. Height, 2.5 inches.

Mold warmer for a pill bottle with a threaded screw closure. Corresponds to the "watch shape" screw-top pill bottle shown in the Whitney price list of 1904; the round, flat shape is similar to that of a pocket watch. Height, 2 inches.

Fantastic mold warmer. Wing is due to a slightly open mold. Height, 3.5 inches.

Generic screw-top pill bottles. Height, 2.5 inches.

Two amber mold warmers, one with P.D. & Co. on its bottom. Height, 1 inch.

The Artifacts Inventoried

Although the Whitney Glass Works manufactured fruit jars (Mason jars) and beverage bottles during the period of interest, no fruit jars or beverage bottles were found in the ditch.

Miscellaneous artifacts that were, unfortunately, not preserved, include pieces of insulated wire mesh and work gloves, both of which may have consisted of asbestos.

The glass and iron artifacts recovered by the author are summarized in Table 1 on the following page:

Table 1
Glass and Iron Artifacts Preserved
Railroad Drainage Ditch along Girard Road North
Glassboro, Gloucester County, New Jersey
Collected in 1981 and 1982 by Michael Bernstein
Donated to Rowan University in 2012

GLASS ARTIFACTS					
Hollowware					
Object(s)	**Height or Length**	**Color**	**Embossed Markings**[a]	**Number of Objects**	**Comments**
Vials	0.8 inch	Clear	None	5[b]	Probably "homeopathic vials" per 1904 price list; opium or morphine per Ed Pfeiffer.
Bottles	3.2 inches	Clear	P.D. & Co. 332[c]	2	Rims unfinished; pulled off blowpipe and discarded.
Bottle	3.5 inches	Clear	E.L. & Co. 31[c]	1	Rim unfinished; pulled off blowpipe and discarded.
Bottles	5 inches	Clear	McIlhenny Tabasco Sauce	10[b] [d]	Various defects.
Bottles	2.5 inches	Clear	None	7[b]	Generic pill bottles with screw closure; pulled off blowpipe and discarded.
Bottle	2.3 inches	Clear	Topum	1	Embossing on side of bottle; research failed to identify this product.
Bottle	2 inches	Clear	5 Drops	1	Cure-all marketed by Swanson Rheumatic Cure Co. of Chicago.
Bottle	3.5 inches	Clear	SC	1	See winged mold warmer.
Bottles	3 inches	Clear	None	4[b]	Finished bottles; contained "British oil" per 1904 price list.
Bottle	4 inches	Amber	P.D. & Co. 362[c]	1	Finished bottle; no apparent defect.
Bottle	3.2 inches	Amber	P.D. & Co. 323[c]	1	Finished bottle; no apparent defect.

Bottle	5.5 inches	Clear	None	1	Generic prescription bottle; pulled off blowpipe and discarded.
Bottle	3 inches	Clear	Illegible	1	Possible perfume bottle; pulled off blowpipe and discarded.
Bottle	2.3 inches	Amber	Illegible	1	Grossly deformed.
Mold Warmers					
Height	**Color**	**Embossed Markings**		**Number of Objects**	**Comments**
2 inches	Clear	Pettingill's Kidney-Wort Tablets		3[(b)]	See product box and label.
2.5 inches	Clear	The Economical Drug Company Chicago		1	"It is the only drug store on earth that discriminates against 'patent' nostrums and boldly advertises their fraudulent character."[(e)]
3.3 inches	Clear	George G. Steketee's Haarlem Oil		1	Proprietor and manufacturer located in Grand Rapids, Michigan.
3.5 inches	Clear	SC		1	Wing present due to open mold.
3 inches	Clear	[incomplete; fragmented words]		1	Unidentified product for skin and hair from druggist located in New York City.
3.5 inches	Clear	None		1	Corresponds to generic prescription bottle cited above.
3 inches	Clear	472[(c)]		1	Generic prescription bottle per 1904 price list.
5 inches	Clear	456[(c)]		1	Generic prescription bottle.
3 inches	Amber	E.L. & Co. 4[(c)]		1	Massive solid plug of glass.
2.5 inches	Clear	None		1	Diagonally cross-hatched pattern impressed on front and rear.
2.3 inches	Amber	P.D. & Co. 190[(c)]		1	None.

1.8 inches	Amber	E.L. & Co. 52[c]	1	None.
1.6 inches	Clear	McIlhenny Tabasco Sauce	1	Basal portion of bottle; very clear impression of wording.
2 inches	Clear	P.D. & Co. 397[c]	3[b]	Pill bottle with screw-top closure.

Pressed Glass

Objects	Height/ Length	Color	Number of Objects	Comment
Stopper Forms	Approx. 5 inches long	Amber	2	Fragments, with stoppers still attached.
Stoppers	1.3 inches	Amber	21[f]	Eight designs represented.

Whimsical Pieces

Object	Lengths	Colors	Cross Section	Comment
Walking stick or stirring rod	9 and 5.9[b] inches	Clear with amber core	Square cross section, each side 0.6 inch	Ends pulled off while plastic.

IRON ARTIFACTS

Object(s)	Dimensions	Use	Comments
Wedge	3.5 inches long	Likely for leveling and/or opening molds.	None.
Tongs	12.5 inches long	Handling of bottles.	None.
Plate	23 inches long by 4 inches wide by 0.3 inch thick	Removal of moil from blowpipe by scraping against the plate.	Loaned to Heritage Glass Museum in 1982; unavailable in June 2009.

(a) Located on bottom of bottle except where noted otherwise.
(b) Includes one specimen loaned to Heritage Glass Museum in 1982; unavailable in June 2009.
(c) Whitney Glass Works mold number.
(d) Includes two specimens transferred to McIlhenny Company in 1982.
(e) Per *Bulletin of the Medical Women's Club of Chicago*, Vol. 1, No. 8, 1913.
(f) Includes three specimens loaned to Heritage Glass Museum in 1982; unavailable in June 2009.

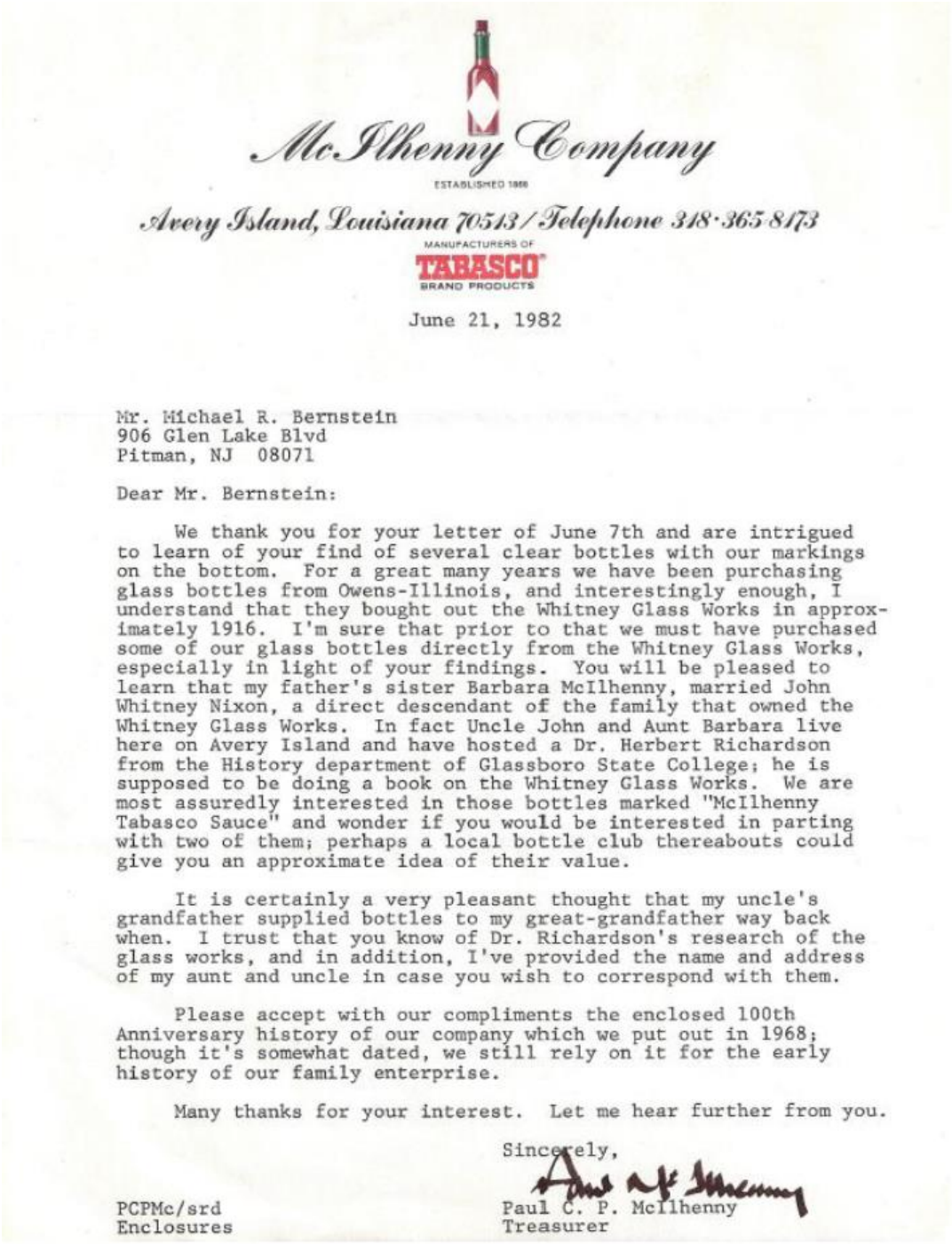
The pressed-glass stoppers are of uniform height; only the shapes of their tops vary. One amber bottle was found whose bore fits the stoppers. The amber stoppers and bottles were intended for products that would have chemically degraded by exposure to sunlight through clear glass. The bottoms of all the amber bottles are embossed with P.D. & Co. or E.L. & Co., which represent Parke, Davis & Company of Detroit, Michigan, and Eli Lilly & Company of Indianapolis, Indiana.

Bottles for McIlhenny Tabasco® Sauce

The most identifiable bottles recovered from the ditch at Glassboro occurred as a cluster of ten specimens, and likely represented an individual glassblower's attempts to master the volume of this particular bottle. These bottles are the circa-1900 version of today's two-ounce bottle of the famous McIlhenny Tabasco Sauce, and are embossed with "M^{c}Ilhenny Tabasco Sauce" on their bottoms. This trade-named product has been prepared on Avery Island, Louisiana, since 1868. Only McIlhenny Company's product is Tabasco sauce; all others are generic pepper sauces.

The author corresponded with Paul C.P. McIlhenny[16] and provided two bottles that fortunately survived shipment.

[16] Letters to author from Paul C. P. McIlhenny, Treasurer, McIlhenny Company, Avery Island, LA, June 21, August 16, and October 25, 1982.



McIlhenny Company

ESTABLISHED 1868

Avery Island, Louisiana 70513 / Telephone 318·365 8173

MANUFACTURERS OF
TABASCO
BRAND PRODUCTS

June 21, 1982

Mr. Michael R. Bernstein
906 Glen Lake Blvd
Pitman, NJ 08071

Dear Mr. Bernstein:

We thank you for your letter of June 7th and are intrigued to learn of your find of several clear bottles with our markings on the bottom. For a great many years we have been purchasing glass bottles from Owens-Illinois, and interestingly enough, I understand that they bought out the Whitney Glass Works in approximately 1916. I'm sure that prior to that we must have purchased some of our glass bottles directly from the Whitney Glass Works, especially in light of your findings. You will be pleased to learn that my father's sister Barbara McIlhenny, married John Whitney Nixon, a direct descendant of the family that owned the Whitney Glass Works. In fact Uncle John and Aunt Barbara live here on Avery Island and have hosted a Dr. Herbert Richardson from the History department of Glassboro State College; he is supposed to be doing a book on the Whitney Glass Works. We are most assuredly interested in those bottles marked "McIlhenny Tabasco Sauce" and wonder if you would be interested in parting with two of them; perhaps a local bottle club thereabouts could give you an approximate idea of their value.

It is certainly a very pleasant thought that my uncle's grandfather supplied bottles to my great-grandfather way back when. I trust that you know of Dr. Richardson's research of the glass works, and in addition, I've provided the name and address of my aunt and uncle in case you wish to correspond with them.

Please accept with our compliments the enclosed 100th Anniversary history of our company which we put out in 1968; though it's somewhat dated, we still rely on it for the early history of our family enterprise.

Many thanks for your interest. Let me hear further from you.

Sincerely,

Paul C. P. McIlhenny

PCPMc/srd
Enclosures

Paul C. P. McIlhenny
Treasurer

Letter from Paul C. P. McIlhenny (1944–2013) to the author, dated June 21, 1982. It includes information regarding personal relationships between the Whitney and McIlhenny families.

Early two-ounce bottles of Tabasco sauce. Possibly, but not necessary, made at Glassboro. *The 100 Year History of Tabasco*. (Avery Island, LA: McIlhenny Co., 1968).

Whimsical Pieces

Two fragmentary objects from the ditch are what glass historians refer to as "whimsical" pieces. One of the objects is a 9-inch-long piece of clear glass with an amber core, square in cross section and measuring 0.6 inch on each side. Its ends were pulled off when the glass was in the plastic state. The second piece is identical, but 5.9 inches in length. Such "off-hand" pieces known to have been made at the Whitney Glass Works include walking sticks, chains, paperweights, and lily pads.

Non-Glass Artifacts

Three rusted iron tools were recovered from the ditch: a pair of tongs, a small wedge, and a rectangular plate. According to Ed Pfeiffer, the residual glass that remained on the blowpipe after a bottle had been blown was removed by scraping the end of the blowpipe against this plate. If there was a name for this object, Pfeiffer did not note it.

Unfortunately, the author did not preserve the insulated wire mesh and work gloves he had found. Had he done so, they would have been submitted for asbestos analysis by polarized light microscopy.

Tabasco sauce bottles from the ditch. The mouths of all six bottles are unfinished. The body of the bottle at the far left has collapsed. The bottle at the far right is underinflated, which would have resulted in a short measure of sauce; the bottle to its left is a bizarre deformity. Height, 5 inches.

Dating of the Artifacts

Ed Pfeiffer dated the material to 1900, plus or minus ten years. The 1902 product registration date for Pettingill's Kidney-Wort Tablets concurs.[17] The reported end of mouth-blown production in 1913 also approximately agrees with Pfeiffer's dating.

[17] Oregon State Archives, Historical Oregon Trademark No. 740 for *Pettingill's Kidney Wort Tablets*, Wells, Richardson & Company, Vermont, 1902.

Bottom of a Tabasco sauce mold warmer.

Length of a glass walking stick or punch stirrer, clear with amber core. Length, 9 inches.

Whitney Glass Works' Price List of 1904

In 1904, Whitney published an illustrated booklet of their wares.[18] The products include a broad range of generic "prescription bottles." These bottles bore no embossing; paper labels were attached. Many of the bottles recovered from the ditch are generic prescription bottles.

Punch-bowl stirrer and ladle, of clear glass with amber core. Very similar to the fragments found in the ditch at Glassboro. Private collection, Clayton, New Jersey.

[18] *Price-List of the Whitney Glass Works* (Glassboro, New Jersey: Whitney Glass Works, 1904).

Table 2
Bottles and Vessels for Generic Products per 1904 Price List
Whitney Glass Works, Glassboro, New Jersey

Pharmaceuticals
Citrate of magnesia, quinine, morphine, strychnia, ammonia, cod liver oil
Personal Hygiene Products
Tooth powder, tooth wash, ointment, perfume, toilet water, violet water, pomade (fruit-based hair dressing), Vaseline
Non-Food Products
Sewing machine oil, ink, electric battery jars, cement, shoe dressing, acids, mucilage (adhesive)
Food Products
Chow-chow, mustard, club sauce, horseradish, catsup, pepper sauce, salad dressing, pickles, olives, olive oil, honey, maple syrup, candy, fruit, jam, jelly, preserves, celery salt, spices, flavoring extract, malt extract
Beverages
Schnapps, bitters, wine, whiskey, gin, milk, spring water, soda, beer

The vials from the ditch are smaller than the smallest of the listed morphine vials, which contained 1.25 ounces. The "homeopathic vials" contained as little as 1/8 drachm (1 drachm = 3.888 grams) and appear to better correspond to the subject vials. Although the homeopathic vials are shown with rims, the "tube vials" in the list are rimless, as are the vials from the ditch.

Three designs of amber stoppers are identified in the price list: "mushroom," "flat," and "ball." The top of a mushroom stopper was circular and horizontal. The top of a flat stopper was tabular and vertical. The top of a ball stopper was spherical. Fifteen of the 21 stoppers collected from the ditch are varieties of "flats." One stopper is of the mushroom type. Two of the stoppers have simple rounded tops, not illustrated in the price list. No ball types were found.

Several finished bottles, tall and narrow and diamond-shaped in cross section, were recovered. Per the price list, they contained a medicine called "British oil."

Lohmann's discussion amended to the price list of 1904 identifies Whitney customers located in Massachusetts, New York, Ohio, New Jersey, and Connecticut. The material from the ditch identifies customers located in Illinois, Michigan, Quebec, New York, Vermont, Louisiana, and Indiana. New York is the only concurrence between the two data sets and dates. Lohmann also refers to P.D. & Co. and identifies it as Parke, Davis & Company.

Downtown Glassboro or Temperanceville?

In 1834, the Stangers erected a new glassworks approximately 1,500 feet south of the Harmony Glass Works. The proprietors were temperance men, and proposed to hire no man who drank alcohol. The site came to be known as Temperanceville (a name applied to locations across America during the years of the temperance movement). In 1835, Thomas Whitney bought a one-third interest. In 1837, Whitney Brothers purchased the remaining two-thirds. In 1842, the Temperanceville plant began operating under the Whitney name. Although ownership changed hands again shortly thereafter, the plant continued to operate to the order of Whitney Brothers, who contracted for all of Temperanceville's production of bottles. In 1864, Whitney Brothers regained a one-half interest in Temperanceville, discontinued the manufacture of hollowware, and began the exclusive manufacture of window glass.[19] Other accounts date the conversion to window glass to 1856.[20,21] A third account dates the transition to 1859.[22]

[19] *Combination Atlas Map of Salem & Gloucester Counties, New Jersey* (Philadelphia: Everts & Stewart, 1876), 98.
[20] Thomas Cushing and Charles E. Sheppard, *History of the Counties of Gloucester, Salem, and Cumberland, New Jersey* (Philadelphia: Everts & Peck, 1883), 231.
[21] *South Jersey: A History, 1664–1924* (Lewis Historical Publishing Co., Inc., New York, Vol. 1, 1924), 472.
[22] Adeline Pepper, *The Glass Gaffers of New Jersey* (New York, New York: Charles Scribner's Sons, 1971).

Close-up of a mold warmer for Pettingill's kidney-wort tablets. "The great remedy for all kidney, bladder, and liver complaints." Chocolatey, too. Height, 2 inches.

Retail box and bottle label for Pettingill's kidney-wort tablets. The tapered label corresponds to the form of the mold warmer.

The Whitney Glass Works was served by the West Jersey Railroad and the Williamstown & Delaware River Railroad, but only the Williamstown & Delaware River Railroad originally served Temperanceville. Because the waste was discovered along the former West Jersey Railroad tracks, the railroads depicted on the map revised in 1903 imply that the waste originated at the Whitney Glass Works. Sanborn fire insurance maps of 1900 and later depict interconnection between the West Jersey Railroad and the Williamstown & Delaware River Railroad in the area between the two glassworks.

If the origin of the material in question cannot be determined on the basis of railroad service, other evidence still indicates that the artifacts were manufactured at the downtown Whitney Glass Works, and not at Temperanceville.

Although Ed Pfeiffer mentioned the Temperanceville Glass Works during his discussions with the author, he attributed the artifacts to the Whitney Glass Works in downtown Glassboro. The production of hollowware at Temperanceville was reportedly discontinued in 1856 at the earliest, and 1864 at the latest. If Pfeiffer was in error and the artifacts were manufactured at Temperanceville, then at least some of the bottles should be expected to bear pontil marks (a ring of glass adhering to the bottom of a bottle). Not a single bottle preserved by the author, and not a single fragmentary bottle observed in the ditch but not retained, bore a pontil mark.

Several types of bottles from the ditch were manufactured for Parke, Davis & Company and Eli Lilly & Company. The name Parke, Davis & Company was adopted in 1871.[23] Eli Lilly & Company was established in 1876.[24] Therefore, hollowware for Parke, Davis & Company and Eli Lilly & Company could not have been manufactured at Temperanceville if the production of hollowware at Temperanceville was discontinued in 1864 at the latest.

Sanborn fire insurance maps for 1895, 1900, and 1905 include notations that the works were not in operation at those times. Furthermore, the fire insurance map of 1910 notes that the former window glassworks were "In extremely dilapidated condition," and states "14 years since glass mill has been used."[25] According to these notations, Temperanceville was not operating during most of the years in which the objects in question are believed to have been manufactured, and had not manufactured hollowware in decades.

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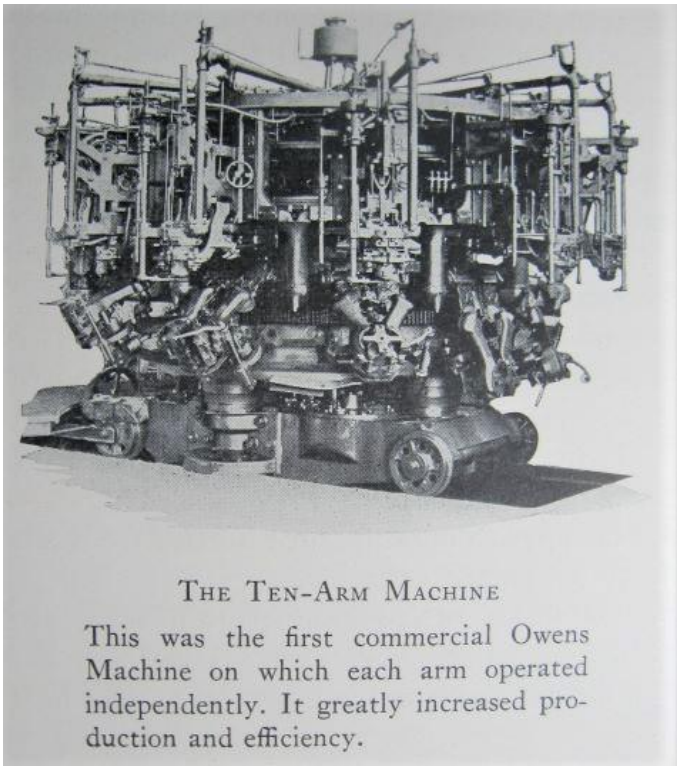
[23] Park, Davis Research Laboratory Records, 1902–1950. Smithsonian Institution Research Information System: Archives, Manuscripts, Photographs Catalog.
[24] Eli Lilly & Co. https://www.lilly.com (accessed July 7, 2021).
[25] Sanborn fire insurance map of Glassboro, New Jersey (New York: The Sanborn Map Company, 1910), Sheet 8.

On the basis of this evidence, the waste encountered in the ditch did not originate at Temperanceville.

Heritage Glass Museum and Rowan University

The Heritage Glass Museum occupies the former Glassboro Title & Trust Company building, on the Whitney Glass Works site. It has exhibits of maps, glass artifacts, and tools, but very limited hours. In 1982, the author loaned 12 objects from the ditch to the museum; they were unavailable during the author's visit in June 2009 and may have been lost, sold, or stolen.

The Frank H. Stewart Room at Rowan University's Keith & Shirley Campbell Library contains material pertaining to the Whitney Glass Works and other South Jersey glass manufacturers.



The 10-arm Owens machine of circa 1910. The final nail in the coffin of the Whitney glassblowers.

Conclusion

During his 31 years of performing Phase I Environmental Site Assessments, the author has visited industrial facilities that generated a wide range of wastes. These wastes were usually generated by processes attendant to the product, and did not contain or consist of the product itself. The artifacts collected from the ditch in Glassboro in 1981 and 1982 and presented to Rowan University in 2012 are the physical remnants of the products and wastes of a famous New Jersey glassworks shortly before automation changed bottle manufacturing and manufacturers.

The artifacts admittedly reveal little that was not already known about the Whitney Glass Works. More important, perhaps, they demonstrate that being curious and acting when an unexpected opportunity presents itself can reward the avocational historian with a chance to make a contribution to archeological recovery, preservation, and study.

Michael Bernstein received a BA in geography from Glassboro State College in 1982. In 2020, he semiretired from a 34-year career in the environmental consulting industry, having performed Phase I Environmental Site Assessments of commercial and industrial properties in 35 states plus Canada, Mexico, and Germany. His South Jersey fossil collection is being donated to the Academy of Natural Sciences of Drexel University. In 2016 and 2017, the Historical Society of Pennsylvania acquired his archive of Delaware River shipyard material. In 2003, Mike restored to the New Jersey State Archives four Colonial legislative documents stolen during the 1930s. In 1985, he donated to the New Jersey State Museum the sea turtle bones he found at the locality of the Haddonfield dinosaur. The results of his research have been published in IA: The Journal of the Society for Industrial Archeology, Nautical Research Journal, *and* Northeastern Geology, *with historical articles also appearing in* Pennsylvania Magazine *and environmental articles in* Arizona Contractor & Community *magazine.*