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R O U T E 9 A
RECONSTRUCTION PROJECT

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CONTEXTUAL STUDY
BLOOMINGDALE FLINT GLASS WORKS

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A. INTRODUCTION

The development of the glass industry in the Northeast has played an influential role in the availability of consumer goods to varying classes of urban and rural populations. Particularly, the nineteenth century was witness to numerous innovations in production techniques which drastically affected product availability, price, and ultimately demand. In New York City, the Bloomingtondale Flint Glass Works was established in 1820 and closed its operation in 1840. The glassworks was constructed on a plot of land in the vicinity of West 47th Street and the Hudson River, and produced high quality cut and engraved glassware. By 1821 a factory was built and by 1823 housing for workers was built to the east near Eleventh Avenue.

A contextual overview of glass making was prepared, from which theoretical questions about this particular site were derived. The initial research conducted for the Route 9A reconstruction project raised some question as to the exact whereabouts of the glasswork's main structure. Intensive documentary research was conducted to define better the location of the main structure and to try to determine if any outbuildings or dumps, areas of waste deposits, exist within the project area. This site was also compared to other known archeological sites of its type to assess the visibility of archeological remains and the ability to address specific research questions. If remnants of the glassworks are in the project area, these could be potentially significant since the number of comparable sites in New York City and the Northeast is minimal.

B. RESEARCH

HISTORICAL CONTEXT

The process of glass blowing was practiced by the Egyptians over 4000 years ago, although the invention of the process was claimed by the Phoenicians. Glass is produced by fusing silicates in a furnace or kiln with soda or potash, lime, and sometimes various metallic oxides which may be used as coloring agents. Kilns, commonly made of stone and clay, were usually wood fired. Moulded glass, primarily manufactured until other methods of glass production were introduced, was made by pouring molten glass into a mould which was in the form of the exterior of the desired object. "Some of the earliest glass was made in moulds filled with powdered glass which was subsequently fused by heating...The earliest blown glass vessels were blown into a mould, free-blowing being a later development" (Savage 1973:6).

In 1608 the first glass factory was established in North America at Jamestown. The factory's location was probably chosen because of the availability of nearby wood for fuel, and the proximity to a river for transportation. The furnaces were

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constructed of locally available rounded cobbles and clay (Harrington 1952:15). The complex consisted of four furnaces, a well, and an on-site clay pit (Ibid.). Here glass was produced in stone crucibles (melting pots), with much of the finished product exported to England. Also in the 1600s, a glass factory was reportedly operating near the southern tip of Manhattan although little is known of this operation (Pearce 1949:23).

England was one of the main producers of glass in the seventeenth century. In 1615 prohibition was enacted against the use of wood for glass making-furnaces, resulting in the use of coal for firing. In order to keep the coal smoke from spoiling the quality and purity of the glass, closed pots were used in the kilns. However, the closed pots created problems in melting the glass. In order to remedy this problem, in c.1675 George Ravenscroft added lead to the glass to act as a flux. The lead added a new lustre and brilliance to the glass which acquired the name "flint glass" (Matsumura 1983:13). This was a general term for colorless glass used to make tumblers, goblets and tablewares. Since blown flint glass contained a considerable quantity of lead, it was dubbed "lead crystal."

Shaping the molten glass was accomplished in several ways. These included stamping, moulding, blowing, and cutting. It wasn't until after 1740 that the English began engraving, cutting, gilding or enameling their glass. Lead glass was often copied in America, and its production became successful in the late eighteenth century when domestic producers realized that lead glass was the ideal material for cut decoration (Newman 1977:12).

In 1732, the metropolitan New York area had two glassworks. One of these stood on the Glass House Farm in the vicinity of West 34th Street. Although the structure stood through the 1860s, by 1763 it was reportedly used as a road house (McKearin 1941:98). However, other reports indicate that the factory was still operating as late as 1767, and during its operation imported workers from abroad (Gorman 1982:70,78).

Prior to the 1790s, the U.S. market principally relied on glass imported from Europe because of the lack of domestic glassworks. However, with the Napoleonic Wars and the spinoff War of 1812, domestic glass production was necessitated (Barret 1966:1). In 1800 few glass manufacturers existed in America, but by the 1830s there were at least ninety glass producers. Most of these were started prior to 1815 or in the 1820s after the post-war depression (McKearin 1949:54). By 1820 the national economy had risen out of the depression, stimulating industrial growth. At first, domestic glass producers faced the problem of poor transportation routes as the lack of roads hindered reaching inland markets. This changed with the introduction of the steam powered boat in 1807, the opening of the Erie and Champlain Canals in 1824-25, and an increase in the number of private and public turnpikes and bridges.

The majority of domestic glasshouses produced window and bottle glass, while fewer specialized in the production of flint or lead glass for tableware. Merchants previously involved with selling porcelain, glass, and earthenware, took a special

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interest in entering the glass production market. Finding skilled laborers was increasingly difficult in the U.S. at that time; England, hoping to maintain its stronghold on the market, refused to permit glassmen to leave the country.

Cut glass dominated the international market until 1825 when pressed glass was introduced by Bakewell and Company of Pittsburgh. Pressed glass contained little or no lead and was more easily produced than blown glass. As a result, workers required less training and the industry grew quickly. For the first time, producers were able to bring quality decorated glass, cheaply made, into the poorer classes of society. As demands increased during the 1820s, the coal firing and pressed glass process began to flourish in the United States (Douglas and Frank 1972:35). Pressed glass was made in cone shaped furnaces, heated by a central furnace below ground. Air was supplied to the fire by a below ground tunnel (Ibid.:106). The availability of fine sand deposits soon rendered Pennsylvania the center of pressed glass production. Between 1820 and 1830, only 33 pressed glass factories existed nationwide (McKearin 1941:595).

By the 1830s, 33 glass factories were in operation in the Midwest. In the Northeast, glasshouses were established in Massachusetts, New Hampshire, Vermont, Connecticut, New York, New Jersey and Pennsylvania. By the 1870s, over 40 glasshouses were established in New York State (McKearin 1941:171). Many of these new manufacturers produced tablewares for homes, steamboats, inns and hotels, as well as more utilitarian items such as gas globes, lamps and candlesticks (Ibid.:135). Some of the more well known of these enterprises include the New England Glass Works in Cambridge, Massachusetts, the Sandwich Glass Works in Sandwich, Massachusetts, and Bakewell and Company of Pittsburgh, Pennsylvania.

The New England Glass Works was established in 1818 and had a cutting department operated by steam power and a lead furnace on-site for making the flux for the flint glass. It was the second glasshouse to employ mechanical pressing, originally developed by Bakewell and Company of Pittsburgh, Pennsylvania (McKearin 1949:79-80). The company produced mould-pressed glass, lacy glass, mould blown glass, and innovative colored glass developed by Joseph Locke (Newman 1977:214). The company closed in 1888 after suffering from the competition of lime glass, introduced in 1864 by William Leighton at the Wheeling Glass Factory in West Virginia as a substitute for lead glass (Newman 1977:184). The Bakewell factory was the first to make cut-glasswares commercially in America, operating between 1808 and 1882 (McKearin 1941:138).

One of the founders of the New England Glass Company, Deming Jarves, established the Sandwich Glass Company in 1825, producing cut, engraved, and eventually pressed glass. The Sandwich complex consisted of eleven buildings, located in a spot easily accessible for ship dockage to import raw materials and export finished products. In 1839, the glassworks covered six acres of land and employed 225 workmen. Raw materials imported per year were "glass 600 tons; red lead 700,000 pounds; pearlash 450,000 pounds; saltpeter 70,000 pounds. They consumed 1,100

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cords of pine wood, 700 cords of oak wood, and 100,000 bushels of bituminous coal" (Wilson 1969:41).

Many of the glasshouses in the Northeast supplied local markets, but several shipped their wares to large cities, West, South, or abroad to the Bahamas and South America. In New York State, tablewares were produced largely for the local market, with many glass blowers following the South Jersey tradition in shape and design (McKearin 1941:171). The up-state New York factories excelled in creating lily-pod pieces in green and aquamarine, an adaptation of the South Jersey design.

The Bloomingdale Flint Glass Works was established in 1820 in the area of Manhattan known as Bloomingdale. It was known to produce cut flint glass and decorative wares. The Bloomingdale Flint Glass Works was founded by the Fisher brothers, together with John L. Gilliland, and was also known as Fishers' Factory. John Fisher was previously employed by the New England Glass Company, where he created a cut-glass urn intended for President Monroe (McKearin 1949:62). His brother Richard was "a skilled English glasscutter who had come to America in 1810. Because it was against the law for glassworkmen to leave England, Fisher was smuggled into America in a barrel. He first became a member of the firm of Emmet, Fisher and Flowers (1815-1817), which failed" (Daniel 1981:126).

Sources refer to the high quality of the Fishers' products (Daniel 1981:126). In 1829 the brothers received a "Discretionary Premium" award, and in 1835 the glassworks was the recipient of another award for the "second best specimen of cut glass," both received at the Annual Fair of the American Institute of the City of New York (McKearin 1949:81). The Fishers' hand-cut flint glass included decanters, pitchers, tumblers, goblets, and "wines of many beautiful patterns, the strawberry design being one of exceptional brilliance...with its fine diamond cutting...Chemical bottles, glass washbowls and chambers, and almost every other article of glassware..." (Hobbes 1933). The Fishers maintained a store in downtown New York at 101 Maiden Lane as "an outlet for their druggist and chemical wares and their fine cut glass" (McKearin 1949:81). The introduction of pressed glass in the 1820s probably infringed on their market. Despite the quality glass produced, the glassworks closed in 1840 following Richard's death.

In 1820 another glassworks was erected near Chatham Square in New York City, which closed by 1923. The brief life of this endeavor rendered the Fishers the main manufacturers of flint glass within the city proper at that time (McKearin 1941:595). In Brooklyn and New Jersey, however, other cut glass manufacturers operated contemporaneously. In nearby New Jersey, George Dummer had established the Jersey Glass Company, which operated between 1824 and 1862 making high quality cut glass (Spillman and Frelinghuysen 1990:708). In addition, one of the partners in the Fisher brothers' glass enterprise in Bloomingdale, John L. Gilliland, withdrew from the company in 1823 to establish the Brooklyn Glass Works in Brooklyn, New York.

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The Brooklyn Glass Works was in production for many years, its glass was "heavy, clear and cut in design similar to those used by the Fishers...except that Gilliland employed the heavy fan scallop long before it was in general use" (Daniel 1981:137). The Brooklyn facility was "hailed as a boon to the community" and "during its first seven years it supplied New York City with glass cups for its lights and then with gas lamps" (McKearin 1949:82). Winning many prizes for its quality cut glass, the facility also produced plain, moulded and pressed glass. The Brooklyn Glass Works maintained a storeroom in New York City at 270 Pearl Street and later at 68 Water Street (New York City Directory 1836-1837:277). After Gilliland withdrew from the Brooklyn company in 1864, the business moved to Corning, New York in 1868 where it was established as the well known Corning Glass Works.

The overall decline in the number of glasshouses in the latter half of the nineteenth century was caused by several factors. The depression of 1837 and exhausted timber holdings which had supplied fuel for furnaces contributed to the demise of many factories, while others relocated further west near accessible coal supplies (McKearin 1941:136). The discovery of natural gas in Pennsylvania in 1859, and later in midwestern states, prompted the move of glasshouses to these areas. In the 1840s, expanded railways helped to foster the industry, and by the 1860s many companies consolidated, specializing in specific techniques and wares.

Although numerous nineteenth century glasshouses produced "fine" wares, little is known about the majority of these manufacturers. "Regarding all but a few, exact information is... scarce...This refers not only to the organization, ownership and operation of the companies, but to detailed information regarding the exact wares manufactured, or authenticated examples of them" (McKearin 1941:137). Any information gathered pertaining to these factories could contribute greatly to the knowledge of glassmaking in nineteenth-century America.

ARCHEOLOGY

Based on the contextual overview of the glass industry, it was established that the Bloomington Flint Glass Works appears to be an important archeological resource. The number of comparable archeological sites in New York and New England is limited; therefore this type of site could have the potential to provide archeologists and historians with an opportunity to further understand glass making methods, techniques, and the labor force. The footprint of the factory itself would provide information on the manufacturing process by the lay-out of the furnaces and work areas, while glass fragments could be analyzed to determine chemical content. Associated features would include the furnace, any outbuildings, associated privies, wells, and cisterns, and a possible on-site dump.

Intensive documentary research has determined that the main structure of the Bloomington Flint Glass Works was located east of the project area. No sources reviewed indicated that outbuildings or additional furnaces were located within the project area. However, cisterns, wells, and privies are commonly associated with industrial sites, and the process of glass manufacturing also results in by-products

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and waste that are commonly thrown in an on-site dump. An industrial dump such as this can provide an important source of information potentially able to address specific research concerns.

Comparable glass sites in the Northeast have been successfully excavated to address specific research issues (Gay Taylor, Curator-Museum of American Glass, Wheaton Village, personal communication to Faline Schneiderman-Fox, November 2, 1990). At least five sites dating to the seventeenth and eighteenth centuries, and five sites dating to the nineteenth century have been researched. The oldest of these sites was at Jamestown, where archeological investigations were performed on the first glass factory in North America. Research unearthed an early seventeenth century complex which consisted of four furnaces, a well, and an on-site clay pit for making crucibles (Harrington 1952:15).

At the New England Glassworks site in Temple, New Hampshire, archeologists working for three seasons uncovered a late eighteenth-century glasshouse, three additional house foundations, a dump, and an outside oven or kiln. At the time it was excavated, "only one other glass factory of comparable age had been competently excavated and published in this country (Noel Hume 1964, 1976) and little is known as to the variability from one factory to the next" (Starbuck 1977:75). Most of the archeological attention was given to the main glasshouse, with "a single test unit excavated within an outlying factory midden where large samples of badly shattered crucibles and glass bottle fragments were recovered, which probably had been deliberately smashed to permit recycling into new batches of crucible clay and glass" (Ibid.1977:78). Further work on the dump produced even larger quantities of glass bottle fragments, crucible fragments, cullet (scraps of waste glass that can be remelted), hollow ware, flatware and moil (crack-off edging), indicating that this type of resource can contribute to the knowledge of glassmaking techniques (Starbuck 1986:34). The factory's dump was approximately fifteen meters southeast of the glasshouse near the workers' quarters. Subsurface testing showed that the frequency of glassware recovered dropped off precipitously away from the glass house building (Ibid.).

At the New Bremen Glass Works in Maryland, archeological excavations were performed in 1962. The factory, also known as the Amelung Glass Works, was founded by John Frederick Amelung in 1788 at which time it maintained a wood burning oven. The factory was destroyed by fire in the late 1700s. While in operation, Amelung imported many glassworkers from Germany (Stohlman 1964:10). Excavations at the site unearthed a waste heap, fritting ovens, and a few tools. Fragments of glass were tested and found to lack lead. Exceptions to this are thought to represent old glass brought in for remelting (Noel Hume 1964:312). Another late eighteenth century glass factory was excavated in Guilderland, New York, not far from Albany. The Albany Glassworks site was first excavated in 1964, unearthing the main melting furnace (Huey 1980:37). In New Jersey, Budd Wilson successfully excavated the Batsto Window Light Factory in the early 1970s.

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Archeological research on nineteenth century glass companies has been performed at only a handful of sites, one of which was the Boston and Sandwich Glass Company in Sandwich, Massachusetts, researched by amateur archeologists. At the Sandwich factory, "Fragments of the various Heart patterns were found buried four feet beneath the surface, when the excavating was done beneath the foundation of the building which was erected in 1849" (Lee 1939:234). Fragments of glassware predating 1849 were found, indicating that earlier deposits were undisturbed since the area was sealed off by the 1849 building. Collectors were active at the site for years extracting "literally tons of fragments" (Ibid.:538). This was easily accomplished since there was no common dumping ground at the site. Instead, glass was thrown where convenient, and many pieces were found on the bank of an adjacent creek (Ibid.:539). Researchers found that the pattern of discarded glass fragments shed light on the growth of the industry, with early patterns found beneath the 1849 structure, while later more refined versions of these patterns were found elsewhere. Interestingly, pieces from other producers were recovered which may have arrived with cullet and been discarded because of their undesirable color.

In 1806 the Whitall-Tatum glass factory, also known as the Phoenix Glass Works, was established by James Lee in Millville, New Jersey, producing window glass, tableware, and bottles. The factory subsequently produced hollowware, and by 1836 produced glass vials and bottles as well, catering mainly to druggists and physicians. The factory closed in the 1930s when more efficient mechanical techniques began to dominate the industry. While in operation, the company's complex consisted of a variety of primary structures as well as machine shops, box factories, workers housing and a slaughterhouse (Mounier 1990:20). Proposed development of the site necessitated archeological research which entailed excavating six exploratory trenches. One of these trenches revealed multiple fill deposits consisting of sand, ash, rubble, and coal to a depth of 12.5' (Ibid.:24). The preliminary documentary and archeological research determined that the site is potentially eligible for National Register nomination, and further subsurface research has the potential to address numerous research concerns.

The Glastenbury Glass Factory site in Glastenbury, Connecticut, was established in 1816 by a group of local entrepreneurs with little experience in the glass industry. Documentary research was unable to establish the origin of materials or workmen, although blowers were known to use the same techniques as two nearby factories in the Hartford area. The site was excavated in 1962, for the mitigation of potential impacts, and recovered numerous shards from melting pots used in glass production as well as many glass fragments (Wilson 1963:118). An excavated trash pit was found to have been used for general refuse, with cultural material extending to 75 inches below the surface (Ibid.:128). Sherds and slag had been scattered about the yard by the leveling of refuse from the factory after it had gone out of business. Excavations also discovered a nearby stream bed, "the marshy nature of which was a natural invitation to dumping during the period of factory operation" (Ibid.:131). This area proved to be rich in pot sherds, slag rubble glass, and glass-glazed stones and bricks. Although excavations never located the factory foundation or furnace,

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the glass fragments recovered were bountiful enough to address research questions regarding technology, dates, and types of wares produced.

In upstate New York, the Ellenville Glass Works, operating between 1837 and 1894, was excavated in the early 1980s by Dumont Archaeological Surveys, also because of proposed development. The factory, known for its demijohns, represents an example of mechanical adaptation to diminished fuel resources. In 1859 the company switched from wood to coal fuel which required an increased draft in the furnaces. This was accomplished by a turbine supplied with water carried underground from a nearby creek (Dumont 1980a:22). Archeological excavations uncovered subsurface air ducts for the furnaces, foundation walls, numerous glass flasks, and fragments of bottles, canes, and other "whimseys" (Dumont 1980b:109). The site represents one of the few controlled excavations of a mid-to-late nineteenth-century glasshouse.

In Jersey City, New Jersey, a comparable urban center, archeological excavations were successfully completed at a small portion of the nineteenth century Dummer Glass Works, competitors of the Fishers. Research conducted by Ed Rutsch determined that although two later industrial complexes had been built over the glassworks, one corner of the structure's foundation remained undisturbed. This small undisturbed area was excavated to reveal the foundation of a possible annealing furnace, and a three foot by thirty foot bay (Ed Rutsch, personal communication to Cece Kirkorian, November 7, 1990). Molten glass was recovered and is being compared to known Dummer pieces. Research concluded that the Dummer factory apparently introduced European products and processes, taking advantage of the lack of European goods available in the states following the War of 1812.

Archeological remains from a site such as the Bloomingdale Flint Glass Works could add to a comparative data base for the analysis of the glass formula to original European formulas and other innovative nineteenth-century American glassworks companies. For instance, how did the Bloomingdale Flint Glass Works' production techniques compare to other American companies, especially the Brooklyn Glass Works, a competitive company which was established by one of the original founders of the Bloomingdale factory? Data could also contribute to our understanding of specific glass making techniques and vernacular adaptations. Since few remaining pieces from the factory are known to exist, archeological methodology could address these otherwise unanswerable issues.

Archeological remains could also provide data on the local craftsmen and workers. The glass industry at this time relied heavily on immigrant craftsmen and their expertise. Is it possible that the glassworks was producing table wares that were particularly suited to their immigrant staff. Can this be discerned via the archeological record? Or, was the ware produced solely responsive to the local or foreign market demand? It has been suggested that "archaeological evidence of specialized procurement, manufacturing, and maintenance activities at the remains of eighteenth-century glass factories should be evident as spatially compartmentalized

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equipment and materials" (Gorman 1982:79). Nineteenth-century glass factory sites have this potential as well.

The process of cut flint glass production involves melting silicates with lead, forming a blank, and then cutting the blank to produce the desired design. Crucibles were used during the melting process. At the 1608 Jamestown Glass Works site, locally available clays were used to make crucibles. By the 1820s, these clay parts were often made on-site from imported clays (Pearce 1949:45). Where did the Fishers obtain their crucibles? Were they produced on-site or imported? Also, from where did they obtain the silicates and lead supplies? Did they use poorer quality materials than the Brooklyn Glass Works, resulting in a poorer quality product? Most glass industries in the 1820s were established near heavily wooded areas used to fire furnaces (Pearce 1949:42). Why did the Fishers choose a site so far from wood sources? These and other issues could be addressed by archeological resources at the Bloomingtondale Flint Glass Works.

In order to determine the potential archeological visibility of the glassworks, it was important that the exact location of the Bloomingtondale Flint Glass Works be established. Stage I research had uncovered several discrepancies regarding the factory's location. A lithograph of a painting housed at the New York City Historical Society indicated that the glassworks was located at "The foot of West 47th Street." Substantiating this, G. and H. McKearin's book American Glass states that the factory was "erected...at what is now 47th Street and between 47th and 48th Streets..." (1941:595). However, according to the only known map depicting the glassworks, the 1836 Colton Topographical Map of the City and County of New York, the main structure was located on the block between West 46th and West 47th Streets, slightly east of the project area (Figure 1). Further research was required to clarify this issue.

Based on the additional research, the glassworks factory was found to be east of the project corridor. According to deeds from 1819 and 1825 (Liber 179:218 and Liber 193:258), and tax records spanning 1821 through 1840 (New York City Municipal Archives), the main structure housing the factory works and the cone furnace adjacent to it were built mid-block, close to but not fronting the south side of West 47th Street. This agrees with the location printed on the 1836 Colton map showing the building slightly east of the project area. A lane/roadway led from the glassworks through the block, east to Eleventh Avenue and beyond. Tenements for the glass factory workers were located fronting Eleventh Avenue, also near West 47th Street.

The land occupied by the glassworks was leased from John R. Norton by John and Richard Fisher and John Loftus Gilliland. The Fisher brothers owned land north of West 47th Street but never converted the Norton lease into their own property, and it was later divided among Norton heirs (Liber 285:361). In 1822 John Gilliland sold his interest in the glassworks to the Fisher brothers and in 1823 he established the Brooklyn Glass Works in Brooklyn, New York which is considered to be the ancestor of today's well known Corning Glass Works (Brown and Ment 1980:10-11). The Bloomingtondale factory was closed in 1840, and subsequent years brought

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further development that covered, and may have disturbed, part of its original location.

At the Bloomingdale Flint Glass Works site, the main structure appeared to face east, with the Hudson River to the west behind it. All maps dating to this period show a cove with a pier in the block between West 46th and West 47th Streets, behind the glassworks site. The lithograph of the factory shows a ship docked at this pier, but unfortunately gives no clues as to the location of the factory's dump. The main furnace is shown to be in the back of the building, on the side facing the Hudson River (Figure 2). The English flint furnaces were generally eight feet in diameter at the base and six feet at the top (Pearce 1949:45). It is quite possible that the waste products from the production process were dumped behind the building adjacent to the river, within the project area. As at the New England Glass Works site in Temple, New Hampshire, the Amelung Glass Works site in New Bremen, The Glastenbury Glass Factory in Connecticut, and the Jamestown Glass site in Virginia, industrial dump sites contain potentially significant deposits. These sites also show that patterns of deposition varied and that significant deposits can be found surrounding the factory site.

NATIONAL REGISTER CRITERIA

In the 19th century The Bloomingdale Flint Glass Works' wares were recognized regionally, but it is uncertain to what extent they were nationally recognized. However, contemporary glass researchers acknowledge the importance of their work. According to McKearin's book *American Glass*, the Fisher brothers' factory was one of the more important producers of "fine" wares in the early nineteenth century (1941:137). The expansion of the glass industry in nineteenth century North America was prompted by international disputes and the decline of imported products. The founders of the Bloomingdale Flint Glass Works represent a faction of European society, determined to continue their trades in the United States despite international tensions.

The site is important in New York City's development as a center of domestic production as opposed to its earlier role as an importer of foreign wares. In addition, the glassworks represents one of the first industries established on the middle-west side of Manhattan, which later became heavily industrialized. The company may have initiated this trend, paving the way for future manufacturers. The only other contemporary glass manufacturer in Manhattan opened and closed within a short period of time in the area of Chatham square. No archeological research has been pursued at this or any other glass manufacturing site in the metropolitan area. Nor has much archeological research on contemporaneous sites been pursued in nearby counties. Out of ten known glasswork sites in the Northeast subjected to archeological research, five date to the seventeenth and eighteenth centuries, while the remaining five date to the nineteenth century. Of these latter five, one was excavated by amateurs, and one was excavated in 1962. The early date of these projects predated what are now considered to be standard research techniques and methods of analysis. Another site has only had limited testing with

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further work recommended. The Bloomingtondale Flint Glass Works site is the only such one currently known in New York City with the potential to address currently relevant archeological issues.

Current research at the Corning Museum of Glass by Jane Spillman is focusing on identifying the origin of one of the museum's decanters, possibly produced by the Fishers. Although the Fishers' descendants are being sought, the lack of known comparable pieces is presently hindering the identification process. Since the Fishers produced bottle glass which was probably embossed with makers marks, fragments of these diagnostic bottles could aid in this process, further contributing to our knowledge of the Fisher brothers and their glass manufacturing techniques.

Although the site of the factory itself is somewhat east of the eastern boundary of the Route 9A reconstruction project corridor, there is the strong possibility that an industrial dump or midden scatter associated with the glassworks may exist within the project area. In addition, wells, cisterns, and privies may be associated with the glassworks since these were all necessary facilities used by the workers. While associated glass fragments may be recovered, it is often difficult to discern which glass fragments at a site represent discard from production, and which represent cullet imported for remelting (Arlene Palmer-Schwind, Exhibit Consultant, personal communication to Faline Schneiderman-Fox, November 2, 1990). However, this does not negate the potential significance of such remains. Performing tests to determine the chemical composition of glass fragments from glass factory sites will broaden the data base from which to make comparisons and will further help to establish origins. Block 1094 between West 46th and West 47th Streets, which would have been the "back yard" of the glassworks, will be impacted by resurfacing as currently designed (10/90).

The cartographic reconstruction of Block 1094 shows that part or all of Lots 6 through 10, and 55 through 63 were on fast land and are now within the project area. These lots constitute the back yard of the glassworks. Of these, Lots 7 through 10 had brick buildings spanning them between c.1879 and c.1913, and Lots 55 through 60 had wooden buildings on their northern ends by c.1902 which remained until c.1913. These were the only known structures on this parcel. There is no evidence to suggest that any of these structures had basements. With slab foundations, it is possible that potential archeological remains from the glassworks yard would have been sealed off from later disturbance.

Potential retrievability of remains largely depends on prior impacts to the site. The degree of alteration to the original, pre-developed, topography of the project area was difficult to ascertain. The exact elevation of what is now Twelfth Avenue, previously Lots 6 through 10, and 55 through 63, was not recorded. Therefore topographic changes through time were extrapolated from a series of historical maps and photographs. In 1883 and 1920, the elevation at the corner of West 46th Street and Eleventh Avenue was 15', while the elevation at the intersection of West 46th Street and Twelfth Avenue was 9'10" (Robinson 1883; Bromley 1920). This

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indicates there was a westward slope from the east end of the block to the west end, confirming cartographic sources (Viele 1879).

Currently the elevation at Twelfth Avenue between West 46th and West 47th Streets is between 8' and 9'6", one to two feet less than the 1883 elevation at Twelfth Avenue. However, the current Twelfth Avenue is approximately 200 feet east of the 1883 route, since the avenue was moved east and the block shortened in the 1930s. The pre-1930s elevation of the potentially sensitive lots was probably somewhere between 9' and 15', the 1883 elevations recorded at either end of the block. The current elevations of these lots, between 8' and 9', are probably several feet less than they were before the West Side Highway was built over them, representing a minimum depth of land removed during the reconstruction of Twelfth Avenue.

Soil borings do little to clarify the issue of land removal. A soil boring performed at the intersection of West 47th Street and Twelfth Avenue revealed what appeared to be natural deposits below the blacktop to a depth of 8'4", where bedrock was encountered (DNX-38, February 13, 1990). Another boring further west in the middle of Twelfth Avenue also produced sand and gravel to a depth of 28' (DNX-36, February 14, 1990). A third boring in Twelfth Avenue encountered sand, gravel, clay, brick, and wood to a depth of 10', after which clay and silt were found to a depth of 15'. Whether these three borings represent natural deposits is unclear.

Earlier borings, taken between West 46th and West 47th Streets within the project area, show fill extending between 2' and 10' below the surface, containing "sand, silt, brick, concrete, cinders, etc." (Rock Data Map, Vol.2, Sheet 20, 1935). No specific reference to glass was made which may have either been an oversight or deliberate since glass may have been considered insignificant by the reporters and thus categorized as "etc." Two of the borings taken closest to the lots in question have fill to a depth of 2 to 3', one has ash to 9', and one has no fill. The presence of several feet of fill suggests that the nineteenth century structures on these lots were razed and remnants left on-site. This also suggests that if the current elevation of the lots is not far from their original elevations, and fill extends several feet, then some of the original strata may have been removed and the site subsequently filled to its current elevation.

A 1935 photograph of the block between West 47th and West 48th Streets shows that pedestrians along Twelfth Avenue are standing approximately five feet below the grade of the block (#1473-E4, New York Public Library Photograph File). Whether the height of the block is due to rubble from razed structures built up over the original topography, or the original topography itself, is unclear. It is also unclear whether the block between West 46th and West 47th Street has experienced the same phenomenon.

Even if the original topography is relatively intact, the extent of known prior disturbances may have affected the potential retrievability of archeological remains associated with the glassworks on several of the lots. When Twelfth Avenue and

Bloomingtondale Flint Glass Works

the Miller Elevated Highway were built over these lots in the 1930s, public and private utility lines were installed and piles for the highway were driven to a depth of no less than 24 feet. A typical sewer line 12 inches in diameter, required a trench excavated 3 feet wide and 1.6 feet below the top of the pipe (City of New York 1926:45). According to a 1968 map of utilities along the Hudson River, a number of utility lines are located in Twelfth Avenue including a 12" diameter sewer pipe, several electrical ducts, a 4' by 2'8" brick sewer, a 12" water line, a 12" gas line, a 6" C.I. drain, and an 8'6" intercepting sewer line (City of New York 1968:Sheet 16). The installation of each of these represents at least a three foot wide by two foot deep trench. In addition, fire hydrant installation entailed excavating a trench 4' wide by 4' long and 15" deep. Sidewalks were graded to a depth of 10" below the surface.

Utility line installations do not negate the sensitivity of all of the lots since the depth of utility lines is often rather shallow and the actual area that appears to be sensitive for yard scatter and associated features is relatively large. While a trench excavated for a utility line may be three feet wide, that would leave the remainder of a 50 foot wide lot virtually undisturbed. Therefore, while there has been a tremendous amount of subsurface disturbance in the current route of Twelfth Avenue where the sensitive lots now lie, enough of the area may have remained undisturbed to suggest that the lots remain sensitive for potentially significant deposits.

C. CONCLUSIONS

The Bloomingtondale Flint Glass Works site is considered potentially significant based on National Register criteria, since it is an important site not only in the overall development of New York City's middle west side, but because its presence affected other regional glassworks and thus the development of those areas. The wares produced at the factory were considered among the finer produced at that period, and glass historians have cited the Fishers' importance. The Fishers' two awards, as well as John Fisher's earlier piece made for the U.S. President, indicate the Fishers' high quality of craftsmanship. The Fishers were competitive with their original partner, John Gilliland, not only for the local New York market, but for artistic value as well. While Gilliland's factory eventually spawned the current Corning Glass Center, Fishers' factory was forced to close in the 1840s.

The potential information that can be retrieved archeologically from a glassworks site is considered to be significant. The factory site is located out of the project area, but the possible yard debris, outbuildings, dumps, cisterns, wells, and privies, all have the potential to yield important archeological data. As seen at other archeological sites in the Northeast, the factory itself is not necessarily the best source of debris. Adjacent yards, streams, and slopes were commonly used for discard and thus can provide significant deposits.

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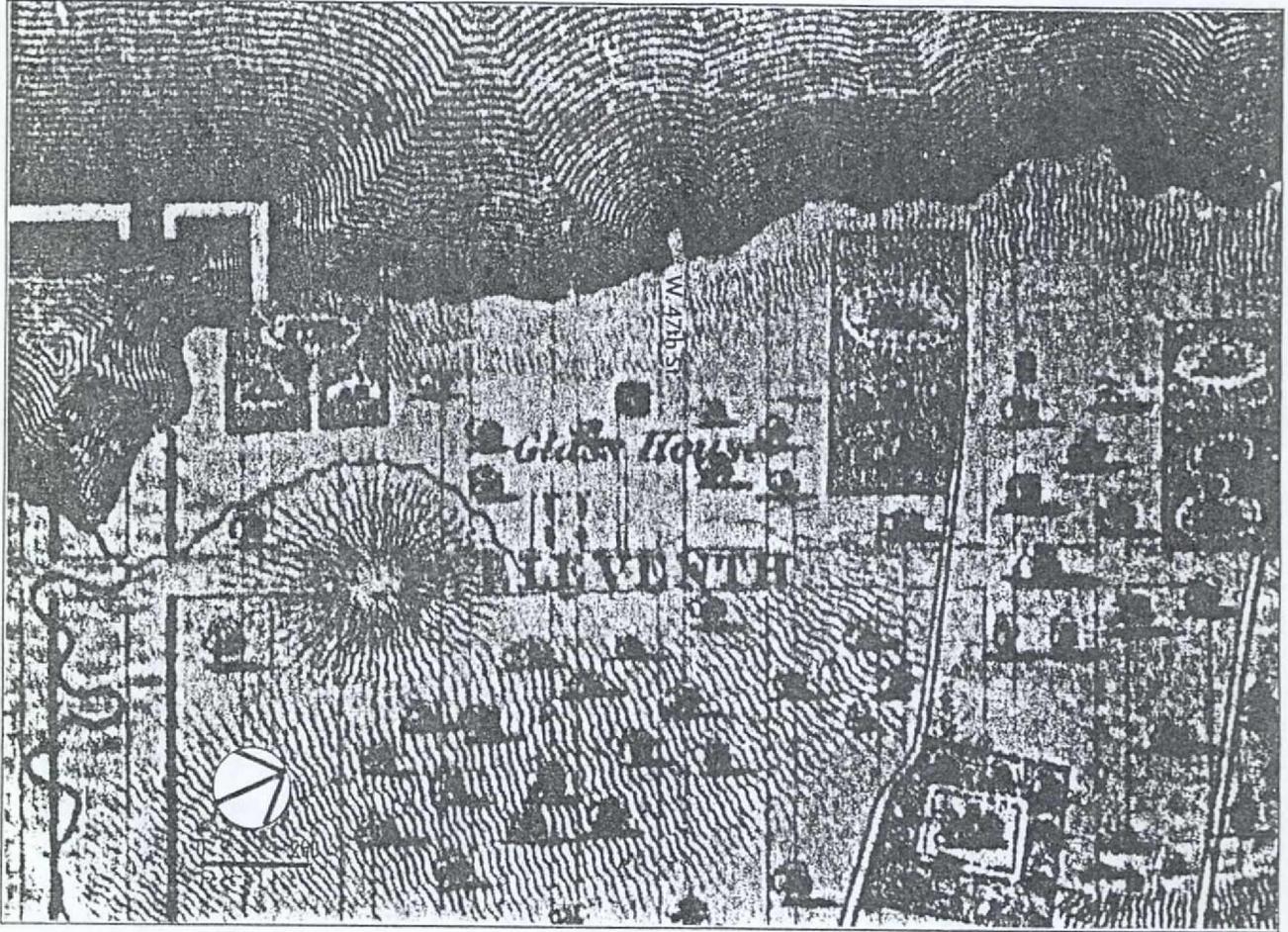
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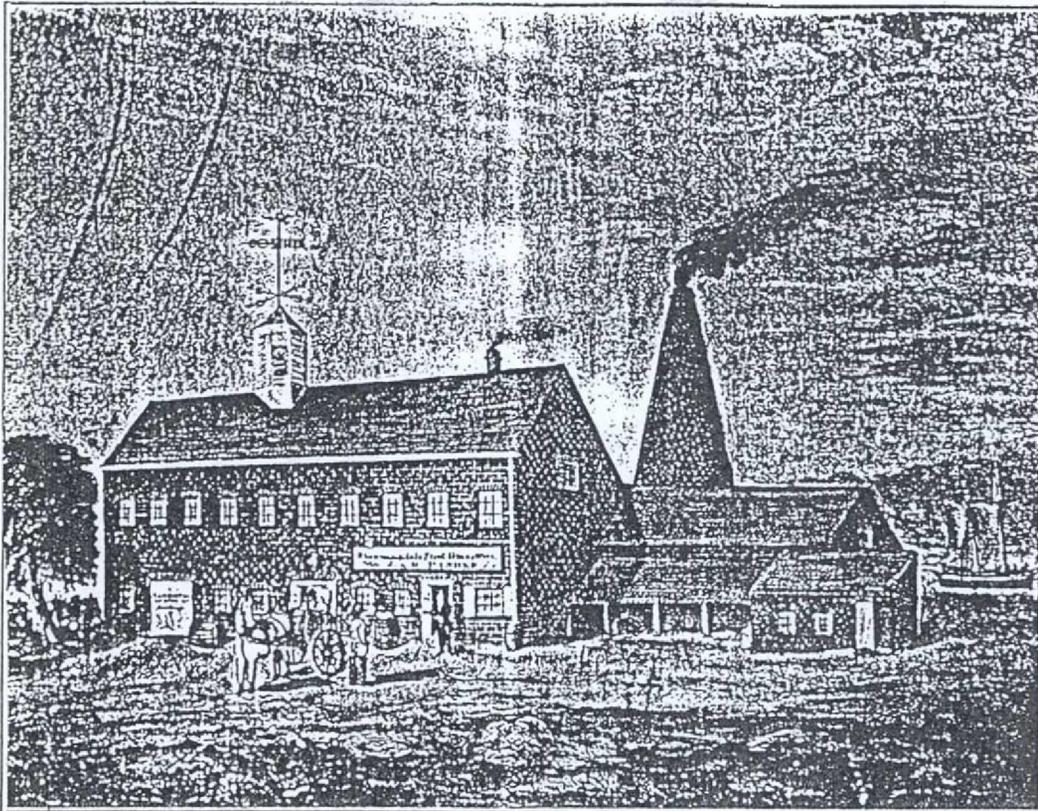
FIGURES



ROUTE 9A RECONSTRUCTION PROJECT

Detail from 1836 Colton Topographical Map of the
City and County of New York

Figure 1



BLOOMINGDALE FLINT GLASS WORKS, FOOT OF WEST 47TH STREET

J. & R. FISHER, PROPRIETORS

(From an original painting by B. Whittle)

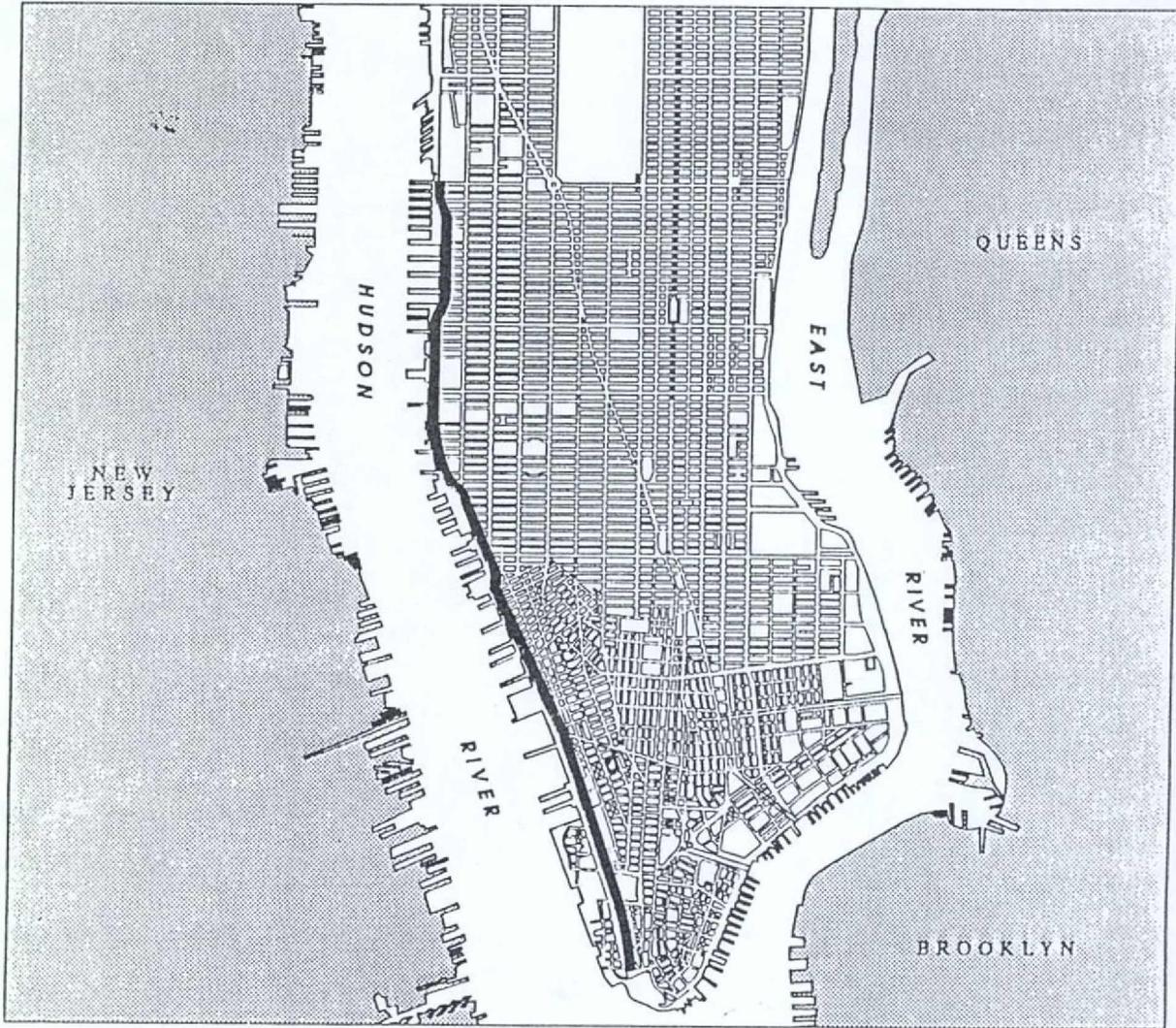
ROUTE 9A RECONSTRUCTION PROJECT

Lithograph of Painting of the Bloomingdale Flint
Glass Factory
Courtesy of the Museum of the City of New York

Figure 2

R O U T E 9 A

RECONSTRUCTION PROJECT



DRAFT CONTEXTUAL STUDY

LUMBER AND BUILDING MATERIALS

January 1991