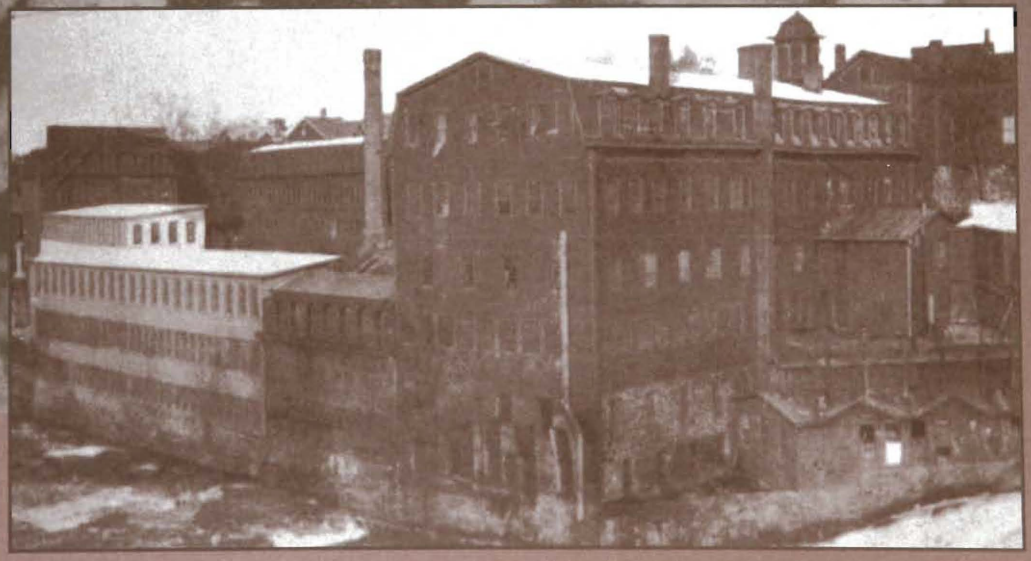
CULTURAL RESOURCES SITE EXAMINATION OF NEW YORK STATE MUSEUM SITE 10935

NEW YORK KNIFE COMPANY

Prepared by Joseph Sopko, M.A.



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CULTURAL RESOURCES SURVEY PROGRAM SERIES NO. 1

Cultural Resources Site Examination of New York State Museum Site 10935 New York Knife Company

Cultural Resources Survey Program Series No. 1

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CULTURAL RESOURCES SITE EXAMINATION REPORT

of

NYSM Site 10935
New York Knife Company Factory Site

New York State Museum
CRSP Series No. 1

PIN 8021.40.101
Bin 1026680
NY 52 over the Wallkill River
Village of Walden (MCD 07144)
Town of Montgomery (MCD 07112)
Orange County, New York

1999 to 2000 Program Year

OPRHP PR# 98PR3690

Prepared by

Joseph Sopko, M.A.
Principal Investigator

New York State Museum

for

The New York State Department of Transportation
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The New York State Department of Transportation (NYSDOT) and the Federal Highway Administration (FHWA) have supported cultural resource surveying since the 1970's as part of its development of transportation projects. As part of the Cultural Resource Evaluation Program, NYSDOT has the State Education Department conduct more than one hundred cultural resource surveys annually. Through these surveys the NYSDOT and FHWA provide a significant contribution to New York State's knowledge about historic buildings, bridges and other structures, districts, and archaeological sites.

Karen McCann
Environment Analysis Bureau
New York State Department of Transportation

PREFACE

The New York State Museum's Cultural Resource Survey Program (CRSP) has provided cultural resource management services to other New York State agencies for almost 30 years. During this time, the program has completed thousands of projects at all phases of work (reconnaissance survey, site examinations, archaeological mitigation, HABS/HEAR documentation, historical contexts, etc.) This work has been done across the state by the Museum and also by other institutions under contract to the State Education Department, the Museum's parent agency.

CRSP is a statewide research program of the Museum. While the primary focus is assisting agencies to meet their cultural resource management (CRM) responsibilities, the program also contributes to the Museum's research and collections program by substantially adding to our understanding of human history in New York State. The collections generated by the program are among the fastest growing in the Museum. As part of the Museum's permanent collections, they are available to the archaeological research community for additional study and are curated by the Museum for future generations of researchers.

As the largest program of its kind, CRSP has had important influences on the development of CRM in New York State. For many years the principal CRSP contractor has been the Binghamton University (SUNY) Research Foundation. Along with its subcontractors, University at Buffalo's Archaeological Survey and Stony Brook University's Institute for Long Island Archaeology, Binghamton's Public Archaeology Facility has served as training grounds for students pursuing careers in CRM. Many of the students trained in theses programs are employed in CRM programs throughout the eastern United States. Collections generated by the university programs during CRSP projects have been used in numerous masters theses and doctoral dissertations at those institutions.

A major goal of CRSP is the dissemination of the knowledge it generates. This goal is met to some extent by an active program of exhibits, public and professional lectures, web sites, and professional publications. An example of the latter is New York State Museum Bulletin 495: *Nineteenth- and Early Twentieth-Century Domestic Site Archaeology in New York State*. The chapters of this edited volume are based on CRM investigations, many of which were done under CRSP. The volume also demonstrates the importance of CRSP in the development of archaeological research on this period of time in New York.

A written report is generated for every project completed by CRSP, but these reports have a very limited distribution. One copy of each report is kept by the Museum, and in the case of contracted projects, by the institution that did the work. Other copies are submitted to the New York State Historic Preservation Office (SHPO) and the client agency. Copies at the Museum, the various SUNY programs, and SHPO are available to professional archaeologists and students for research. This level of distribution is adequate for most reports. However, there has been a long-standing interest in making the reports from selected projects more widely available. Through the generosity of the New York State Department of Transportation and the Federal Highway Administration, this is the first report to be published by the Museum for that purpose. And, this is an excellent report to begin with. Written by Museum archaeologist Joseph Sopko, the report highlights one of CRSP's research strengths, historical archaeology.

Through a combination of extensive archival research, field mapping, and excavations, Sopko has brought to life the history of an important 19th –and early 20th –century industry in the Hudson River valley. As a result of his archival research, Sopko is able to relate the working conditions at the New York Knife Company factory, relationships between workers and management, and the sometimes-contentious relations between the workers themselves. The level of detail assembled about working conditions at the factory is truly impressive. As I sit here tapping the keyboard of a computer in a padded chair inside a thoroughly chilled late 20th –century office building on a very hot August 2001 morning, I marvel at the fortitude of

the men, women, and children who worked 60-hour weeks year round in what must have been unbearable and in many cases illegal conditions by current standards.

Mapping and excavations combined with archival research have allowed Sopko to reconstruct the history of the factory's physical plant and to document the knife-manufacturing process and how that process changed during the history of the factory. The archaeological research enhances information available from written records and provides glimpses of the activities of workers that would not otherwise be available. The collections of artifacts from the excavations along with field and laboratory notes now constitute part of the Museum's archaeological collections. This collection, perhaps the only archaeological collection of its kind held by a public New York institution, ensures that additional research on the manufacturing process will be possible.

This is the first of what I hope will be a continuing series of published monographs on important and broadly interesting projects done by CRSP under the sponsorship of the New York Department of Transportation and Federal Highway Administration. By highlighting little known and understood aspects of the history of human life in New York, the wide distribution of these monographs will ensure that the work done by the CRSP and its sponsoring agencies will benefit larger numbers of the People of the State of New York

John P. Hart
Director of Research & Collections
New York State Museum

ACKNOWLEDGMENTS

I would like to thank the New York State Department of Transportation and the Federal Highway Administration for the funding of the project and Karen McCann and Michael George of the New York State Department of Transportation and John Hart of the New York State Museum for funding and their support for production of this monograph. I appreciated the support and comments on this report made by John Hart and Charles Fisher of the New York State Museum. I would also like to thank several other individuals who contributed to the success of this project; Daria Merwin of the State University at Stony Brook for providing information on the original survey and historical references to the New York Knife Company, Dawn Mellis for cataloging the collection, making the editorial changes, and scanning all of the images, Sylvie Browne and Lihua Whelan for drafting the figures and maps, Victoria Schmitt, Joel Ross, Jennifer Bollen, Michael Twist, Lawrence Xinakes, Michael Jennings, and Rachael Rollo who were members of the field crew. I wish to thank Patricia Mulligan for the layout and John B. Skiba for coordinating the publication of this volume. Finally I want to thank J. Bruce Voyles for his research on the New York Knife Company.

MANAGEMENT SUMMARY

DOT PIN & BIN. PIN 8021.40.101 BIN 1026680 OPRHP PR# 98 PR3690

DOT Project Goal. Replace existing bridge on NY 52 over the Wallkill River, and construction of equipment access road in the southeast quadrant via federal funding.

Cultural Resource Survey Type. Site examination.

Site Identification. NYSM Site 10935, the New York Knife Company factory site.

Location. NY 52 over the Wallkill River in the village of Walden (07144), in the town of Montgomery (07112), Orange County (071), New York.

Project Limits. Length of proposed L-shaped access road approximately 90 m (295 ft), width, 18 m (15 ft); Area, 0.16 hectares (0.40 acres).

USGS Quadrangle. 1957 7.5 minute *Walden, New York.*

Context Statement. The New York Knife Company factory operated for a 75-year period from 1856 to 1931 in the village of Walden. The factory underwent five major expansions that served to modernize and reorganize the production sequence for the manufacturing of jackknives and table cutlery. The expansion of the New York Knife Company's factory was accompanied by an increase in the number of workers, the amount of raw materials used, and the amount of jackknives and table cutlery produced. The New York Knife Company continued to operate until 1931, when it was finally forced to shut down its operation due to the 1929 stock market crash and the Great Depression. The change in size, spatial organization of the factory, and methods of production document the rise of the industrial-era working class through the shift from hand to mass production.

Description of Site and Testing Results. Fourteen units and one shovel test pit (STP) were excavated in the project area to define the New York Knife Company factory site boundaries and determine the stratigraphic sequence, the spatial organization, and activity areas on the site. The archaeological testing at the New York Knife Company factory site revealed temporally distinct stratigraphic deposits associated with the expansion of the factory and production of jackknives and table cutlery. The four periods represented in the archaeological record date from 1856 to 1880, 1880 to 1887, 1900 to 1905, and 1905 to 1931. Artifacts associated with the knife manufacturing process, knife parts, architectural artifacts, and domestic artifacts were recovered from all of the periods. The majority of the artifacts were recovered from the 1905 to 1931 period, with lower amounts from the 1900 to 1905 and 1856 to 1880 periods. The fewest artifacts were recovered from the 1880 to 1887 deposits. A total of 1,424 artifacts were recovered from the New York Knife Company factory site. Seventy-two percent of the site assemblage, or 1,028 artifacts, are associated with the jackknife and table cutlery manufacturing process. These artifacts represent five categories: raw materials, production scrap, knife parts, assembled parts, and tools and machinery, which reflect the entire process of knife manufacturing. The rest of the assemblage is composed of 21% architectural, 6% domestic, and 1% miscellaneous artifacts.

Significance Statement.

Integrity. The Office of Parks Recreation and Historic Preservation Fields Services Bureau determined the New York Knife Company factory complex eligible for the National Register of Historic Places under Criterion D, as a site that has yielded important information in history. The New York Knife Company factory site exhibits integrity of location, design, material, and associations. Located in the village of Walden, in the town of Montgomery, Orange County, New York, the New York Knife Company factory site represents the shift from the hand production of knives by individual craftsmen to the mass production of knives. The economic and social change associated with this shift has been documented in the construction and arrangement of the factory, the changes in the spatial organization of the factory, and the changes in the knife production process at the site.

Significance of Site/Research Topics. The historical documentation and archaeological testing identified 4 periods of production that correlate with changes in the New York Knife Company factory size, spatial organization, and methods of production. The first period of production, from 1856 to 1880, represents the initial establishment of the factory in the village of Walden in a single building and the hand production of knives by craftsmen. During this period, the workers literally owned the means of production, since the owners of the factory were also required to be workers. The second period, from 1880 to 1887, is characterized by the expansion of the knife factory from 1 to 10 buildings, an increase in the number of employees from 54 to 230, and the reorganization of the knife manufacturing process. During the first expansion, separate buildings were constructed for the storage of raw materials and finished products; forging, tempering, and hardening of the blades and end springs; grinding; and handle production and finishing. The first expansion represents the start of work segmentation replacing craftsmen with machinery and laborers. The period, from 1900 to 1905, is characterized by the expansion of the factory from 10 to 26 buildings, an increase in the labor force from 230 to 400 workers, and the further reorganization and modernization of the knife manufacturing process. Further segmentation of the work process occurred as each step of the knife manufacturing process was carried out either in separate buildings or on different floors within the same building. This is related to the mass production of jackknives and table cutlery and the continuing replacement of craftsmen by machines and laborers. Finally, the fourth period of production, from 1905 to 1931, is characterized by the total segmentation of the knife manufacturing process, the mass production of knives, and the economic decline of the New York Knife Company. Increased competition with a number of knife factories that continued to modernize their machinery and manufacturing process after World War I and the Great Depression resulted in the closing of the New York Knife Company.

The transformation from hand production to mass production of goods was accompanied by changes in the size and spatial organization of the factories, the change in the size and specialization of the workforce, and the development and rise of the working class. The details of this transformation, the documentation of the industrial adaptations to the changing production techniques and market demands, and the specific spatial changes within the factory that resulted have been the subjects of investigation at the New York Knife Company factory site.

Potential Impacts. A portion of the New York Knife Company factory site is within the current project area. The proposed work scope will only impact the site if the grading in the upper portion of the project area extends below 1.5 m (5 ft). The filling in of the lower portion of the project area will not negatively impact the archaeological resources but aid in their preservation.

Recommendations. If the grading of the project area in the location of the upper factory complex extends below 1.5 m (5 ft), this area should be monitored during construction to locate and document any features or deposits associated with the New York Knife Company factory. The filling in of the lower portion of the project area should protect the subsurface deposits; however, care should be taken in the location of the extant eastern wall of Feature 4 and the inscribed concrete slab, the brick-and-stone–covered arch, and the east and west walls of Feature 5 so they are not damaged during the deposition of fill for the construction of the access road.

Author/Institution. Joseph Sopko, New York State Museum Cultural Resource Survey.

Date of Report. December 7, 2000.

Sponsor. New York State Department of Transportation and the Federal Highway Administration.

INTRODUCTION

The reconnaissance survey for PIN 8021.40.101, NY 52 over the Wallkill River, village of Walden, Town of Montgomery, Orange County, New York, was conducted in July of 1999 (Figure 1). The project consists of the replacement of the BIN 1026680 over the Wallkill River. As a part of the project, an equipment access road will be constructed in the southeast quadrant 45 m (148 ft) south of the intersection of NY 52 and Orchard Street. The access road extends 40 m (131 ft) west from Orchard Street to the base of the slope and then 50 m (164 ft) north to the bridge along the Wallkill River. The construction of the access road consists of the grading of the upper portion of the slope and the deposition of soil on the lower portion of the slope and along the Wallkill River (Photos 1-6). The 1999 survey conducted by the State University of New York at Stony Brook identified extant ruins of the New York Knife Company factory in and adjacent to the project area. The subsurface testing consisted of the excavation of one STP within the ruins of the knife factory in the project area. The investigation identified the presence of substantial above-and below-ground structural remains and subsurface deposits and artifacts associated with the production of jackknives during the late nineteenth and early twentieth centuries (Merwin 1999). The Office of Parks Recreation and Historic Preservation Fields Services Bureau determined the New York Knife Company complex eligible for the National Register of Historic Places under Criterion D, as a site that has yielded important information in history (Pierpont, Appendix C.). Region 8 of the New York State Department of Transportation requested that a site exam of NYSM Site 10935 be conducted to further document the above-and below-ground structural features and the archaeological deposits in and immediately adjacent to the project area. This report will summarize the previous work and discuss the site examination of the New York Knife Company factory site conducted by the staff of the New York State Museum in September of 2000 (Appendix C, Form A).

New York State Museum Site 10935, New York Knife Company factory site

Location. The New York Knife Company factory site is located on the southeast side of the intersection of NY 52 and Orchard Street on the east side of the Wallkill River in the village of Walden, Town of Montgomery, Orange County New York.

Summary of Historic Background. The New York Knife Company was originally established in 1852 in Matteawan, Dutchess County. The company purchased the site of the Scofield, Capron, and Gowdy cloth mill on the Wallkill River in the village of Walden, Orange County, in 1856. The New York Knife Company factory is present on the 1859 map of Orange and Rockland Counties and on the 1875 Atlas of Orange County as a single building with an extensive millrace. The 1887 Burleigh panoramic map of the village of Walden indicates that the factory was expanded between 1875 and 1887. The factory in the 1887 panoramic view consists of a large building with two large wings on the northeast and northwest corners and a series of buildings along Orchard Street. The addition on the west side along the Wallkill River consists of a single one-and-a-half-story building that stretches from the original building to the bridge. The factory appears to have been expanded again during the period from 1887 to 1903, based on the size and shape of the New York Knife Company factory on the 1903 Atlas of Orange County. The growth during this period consisted of the expansion of the wing on the northeast side of the factory and a building that connected the two wings on the north end by the bridge. The factory at the height of its production extended 130 m (425 ft) from north to south, and 50 m (165 ft) from east to west, encompassing 6,500 m^2 (69,940 ft^2), or 0.65 hectares (1.6 acres). There are several walls still present above ground.

Summary of Site Exam Request. The current project area cuts through the portion of the factory that was expanded during the period from 1875 to 1887. There are several stone and brick walls still visible in and adjacent to the project area. There are three substantial stone and brick walls associated with the lower factory complex in and adjacent to the project area. The first is the 10 m (33 ft) long north to south stone and brick wall that is located adjacent to the construction access road where it curves to the north. This wall is the rear or east wall of the lower complex and is immediately adjacent to the south side of the project area (Photo 3). The second is the 12 m (39 ft) long building foundation and millrace, which is located in the project area (Photo 4). The final wall is the 45 m (148 ft) long stone wall that extends north to the bridge and is located adjacent to the east side of the project area. This wall is the west wall of the lower factory complex along the Wallkill River (Photo 5). No visible walls are located in the upper portion of the project area. Eighty artifacts

were recovered from STP 1, excavated within the project area to a depth of 40 cm (16 in.) in the southern portion of the lower factory complex. The artifacts include architectural rubble, domestic debris, and objects associated with the manufacture of knives (Merwin 1999).

The Phase 1 investigation indicated that the majority of the site is undisturbed and has both vertical and horizontal integrity. The artifact assemblage recovered from the subsurface testing can be associated with the production of jackknives and table cutlery during the second half of the nineteenth century and the early twentieth century. The features, such as the mill race and the building foundations, may provide evidence of the function of the various buildings and spatial organization of the factory. Based on the cultural material and features, NYSM Site 10935 has the potential to yield important information regarding the development of a nineteenth century industry in rural New York State as well as knife production techniques and factory organization (Merwin 1999).

The proposed construction of the access road will directly impact extant features associated with the northern portion of the New York Knife Company factory complex; a site examination was recommended by SUNY Stony Brook. The site exam would entail the excavations of backhoe trenches in the upper portion of the project area and 1 by 1 m units throughout the lower portion of the project area to define the spatial organization of the factory and assess the integrity and research potential of the below-ground resources within the project area. Also, further documentary research would be undertaken as a part of the site examination (Merwin 1999).

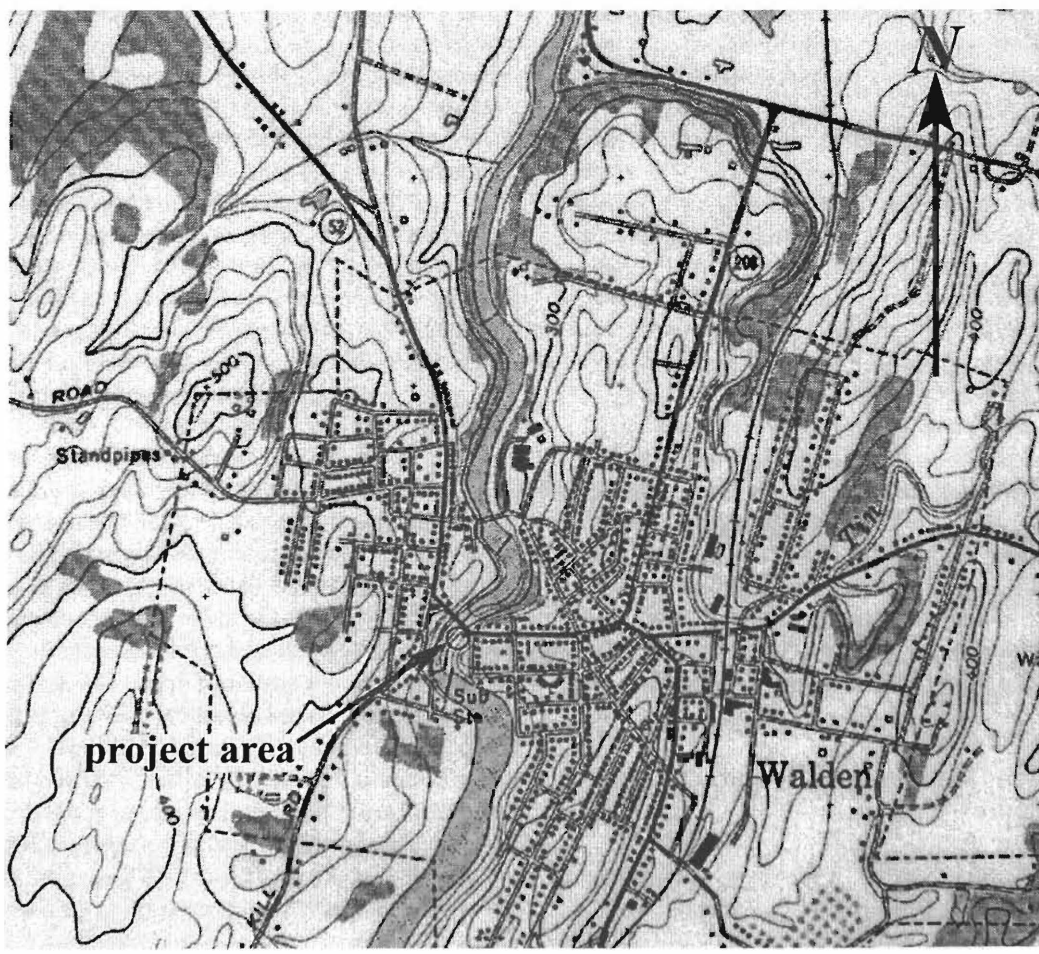


Figure 1. Location of the project area for the replacement of BIN 1026680, NY 52, over the Wallkill River and of NYSM Site 10935 within the village of Walden, Town of Montgomery, Orange County, New York.

Photo 1. View west of the upper portion of the project area on the west side of Orchard Street.

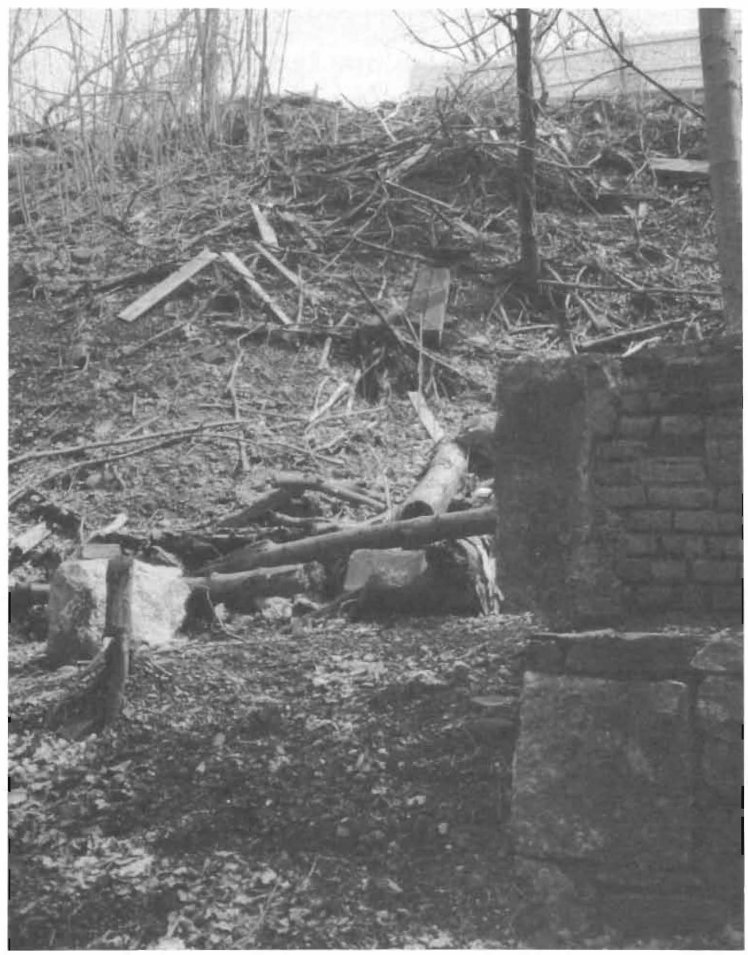


Photo 2. View east of the project area, with the centerline of the construction access road marked by the stakes in the center of the photo. There is a wall partially located in the project area on the right, or south, side of the photo.

Photo 3. View of the east or rear wall of the lower factory complex that is located immediately adjacent to the construction access road.

Photo 4. View north of the project area of the north wall of the building foundation and mill race located in the project area. The stake in the center of the photo is the centerline and the stake on the right, or east, is the right of way marker.

Photo 5. View south of the project area along the Wallkill River. The stake marks the center-line of the proposed access road. The stone wall on the left of east side of the photo is the west wall of the lower factory complex and is located adjacent to the east side of the proposed construction access road.

Photo 6. View east of BIN 1026680 on NY 52 over the Wallkill River, with the factory site on the east, or right, side of the photo.

HISTORIC CONTEXT

The area of Orange County where the village of Walden is located was first settled in 1712 by Henry Wileman, who acquired a 3,000-acre parcel of land that encompassed the current location of the village. The economy of eighteenth and nineteenth century Walden was based on agriculture. Early industries were established on the local waterways and were associated with the processing of local agricultural products. The early industries included distilleries, cider mills, gristmills, and sawmills. One of the first industries established in the current village of Walden was James Kidd's gristmill. The gristmill was built prior to 1768, and may have utilized the power produced by the high falls on the Wallkill River located south of the current project area. The gristmill was converted into a mill that produced cotton cloth during the late eighteenth or early nineteenth century. This cloth mill continued to operate throughout the first half of the nineteenth century. In 1856 the cotton mill, which was owned by Scofield, Capron, and Gowdy, went out of business. The village officials offered the location on the high falls on the Wallkill River to the owners of the New York Knife Company (Merwin 1999).

Sixteen workers from the Waterville Knife factory in Connecticut established the New York Knife Company in 1852 after the management decided that the cutlers would have to buy their own files and tools. The 16 workers each put in $200 and agreed that they all must be workers and not stockholders in their company. They were at first reluctant to move to Walden, until the community offered to help move the factory across the river to Walden (Voyles 1995). In 1860, just 4 years after the move to the village of Walden, the New York Knife Company invested $20,000 worth of capital in the building, tools, and machinery. The same year, the company also invested $4,630 in raw materials, which included 3,000 pounds of steel, 320 pounds of bone and shell, 1,700 pounds of brass, 2,400 pounds of iron, and other miscellaneous materials worth $3,000, such as wood, coal, and tools. The factory in 1860 produced $24,750 worth of knives and employed 25 males and 2 females. The males earned an average of $46 a month, or $12 for a 60-hour week, while the females earned $12 a month, or $4 a week (Federal Products of Industry Census 1860). The 2 women may have been employed in either the whetting room, where the knives were finished, or possibly the matching rooms, where sets of table knives were put together. The shortage of skilled cutlers in the United States forced the company to recruit workers from the knife factories in Sheffield, England.

By 1865 the factory workforce increased to 66 workers, which included 31 adult males, 20 males under the age of 18, 11 adult females, and 4 females under the age of 18. In 1865 the average monthly wage of the male factory workers was $36, while the female workers only received $12 a month. In 1864 the factory produced 9,000 dozen knives worth $36,000 (New York State Census 1865). During the 5-year period from 1865 to 1870, the factory workforce remained stable. In 1870 the factory still employed 66 workers. The workforce was composed of 35 adult males, 8 adult women and 23 children under the age of 16 (Federal Products of Industry Census 1870). Unfortunately, the number and value of the knives produced in 1870 were not legible in the 1870 Census.

Tom Bradley Jr. in 1870 took over the management of the New York Knife Company from his father. He was immediately faced with a crisis, which resulted in the formation of a competing knife company. A group of workers left and formed the Walden Knife Company, which was also located in the village, and utilized the waterpower from the Wallkill River. The split supposedly came about over a baseball game. The workers from the different floors of the New York Knife Company would play each other during lunch. When one of the games resulted in a brawl, Tom Bradley Jr. issued an order that baseball was not to be played at lunch. Several of the employees were either upset with this edict or with his management of the company, and decided to leave and start their own company (Voyles 1995). As a response to the startup of a new company, Tom Bradley Jr. may have decided to expand the production capabilities of the New York Knife Company, based on evidence obtained during the 2000 archaeological testing. The evidence consists of initials (GWS) and a date (1873) scratched into a concrete pad located near the northeast corner of the one-story building present on the 1885 Sanborn Insurance Map (Figure 3) on the northwest corner of the original six-story building. This indicates that the construction of this addition was started in 1873. The depiction of the factory on the 1875 map still consists of a single rectangular-shaped building adjacent to the creek, with a mill race on its east side (Figure 2).

Photo 7. View of the concrete pad adjacent to Unit 7, with the inscribed initials and dates outlined in chalk.

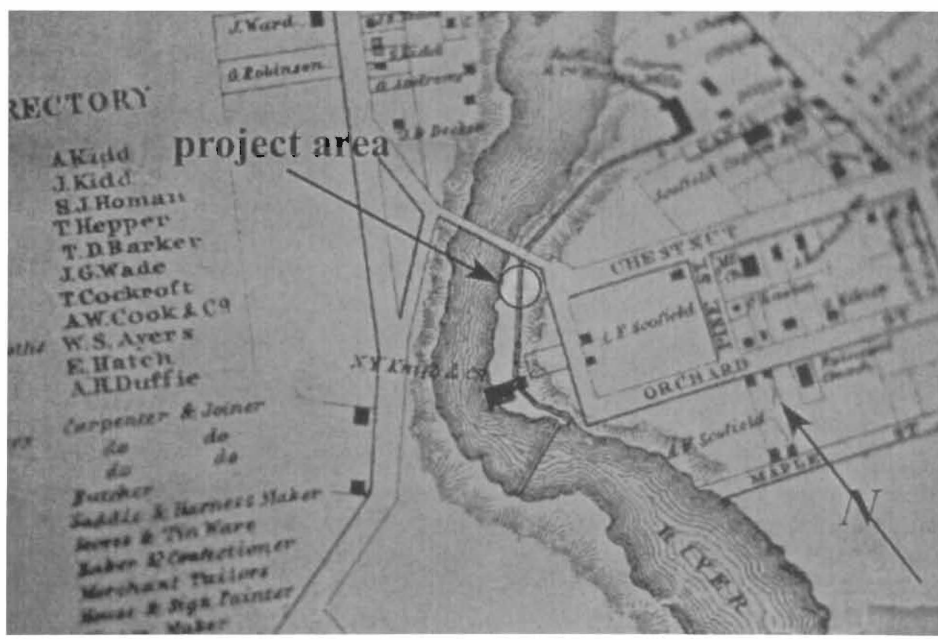


Figure 2. 1875 County Atlas of Orange, New York, depicting a single factory building to the south of the project area (Beers). (New York State Archives)

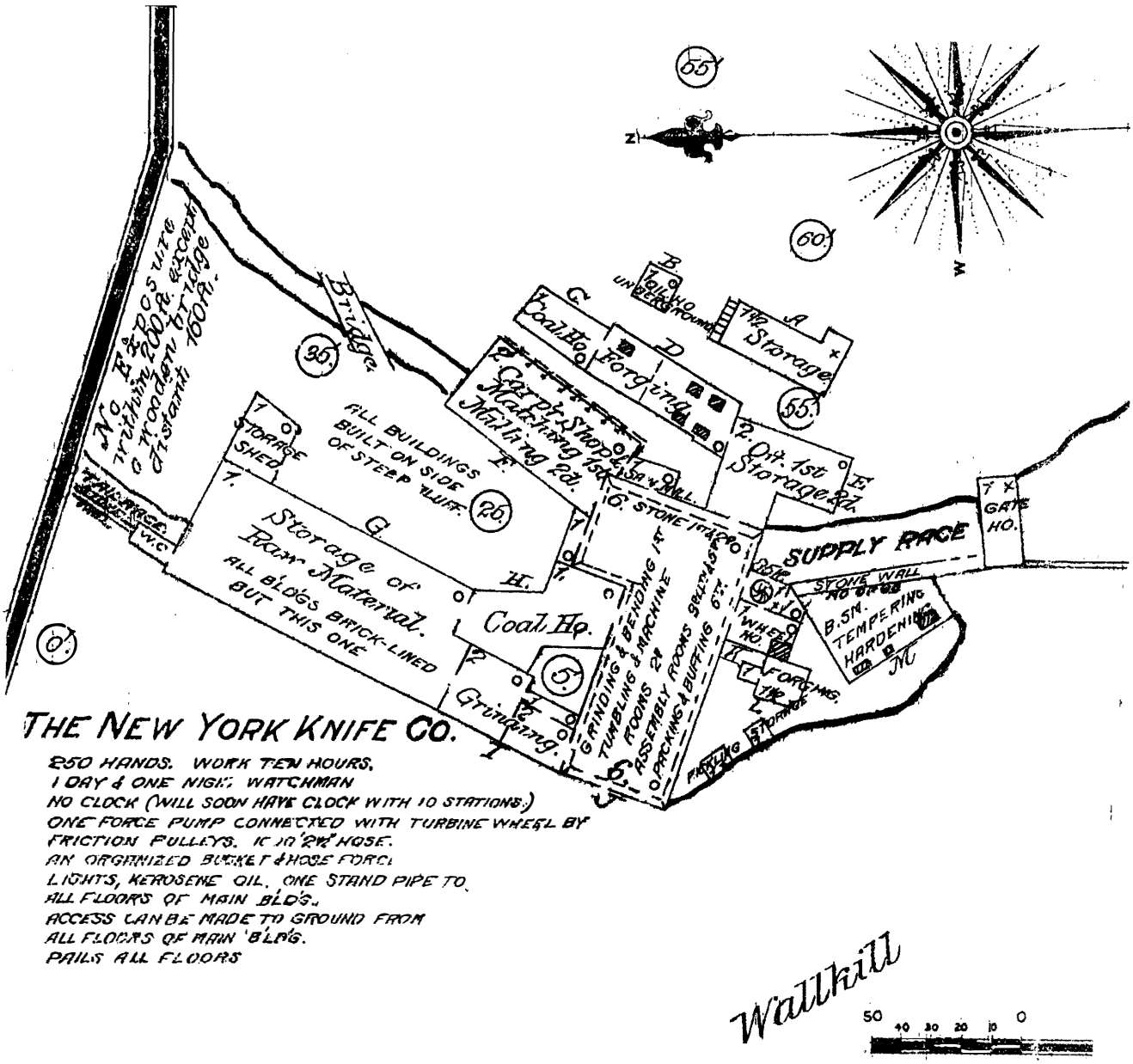


Figure 3. The 1885 Sanborn Insurance Map, which depicts the original building, with additions on its northeast and northwest corners and on the south and east sides. (New York Sate Library)

The best explanation for the delay in the construction of the addition may be the economic crisis caused by the 1873 Financial Panic. The 1873 Panic caused the shutdown of the stock market for a 10-day period, bank failures across the country, and a dramatic decrease in the value of stocks and U.S. Treasury bonds. As a result, credit in business was refused, debtors were pressed for payment, securities dropped in value, manufactured goods could not be sold, factories were forced to shut down, and the prices of agricultural products dropped in value (Armstrong 2000). The 1873 Panic brought about a short-term depression that was almost as severe as the Great Depression in the 1930s. Tom Bradley Jr.'s response to the crisis was to cut his workforce back to four-day weeks and keep the New York Knife Company factory operating by borrowing against everything he owned. Since there was no market demand for manufactured goods, which included pocket- and table knives, he rented barns throughout Orange County to store the knives until they could be sold. Apparently,

Bradley stopped the expansion of the factory during this period in order to retain his skilled workforce and keep the factory in operation. His plan worked. During the recovery he had a loyal and experienced workforce, while the other knife factories had to find new employees. In addition, he had a tremendous inventory of knives to sell when the other factories were only starting to resume manufacturing.

The depression caused by the 1873 Panic was over by 1875, when the New York Knife Company was back in full operation. In 1874 the factory employed 54 individuals, comprising of 35 adult males, 15 adult females, and 2 males and 2 females under the age of 16. Although the number of workers represents a drop of 12 individuals from 1870, their wages appear to have increased slightly. In 1874, the adult male employees were paid $36; the adult females, $18; the males under 18 years, $15; and the females under 18, $12 a month. The production of knives also appears to have increased. In 1874 the factory used $30,000 worth of steel, iron, brass, wood, pearl, and ivory to produce $60,000 worth of pocketknives and $30,000 worth of table knives. The value of knives produced in 1875 is slightly over 3 and a half times the value of the knives that were produced in 1860. The increase in knife production may be related to the increase in the capital invested in the factory. The capital investment in 1865 was $10,000, while in 1875, $10,000 was invested in the factory and $20,000 was invested in tools and machinery. The $30,000 capital investment in 1875 represents a 200 percent increase in a 10-year period. The investment in tools and machinery may have allowed the increased knife production with a smaller number of workers (New York State Census 1875).

The New York Knife Company expanded during the period from 1875 to 1880. The evidence of the factory's expansion during this period is based on the dramatic increase in the number of workers and the increase in the size of the factory on the 1885 Sanborn Insurance Map (Figure 3). In the 1880 federal census the number of workers employed at the factory increased to 230 employees– 4 times the number of individuals employed at the factory in 1875. The increase in the number of employees most likely was accompanied by the expansion of the factory. The New York Knife Company factory on the 1885 Sanborn Insurance Map consists of 10 buildings (Figure 3). The increase in the number of buildings is associated with the separation of the various phases of the knife manufacturing process and the separation of storage space from the production space. Separate buildings were constructed for the forging, the hardening and tempering of the iron and steel, the grinding of the knives, and a carpenter shop for the processing of the knife handles, while the final buffing, grinding, assembly, and packing were now confined to the original building. Several storage buildings for the raw materials, coal, and the finished knives were also constructed along with a separate office space. The waterpower system also was upgraded. A new gatehouse, 85-horsepower turbine, and second race were added to power the lower factory complex. The expansion of the factory by 1879 is represented by the increase in the capital investments from $30,000 in 1875 to $50,000 in 1880. The expansion of the factory resulted in the increased production of knives. In 1879, $50,000 worth of raw materials were used to produce $152,000 worth of pocket- and table knives. Employee wages increased during the period from 1875 to 1880. In 1880 the top wage was $2.25 a day for highly skilled labor and $1.50 a day for ordinary work. The workweek was composed of 6 10-hour days, so the monthly wage was between $39 and $58 per month. The workforce in 1880 comprised 144 adult males, 16 adult females, and 70 children under the age of 16, who were all employed throughout the year (Federal Products of Industry Census 1880).

Between 1885 and 1887 the factory was expanded a second time. The expansion occurred on the lower races as well as in the area adjacent to Orchard Street. Along the lower race, the one-story raw materials building, constructed between 1875 and 1880, was converted into a grinding building and, a large one-story storage building was added on at the north end, which extended the factory to the bridge over the Wallkill River (Figures 4 and 5). Between 1887 and 1894 the New York Knife Company underwent a third expansion. The factory expansion during this period took place along the lower and upper races. The north end of the lower factory complex was expanded into a six-story building, where the milling and finishing of the jackknives and table cutlery took place. The six-story production center was powered by a flume and waterwheel that diverted water from the upper race to power the milling room and machine shop in the building. The expansion along the upper race consisted of the construction of a long one-story storage building. On the south side of the original building, a new forge was built. The new construction along Orchard Street consisted of a one-story storage building for hardwoods, a new office, and a separate brick storage building. In 1894 the factory employed 350 hands (Sanborn Insurance Maps 1894).

The expansion of the factory was aided by a series of tariffs that protected the American knife industry from foreign competition. In 1890 the McKinley Tariff Bill placed a 50 percent tariff on imported cutlery. The reductions of the tariff in 1894 threatened the American cutlery industry with increased competition. Tom Bradley, who was a former member of the House of Representatives, along with the other leaders of the American knife industry, appealed to McKinley and Congress to reinstate the tariffs to protect the American knife industry. Their lobbying efforts resulted in the passage of the Dingley Tariff Bill, which essentially doubled the cost of the imported knives. The tariff made the American knife industry number one in the world and locked foreign companies out of the American market. In appreciation, the workers of Walden erected a statue of William McKinley in the village square. It is inscribed "from the working men of Walden" (Volyes 1995:234) (Photo 8).

Only a few changes were made to the New York Knife Company factory between 1894 and 1900. Two additional buildings were constructed, along with a coal storage shed adjacent to Orchard Streetn a storehouse was built over the head race; and two small one-story additions were constructed to connect the buildings along Orchard Street with the buildings on the upper race. The building that contained the boilers used to heat the complex was expanded from one to two stories during this period. The greatest change during this period was the modification of the structures along the upper race. These buildings were converted from one-story storage structures to three-story buildings where knives were finished, stored, and displayed for wholesalers (Figures 5 and 6). The growth of the factory's production line is also reflected in the number of workers, which increased from 350 in 1894 to 400 in 1900 (Sanborn Insurance Map 1900). The New York Knife Company during this period was manufacturing over one and a half million knives a year.

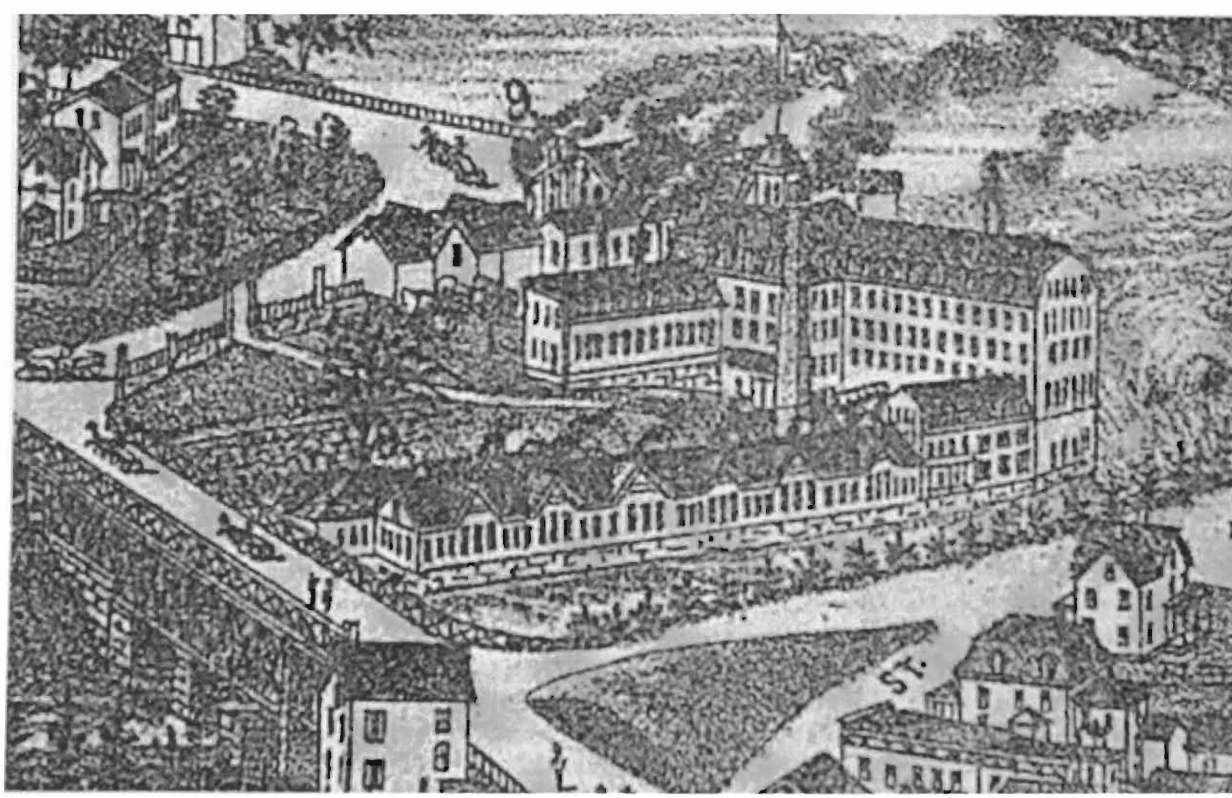


Figure 4. 1887 Burleigh engraving of the upper and lower factory complexes of the New York Knife Company in the village of Walden. (Library of Congress Geography and Map Division)

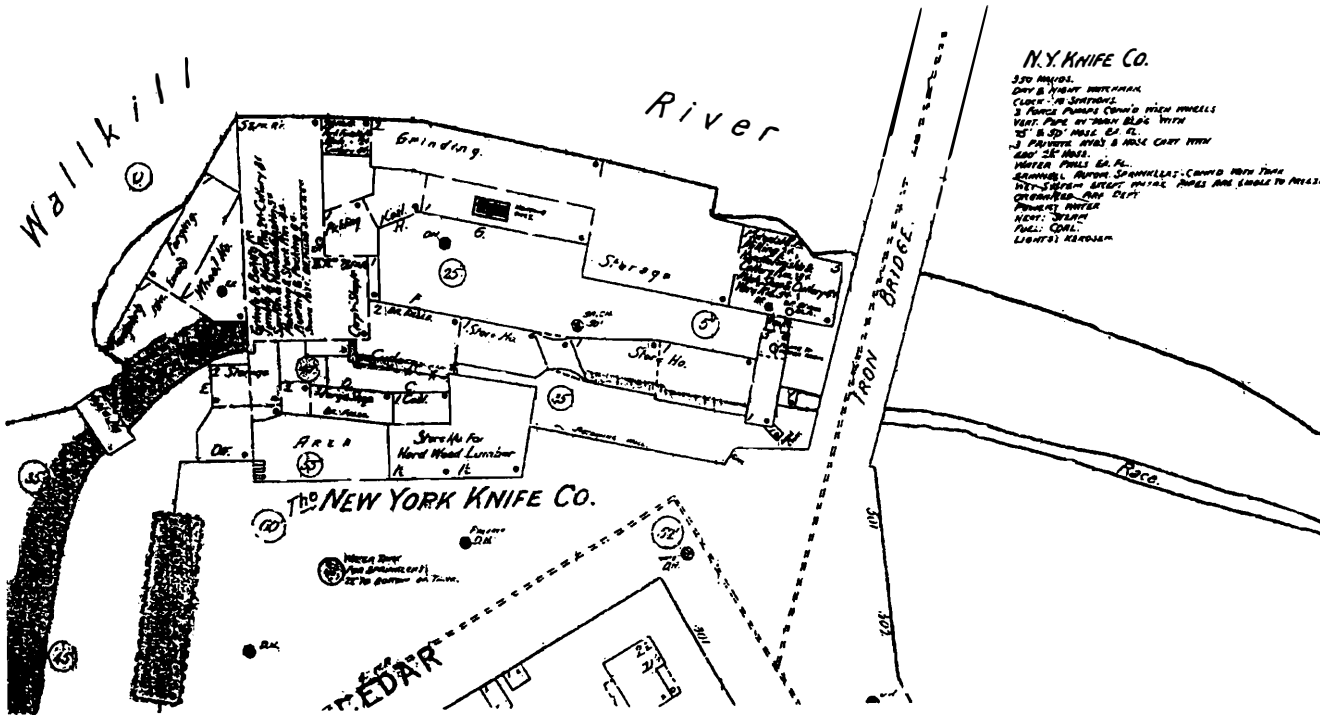


Figure 5. 1894 Sanborn Insurance Map of the New York Knife Company. (New York State Library)

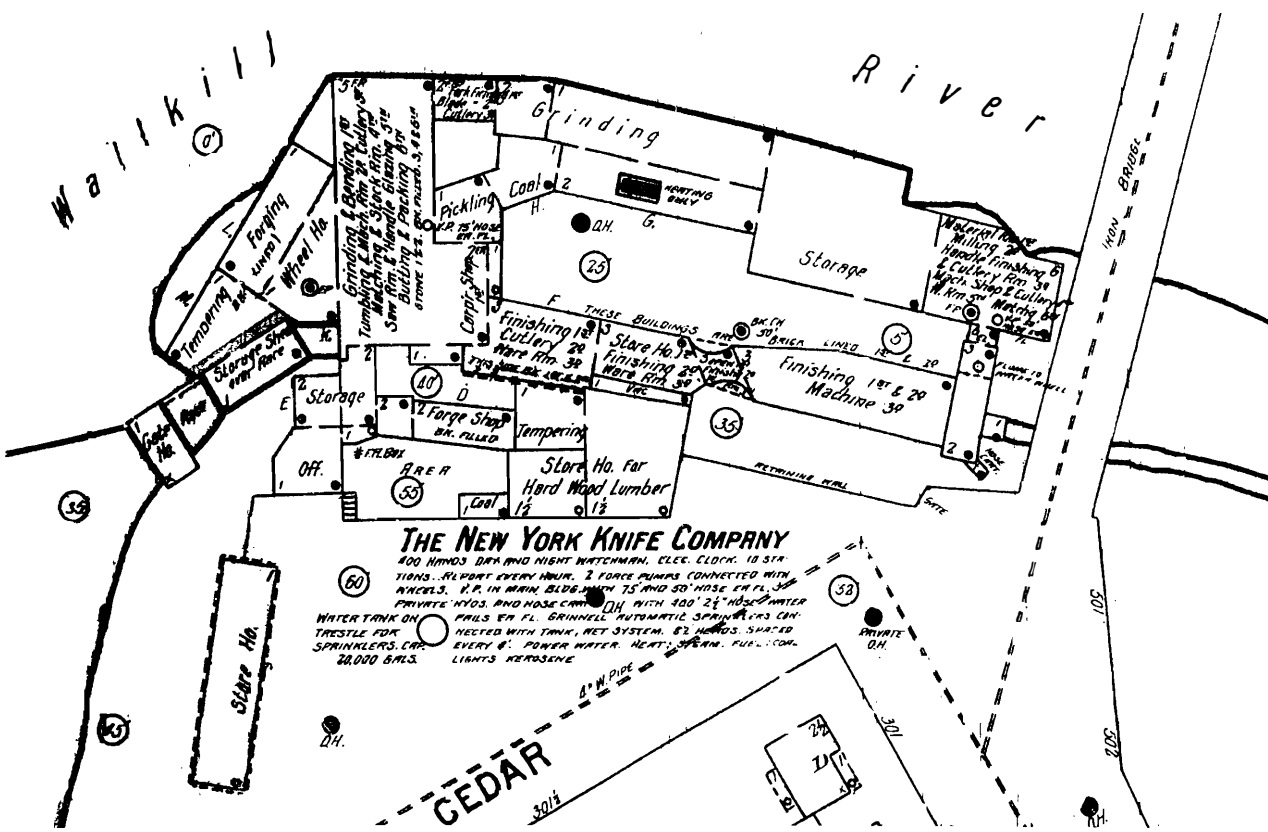


Figure 6. 1900 Sanborn Insurance Map of the New York Knife Company. (New York State Library)

In 1903 Tom Bradley Jr. sold the New York Knife Company to C.B. and J.E. Fuller, the owners of the Electric Cutlery and the Friedman and Lauterjung Importing Company. One of the primary reasons he sold the company was the increased competition with the Walden Knife Company and other manufacturers. In 1902 E.C. Simmons Hardware purchased the Walden Knife Company and introduced a full-line catalog of knives to all of the hardware stores the company owned and supplied. The competition in the knife manufacturing continued to increase when George Schrade left the Walden Knife Company in 1904 and started his own company to manufacture and sell an improved version of the switchblade knife he originally designed for the Walden Knife Company (Voyles 1995: 235). In response to the increased competition the new owners of the New York Knife Company expanded the factory between 1903 and 1905. By 1905 two new buildings; a sample room and storehouse were constructed on Orchard Street. The greatest change occurred in the buildings that were on the lower race. The one-story grinding building on the lower race was reconstructed as a three-story building and used for grinding, finishing, and cutlery production. Also, the one-story storage building on the north end of the grinding building was converted into three separate buildings. The buildings included a one-story grinding building built over the lower race; a four-story building where the grinding, hafting, matching, and the production of table cutlery took place; and a one-story drop shop where knife blades were stamped out of steel (Figure 7). The expansion of the factory during this period did not result in an increase in the workforce, since the factory still employed 400 hands in 1905 (Sanborn Fire Insurance Maps 1905). The expansion of the factory during this period must have either made the production line more efficient or included new machinery, since no additional workers were hired between 1900 and 1905, while the size of the factory increased substantially.

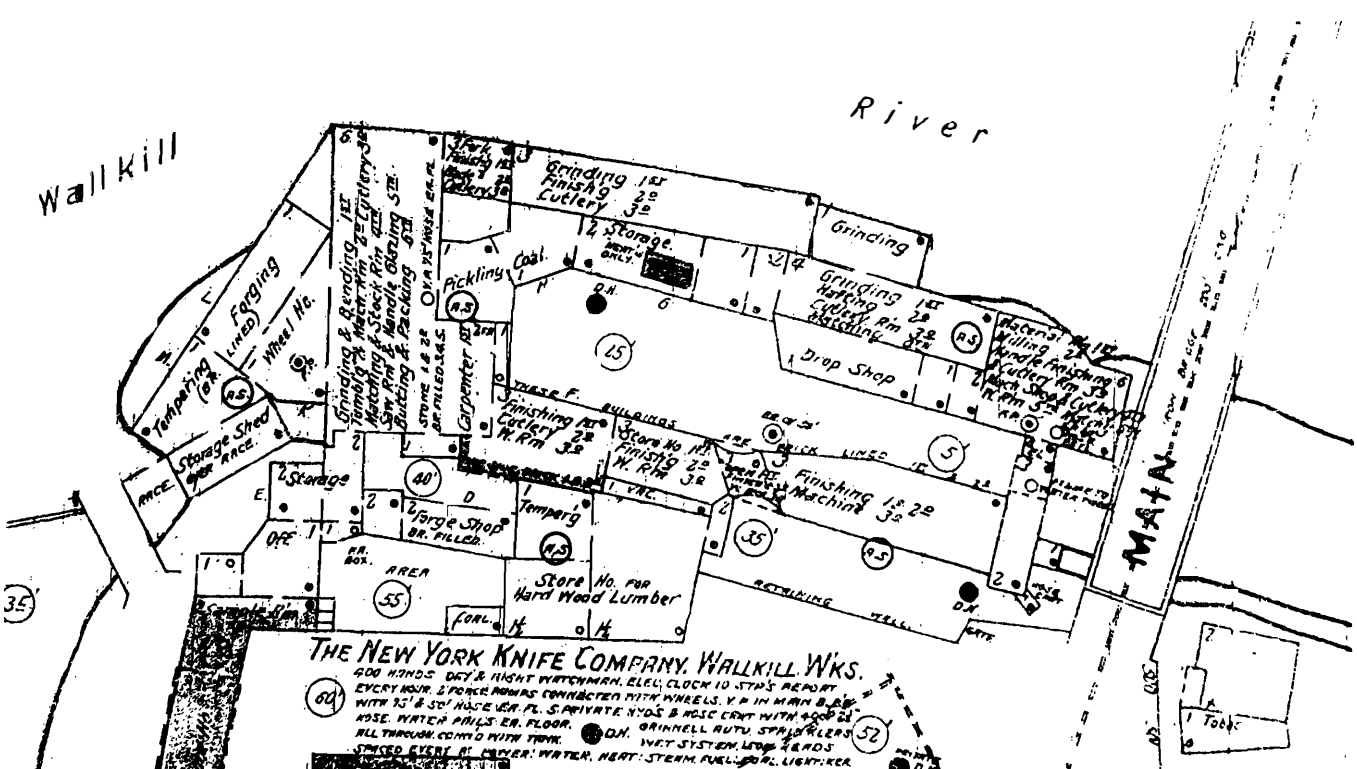


Figure 7. 1905 Sanborn Insurance Map of the New York Knife Compan. (New York State Library)

The New York Knife Company's market share continued to decrease despite the modernization of the factory and increased production. In an attempt to regain its market share the company began producing the only official Boy Scout Knife in 1911 and held this monopoly until 1922 (Voyles 1995:235). The factory during the period from 1905 to 1913 did not expand. However, several new technologies were adopted (Figure 8). The first was the storehouse on the west side of Orchard Street. This was converted into a celluloid works and bone shop to produce bone and plastic handles. The second was that the factory was electrified (Sanborn Insurance Map 1913). The installation of electricity for lights and machinery throughout the plant was a major investment. This investment made the factory more competitive by making the production line faster, more efficient, and lowering the number of workers needed to produce the knives. By 1913, the number of people employed by the company dropped to 327 individuals, which is a decrease of 63 people from 1905. The workforce was composed of 275 adult males, 41 adult females, 8 children between the ages of 14 and 16, and 3 office employees. The adult males in 1912 worked on the average a 63 hour week, the adult females between 58 and 63 hours a week, and the children, 51 hours or less a week (New York State Department of Labor 1915). By 1913, the Walden Knife Company with 340 employees surpassed the number of workers employed at the New York Knife Company, which had 327 employees. The smallest knife manufacturer in Walden at this time was the Schrade Knife Company with, 137 employees. In 1913, 804 people, or 19 percent of the population, of the village of Walden were employed at the three knife factories (New York State Department of Labor 1915). The knife industry, with the employment of such a large percentage of the village population, had a tremendous influence on the local economy.

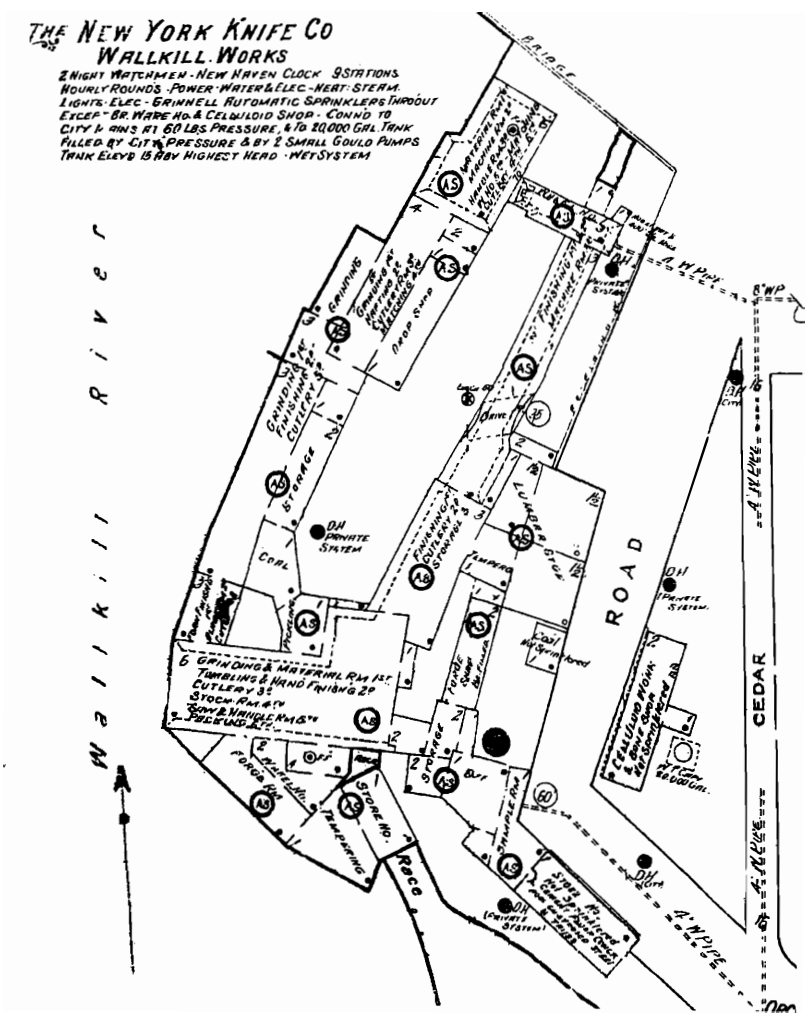


Figure 8. 1913 Sanborn Insurance Map of the New York Knife Company. (New York State Library)

The outbreak of World War I increased the demand for knives and allowed the New York Knife Company to remain in full production. After the war, ended two gun-manufacturing firms, Remington and Winchester, entered the knife manufacturing business. They used the latest technologies and machinery and had tremendous advertising and promotion campaigns to promote their products. The post-war catalogs that had once only shown the full line of New York Knife Company knives now was split between Remington and the New York Knife Company. Remington's market share continued to increase, as the New York Knife Company's market share decreased after World War I. In 1922 the New York Knife Company suffered a further setback when Remington and the Ulster or Schrade Knife Companies gained the right to manufacture Boy Scout knives, thus ending the New York Knife Company's monopoly. On the 1924 Sanborn Insurance Map there is a notation that the factory was not in operation (Figure 9). It is possible that the factory shut down for a short period of time, possibly to retool or that the owners were having problems due to the increased competition with Remington, the Ulster Knife Company, and Winchester. The final blow for many of the American knife companies was the 1929 stock market crash, which brought about the Great Depression. In 1931 the New York Knife Company was forced to shut down and stop its operation after being in business for 79 years. The only knife company that is still producing knives today is the Schrade Knife Company, which moved from the village of Walden to Ellenville, Ulster County, in 1958. The knife industry in the village of Walden is only represented by the ruins of the New York Knife Company and the two other factories along the Wallkill River and the statue of William McKinley in the village square.

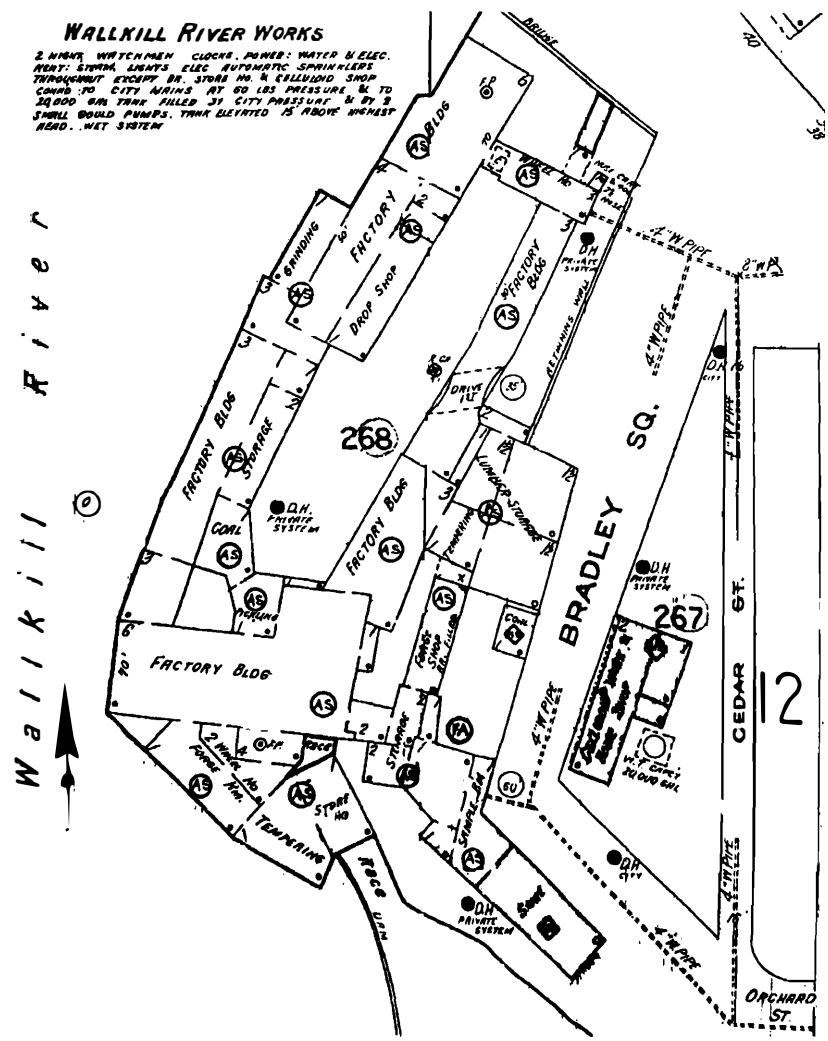


Figure 9. 1924 Sanborn Insurance Map of the New York Knife Company. (New York State Library)

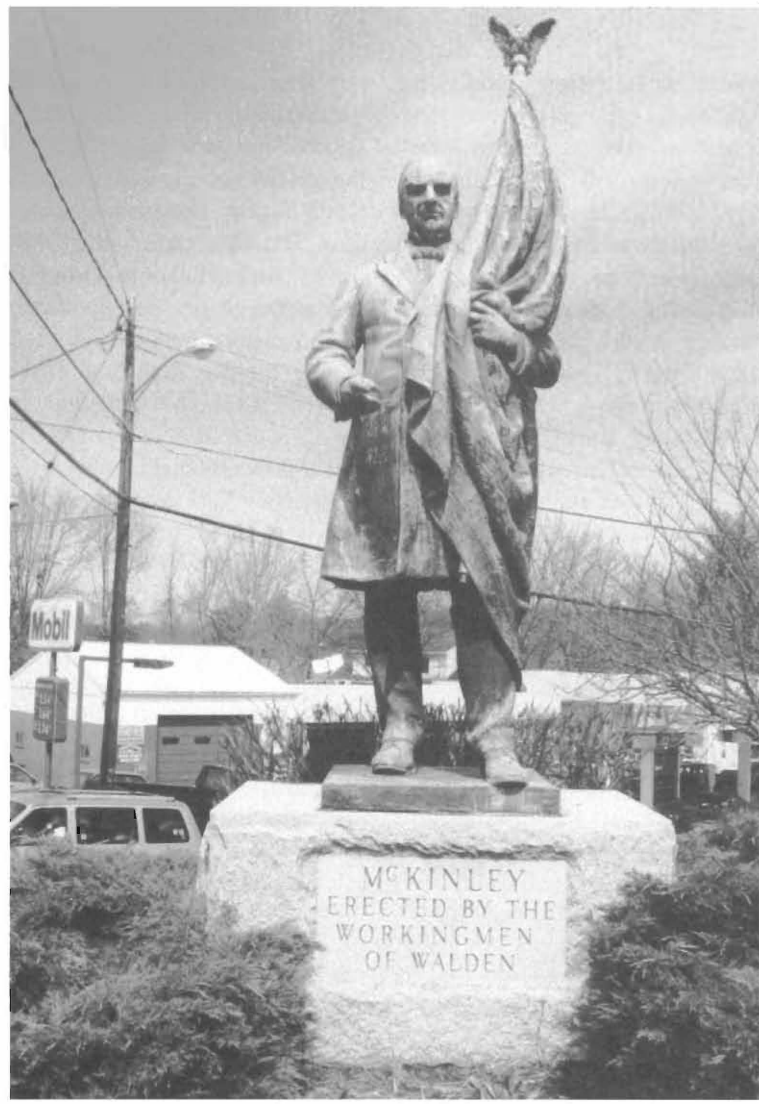


Photo 8. View west of the statue of William McKinley erected by the workers of Walden.

Summary of the History of the New York Knife Company. The New York Knife Company represents the mid nineteenth century development of the knife industry in New York State. During the early nineteenth century several, knife manufacturing companies were started by immigrants from Sheffield, England, in the Connecticut River Valley. By the mid nineteenth century the knife industry started to move into the Hudson River Valley, when the New York Knife Company was formed in 1852. The New York Knife Company moved to the village of Walden in 1856. The factory started in a single building with 27 employees. The passage of several tariff acts during the late nineteenth century protected the American knife industry from foreign competition and allowed the American industry to dominate the world markets. At the New York Knife Company's height in 1900 to 1905, the factory consisted of a complex of 28 buildings and 2 races and produced 1 and a half million knives a year, with the ability to produce 4,000 knives a day. The 28 buildings included 2 6-story, 1 4-story, 5 3-story, 7 2-story, 1 1-and-a-half-story, and 12 1-story structures. Between 1856 and 1931 the factory underwent 4 major expansions. Each time the factory was expanded, its spatial organization changed. These re-organizations were related to increasing the efficiency of knife production and the number of knives produced in a year, allowing the company to remain competitive. The yearly production rate of knives increased from 108,000 knives in 1865 to 1 and a half million knives in 1900. The increase in production was necessary to maintain the company's profits while paying the cost for the expansions and modernization of the factory, since jackknives in the *1902 Sears and Roebuck Catalog* sold from 23 to 94 cents apiece, and a set of 6 table knives and forks ranged in price from $.50 to $2.03 (Sears and Roebuck 1902).

The size of the factory and its yearly production totals made the New York Knife Company one of the largest knife companies in New York State, if not the United States, during this time period. The company also had one of the largest workforces and one of the better wage scales in the manufacturing industry. The company's workforce throughout the nineteenth and early twentieth centuries included women and children under the age of 16. Although there were different pay rates for adult males, adult females, and children, the wage scales for each category was above the wages paid in other industries. The wage scale from 1860 to 1875 for adult males averaged $36 a month; adult females, $18 a month; males under 18, $15 a month; and females under 18, $12 a month. By 1880 the wages were $ 2.25 a day, or $60.75 a month, for skilled jobs, and $1.50 a day, or $40.50 per month, for ordinary work. The work-week during this period consisted of 6 10-hour days, and unlike many factories during this period, the New York Knife Company operated year-round. To put these wages in perspective, the average wage for manufacturing skilled workers in 1900 was $435 a year, or $33.50 a month; and for unskilled labor was only $22 a month; and even as late as 1974, a minimum-wage job would only pay only $16 a day (Schlereth 1991:78). Both of these figures indicate that the New York Knife Company workers were being paid well above the average manufacturing salary as early as 1860.

The various expansions of the factory may be viewed as the specialization of space and labor, which allowed the New York Knife Company to compete in the global economy. The majority of the New York Knife factory complex is located outside the project area. The small segment of the factory located in the project area is the only portion of the factory where all four of the major expansions are represented. The factory expansions that represented in the project area include the first expansion of the factory that occurred between 1875 to 1880, and three other expansions, which occurred between 1885 to 1887, 1894 to 1900, and 1900 to 1905 (Figures 2 to 9). The four expansions of the New York Knife Company factory represent the industrial development toward mass production that occurred from the mid nineteenth to the early twentieth centuries. The factory also represents the history of a specific industry and the effects of the global market on the knife industry in the United States. The development of the factory represents the shift from non-capitalist, non-commercial economy, where the individual craftsmen controlled the means and tempo of production, to a capitalistic, commercial economy, where laborers were controlled by the clock and the tempo of the machinery. In this system, the worker was at the mercy of the capitalist for the support of himself and his family (Shackel 1996).

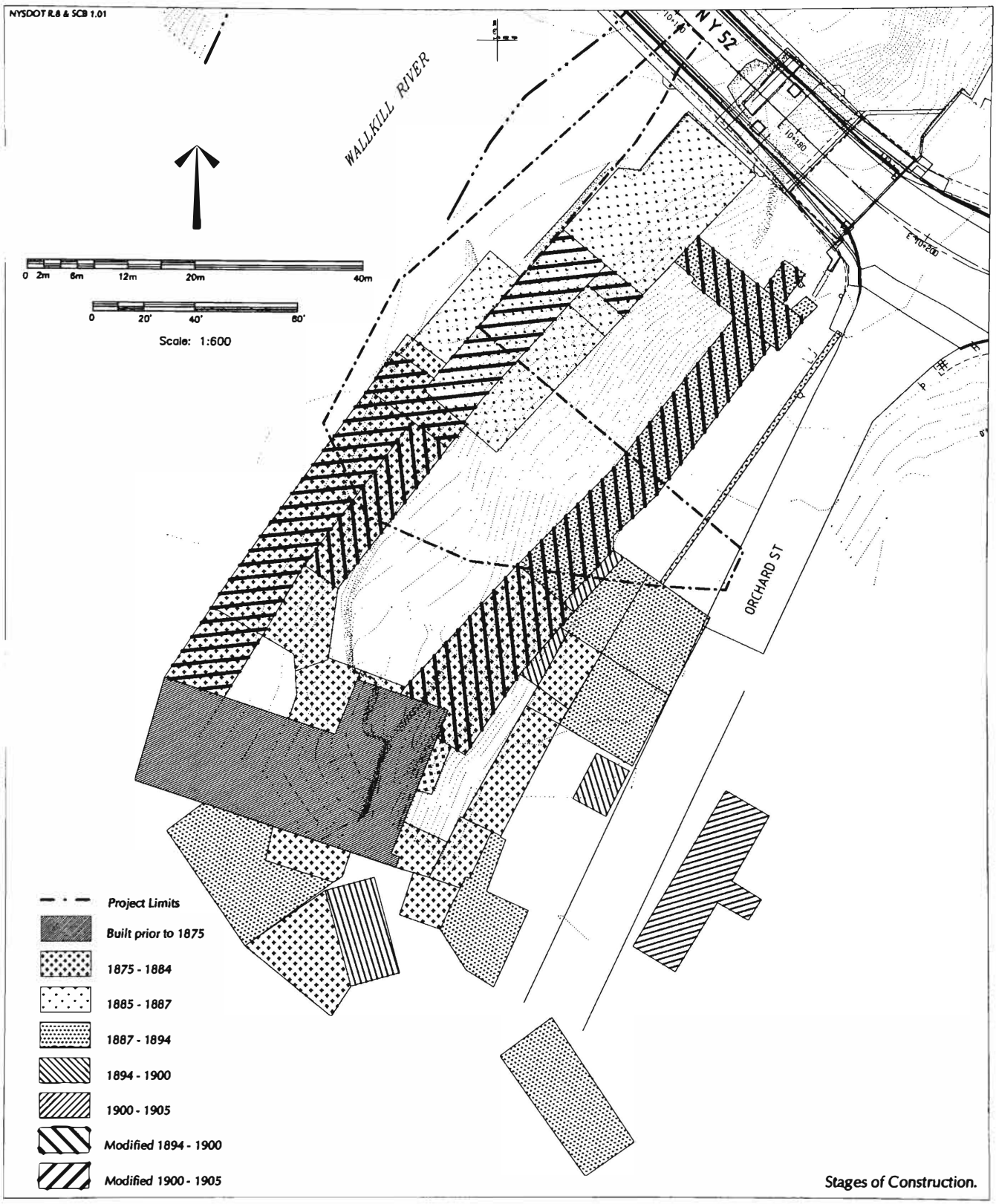


Figure 10. Development of the New York Knife Company factory from 1856 to 1931.

ARCHAEOLOGICAL SURVEY METHODOLOGY

FIELD METHODOLOGY

The Phase one testing of the New York Knife Company site consisted of the excavation of one STP. The STP was 40 cm in diameter and was excavated at a depth of 40 cm (16 in.). The STP was excavated to determine whether any artifacts associated with the 1856 to 1931 production of jackknives and table cutlery were present in the subsurface deposits.

The field methodology for the site exam was devised to test the New York Knife Company factory complex, and consisted of the excavation of backhoe trenches in the area adjacent to Orchard Street at the top of the slope, and the hand excavation of units at the base of the slope adjacent to the Wallkill River, where structural features are still visible.

Four backhoe trenches were excavated in the area west of Orchard Street and the top of the slope. The trenches ranged in size from 1 to 2.5 m (3 to 8 ft) in length. Trench A was excavated in the area located partially down the slope to the area where the level yard starts and was 2.5 m (8 ft) in length. Trench B was located approximately 1 m (3.3 ft) to the east and south of Trench A and was 1.5 m (5 ft) in length. Trench C was 1.5 m (5 ft) in length and was located on the west side of the concrete retaining wall that was partially visible. Trench D was located on the east or street side of the partially visible retaining wall and was 1.5 m (5 ft) in length (Figure 12). The trenches were staggered to give maximum coverage within the project area. The two features revealed by the backhoe excavation appear to be the east wall of the upper mill complex (Feature 2) in Trench A and the circa 1885 to 1894 retaining wall. The photos of the backhoe trenches were destroyed when the camera malfunctioned, but the drawings and maps document the excavations.

Units were also excavated to determine the stratigraphic sequence on the portion of the lower factory complex located at the base of the slope adjacent to the Wallkill River. The units were excavated to locate any features, such as foundations, floors, or knife fragments associated with the nineteenth- and early twentieth-century operation of the New York Knife Company factory site. Ten 0.75 by 1 m (2.5 by 3.3 ft) and four 0.5 by 1 m (1.6 by 3.3 ft) units were excavated to determine the relationship of the features identified to the stratigraphic sequence on the site, to date their construction, modification and/or demolition. The features located on NYSM Site 10935 are defined in Table 1 and presented in Figures 10 and 12).

Table 1. Features Located on NYSM Site 10935, New York Knife Company factory Site.

Feature	Definition	Condition	Initial Date of Construction
Upper Factory Complex			
1	Retaining wall	Partially visible	1887-1894
2	East wall of the upper factory complex	Subsurface	1887-1894
Lower Factory Complex 1875-1880 expansion			
3	Grinding, finishing cutlery building	Partially visible	1875-1880
4	Storage room	Buried	1875-1880

Table 1. Continued.

Feature	Definition	Condition	Initial Date of Construction
1885-1887 expansion			
5	Grinding shed & tail race	Visible	1885-1887
6	Grinding, hafting, matching & cutlery building	Buried	1885-1887
7	Drop shop	Buried	1885-1887

The units were excavated by natural stratigraphic levels, and when it was possible, excavation was continued under the concrete floors. The number of cultural or stratigraphic levels present in the units varied from one A horizon in Units 1, 4, 6, 8, 9, and 11, and from two to four levels in Units 2, 3, 5, 7, 10, 12, 13, and 14. These levels represent the current A horizon, and from one to three levels of redeposited soil associated with the construction and expansion of the lower factory complex. The units were excavated with shovels and trowels and screened through one-quarter inch (0.625 in.) mesh. The size, location, rational, stratigraphy, and depths for each of the 12 units are presented in Table 2.

Table 2. Size, Location, Rationale, and Stratigraphic Sequence of the 14 Units Excavated on NYSM 10935.

Unit	Size (m)	Placement and Rationale	Levels	Depths (cm)
Lower Factory Complex				
1875-1880 expansion				
1 6	0.5 x 1 0.5 x 1	Units 1 and 6 were excavated to locate the wall dividing the 1875 to 1880 and the 1885 to 1887 expansion (Features 3 and 5) and document the stone arch over the tailrace.	1 N wall E wall Floor	0-10/40 10/11-40+ 14/20-40+ 22/40-
9	0.75 x 1	Unit 9 was excavated to locate the east wall of Feature 3.	1 E wall Floor	0-30/49 0-40 30/49 -
3	0.75 x 1	Unit 3 was excavated on the east side of an internal wall in the interior of Feature 3 to determine the function of the room and the stratigraphic sequence under the concrete floor.	1 Floor 2 3	0-9/11 9/11-15/19 15/19- 26/30 26/30-95/100+

Table 2. Continued.

Unit	Size (m)	Placement and Rationale	Levels	Depths (cm)
4	0.75 x 1	Unit 4 was excavated to determine whether the east wall of the 1875 to 1880 expansion continues to the north.	1 E wall Clay drainage pipe	0-14/100+ 14/38-83+ 83-
7	0.75 x 1	Unit 7 was excavated on the exterior of Feature 4 to determine the the stratigraphic sequence on the exterior of 1875 to 1880 expansion.	E wall 1 2	0-100+ 0-7/14 7/14-98-100+
1885-1887 expansion				
2	0.5 x 1	Unit 2 was excavated to locate the wall between Features 5 and 6 in the 1885 to 1887 expansion and the wall between the 1875 to 1880 and the 1885 to 1887 expansions.	1 Floor Stone wall Pipe trench 2 3	0-7/8 7/8-8/13 7/8-54+ 7/8-54 8/13-44/46 44/46-54+
5	0.5 x 1	Unit 7 was excavated to locate and document the wall between the 1875 to 1880 and the 1885 to 1887 factory expansions	1 Floor 2A Stone wall 2 3	0-4/11 4/11-8/13 8/13-14/24 14/18-100+ 10/24-43/60 43/60-97/100+
1885-1887 expansion				
10	0.75 x 1	Unit 10 was excavated to locate and document the stratigraphic sequence on the north side of the of the stone wall associated with 1875 to 1880 factory expansion.	1 2 Stone wall 2B 3 4	0-4/10 4/10-32/34 14/20-97+ 32/34- 7/39 37/39-55/62 55/62-95/97 +
8 & 11	1.5 x 1	Units 8 and 11 were excavated in the interior of Feature 6 of the 1885 to 1887 expansion.	1 Floor	0-7/18 7/18-
12	0.75 x 1	Unit 12 was excavated in the interior of Feature 6 of the 1885 to 1887 expansion.	1 2 Pipe trench 3 4	0-10/14 10/14-34/35 32/35-52 34/35 - 41/58 41/58 - 66/75+
13	0.75 x 1	Unit 7 was excavated in the interior of Feature 7 of the 1885 to 1887 expansion.	1 2 Floor	0-49/7d 49/71-92/93 92/93-
14	0.75 x 1	Unit 8 was excavated in the interior of Feature 7 of the 1885 to 1887 expansion.	1 2 3 Floor	0-1/48 1/48-32/63 32/63-72/97 72/97-

Prior to the excavation of these units it was decided that only small samples of the brick, mortar, concrete, and window glass would be saved. The focus of the excavations was to locate any artifacts associated with the production of knives and determine whether there are any differences in the functions within the various subdivisions of the factory.

LABORATORY METHODOLOGY

Processing. Following fieldwork, all artifacts were processed and analyzed in the Anthropological Survey lab of the New York State Museum. Processing included washing, dry brushing fragile materials, cataloging, and numbering the artifacts.

Analytical Procedures. Historical artifacts were cataloged according to a New York State Museum system based on South's classification (South 1976). Each artifact was first classified as being related to the knife manufacturing process (blades, handles, tools, or raw material), domestic artifacts (faunal, ceramic, bottle glass, table glass, tobacco pipes, toys, etc.), or architectural artifacts (brick, mortar, concrete, flat or window glass, and nails). These three general categories were then divided into specific groups based on manufacturing techniques. The identification of knife parts was based on information found in Lenik (1969) or Volyes (1995) (Figure 11).

Repository. All artifacts, field notes, maps, and other documentation of the site examination are curated as part of the collections of the New York State Museum Anthropological Survey.

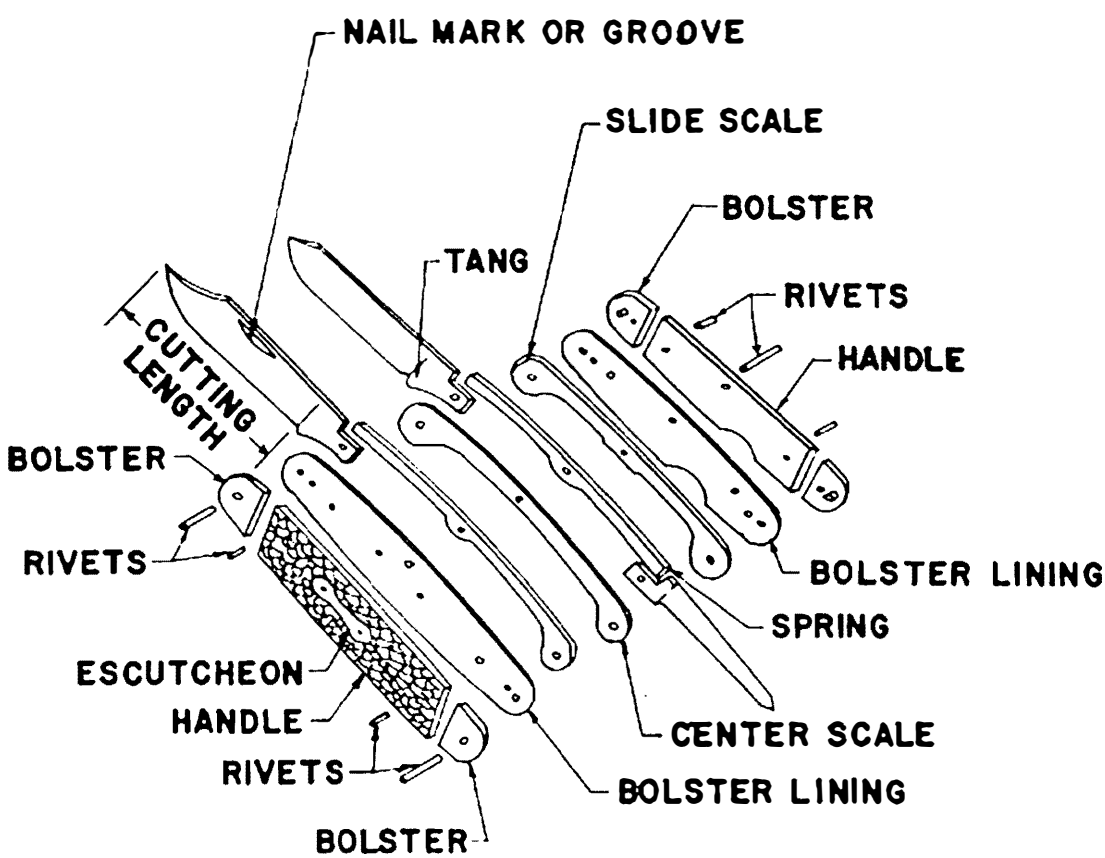


Figure 11. Jackknife parts (Peterson 1958 & Lenik 1969).

RESULTS OF THE SITE EXAMINATION OF NYSM SITE 10935

SITE BOUNDARIES

Horizontal. The site area extends north and south of the current project area based on the presence of visible stone and brick walls. The portion of the lower factory complex located adjacent to the north side of the project area is shown in a series of photographs.

Photo 9. View south of the remains of the three-story grinding, finishing, and matching building, with its west wall in the stream on the right side of the photo.

Photo 10. View east of a below-ground race on the northern right-of-way line that carried water from the upper factory complex to the lower factory complex.

Photo 11. View southeast of the foundations for the inner row of buildings in the lower factory complex. This foundation was for a storage building where the factory boiler or heating plant and the coal storage and picking room brick were located.

Photo 12. View south of the foundations for the original 6-story L-shaped building that appears on the 1859 and 1875 maps. The west end of this building projected out into the stream and is no longer present.

Photo 13. View southeast of the ruins of the Forge and Tempering rooms and Wheel house that were located on the east side of the original six story original factory building.

Photo 14. View east of the ruins of the carpenter shop and race in the upper factory complex located adjacent to the northern project limit. The foundation in the upper left of the photo is associated with the lumber storage sheds that were on Orchard Street.

Photo 15. View east of the carpenter shop and mill race in the upper factory complex, with Orchard Street located on top of the slope.

Photo 16. View south of the ruins of the east walls of the original six-story factory building in the upper factory complex.

Photo 17. View south of the upper mill race on the right side of the photo. The mill race ran through the east end of the original six-story factory building and the carpenter shop.

Photo 18. View southeast of the modern Niagara Mohawk power dam located adjacent to the south side of the original 6-story factory building. The construction of the current dam impacted the location of the original headrace and dam.

Photo 19. View south of the Niagara Mohawk dam and powerhouse located adjacent to the south end of the New York Knife Company factory.

The only visible ruin present south of the project area is the west wall of the lower factory complex. This is located adjacent to the project area which is shown in Photos 4 and 5. The east wall of the lower factory complex and the entire upper factory complex are covered with a deposit of recent fill. Only a small portion of the factory site is located in the current project. Approximately 196 m^2 (2,110 ft^2), or less than 10 percent of the factory, is located in the current project area (Figure 12). Cultural materials associated with the production of knives during the period from 1875 to 1931 were recovered from all of the units and the STP excavated in the project area.

Vertical. The excavation of the 14 units and one STP revealed that there are historic stratigraphic deposits related to the construction and use of the site present within the project area. The excavation of five units (2, 3, 5, 10, and 12) through the concrete floor of the lower factory complex revealed the presence of two levels of soil that may be associated with the 1875 to 1879 and the 1885 to 1894 expansions of the factory. The two soil deposits extended over 1 m (3.3 ft) below the concrete floor. It is highly likely that these deposits are also present under the concrete floor in Units 8 and 11. Three of the units (1, 5, and 9) excavated over the stone-arch – covered mill race that ran under the 3-story building revealed the presence of 20 to 45 cm (8 to 18 in.) of soil that has accumulated over the brick floor of the grinding room. The brick floor was constructed over the stone-arch – covered mill race. Two of the units (4 and 7) excavated on the exterior of the lower factory complex revealed the presence of two soil levels and features that were present in the courtyard area between the upper and lower factory complexes. Two units (13 and 14) excavated in the drop shop revealed the presence of 0.9 to 1 m (3 to 3.3 ft) of soil over the brick- and concrete-floor of the drop shop. The soil deposits in Units 13 and 14 consist of one or two levels of soil deposited over a level that is associated with the demolition of the factory (Figures 10 and 12).

The stratigraphic sequence on the site varies from feature-to-feature or building-to-building divisions. In the interior of Feature 3, the three-story grinding, finishing, and cutlery building, there is only one soil level that is present over the brick floor, which overlies the stone-arch – covered mill race. In Feature 4, the storeroom, and in Feature 6, the four-story grinding, hafting, matching, and cutlery building, there is one soil level above the concrete floor and from two to three soil levels under the floor. In Feature 7 (the drop shop) there are two to three levels of soil present above the brick- and concrete-floor. Finally, in the area outside the lower factory complex, there are two soil levels present adjacent to the east or the rear of the buildings.

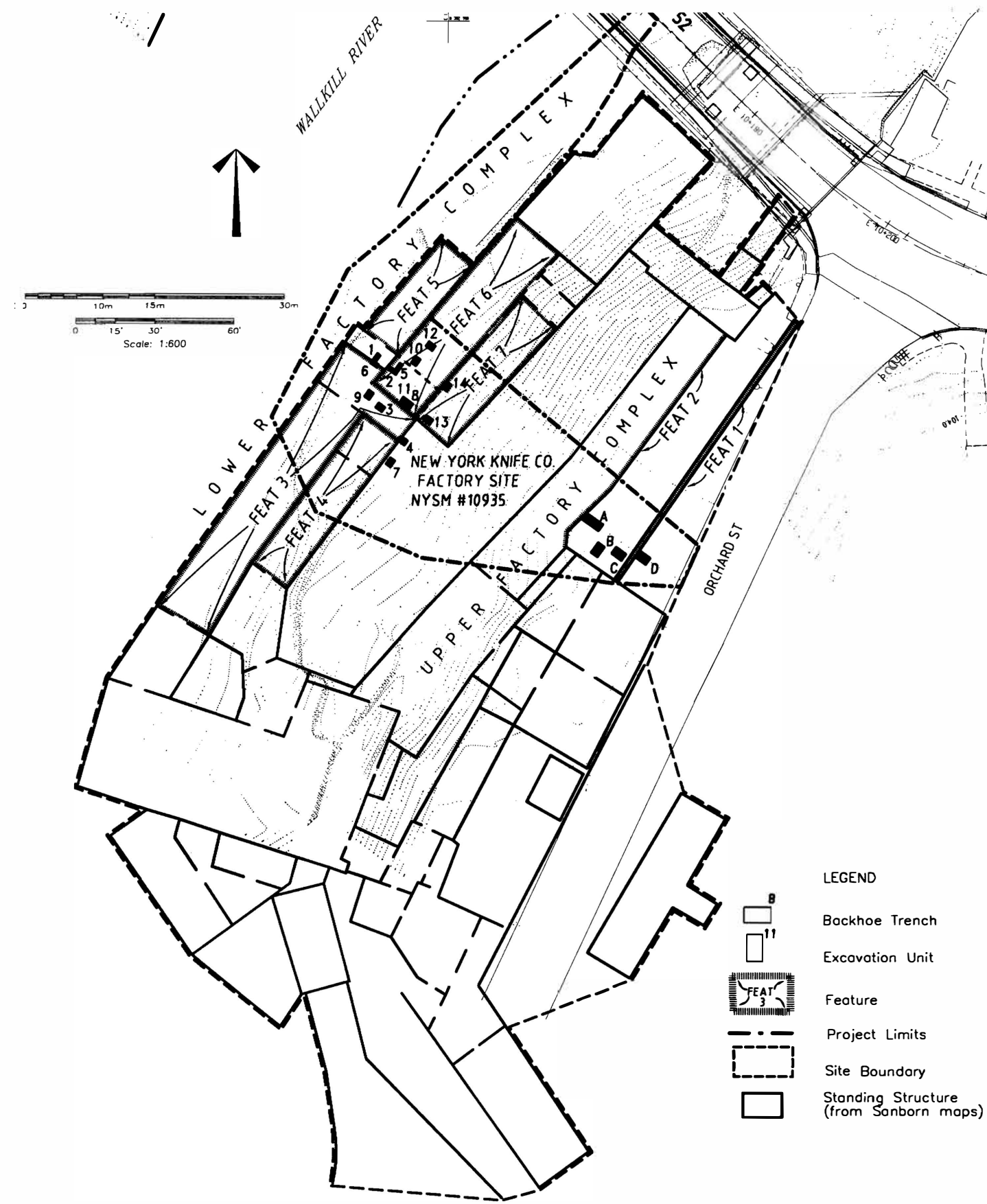


Figure 12. Map of the results of the archaeological testing conducted on the New York Knife Company factory complex.

SITE STRATIGRAPHIC SEQUENCE

Soils and Features. The subsurface testing conducted on the New York Knife Company factory site revealed the presence of a fill deposit over the upper factory complex (Features 1 and 2), a single cultural deposit in Feature 3 built over the covered mill race (Feature 5), and stratified deposits that extend under the concrete floor and on the exterior of two of the other structures (Features 4 and 6). Also, the testing revealed the presence of a fill deposit in the interior of Feature 7 at the base of the slope. The fill at the base of the slope in Unit 14 appears to be the same deposit that is present at the top of the slope in the backhoe trenches. The features that were present on the site include the retaining wall and the finishing room in the upper factory complex (Features 1 and 2), and four of the buildings in the lower factory complex. The features in the lower factory complex consist of the three-story grinding, finishing, and cutlery building (Feature 3), the two-story storage and heating plant structure (Feature 4), the one-story grinding shed built over the lower mill race (Feature 5), the four-story grinding, hafting, matching, and cutlery building (Feature 6), and the one-story drop shop (Feature 7).

Upper Factory Complex. The subsurface testing in this location consisted of the excavation of four backhoe trenches (A-D). The excavation of the backhoe trenches revealed the presence of two features within the upper project area and from 1 to 1.5 m (3 to 5 ft) of circa late1960s to early 1970s fill, based on the recovery of a pull-tab coke can and plastic in Trenches A-C. In Trench D, excavated on the east side of the retaining wall (Feature 1), natural soils consisting of 30 to 45 cm (12 to 18 in.) of a dark gray brown silty loam A horizon and the yellow brown silty loam B horizon were present, while the three trenches excavated on the west side of the wall revealed the presence of an extensive fill deposit in the project area overlying the B horizon. The fill deepens from west to east, from 1 m (3 ft) in Trench C to 1.6 m (5.5 ft) in Trench D, excavated at the top of the current slope. The two features revealed by the backhoe excavation appear to be the east wall of the upper mill complex (Feature 2) in Trench A, which was present under 1.6 m (5.5 ft) of fill. The second feature is the circa 1885 to 1894 retaining wall that was located between Trenches C and D (Figure 13). During the cleanup of Trench A to document and photo the stone wall of the upper factory complex, the trench walls composed of 1.6 m (5.5 ft) of fill collapsed, negating the effort to document the wall. The east wall of the upper factory complex appears to have been excavated into the B horizon. A schematic profile of the upper portion of the project area, using the depths of the soils and fill measured in the four trenches excavated within the project area, was created to document the subsurface features and soils (Figure 13). Feature 2, the east wall of the upper factory complex, was constructed from 1885 to 1894 and was modified from a one-story to a three-story building during the same period. The west wall of the upper factory complex could not be tested either by backhoe trenches or hand excavations due to the steepness of the slope (Photo 2).

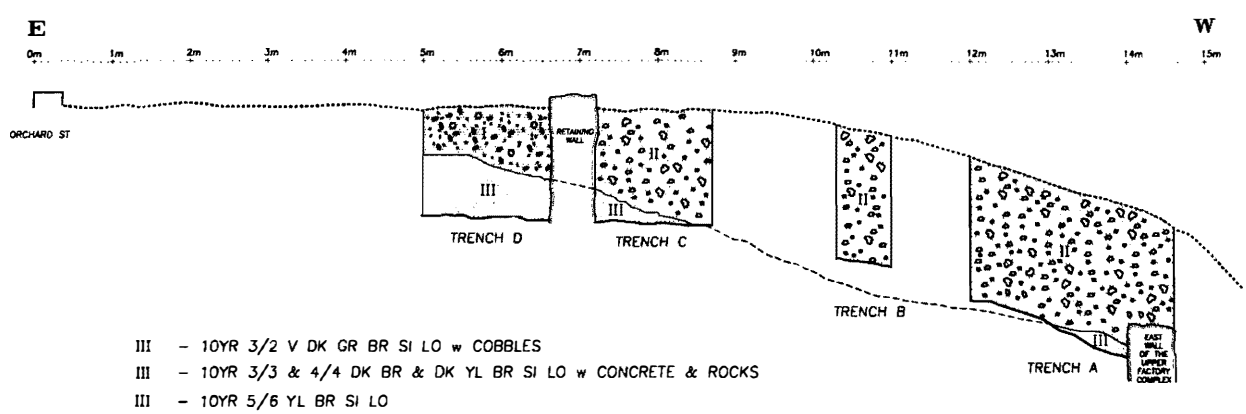


Figure 13. Schematic plan view of the soil profile in the area located between the west side of Orchard Street and the top of the slope down to the Wallkill River.

Lower Factory Complex. Fourteen units were excavated in the segment of the project area that cuts through a portion of the lower factory complex. The historical documentation in conjunction with the visible features and walls indicates that this is the location of the 1875 to 1880 and the 1885 to 1887 factory expansions. The structures associated with both of the factory expansions were further modified from one-story to three- or four-story buildings during the 1900 to 1905 factory expansion. Units 1, 6, 3, and 9 were excavated in the interior and Units 4 and 7 were excavated on the exterior of the buildings constructed during the 1875 to 1880 expansion (Features 3 and 4). Units 2, 5, 10, 12, 13, and 14 were excavated in the interior of the buildings constructed during the 1885 to 1887 factory expansion (Features 5, 6, and 7). The subsurface testing revealed the presence of one to five cultural soil levels within the lower factory complex, representing three different stratigraphic sequences. The stratigraphic sequence of the site varies from west to east.

Features 3 and 5. Feature 3 was the three-story grinding, finishing, and cutlery building, originally built during the period from 1875 to 1880, and was modified between 1885 and 1894, and 1900 and 1905. Feature 5 was the one-story grinding shed built over the lower tail race between 1885 and 1887. The dimensions of Feature 3 on the 1905 map are 32 by 6.6 m (105 by 22 ft) and the dimensions of Feature 5 are 5 by 14-m (46 by 16 ft). The subsurface testing of Features 3 and 5 on the west side of the lower factory complex adjacent to the Wallkill River revealed the presence of a single cultural level, a black silty loam in Units 1, 6, and 9 that has accumulated over the interior brick floor. The brick floor was built directly on the top of the stone arch constructed over the lower tailrace. The majority of artifacts from these units were recovered within 10 cm (4 in.) of the floor, suggesting that they were discarded in the corner of Feature 3 during the manufacturing process. The recovery of porcelain electrical insulators indicates that the deposit has to date after the factory was electrified, which occurred between 1905 and 1913. The recovery of a patent medicine bottle manufactured by the Mark-Owens Bottle Company from 1912 to 1929 (Fiske 1987) suggests that the artifacts recovered from this deposit represent the last few years that the New York Knife Company factory was in operation from circa 1905 to 1931 (Figures 14-16, and Photos 20-22).

Photo 20. View south of the stone-arch – covered tailrace (Feature 5) with Units 1 and 6 located on top of the arch in the center of the photo. The stadia rod is in the race.

Photo 21. View north of the interior brick floor and the south and east walls of Feature 3, the grinding and finishing building in Units 1 and 6.

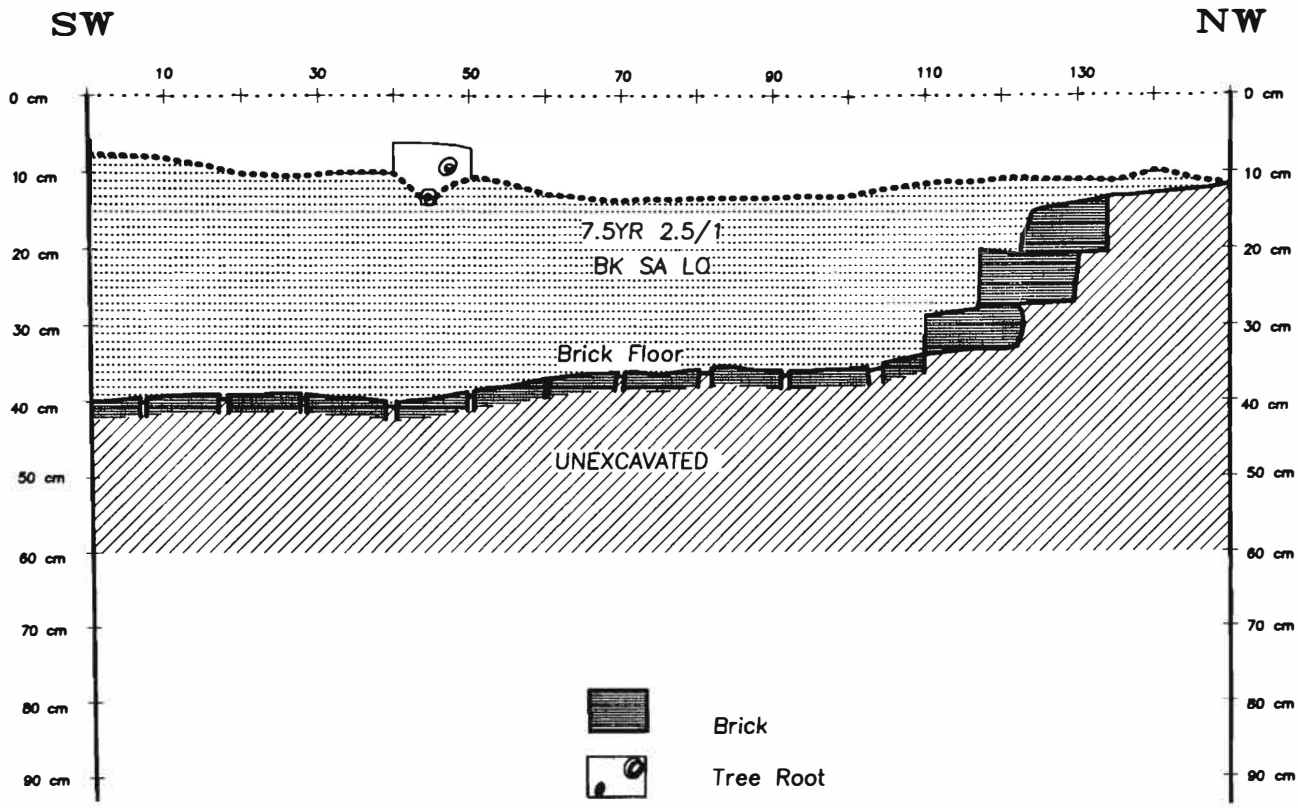


Figure 14. The west wall profile of Unit 1.

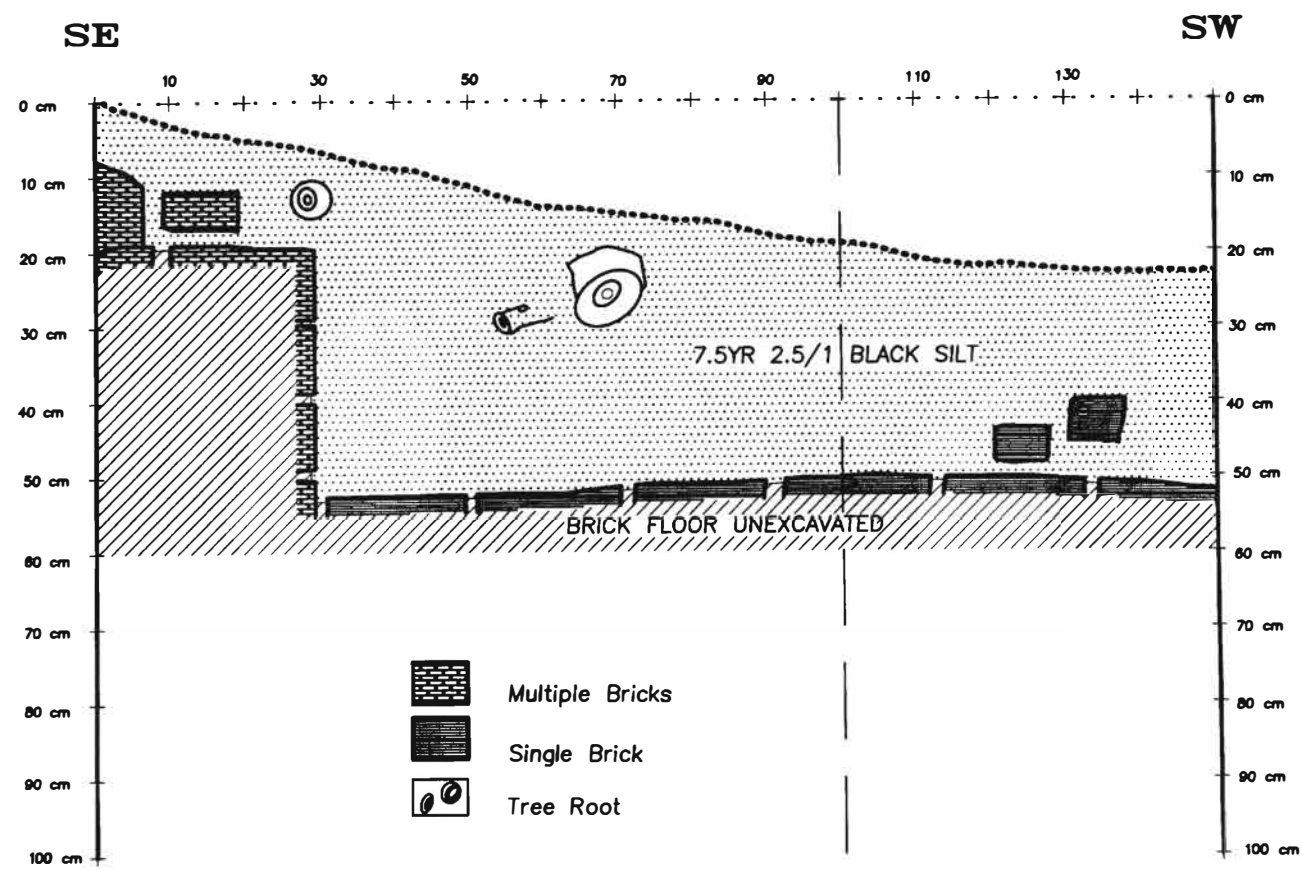


Figure 15. The south wall profile of Units 1 and 6.

Photo 22. View east of the brick floor and east wall of Feature 3 in Unit 9.

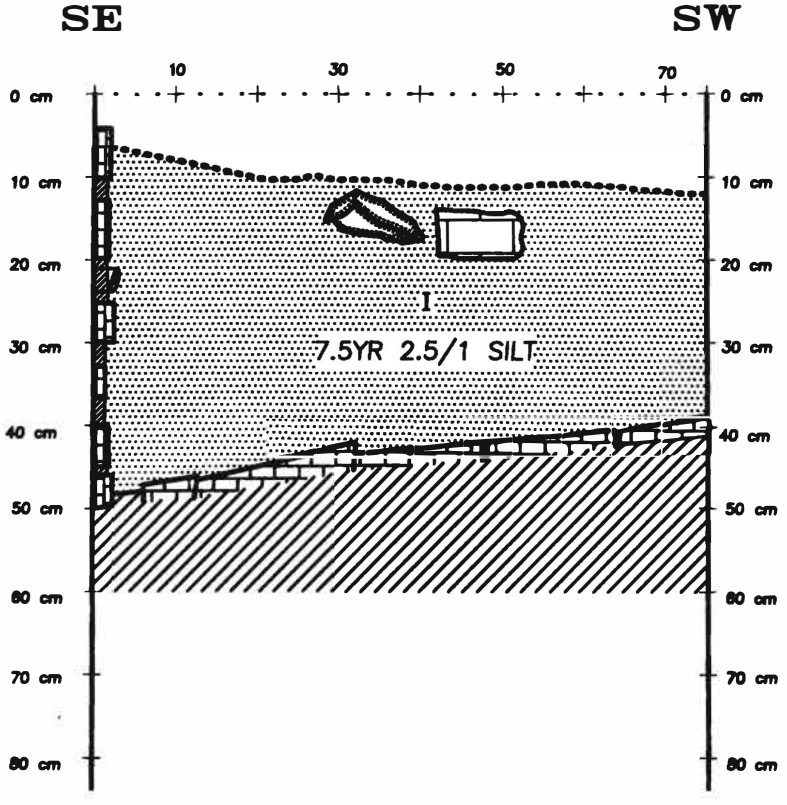


Figure 16. The south wall profile of Unit 9.

Features 4 and 6. Feature 4 is a part of the one-story storage building built between 1875 to 1880, which was modified into the factory's heating plant between 1887 and 1894, and modified into a two-story building between 1894 and 1900. Feature 6 is a part of the 1885 to 1887 expansion of the factory and was modified into a four-story building where the grinding-hafting, cutlery manufacturing and matching took place between 1900 and 1905. The dimensions of Features 4 and 6, based on the 1905 Sanborn Insurance Map are 21.5 by 5 m (70 by 16 ft) and 25 by 6.7 m (80 by 22 ft), respectively. The excavation of Units 3, 2, 5, 8, 10, 11, and 12 in the interior of Features 4 and 6 revealed the presence of one level of soil above the concrete floor, and two to three levels of redeposited soils and a buried A horizon under the concrete floor. The testing also located the north wall of the 1875 to 1880 factory expansion. The stratigraphic sequence present in Features 4 and 6 is presented in Table 3.

Table 3. The Stratigraphic Sequence Associated with the 1875 to 1880 and the 1885 to 1894 Expansions of the New York Knife Company Factory.

Site Level	Depth	Soil	Unit	Unit Level	Date
1	0-4/18 cm	Black to dark grayish brown silty loam	2, 3, 5, 8, 10 11, & 12	1	Post 1931
–	4/18-8/19 cm	Concrete floor	2, 3, 5, 8 10 & 11		1900-1905
2A	8/13-14/24 cm	dark grayish brown silty loam	5 & 10	2A	1900-1905
–	14/18-97+ cm	North wall of the 1875-1880 expansion	5 & 10		1875-1880
2	8/24-26/46 cm	Gray brown to a dark brown silty loam	2, 3, 5, 10, & 12	2	1900-1905
2B	32/34-37/39 cm	Light yellowish brown silty clay	10 12	2B 3	1885-1887
3	37/39-55/62 cm	Dark yellowish brown silty loam	10	3	1875-1885
4	26/60-100+ cm	Gray brown to dk brown silty sand with shale & coal ash	2, 3, 5	3	1875-1880
–	41/62-100+ cm	Gray brown silty sand with coal ash & shale	10, 12	4	1875-1880

The stratigraphic sequence on the north and south sides of the wall varies slightly. The first activity during the expansion of the factory between 1875 and 1880 was the deposition of an extensive deposit of soil composed of a gray brown silty sand with coal ash and shale along the bank of the Wallkill River to level and extend the terrace to the west. This deposit is present in the interior of the 1875 to 1880 factory expansion as Level 3 in Units 2, 3, and 5, and on the exterior of the expansion as Level 4 in Units 10 and 12. This level ranges in depth from 26/30 to 100 cm (10/12 to 40 in.) in Unit 3 to 55/62 to 100+ cm (22/25 to 40+ in.) in Unit 10. The artifacts recovered from this level may represent the operation of the New York Knife Company factory prior to the construction of a large storage building in this location during the 1875 to 1880 expansion. On the exterior of the north wall of the 1875 to 1880 expansion an A horizon, Level 3 in Unit 10, developed over the 1875 to 1880 redeposited soil. The dark yellowish brown silty loam A horizon is present from 37/39 to 55/62 cm (14/15.5 to 22/225 in.) below ground surface. The A Horizon developed on the exterior of the north wall after the 1875 to 1880 expansion and prior to the 1885 to 1887 expansion. The only cultural material recovered from the A horizon consisted of oil lamp chimney glass, clear bottle glass, and window glass (Figure 17).

During the 1885 to 1887 expansion of the factory a large one-story storage building and a six-story manufacturing building were added on to the north side of the 1875 to 1880 expansion. The 1885 to 1887 factory expansion is represented by the deposition of a level of soil on the exterior of the north wall of the 1875 to 1880 expansion in Units 10 and 12. The light yellowish brown silty clay increased in depth from south to north from 32/34 to 37/39 cm (12/13 to 14/15 in.) in Unit 10 and to 34/35 to 41/58 cm (13/14 to 16/23 in.) in Unit 12. This level was deposited as a part of the 1885 to 1887 expansion to raise the elevation and level the terrace that was created during the first factory expansions from 1875 to 1880. The artifacts recovered from this level are associated with the operation of the factory during the period from 1880 to 1887 (Figures 17-24 and Photos 23-27).

The lower factory complex underwent a major renovation during the period from 1900 to 1905. The one-story buildings that were constructed during the 1875 to 1880 and the 1885 to 1887 expansions were reconstructed as three- and four-story buildings. This major renovation is represented by the deposition of two additional soils, Levels 2A and 2, in the interior of Features 3, 4, and 6. Level 2, a grayish brown to dark brown silty loam, is present in Units 2, 3, 5, 10, and 12. The depth of this level varies from unit to unit. In Feature 3 the depth of this deposit ranges from 15/19 to 26/30 cm (6/7.5 to 10/12 in.) in Unit 3, and from 20/24 to 43/60 cm (8/10 to 17/24 in.) in Unit 5, while the depth of the 1885 to 1887 soil level in Feature 6 is more uniform and is present from 4/14 to 32/35 cm (2/5.5 to 12/14 in.) in both Units 10 and 12. Prior to the deposition of the 1900 to 1905 level a one-inch waterline was excavated into the early levels in Units 2 and 12. Also, the 1875 to 1880 stone wall in Units 2 and 12 was demolished to the ground level and then covered with Level 2A, which is present from 4/13 to 14/24 cm (2/5 to 5.5/9.5 in.) below the ground surface. The concrete floor was then poured over Levels 2 and 2A during the 1900 to 1905 modification of the two earlier additions. Finally, Level 1, a black to dark grayish brown silty loam, is present from 0 to 4/18 cm (1.5 to 7 in.) above the concrete floor. The concrete floor is present from 8 to 20 cm (3 to 8 in.) below the ground surface. Level 1 represents the development of an A horizon after the factory stopped operating in 1931. The artifacts from Level 1 were recovered within 5 cm (2 in.) of the brick or concrete floor, indicating that they may be associated with the operation of the factory during the period from 1905 to 1931 (Figures 17-24 and Photos 23-27).

The excavation of Units 4 and 7, adjacent to the east wall of Features 3 and 4 in the courtyard area between the upper and lower factory complexes, revealed the presence of one soil level in Unit 4 and two soil levels in Unit 7. Level 1 in Unit 4 and Level 2 in Unit 7 are similar soils, a very dark grayish brown silty sand with coal ash. This soil is a deposit that is similar to the 1900 to 1905 level that was present in the interior of Features 3, 4, and 6. This soil may have either been deposited or modified during the 1900 to 1905 modification of the earlier factory buildings, when these structures were changed from one- to three- or four- story buildings. The foundation and exterior walls may have been rebuilt or reinforced for the expansion of the structures into multiple-story buildings. The poured-concrete walls above the courses of brick may represent the modification of the walls. This soil level in Unit 4 is deposited over the brick and concrete doorway, which indicates that the upper portion of this level may represent the redeposition of soil through erosion or slope wash from the upper factory complex. The upper portion of Level 2 and Level 1, a black silty loam in Unit 7, also may represent the redeposition of soil from the upper factory complex through erosion or slope wash. In Unit 4 a stoneware drainage pipe is present at 83 cm (33 in.)

below the ground surface adjacent to the exterior of the east wall. This pipe may have been associated with either a bathroom located in the interior of Features 3 or 4, or served to drain water away from the factory. Adjacent to the north side of Unit 7 is a square concrete-coated catch basin or cistern that has a red-colored concrete cover inscribed with the initials G.W.S. and the date 1873. This feature, located near the northeast corner of the 1875 to 1880 factory expansion, may represent the starting date for the factory expansion that was not completed until the period from 1875 to 1880 due to the economic downturn caused by the Panic of 1873. The stoneware drainage pipe in Unit 4 may connect with this feature adjacent to the north side of Unit 7 (Figures 17-24 and Photos 23-27).

In summary, the excavation of Units 2, 3, 4, 5, 7, 8, 10, 11, and 12 revealed that the terrace the lower factory was constructed on is a man-made feature. The excavation of these units revealed that there are three levels of soil associated with the 1875 to 1880 and the 1885 to 1894 factory expansions and the 1900 to 1905 modification of these structures into multiple-story buildings. The deposition of over 1 m (3.3 ft) of soil created the terrace that is currently adjacent to the east side of the Wallkill River. The artifacts recovered from these deposits represent the construction and modification of the various buildings as well as the manufacturing of knives during the period from 1875 to 1931.

Photo 23. View south of the stone wall associated with the 1875 to 1880 expansion of the New York Knife Company factory and the meter of cultural deposits in Unit 2 that have been deposited in this location during the period from 1875 to 1931.

Photo 24. View south of the 1875 to 1880 wall in Unit 10 and the four levels of soil that were deposited from 1875 to 1931 to create the terrace the lower factory complex was constructed on.

Photo 25. View north of the 1856 to 1875 soil level and waterline in Unit 12.

Photo 26. View east of the east wall of Features 3 and 4 in Unit 7.

Photo 27. View south of the inscribed concrete pad adjacent to the north side of Unit 7. The inscription was chalked in for the photo.

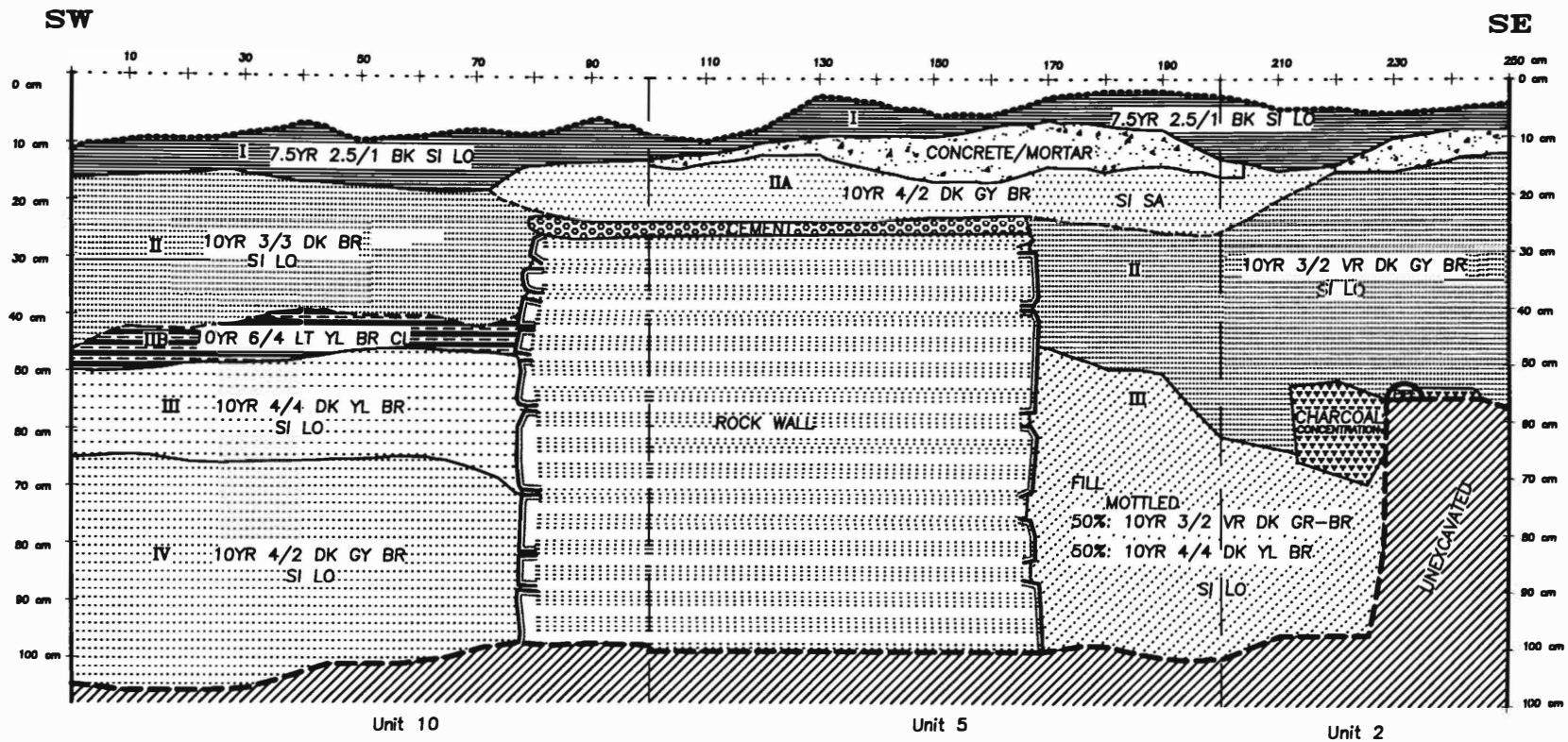


Figure 17. The east profile of Units 2 and 5 and the west profile of Unit 10.

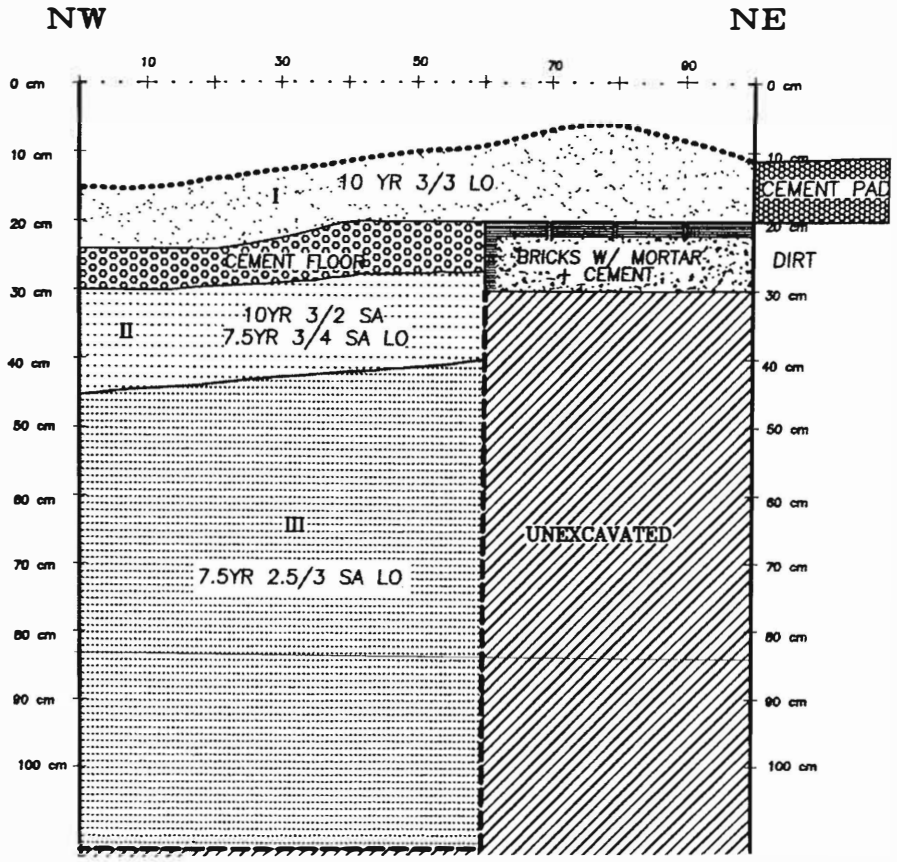


Figure 18. North profile of Unit 3.

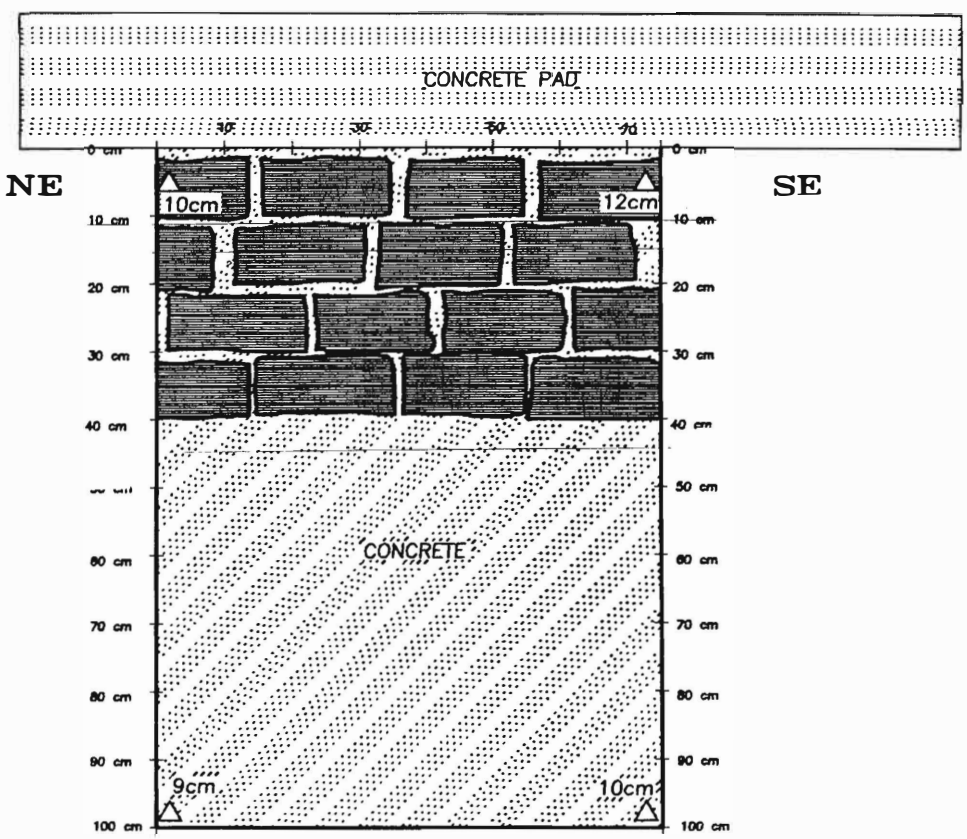


Figure 19. The plan view of the brick and concrete floor in Unit 3.

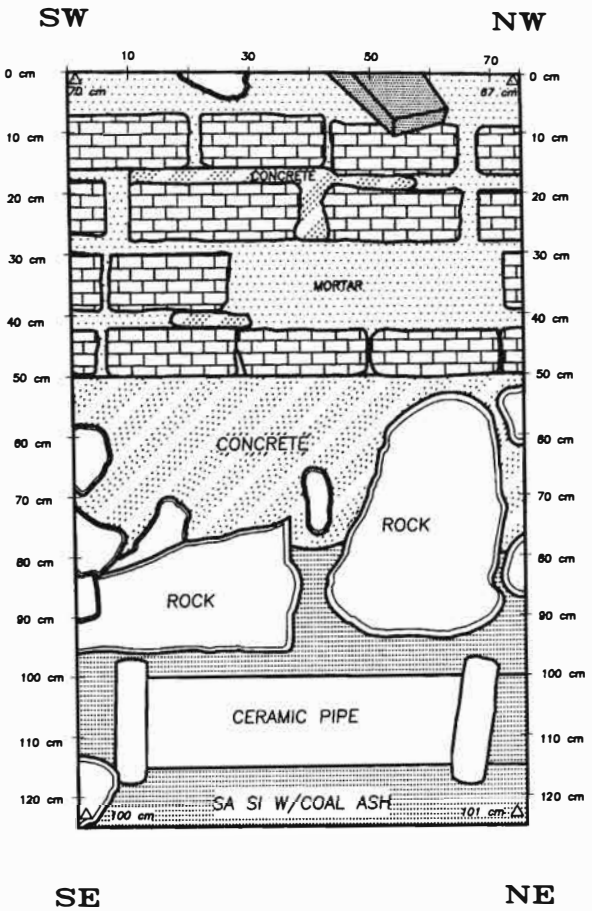


Figure 20. Plan view of the stoneware pipe and the east wall of Features 3 and 4 in Unit 4.

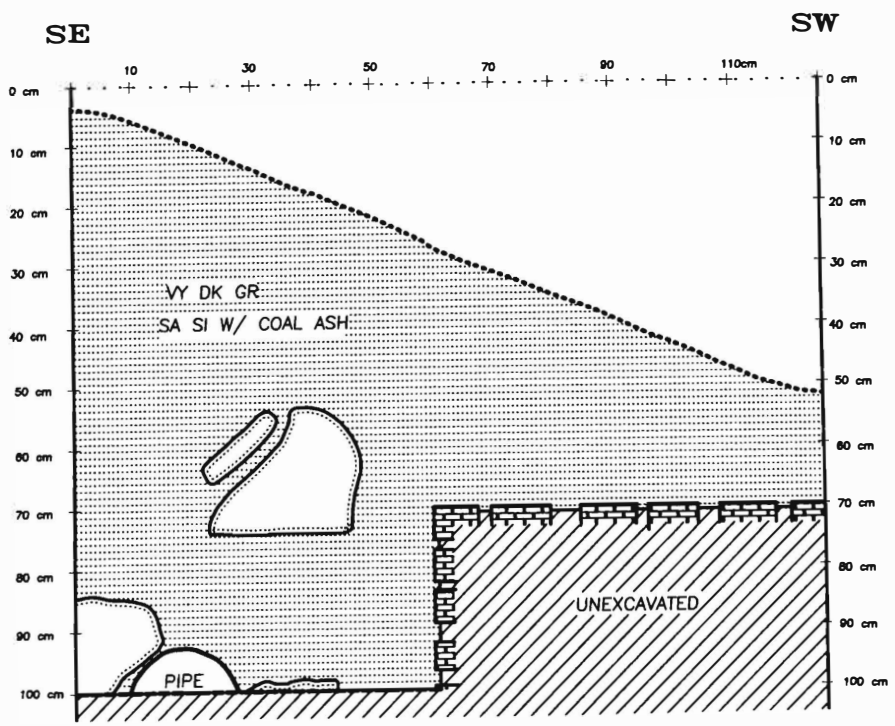


Figure 21. South profile of Unit 4.

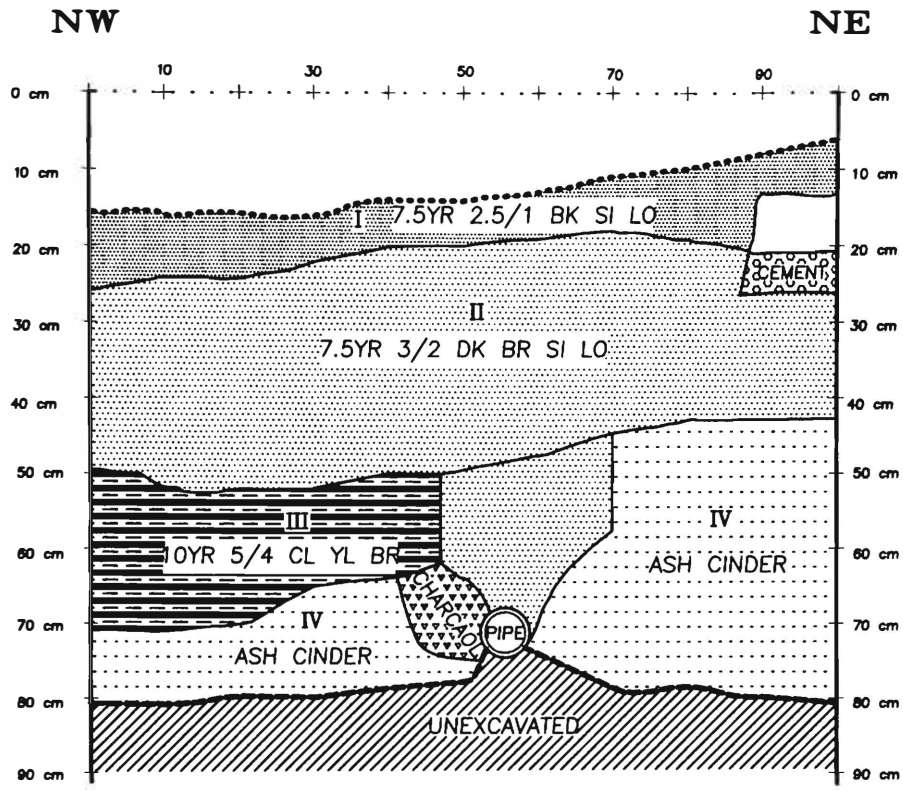


Figure 22. North profile of Unit 12.

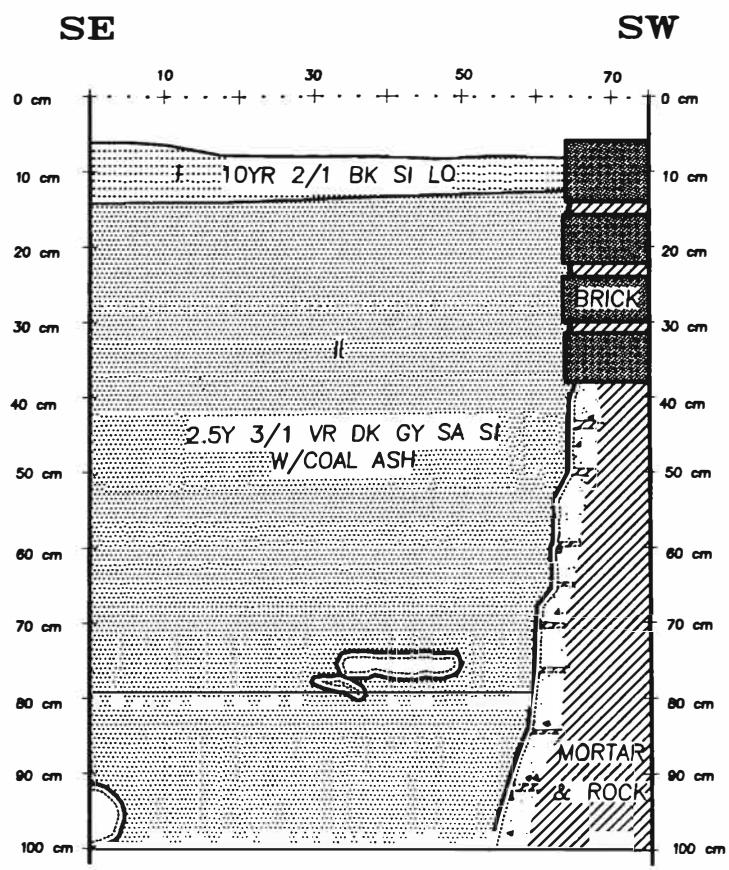


Figure 23. South profile of Unit 7.

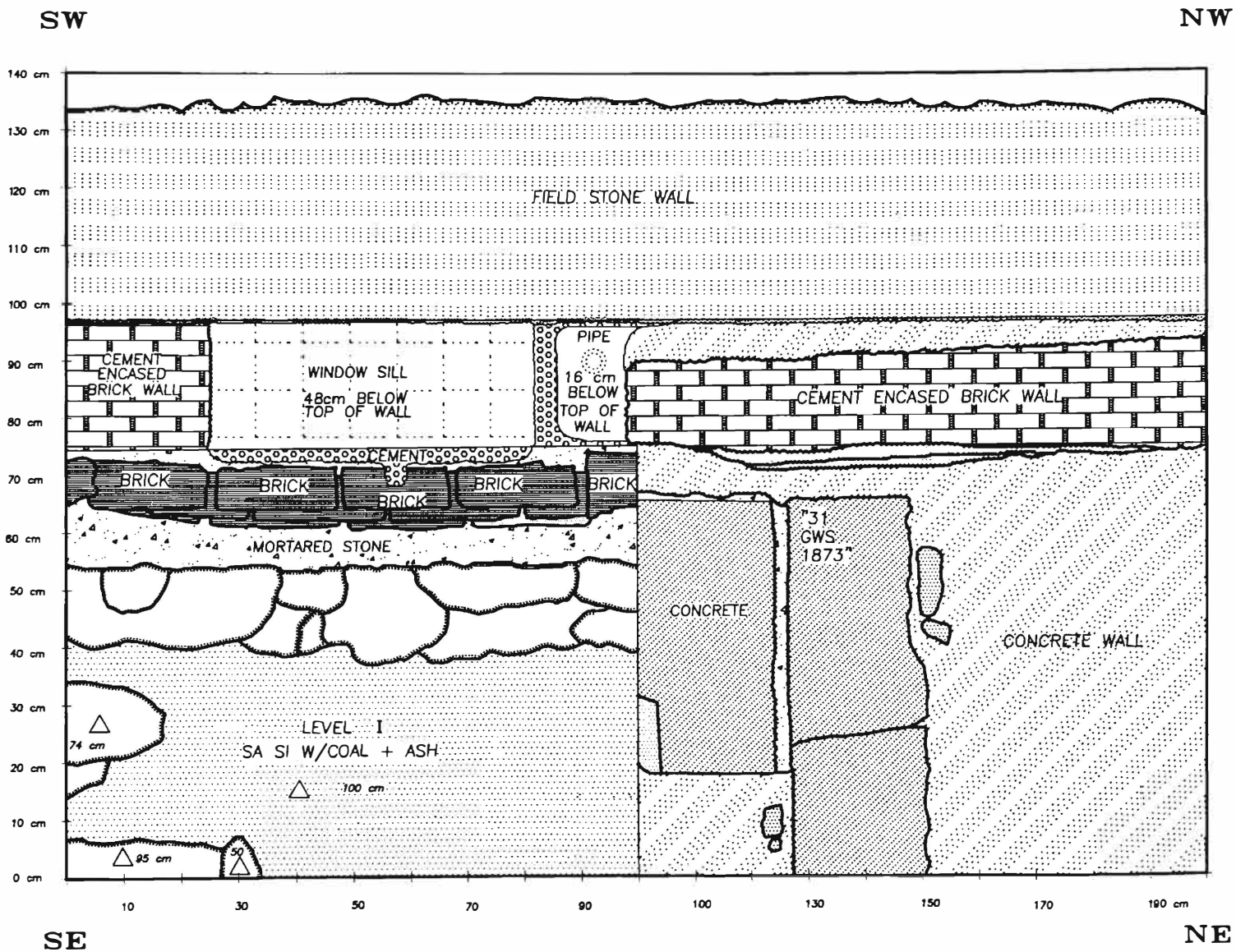


Figure 24. Plan view of the east wall of Features 3 and 4 in Unit 7 and the inscribed concrete pad on the north side.

Feature 7. Feature 7 was originally the eastern third of a large one-story storage building that was constructed during the 1885 to 1894 expansion of the lower factory complex. During the 1900 to 1905 modification Feature 7 was converted into a one-story drop shop, where the knife blades and bolster linings were stamped out of steel and brass plates. Feature 7 is a 18.5 by 5.7-m (60 by 18e ft) structure. Units 13 and 14 were excavated in the interior of the structure. The two units have slightly different stratigraphic sequences, although they are only 3.5 m (11.5 ft) apart. In Unit 13, located adjacent to the south wall of the structure, there are two soil levels deposited above the brick floor of the drop shop. Level 1 is a very dark grayish brown sandy silt with coal ash that extends from 49 to 71 cm (16 to 28 in.) below the current ground surface. The depth of Level 1 increases to the east, or up slope. This deposit may represent soil from the upper factory complex carried down the slope by erosion or slope wash. Level 2, a very dark brown sandy silt with pieces of concrete, is present from 49/71 to 92/93 and is deposited on the brick floor of the drop shop. This level represents the demolition of the drop shop sometime after the factory stopped operation in 1931 (Figures 25 and 26 and Photos 28 and 29). The artifacts from Level 2 were recovered within 7.5 cm (3 in.) of the floor and may represent the last few years of the factory's operation as well as the demolition of the shop.

In Unit 14 there are three soil levels deposited over a concrete floor or platform in the interior of the drop shop. The first two levels are present from 0 to 1/48 cm (0 to 0.5/19 in.) and 1/48 to 32/63 cm (0.5/19 to 13/25 in.) below the current ground surface. Both of these soil deposits appear to postdate the operation of the New York Knife Company factory. Level 3, a very dark grayish brown silty loam with rubble present from 32/63 to 72/97 cm (13/25 to 29/39 in.) below ground surface, was deposited when the drop shop either was demolished or fell into ruins after 1931. Artifacts were only collected from Level 3, which represents the last few years the knife factory was in operation, from ca 1905 to 1931. No artifacts were collected from Levels 1 and 2 (Figures 27 and 28 and Photo 30). The artifacts recovered from Levels 1 and 2 in Unit 13 and Level 3 in Unit 14 are associated with the last few years the New York Knife Company was in operation from circa 1905 to 1931.

Photo 28. View of the east profile of Unit 13 and the brick floor of Feature 7 in Unit 13.

Photo 29. View east of Unit 13 in relationship to the poured-concrete south wall of Feature 7 located in the upper right of the photo.

Photo 30. View of the south profile of Unit 14 and the concrete floor in this portion of Feature 7.

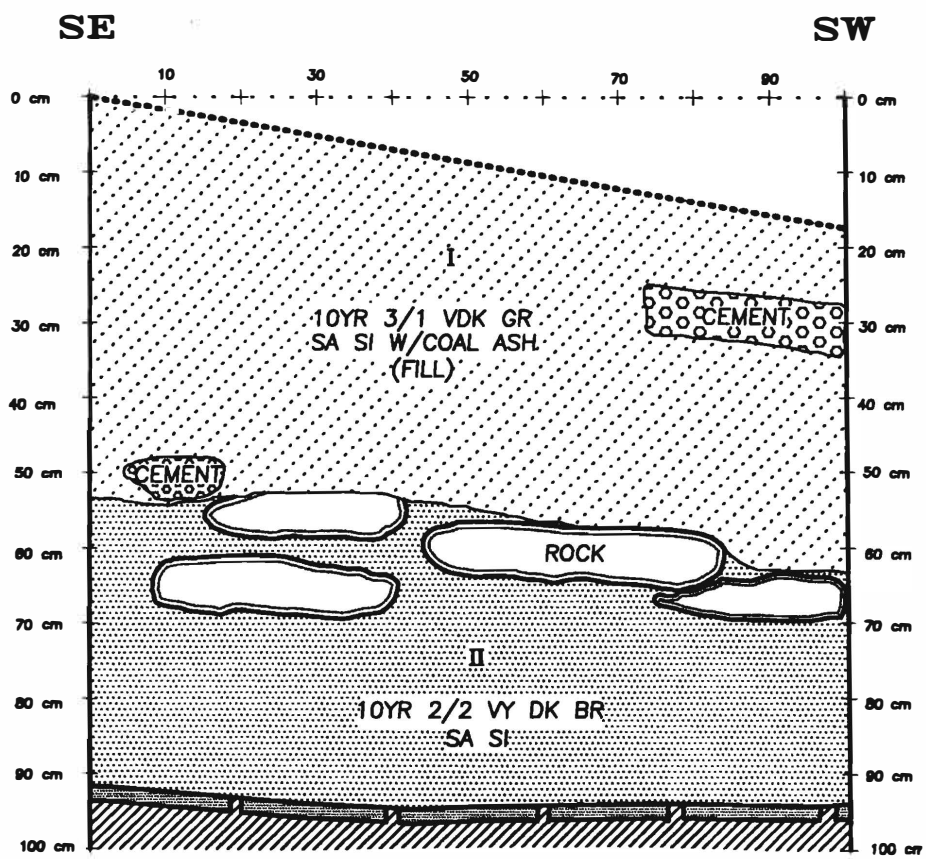


Figure 25. South profile of Unit 13.

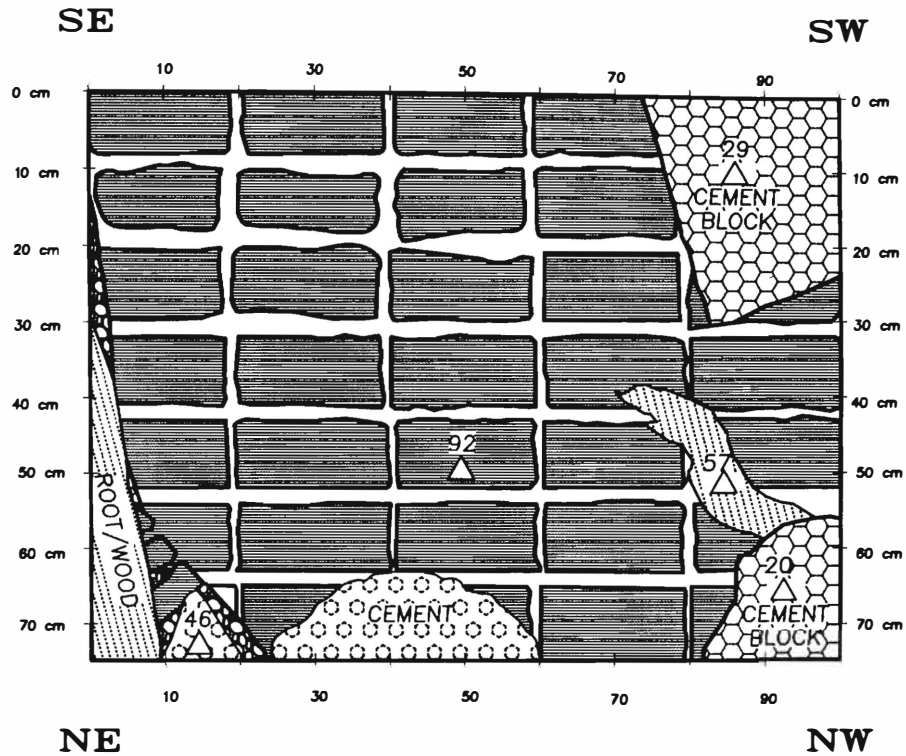


Figure 26. Plan view of the brick floor in Unit 13.

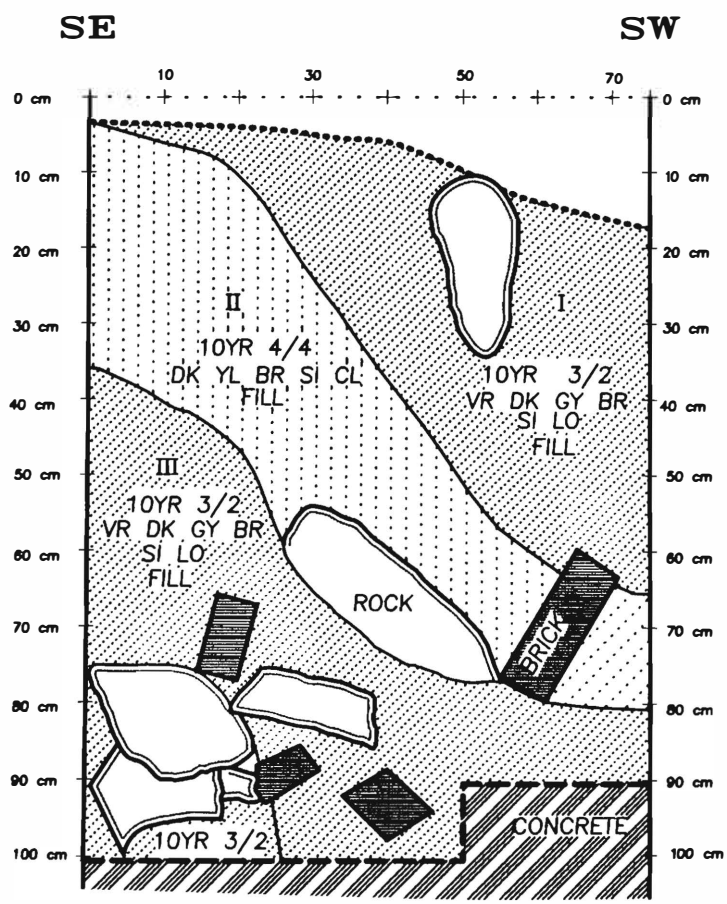


Figure 27. South profile of Unit 14.

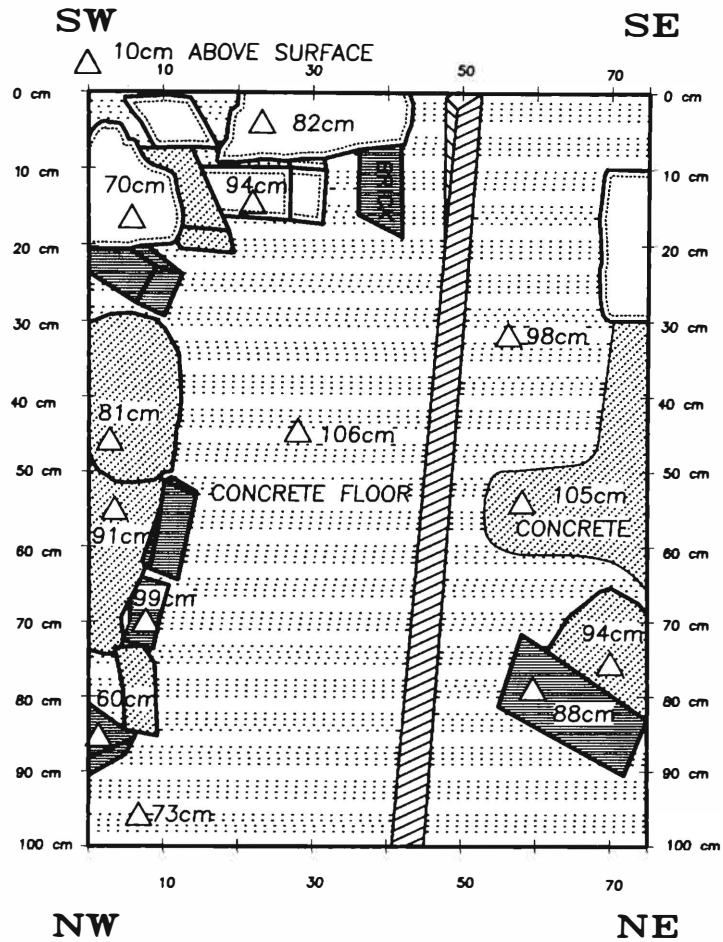


Figure 28. Plan view of the concrete floor in Unit 14.

In summary, the excavation of 14 units in the lower factory complex of the New York Knife Company documented the construction and modification of five features or structures that are partially located in the project area. The excavation of the units also documented the stratigraphic deposits that are associated with the 1875 to 1880 expansion, the 1885 to 1894 expansion, the 1900 to 1905 modification of both additions, and either the demolition or the gradual fall of the factory into the ruins that are present in and adjacent to the project area today.

ARTIFACT ANALYSIS

A total of 1,424 artifacts were recovered from the New York Knife Company factory site. These artifacts were divided into four classes; knife production, domestic, architectural, and miscellaneous. The artifacts associated with the production of knives can be further broken down into five categories that reflect the knife manufacturing process. The categories include: (1) raw materials, (2) scraps of materials from the production process, (3) jackknife parts and handles, (4) finished or almost finished products, and (5) tools and machinery. The domestic artifacts include ceramics, bottle glass, oil lamp chimney glass, faunal remains, kaolin pipe fragments, and clothing items. The architectural items include brick, mortar, concrete, window glass, nails, screws, hardware (such as hinges, staples, electrical parts) and architectural ceramics (such as sanitary stoneware and drainage pipes). The final category is miscellaneous artifacts, such as unidentified iron/steel strapping, grommets, and other unidentifiable metal objects.

The assemblage recovered from the site is composed of 72% knife manufacturing, 21% architectural, 6% domestic, and 1% miscellaneous artifacts. The location and number of each category of artifacts associated with the different periods of the factory expansion are presented in Table 4.

Table 4. The Location and Number of Artifacts Associated with the Different Periods of the Operation of the New York Knife Company Factory Site.

Period	Location	Knife Manufacturing	Domestic Artifacts	Architectural Artifacts	Misc. Artifacts	Total
1905-1931	Feature 3	387	19	33	3	442
	Feature 4	71	1	25	2	99
	Feature 6	114	16	104	5	239
	Feature 7	48	7	27	12	94
	All	620	43	189	22	874
1900-1905	Fea. 3 & 4	34	0	32	0	66
	Ext.	44	8	10	0	62
	Fea.6	175	2	26	0	203
	All	253	10	68	0	331
1885-1887	Fea. 6	40	1	10	0	51
1875/1880-1885/1887	A horizon	–	7	1	0	8
1856-1875/1880	Fea.3 &4	115	18	27	0	160
Site Total		1028	79	295	22	1424

KNIFE MANUFACTURING ARTIFACTS

Seventy-two percent of the site assemblage, or 1,028 of the artifacts, are associated with the jackknife and table cutlery manufacturing process. These artifacts were further subdivided into five categories: raw materials, production scrap, knife parts, assembled parts, and tools and machinery, which reflect the entire process of knife manufacturing. The distribution of these artifacts for the different four periods of the factory operation is presented in Table 5.

Table 5. Distribution of the Knife Manufacturing Artifacts.

	1856-1875/1880	1885-1887	1900-1905	1905-1931
Raw Materials				
Pig iron	–	–	–	3
Steel rod	1	–	–	3
Brass sheet	–	–	–	5
Steel sheet	2	–	11	3
Rivet wire	1	–	–	6
Square steel wire	12	–	8	8
Iron/Steel frags	12	1	18	34
Scrap				
Steel/Brass from bolsters	4	–	2	9
Brass from escutcheons	–	–	1	–
Steel scrap from blades or springs	6	1	16	23
Steel plate from blades	1	1	5	4
Slag	–	–	1	1
Handle scrap	–	–	–	1
Parts				
Table knife blades	7	–	3	11
Unfinished blades	12	–	–	5
Spey or spay blades	–	–	3	26
Clip	–	–	2	40
Pen	–	–	–	94
Spear	1	–	9	72
Punch	–	–	9	3
Spiral punch	–	–	–	5
Nail file	–	–	–	4
Can opener	–	–	1	4
Screw drives	–	–	–	7
Spatula	–	–	–	2
Other	1	–	–	2
Blade fragments	26	16	23	76
End spring/slide	3	17	102	14
Double end spring	–	–	6	–
Single end spring	–	1	9	6
Slide/Center scales	1	1	–	5
Bolster lining	–	1	4*	9
Escutcheon	–	–	1	1
Handles				
Wood	6	1	3	12
Bone	6	–	1	–
Horn/Antler	6	–	–	4
Shell	5	–	4	3
Celluloid	–	–	3	11
Assembled Parts				
Knives	–	–	1	12
Forks	–	–	1	5
Tools	–	–	–	26
Machinery	2	–	6	61
Total	115	40	253	620

Raw Materials. Twelve percent, or 128, of the artifacts associated with the knife manufacturing process represent the raw materials that were used in the manufacturing process. The raw materials are represented by three handles to pig iron and four steel bars that were used to make the steel plates for the manufacture of the blades and the square steel bars used to make the end springs and slide scales. All the pig iron and all but one of the steel rods were recovered from the 1905 to 1931 deposits. The other steel rod was recovered from the 1856 to 1880 deposit. Twenty-eight fragments of the square steel bar stock or wire and 65 fragments of steel plates of varying thickness were recovered from the four periods of production. The majority of the iron and steel plate fragments were recovered from the 1905 to 1931 deposits, with lesser amounts recovered from the 1900 to 1905 and the 1856 to 1880 deposits. Only one fragment was recovered from the 1885 to 1887 deposit. Five brass sheets and 16 steel sheet fragments used to manufacture the bolster linings were recovered. All of the brass scraps and three of the steel sheeting fragments are associated with the 1905 to 1931 period of operation. Eleven of the steel sheet fragments were recovered from the 1900 to 1905 deposits, and two from the 1856 to 1875/1880 deposits. Finally, seven pieces of steel wire used to manufacture the rivets were recovered. Six of the fragments were recovered from the 1905 to 1931 deposits, and one from the 1856 to 1880 level (Photo 31).

Production Scrap. The production scraps consist of pieces of brass and steel sheeting from which the bolster linings were stamped or cut out, scraps of spring steel from the production of the end springs, and steel plates from which the knife blades were produced. Other production scraps include wood from the production of some of the handles and slag from the forging process. Seven percent, or 76, of the artifacts represent scrap from the production of knife parts. The majority of the production scrap recovered from the excavations are the steel scraps from the production of the knife blades, springs, or slides. Scraps of spring or blade steel were recovered from all four periods of the factory production, with the highest amounts recovered from the 1905 to 1931 deposits and the 1900 to 1905 deposits. The next highest category is the steel and brass scraps from the production of the bolster linings. The trimmings from the bolster linings were recovered from all the periods of production except from the 1885 to 1887 deposits. Ten of the production scrap artifacts are the steel plates from which the blades were produced. The plates with the blades cut out were recovered from all of the production periods, with the majority recovered from the early twentieth century deposits. Small amounts of scraps from the production of the escutcheons, handles, and slag were recovered only from either the 1900 to 1905 or the 1905 to 1931 deposits (Photo 32).

Knife Parts. The knife parts recovered from the four periods of the factory's operation include blades, end springs, slide and center scales, bolster linings, escutcheons, and handles. Seven hundred and nine knife parts, or 69% of the total number of artifacts, were associated with the production of table cutlery and jackknives. Sixty-five percent, or 464, of the knife parts are blades, and six, or 1%, are forks. The knife blades include unfinished blades, table knives, jackknives, and blade fragments. The jackknife blades exhibit the greatest diversity in size and type. The jackknife blades include spey or spay, clip, pen spear, punches, nail files, can openers, screwdrivers, spatulas, a hunting or skinning blade, and a pipe tamp or reamer. Seventy-seven percent of the blades were recovered from the 1905 to 1931 deposits. This level also had the greatest diversity in the types of blades that were recovered, and the highest number of blade fragments. The highest amounts of table knife blades recovered were from this period. The second highest amount of blades was recovered from the 1900 to 1905 level. Ten percent of the knife blades were recovered from this deposit. The blades include three table knives, three spay, two clip, nine spear-shaped blades, and nine punches or awls. Four percent of the knife blades, all fragments, were recovered from the 1885 to 1887 deposit. Finally, 9% of the blades, which includes seven table knives, one spear, and one unfinished long jackknife blade, were recovered from the level that represents the operation of the factory from the 1856 to 1880 period of production. Along with the blades, there are six forks that were recovered from the 1900 to 1905 and the 1905 to 1931 periods of operation. The forks may have been associated with the carving knives the factory was producing during this period (Photo 33).

The next largest category of knife parts is composed of the end springs and slide and center scales, which were installed between the springs, bolsters, and multiple knife blades. Twenty-three percent, or 165, of the artifacts are either end springs or slide or center scales. Six double end springs, 16 single end springs, 7 slide or center scales, and 136 end spring or scale fragments were recovered from the 4 soil levels that represent the factory's operation from 1856 to 1931. Seventy-one percent of the end springs or scales were recovered

from the 1900 to 1905 deposits. The majority of these artifacts were fragments of either end springs or scales. However 6 double end springs and 9 single end springs were recovered from this deposit. Fifteen percent of the end springs and scales were recovered from the 1905 to 1931 deposits. Most of the slide or central scales were recovered from this period. Twelve percent of the end springs and scales were recovered from the level associated with the 1885 to 1887 expansion of the factory. Finally, 2% of the end springs and scales were recovered from the soil level that was deposited during the period from 1856 to 1875/80 (Photo 34).

Two percent of the knife parts are bolsters or bolster linings or escutcheons. Brass and steel bolster linings where the handles are attached were recovered from the 1885 to 1887, the 1900 to 1905, and the 1905 to 1931 soil levels, while escutcheons were only recovered from the 1900 to 1905 and the 1905 to 1931 levels. The majority of the bolster linings were recovered from the soil level associated with the 1905 to 1931 operation of the factory. Only one bolster was recovered from the 1900 to 1905 soil level. Lower amounts of bolster linings were recovered from the other two periods. Both of the escutcheons are 7.5 by 1.5 cm (3 by 5/8 in.) brass plates that have the New York Knife Company name inscribed on one side. No bolster, bolster linings, or escutcheons were recovered from the 1856 to 1875/80 level (Photos 34 and 35).

Nine percent, or 65, of the knife parts are handle fragments. There are five different types of handle materials that were recovered from the four periods of the factory's operation: wood, bone, horn/antler, shell or mother-of-pearl, and celluloid. The handle fragments represent blanks out of which the handles were manufactured, pieces of material that were trimmed to form the handle, and handles that were broken during manufacture or assembly. Forty-six percent of the handles were recovered from the 1905 to 1931 deposits. The most popular handle material during this period was wood, followed by celluloid (a plastic-like material developed in 1870), horn or antler, and mother-of-pearl made out of abalone shell. The next highest amount, 35%, was recovered from the 1856 to 1880 level. In these deposits there are almost equal amounts of wood, bone, horn/antler, and shell present. Seventeen percent of the handles were recovered from the 1900 to 1905 deposits. There are equal amounts of wood, mother-of-pearl or shell, and celluloid, present along with one bone or antler handle fragment. Only 2%, or one wood handle, was recovered from the 1885 to 1887 deposits (Photo 36).

Two percent, or 13, of the knife parts represent various parts that have been assembled together. Twelve of these partially assembled knifes were recovered from the 1905 to 1931 deposits, and one was recovered from the 1900 to 1905 level. Four of the partially assembled knives recovered from the 1905 to 1931 period appear to be table cutlery and the other eight are jackknives. Only a partially assembled jackknife was recovered from the 1900 to 1905 period. The assembled parts include bolsters, bolster linings, handles, escutcheons, end springs, slide and center scales, and blades in various combinations. No assembled parts were recovered from the two earliest periods of the factory's operation from 1856 to 1875/80 and 1885 to 1887 (Photo 36).

Tools and Machinery Parts. Nine percent of the artifacts associated with the manufacturing of knives are either hand tools or are associated with the machinery that was used to produce the knives. The hand tools were only recovered from the 1905 to 1931 period of production. Twenty-six hand tools were recovered from these deposits. The hand tools include 18 steel files, a riveting hammer, a circular saw blade, a cold chisel, and five clamp-like or gauging devices. The files include 12 triangular, five flat, and one half-round files. The majority of these were recovered in or adjacent to Feature 3, a grinding building. The files were used during the blade sharpening process. The riveting hammer and the five clamps or gauges were also recovered from Feature 3, and must have been associated with the sharpening or assembling processes. The circular saw blade was recovered from Feature 4, where the hafting process occurred during this period. The cold chisel was recovered from Feature 7, the drop shop, and may have been used during the stamping out of the blades of end springs (Photo 37). No tools were recovered from the deposits representing the other three periods of production.

Sixty-nine of the artifacts are associated with the machinery that was used during the production of the various knife parts. Sixty-one of these artifacts were recovered from the 1905 to 1931 period of production. Fifty-eight of these items are associated with the grinding wheels that were used to sharpen the knife blades. These artifacts include 20 grindstone fragments, 13 sprockets or sharpeners, 19 leather drive belt fragments, two belt clips, three brackets, and one collar. The gears, or sprocket-like devises, are mounted on the grindstone frames, and were used to redress the stone when it was in use. The brackets and collar were used to attach the grindstones to their frames. The belt and

two belt clips were used to transfer the power produced by the turbine to operate the grinding wheels. The other three machine parts include a pulley, a large hook, and a V-shaped object that may be associated with a hoist or lift system employed in the factory. Six artifacts that are associated with machinery were recovered from the 1900 to 1905 deposits. These artifacts include five leather drive belt fragments and one machine part. Finally, two leather drive belt fragments were recovered from the 1856 to 1880 period of production (Photo 37). No machine parts or artifacts associated with the power system were recovered from the 1885 to 1887 level. The majority of machine parts recovered from the excavations are associated with the power or drive system and the grinding wheels. There are also approximately 50 to 75 grindstones in the Wallkill River in the location of Feature 3. Feature 3 was built over the tailrace that was constructed earlier. When the building either collapsed or was demolished, the grindstones left in the interior were deposited in the river. Different types of grindstones that were visible from the shore were collected and photographed. After the photo was taken, they were redeposited back into the Wallkill River (Photo 38). The recovered grindstones indicate that there are two basic stone sizes: 55 cm (22 in.) or 27.5 cm (11 in.) in diameter.

Photo 31. Raw materials recovered from the New York Knife Company factory. Top row is pig iron and steel rods. Second row is square spring steel wire. Bottom row is pieces of sheet steel and brass. The three steel rods in the upper right of the photo are 5 cm (2 in.) in length.

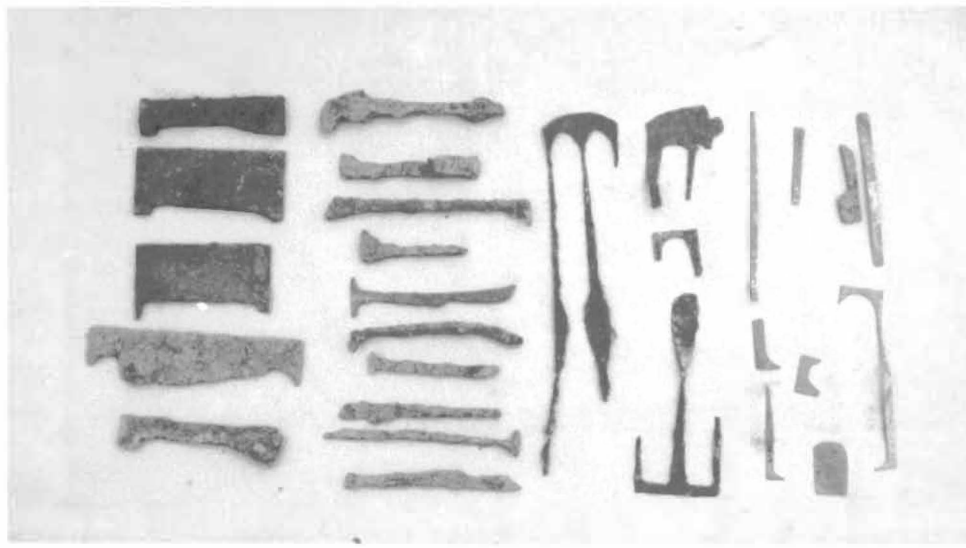


Photo 32. Production scraps recovered from the New York Knife Company factory. The rows of artifacts from left to right include steel plates from which the blades were stamped, steel scraps from the production of the end springs and scales, and sheet steel and brass from which the bolsters and scales were stamped. The two steel plates in the upper left of the photo are 8 cm (3.125 in.) in length.

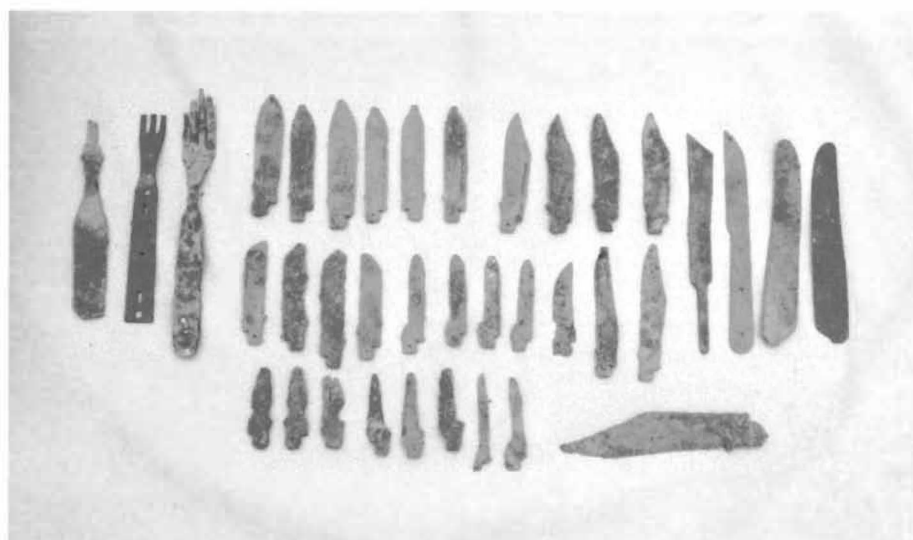


Photo 33. The various types of forks (left), jackknife blades (center), and table knife blades (right) recovered from the New York Knife Company factory. The jackknife blades from top to bottom. Row 1: Spear and clip blades. Row 2: Spay, pen, and slim clip blades. Row 3: Screwdrivers, can opener, spiral punch, punch, and hunting blade. The hunting knife blade in the lower right is 13. 5 cm (5.5 in.) in length.

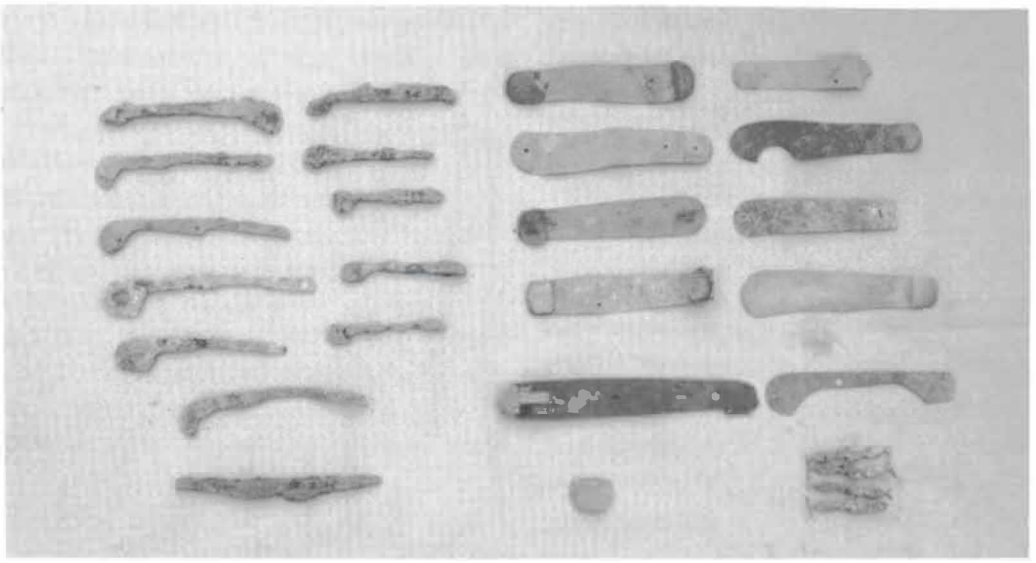


Photo 34. The artifacts from left to right. Rows 1 and 2: End springs, slide and center scales. Rows 3 and 4: Bolster linings and assembled parts, with a bolster and escutcheons at the bottom of Rows 3 and 4. All of the parts were recovered from the New York Knife Company factory. The table knife handle located at the bottom of the third row from the right is 12 cm (4.8 in.) in length.

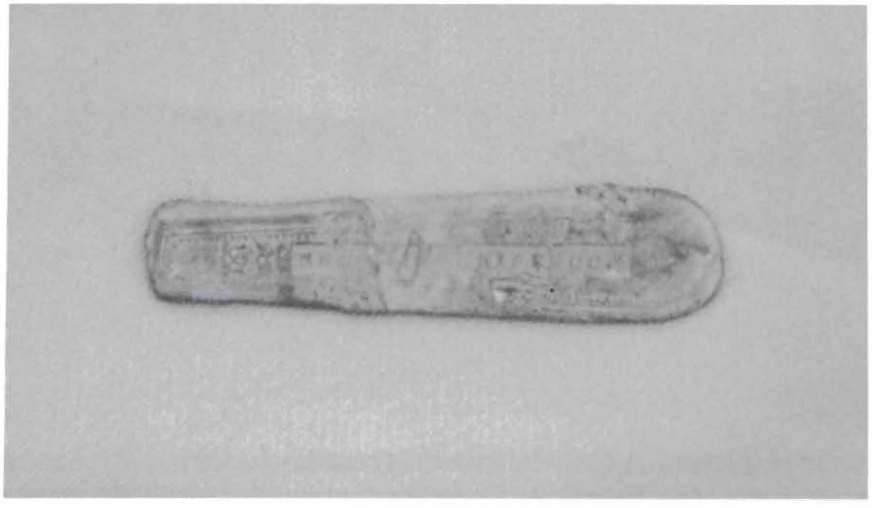


Photo 35. The brass escutcheon inscribed with the New York Knife Company name is 7.5 cm (3 in.) in length.

Photo 36. The various types of knife handles recovered from the New York Knife Company factory. Top row: Antler, bone, and shell handles. Middle row: Seven wood and four celluloid handles. Bottom row: Bolsters with handles. The sawed piece of antler in the upper-left corner of the photo is 8 cm (3.125 in.) in length.

Photo 37. Some of the tools and machine parts recovered from the New York Knife Company factory. Left side: Grinding stone, dressing sprockets, drive belt, and clips. Middle: Pulley, saw blade, gauges or clamps. Right side: Riveting hammer, cold chisel, flat files, and triangular files. The circular saw blade is 17.5 cm (7 in.) in diameter.

Photo 38. The various types of grinding stones recovered from the Wallkill River.

DOMESTIC ARTIFACTS

Seventy-nine, or 6%, of the artifacts recovered from the excavations at the New York Knife Company factory are domestic artifacts. They include faunal items, ceramics, tin cans, bottle glass, oil or kerosene lamp chimney glass, kaolin pipes, buttons, and plastic. The distribution of the domestic artifacts is presented in Table 6.

Table 6. Distribution of Domestic Artifacts.

Dates	1856-1875/80	1875-1885	1885-1887	1900-1905	1905-1931
Ceramics	1	–	1	4	3
Bottle glass and caps	9	3	–	2	29
Faunal	2	–	–	1	3
Tin cans	–	–	–	–	2
Buttons	1	–	–	–	6
Kaolin pipes	1	–	–	2	–
Lamp chimney glass	4	4	–	1	–
Total	18	7	1	10	43

Ceramics. Eleven percent of the domestic artifacts are ceramic sherds. Nine ceramic sherds representing four ceramic vessels were recovered from the five periods of factory production. A semi-porcelain sherd representing an unidentified vessel form was recovered from the 1856 to 1880 deposits. An ironstone sherd from a flatware vessel form was recovered from the 1885 to 1887 period. Four Bennington stoneware sherds representing a single hollowware vessel were recovered from the 1900 to 1905 deposits on the exterior of the factory. Three-whiteware sherds from a hollowware vessel were recovered from the 1905 to 1931 soil level. These ceramic vessels may represent either vessels that were discarded in the fill, vessels that were used for the workers' lunches, or vessels that were adapted for use in knife manufacturing to hold grease or lubricating oil.

Faunal Items. Six faunal items were recovered from the five periods of the factory's operation. The faunal items form 8% of the domestic artifacts and consist of two small clamshell fragments recovered from the 1856 to 1875/80 deposits, and four bone fragments recovered from the 1900 to 1905 and the 1905 to 1931 deposits. Two of the bone fragments have butcher marks consisting of sawn surfaces, while the other two are small fragments. The presence of butcher marks on the bone indicates that they result from either a workers lunch or rodent activity within the factory. The clamshells are very small in size and may represent a stray clamshell that was delivered along with the abalone shell used for the mother-of-pearl knife handles.

Bottle Glass and Tin Cans. Bottle glass and closures form 54% of the domestic artifacts. Forty pieces of bottle glass and three lids or caps were recovered from the five periods of occupation. Twenty-two percent of the bottle glass fragments, representing an aqua-, a clear, and a green-colored bottle, were recovered from the 1856 to 1875/80 period. Eight percent of the bottle glass, representing a clear bottle, was recovered from the 1875/80 to 1885 A horizon located on the exterior of the mill. Five percent of the bottle glass, representing a green-colored bottle and a milk glass vessel, were recovered from the 1900 to 1905 level. The majority of the glass, 65%, and all of the lids or caps were recovered from the 1905 to 1931 level. The 26 pieces of bottle glass represent at least five bottles: two clear, a light green, a green, a brown, a clear glass jar, and a milk glass vessel. The three lids that were recovered include two crown bottle caps and a jar lid. One of the clear bottles is an almost complete patent medicine bottle that was manufactured by the Mark-Owens Bottle Company between 1912 and 1929 (Fiske 1887). The date of manufacture for this bottle indicates that some of the bottle glass was deposited when the factory was in operation.

Three percent of the domestic artifacts are tin can fragments. The two tin can fragments recovered from the 1905 to 1931 deposits represent a 1.25 in. by 1.75 in. rectangular pill tin similar to the ones that are still occasionally used for aspirin.

Personal Items. The personal items are composed of seven shell buttons and three kaolin pipe fragments. The buttons form 9% and the kaolin pipes 4% of the domestic artifacts. Six of the shell buttons and two of the kaolin pipe fragments were recovered from the 1905 to 1931 deposits. The other button and kaolin pipe fragment were recovered from the 1856 to 1875/80 deposits. Three of the shell buttons are small shirt buttons, and three of the buttons are larger coat buttons. The kaolin pipes were recovered from the interior of the factory, where they were associated with knife factory employees.

Lighting Artifacts. The lighting artifacts are composed of a kerosene vertical wick burner and eight pieces of clear lamp chimney glass and form 11% of the domestic assemblage. The oil or kerosene lamp chimney glass was recovered from the 1856 to 1875/80 deposit and the 1875/80 to 1885 A horizon, and was equally distributed between the two deposits. The vertical wick burner was recovered from the 1900 to 1905 level in Unit 4, located on the exterior of the factory. All of the kerosene lamp parts were used prior to the installation of electricity, which, at the factory occurred between 1905 and 1913.

Photo 39. Some of the bottles, ceramics, kaolin pipes, buttons, and the pillbox recovered from the New York Knife Company factory. Bottle in the lower left is 12.5 cm (5 in.) in length.

ARCHITECTURAL ARTIFACTS

Twenty-one percent, or 295, of the artifacts are architectural items. The architectural artifacts include cut and wire nails, screws, bolts and washers, window glass, electrical parts, plumbing parts, brick, and concrete. The distribution of the architectural artifacts is presented in Table 7.

Table 7. Distribution of the Architectural Artifacts.

Dates	1856-1875/80	1875-1885	1885-1887	1900-1905	1905-1931
Wire nails	3	–	1	9	17
Cut nails	17	–	8	29	28
Screws	–	–	–	1	8
Bolts/Washers	–	–	–	2	6
Window glass	6	1	1	1	32
Brick	1	–	–	4	4
Concrete	–	–	–	–	7
Plumbing	–	–	–	11	20
Electrical	–	–	–	–	61
Other	–	–	–	1	6
Total	27	1	10	68	189

Two-thirds of the architectural artifacts were recovered from the 1905 to 1931 deposits. These artifacts represent the demolition and the gradual decline of the factory into the architectural ruins that are currently present within and adjacent to the project area. The architectural materials recovered from the 1905 to 1931 deposits represent all of the factory expansions that occurred between 1875 and 1880, 1885 and 1887, 1887 and 1894, 1894 and 1900, and 1900 and 1905. Twenty-three percent of the architectural artifacts are associated with the 1900 to 1905 expansion, 4% with the 1885 to 1887 expansion, and 9% with the 1875 to 1880 expansion.

Nails, Screws, and Bolts and Washers. One hundred and twelve nails, nine screws, and eight bolts and washers were recovered from the New York Knife Company factory. The nails form 38% of the architectural artifact assemblage and include 30 wire and 82 cut nail fragments. Wire and cut nails were recovered from the 1856 to 1875/80, the 1885 to 1887, 1900 to 1905, and the 1905 to 1931 deposits. The recovery of three wire nails from the 1856 to 1875/80 level indicates that wire nails were being used during the 1875 to 1880 expansion of the factory. The number of wire nails increased throughout the late nineteenth and early twentieth centuries although they never entirely replaced cut nails.

Six percent of the artifacts are screws and bolts and washers. Nine screws, six bolts, and two washers were recovered from the 1900 to 1905 and the 1905 to 1931 deposits. The majority of these items were recovered from the 1905 to 1931 level, with only one screw, one bolt, and one washer recovered from the 1900 to 1905 deposits.

Window Glass. Window glass forms 17% of the architectural artifacts and was recovered from all the cultural levels. The majority of the window glass, 63%, was recovered from the 1905 to 1931 deposits, with much lower amounts, from 2 to 22%, recovered from the levels associated with the 1875 to 1880, the 1885 to 1887, and the 1900 to 1905 factory expansions.

Masonry Products. The masonry products include nine brick and seven concrete fragments, and forms 5% of the architectural assemblage. Brick and concrete were present in all of the levels. The nine brick fragments and seven pieces of concrete were saved as a sample. Four of the bricks recovered from the 1900 to 1905 and the 1905 to 1931 levels are fire brick, which were used in the interior of furnaces and boilers and may be associated with the boiler that was in the southern end of Feature 4. Seven pieces of concrete were saved from the 1905 to 1931 deposits. This concrete was saved, since production scrap from cutting out the blades was used to reinforce the concrete.

Plumbing Parts. The artifacts associated with plumbing form 11% of the architectural assemblage and include cast iron pipe, ceramic sewer or drainage pipes, lead solder, and urinal fragments. These artifacts were only recovered from the 1900 to 1905 and the 1905 to 1931 deposits. Eight fragments of a stoneware drainage or sewer pipe, two cast iron fragments, and one sanitary stoneware pipe fragment were recovered from the 1900 to 1905 deposits. Twenty of the plumbing artifacts, consisting of 11 pieces of sanitary stoneware from a urinal, four ceramic pipe fragments, four cast iron pipe fragments, and a piece of lead solder, were recovered from the 1905 to 1931 deposits. The recovery of 12 fragments of a urinal from Units 3, 7, 11, and 13 may indicate that a bathroom was located in the northern portion of Feature 4 during the period from 1900 to 1931. These urinal fragments are similar in size and shape to the one urinal displayed for sale in the *1902 Sears and Roebuck Catalog*. The iron and ceramic pipe fragments may also be associated with the water- and waste lines that were installed in this location during this periode

Figure 29. The urinals and toilet bowls depicted in the *1902 Sears and Roebuck Catalog*. The urinal in the center of the ad is similar to the one represented by the fragments recovered from the excavations.

Electrical Parts. Electrical parts form 21% of the architectural artifacts. All of the electrical parts were recovered from the 1905 to 1931 deposits. The Sanborn Fire Insurance maps indicate that the factory was electrified between 1905 and 1913. The electrical parts include two fragments of a glass insulator, 11 fragments of round porcelain insulators, four fragments of the narrow rectangular cleats, nine fragments of either the wider porcelain cleats or the porcelain main cutouts, 32 fragments of porcelain tubes, a wiring staple, a small metal box cover, and a bulb base. These fragments represent one glass and nine porcelain insulators, three narrow cleats, three of the wider cleats or main cutouts, and three tubes that insulated the wire when they went through the floor or wall. All of these parts are depicted in the *1902 Sears and Roebuck Catalog* (Figure 30). The electrical parts represent the shift from kerosene and waterpower to electricity during the period from 1905 to 1913.

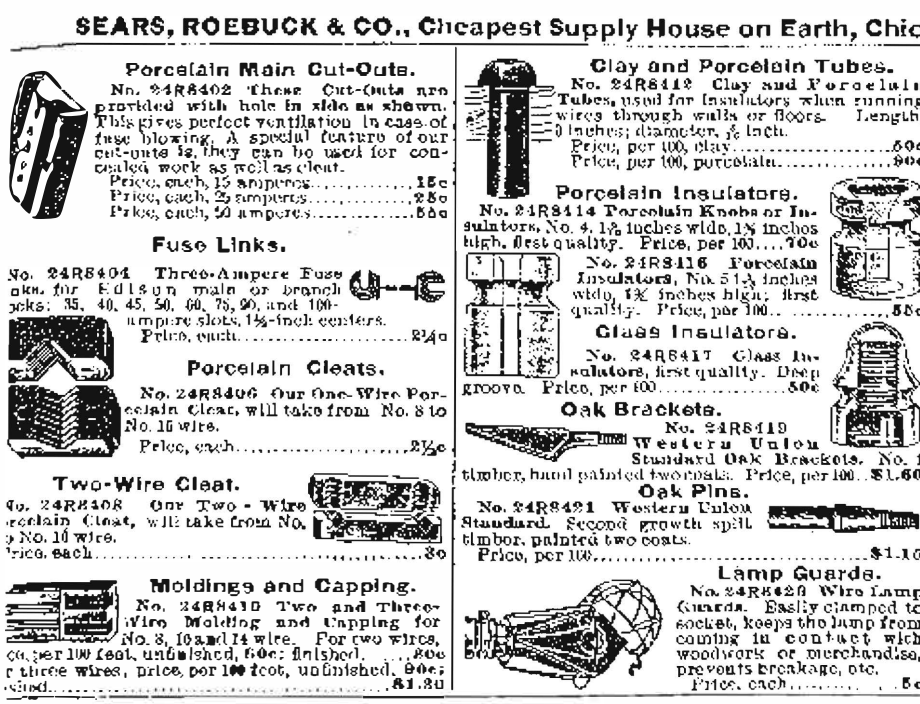


Figure 30. The electrical fixtures from the *1902 Sears and Roebuck Catalog*.

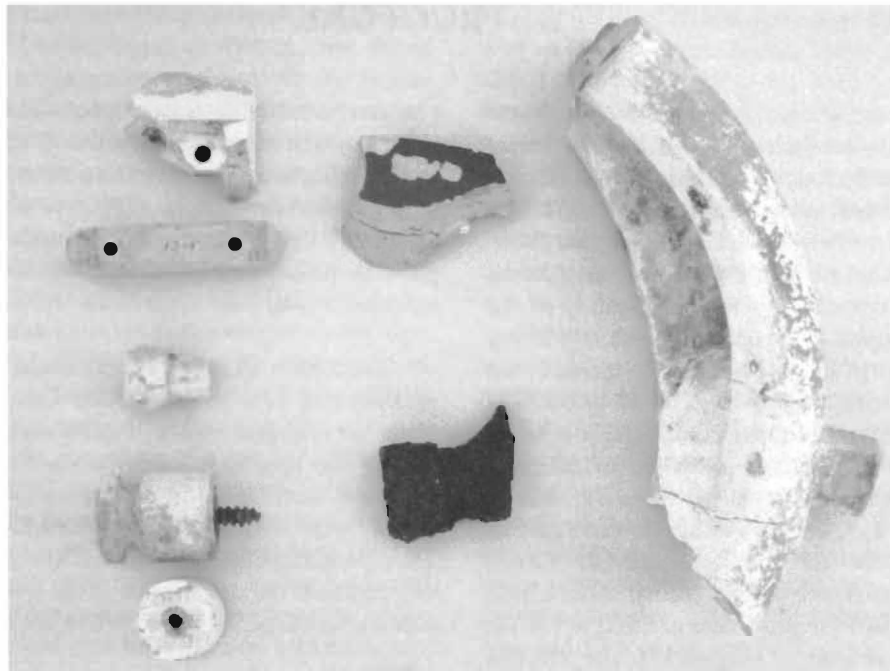


Photo 40. Some of the electrical knobs, tubes and cleats, pipes, and the urinal recovered from the New York Knife Company factory. The urinal fragment on the right side of the photo is 23 cm (9.25 in.) in length.

Finally, 2% of the architectural artifacts are miscellaneous items. These include an iron staple recovered from the 1900 to 1905 deposits, and two pieces of asphalt roofing, and four hinges recovered from the 1905 to 1931 deposits. All of the hinges were recovered from Unit 13, which may have been excavated near a doorway.

MISCELLANEOUS ARTIFACTS

One percent, or 22, of the artifacts fall into the miscellaneous category. These miscellaneous artifacts were all recovered from the 1905 to 1931 deposits. They consist of two iron rings, 11 pieces of metal strapping for crates, two casters, three paint can fragments, two grommets, and two pieces of plastic. All of the miscellaneous artifacts, except for the two pieces of plastic, may be associated with the operation of the New York Knife Company factory during the period from 1905 to 1931.

SITE STRUCTURE

The artifacts are present in one to five soil levels and are associated with the production of table cutlery and jackknives and the four major expansions of the factory during the 75-year period from 1856 to 1931. The first expansion of the New York Knife Company factory occurred between 1875 and 1880. The factory during this period was expanded by the construction of the lower factory complex, composed of a race, a grinding building, and a large storage building (Figures 3 and 10). The archaeological testing revealed the presence of the 1875-1880 north wall of the lower factory complex in Units 5 and 10. A deposit composed of coal ash, shale, and silt loam was present on the south side, or interior, in Units 2, 3, and 5, and on the north side or exterior of the north wall in Units 10 and 12. The soil ranges in depth below the current ground surface from 26 to 100 cm (10 to 40 in.) in Unit 3 to 55/62 to 100 cm (22/25 to 40 in.) in Unit 10 (Figure 17). The soil was deposited either to level or create the terrace prior to or during the construction of the lower race and factory complex between 1875 and 1880. The artifacts recovered from this level may represent the operation of the New York Knife Company factory from the start of its operation in 1856 to the first expansion of the factory that occurred between 1875 and 1880. Eleven percent of the artifacts recovered from the site were recovered from the 1856 to 1880 deposits.

The artifacts recovered from the 1856 to 1880 deposits represent 11% of the artifacts associated with the manufacturing of table cutlery and jackknives, 23% of the domestic artifacts, and 9% of the architectural artifacts recovered from the site. The distribution of the three classes of artifacts varies slightly. Forty-six percent of the artifacts associated with the knife manufacturing process were recovered from Unit 10, 32% from Unit 5, 17% from Unit 3, and 5% from Unit 12. The artifacts recovered from the 1856 to 1880 deposits represent almost all of the stages associated with knife manufacturing. Twenty-two percent of the raw materials, 14% of the production scrap, 33% of the table knife blades, 5% of the jackknife blades, 18% of the blade fragments, 2% of the end springs and scales, and 35% of the handle fragments were recovered from this period. The only knife parts that are not represented in this assemblage are the bolster linings and escutcheons. Also, 3% of the machine parts composed of leather drive belt fragments were recovered. No tools were recovered from this deposit. The raw materials, production scrap, and knife parts are not concentrated in any particular unit or groups of units. There is an almost even distribution of artifacts recovered from the exterior (51%) and the interior (49%) of the 1875 to 1880 expansion. This suggests that the artifacts in this level pre-date the expansion and represent the production of table knives and jackknives from 1856 to 1880.

The highest amount of architectural artifacts recovered from the 1856 to 1880 period were recovered from Units 10 (41%) and 5 (33%), located adjacent to the north wall of the 1880 expansion. Twenty-two percent were recovered from Unit 3 in the interior of the expansion, and 4% were recovered from the exterior of the factory. The distribution of the architectural artifacts suggests that they represent the construction of the lower factory complex during the period from 1875 to 1880.

The majority of the domestic artifacts, 72%, were recovered from Units 3 and 5, located in the interior of the 1875 to 1800 factory expansion. The artifacts recovered from the interior of the factory include two bottles, a clamshell, a kaolin pipe, and glass lamp chimney fragments from a kerosene lamp, while the artifacts recovered from the exterior represent a semi-porcelain vessel and an aqua-colored bottle. The recovery of these domestic items from the interior of the factory suggests that they are associated with the workers employed in the factory from 1856 to 1875/80.

After the construction of the lower factory complex an A horizon developed over the first level on the exterior of the north wall in Unit 10 (Figure 17). The A horizon developed between circa 1880 and 1885 or 1887, when the lower factory complex was expanded for the second time. This A horizon is present from 37/39 to 41/58 cm (14/15 to 16/23 in.) below the current ground surface. The 1885/1887 expansion is represented by the deposition of a level of soil on the north side of the wall in Units 10 and 12. This level ranges in depth from 33 to 38 cm (13 to 15 in.) in Unit 10 to 35 to 41/58 cm (14 to 16/23 in.) in Unit 12. This soil was deposited to level and expand the artificial terrace for the lower factory complex. Only 4% of the total number of artifacts recovered from the site were recovered from the 1880 to 1885 A horizon and the 1885 to 1887 deposits. Eighty-six percent of the artifacts were recovered from the 1885 to 1887 level in Units 10 and 12, and 14% were recovered from the A horizon in Unit 10.

The artifacts represent 4% of the knife manufacturing artifacts, 10% of the domestic artifacts, and 4% of the architectural artifacts recovered from the site. A limited number of artifacts associated with the knife manufacturing process were recovered from the 1880 to 1887 deposits. One percent of the raw materials, 3% of the scrap from production, 11% of the knife blade fragments, 12% of the end springs and scales, 6% of the bolsters and bolster linings, and 1% of the handle fragments were recovered from the 1880 to 1887 period of production. No tools or machine parts were recovered from these deposits. The artifacts represent the manufacturing of knives from 1875/1880 to 1885/1887. No artifacts associated with the knife manufacturing process were recovered from the A horizon that was located on the exterior of the 1880 expansion. The architectural artifacts represent the construction of the northern half of the lower factory complex in the period from 1885 to 1887. The domestic artifacts represent a clear bottle and one ironstone flatware vessel recovered from the interior of the factory, and may be associated with the workers who were employed at the factory during the 1880s. Glass lamp chimney fragments from a kerosene lamp were recovered from the exterior of the factory.

The lower complex of the knife factory for the next 13 years did not undergo any major changes until 1900 or 1905, when it was modified from one- or two- story buildings to three- and four-story buildings (Figures 7 and 10). As a part of the modification of the structures, a third level of soil was deposited in the interior of the buildings in order to raise the elevations of the first floor. This level is present in Units 3, 5, 10, and 12 in the interior, and Units 4 and 7 on the exterior of the 1875 to 1880 and the 1885 to 1887 factory expansions. Waterlines represented by 1 1/2-inch iron pipes in Units 2 and 12 were laid down in the factory interior prior to the deposition of the 1900 to 1905 level. In the interior of the factory the depth of the 1900 to 1905 deposits ranges from 15/19 to 26/30 cm (6/8 to 10/12 in.) in Unit 3, and to 10/14 to 34/35 cm (4/ 6 to 13/14 in.) in Unit 12. The soil level on the exterior of the factory extends 7/14 to 100 cm (3/6 to 40 in.) below ground surface in Unit 7. The north wall of the 1875 to 1880 expansion was covered by the 1900 to 1905 soil level and no longer served as an internal division in the interior of the factory. After the soil was deposited to level the area, a concrete floor was poured in the interior of the factory. Twenty-three percent of the artifacts recovered from the site were recovered from the 1900 to 1905 level.

Twenty-five percent of the knife manufacturing artifacts, 13% of the domestic artifacts, and 23% of the architectural artifacts were recovered from the 1900 to 1905 deposits. The artifacts recovered from this level represent all of the various stages of the knife manufacturing process and the various knife parts. Twenty-nine percent of the raw materials, 33% of the production scrap, 14% of the table knife blades, 8% of the jackknife blades, 16% of the blade fragments, 71% of the end springs and scales, 31% of the bolsters and bolster linings, and 17% of the handle fragments were recovered from the 1900 to 1905 deposits. One almost-complete fork and a partially assembled jackknife were recovered from this level along with 9% of the machine parts. The machine parts are composed of fragments and metal clips from the leather drive belts that powered the grindstones and other machinery in the factory. The distribution of the knife parts found in this level varies. Sixty-nine percent of the knife parts, including almost all of the end springs and scale fragments, and over half of the production scrap, knife blades, and fragments, were recovered from Units 10 and 12 in the interior of Features 6 and 7. Thirteen percent of the artifacts associated with knife manufacturing, including over a third of the raw materials and production scrap, was recovered from Units 3 and 5, located in the interior of Features 3 and 4. The distribution of the artifacts from the knife manufacturing process recovered from Features 3 and 4, Features 6 and 7, and the exterior of the factory is presented in Table 8.

Table 8. Distribution of the Artifacts Associated with the Knife Manufacturing Process in the 1900 to 1905 Level.

Location	Raw Materials	Production Scrap	Blades	End Springs & Scales	Bolsters/ Bolster Linings	Handles
Features 3 & 4 (Units 3 & 5)	29%	26%	21%	15%	6%	3%
Features 6 & 7 (Units 10 & 12)	9%	8%	16%	64%	1%	2%
Exterior Features 4 & 7 (Units 4 & 7)	29%	7%	36%	9%	2%	17%

Sixty-nine percent of the materials and knife parts were recovered from Features 6 and 7, 14% from Features 3 and 4, and 17% from the exterior of the factory. The distribution of the various raw materials, production scraps, and knife parts indicates that the function of Features 3 and 4 was different from the function of Features 6 and 7 during this period. Features 3 and 4 represent two different buildings: a one-story grinding building (Feature 3) and the two-story building, where the boilers and storage space were located (Feature 4). Features 6 and 7 during this period are a part of a large storage building located on the south end of a six-story building where material handling, milling, handle finishing, and machining took place. The recovery of the majority of the artifacts associated with the raw materials, production scrap, and knife parts from the interior of the storage building (Features 6 and 7) indicates that the various knife parts were stored there prior to assembly, or that this area may have been used for the production of jackknives. The materials found on the exterior of the lower factory complex represent the removal and discarding of the broken knife parts and production scrap from the various factory buildings. The low amount of materials and knife parts recovered from Feature 4 reflects the use of the majority of that structure for the boilers. The northern portion of the building may have served as a temporary storage area for materials prior to their reuse, disposal, or assembly into finished jackknives and table knives.

The distribution of the architectural materials was more even with the 47% recovered from Units 3 and 5 in Features 3 and 4, the 38% from Units 10 and 12 in Features 6 and 7, and the 15% from the exterior of the lower factory complex in Units 4 and 7. The architectural materials represent the modification of buildings from one- and two-story structures to three- and four-story buildings during the period from 1900 to 1905.

Eighty percent of the domestic artifacts consist of four sherds of a Bennington stoneware hollowware vessel, a bone fragment, two pieces of a kaolin pipe, and a glass chimney from a kerosene lamp. Twenty percent of the domestic artifacts, consisting of a green-colored bottle and a milk glass, were recovered from Unit 10 in the interior of Feature 6. The domestic artifacts may be associated with the workers employed in the factory, and one glass lamp chimney from a kerosene lamp used for the factory lighting during this period.

From 1905 until 1931, when it ceased operation, the knife factory did not undergo any major changes. The artifacts from this period were recovered from the lower portion of the A horizon within 10 cm (4 in.) of the 1905 to 1931 concrete floor of the factory. The recovery of the majority of the knife parts from the floor suggests they represent the last few years of the production of jackknives and table cutlery. Sixty-one percent of the artifacts recovered from the site were recovered from the A horizon that developed after 1931, when the factory ceased operation. These artifacts represent the production of jackknives and cutlery during the period from 1905 to 1931.

Sixty percent of the knife manufacturing artifacts, 54% of the domestic artifacts, 64% of the architectural artifacts, and 100% of the miscellaneous artifacts were recovered from the 1905 to 1931 deposits. The artifacts represent all of the various stages of the knife manufacturing process and the various knife parts. Forty-eight percent of the raw materials, 50% of the production scrap, 52% of the table knife blades, 87% of the jackknife blades, 54% of the blade fragments, 15% of the end springs and scales, 63% of the bolsters and bolster linings, and 46% of the handle fragments were recovered from the 1905 to 1931 period. Five almost-complete forks and 12 partially assembled jackknives were recovered from this level, along with all of the tools and 84% of the machine parts. Twenty-six hand tools, consisting of a riveting hammer, a cold chisel, a small circular saw blade, 5 gauges or clamps, 5 flat files, 12 triangular files, and 1 half-round file, are present in this collection. The 61 machine parts can be divided into 3 categories that are parts associated with the grinding apparatus, parts associated with the power system, and miscellaneous items. The parts associated with the grinding process include 20 fragments of grindstones, 13 gears that dressed the stones during their operation and 3 brackets and a collar that were used to mount the grindstones into a frame. The power system is represented by 19 leather belt fragments and 2 belt clips that held the belts together. The miscellaneous items include a pulley, a large hook, and a large U-shaped bracket. The distribution of the artifacts from the knife manufacturing process recovered from Features 3, 4, 6, and 7 is presented in Table 9.

Ninety-two percent of the artifacts recovered from Feature 3 are knife blades. The other 8% of the assemblage recovered from Feature 3 include 17 pieces of raw materials, a few pieces of production scrap, an end spring, a bolster lining, 2 almost completely assembled knives, and a fork (Table 15). Also, 16 tools comprising a riveting hammer, 10 files, and 5 hand gauges or clamps, and the fragments of the grindstones, power belts, the belt clips and dressing gears, were recovered from Feature 3. The assemblage from Feature 3 indicates that grinding and finishing the knife blades was the dominant activity conducted in this area of the factory during the period from 1905 to 1931.

Table 9. Distribution of the Artifacts Associated with the Knife Manufacturing Process in the 1905 to 1931 Deposits.

Location	Raw Materials	Production Scrap	Blades	End Springs & Scales	Bolsters/ Bolster Linings	Handles	Partially Assembled Knifes	Forks
Feature 3 (Units 1, 6, & 9)	5%	1%	92%	0.5%	0.5%	–	0.5%	0.5%
Feature 4 (Units 3, 7 & surface)	13%	6%	11%	10%	11%	30%	13%	6%
Feature 6 (Units 2, 5, 8, 11, 10, & 12)	27%	27%	27%	12%	–	7%	–	–
Feature 7 (Units 13 & 14)	25%	3%	29%	18%	7%	11%	7%	–

All of the categories representing the production of knives are represented in the assemblage recovered from Feature 4, a two-story storage building with a one-story room on its north end. The raw materials, production scraps, blades, bolster linings, end springs or scales, and partially assembled knifes and forks have a relatively even distribution that ranges from 6 to 13% of the assemblage from Feature 4. The only exceptions are the knife handle fragments, which form 30% of the assemblage (Table 15). The relatively even distribution suggests that Feature 4 was used to store raw materials and recycled production scrap in addition to various knife parts prior to final assembly, and possibly the finished products, especially the table cutlery and forks.

Only five of the categories (raw materials, production scrap, knife blades, end springs or scales, and handles, along with two triangular files, a small circular saw blade, and one machinery part, a dressing gear or sprocket) were recovered from the interior of Feature 6. Feature 6 was a four-story building used for grinding, hafting, and the production of table cutlery. Raw materials, production scrap, and knife blades form 81% of the assemblage, while the end springs and handle fragments form the other 19% (Table 15). The knife blades, end springs, and handle fragments, the tools, and the machine part were related to the grinding and hafting activities that took place in Feature 6. The raw materials and production scrap recovered from Feature 6 are predominantly composed of flat steel and blade fragments, indicating that either table knife blades or jackknife blades were being produced in Feature 6. Another possible explanation for the presence of these materials in Feature 6 is that these materials were being stored in Feature 6 before and after they were being used in Feature 7, the drop shop, which is located adjacent to the east side of Feature 6.

Fifty-six percent of the assemblage recovered from Feature 7, a one-story drop shop, consists of raw materials, production scrap, and knife blades. The majority of the raw materials and production scrap are from the steel plates used to produce the knife blades through the drop-forging process. Twenty-five percent of the assemblage are end springs, scales, bolster linings, and bolsters. The drop-forging process in Feature 7 also produced these parts. The other 11% of the assemblage are handle fragments (Table 15). The assemblage recovered from the drop shop indicates that the blades, end springs, and bolster linings were stamped of drop-forged out of steel plates and sheets of brass or steel in Feature 7 during this period. The raw materials, production scrap from the blade production, finished and unfinished blades, and end springs recovered from Feature 7 are related to the production of the knife blades and end springs through a cold-forging process that took place in the drop shop.

Sixty-four percent of the architectural artifacts were recovered from the 1905 to 1931 deposits, fifty-five percent were recovered from Feature 6, 17% from Feature 3, 14% from Feature 4, and 14% from Feature 7. Thirty-two percent of these artifacts are electrical insulation knobs, tubes, or cleats used to install wiring during the early twentieth century. The recovery of these artifacts from Features 3, 4, 6, and 7 indicates that the factory

was electrified after 1905, and based on the Sanborn Insurance maps, prior to 1913. Eleven percent of the architectural artifacts are related to plumbing. Eleven pieces of sanitary stoneware or a urinal were recovered from Features 3 and 4, indicating that a bathroom may have been located in the northern end of Feature 4, possibly in a portion of the one-story room located on the Sanborn Insurance maps. The recovery of 1.5 inch iron and ceramic drain or sewer pipes from Features 6 and 7 indicates that the plumbing extended into these features possibly for the sprinkler system, which was installed by 1913. Two percent of the architectural artifacts are firebricks that are used in boilers. All of the firebrick was recovered from Features 3 and 4. The firebrick may be related to the boilers that were present in Feature 4 during the period from 1894 to 1931. The other 55% of the architectural materials are composed of wire and cut nails, screws, bolts, window glass, concrete, and a few miscellaneous items, which were recovered from all of the features and units. These materials are related to the demolition of the factory after 1931.

Fifty-four percent of the domestic artifacts were recovered from the 1905 to 1931 deposits. Eighty-one percent of the domestic artifacts were recovered from Features 3 and 6, and the other 19% from Features 4 and 7. The difference in the distribution may be due to the higher number of workers employed in the grinding and hafting buildings (Features 3 and 4) than the number of those in the store room-boiler room and drop shop (Features 4 and 7). Three bottles (one of which is a 1912 to 1929 patent medicine bottle), a pillbox, three bones that have evidence of butcher's marks, and a whiteware hollowware vessel were recovered from Feature 3. Two bottles, a milk glass vessel, and three shirt buttons were recovered from Feature 6. A clear-glass jar and three shell coat buttons were recovered from Feature 7.

The archaeological testing at the New York Knife Company factory site revealed temporally distinct stratigraphic deposits associated with the expansion of the factory and production of jackknives and table cutlery. The four periods represented in the archaeological record date from 1856 to 1880, 1880 to 1887, 1900 to 1905, and 1905 to 1931. Artifacts associated with the knife manufacturing process, knife parts, and architectural and domestic artifacts were recovered from all of the periods. The majority of the artifacts were recovered from the 1905 to 1931 period, followed by the 1900 to 1905, the 1856 to 1880, and finally, the 1880 to 1887 periods. The fewest artifacts were recovered from the 1880 to 1887 deposits, which may reflect the short period of time represented.

The artifacts associated with the knife making process, knife parts, and the domestic artifacts recovered from the 1900 to 1905 and the 1905 to 1931 periods have different spatial distributions. The artifacts recovered from the 1900 to 1905 deposits in Features 3 and 4 and Features 6 and 7 appear to have different distributions. Sixty-nine percent of the materials and knife parts were recovered from Features 6 and 7, 14% from Features 3 and 4, and 17% from the exterior of the factory. The distribution of the various raw materials, production scrap, and knife parts indicates a difference in the function of Features 3 and 4 and Features 6 and 7 during this period. Likewise, the spatial distribution of the artifacts associated with the knife making process, the knife parts, tools, and domestic artifacts recovered from the 1905 to 1931 deposits also have different spatial distributions. Sixty-two percent of the artifacts associated with the knife manufacturing process and knife parts were recovered from Feature 3, 12% from Feature 4, 21% from Feature 6, and 5% from Feature 7. The different distribution indicates that different activities associated with the knife making process were carried out in different areas of the factory. The domestic artifacts from this period also have a different distribution, with 81% recovered from Features 3 and 6, and only 19% from Features 4 and 7. The difference in the distribution may be related to the number of employees who worked in each of the buildings. The differences in the temporal and spatial distributions allow the interpretation of the site from different time periods. This in turn provides the basis for the analysis of the transformation of the factory and workers' roles in terms of the local and regional economic and social conditions during the factory's operation.

INTERPRETATION

LOCAL AND REGIONAL CONTEXT

The knife manufacturing industry in the United States started in 1819, when a small factory was established in Worchester, Massachusetts, using the waterpower of the Connecticut River. The knife industry along the Connecticut River Valley in both Massachusetts and Connecticut slowly developed during the early nineteenth century. After 1830 the American knife industry went through a period of rapid development and growth through the hiring of skilled workers and innovations in the manufacturing process. A change in the American knife industry occurred in 1832, when John Russell established the Green River Knife Company with workers recruited from Sheffield, England, which was the center of the European knife industry. The Sheffield knife workers were lured to America by Russell's offer of higher wages and better working conditions. Russell modernized the knife manufacturing process by using a trip hammer to forge the blades, which allowed knives to be made faster and in greater numbers than the traditional hand-forging methods. During the 1830s several other companies (Meriden, Holley, Northfield, Burinshaw, Lakeville, and Waterville) were established in the Connecticut River Valley. By the mid nineteenth century, the Waterville Knife Company in Connecticut was the largest and most modern knife factory in the United States. The company machines produced the blades, springs, and scales, and its workers were paid $7.00 a week, well above the average wages earned by other types of factory workers.

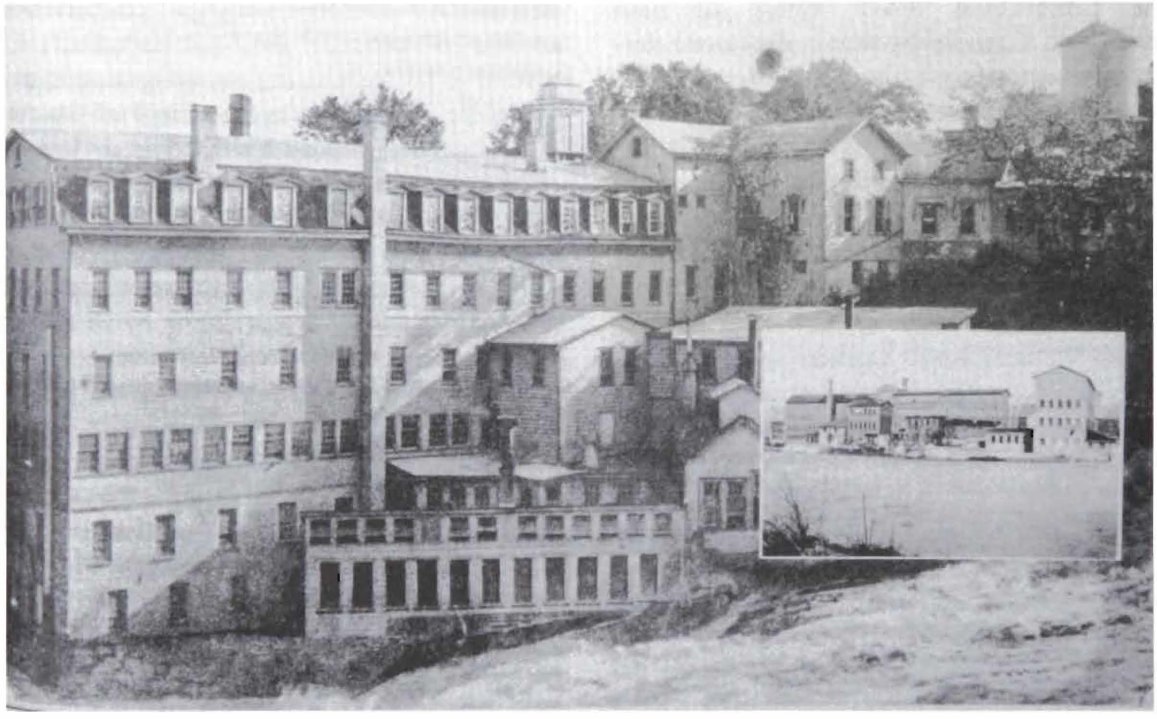
In 1852 a group of 16 workers who were upset over the cost-cutting policies of the management of the Waterville Knife Company, especially the new policy of having the cutlers provide their own files and tools, left to establish the New York Knife Company. The site the workers chose for their new factory was located on the east side of the Hudson River in Mattewan, near Beacon, in Dutchess County, New York. This location had available waterpower, while the majority of sites in the Connecticut River Valley were already developed and occupied by the existing factories, including over 100 knife manufacturing companies. The New York Knife Company was the first knife manufacturing company established in New York State. In 1856 the village of Walden in Orange County enticed the New York Knife Company to move to the village on the west side of the Hudson River to utilize a recently closed cotton mill adjacent to the high falls on the Wallkill River (Voyles 1995).

The New York Knife Company factory in the village of Walden operated for a 75-year period, from 1856 to 1931. From 1856 to 1870 Tom Bradley Sr., and from 1870 to 1903 Tom Bradley Jr. were the managers of the company. The factory underwent five major expansions that served to modernize and reorganize the production sequence for the manufacturing of jackknives and table cutlery. Not only did the New York Knife Company expand its production, but two competing knife companies were also formed in the village of Walden during this period. The Walden Knife Company was formed in 1870 by several disgruntled employees who left the New York Knife Company. The third company was formed in 1904, when George Schrade left the Walden Company to establish the Schrade Cutlery Company (Voyles 1995).

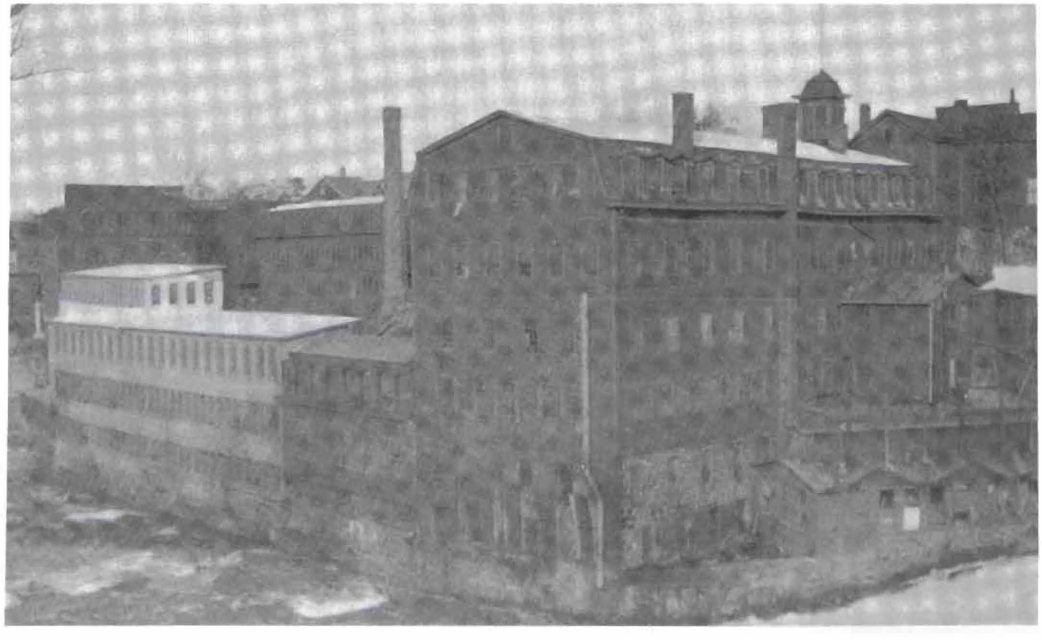
The expansion of the New York Knife Company's factory was accompanied by an increase in the number of workers, the amount of raw materials used, and the amount of jackknives and table cutlery produced. In 1860, just four years after it established in the village of Walden, the factory consisted of a single building, with 25 male and 2 female employees. The company used $4,630 of raw materials to produce $24,750 worth of knives. By 1880 the factory consisted of 13 buildings, where 144 adult males, 16 adult females, and 70 children used $50,000 worth of raw materials to produce $152,000 worth of jackknives and table cutlery (Federal Products ofIndustry Census 1860 and 1880). The factory size, number of employees, and the production of knives continued to increase from 1880 to 1905. By 1905 the New York Knife Company factory consisted of 28 buildings ranging in size from 1 to 6 stories that were arranged into a lower and upper factory complex separated by an open courtyard, with the original factory building on the south side. The number of workers employed in the factory increased from 350 in 1894 to 400 in 1900 (Sanborn Insurance Maps 1894, 1900, and 1905). During this period the factory was producing over one and a half million knives a year, with a single-day production record of 4,000. This record stood until after 1918, when it was surpassed by Remington, which started manufacturing knives after World War I to make up for the lower post-war sales of their rifles (Voyles 1995).

In 1903 Tom Bradley Jr. sold the New York Knife Company to the Fuller brothers, who also owned the Electric Cutlery Company. The factory continued to prosper under the new management until the increased

competition from the recently established Ulster, Winchester, and Remington Knife factories with modern equipment began to cut into the New York Knife Company's share of the market. The New York Knife Company in 1911, in order to shore up its market share, began producing the only official Boy Scout knife, a monopoly the company held until 1922 (Voyles 1995). By 1913 the number of people employed by the company dropped to 327 individuals, which is a decrease of 63 people from 1905. The workforce was composed of 275 adult males, 41 adult females, 8 children between the ages of 14 and 16, and 3 office employees. In 1913 the Walden Knife Company for the first time surpassed the New York Knife Company in the number of employees, with 340. The smallest knife manufacturer in Walden at this time was the Schrade Knife Company, with 137



Historic Photo 1. 1910 photo the New York Knife Company factory's south side and the Walden Knife Works in the inset. (Voyles 1995 by permission of Krause Publications)



Historic Photo 2. Early twentieth century view of the south and east sides of the New York Knife Company factory. (by permission of Daria Merwin)

employees. In 1913, 804 people, or 19% of the entire population of the village of Walden, were employed at the three knife factories (New York State Department of Labor, 1915). As the result of the employment of such a large percentage of the village population, the knife industry had a tremendous influence on the local economy. After it lost the monopoly on the production of the Boy Scout knives, the New York Knife Company could no longer compete successfully with the more modern knife producing factories. A notation on the 1924 Sanborn Insurance Map states the factory was not in operation, and the only employees were two night watchmen, indicating the factory may have had to shut down for short periods of time and had to temporarily lay off its workers. The condition of the company continued to worsen, especially after the 1929 stock market crash. The New York Knife Company factory continued to operate for parts of two more years before it was finally forced to shut down its operation for good in 1931. Only one of the other knife companies established in the village of Walden (Schrade) managed to survive the stock market crash and the Great Depression and continues manufacturing jackknives and other knives today. Along with Schrade there are still six knife manufacturing companies left in New York State: Wenger-Swiss Army in Orangeburgh, Ontario Knife Co. in Franklinville, Camillus Cutlery in Camillus, J.A. Henckel in Hawthorne, and Ka-Bar in Olean.

SITE AGE

The New York Knife Company factory, NYSM Site 10935, was established in the village of Walden in 1856. The historical documentation and archaeological testing revealed that the factory was expanded at least five times between 1856 and 1931. The expansions of the factory occurred between 1875 and 1880, 1885 and 1887, 1887 and 1894, 1894 and 1900, and 1900 and 1905. During four of the expansions soil was deposited to create and then raise the elevation of the terrace that the lower mill race and factory complex was built on. The archaeological testing revealed historic deposits in the project area from the 1875 to 1880, the 1885 to 1887, and the 1900 to 1905 expansions. The subsurface testing also revealed the presence of an A horizon that developed between 1880 and 1887 on the exterior of the 1875 to 1880 expansion, and the development of the current A horizon, or surface level, which represents the 1905 to 1931 operation of the New York Knife Company factory.

Several outside factors influenced the expansion of the factory during these periods. The first expansion, which occurred between 1875 and 1880, may have been related to the formation of a competing knife company in the village. Several employees upset with the management's attempts to control their time and constrain their autonomy left the New York Knife Company in 1870 to form the Walden Knife Company. Shortly after the Walden Knife Company was formed, the New York Knife Company started to expand, but its plans were put on hold by the financial crisis caused by the Panic of 1873. The archaeological testing provided the evidence for the expansion, which located a poured-concrete pad inscribed with the initials GWS and the date 1873, adjacent to the northeast corner of the large storage building that is present on the 1885 Sanborn Insurance Map. The expansion was stopped by the Panic of 1873, since the 1875 map of Orange County and the village of Walden still depicts the factory as a single building. The expansion appears to have finally occurred sometime between 1875 and 1880, based on the increase in the number of workers from 54 in 1875 to 235 in 1880. The second, third, and fourth factory expansions that occurred between 1880 and 1900 may be related to the Dingley and McKinley tariff bills that were passed by the United States Congress during this period. The tariffs protected the American knife industry by essentially doubling the cost of imported knives. The demand for jackknives, which were a common, everyday tool, and table cutlery may have brought about the expansions in order to increase the production capabilities of the factory. The final factory expansion, which occurred between 1900 and 1905, resulted after the company was sold to new owners in 1902, and the Schrade Cutlery Company was formed in the village of Walden in 1903. The factory does not appear to have been modified or expanded between 1905 and 1931, when the factory shut down due to the 1929 stock market crash and the resulting Great Depression.

The soil levels and the A horizons represent four different periods of production at the New York Knife Company factory. The four periods are 1856 to 1880, 1880 to 1887, 1900 to 1905, and 1905 to 1931. The artifacts recovered from the various deposits and A horizons represent the operation of the New York Knife Company factory during the 75-year period from 1856 to 1931.

SITE FUNCTION

Jackknives, penknives, and pocketknives were popular and common personal tools that performed many jobs during the nineteenth century. Jackknives were produced in a variety of styles and were used by almost every adult male, from office workers to farmers. The common occurrence and importance of jackknives in

everyday life during the nineteenth century is perhaps best demonstrated by the fact that on the night President Abraham Lincoln was assassinated, among the contents of his pockets was a jackknife. Seventy-two percent of the artifacts recovered from the site were either knife parts or artifacts associated with the knife manufacturing process, such as raw materials, scrap left over from the production of the various knife parts, tools, or machinery. The distribution of the raw materials, production scraps, knife parts, tools, and machine parts recovered from the four periods of production varies. Fifteen percent of the artifacts associated with the production of jackknives and table cutlery were recovered from the deposits associated with the 1856 to 1880 and the 1880 to 1887 periods, while 85% of the artifacts associated with the knife manufacturing process were recovered from the 1900 to 1905 and the 1905 to 1931 periods of production.

The difference in the temporal distribution of the artifacts between the mid to late nineteenth century and the early twentieth century periods of production are related to the modernization and reorganization of the knife manufacturing process. During the 1856 to 1880 operation, all of the various stages of knife manufacturing, from the production of the different knife parts to the assembly and packaging of the final product, were carried out within a single structure. While machines were introduced in the earliest years of production, craft-oriented practices remained an integral part of the production process during this period. The knife parts were manufactured either by hand or by belt-driven machinery whose tempo was controlled by the individual skilled craftsman. The traditional slower method of manufacturing may have resulted in the production of knife parts that had fewer imperfections or flaws and therefore fewer of the parts had to be discarded. This rate of production is best represented by the 1865 production of 108,000 knifes by the 66 employees of the New York Knife Company, which averages out to a production rate of approximately 5 knives a day per worker (New York State Census 1865). Even this rate of production was profitable, based on the 1875 expenditures and profits. In 1875 the factory produced $90,000 worth of jackknives and table knifes, expended $30,000 for raw materials and $19,000 for labor, leaving $41,000 for the stockholders or owners, the manager's salary, advertisement, and upkeep and maintenance of the factory structure and machinery (New York State Census 1875).

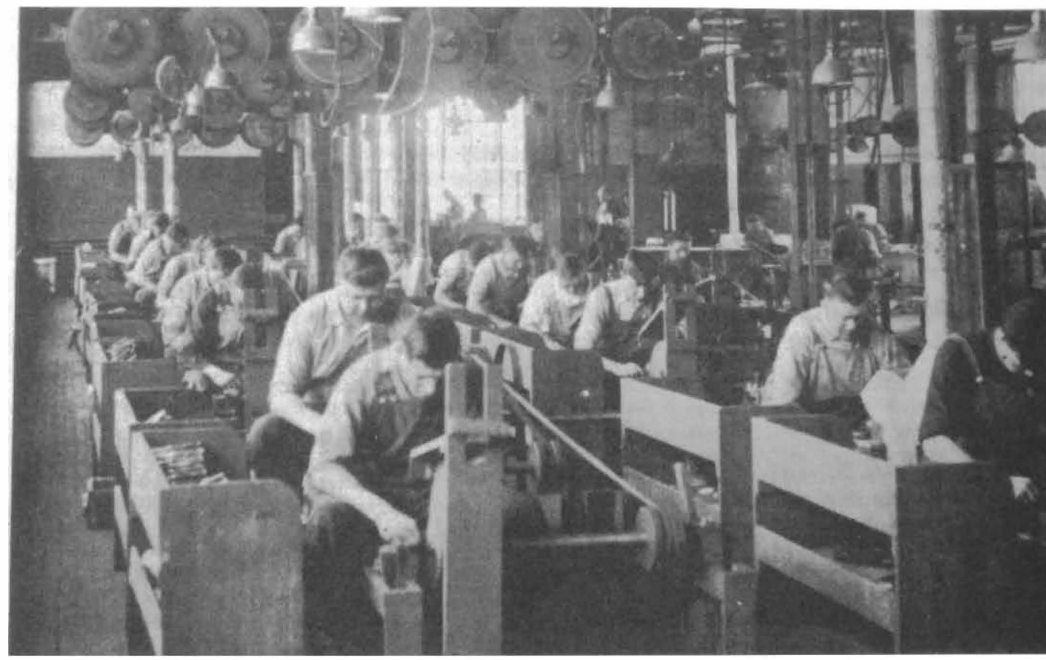
During the period from 1880 to 1905, the New York Knife Company factory underwent four major expansions. The architectural artifacts represent the four factory expansions, and forms 21% of the artifacts that were recovered from the site. Each of the factory expansions appears to be related to the modernization and the reorganization of the knife making process. Separate buildings were constructed for each step of the manufacturing process and for the storage of raw materials and finished products. The processes that were established in separate buildings during this 25-year period include the forging, tempering, hardening, and grinding of the blades, handle production, and finishing. Also, the production of table cutlery was located in areas that were separate from the area where the jackknives were produced. Separate buildings were constructed for these processes to either reorganize the production sequence or to incorporate new machinery that was at first water-powered then steam powered, and later powered by electricity. The recovery of plumbing parts, especially the cast iron pipe fragments, represents the installation of steam power during the expansion that occurred between 1885 and 1894, while the recovery of electrical parts from only the 1905 to 1931 level indicates that the factory was electrified after 1905 and prior to 1913. The new machinery, such as steam-driven hydraulic presses and steam-powered drop forges, served to mass produce the various knife parts at a much more rapid rate than the older hand-machined methods. The increase in the production rate can be seen in the number of knives that were produced during the period from 1900 to 1905. The 400 workers employed at the factory during this period produced 1,500,000 jackknives a year, which works out to a production rate of 12 knives a day per worker (Voyles 1995). This production rate is almost two and half times greater than the 1875 production rate of 5 knives a day per worker. The separation of the various production sequences, finishing, and assembly allowed these activities to continue uninterrupted by other phases of the manufacturing process throughout the 10-hour workday. The tempo and production rate of the machinery now controlled the process rather than the individual craftsman. The workers were no longer in charge of a process but just a part of the assembly line, producing or assembling a single part. The segmentation of the labor process reduced the level of skill needed to perform a task and served to constrain the workers' autonomy while it increased efficiency and reduced the cost of production. The transfer of the skills from the worker to the machinery gave the factory owners increasing control over the work process and the workers (Shackel 1996:168). The segmentation of the labor process and increased production speed may be represented by the increase in the number of knife parts that were manufactured with imperfections or flaws and discarded during the 1900 to 1905 and the 1905 and to

1931 periods of production. This was observed archaeologically in the increase in the number of artifacts associated with the knife manufacturing process recovered from the early twentieth century deposits.

The artifacts associated with the knife making process recovered from the 1900 to 1905 and the 1905 to 1931 periods have different spatial distributions. Sixty-nine percent of the materials and knife parts were recovered from Features 6 and 7, 14% from Features 3 and 4, and 17% from the exterior of the factory. The distribution of the various raw materials, production scrap, and knife parts seems to indicate a difference in the function of Features 3 and 4 and Features 6 and 7 during the 1900 to 1905 period of production, while 62% of the artifacts associated with the knife manufacturing process during the 1905 to 1931 production period were recovered from Feature 3, 12% from Feature 4, 21% from Feature 6, and 5% from Feature 7. The differences in the spatial distributions of the artifacts associated with the knife manufacturing process recovered from the 1900 to 1905 and the 1905 to 1931 periods of production indicate that different activities— grinding, drop forging the blades and end springs, and hafting— were now conducted in the different buildings within the factory complex. The difference in the spatial distribution of the various knife parts, production scrap, and raw materials represents the reorganization of the production sequence and the segmentation of the labor process that occurred during the early twentieth century at the New York Knife Company factory.

Finally, the last artifact category, domestic artifacts, forms 6% of the total number of artifacts recovered from the site. These artifacts provide insights on some of the workers' activities and behavior during the 75-years that the factory was in operation. The majority of the domestic artifacts recovered from the site consist of bottle glass. Bottle glass was recovered from all four periods of the factory's production, mostly from the 1905 to 1931 deposits. The recovery of an almost whole patent medicine bottle manufactured between 1912 and 1929 may indicate that most of the bottle glass recovered from all the periods of production was associated with patent medicines bottles. The presence of patent medicine bottles along with one pillbox represent the worker's health conditions and the illicit consumption of alcohol on the job. Employment in a late nineteenth or early twentieth century factory, including the New York Knife Company factory, could be dangerous to one's health and safety. Almost every article written about knife factories or the manufacturing process mentions that the workers in the grinding rooms eventually suffered the ill effects of grinder's consumption. Grinder's consumption is better known today as silicosis. Apparently, the fine particles of dust created when the knife blades were ground on sand-

Historic Photo 3. 1911 photo of grinding room employees at the New York Knife Company. (Voyles 1995 by permission of Krause Publication)



Historic Photo 4. Early twentieth century photo of a grinding room in a knife factory. (Voyles 1995 by permission of Krause Publication)

stone grinding wheels would collect in the cutlersh lungs, causing silicosis after only a few years of work (Peterson 1958:145). Perhaps the workers tried to combat the effects of silicosis by consuming the patent medicines and pills during the workday. Another possibility is that the workers were consuming the patent medicines for their moderate to high alcohol content. The discreet consumption of alcohol during the workday may have been a way the workers protested the increasing control over their lives brought about by the segmentation of the labor for the knife manufacturing process. Other dangers in the factory included bursting grindstones, broken drive belts, red-hot materials, and belt drives that could catch the workersh clothing and draw them into the machinery, injuring hands, arms, or legs. Perhaps the six buttons recovered from the factory represent clothing that got caught in the machinery. The other domestic materials include a few ceramic vessels and a couple of faunal items that were recovered from the factory area. These items may represent workers' lunches that were delivered to the factory by their spouses or mothers. The final domestic items are the kaolin pipe fragments that were recovered from the 1856 to 1880 and the 1905 to 1931 deposits. Kaolin pipes during the late nineteenth century became established as the working man's preferred method of smoking and were a symbol of the working class. The continued use of the kaolin pipes by the working class during the third and fourth quarters of the nineteenth century and the early twentieth century can be seen as a rejection of middle-class values, which viewed smoking as a leisure activity. Thus, the clay pipe that would be smoked during the workday became a symbol of the working class, which set them apart from the middle class and their value system (Cook 1989:215-222). The use of kaolin pipes may also have been a reaction to the reduction of the employee's status from craftsman to assembly line worker that occurred during the segmentation of the labor process in the early twentieth century.

Similar artifacts and results were recovered from the excavations conducted by Edward Lenik at the Booth Brothers Knife factory in Stockholm, New Jersey, in 1968. Lenik, in advance of the expansion of State Highway 23, documented the power system and the factory building, and conducted excavations that revealed cultural deposits associated with the operation of the Booth Brothers Knife factory. The factory was in operation at this location from 1889 to 1903. Thousands of knife parts from all phases of the manufacturing process were recovered along with architectural and domestic artifacts. The blades, end springs, bolster linings, handles, and scraps of brass and iron were recovered from the archaeological excavations along with 218 triangular files, blacksmith tongs, grindstone fragments, and metal cutting shears. The tools and knife parts are very similar to the ones recently recovered

from the excavations at the New York Knife Company factory. What is more interesting is that the domestic material recovered from the Booth Brothers Knife factory is also similar to the ceramics and bottles recovered from the New York Knife Company factory. Hundreds of ceramic sherds, 435 kaolin pipe fragments, 19 buttons, and thousands of pieces of bottle glass were recovered from the excavations of a refuse dump at the downstream side of the base of the dam. At least 8 of the ceramic sherds had maker's marks that date between 1875 and 1890, and suggest that the artifacts were deposited during the period from 1889 to 1903, when the factory was in operation. The kaolin pipe fragments represent over a hundred pipes. The kaolin pipe styles represented in the refuse dump include Home Rule, Peter Dorni, and ones made in Scotland and Germany. The bottle glass represents at least 34 bottles and includes 13 patented medicine bottles, 1 warranted flask, 7 soda bottles, 2 perfume bottles, and 11 bottles whose contents could not be identified (Lenik 1968).

While the artifacts recovered from the Booth Brothers Knife factory are similar to the ones recovered from the New York Knife Company factory, there are differences in the assemblages. The major difference is that the majority of the tools, production scrap, and knife parts were recovered from a single level on the exterior of the Booth Brothers Knife factory, while the artifacts recovered from the New York Knife Company factory were recovered from stratified deposits, with at least two of the levels showing differences in the spatial distribution of the artifacts recovered from the interior of the factory. Although the Booth Brothers Knife factory had fewer employees— between 20 and 30 workers— more ceramic vessels, kaolin pipes, and bottles were recovered from there than from the New York Knife Company factory which employed between 230 and 400 workers during the same period. Although the difference in the number of domestic items may be related to the difference in the percentage of the site that was excavated, it also can be related to the differences in the production style employed at the two factories. At the smaller Booth Brothers Knife factory, which consisted of a single building, individual craftsmen still manufactured knives by hand rather than on an assembly line, where the work was segmented into a series of repetitive tasks and mostly done by machine. The traditional craftsman pattern of work is characterized by the individual controlling his own time and rate of production, with cycles of work followed by leisurely breaks for conversation and even pints of beer. This differs greatly from the pattern of work used by the assembly line to mass production, which reduces work to a series of repetitive tasks and where the management controls the workers' time, and the pace of production is set by the machinery. The second difference is that the deposits at the Booth Brothers Knife factory only represent one period of production, from 1889 to 1903, although the company started in 1864 and continued to operate in the borough of Sussex, New Jersey, after 1903. Apparently, when the owners of the Booth Brothers Knife Company adopted new technologies or manufacturing processes they usually moved their operation into a larger, existing mill building that was located in a new location rather than expand their existing factory. The absence of the earlier and later deposits associated with the knife manufacturing process and workers does not allow changes in either the methods of production or workers' behavior to be observed over time, unlike the stratified deposits at the New York Knife Company. In 1900, the New York Knife Company factory was not only one of the largest knife factories in New York State but also was one of the larger knife factories in the United States. The stratified deposits at the New York Knife Company factory document the changes that occurred in the size and spatial organization of the factory, the changes in production technology and methods, and the workers' behavior over time.

The continuing changes in size and spatial organization of the New York Knife Company factory and methods of production document the rise of the industrial era, characterized by the shift from hand to mass production and the rise of the working class. The shift from an agricultural to an industrial economy had a tremendous impact on everyday life. The daily and seasonal rhythms of agricultural life, which governed the majority of the population during the nineteenth century, were replaced by the clock and calendar in the industrial economy. The factory operated throughout the year, 6 days a week, 10 hours a day. The workersh world was more specialized, disciplined, and mechanized than the farmersh or craftsmen's. The industrial workers' time was controlled by the factory's management; they had to be at work at a certain hour and spend a predetermined amount of time doing a specific task. Work was reduced to a series of repetitive tasks that limited the workersh control of production, unlike the farmers or craftsmen, who controlled their own time and production. The historical research and the archaeological investigations conducted at the New York Knife Company site not only documented the growth of a specific industry, but also revealed information on the impact of industrialization and capitalism on the factory's production methods and workers.

SIGNIFICANCE ASSESSMENT

INTEGRITY

Integrity is the ability of the property to convey its historical significance. Location, design, materials, and associations are generally the most relevant aspects of integrity mentioned under "Criterion D" for National Register eligibility (Townshed, Sprinkle, and Knoerl 1993:17). Criterion D defines a significant property as one likely to yield, or one that has yielded information of historical importance. Information that contributes to our understanding of history is important. The archaeological and historical research at NYSM Site 10935, the New York Knife Company factory site, has provided data that relates to specific research topics that are currently subjects of investigation by historians and archaeologists. The New York Knife Company factory site exhibits integrity of location, design, material, and associations. Located in the village of Walden, in the Town of Montgomery, Orange County, New York, the New York Knife Company factory site represents the shift from the hand production of knives by individual craftsmen to the mass production of knives through the segmentation of the knife manufacturing process. The segmentation of labor reduced the work to a series of repetitive tasks conducted by different workers, reducing the level of skill needed to perform a task, which served to constrain the workers' autonomy, increased efficiency, and reduced the cost of production. The segmentation of work in American industries gave rise to the working class during the late nineteenth and early twentieth centuries. The economic and social change has been documented in the construction and arrangement of the factory, the changes in the spatial organization of the factory, and the changes in the knife production process at the site. In addition, the historic and archaeological evidence document a change in the aspects of the site's spatial organization or design, cultural materials, and associations over the 75-year period of the factory's occupation.

The identification of intact archaeological deposits, separated in space both vertically and horizontally, at this site has resulted in the interpretation of the site from different time periods. This allows the analysis of the transformation of the specific site in terms of the local and regional economic and social conditions at different times. Soil and material units are separated horizontally in the excavations, and features have been dated by archaeological methods to represent different spatial arrangements of the site during different occupational periods.

The New York Knife Company factory site exhibits integrity of association in the strong relationship between the site's data and the research questions of technological, economic, and social change brought about by the shift from an agricultural based economy to an industrial economy. The shift to an industrial economy occurred earlier in the village of Walden than in most of the small towns in New York State due to the presence of the New York Knife Company and the two later knife manufacturing companies, Walden and Schrade.

SIGNIFICANT RESEARCH TOPICS

The historical documentation and archaeological testing identified four periods of production that correlate with changes in the New York Knife Company factory size, spatial organization, and methods of production. The first period of production, from 1856 to 1880, represents the initial establishment of the factory in the village of Walden in a single building and the hand production of knives by craftsmen. During this period the workers literally owned the means of production, since the owners of the factory were also required to be workers. The second period, from 1880 to 1887, is characterized by the expansion of the knife factory from one to 10 buildings, an increase in the number of employees from 54 to 230, and the reorganization of the knife manufacturing process. During the first expansion separate buildings were constructed for the storage of raw materials, finished products, forging, tempering and hardening, grinding, handle production, and finishing. The first expansion represents the start of the segmentation of the work where craftsmen were replaced with machinery and laborers. The third period, from 1900 to 1905, is characterized by the expansion of the factory from 10 to 26 buildings, an increase in the labor force from 230 to 400 workers, and the further reorganization and modernization of the knife manufacturing process. This period is also characterized by the further segmentation of the work process, whereby each step of the knife manufacturing process was carried out either in separate buildings or on different floors within the same building. The further segmentation of the work process is related to the start of the mass production of jackknives and table cutlery and the replacement of craftsmen by machines and laborers. Finally, the fourth period of production, from 1905 to 1931, is characterized by the total segmentation of the knife manufacturing process, the mass production of knives, and the economic decline of

the New York Knife Company. The economic decline of the New York Knife Company factory was caused by increasing competition with a number of knife factories that had continued to modernize their machinery and manufacturing process after World War I.

The transformation from hand production to mass production of goods was accompanied by changes in the size and spatial organization of the factories, the change in the size and the specialization of the workforce, and the development and rise of the working class. The details of this transformation, the documentation of the industrial adaptations to the changing production techniques and market demands, and the specific spatial changes within the factory that resulted have been the subjects of investigation at the New York Knife Company site. Additional archaeological research will contribute to our ability to address the following list of significant questions:

Can the knife manufacturing process for each of the four periods of production be refined spatially and temporally?

How did the shift from craft to assembly line production, represented by the segmentation of the work process affect the quantity and quality of the raw materials and finished product?

Is the increase in production waste or errors related to the shift from craft to assembly line production, the use of lower-quality raw materials, the organization of the factory, or the use of less-skilled labor?

What are the relationships between variation in knife design and competition, economic conditions, transportation, and raw materials?

Can additional domestic middens related to the workers be located to further document the impact of the segmentation of the work process on the factory employees?

ADEQUACY OF HORIZONTAL AND VERTICAL BOUNDARY DEFINITION

The site examination conducted on NYSM Site 10935, the New York Knife Company factory site, indicated that the archaeological deposits are intact and have not been disturbed by the post-1931 demolition of the factory or any other post-occupational activities conducted on the site. Based on the excavation of one STP during the Phase 1 testing and 14 units during the site examination and the presence or absence of cultural material, the site area extends north and south of the current project area. The subsurface testing indicated that the majority of the site is undisturbed and has both vertical and horizontal integrity (Figure 31).

ASSESSMENT OF POSSIBLE PROJECT EFFECTS

NYSM Site 10935, the New York Knife Company factory site, is in the project area for PIN 8021.54.101, NY 52 Replacement of BIN 1026680 over the Wallkill River, in the village of Walden, in the Town of Montgomery, Orange County, New York, Office of Parks, Recreation and Historic Preservation project review number 98PR3690. The presence of 1 to 1.5 m (3 to 5 ft) of fill on top of the slope in the location of the upper factory complex and 1 m (3 ft) of fill in the northern half of the project area in the lower factory complex in the location of Units 13 and 14 will protect the majority of the site within the proposed project area from the impact associated with the cutting and filling for the proposed construction of an access road. The deposition of fill over the southern half of the project area in the lower factory complex for the road construction will also serve to protect this portion of the site from the impact of the proposed road construction (Figure 31).

RECOMMENDATIONS

If the grading of the project area in the location of the upper factory complex extends below 1.5 m (5 ft), this area should be monitored during construction to locate and document any features or deposits associated with the New York Knife Company factory. The filling in of the lower portion of the project area should not impact the subsurface deposits. However, care should be taken in the location of the extant eastern wall of Feature 4 and the inscribed concrete slab, and the brick-and-stone–covered arch and the east and west walls of Feature 5 so they are not damaged during the deposition of fill for the construction of the access road. The recommendations are limited to the site area currently within the proposed project area. The New York Knife Company factory extends beyond these project boundaries and any alteration of the project limits, or additional work outside of these limits, should be assessed separately for the impact on this National Register–eligible archaeological site.

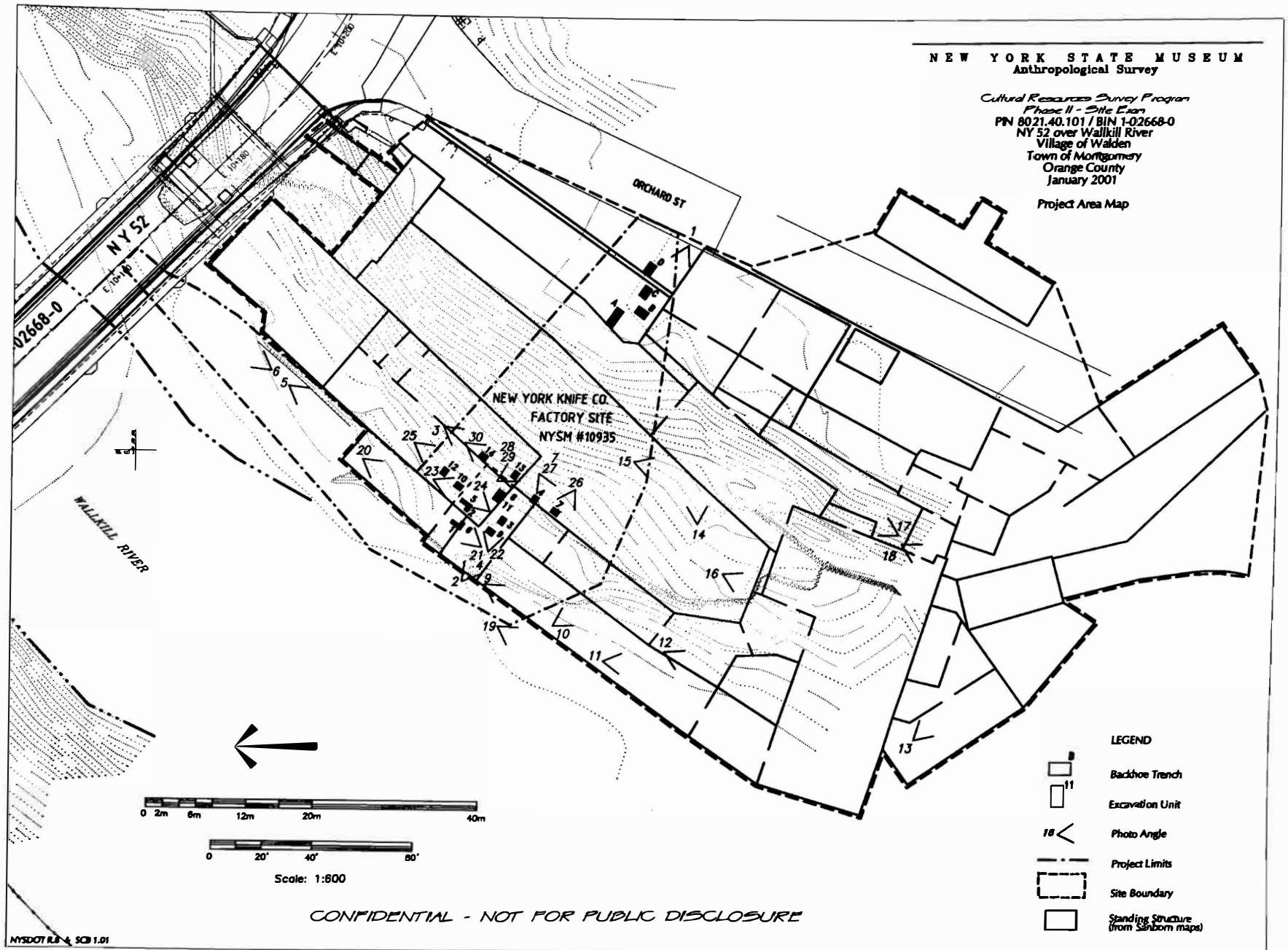


Figure 31. Archaeological testing conducted on NYSM Site 10935 during the site examination for PIN 8021.40.101.

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APPENDIX B. UNIT AND STP DATA

Unit	Level	Depth (cm)	Soil Description	Cultural Material
1	1	0-10/32	Black sido	CM
		10/11-	Brick wall	–
		22/32-	Brick floor	–
2	1	0-7/8	Dark br sido	NCM
		0/8-8/13	Concrete floor	–
		7/8-54+	Concrete coated rock wall	–
		7/8-54	Pipe trench gr br & br Sandy lo w coal ash	NCM
	2	8/13-44/46	Grey br si sa	CM
	3	44/46-54+	Brown sa lo w coal ash and shale	NCM
3	1	0-9/11	Very dk bl loam	CM
		9/11-15/19	Brick and concrete floor	–
	2	15/19-26/30	Very dk gr br sa & dk br sa lo w gravel	CM
	3	26/30-95/100+	Very dj br sa lo w coal ash, slag, and shale	CM
4	1	0-14/101	Very dk gr sa si w coal ash	CM
		14/38-	Brick and concrete wall	–
		83-	Clay drainage pipe	–
5	1	0-4/11	Black sido	CM
		4/11-8/13	Concrete floor	–
	2A	8/13-14/24	Dark gr br si sa	NCM
		14/18-90+	Concrete capped Stone wall	–
	2	20/24-43/60	Dark gr br si lo	CM
	3	43/60-97/100+	Very dk gr br & dk yl br si lo	CM
6	1	0-20/40	Black sido	CM
		14/20-	Brick wall	–
		29/40-	Brick floor	–
7		0-100	Brick and stone wall	–
	1	0-7/14	Black sido	CM
	2	7/14-98/100+	Very dk gr sa si w coal ash	CM
8	1	0-10/12	Black sido	CM
		10/12-	Concrete floor	–

Unit	Level	Depth (cm)	Soil Description	Cultural Material
9	1	0-30/49	Black sielo	CM
		0-40	Brick wall	–
		30/49-	Brick floor	–
10	1	0-4/10	Black sielo	CM
	2	4/10-32/34	Dark br sielo	CM
		14/20-96+	Concrete-capped stone wall	–
	2B	32/34-37/39	Light yl br si cl	CM
	3	37/39-55/62	Dark yl br si lo	CM
	4	55/62-90/95+	Dark gr be si sa lo	CM
11	1	0-7/18	Very dk gr br si lo	CM
		7/18-	Concrete floor	–
12	1	0-10/14	Black sielo	CM
	2	10/14-34/35	Dark br sielo	CM
	3	34/35-41/58	Yellow br si cl	CM
		32/34-52	Cast iron pipe	–
		41/58-66/75+	Ash, cinder and shale	CM
13	1	0-49/71	Very dk gr sa si w coal ash	CM
	2	49/71-92/93	Very dk br sa si	CM
		92/93-	Brick floor	–
14	1	0-1/48	Very dk gr br si lo	NC
	2	1/48-32/63	Dark yl br si cl	NC
	3	32/63-72/97	Very dk gr br si lo	CM
		72/97-	Concrete floor	–

Key

v- very	gr- gray	sa- sand	NC- Not Collected
dk- dark	bl- black	si- silt	NCM- No Cultural Material
lt- light	br- brown	cl- clay	CM- Cultural Material
	yl- yellow	lo- loam	

NEW YORK STATE MUSEUM

Artifact Catalog

8021.40.101
NY 52 over the Wallkill
Town of Montgomery
Orange County

Site: NY Knife Co.

Site Number: 10935 **Accession Number: A2000.31**

Unit: 1

Prov. #	Level	Spec. #	Qty	Description
1	1	1	3	whetstone; grinding stone frags.
		2	1	kitchen bone
		3	2	unidentified bone frag.
		4	1	unidentified iron/steel; pig iron, possible raw material
		5	1	lead
		6	1	brass; bolster lining w/standard bolsters
		7	5	machine cut nail; 2=6.5 cm, 1=11.2 cm, 1=frag 4.1 cm (ca. 1835)
		8	1	common wire nail; 5.7 cm (ca. 1875)
		9	1	large common wire nail; 10.7 cm - (ca.1875)
		10	1	screw; 4.3 cm
		11	1	rivet
		12	2	rod; steel bar stock
		13	1	metal sheeting; brass, raw material for bolsters
		14	1	bracket; strip formed into long loop and bolt w/washer and nut
		15	2	bracket; rectangular w/drill holes and bolt w/washer and nut
		16	10	sprockets
		17	1	other hardware; pulley with metal hook
		18	1	other hardware; possible clamp, engraved "wm johnson england"
		19	3	iron file; 1=complete triangular, 20 cm; 2=flat frags, 12 cm
		20	26	jackknife; possible "spear" blades, 6-9cm
		21	21	jackknife; blade frags.
		22	36	jackknife; "pen" blades, 5-7 cm
		23	15	jackknife; possible "clip" blades, 7-9 cm
		24	10	jackknife; possible "spay" or "spey" blades, 6-8 cm
		25	2	jackknife; possible unfinished blades, 7 cm
		26	2	jackknife; large "spear" blades, 9.5 cm
		27	2	jackknife; large "spear" blades, 8.5 cm
		28	5	jackknife; possible "spiral punch" tool, 5-6 cm
		29	1	jackknife; "nail file" tool, 6 cm
		30	1	jackknife; "can opener" tool, 4.5 cm
		31	1	jackknife; possible "punch" tool, 5.5 cm
		32	5	jackknife; "screwdriver" tool, 5 cm
		33	2	other brick; fire brick, 1=w/imprinting "terra/cotta/obbric"
		34	9	other leather
				Total for Unit 1 - Level 1: 177 items.

Unit: 2

Prov #	Level	Spec #	Qty.	Description
		2	1	1 1 oyster shell; mother-of-pearl; jackknife handle frag
		2	1	wood frag; wooden peg, 8 cm
		3	5	unidentified iron/steel; possible scrap from blade manufacture

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Unit: 2

Prov#	Level	Spec#	Qty.	Description
2	1	4	21	unidentified iron/steel; thick, flat chunks
		5	3	brass; scrap brass from which bolster lining was cut
		6	6	unidentified square nail; 3=7 cm, 5 cm, 4.5 cm, 3 cm
		7	1	common wire nail; 6.5 cm (ca. 1875)
		8	1	large common wire nail; 10.3 cm (ca. 1875)
		9	2	bolt; 6 cm, 5.5 cm
		10	1	screw; 2.5 cm
		11	1	spike; 13 cm
		12	1	handle
		13	5	jackknife; possible "spear" blades, 8 cm
		14	1	jackknife; possible "punch" or "file" tool
		15	4	jackknife; "pen" blades, 4-6 cm
		16	2	jackknife; unfinished blades, 6 cm, 7 cm
		17	4	jackknife; blade frags
		18	10	jackknife; possible spring frags
		19	1	mortar
		20	1	porcelain electrical object
		21	4	stoneware sewer pipe frag
		22	1	aqua flat glass
		23	1	slag
		24	3	plastic; cellulose; jackknife handle frag; 1=imprinted to look like antler
				Total for Unit 2 - Level 1: 81 items.

Unit: 3

Prov #	Level	Spec #	Qty.	Description
3	1	1	3	screw; 3.7 cm, 2.7 cm, 2.5 cm
		2	1	jackknife; single end spring part, 8.2 cm
		3	1	jackknife; bolster lining w/tip and standard bolsters w/horn or cellulose handle
		4	1	other brick; yellow brick
		5	4	porcelain electrical object; tube shape, 1 w/6 cm screw in center
		6	3	white sanitary stoneware frag; 2-pc. refit
		7	4	aqua flat glass
		8	2	asphalt roofing frag
		9	1	leather belt or strap frag
				Total for Unit 3 - Level 1: 20 items.
4	2	1	7	unidentified iron/steel; possible end spring or slide scale frags
		2	3	unidentified square nail; 4.8 cm, 4.1 cm, 2.5 cm
		3	3	unidentified cut nail; 6 cm, 5.7 cm, 4 cm (ca. 1790)
		4	3	common wire nail; 7 cm (bent), 6.5 cm, 2.6 cm (ca. 1875)
		5	2	unidentified nail; 5.3 cm, 7.1 cm
		6	1	handle; possible cutlery or jackknife handle, 10 cm
		7	1	cutlery; knife frag, 15 cm
		8	2	jackknife; possible end spring
		9	1	jackknife; unidentified tool, possible "can opener"
		10	2	jackknife; bolster lining
		11	1	jackknife; possible single end spring part, 7 cm
		12	1	jackknife; possible "spear" blade, 8 cm
		13	1	unidentified brick; w/mortar
		14	1	other brick; fire brick
		15	1	white sanitary stoneware frag
		16	1	aqua flat glass
				Total for Unit 3 - Level 2: 31 items.

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Unit: 3

Prov #	Level	Spec #	Qty.	Description
5	3	1	2	clamshell; small, complete shells, 0.6 cm diameter
		2	1	oyster shell; mother-of-pearl handle frag
		3	6	unidentified iron/steel; end spring or slide scale frags
		4	1	unidentified iron/steel; squared strip bent into a circle w/ends, stock for end springs twisted
		5	2	unidentified iron/steel; small frags
		6	2	machine cut nail; possibly burnt; 5.4 cm, 4.2 cm (ca. 1835)
		7	1	unidentified square nail; possibly burnt; 4.4 cm
		8	5	cutlery; table cutlery blades
		9	1	jackknife; long blade, 10.5 cm
		10	1	kaolin pipe stem frag, 5/64-in. bore
		11	3	aqua flat glass
		12	4	clear curved glass
		13	1	green curved glass
		14	4	lamp glass
		15	3	plastic; cellulose; jackknife handle frags
				Total for Unit 3 - Level 3: 37 items.

Unit: 4

Prov #	Level	Spec #	Qty.	Description
6	1	1	1	oyster shell; mother-of-pearl frag
		2	2	wood frag
		3	1	unidentified iron/steel; possible jackknife or cutlery part
		4	4	unidentified iron/steel; small frags
		5	1	unidentified iron/steel; squared strip bent into circle w/ends twisted together
		6	1	unidentified iron/steel; possible bead or tool
		7	1	unidentified iron/steel; bent strip
		8	2	unidentified iron/steel; scrap metal from blade manufacture
		9	1	unidentified iron/steel; large, thick strip, 9x5 cm, w/hole at end
		10	1	unidentified iron/steel; possible sheet frag
		11	3	unidentified square nail; 6.2 cm, 6 cm, 4 cm
		12	1	large common wire nail; 10.5 cm (ca. 1875)
		13	1	unidentified nail; 4.2 cm
		14	2	washer; diameter- 2.5 cm, 11 cm
		15	1	metal pipe; frag w/screw threads
		16	4	jackknife; single end spring parts; 3=8.6 cm, 1=5.6 cm
		17	1	jackknife; possible "clip" blade; 9 cm
		18	8	jackknife; possible "punch" tools; 6 cm
		19	3	jackknife; blade frags; 4.5 cm, 6 cm
		20	1	jackknife; possible "spay" or "spey" blade; 8 cm
		21	1	lamp parts; complete vertical wick lamp burner
		22	3	rockingham/bennington yellowware; body sherds, 2=glaze losses (ca. 1812-1900)
		23	1	undecorated kaolin pipe bowl frag
		24	1	kaolin pipe stem frag. 5/64-in. bore
		25	3	aqua curved glass; burnt
		26	1	slag
		27	1	plastic; cellulose jackknife handle frag
				Total for Unit 4 - Level 1: 51 items.

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Unit: 5

Prov #	Level	Spec #	Qty.	Description
7	1	1	16	unidentified iron/steel; possible scrap metal from manufacture of the end springs
		2	1	brass; possible scrap from which bolster lining was cut
		3	1	common wire nail; 7.9 cm (ca. 1875)
		4	3	jackknife; possible scale/spring frags
		5	3	porcelain electrical object; tube shape; 1=6.5 cm screw in center
		6	2	aqua flat glass
		7	3	plastic; cellulose frags
				Total for Unit 5 - Level 1: 29 items.
8	2	1	1	oyster shell; mother-of-pearl frag
		2	1	charcoal
		3	9	unidentified iron/steel; 2=large flat pieces, 7=small chunks
		4	2	unidentified iron/steel; possible nails; 5 cm, 4.3 cm
		5	1	unidentified iron/steel; thin, flat strip
		6	2	unidentified iron/steel; end spring or scale frags
		7	1	brass; scrap brass from which multiple escutcheons were cut
		8	1	brass; scrap brass from which bolster lining was cut
		9	1	unidentified square nail, 4.2 cm
		10	3	unidentified cut nail; 6 cm, 4.5 cm, 4.2 cm (ca. 1790)
		11	1	jackknife; "punch" tool
		12	2	jackknife; blade frags
		13	2	unidentified brick
		14	8	stoneware sewer pipe frag
		15	1	aqua flat glass
				Total for Unit 5 - Level 2: 36 items.
9	3	1	1	unmodified bone
		2	1	other worked bone; jackknife handle frag
		3	3	other worked antler; jackknife handle frags
		4	3	oyster shell; mother-of-pearl jackknife handle frags
		5	1	oyster shell; mother-of-pearl button; 0.9 cm diameter
		6	1	wood frag; smoothed; possible jackknife handle frag
		7	10	unidentified iron/steel; thin, flat pieces
		8	4	unidentified iron/steel; possible nails; 7 cm, 4.4 cm, 3.5 cm, 3.3 cm
		9	1	unidentified iron/steel; squared metal strip, curved into hook shape; 5 cm
		10	1	brass; scrap brass from which bolster lining was cut
		11	2	unidentified square nail; 4 cm, 3.1 cm
		12	4	unidentified cut nail; 7 cm, 6.2 cm, 3 cm, 2.7 cm (ca. 1790)
		13	3	common wire nail; 4.7 cm, 2.6 cm, 2.5 cm (ca. 1875)
		14	12	jackknife; blade and unfinished frags; 3.9-7 cm
				Total for Unit 5 - Level 3: 47 items.

Unit: 6

Prov #	Level	Spec #	Qty.	Description
10	1	1	1	unidentified iron/steel; pig iron; possible raw material
		2	2	unidentified iron/steel; thin, squared strips
		3	1	unidentified iron/steel; flat
		4	4	brass; thin scrap sheets
		5	1	buckle; circular, may be industrial; 3" diameter
		6	5	machine cut nail; 11.4 cm, 10 cm, 6.4 cm, 6.2 cm, 4.2 cm (ca. 1835)
		7	2	unidentified cut nail; 5.4 cm, 4.5 cm (ca. 1790)
		8	1	bolt; thick, heavy construction; 3" long

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Unit: 6

Prov #	Level	Spec #	Qty.	Description
10	1	9	1	sprockets
		10	3	other hardware; clamps; 2=11 cm, 1=9.5 cm
		11	2	other hardware; belt clamp; flat w/teeth to grip; 1=attached washer
		12	2	can frag
		13	1	cutlery; cutlery blade w/handle tong
		14	6	cutlery; 5=knives, 1=fork
		15	2	iron file; triangular; 16.5 cm
		16	1	jackknife; majority of knife is complete; both bolster linings, 2 standard bolsters, center lining, 4 rivets; 9 cm
		17	1	jackknife; "screwdriver" tool, 5 cm
		18	21	jackknife; "spear" blades; 7-9 cm
		19	12	jackknife; possible "spey" blades; 6.4-8 cm
		20	2	jackknife; possible "manicure" tools; 5.5 cm, 6.5 cm
		21	1	jackknife; possible "skinner" blade; 6.5 cm
		22	1	jackknife; "punch" tool; 6.2 cm
		23	1	jackknife; possible pipe reaming tool; w/rounded end
		24	18	jackknife; possible "clip" blades; 7.2-13.5 cm
		25	35	jackknife; "pen" blades; 2=7 cm, 5=6.6 cm, 17=6.3 cm, 8=5.6 cm
		26	13	jackknife; blade frags
		27	1	large-handled tool; hammer head
		28	3	other whiteware; 1=base sherd, 1=rim sherd; burnt; white glaze w/blue splotches
		29	3	porcelain electrical object; tube shape, 1 w/screw in center
		30	1	aqua flat glass
		31	3	clear curved glass
		32	1	clear bottle glass; neck and lip; ground lip; unknown finish type
		33	1	clear bottle glass; 2-pc. refit; medicine bottle; mark-owens bottle company, 1912-1929; reinforced extract lip, hub oval base, 5" tall; Toulouse: pg 393, Fike: pg 8&10
		34	3	leather belt or strap frag
				Total for Unit 6 - Level 1: 156 items.

Unit: 7

Prov #	Level	Spec #	Qty.	Description
11	1	1	1	common wire nail; 6.5 cm (ca. 1875)
2	1			large common wire nail; 11.5 cm (ca. 1875)
3	1			porcelain bathroom fixture
4	1			clear curved glass; burnt
Total for Unit 7 - Level 1: 4 items.				
12	2	1	1	unmodified bone
2	1			oyster shell; mother-of-pearl
3	1			wood frag; jackknife handle w/escutcheon attached
4	3			unidentified iron/steel; small chunks
5	1			cutlery; fork frag
6	1			jackknife; metal handle; "new york knife co." embossed
7	1			jackknife; "spear" blade frag; 6.5 cm
8	1			undecorated yellowware; small body sherd (1830-1940)
9	1			plastic; cellulose
Total for Unit 7 - Level 2: 11 items.				

Unit: 8

Prov #	Level	Spec #	Qty.	Description
13	1	1	1	common wire nail; 6.4 cm (ca. 1875)
		2	1	unidentified wire nail; 4.7 cm (ca. 1875)

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Unit: 8

		Prov #	Level	Spec #	Qty.	Description
13	1	3	1			screw; 3 cm
		4	1			wire; short, curved piece
		5	1			crown bottle cap (ca. 1890)
		6	2			iron file; triangular; top point-8.5 cm, base-17.5 cm
		7	2			jackknife; "pen" blades; 6 cm
		8	1			jackknife; end spring; 5 cm
		9	2			jackknife; "spear" blades; 7.5 cm
				10	1	electronic component; possible fuse cover; round cap w/hole in center; embossing around outside edge "weber 15 25v"
		11	17			white porcelain insulator
		12	7			porcelain electrical object
		13	15			aqua flat glass
		14	3			clear bottle glass; 1 bottle; 1 w/embossing "e...qu/liqui/l' s...d"
		15	2			plastic; white, curved frags

Total for Unit 8 - Level 1: 57 items.

Unit: 9

Prov #	Level	Spec #	Qty.	Description
14	1	1	1	whetstone; 2-pc refit, half; 12" diameter; square hole in center
		2	2	unidentified iron/steel; bar iron for blades, end springs, slide scales
		3	4	unidentified iron/steel; strips, 1=bent into "v"
		4	1	unidentified iron/steel; pig iron, possible raw material
		5	1	brass; scrap brass from which bolster lining was cut
		6	4	machine cut nail; 2=8 cm, 6.5 cm, 4.5 cm (ca. 1835)
		7	2	common wire nail; 7.5 cm, 4 cm (bent) (ca. 1875)
		8	1	rod; steel; possible raw material
		9	1	eyelet/grommet; grommet
		10	1	other hardware; possible machine part; round w/hole in center; flat on one side, rounded on other
		11	1	other hardware; clamp
		12	1	other hardware; cap on bottom of tool
		13	1	can frag; rim frag
		14	1	cutlery; large knife w/two holes on non-cutting edge
		15	5	iron file; 4=triangular, 1=flat
		16	1	jackknife; possible "grooved manicure" tool
		17	2	jackknife; possible "spatula for physician's knife"
		18	1	jackknife; complete; possibly two blades rusted inside; wood handles; possible swell end jack
		19	31	jackknife; blade frags
		20	1	jackknife; possible "spay" or "spey" blade; 8 cm
		21	5	jackknife; possible "clip" blades; 5.5-8.5 cm
		22	13	jackknife; "pen" blades;2=6 cm, 4=5.5 cm, 3=5 cm, 4=4.5 cm
		23	3	jackknife; "can opener" tools
		24	1	jackknife; "screwdriver/cap lifter" tool
		25	1	jackknife; possible single end spring
		26	10	jackknife; "spear" blades; 6-8 cm
		27	1	mortar
		28	2	porcelain electrical object
		29	1	aqua flat glass
		30	1	clear curved glass
		31	4	green curved glass
		32	4	leather belt frag

Total for Unit 9 - Level 1: 109 items.

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Unit: 10

Prov#	Level	Spec#	Qty.	Description
15	1	1	1	unidentified iron/steel; possible nail
		2	2	unidentified iron/steel; possible jackknife parts/tools
		3	2	common wire nail; 6.9 cm, 6 cm (ca. 1875)
		4	1	large common wire nail; 3" (ca. 1875)
		5	1	screw; 4 cm
		6	1	sprockets
		7	2	metal pipe; frag of threaded section
		8	3	jackknife; blade frags; 2=7 cm, 6.5 cm
		9	1	jackknife; "pen" blade; 6 cm
		10	1	porcelain electrical object; "pat apr 27 1901" embossed
		11	1	aqua flat glass
		12	1	clear curved glass
		13	1	green curved glass
		14	1	brown bottle glass; 1 bottle; lip frag
				Total for Unit 10 - Level 1: 19 items.
16	2	1	3	unidentified iron/steel; 1=end spring, 2=iron/steel frags
		2	39	unidentified iron/steel; possible end spring or slide scale frags
		3	3	unidentified iron/steel; flat, rectangular pieces
		4	1	unidentified iron/steel; possible cutoff from mold sprue
		5	3	unidentified iron/steel; scrap metal from which tools/blades were cut
		6	1	brass; scrap brass from which bolster lining was cut
		7	1	other metal; possible pewter
		8	8	unidentified square nail; 2=8.3 cm, 8 cm, 7 cm, 6 cm, 5 cm, 2=2.2 cm
		9	2	common wire nail; 8 cm, 5 cm (ca. 1875)
		10	1	bolt; 11" w/nut and washer
		11	1	metal pipe; 3.75"
		12	1	jackknife; bolster lining frag w/rivet
		13	1	jackknife; possible "clip" blade; 7 cm
		14	22	jackknife; knife parts; possible springs/center scale frags
		15	2	jackknife; possible "spay" or "spey" blades; 5.7 cm, 6.5 cm
		16	10	jackknife; blade and part frags
		17	5	jackknife; "spear" blades; 6.5-8.5 cm
		18	2	aqua flat glass
		19	1	green curved glass
		20	1	curved milk glass; small frag
		21	1	leather belt or strap frag
				Total for Unit 10 - Level 2: 109 items.
17	2B	1	10	unidentified iron/steel; possible end spring or center slide scale frags
		2	10	unidentified iron/steel; flat pieces, possible blade frags
		3	8	unidentified iron/steel; end spring or center slide scale frags
		4	1	unidentified iron/steel; scrap from blade manufacture
		5	5	unidentified square nail; 6.5 cm, 6 cm, 2=4.5 cm, 3 cm
		6	2	unidentified cut nail; 10 cm (bent), 6.5 cm (ca. 1790)
		7	1	common wire nail; 7.2 cm (ca. 1875)
		8	1	jackknife; bolster lining frag
		9	1	jackknife; blade frag
		10	1	aqua flat glass
				Total for Unit 10 - Level 2B: 40 items.
18	3	1	1	aqua flat glass
		2	3	clear curved glass
		3	4	lamp glass
				Total for Unit 10 - Level 3: 8 items.

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Unit: 10

Prov#	Level	Spec#	Qty.	Description
19	4	1	4	other worked bone; jackknife handle frag, blank
		2	1	oyster shell; mother-of-pearl jackknife handle frag
		3	5	wood frag; possible handle frags; 1=rivet hole
		4	24	unidentified iron/steel; possible knife frags
		5	1	unidentified iron/steel; squared steel bar
		6	3	unidentified iron/steel; flexible squared steel
		7	3	unidentified iron/steel; square steel wire frags
		8	2	unidentified iron/steel; large flat strips
		9	1	unidentified iron/steel; scrap from blade manufacture
		10	3	brass; scrap brass
		11	8	unidentified square nail
		12	1	wire; 7.5 cm
		13	2	cutlery; knife frags
		14	1	jackknife; knife part
		15	1	unidentified brick
		16	2	aqua flat glass
		17	3	aqua curved glass
		18	1	cinder
		19	2	leather belt frag
				Total for Unit 10 - Level 4: 68 items.

Unit: 11

Prov#	Level	Spec#	Qty.	Description
20	1	1	3	shell button
		2	2	unidentified iron/steel; square steel bar; raw material for spring/center scale
		3	1	unidentified iron/steel; thin sheet w/bent corner
		4	1	brass; scrap brass from bolster manufacture
		5	1	unidentified cut nail; 5.5 cm (ca. 1790)
		6	2	large common wire nail; 4.5", 2.75" bent (ca. 1875)
		7	1	staple
		8	2	can frag
		9	2	jackknife; "pen" blades; 6.5 cm
		10	1	jackknife; unidentified blade; 8.5 cm
		11	1	jackknife; possible "spear" blade; 8 cm
		12	11	white porcelain insulator; 2 tube frags w/"thomas" imprinted
		13	2	porcelain electrical object; 1="61935" embossed
		14	2	white sanitary stoneware frag
		15	5	aqua flat glass
		16	3	clear curved glass
		17	2	green curved glass; possible bottle glass; 1="qua" embossed
		18	1	curved milk glass; small frag
				Total for Unit: 11 - Level: 1: 43 items.

Unit: 12

Prov#	Level	Spec#	Qty.	Description
21	1	1	2	unidentified iron/steel; scrap metal from blade and bolster lining manufacture
		2	1	unidentified cut nail; frag 4 cm (ca. 1790)
		3	1	common wire nail; 6.4 cm (ca. 1875)
		4	1	eyelet/grommet; grommet
		5	1	other hardware; circular saw blade; 7" diameter
		6	1	other architectural metal; concrete reinforcement beam w/concrete attached
		7	1	jackknife; blade frag; 5.3 cm

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Unit: 12

Prov #	Level	Spec #	Qty.	Description
21	1	8	1	jackknife; "pen" blade; point missing; 5.5 cm
		9	1	porcelain electrical object; insulator, tube shape; 3" tall
				Total for Unit 12 - Level 1: 10 items.
22	2	1	1	other worked bone; jackknife handle frag
		2	1	other worked antler; jackknife handle frag
		3	1	oyster shell; mother-of-pearl handle frag
		4	1	wood frag
		5	15	unidentified iron/steel; from end spring/scale manufacture
		6	5	unidentified iron/steel; square steel for end spring/scale manufacture
		7	4	unidentified iron/steel; scrap metal from blade manufacture
		8	4	unidentified iron/steel; flat, rectangular sheets
		9	4	unidentified cut nail; 2=6 cm, 5.5 cm, 2.5 cm (ca. 1790)
		10	3	large common wire nail; 4.5", 4" (ca. 1875)
		11	1	screw; 4.5 cm
		12	1	staple
		13	2	jackknife; "pen" blades; 6 cm, 5 cm
		14	8	jackknife; blade frags
		15	4	jackknife; possible single end spring; 2=8.5 cm, 6 cm, 5.5 cm
		16	3	jackknife; possible two end springs; 9.5 cm, 8 cm, 6 cm
		17	29	jackknife; knife parts; possible center scale/spring frags
		18	4	aqua flat glass
		19	4	leather belt or strap frag
				Total for Unit 12 - Level 2: 94 items.
23	3	1	1	wood frag; jackknife handle frag
		2	1	unidentified iron/steel
		3	1	unidentified square nail; 4.9 cm
		4	1	jackknife; possible single end spring
		5	5	jackknife; blade frags
		6	1	jackknife; possible slide scale
		7	1	undecorated ironstone; base frag w/footring (ca. 1813-1885)
				Total for Unit 12 - Level 3: 11 items.
24	4	1	2	unidentified iron/steel; possible blade frags
		2	3	unidentified iron/steel; possible jackknife part; center scale/spring frags
		3	1	jackknife; blade frag
		4	1	undecorated porcelain; curved body sherd
		5	1	aqua flat glass
		6	1	aqua curved glass
				Total for Unit 12 - Level 4: 9 items.

Unit: 13

Prov #	Level	Spec #	Qty.	Description
25	1	1	13	whetstone; grindstone, 12 frags, 1=half of wheel, 12" diameter
		2	1	other worked antler; possible antler handle frag
		3	2	snail shell
		4	3	shell button
		5	8	unidentified iron/steel; metal strapping, very thin strips, bent; 1=attached buckle shape
		6	1	unidentified iron/steel; possible tip of spike
		7	1	unidentified iron/steel; 8x2.5 cm strip w/rounded ends; 2 screwheads visible on one side; electrical box cover
		8	1	unidentified iron/steel; long, thin strip; 17 cm

Site: NY Knife Co.

Site Number: 10935 Accession Number: A2000.31

Unit: 13

Prov #	Level	Spec #	Qty.	Description
25	1	9	1	unidentified iron/steel; possible scrap from blade manufacture
		10	1	unidentified iron/steel; possible hinge
		11	1	unidentified iron/steel; 4 thin strips of wire attached and bent into circular shape; tread to iron pipe
		12	1	unidentified square nail; 6 cm
		13	2	bolt; 9.5 cm, 4 cm
		14	1	screw; 3.5 cm
		15	1	jackknife; possible swell end jack; 1 bolster lining w/escutcheon and rivets; 1 single end spring; possible blade or spring, rusted
		16	2	jackknife; possible single end spring part
		17	2	jackknife; bolster lining w/rivets frags
		18	1	jackknife; "pen" blade; 6.5 cm
		19	2	jackknife; possible "spey" blade; 6 cm
		20	1	jackknife; possible "spay" blade; 6 cm
		21	2	jackknife; blade frags
		22	2	porcelain electrical object; insulators; 1=round, 1=cleat
		23	6	white sanitary stoneware frag
		24	1	clear curved glass
		25	2	blue curved glass
		26	2	glass insulator; blue-green glass
		27	1	plastic; cellulose frag; swell end jack shape
				Total for Unit 13 - Level 1: 62 items.
26	2	1	1	unidentified iron/steel; large thin flat sheet w/bent corner, raw material for blade manufacture
		2	3	unidentified iron/steel; strapping, very thin strips
		3	1	unidentified iron/steel; possible crimping to hold belt together
		4	1	unidentified iron/steel; hook; 12"
		5	1	unidentified iron/steel; >12" "v"-shape; possible pipe support
		6	1	washer
		7	1	ring; thin, squared
		8	5	wire; rings of wire
		9	3	hinge
		10	1	other hardware; cold chisel
		11	1	metal pipe; frag of threaded section
		12	1	bottle/jar lid; threaded bottle cap
		13	2	iron file; 1=triangular, 1=flat w/rounded side
		14	2	jackknife; knife part; possible scale/spring
		15	1	jackknife; "pen" blade; 4.5 cm
		16	1	jackknife; 2 bolster linings w/2 of 4 bolsters, 2 rivets, spring; possible swell end jack
		17	1	lamp parts; light bulb screw-in end w/attached wires and glass tube
		18	1	unidentified brick
		19	2	clear curved glass
		20	1	plastic; jackknife handle frag; imprinted to look like antler
		21	1	leather belt or strap frag
				Total for Unit 13 - Level 2: 32 items.

Unit: 14

Prov #	Level	Spec #	Qty.	Description
27	3	1	1	jackknife; possible single end spring or scale
				Total for Unit 14 - Level 3: 1 item.

Site: NY Knife Co.

Site Number: 10935 Accession Number: A2000.31

Unit: Surface

Prov #	Level	Spec #	Qty.	Description
28		1	3	whetstone; 2=frags; 1=complete grinding stone, 9" diameter, 3.25"-width square hole in middle
		2	3	other worked antler; handle frags
		3	1	oyster shell; mother-of-pearl handle frag
		4	11	wood frag; jackknife handle frags
		5	1	unidentified iron/steel; squared strip bent into circle w/ends twisted together, raw material from manufacture of spring/scale
		6	2	unidentified iron/steel; from blade manufacture
		7	2	unidentified iron/steel
		8	7	unidentified iron/steel; bolster lining frags
		9	2	brass; round, 1" diameter; possible castors/doorpulls
		10	6	brass; bolster linings; 2 w/bolsters
		11	1	unidentified cut nail; 11.2 cm (ca. 1790)
		12	1	cutlery; complete; bone handle from table knife; cross shape formed in bone handle
		13	4	cutlery; knife frags; 14.5 cm
		14	4	iron file; 2=trianglar, 2=flat
		15	4	jackknife; "fork" tool frags
		16	5	jackknife; possible center scale frags or handle end of knife
		17	3	jackknife; possible "spear" blades; 7 cm, 6.5 cm, 6 cm
		18	1	jackknife; handle frag; bolster lining w/ bolsters, metal handle w/"new york knife co." embossed; possible swell end jack
		20	1	jackknife; bolster and center scale frag; forms possible cross shape
		21	1	jackknife; bolster and center scale frag; forms into bell shape on scale
		22	1	jackknife; bolster and center scale frag; small bone handle frag
		23	1	jackknife; handle; bolster lining w/bolsters, wood handle w/rectangular 2.7x0.3 cm escutcheon
		24	4	plastic; cellulose frags; green; 1=antler-like surface imprints
		25	4	cement frag; reinforced concrete frags, metal stains visible
		26	1	leather belt or strap frag
		1921	1	jackknife; handle; bolster lining w/bolsters, cellulose w/notched surface, possible reverse peanut
				Total for Unit Surface - 75 items.

Total for NYSM# 10935 NY Knife Co.: 1427 items.

APPENDIX C. CORRESPONDENCE

FORM A (revised 1/4/99)

CULTURAL RESOURCE SURVEY CHECKLIST

SURVEY___ ADDENDUM ___ SITE EXAM_X_ DATA RECOVERY PLAN___ DATA RECOVERY____
HABS/HAER ___ DATE REQUEST SUBMITTED (today's date) _8/31/00_____
IS THIS A ROLL-OVER PROJECT (Y/N) __No___ IF YES, DATE PREVIOUSLY REQUESTED_____

ANY PREVIOUS SURVEYS (Y/N) __Yes__ IF YES, SURVEY DATE __8/99_____ PR # 98PR3690

PIN (must have nine digits): 8021.40.101 FUNDING: FEDERAL __X__ STATE _____

ENTIRE PROJECT AREA: ROUTE (given type and local name, e.g. CR18/Main St.): 52 over the Wallkill River.

MINOR CIVIL DIVISION(S) & COUNTY: Village of Walden, Orange County

ENTIRE PROJECT DESCRIPTION: (be as specific as possible and include ROW acquisition)
The project will replace the bridge over the Wallkill River and provide new granite curb and sidewalks along Main Street to Ulster Ave.

AREA TO BE SURVEYED: (give recognizable beginning and end point, show impact area on project map)
Fill area along top of embankment; 1 M test units by walls near stream; surface collection.

PROPOSED WORK: (Check all that apply)
resurfacing_X_ reconstruction___ realignment___ intersection improvement___ widening___ new construction___
slope stabilization___ drainage___ bridge rehabilitation___ relocation___
bridge replacement_X_ recondition & preservation_____ OTHER_____

ESTIMATED LENGTH: 1 mile± ESTIMATED WIDTH:

ESTIMATED NUMBER OF BUILDINGS IN PROJECT AREA: Numerous
ESTIMATED NUMBER OF BUILDINGS TO BE ACQUIRED/REMOVED None

DATE, TYPE OF BRIDGE & BIN: (if applicable) 1934 Steel Truss - BIN 1026680
NATIONAL REGISTER LISTED OR ELIGIBLE: Yes____ No_X_

BRIDGE/PROJECT PREVIOUSLY SCREENED: (Y/N) Yes If yes, attach screening results to Form A

FEDERAL PERMITS REQUIRED: (include Nationwide) (Y/N) Yes

DATE SURVEY NEEDED BY: (MONTH/YEAR) ASAP

PRESENT PROJECT STAGE: IPP____ SCOPING_____ DESIGN_X_ SCHEDULED DESIGN APPROVAL_____

TYPE OF SURVEY NEEDED:(if sections of the project need different types of surveys, also check "varied" and specify type of survey needed on the project plan sheet)
ARCHEOLOGICAL:_X_ ARCHITECTURAL :____ BOTH: _____ VARIED:_____

USGS QUAD OR DOT PLANIMETRIC (location map) MAP INCLUDED: (Y/N) Yes USGS Walden Quad #1441
(include quad name and show project survey limits on map) ELECTRONIC MAPS AVAILABLE (Y/N) No

TWO COPIES OF RECENT PLANS WITH PROJECT BOUNDARIES: (Y/N) Yes (Show project/survey limits on plans)

REGIONAL CONTACT: Michael George TELEPHONE: (845) 431-5824

ADDITIONAL COMMENTS: Backhoe testing is scheduled for the week of 9/18/00.

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
4 BURNETT BOULEVARD
POUGHKEEPSIE, N.Y. 12603

ROBERT A. DENNISON III, P.E.
REGIONAL DIRECTOR

JOSEPH H. BOARDMAN
COMMISSIONER

August 31, 2000

Mr. Charles Fisher
Cultural Resource Survey Program
New York State Museum
3118 Cultural Education Center
Albany, New York 12230

RE: ADDITION TO REGION 8
CULTURAL RESOURCE SURVEY PROGRAM 2000-2001

Dear Mr. Fisher:

Please add the following site exam to a previous survey project in our Regional program:

PIN 8021.40.101
ROUTE 52 OVER THE WALLKILL RIVER
VILLAGE OF WALDEN
ORANGE COUNTY

Form A and set of plans are enclosed for this project.

Very truly yours,

MICHAEL J. GEORGE
Cultural Resource Coordinator

Enclosures

cc: M. Ivey, Environmental Analysis Bureau, MC=0473
K. Edwards, Bridge Design Group, Region 8

MEMORANDUM
DEPARTMENT OF TRANSPORTATION

DATE: August 4, 1995

TO: P. C. Crocker, Regional Design Engineer, Region 8

FROM: M. E. Ivey, Environmental Analysis Bureau, 5-303 M E Ivey

SUBJECT: BRIDGE SCREENINGS
PIN: 8021.40 BIN: 1-02668-0
ROUTE 52 OVER WALLKILL RIVER
VILLAGE OF WALDEN, ORANGE COUNTY

A site visit was made by our staff and the Region Cultural Resource Coordinator to determine if there are cultural resource issues for the above referenced bridge project.

Based upon the site visit, a review of the Office of Parks, Recreation and Historic Preservation (OPRHP) and the State Education Department's (SED) site files and an examination of the historic maps of the project area, we determined the following:

Archeological Sensitive Yes - Historic & Prehistoric

Bridge Date 1934 Bridge Type Steel truss
Previously evaluated by OPRHP? No
Need evaluation? No

Terrain Flat to slightly rolling terrain in all quadrants beyond steep river embankment.

Pre-1945 Properties/Structures Within Project Area? Yes - All quadrants
Previous evaluated by OPRHP? No

Recommendations
Survey needed? yes

Above ground concerns? Yes
What quadrants? all

Additional Comments Survey not needed if replacement on existing alignment and there are no landscape changes at the pre-1945 properties.

Please review this memorandum and determine if a survey is needed for this undertaking. If a survey is not needed, include this memorandum in the project's design report as supporting documentation.

If you have any additional questions, contact Linda Harvey-Opiteck at (518) 457-1722.

MEI/LHO

cc: M. George, Cultural Resource Coordinator, Region 8
K. McCann, Environmental Analysis Bur., 5-303
P. Bellair, Design Quality Assurance Bur., 5-408
L. Pitaniello, Project Letting Mgmt. Bur., 5-520
File

New York State Office of Parks, Recreation and Historic Preservation
Historic Preservation Field Services Bureau
Peebles Island, PO Box 189, Waterford, New York 12188-0189 518-237-8643

Bernadette Castro
Commissioner

October 20, 1999

Mary Ivey
NYS Department of Transportation
State Campus, Bldg. 5, Room 303
1220 Washington Avenue
Albany, New York 12232

Dear Ms. Ivey:

Re: FHWA PIN 8021.40.121
NY 52 Bridge Over Wallkill River
Walen, Orange County
98PR3690

Thank you for requesting the comments of the Office of Parks, Recreation and Historic Preservation (OPRHP) concerning your project's potential impact/effect upon historic and/or prehistoric cultural resources. Our staff has reviewed the documentation that you provided on your project. Preliminary comments and/or requests for additional information are noted on separate attachments accompanying this letter. A determination of impact/effect will be provided only after ALL documentation requirements noted on any attachments have been met. Any questions concerning our preliminary comments and/or requests for additional information should be directed to the appropriate staff person identified on each attachment.

In cases where a state agency is involved in this undertaking, it is appropriate for that agency to determine whether consultation should take place with OPRHP under Section 14.09 of the New York State Parks, Recreation and Historic Preservation Law. In addition, if there is any federal agency involvement, Advisory Council on Historic Preservation's regulations, "Protection of Historic and Cultural Properties" 36 CFR 800 requires that agency to initiate consultation with the State Historic Preservation Officer (SHPO).

When responding, please be sure to refer to the OPRHP Project Review (PR) number noted above.

Sincerely,

Ruth L. Pierpont
Director

RLP:bsd
Attachment(s)

cc: Michael George, NYSDOT, Region 8
John P. Hart, NYS Museum

ARCHEOLOGY COMMENTS

98PR3690

Based upon a review of the Cultural Resource Survey Report for PIN 8021.40.101 the State Historic Preservation Office (SHPO) concurs with the archeological recommendations of the report that the remains of the New York Knife Factory (A07144.000271) represent a significant archeological site that should be avoided if possibe. If this site can not be avoided SHPO recommends that a Data Retrieval Mitigation Plan be prepared and submitted for our review.

This report has identified substantial above and below surface remains of the New York Knife Company, a mid to late 19th century industrial site. SHPO has reviewed the data presented in the Phase 1 report and concurs that this site meets the eligibility criteria for nomination to the National Register of Historic Places under Criterion D (see attached eligibility determination). The current construction plans calls for an access road that will impact this archeological deposit. Therefore, SHPO recommends that the construction plan be modified to avoid this site or, if project redesign is not feasible, that a Data Retrieval plan be prepared and submitted for review.

If project redesign is used to avoid the identified remains it may be necessary to conduct additional Phase 1 survey to ensure that the alternate routing does not impact additional historic deposits.

If you have any questions concerning archeology, please call Douglas Mackey at (518) 237-8643 ext. 3291.

SITE EVALUATION AND ELIGIBILITY DISCUSSION

FHWA (Agency)

__(V) , WALDEN, ORANGE COUNTY (Location)

PIN 8021.40.101 NY 52 over the Wallkill River, Village of Walden (Project Name)

New York Knife Company Remains A07144.000271 (Site Identifier)

I. X Property appears NR/SR eligible.

- Identify relevant theme: _____
- Existence of relevant context: _ yes __ no (undeveloped)
  Discuss: 19th Century Industrial Remains

SPECIFIC CRITERIA:

A. ___ Associated with events that have made a significant contribution to the broad patterns of our history; OR
B. ___ Associated with lives of persons significant in our past; OR
C. ___ Embodies the distinctive characteristics of a type, period, or method of construction; OR represents a significant and distinguishable entity whose components may lack individual distinction; OR
D. _x_ Have yielded, or may be likely to yield, information important in pre-history or history.

DISCUSSION: The New York Knife Company Site contains the remains of a mid 19th to early 20th century industry. At the turn of the 20th century this business was one of the largest knife producers in the country and represented an important factor in local and regional economies. The remains encountered consist of both artifactual and architectural components. Artifacts include domestic refuse and objects associated with the manufacture of various types of knives. Structural remains encountered to date include building foundations, a millrace and other aspects of architecture that date to the period of 1875-1887. The site retains a high degree of integrity as there has been little ground disturbance in the area since the period of construction. This site has the potential to provide information on 19th century industries in rural New York,. More specifically, it has the potential to yield information on 19th century knife production techniques, factory organization and construction techniques. Associated documentary research may also yield data on raw material requirements and acquisition, markets served and labor structure.

Evaluated by: Douglas P. Mackey, Historic Preservation Program Analyst
October 14, 1999