Papermakers at home

ARCHAEOLOGICAL AND HISTORICAL
PHASE 1 AND PHASE II SURVEYS IN CONNECTION WITH

MOUNT LEBANON ROAD AND ROCKLAND ROAD INTERSECTION IMPROVEMENTS
BRANDYWINE HUNDRED, NEW CASTLE COUNTY, DELAWARE
DELAWARE DEPARTMENT OF TRANSPORTATION PROJECT 84-041-03

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1. INTRODUCTION

DELAWARE DEPARTMENT OF TRANSPORTATION proposes to improve an intersection in the hamlet of Rockland, New Castle County. Proposed safety improvements will consist of a new intersection for Rockland and Mount Lebanon roads. The area of the proposed intersection was the known location of buildings associated with the historic Rockland paper mill, now an apartment complex (FIGURES 1 AND 2, PLATE 1).

Rockland has been listed in the National Register of Historic Places since February 1, 1972. The project site was included in that nomination (Eleanor Webster 1971).

A draft nomination prepared by another consultant concurrently with the present study would draw the district line along the east side of Rockland Road, excluding the project area (Bower 1990).

In order to comply with Section 106 of the National Historic Preservation Act, the author was engaged by the Department to conduct Phase I and Phase II investigations in the areas of these improvements.

2. PROJECT AREA LOCATION AND DESCRIPTION

THE PROJECT AREA lies in the Piedmont uplands valley of Brandywine Creek northwest of Wilmington, in Brandywine and Christiana hundreds.

It is served by a road system radiating northwestward from the city into the Pennsylvania hinterland. Connecting these radial roads are local service roads, of which Rockland Road is one. It leads from the mill village toward Concord Pike, the local trunk road.

On either side of the project area are larger roads, Kennett Pike (State Route 52) and Concord Pike (US 202), former turnpikes along the ridgetops that linked the Chester County, Pennsylvania, hinterland with the port of Wilmington, Delaware.

Rockland is served on the west by a very old local road from Centre Meeting. Now called Route 232, the road follows the valley of Wilson's Run. It has most frequently been called Adams' Dam Road or the road to Centre Meeting. A segment is part of Route 100, causing some confusion of nomenclature.

SOILS, DRAINAGE, AND ENVIRONMENT

Soils belong to the Neshaminy-Aldino-Watchung association, "level to steep, well drained, moderately well drained, and poorly drained, medium-textured soils formed over dark-colored gabbroic rocks; on uplands " (Soil Conservation Service 1970).

The Rockland site is Neshaminy and Talleyville very stony silt loams, considered unsuitable for cultivation. Its steep topography virtually eliminates it as a possible prehistoric site.

The Delaware Piedmont physiographic province is a fertile area of gently-rolling hills underlain by igneous and metamorphic rocks.

The fall line of the Brandywine is not an abrupt cataract. Instead, the stream falls gently through New Castle County to tidewater at Wilmington, providing power for numerous mill seats along the way. This widely-distributed source of cheap and reliable power was the creek's main geographical advantage

Numerous outcrops along the Brandywine provided ready quarries for building stone, from earliest colonial times. Stone houses were being built during the seventeenth century. Brandywine "granite" was used widely for rubble fill, in such projects as the breakwaters at the mouth of Delaware Bay.

The creek also is a source of fresh drinking water for the population of Wilmington. The creek's pure water was also used by the Rockland paper mill.

PREVIOUS INVESTIGATIONS

Previous investigations in the project area include the forthcoming cultural resources management plan for the Brandywine Creek State Park, which is liberally quoted herein (Blume, Clark, and Dunn 1990).

The Rockland mill complex (PLATE 1, FIGURE 3) has been prominently mentioned in a number of studies of Brandywine industry . The 80-acre historic district is listed in the National Register of Historic Places (Webster 1971); the paper mill was inventoried by the Historic American Engineering Record before its conversion to multi-family dwellings, which essentially destroyed its historic fabric (Del.-63, Del.-64).

3. RESEARCH ORIENTATION AND THE STATE PLAN

PREVIOUS RESEARCH in the region has provided valuable insights into the locations of human activities through time. In some cases, as in the project area, settlement models are so well developed that sites can be predicted with uncanny accuracy, but there is yet much to be learned about human utilization of this part of New Castle County.

INDUSTRIAL SITE DEFINITION

The traditional definition of an archæological site has been "a place where artifacts are found," which is misleading and unduly restrictive in the context of modern industrial archæology.

Twenty years ago, some archæologists could define archæology as "the excavation of data," (Foley 1969:93) and restrict archæological studies to uncovering that which has been physically hidden.

Identification of sites with artifacts forces researchers to ignore loci where artifacts are not found, or places where the site itself is the artifact, or sites where artifacts are intangible or at least not solid. Intangible artifacts may be found on industrial sites or sites where the general landscape has interacted with, and been changed by, humankind in ways that are subtle and not expressed as traditionally recognizable artifacts.

A more satisfactory, but too verbose, definition is one offered by Deetz (1967: 11): "a spatial concentration of material evidence of human activity." This definition distances itself somewhat from the concept of an artifact, as well as from the concept of digging or uncovering.

Industrial sites, in particular, contain elements that do not fit the traditional definition of artifacts. Stream pollution, soil chemicals, odors, and even the acidity of the rain, are artifactual evidence from which human activity can be deduced, even though we do not normally conceive of a gas, a chemical formula, or an effect as an artifact in the sense that a projectile point or a potsherd is an artifact.

It is more correct to define a site, after the example of Deetz, as *a place containing evidence of human agency*.

The object of the archæologist's attention can therefore be identified as the study of man's effect on his environment, or the environment's effect on man, as expressed in measurable phenomena.

Each manifestation of human agency therefore becomes the equivalent of an artifact within a site, the definition of which is more properly broadened to include any place where man has left evidence.

This redefinition is useful, for the holistic industrial archæologist, since much useful evidence of human agency may be atmospheric, environmental, or even intangible.

In the project area, it turns out, the most important artifact may be an engineering idea expressed in feet above sea level, reflecting the personality of an extremely wealthy civil engineer. The artifact has such dimensions as horsepower and volume, in addition to the established dimensions of superficial size and age.

PREHISTORIC MANAGEMENT PLAN

The Delaware prehistoric cultural resources management plan (Custer 1986) and the companion management plan for Northern Delaware (Custer and DeSantis 1986) identify the Brandywine Valley as a high priority area for archæological research, both because of development pressures and because of the scarcity of reported sites.

The plan was based upon a cultural ecological or cultural materialist approach, which examines the relationship between an environment and its people.

In the Piedmont uplands, Custer and DeSantis point out, there has been, historically, little environmental diversity. The streams have very narrow floodplains and there are few swamps. Through most of prehistory, the region was forested. Deciduous forests would have had a high carrying capacity for wildlife.

This part of New Castle County is ranked as having poor data quality and low site probability. Yet the plan identifies the Brandywine Valley as a corridor possessing a high research priority because of development pressures.

In short, any prehistoric archæological site in the Brandywine Valley is to be considered potentially valuable, simply because of rarity.

THE STATE HISTORIC PRESERVATION PLAN

In order to implement the National Register of Historic Places program, the Delaware historic preservation office has issued a set of documents that collectively constitute the state plan for historic preservation.

The historic contexts section of the Delaware Comprehensive Historic Preservation Plan (Herman and Siders 1989) lists a number of historic property types. The following is a list of property types that are present in the project area, as they are grouped in the plan within three of the historic themes:

ECONOMIC AND CULTURAL TRENDS
- Agriculture - Crops
  - [not listed: Hay]
- Agriculture - Methods
  - Land Improvement
  - Mechanized (includes animal labor)
  - Labor
    - Tenant
    - [not listed: Contract Labor Gangs]
- Agricultural Orientation
  - Local Market
  - Estate
  - [not listed: Industrial Support Farms]
- Forestry
  - Saw Mills
  - Dams
  - [not listed: Raceways and Penstocks]
- Shipping/Transporting
  - Land
    - Roads
    - Crossroads
- Manufacturing
  - Rural Industries
    - Saw Mills
    - Grist Mills
  - Heavy Manufactures
    - Cloth Mills
    - Paper Plants [actually paper *mills*]

LANDSCAPE
- Change through Occupation
  - Village/Town Sites
  - Early Plantation Sites
  - Early Industrial/Commercial Sites
- Transportation Networks
  - Land
    - Roads and Toll Roads
    - Crossroads
- Suburbanization
  - Industrial

PEOPLE
- Major Families and Individuals
- [Not listed: Immigration]

The plan divides the state into five geographical areas, the first of which is the Pennsylvania Piedmont, in which the project lies.

For the purpose of creating contexts, the plan identifies five historic periods:

A. 1630-1730 Exploration & frontier settlement
B. 1730-1770 Intensified & durable occupation
C. 1770-1830 Early industrialization
D. 1830-1880 Industrialization & early urbanization
E. 1880-1940 Urbanization & early suburbanization

The plan sets priorities for all these various plan elements (Ames et al 1989: 79-82). According to the authors of the plan, "The Piedmont Zone is not a high priority now because much of the historic landscapes of the nineteenth century have already been compromised or destroyed. By the late 1990s the Piedmont will have the greatest number of potentially eligible resources in the state from the early twentieth century and should move up in the Geographic Zone priorities."

Agriculture is the plan's first-ranked priority among above-ground resources, followed by settlement patterns and demographic change. Manufacturing is the third priority for above-ground resources. The term "above-ground" refers to visible structures, while "below-ground" does not necessarily include historical archæological sites.

For below-ground resources, the plan identifies settlement patterns and demographic change as the highest ranking priority for preservation attention. Trapping and hunting is second, followed by mining and quarrying. At the bottom of the list, seventh, is manufacturing.

It would seem that manufacturing is of little concern to the historic preservation planning process in Delaware, and that there is little to be gained from studying and protecting below-ground industrial historic resources in northern Delaware. The opposite is true.

The Piedmont Zone is fifth on the priority list for above-ground resources and is similarly low on the priority list for below-ground resources. The state plan notwithstanding, Delaware history is dominated by industrial history, and industrial sites in the state are major concerns to preservation interests.

When the plan's composite list of priorities was compiled, the Piedmont fell near the bottom in every configuration of the data:

Above-Ground

#1: Agriculture

1770-1830±, 1830-1880±
Upper Peninsula, Lower Peninsula/Cypress Swamp, Coastal

#2: Settlement Patterns and Demographic Change

1830-1880±, 1880-1940±
Urban (Wilmington)

#3: Settlement Patterns and Demographic Change

1770-1830±, 1830-1880±
Piedmont, Upper Peninsula, Lower Peninsula/Cypress Swamp, Coastal

Below-Ground

#1: Settlement Patterns and Demographic Change
1630-1730±
Coastal

From this it can be inferred that the state plan assigns low priority to virtually all preservation issues in and around the project area. In practice, manufacturing centers on the Brandywine have received lavish preservation attention. Not the least of these is the Rockland mill, of which the project area was once a part.

Since two of the plan's temporal divisions are labelled "industrialization," it seems strange that manufacturing should be lightly regarded among the preservation priorities, especially in view of the rapid erosion of industrial resources.

COMMERCIAL ORIENTATION

Transportation-related sites are, by definition, an element of commercial history. The project-area sites are commercial and industrial elements of the larger Philadelphia sphere of influence.

From the establishment of Philadelphia in 1682, Delaware has been part of Philadelphia's commercial hinterland.

Even after Delaware broke away from Pennsylvania politically in 1776, local commerce has continued to flow into the Pennsylvania economy. When steam navigation and railroads were introduced during the nineteenth century, Delaware's farmers turned to Philadelphia for access to the national markets beyond.

Wilmington, a commercial satellite of Philadelphia, was a market center for Delaware and Pennsylvania hinterlands to the west and northwest, up the Christina and Brandywine Valleys. Elsewhere in Delaware, Wilmington played no role whatever in the economic system. In terms of regional commerce, the city looked entirely to its westward and northwestward.

To tap this market, Wilmington interests built turnpikes, railroads, and local roads that radiated out from the city. The network of roads we now call Route 100 was never a turnpike, but it served as a secondary artery into Wilmington markets.

The Wilmington and Northern Railroad, which penetrated the Pennsylvania hinterland as far as Reading, was an attempt to siphon off some of Philadelphia's natural trade into the secondary market in Wilmington. Instead of becoming a hub, Wilmington became a corridor, through which rail traffic passed en route to somewhere else.

Wilmington's economic isolation from the rest of Delaware was broken with the construction of paved highways shortly after World War I. For the first time, downstate markets opened for upstate businesses through the highway system.

Wilmington's brief period of statewide economic dominance may prove to have been fleeting, as the state's center of population and influence moves again to the southward and newer networks, based on the Interstate highway system, redirect commerce to other, more distant, centers.

In the history of the project area, Philadelphia interests loom large, but the

powder mills are intimately entwined with the larger history of the nation. While the Rockland mills were established by Philadelphia interests, the powder mills were from the start considered instruments of national policy. Neither mill served a Wilmington market, and during the nineteenth century neither company had a significant presence in the life of the city.

The Brandywine banks were, largely, a rural industrial environment detached from the urban industries around Wilmington, a scant four miles away. In the context of the period, "industrial" was not synonymous with "urban" in America.

INDUSTRIAL NATURE OF FARM SITES

During the nineteenth century, industries depended heavily upon their agricultural surroundings. It was impossible to run a factory without a complementary farm, and bigger factories requried bigger agricultural establishments.

Christiana Hundred along the Brandywine functioned as a support structure for the mills along the creek. Animals for motive power and transportation, wood for building and fuel, stone for building, food for man and beast, all were provided by farmlands along the edge of the valley.

In spite of their bucolic appearance, the farms of Christiana Hundred's "Chateau Country" are historically industrial in nature. Many acres were owned or controlled by the duPont Company as hay plantations to feed the draft animals; hundreds of other acres fed the workers who lived in the little industrial villages down in the valley. Only in the present century has Delaware's Brandywine Valley become largely devoted to purely residential estates that do not materially support the local industries.

Co-minglings of agriculture and industry were the rule on the Brandywine as elsewhere in America during most of the nineteenth century. In 1832, W. W. Young reported that his company's activities at Rockland comprised several farms, plus wool and cotton spinning and weaving, which "necessarily, are blended with each other, and there is much difficulty to identify them separately with exactness." A Wilmington tanner reported a similar difficulty of separating his tannery from his farms, which he described as "intimately connected" (Porter 1990:61).

LOCAL PRESERVATION ENVIRONMENT

The Brandywine Valley is an area where cultural resources have been lovingly preserved, but at the same time is suffering intense development pressure. The valley enjoys an active preservation movement, which extends to both historic and natural features.

Historic Preservation in the valley is primarily residential in focus, even though the Hagley Museum is an industrial-history center. Outside Hagley, the preservation movement has parallelled the transformation of the valley from hay farms and industries into a residential suburban region.

Rockland is an example of this phenomenon. The shells of the buildings that once housed the paper mill have been recycled to create upscale housing, rendering interpretation of the mill function all but impossible.

In some cases, progress has taken bizarre turns that have obliterated the historic landscape, sometimes in the name of historic preservation. The realities of the past have received cosmetic treatments that sometimes obscure the truth.

Ugly but significant historic sites have been made æsthetically pleasing in the name of preservation, degrading the historical integrity of the industrial landscape. Historically polluted watercourses are clean and green; historically noisy places have become quiet, and historically noisome places smell sweet, all in the name of historic preservation.

So that more people can enjoy the open spaces, the construction industry is busily throwing up houses in nearly every neighborhood, diminishing the open landscape that characterized the valley for three centuries. Hay fields, which once dominated the valley, are turning into subdivisions, golf courses, and lawns. The visual link with nineteenth-century industry recedes in step with the march of the suburbs.

While isolated artifacts of the nineteenth-century industrial period survive, the built environment in the Brandywine Valley today is primarily a product of the twentieth century, erected after the decline of local industry. Suburbanization is an important historical process, and the name of the most recent temporal division of the state plan.

As the state plan predicts, early examples of the suburbanization process soon will be eligible for the National Register.

4. HUMAN HISTORY

PEOPLE ARRIVED in the Delaware Valley near the end of the last (Wisconsin) glaciation (Kraft 1986:31). Glaciers entrapped so much water that the ocean lay fifty miles east of the present Sandy Hook, New Jersey. As glaciers retreated and the ocean advanced, area ecology changed.

During the ten millenia before European settlement, Delaware's climate evolved from glacial tundra to temperate hardwood forest. Man's adaptation to the changing climate was marked by gradual cultural evolution. Custer and DeSantis (1986) have provided a useful table that correlates human and climatic change:

PREHISTORIC CHRONOLOGY

Dates	Environmental Episode	Cultural Period
8080 BC	Late Glacial	Paleo-Indian /Early Archaic
6540 BC	Pre-Boreal/Boreal Atlantic	Middle Archaic
3110 BC	Sub-Boreal	Late Archaic
810 BC	Sub-Atlantic	Woodland I
AD 1000		Woodland II
AD 1600		

These changes in climate have forced changes in man's subsistence strategies, family structure, and social organization .

PREHISTORY

Mammoths, musk ox, horses, caribou, and walrus provided food for dire wolf, short-faced bear, and other predators. Man was among the smaller competitors in the tundra food chain, but his skills compensated for his physical shortcomings. Nomadic people of this Paleo-Indian period were among the most skilled makers of stone tools in the world. They would travel great distances to quarry the best flinty cobbles from which they made exquisite spearpoints, knives, and small tools.

Paleo - Indian hunting - gathering society lasted until about 6,500 BC, when the Atlantic climate episode and the Archaic period of prehistory began (Custer 1984:31). Northern hardwood forests had replaced the tundra, the ocean had risen, and the climate was warmer. Pleistocene megafauna were replaced by smaller game, which required different hunting techniques and tools.

Archaic people fashioned tools made of quartz, a material that is less tractable than the flinty materials that Paleo people had favored. Ground stone axes and other heavy tools appear during this period.

By 3,000 BC, prehistoric society was decidedly different. Because people had stopped moving around so much, regional cultural differences began to appear in the artifact assemblages. Sedentary lifestyles ultimately led to horticulture, complex religious practices, and the accumulation of more, less portable, material goods. The last prehistoric period, the Woodland, is characterized by larger groups of people living together in villages, using pottery and other heavy or fragile goods that would have been difficult to move from place to place. Woodland people tended to form more or less permanent settlements at places with abundant multiple resources. They sent out hunting parties, but they seldom dispersed whole populations to live off the land in the manner of their hunter-gatherer ancestors.

COLONIAL NEW CASTLE COUNTY

New Castle County was first settled by Europeans during the second quarter of the seventeenth century, first by Swedish settlers and then by the Dutch. Settlement reached the project area after the English takeover in 1664. It was the Quakers, who flooded the colony with settlers after Penn's takeover in 1682, that brought Western civilization to the project area.

Under the Dutch and the Duke of York, local courts had charge of parcelling out the unclaimed land, but the new proprietor soon concentrated authority in his own land office at Philadelphia. The ensuing period was marked by large grants to Philadelphia merchants and speculators, including members of the Penn family, who effectively controlled access to vacant land for another century. One of these tracts was the Manor of Rockland.

The upper Brandywine, including the project area, was one of the areas settled by the first wave of Penn's Quaker settlers. During the eighteenth century, the creek's abundant water power gave rise to flour, saw, and fulling mills, which were followed in the nineteenth century by paper, powder, and textile mills.

Delaware's Piedmont remained largely agricultural during the nineteenth century, in spite of industrialization and urban housing types in the river valleys. The non-farm population tended to live in closely-packed rows of houses around the milling centers, such as Rockland. Suburban sprawl, a characteristic of later periods, was unknown.

The surrounding farmlands were as much a part of the industrial scene as the mill villages. Even though the valley was served by short-line railroads, most industrial transportation still depended upon horse power. Every factory had its stables, pastures, and hayfields to support its draft animals.

In a larger sense, the upper valley mills can be interpreted as rural industry serving Philadelphia and even wider markets, beyond the purely local mills found elsewhere. Some of the mills were grist and saw mills, serving the needs of nearby farmers, but others functioned to process raw materials from distant sources for distant markets.

Thus it is difficult to distinguish between rural and industrial features of the landscape or to discuss the villages in isolation from their surrounding farms. One of the sites in the present project is part of a mill property in a "rural" setting, while the other, a short distance away, is a "village" environment. Both are decideldy industrial.

Much of the land in the area belonged during the nineteenth century to the duPont powder business, which was then a family-owned partnership. Members of the family appropriated the farms as estates, creating the nucleus of what has become known as "chateau country," the vanguard of suburbanization. Best known of these estates is Winterthur, which the last duPont owner endowed as a museum of early American decorative arts. Part of the Winterthur tract became Brandywine Creek State Park, while the family's first home at Eleutherian Mills became part of the Hagley Museum.

5. HISTORY OF ROCKLAND

WILLIAM PENN'S MANOR of Rockland was reserved for his family, who were entitled to personally collect ground rents beyond the customary proprietary quitrents, which were actually taxes paid to the proprietor's office.

Rockland was one of the earliest and longest-functioning mill seats on the Brandywine. John Gregg[Grigg] and Adam Kirk had a grist mill on the west bank in 1724. The place was known as Kirk's Ford until the first bridge was built on the present site. The east bank is still occupied by the shell of a former mill building, which now contains a condominium residential complex.

A fulling mill, for finishing wool cloth, was built here in 1733. Caleb Kirk in about 1795 began the improvements that eventually became the Rockland mill complex.

In the early nineteenth century, the stone mill on the west bank housed some of the earliest powered cotton spinning machinery in the United States. William Young was making paper here in 1800 for the U. S Treasury. Tradition states that William Young in 1802 built the stone worker houses that are the subject of this investigation (Le Compt n d).

In 1804, the plant made ten reams of paper from American mulberry roots, but the experiment came to nothing. The first paper mill burned in 1814. Papermaking stopped in 1822, when the mill was converted to cotton manufacture. The Rockland Manufacturing Company was incorporated in 1825 to make woollen cloth. William Young died in 1829, and the Company was operated by his sons until the factory burned in 1846.

Alfred Victor duPont became a director of the Company in 1846, and obtained an Act of the Delaware legislature to incorporate the enterprise in 1847. In spite of the attempt at reorganization, the plant was sold by the U. S. Marshal in 1849 (Riggs 1970: 81-82). In connection with the 1849 events, Joseph Taylor drew a remarkably detailed pictorial map of the site (FIGURE 5), which was engraved as an advertisement. A cotton milling operation followed briefly, failing in 1854.

Augustus Jessup bought the property at sheriff's sale and Rockland's second paper mill was begun. Jessup created the partnership of Jessup and Moore when he conveyed the property to this son-in-law Bloomfield Moore and his sons Alfred and Edward as tenants in common. The firm acquired adjacent properties as well, assembling 134 acres. A corporation was formed and management eventually shifted to New York.

The new ownership enlarged the mill and turned the Rockland seat into a paying proposition. By 1880, Rockland had a population of 200, two churches, a hotel, schools, and a large paper mill (Edwards 1880). There were eventually twenty-eight company-owned houses on the property, several of which are still standing (Le Compt nd) on the hill above the project area.

Jessup and Moore made fine book papers at Rockland and at another mill downstream. The mill operated under the name of Jessup and Moore until 1933. Trustees in Bankruptcy sold the property in 1934, and it changed hands several times.

Rockland shrank during the Depression. It was reported in 1940 that the postmistress had resigned because her house was being torn down (LeCompt n d).

Finally in 1940, the mill became the property of a firm called San-Nap-Pack, which later became Doeskin Products, manufacturer of tissue papers. Corporate financial problems, pollution concerns, and a fire in 1958 crippled the operation. New owners, Consolidated Cellulose Products, bought the business in 1967 and continued the Doeskin name.

During this period of reorganization and retrenchment, several older buildings, including those in the project area, were demolished.

The plant closed permanently in 1973, when it was sold to Bissell-Vinton Associates, who developed the condominium in the old mill buildings.

PAPERMAKING TECHNOLOGY

During the Jessup and Moore and the later Doeskin ownership, the mill made paper by the Fourdrinier continuous process, rather than the traditional sheet-by-sheet method. Continuous paper machines were introduced into America by Thomas Gilpin at Kentmere on the Brandywine in 1816.

Introduction of continuous machines altered the power and water needs of paper mills. Traditional paper mills used water power to operate their hollanders, machines that macerated old rags to make linen pulp.

Actual forming of the paper was a hand process, in which papermakers dipped screens into a pulpy soup of fibers and pulled out the wet sheets, which were then drained and pressed dry.

Continuous machines formed the paper on a porous belt, onto which a slurry of pulp was poured. A roll of dry paper came out the end of the machine at a much higher rate than any hand workman would have been able to match.

The new machinery required more power. It also needed more hollanders, which required more power. The mills also needed large supplies of very pure water, which was kept in a pond on the premises and re-used constantly.

Installation of the new machinery undoubtedly explains the expansion of the mill building under Jessup and Moore, soon after the firm was established.

This is the building that was gutted to form the basis for a condominium complex that retains architectural elements of the original mill. The mill's pond survives adjacent to Rockland Road, on the edge of the project area.

The site of the original mill, which stood above the bridge, probably is covered by the cement-block building that now stands upstream from the condominium complex. It appears on the 1849 survey of the Rockland property (FIGURE 4).

Another consequence of the new machinery was a change in workforce. Papermaking became an industrial operation, rather than a craft.

The 1882 Ferris Brothers directory described Rockland as "A thriving little town near DuPont's Station on the Wilmington and Northern Railroad" that was "fast becoming an important business center." Scharf's 1888 history, however, noted that the inhabitants were mostly Jessup and Moore employees, and "Alexander Colquohoun is the merchant of the village." (Scharf 1888:906)

The project area was part of the Rockland mill property through most of the nineteenth century. The 1849 survey (FIGURE 4) shows a three-unit row of houses in the project area, but the map is ambiguous about the locations and orientations of buildings. The 1835 painting (PLATE 1, PAGE 4), the Beers atlas of 1868 (FIGURE 3, PAGE 5), and the Baist atlas of 1893 (FIGURE 3, PAGE 9) are unanimous in placing the houses between Mount Lebanon Run and the extension of the road over the bridge, an apparently uncharted street.

Inside the intersection of Mount Lebanon Road and Rockland Road was a store, which shows on both the Beers and Baist maps. Locations of the store and the houses are shown on the sketch map of modern conditions, Figure 6, page 19 and on the 1918 survey, Figure 7, page 21, below. In the 1893 Baist atlas map (FIGURE 3), the store is shown in the intersection of Mount Lebanon Church Road and Rockland Road, approximately where the new intersection is to be built.

All of these sources agree on the more or less precise locations of the eight-house row and the post office and store

combination. All that was left for investigation was the issue of integrity.

The mill village is already listed in the National Register of Historic Places, but a site does not remain eligible after it loses its integrity. Since the row houses and store building had been destroyed, they would remain eligible for inclusion in the Register only as non-contributing parts of the district, or as archæological sites.

Accordingly, Bowers (1990) recommended reducing the district to eliminate the site here under consideration, since the revised nomination makes no mention whatever of archæological potential.

A building site can retain archæological integrity and contribute to a district even after it is destroyed.

Archæological integrity of the site, therefore, remained the only question unanswered. Mr. Burl Owens, now the security chief at the condominimum complex, reported that the buildings had been stripped of their wooden parts and then levelled, with nothing surviving above ground.

Mr. Owens pointed out locations of the store, the two worker housing blocks, and other features of the former village. He said that the destroyed rows resembled the one surviving stone row (PLATE 2, BELOW) that aligns with their foundations (PLATE 3).

Plate 2
Rockland project area

At right is a surviving mill worker house, similar to the one investigated, looking eastward from a point opposite the entrance to the former mill building. The road in foreground is the road over Rockland bridge, the extension of which would have passed in front of the houses.

6. Phase II Evaluation and Assessment of Impact at Rockland

THE ROCKLAND PAPER MILL was destroyed as an industrial artifact when the building was gutted and filled with housing units. Residential adaptation completely removed the mill, leaving only the shell of the building in which the most recent paper mill had been located. Since the main archæological and historical feature of the community was unalterably destroyed, the integrity of the Rockland district is seriously compromised.

Near-total loss of integrity might be a convincing reason to remove Rockland from the National Register, at least in terms of its industrial significance. There are, however, areas of architectural or æsthetic significance, distinct from the mill property's past or potential contributions to archæological or historical knowledge.

In particular, there is reason to believe that the village might have extraordinary National Register value under criterion D, which generally is reserved for archæological sites that have contributed, or might be expected to contribute to our knowledge of the past.

Outside the mill itself are the ancillary features of the mill community that might add as much to knowledge as the mill itself (PLATE 4, BELOW). Like the other mill seats along the Brandywine, Rockland still contains some of its worker housing, including some unusual frame rowhouses along the old county road up the Brandywine.

The area of the intersection improvement will cross the sites of three known structures: two

Plate 4
Stone house located just above the project right-of-way, formerly associated with the mill

four-unit stone rowhouse buildings and a frame store. These buildings can easily be located on the historic maps, with some accuracy. On the ground their locations are not so easily discerned, since the whole area was covered with clean fill after the buildings were demolished (FIGURE 6). When the 1918 map (FIGURE 7) was compared to existing conditions, it was possible to pinpoint historical features that are known to have existed.

In the vicinity of the rowhouse units, Mount Lebanon Run is contained between stone walls. The ground is covered with building debris including brick and stone masonry fragments and wall sections. One part of a masonry foundation and the remains of a springhouse are visible in the underbrush.

The store site has been cleared and graded, leaving no surface indications. Along Rockland Road, the apparent depth of fill is as much as ten feet in places. In the store site is a large Wilmington water department underground complex of meters and other equipment, marked on the surface by three manholes. Informants identified the manholes as occupying the site of the store, which is confirmed by the map.

The upper part of the project area has been deeply filled to provide a level yard for a house served by the private drive at the top of the sketch map, Figure 6. This house, shown in Plate 4, while not in the project area, will be impacted visually by the project. A house appears on this location in the 1868 map but not in the 1849 map, which gives a good bracket for the construction date of the house.

TEST TRENCHES

In order to assess the integrity, for purposes of determining archæological potential, a series of three machine-cut trenches were sunk into the site. The Gradall machine was chosen over the more traditional hand tools because it was known that the site had been covered with a heavy layer of clean fill. The former locations of the three principal historic buildings had been accurately established from historical documents (FIGURE 7).

Test objectives were limited to the Phase II purpose of determining the extent and integrity of the resource, which was known both from the documents and field observation. No features would be opened.

The first of these trenches, labelled Test 1 on Figure 8, was sunk into the area occupied by the lower row of four houses. Fill consisted largely of basketball-sized rocks, some with mortar still adhering, in a matrix of brown soil. These were assumed to be parts of the walls. Two layers of such rubble were separated by a layer of yellow sandy fill. Toward the road, large boulders appeared to be part of a demolished wall. Because of the nearness of sewer and water lines, it was deemed unwise to further explore these boulders.

The rubble ended near the present water table on a yellow sandy subsoil at the water table nine feet below current grade. Ceramics from the lower levels of the rubble (Island Field accession 90/56/1) are consistent with a building erected in 1802 and occupied until 1960. They include black-glazed red earthenware, green shell-edged pearlware, hand-decorated white earthenwares, transfer-printed white earthenwares, and ironstone.

Because the fill was extremely unstable, it was necessary to confine recordation to sketches, rather than tightly measured and controlled profiles. Water was encountered at the bottom, on the apparent natural sand level.

Informants reported that the houses had English basements, which would have placed their lowest elevation above the bottom of the rubble.

This trench confirmed the report that the demolition contractor, at least in this area, had diligently obliterated the houses, removing all intact masonry from the area of this test.

At the opposite side of the project area, on the site of the store and post office, a second trench was opened. Informants reported that the building was a lightweight frame structure, which the contractor had completely removed.

Plate 5

Excavating Test 2 with a Gradall

Test 2 was a machine-cut trench into the store site (PLATE 5). At a depth of five feet eight inches, an apparent natural clay layer was reached, which was tested another foot and a half, in order to confirm that it was natural. The bottom layer, resting on this clay, consisted of blacktop pavement and other very recent building debris. Between this test trench and the roads the ground has been further disturbed by extensive utility improvements, probably obliterating all meaningful traces of the store building.

It can therefore be concluded that the area designated as "cleared and graded" on figure 5 is so disturbed that it possesses no integrity. To the east, in the scrub woodland, the picture is very different. The demolition contractor had not been so diligent in removing the upper row of four houses.

At the top of the rowhouse unit stands the ruin of a springhouse (PLATE 6), which was built on a large natural outcrop. Looking down from the springhouse, a natural channel is apparent, flowing westward toward Rockland Road. This channel is covered over with rubble and trash, but it proved to be still very active.

North of the spring is a level space, extending sixty feet back almost to Rockland Run.Two large trees stand on this level platform, indicating that the landform is a feature predating the house demolition of twenty years ago.

At the opposite end of this plateau, alongside the channel, a small fragment or mortared stone wall was visible. When the debris in front of this wall was removed, it proved to be standing forty inches above the muck of the channel leading from the spring.

A dry-laid cross wall, eight feet long, stands athwart the channel, creating a waterfall about three feet high. as the stream steps down.

Plate 6

Remains of the spring house

In the muck of the streambed were several identifiable ceramic artifacts, including slip-decorated red earthenware, printed and painted white earthenwares, and black-glazed red earthenwares. These are consistent with nineteenth-century workers' houseware.

Longtime resident Burl Owens reported that the springhouse had not been used toward the last, since a deep dug well had replaced it.

Since there was a high probability that the channel might contain undisturbed deposits, it was backfilled gently, leaving the wall segment visible above ground for future reference.

No further archæological work is recommended for the area marked "heavily filled and disturbed" on figure 8. The house site, however, definitely warrants appropriate data-recovery treatment. The store site is apparently completely obliterated, and requires no further attention.

This site, especially the filled channel of the spring branch, has high potential for containing intact deposits that could shed light on the lives of nineteenth-century workers.

The state management plan for historical archæological resources, which was issued during this investigation, identifies suburban New Castle County as a threatened area. The theme of technological revolution, 1770-1830, is identified as a context needing attention (DeCunzo and Catts 1990:190).

Considering the investment that has been lavished on preserving fragmentary above-ground mementoes of the industrial period, there should be little difficulty justifying attention to the more substantial and informative remains that lie intact below the surface at Rockland. The village contains some of the earliest and latest occupied factory worker housing in Delaware.

Plate 8

Excavated wall segment, looking northeast

Built in 1802, the first industrial rowhouses at Rockland served their original purpose for more than a century and a half, and can be expected to provide an uninterrupted chronicle of life in a company house for the full span of the industrial revolution in America.

ELIGIBILITY AND EFFECT

The upper row of worker houses retains its archæological integrity, but the lower row has been severely damaged. The wall shown on Plate 8 is part of a stone platform on which stood the upper block of row. It also retained the spring branch.

In the area tested, this drain ran along the foot of the wall from a springhouse, perpetually wetting the soil. Organic remains could be preserved in the wet area.

Investigation of the house site could add to our knowledge of the living conditions of Brandywine workers during the nineteenth century. This particular site is set apart from other worker housing by the possibility of organic preservation in the waterlogged ground along the spring drain.

As an archæological expression of the qualities for which the district was nominated to the Register, the row of worker houses clearly is a contributing district element.

The current plan would have an adverse effect on these remains. If it is impossible to avoid disturbing the ruins, data recovery will be the preferred treatment.

PLANNING IMPLICATIONS

This project illustrates one of the inherent problems of preservation planning. Sites tend to be departmentalized, even though they might have diverse attributes.

In the normal course of business, an archæological site will be evaluated for eligibility by an archæologist, and a standing structure will be evaluated by an architectural historian. In theory, each consultant or other evaluator should take into account the other disciplines that might be involved.

The program recognizes [on paper at least] that any property might be eligible under more than one criterion, and that all properties should be evaluated against each of the criteria. Academic orientation of the evaluator, however, will skew the evaluation.

In the case of Rockland, the old nomination included the present project area, even though it did not address the archæological aspects of demolished houses.

The most recent re-evaluation eliminated the project area because the historic buildings had been demolished. Yet the present study revealed potentially significant archæological deposits. These deposits, independent of the existing district nomination, qualify the site for the Register.

Unless the archæological potential of a registered site has been recognized in the nomination, it is necessary to re-evaluate the property "from scratch" whenever a cultural resource management report is drafted. In the present instance, both the architectural and archæological dimensions of Rockland were being evaluated concurrently by consultants who reached opposite conclusions regarding worker housing ruins.

This situation gives rise to an effective "dual registration" for every major site, since the archæological dimension is inherent in human activities virtually everywhere.

A "quick fix" for the problem would be for each discipline to write a separate section of each nomination, regardless of the main thrust and the criterion under which the property is being primarily considered. So long as the Federal guidelines require professional qualifications for consultants in particular fields, it follows that a full complement of qualified individuals should consider each property, or the reviewing agencies should coordinate the efforts of diverse experts engaged separately to evaluate a single property.

Until then, cultural resources will be evaluated in the manner of the blind men describing an elephant in the Hindu legend.

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INFORMANTS

Robert Howard, curator, Hagley Museum, interviewed September 13, 1990.

Burl E. Owens, longtime resident of Rockland, interviewed November 1990

Qualifications of the investigator

Heite Consulting, a firm consisting of Dr. Louise Heite and Edward F. Heite, specializes almost exclusively in reconnaissance-level and phase I cultural resource management studies.

Edward Heite served as Historic Registrar and Chief of the Bureau of Archives and Records Management for the State of Delaware. His assignments with the state included the statewide survey of historic sites and the restoration of the Old State House at Dover. He was previously archæological historian for the Virginia Historic Landmarks Commission, for whom he directed the excavation of eighteenth-century Fredericksville Furnace and the seventeenth-century Hallowes site in Virginia.

Since 1980, the firm has completed reconnaissance-level studies and phase I studies for the Philadelphia District, United States Army Corps of Engineers, National Park Service, United States Navy, Waste Management of North America, BCM Eastern, Inc., the Trustees of the New Castle Common, and the Delaware Department of Transportation.

CERTIFICATIONS

Both principals of the firm are members of the Society of Professional Archæologists, certified in theoretical/archival research, document research, and historical archæology. Edward Heite is also certified by SOPA in field research and cultural resource management. They meet the professional standards for both historians and archæologists set forth in 36 CFR Part 61 and 43 CFR Part 7 (1984) and in the Secretary of the Interior's standards and guidelines for archæology and historic preservation (*Federal Register* Thursday, September 29, 1983, pages 44738-44740).