with this structure, the unusual conglomeration of building stages represented, and many significant remaining interior details, however, may make it eligible for listing on the National Register".

Fieldwork in 1980 on the Blue Ball Tavern tract was divided into two phases, Phase I and Phase II. The Phase I field investigations consisted of an examination of the standing structures, a surface collection and testing using a manual posthole digger (Thomas et al 1980:II-20). This work revealed several concentrations of artifacts as well as data which suggested subsurface archeological and architectural remains. The Phase II investigations consisted of a series of test excavations including four test units and four trenches. This fieldwork revealed the presence of two middens, possible outbuildings as well as foundation remnants and builder's trenches associated with a house/tavern and a possible well. The researchers felt that the date of construction for this structure would have been post-1850 as a wire nail was found in association with one of the builder's trenches. Thomas recommended that the site may be considered eligible for nomination to the National Register of Historic Places.

CULTURAL HISTORICAL BACKGROUND

Prehistoric

Delaware's regional prehistory has been subdivided into four major time periods (Custer 1980, 1984). They are the Paleo Indian Period (ca. 12,000 B.C. - 6500 B.C), the Archaic Period (6500 B.C. - 3000 B.C.), the Woodland I Period (3000 B.C. - A.D. 1000) and the Woodland II Period (A.D. 1000-1650). The Contact Period, dating from A.D. 1650 to 1750, follows the four major time periods. After about 1750, the aboriginal population in Delaware had ceased to exist as a relatively unacculturated way of life.

Paleo Indian Period

This time period dates to the terminal Late Pleistocene and early Holocene climatic eras, a time that marks the final retreat of the glaciers and the gradual development of modern climatic regimes. The Paleo Indian climate consisted of alternating wet and dry conditions characteristic of the Late Pleistocene and early Holocene and which supported the various extinct species of large game mammals such as mastodon, mammoth and moose. These animals were adapted to the various vegetational communities that existed, a mixed mosaic of deciduous and boreal forests, as well as grassland environments.

The tool kit of the Paleo Indian was oriented primarily toward the hunting of the various large game animals. Diagnostics are fluted and notched projectile points (the latter characterizing the Early Archaic) as well as several kinds of side and end scrapers. A preference for high quality crypto-crystalline lithic raw

material is indicated. This reliance on high quality stone had a great effect on the Paleo Indian settlement pattern; base camps were located in the vicinity of quarries, with radiating hunting camps and special procurement sites located away from the base camp/quarry locale. A Kirk Corner Notched point was found at the Concord Pike site during the Phase I investigations reported here.

Archaic Period

The changes in the climate mentioned previously led to the establishment of modern conditions by approximately 6500 B.C. There was a corresponding change in the adaptive pattern of the aboriginal groups inhabiting the Middle Atlantic. The extinction of the large game species by this time was caused, at least in part, by the reduction in the grassland environments and the development of closed mesic forests. The larger species were replaced by more solitary browsing species such as deer, elk and moose. Adaptive patterns were geared to the hunting of the more solitary species and the collecting of plant foods. This change in subsistence patterns is marked by the development of various grinding tools, a new technology and variety of new projectile point forms made from a wide variety of lithic materials. Settlement patterns were characterized by small seasonal base camps located to take advantage of seasonally available resources, with smaller groups fissioning off in pursuit of locally available kinds of plant and animal foods. Human population greatly increased over the preceding period. Examples of sites of this time period found during this survey include the Matson Run and the Rock Manor sites. Matson Run is a Middle Archaic lithic scatter at which a grinding stone and a Morrow Mountain point were recovered. A Morrow Mountain point was found at the Rock Manor site as well.

Woodland I

By 3000 B.C., increasing sea level had caused climatic/environmental changes that led to adaptive changes in the prehistoric way of life. This rise resulted in the development of brackish water estuaries. The mesic forest was replaced by a xeric type characterized by oak and hickory species, with an increase in grasslands. Temperatures were warmer and drier than before. The development of the estuaries created a rich environmental zone that could support large base camps on a seasonal schedule, which was, in part, probably semi-sedentary for a large part of the year. Further increase in population is noted at this time.

The Woodland I tool kit is characterized by the broad bladed Savannah River point forms and their derivatives, as well as solid container technology. The inorganic container technology is first characterized by soapstone bowls in the initial phases of the Woodland I period and subsequently by ceramic containers. Ground stone stools continue to be part of the tool kit. participation in regional trade networks are also a highlight of this era. No sites were found that could be definitely assigned to the Woodland I period.

Woodland II

The main characteristic marking the emergence of the Woodland II period is the development of a stable agricultural adaptation in many parts of the Middle Atlantic. Research in Delaware indicates that such a shift is not as marked as in other parts of the Middle Atlantic and that the Woodland I adaptive system continues to function, a system characterized by intensive plant cultivation and hunting. Various ceramic types with complex decorations are characteristic of the Woodland II period in Delaware. These wares evolved out of the earlier Woodland I ceramics. Small triangular projectile points are ubiquitous and indicate the use of the bow and arrow. No sites were found in the study area which could be assigned to Woodland II.

Contact Period

The Contact period is the time when the Indians were in active interaction with the newly arrived European traders and settlers. The information available comes from ethnohistoric sources, and shows rapid disruption and deculturation brought about by the combination of several factors, including high mortality rates from European introduced diseases, dependence on European manufactured goods and loss of land. At the time of contact the Indians in the northern Delaware area fall into the rather loosely defined Delaware Nation. The Delaware at the early Historic period consisted of widely scattered, rather loosely organized and relatively independent local groups. Only much later did the shattered remnants form a cohesive Pan-Delaware polity. All belonged to a larger linguistic grouping known as the Coastal Algonquin, of which Delaware is a subdivision. Within the category Delaware are further divisions, which include the Southern Unami, who lived in southern New Jersey and along the southern shore of the Delaware River and Delaware Bay (Goddard 1978). The Minguannan are the mapped groups closest to the project area. No evidence for sites of this time period was found in the survey area.

Historical Context

Introduction

In a project like the Route 141 Study that covers a diverse collection of resources it is desirable to provide a framework that integrates the interpretation of all the cultural resources within the project area. A model for such an integrating framework is provided by the concept of historic context, as defined in the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation:

"A historic context is an organizational format that groups information about related historic properties, based on a theme, geographic limits and chronological period. A single historic context describes one or more aspects of the historic development of an area, considering history, architecture, archeology,

engineering and culture; and identifies the significant patterns that individual historic properties represent" (Federal Register 48(190): 44718,9/29/1983).

The procedures given for the development of the historic context include (1) identifying the concept, time period and geographical limits for the historic context; (2) assembling the existing information about the historic context; (3) synthesizing the information; (4) defining property types; and (5) identifying information needs. The reason for creating historic contexts is to provide points of reference for the preservation planning process. At the state level, this process is guided by the State Historic Preservation Office, but there is a need for these constructs at a more local level as well. This is particularly true in an area like northern New Castle County, Delaware, which is undergoing rapid development and change. Unless the concerns for historic values are integrated into the broad-scale planning processes for land use, those values will be submerged in a torrent of competing contemporary concerns.

The model provided in the Secretary of the Interior's guidelines was elaborated at an earlier point in a publication by the Department of the Interior entitled "Resource Protection Planning Process" (Heritage Conservation and Recreation Service 1980). This analysis calls for the definition of "study units" which are equivalent to the Historic Contexts described above. Here the concept of "theme" is presented as "conceptual framework", and the example of a study unit for the 19th century textile industry is given, which is opposite to the project area discussed here. The example represents the related concepts of a factory system, labor force, organization of production, product distribution, and the supporting social, economic and political structure of community. These may be directly applicable to the project area considered here which includes 19th century mill-based industry.

With these guiding ideas in mind we may proceed to consider the Route 141 corridor. Its location is shown in Figure 2, and it crosses northern New Castle County on an angle from southwest to northeast, connecting four important 19th century north-south arteries: the Newport-Gap Turnpike, its principal branch; the Lancaster Turnpike; the Kennett Turnpike; and the Concord Turnpike. The first three are in Christiana Hundred and the last is in Brandywine Hundred. Until quite recently the area traversed by the corridor, which represents an extension of the Centre Road, was entirely rural in character and this offers our first unifying theme, The Rural Landscape. An examination of the cultural setting in its broadest sense reveals that there are two distinct, though related, historical contexts within the rural landscape being considered: the Agricultural Context and the Industrial Context. Both these contexts were undergoing change and development during the nineteenth century and we will examine the economic infrastructures that were the engines for these changes as a first

step in understanding the other kinds of changes evident in the historical and archeological records.

At this point a limitation in the application of the historic context model, as outlined in the Department of the Interior publications, must be considered. The geographical limits of the context or study unit are most desirably defined by the distribution of the thematic resources themselves, though other considerations may be applied. For example, "often the geographical area will have recognizable natural characteristics that have facilitated, inhibited, or otherwise influenced human activity (prehistoric and historic) within its boundaries" (Heritage Conservation and Recreation Service 1980:12), and some attention will be given to these characteristics below. Although considerable inventory activity has been carried out in New Castle County, it is beyond the scope of this study to consider all the resources in that political subdivision. The geographic boundaries of the corridor study constitute a kind of transect through the area and, as such, present a somewhat constricted sample of the resources related to the conceptual themes that are used in the discussion. In spite of this limitation, the procedure is still a useful one, and reference will be made to other studies and inventories without trying to provide an exhaustive or all-inclusive account of them.

The notion of a transect is a useful one for highway corridor studies, but it should be observed that it functions as a representative sample of the northern New Castle County area only in an informal sense. A highway corridor is developed to address on-the-ground transportation needs and is not placed randomly or systematically to satisfy statistical criteria (see Mueller 1975 for discussions of the uses of this method), but in this case it does provide a rough cross section of what was formerly an entirely rural landscape north of Wilmington.

The Rural Landscape

We commonly tend to think of "landscapes" as rural, or wild, to begin with so to some extent the term is redundant, but as defined by Melnick, the term would be applied specifically to areas tangibly affected by human activity (Melnick 1984:2). He draws on ideas of the geographer Carl Sauer to describe the rural landscape as a dynamic and evolving "medium" sculptured by human activities. Three kinds of spatial contexts can be overlaid to help define the boundaries of rural districts and their landscape components: (1) the physiographic context, (2) the ecological context, and the (3) historical and cultural context. As previously mentioned, it is not the objective of this study to provide a detailed discussion of context boundaries, but these three levels of analysis can lead us to our goal of considering the historical context at a conceptual level. We'll deal with the first two here and set aside a separate section for the last one.

The Physiographic Context

A succinct description of the physiography of the Route 7 corridor, a few miles to the west, fits the present study area moderately well. The area is described as being in the Piedmont uplands with diversified relief, narrow, steep stream valleys, and isolated knolls (Catts, et al. 1986:4). The underlying geologic formations are folded Paleozoic and Pre-Cambrian metamorphic and igneous rocks (Custer 1981:33). The topography and drainage characteristics, which are convenient for the construction of water-powered mills, contributed to the development of a variety of milling industries in the area. The fact that the study area is near the fall line junction of the Piedmont with the Coastal Plain, and that there is immediate access to a major navigable river, further encouraged the development of the industrial context by providing ready access to both domestic and foreign markets for the various raw materials and products manufactured (Lemon 1972:146). This represents a relatively modern expression of the tendency of human populations to exploit ecotonal settings.

The soils in the Route 141 corridor are predominantly in the Talleyville-Montalto series (Passmore 1978:21), which are described as mineral soils with an illuvial horizon of silicate clays, low base saturation, possessing the simplest set of horizons, and with moisture available to mature a crop in most years (Talleyville. Typic Hapludults; fine-silty, mixed mesic family. Montalto. Ultic Hapludalfs; fine mixed mexic family: Soil Conservation Service 1972). They tend to be thin however, and without proper management they can become rapidly depleted (Passmore 1978:19). These characteristics stimulated an early recognition of the problems of cultivation practices and early attempts to find innovative solutions through technology and new crops. (The New Castle County Agricultural Society was found in 1804: Passmore 1978:100). Important characteristics of the agricultural context were influenced by these conditions, as the cycle of shifting market demands was played out in the county.

Therefore, the elements of the physiographic context that are most germane to the conceptual units being developed are general soils characteristics, which affected the practice of farming and, along with cultural factors, stimulated innovation, and the narrow valley of the Brandywine Creek which offered such excellent conditions for the establishment of water-powered industry.

The Ecological Context

During historic times, up until recently, the natural ecology of the study area has been dominated by the practice of agriculture, which replaced the native forests with open cropland. Although the virtues of the narrow stream valleys for the construction of mills were recognized early, locations in this steep-sided terrain that were not mill sites generally remained wild, since they had little other economic potential. This undeveloped character is occasionally reflected in the deed

descriptions mentioned in the property histories. Some additional use of the steep sides of the Brandywine Creek valley was made for workers' housing as the mills associated with the DuPont company increased in number and size, but much of this has been abandoned and has reverted to a wild state. A few other relatively undeveloped areas reflecting natural conditions remain near the study area (i.e. Triangle Woods between Old Murphy Road and the Concord Pike; Fleming 1978:102-3), but in general the increasing intensity of cultural uses for the landscape, such as large corporate offices (e.g. DuPont Company, ICI), shopping centers and subdivisions has obliterated the natural vegetation and even altered the drainage and topography in some places. This is the end point of a series of cultural processes that are considered in more detail below.

The Cultural Setting

The present condition of the landscape has been described above, as well as the prior state of agricultural use. The mercantile motives of the earliest settlers had focused on the extraction of furs, fish and other natural bounty of the land (Hoffecker 1977:9-12; Custer 1984:174), but the need and value of establishing a colony of cultivators soon became apparent (Hoffecker 1977:16). Cultivated fields gradually replaced the ancient forest, although as late as 1756 a Swedish visitor observed that most of the farms were "newly cleared" (Hoffecker 1977:23). Farming continued to occupy the vast majority of the landscape that was susceptible to it until quite recently, and most of the descendants of the diverse groups of early settlers, the Swedes, Dutch, and English - that remained shared that ancient occupation.

Cultural diversity was a distinct characteristic of the early settlement of New Castle County because several European powers had competed for control of the area (Hoffecker 1977:8-23). In 1790 the population of the new state was divided among these groups as follows: English, 60.0%, Scotch, 8.0%; Ulster Irish, 6.3%; Free State Irish, 5.4%; German, 1.1%; Dutch, 4.3%; French 1.6%; Swedish, 8.9%; Unassigned, 4.4% (white population, only) (U.S. Bureau of the Census 1976: Series Z 20, p. 1168). There may initially have been some differences in how these different groups cleared the landscape (Hoffecker 1977:23), but there is no evidence to suggest that they used it much differently on a broad scale, at least during the nineteenth century. Immigration continued to supply foreign influence, including the duPont family who developed several industries along the Brandywine Creek. Other French influences were provided by emigres from Hispaniola, who had fled that island after their slaves had revolted. They provided an effect on the popular culture of the area by creating an interest in French Language and art (Munroe 1954:149-50). The duPont family, and E. I. duPont in particular, assisted in the immigration of numerous individuals and families to work in his powder yards. His original desire was to attract experienced workers from France, but this plan met with little success, so he found willing workers in Ireland and paid the passage for many of them (Hoffecker

1977:113). By 1870, while slightly better than half the residents of Henry Clay Village (54.8%) had been born in Delaware, a quarter of the total (25.3%) had come from Ireland (Sisson 1980:36).

Although the diversity of cultural origin for the population of the state, and the project area in particular, was high throughout the nineteenth century, and there was some tendency to preserve the heritage of origin in the first generations (Hoffecker 1977:115), most of these groups were in fact gradually assimilated into the larger society. No research comparable to that carried out by McHenry (1986) for the Vermont countryside has been completed in Delaware, but an impressionistic evaluation of property boundaries and nineteenth century land use indicates that the differential patterning of field forms by different cultural groups found in Vermont is not present in Delaware. The particular influences on other aspects of material culture by different cultural groups is mentioned below, but there is little in the physical landscape that is not more "American" than anything else.

The landscape that is the setting for the events that compose our contextual themes has been primarily farmland since the early settlers drove the natives away from their forests and river floodplain fields. The practice of agriculture in the study corridor and surrounding area has undergone a number of changes through the years, but it has been conditioned largely by local environmental and economic conditions and, where practices that derive from ancestral cultural traditions have survived, it has been because they were consistent with those limitations. The second important element of the landscape is the Brandywine Creek. The geometry of the stream is particularly favorable for the establishment of water-powered industry, and the position of the valley in the study corridor is sufficiently near to the harbor that access to national and international markets could be maintained.

Agricultural Context

Our theme for this context will be the development and change of the practice of farming and the lives of its practitioners in the area of the study corridor from late colonial times to the end of the nineteenth century. This time frame is selected because the majority of the historic properties identified for the 141 project area thus far are included in these temporal brackets. As indicated previously, we cannot fully assess the issue of geographical limits beyond the study corridor. Farms are, by nature and necessity, dispersed across the landscape, but the particular developments and changes represented by the agricultural properties in the study corridor reflect some trends that resulted, in particular, from proximity to the growing city of Wilmington. To map the outside boundary of these effects would require a rather detailed historical study of a variety of market processes, and there would be thresholds that would differ for different kinds of economic interaction, creating a set of tiers with differing characteristics from each other through time. (For an example of

these processes on a larger scale, Lindstrom's 1978 study of the Philadelphia region, of which the study corridor is a part, will serve. The study corridor probably represents the innermost of these concentric tiers, but additional research will be necessary to verify this.

The agricultural properties contained within the study corridor, and similar ones nearby, represent primarily residences and service facilities that provide material continuity through the changing circumstances that will be described. Often even the functional service buildings, such as barns, chicken coops, dairies, etc. are gone or have been replaced with more modern structures, while the residences remain in various states of remodelling or decay. Our primary historical and thematic interest is in the individuals and families who occupied these buildings and worked the surrounding land, but, in order to see their circumstances clearly, we must consider the larger economic milieu in which they operated and to which they had to adapt.

Economic Trends

Markets

It is generally acknowledged that market production of grain was well established in the Middle Colonies before the American Revolution and that both domestic and foreign markets were being served (Bidwell and Falconer 1941:138; Lemon 1972:181). The same authorities assert the primacy of Philadelphia as the chief export port for grain and flour. Britain's domestic supplies of grain fluctuated during the last half of the eighteenth century, but her West Indian colonies were in constant need of American foodstuffs, and the island colonies of other nations required supplies as well. Bidwell and Falconer point out that while New England exported some farm products such as cattle, wool, vegetables, etc., she was dependent on the Middle Colonies for flour and wheat (Bidwell and Falconer 1941:143).

After the American Revolution, European and Caribbean demand continued to draw on the capacity of American farmers to produce. Frontier areas in western Virginia and Pennsylvania were almost immediately drawn into market production, bypassing the stage of subsistence farming hypothesized by Turner (Mitchell 1977:4). The chain of delivery for these products included several links, as described by Appleby: "American farmers, American teamsters, American flour and biscuit processors, American shippers forged the commercial chain which linked the hinterland of Norfolk, Baltimore, Philadelphia, Wilmington, and New York to Kingston, Teneriff, Oporto, and, after the Revolution, Bordeaux, Barcelona, and London" (Appleby 1980:13). We find examples of all these activities in New Castle County, particularly in the early part of the nineteenth century when the quality of the flour milled on the Brandywine was legendary. The emphasis on improved market access for raw materials and products stimulated the construction of canals and toll roads such as the Lancaster Turnpike, the Kennett Turnpike and

the Concord Turnpike, and less expensive water-borne transport linked the Brandywine Mills with the Port of Philadelphia and the world beyond (Dauer 1978).

One essential element in a landscape where the dwellings are dispersed, and where sizable distances must be crossed to deliver products for processing and marketing, is the tavern. Travel on unimproved roads, and even on turnpikes was slow, averaging only 15 miles a day for a loaded wagon (Ward 1968:14). The tavern provided shelter and refreshment to teamsters and travelers and provided a meeting place for social purposes for the residents of nearby towns. The services of a smith or wheelwright might be provided at the tavern or on an adjacent property, and these occupation units could remain by themselves and provide a prosperous living for their proprietors, or, if their location was sufficiently favorable, a small village might grow up around them. Examination of early maps of the area of New Castle County reveals numerous taverns and "shops" to serve both the local population and the teamster and merchant as they made their way slowly toward the culmination of their business.

Political events following the achievement of independence created fluctuating markets for agricultural goods, however. There had been considerable indigenous development of industry and commerce during and following the Revolution which resulted in adverse economic pressure on the new nation, in particular, from England, where mercantile interests resented the loss of their captive markets. In response, President Jefferson initiated a series of trade embargoes. These affected the price of grain and flour adversely by cutting off major export markets, and the situation was further aggravated by the War of 1812 (Groner 1972:58-9). In the period following the removal of these limiting conditions, foreign demand expanded, and this, along with improved transportation systems, encouraged the opening of additional lands to cultivation on the western frontier (Lindstrom 1978b:20). Foreign demand began to decline again after 1820, with the passage of the Corn Laws and the closing of British West Indian ports to American grain, but internal demand was increasing, particularly in Philadelphia. Lindstrom has developed the hypothesis that the Philadelphia region (including New Castle County) developed as a market area by achieving greater internal regional integration in the first decades of the nineteenth century. One of the aspects of this integration was that farmers began to diversify their production to serve the diversified demand in the growing urban market, and specialized zones of production emerged, approximating a model put forth by the geographer von Thunen (Lindstrom 1978a:145; 1978b:20).

The differentiation and specialization of agricultural production in the regional hinterlands of large urban centers was also encouraged by the fact that, as the nineteenth century progressed production of basic commodities such as flour burgeoned, in the newly opened lands west of the Alleghenies. Although exports had declined the rapidly expanding domestic market provided

an ever-increasing demand that was supplied through the increasingly efficient canal and rail net, and via the Mississippi River and the Gulf (Bidwell and Falconer 1941:306-315). As these products appeared in the east to compete with those grown on less productive soils, eastern farmers shifted production into items with greater demand and less competition. The necessity for making these responses "tended to make the agriculture of the period (1840-1860) rational rather than traditional" (Bidwell and Falconer 1941:452), and New Castle County farmers were well known for their progressive practices, including the use of fertilizer and crop rotation (Hoffecker 1977:45).

New Castle County is within the first or second of the von Thunen production zones, tied closely to the Philadelphia core by rapid, inexpensive coastal transportation. Its production of oats and corn, the fuel for the increased horse-drawn transportation in the growing urban centers, was particularly intensified (Lindstrom 1978a: Table 5.8, p. 142). Various measures such as per capita agricultural incomes, real estate values, and increasing per acre evaluations of farms (Lindstrom 1978b:21; U.S. Bureau of the Census 1976:Series K47, p. 461 and 463) indicate an increasing market participation and a sustained reward for the practice of farming in the Philadelphia region and the State of Delaware. New Castle County farmers were even more responsive to the needs of the growing industrial population in Wilmington and along the Brandywine during the nineteenth century. In addition to oats and corn, urban transportation required hay, and decreasing crop yields encouraged rotation with marketable fodder grasses (Bidwell and Falconer 1941:235; Passmore 1978:29). Since these fields in the vicinity of the earliest settlements had been brought into cultivation first, their crop output declined first, and the existence of markets for less demanding produce was welcomed. Urban markets also required meat which was commonly grown in the outermost hinterland zone and driven to the urban market, where the slaughter animals, primarily cattle, were fattened in nearby pastures before being sold. This practice was also a response to other market conditions: the high cost of farm labor, needing only a seasonal basis for crop production, was obviated since cattle management required fewer workers (Bidwell and Falconer 1941:235), and an increasing recognition of the value of cow manure as fertilizer gave value to a byproduct of beef production (Passmore 1978:36). Ultimately dairying, whose product also found a ready market in the urban centers, became a more important alternative to crop production in Delaware (Passmore 1978:36).

Finally, market gardening of fruits and vegetables was an important aspect of location near the growing urban market (Bidwell and Falconer 1941:261) and many of the farms of Christiana and Brandywine Hundred participated in this market (see Tables 5, 6, 10 and 13). Supplying a variety of foodstuffs for the tables of urban and other workers who did not produce their own food provided a good return to New Castle County farmers. Their position near the purchasers allowed them to adjust rapidly to changes in demand. New Castle County farmers participated in the great peach

production beginning in the 1840's (Hoffecker 1977:45) but were forced to adjust again when "the Yellows" made its first inroads there (Passmore 1978:71). It should be observed that while diversification was an important aspect of response to urban market conditions, quantities of wheat, potatoes and other staple crops were still being produced (Tables 5, 6, 10 and 13), so some of the basic production factors were still operating. Between 1860 and 1870 the proportion of farms with market gardens shown in the Agricultural Census returns actually declined. The changing demands of the marketplace created adjustments in the composition and activities of the farm household, and these are discussed in the next section.

Households

The point has already been made that market production was an important feature of agricultural life in colonial times, and analyses of data at a more individual scale confirm this. Lemon examined a series of 159 wills from Lancaster County, Pennsylvania, dating between 1740 and 1790, and concluded that at least forty percent of the farm production was available for sale (Lemon 1967:60). Obviously, the larger portion remained for home consumption, and certainly much of the cloth and clothes particularly of the rural population was manufactured in the home, though commercially made products were available (Lemon 1967:67). If the colonial farmer was not entirely self-sufficient he still provided a sizable proportion of his family's needs in food and material goods, or worked reciprocally with his neighbors to acquire them.

Population data for Delaware as a whole indicate that although the proportion of the rural population slowly declined as urban centers grew, the majority of the citizens of the state lived in rural areas until after 1910 (U.S. Bureau of the Census 1976: Series 202 and 203, p. 25). The rural inhabitant therefore represents the typical citizen and the farmer was the basic producer. His circumstances changed inexorably throughout the nineteenth century, however.

Detailed information about farms was not gathered until 1850, but from that time until 1910 the number of farms in Delaware increased from six thousand to eleven thousand (U.S. Bureau of the Census 1976: Series K47, p. 459). The value of those farms individually fluctuated around an average of $4232, although the average acreage steadily decreased, which implies an increase in the average value per acre overall. Lindstrom observes that incomes for farmers in the Middle Atlantic remained above average for the nation until at least as late as 1840 (Lindstrom 1978b:37). Although the proportion of people living in rural areas declined relatively slowly, the number of people moving to urban areas increased, and it is clear that many of these were migrants from the countryside apparently responding to lack of opportunity for employment in agriculture (Lindstrom 1978b:21). Clearly the shift from the agricultural household to the urban or industrial life was

a gradual one, with many individuals shifting back and forth, perhaps on a seasonal basis (Bushman 1980:37-38). This may have contributed to an additional trend away from home production of material goods and toward the purchase of items manufactured in the new factories at home (Lindstrom 1978b:37; Bidwell and Falconer 1941:250-253). Part-time employment in a nearby factory brought the rural worker into contact with more fashionable mass-produced goods and also provided additional cash income with which to purchase them, creating a kind of feedback loop which stimulated industries producing standardized consumer goods (Lindstrom 1978b:23). The entire household was drawn into greater and greater articulation with the cash economy, and became more dependent not only on the markets for their own production, but also on the regional and national economic cycles. This is particularly true in New Castle County, with easy access to urban markets and manufactured goods.

While individuals might shift back and forth from agriculture to manufacturing, the overall trend was toward the latter, so that the proportion of rural households declined as a percentage of the whole, just as the population did. The average size of households declined for the country as a whole during the nineteenth century from 5.79 in 1790 to 4.76 in 1890 (U. S. Bureau of the Census 1976:Series K291, p. 41), and since the majority of households were rural we can assume that the decline in these values reflects rural circumstances. In the period from 1800 to 1900 the number of man-hours per acre needed for the production of wheat declined from 56 to 15 (U.S. Bureau of the Census 1976:Series K445, p. 500) and the man-hours per bushel produced declined from 373 to 108 (U.S. Bureau of the Census 1976:Series 449, p. 500). Since much of the labor for production was drawn from the household, the need and incentive for able-bodied family members to remain on the farm would have declined with these figures. Thus a pool of underemployed individuals was created to provide labor for growing industries, and to open new fields on the western frontier. The increased efficiency of production can be attributed to a number of factors: improvements in the biological stock of plants and animals, increased use of fertilizer, and improvements in technology such as plows and storage facilities. The farmer in the urban fringe was already shifting his production away from traditional crops to respond to new markets, and so he was receptive to new techniques and methods. Among other responses he could successfully cash crop a much smaller parcel of land by specializing <u>only</u> in market gardening and eschewing staple production altogether. If the completely self-sufficient farmer has always been a myth (Bushman 1980:30-31), the increase in participation in the cash economy stimulated a further decline in the production of subsistence goods on the individual farm.

Material Culture

Technology

Farmers are inclined to be conservative and the introduction of technological improvements for farming often long preceded their common use. While the eastern farmer was producing more offspring than his limited supply of land could support, the western farmer, who was taking over the grain market, had fewer hands than he needed to bring his crop to market. Cyrus McCormick developed his mechanical reaper in the Shenandoah Valley of Virginia in the early 1830's, but his success was achieved when he moved his plant to Chicago 1844 (Groner 1972:13). The diversified farmer in New Castle County continued to produce market grains, particularly fodder, but generally smaller fields and more available hand labor would have reduced his incentive to employ labor saving machinery. These factors, rather than a reverence for tradition, would have slowed the adoption of these newer methods. As noted above, innovation in agricultural technology was applied toward mass production of bulk grain commodities, and was less likely to be applied toward the diversified production of the urban fringe farmer. Here fruit and market garden crops could be harvested by hand labor available on a seasonal basis in much the same way that they are still brought in, though, in the nineteenth century, laborers were more commonly brought out from nearby urban areas rather than from foreign countries.

Domestic

The profound changes taking place in the structure of the household economy of farm families was affecting all levels of their material culture. A number of scholars have examined the remains of ethnic traditions in various aspects of material culture and have created geographic models of their distribution. Henry Glassie was able to define a "Mid-Atlantic Folk Culture Region" based primarily on architectural characteristics that represent contributions from British and German traditions, with the latter predominating (Glassie 1968:36-64). He has provided a more detailed analysis of Delaware Valley architectural traditions, giving examples of the synthesis of these traditions in individual structures and describing the gradual dominance of what evolved as an ultimately new form from traditional roots (the majority of examples that he examines are rural farmhouses where vernacular forms were almost invariably used). Grafting a Georgian model onto both Germanic and British vernacular structural forms produced a characteristically American style of house (Glassie 1972;47). Elsewhere, in the Shenandoah valley, the adoption of a distinctly Anglo-American house form has been observed to be concurrent with the gradual suppression of Old World ethnic traditions and language (Chappell 1980:63). In that location the contrast between new and old is extreme and the shift toward a more homogeneous American culture more obvious. Although Glassie does not specifically make the point, the emergence of the synthetic house form in the Delaware Valley may represent the same kind of shift. Many of the

synthetic architectural forms that Glassie illustrates may be found in northern New Castle County, in locations not overrun by urban sprawl.

Glassie emphasizes that structures are "unitary" forms whose stylistic components are self-contained, and whose arrangement is with reference to abstract templates (Glassie 1972:49). The arrangement of the buildings into a functional grouping must be more responsive to environmental constraints and he identifies two plans for farms in the Delaware Valley. In the plan for southern Pennsylvania and its areas of cultural continuity, "The ideal...consists of lining up the house and barn gable to gable and positioning this linear structure so that the fronts of both the house and the barn face south, east, or somewhere in between..." (Glassie 1972:51). He points out that the plan may be fulfilled even with modern structures, and may be modified to adjust to variables of compass alignment, road location, etc. He concludes that the model expresses the integration of house and barn as a functional unit, though this expression is less tightly realized than the European models upon which it is based. The integrated character of house and barn plans in the Delaware Valley contrasts with other cultural areas such as the midwest, where no traditional plan relationship is found between residential and maintenance and production facilities (Glassie 1972:55). It is difficult to observe farm plans in the inner portion of New Castle County because, in most cases, the barns and outbuildings have been destroyed for lack of use, even when the residence remains, but in at least some cases archeological research might yield evidence of this cultural pattern.

If a shift to a more homogeneous architectural style marked a self-conscious movement toward a national identity, then the acquisition of mass-produced consumer goods, purchased as alternatives to homespun and homemade, no doubt contributed to the same integrating impulse. Greater participation in the cash economy provided the ability to participate in this market, and the reallocation of effort to tasks outside the home, particularly near urban and industrial areas where opportunities were available, drew time away from home manufacture and provided the wherewithal to purchase substitutes. The putting-out system, an ancient manifestation of industry in Europe, brought the manufacture of shoes, bonnets, and clothes to the farmhouse after 1830, where there was no factory nearby. Since these goods were produced for sale, and the money thus earned applied to the purchase of necessities formerly produced in the home as well as to inexpensive "luxuries", the transformation of the assemblage of household goods was not confined to urban fringe or industrial areas (Bidwell and Falconer 1941:253). It is likely that one of the main effects, if not a conscious cause, of turnpike construction providing improved transportation conditions was to increase the flow of mass-produced consumer goods from commercial and industrial centers out into the countryside to these waiting markets (Lindstrom 1978a:100).

In fact, Lindstrom asserts that the relatively simple, functional quality of household-manufactured goods predisposed rural residents to mass-produced goods which possessed the same qualities and lacked the decorative embellishments of the expensive items hand-crafted by specialists for the well-to-do (Lindstrom 1978b:23). Again, a feed-back effect expanded the demand and production of these items. As the tendency toward centralized production increased, ethnic or regional preferences were submerged in the mass of simple, generalized designs whose unified pattern was becoming available in the 1830's and is finally pictured in the mail-order catalogues at the end of the century (Brady 1972:63). Robert Heilbroner sums up these shifts in three generalizations: 1. "...the transformation of the economy changed the character of domestic life, displacing many tasks formerly done at home into the market arena"; 2. "A second general change was the homogenization of material culture - a leveling of material standards in many areas. The availability of cheap watches, railway travel, vulcanized mackintoshes, machine-sewn shoes...the introduction of machine-made products set into motion a 'democracy of things' that we can trace through the ensuing years down to our own time"; 3. "...the introduction of a new state of common expectation, a new state of mind about the material environment itself" (Heilbroner 1977:54-55).

Brady observes several trends which would have transformed the inventory of material possessions of middle-class consumers, a majority of whom lived on farms in the nineteenth century. Cook stoves with ovens and a variety of forms of pots and pans became widely available. The introduction of home canning technology in the late 1850's enhanced a tradition of household frugality, and may have retarded the commercial canning industry. While the production of cloth in the home had been almost entirely abandoned by the end of the nineteenth century, the introduction of the sewing machine at that time provided a new demand on commercial cloth production (Brady 1972:67). The development of light-weight camp beds during the Civil War encouraged the production of beds with springs (Brady 1972:69). By 1853 Chauncey Jerome was producing 444,000 clocks a year and selling them for $1.25 apiece (Groner 1972:102-103), putting what was once a luxury for the wealthy within reach of many households. Even when the principal carrier of produce to market used water or rail, at least the first trip for agricultural products was made in the farmer's own wagon. In the Philadelphia hinterland, the dollar-value output of carriages and wagons increased from $87,000 to $1,241,000 between 1810 and 1840 (Lindstrom 1978a:148). By the 1860's techniques for steam bending wood into lightweight wagon wheels allowed the addition of lightweight buggies (Brady 1972:70) to the inventory of heavy farm wagons needed for produce. The buggies provided more convenient transportation for activities not directly related to production such as social gatherings and shopping trips. A mass produced farm wagon had been marketed by 1829 (Groner 1972:86), and if the local smith had lost the trade of manufacturing wheeled transportation to the factory, the need for his services for

repairs still expanded with the supply of vehicles. At least one wagon was needed at every farm.

Brady speculates that glass (probably excluding storage vessels) first entered most farmhouses in the nineteenth century in the form of candle lanterns, before glass panes had replaced paper ones in the windows (Brady 1972:72). Various items for recreation, personal and medical care, tobacco, etc. are combined under "sundries" by Brady and she finds the largest contrast in expenditures between farm and town in the area of food. Much less was spent for this item on farms and proportionately more, therefore, was spent on other items. Even if the average farmer failed to produce all of the food his family consumed, he was still providing a noticeable quantity to offset his consumer expenditures (Brady 1972:78-79), at the same time that he was becoming a specialized commercial producer.

Other than the collections of a few specialized museums the major source of examples of the material culture of late eighteenth and nineteenth century rural America is the archeological record. The data exist at a variety of scales from field patterns and farm plans to potsherds, and the latter items figure prominently in archeological analyses of dating, economic status, and function of the contexts and households they represent. Ironically, these items are rarely discussed or evaluated outside the archeological literature and little direct data are available on them. The sources cited above that focus specifically on consumer goods and their use in households do not even mention them. U.S. Bureau of the Census (1976:Series P340, p. 700) data indicate that in 1869, the earliest date for which a tabulation is given in the summary volume, the dollar value of "China and household utensils" produced for domestic consumption is 9.9% of the total value of consumer durable goods produced in that year. If the twenty-six million dollar value given for that output is divided equally among the seven million, five hundred and seventy-nine households tabulated for the following year (1870; U.S. Bureau of the Census 1976: Series A288, p. 41), then the average annual per household expenditure for "China", etc. is three dollars and forty-three cents. This does not take into account ceramics imported from foreign countries, but even if those were included, the amount consumed was still a small amount. An evaluation of the proportionate value of china in probate inventories reveals that when these items are even mentioned, they are a small proportion of the total value of the estate. This does not suggest that ceramics and glass (whose presence is equally obscure in references and documents) are not useful tools of analysis, but rather that their significance in the material culture assemblage of past households must be evaluated almost entirely on archeological grounds.

In summary, the agricultural context of the study area includes an economic situation in which the value of its products remained relatively stable throughout the nineteenth century, but in which the content of the production shifted to meet new needs

and markets. The number of farms and households grew slowly in comparison to those of urban contexts which, along with westward migration, were absorbing a large proportion of the large rate of increase in the total population. Changes in household structure included a greater involvement of household members who remained on the farm in production activities other than agriculture and a greater reliance on mass-produced technology and material culture. In the study corridor in particular, articulation with nearby rural based industries was a factor which will be considered further in the next section.

Industrial Context

The theme for this context is the growth of industry and the population that served it. The geographic boundaries of this context are somewhat easier to define than those for the agricultural context since the industries themselves are confined to the watercourses of the local streams, particularly the Brandywine. The study corridor includes residential properties related to powder and textile mills, and while the former are somewhat unusual in the array of early industrial activities, the latter were a common expression of the drive toward industrialism. Both standing structures and archeological remains of industrial residences are present where the study corridor crosses the Brandywine Creek.

Economic Trends

In the 1730's and 1740's Quaker millers began the industry of merchant milling along the Brandywine and other New Castle County rivers and streams (Hoffecker 1974:8). Millers, who converted grain to flour, were a common feature in agricultural landscapes in the eighteenth century. The custom miller ground in several grades to the farmer's specifications and returned the flour to him in exchange for a portion of the produce. As mentioned above, farmers were growing to sell, as well, and by 1772 at least a third of the production of farmers in southeastern Pennsylvania was exported through the port of Philadelphia (Lemon 1972:181). Much of this product passed through the Brandywine mills, creating a level of activity that can be referred to as industrial, since it transcended the small scale operation of the custom miller in size and output (Munroe 1954:120). The need for efficient equipment to handle commercial volumes of grain inspired a young Delaware inventor, Oliver Evans, to assemble five separate devices, all powered by the same power source, to process the grain (Wilson 1960:57), creating a model for the industrial mill factory. Lemon thinks that the advantageous combination of good mill sites on the Brandywine and direct access to the tidewater transportation network kept Wilmington "from the atrophy that other towns suffered under the commercial shadow of Philadelphia" (Lemon 1972:146), and, as the early national period opened, variety of newer industrial activities joined the merchant millers along the swiftly flowing course of that stream.

The idea that the development of the industrial enterprise in North America was desirable had been acknowledged by some before the Revolution, but British mercantile policies severely restricted its growth. The war for independence cut the new nation off from European supplies, and also created a demand for certain technical equipment and supplies that had formerly been imported. After the conclusion of the peace certain individuals, particularly Alexander Hamilton, began to gather information about how to encourage new industries (Wood 1977:347). American businessmen and merchants reported to Hamilton that they needed capital, workers, greater know-how, bounties, and protection through tariffs (Groner 1972:51). He supported the Jay Treaty which included unpopular provisions for the new government to assume private debts owed to British citizens, because he correctly concluded that foreign confidence in the new country would be reinforced by this, and that foreign capital would flow in where there was no domestic capital available (Wood 1977:345; Groner 1972:51). This helped to supply one of the critical variables.

New supplies of land in the west drew some of the rapidly growing population and aggravated the labor shortage, however. New technologies had been developed in England which reduced the amount of labor necessary to make cloth and speeded up its production, but these production secrets were jealously guarded. Samuel Slater emigrated from England to the new nation disguised as a farm boy, having memorized the construction of critical machines. He went into partnership with the Rhode Island merchant Moses Brown, creating the first American integrated textile plant which went into production in 1791 (Groner 1972:64). Cotton cloth, in particular, had been an important element in the mercantile trade, and British merchants were so unhappy with the development of American production to compete with them that they blatantly practiced "dumping" to discourage the growth of this and other industries, having failed to prevent the importation of technical knowledge. A political fallout from this mercantile competition was that the British Navy began to raid American ships who were trading freely with France and her other military enemies. In response, Congress declared an embargo against foreign trade, which provided some encouragement to the new and struggling American industries, but strangled the export trade in raw materials such as breadstuff and cotton. This provoked angry responses from farmers, the majority of the citizens in the young republic. The embargo was repealed, but the conflicts continued, culminating in the War of 1812.

One of the categories of industry particularly encouraged by the young government during and after the Revolution was the production of military supplies. In 1801 President Thomas Jefferson gave a young French emigre his first production order for his new business on the banks of the Brandywine: this was for refined saltpeter. By 1804 E. I. duPont was selling fine grade gunpowder, and, although his business grew slowly because of disagreements with his business partners, by 1811 he was operating the largest industrial plant in America (Groner 1972:69). Powder

making did provide a relatively steady return, particularly in comparison to other industries, and census data indicate that the production of that commodity in the eastern hinterland of Philadelphia (including New Castle County) grew in value from $59,999 in 1810 to $294,613 in 1840 (Lindstrom 1978a:126). Gunpowder was needed on the new frontiers and the growing mining industry demanded explosives. The War of 1812, continued wars against the Indians, and a war in Mexico provided steady military demands which culminated in the Civil War in which unprecedented quantities of powder were expended.

Other fledgling industries exhibited even more spectacular growth during the period of 1810 to 1840, and the adjustment of the locations of these manufactories to more efficiently serve their markets in the Philadelphia region signaled the growing integration of the regional economy, according to Lindstrom (1978a:128). The cotton textile industry had enjoyed spectacular growth during the period of the embargoes and the War of 1812 (Boatman 1957:12). In 1807 there had been fifteen or twenty cotton mills and by 1810 there were more than ninety, no doubt encouraged by the limitation of supplies from Europe. In 1816 a tariff had been imposed to protect the new cotton, woolen, and iron making industries, but the flood of imports from Britain severely damaged their business (Hancock 1956:9; Groner 1972:83). As a result of these reverses, duPont often found himself buying out investors, or otherwise financially assisting the operators of the textile mills that he had encouraged near his powder factory (Hancock 1956:9). As a member of the National Institution for the Promotion of Industry, E. I. duPont worked for higher tariffs and was encouraged by Henry Clay's Tariff bill in 1824 (Groner 1972:92). The invention of the cotton gin had caused a dramatic shift in the crop output of southern farmers, and the output of that raw material increased steadily up until the Civil War (U.S. Bureau of the Census 1976: Series K554, p. 518). The major market for that product was foreign, however, and tariffs to protect the young textile industry in the U.S. only increased the cost of manufactured consumer goods to those farmers, without enhancing the market for their crop (Groner 1972:99). At the same time, Philadelphia was reexporting and trading heavily in foreign manufactured goods which competed directly with the industries of its region (Lindstrom 1978a:71). That city also purchased manufactured textiles, hats and shoes from New England (Lindstrom 1978b:24). In spite of this, income from manufacturing in Philadelphia's Eastern Hinterland (which included New Castle County) had risen to 22.3% of the total by 1840 (Lindstrom 1978a:155) and per capita measures of income from that source had risen as well. The gradual and often part-time shift of segments of the agricultural population into industrial activities favored those activities where little skill was required, such as textile production (Bushman 1980:40), and these manufactures were a smaller part of the Philadelphia region's industrial output which had favored handcraft and skilled production from colonial days. There is little doubt mill workers on the Brandywine answered the description of the former category

of worker, and some additional details will be provided in the following section.

In the long run, of course, manufacturing would continue to grow and become the prosperous mainstay of the American economy, and if individual entrepreneurs along the Brandywine and elsewhere suffered financial reverses as the result of depressions or mismanagement, there were others to step in and take over their factories to provide further employment for the growing cadre of workers who had settled nearby. The workers themselves experienced a growing demand for their services, and some progress was made toward reducing their workday to ten hours (Groner 1972:135).

Household

The section of the Brandywine industries within the study corridor included the powder mills, production of kegs ancillary to that industry, a continuing grain milling business, and cotton and woolen manufactures. Considerable information is available about the workers in those industries because of the extensive records of the DuPont and associated companies preserved in the Eleutherian Mills-Hagley Foundation Library Archives. Fortunately this prodigious mass of data has been digested by several scholars and these studies are helpful in evaluating the context of the lives of these workers. Harold Hancock (1956) provided the first major analysis of these data and a number of more specialized studies have been produced subsequently (i.e. Uminowicz 1979; Sisson 1980).

Powder making demanded rather more care, if not more skill, than textile manufacture, and E. I. duPont had originally hoped to be able to attract experienced powder workers from France to operate his factory, but for a variety of reasons he was not successful in this (Hancock 1956:18). He assisted in the passage of workers from other European countries, and Ireland was a particularly fruitful source because of continued political and economic unrest there. In 1870 Irish-born residents composed 25.3% of Henry Clay Village, and another nearly 6% were from other foreign countries. Nearly 74% had foreign-born parents (Sisson 1980:36). The various industrial companies constructed housing for their workers in locations convenient to the factories, and, since several different kinds of factories were clustered together, the workers dwellings were clustered together into villages which gathered workers in different industries. It is clear that immigrants were a significant part of the labor force in these industrial clusters, and they were an important part of the "stable core" of continuing employees described by Uminowicz (1979:16). But the pattern of local and transient employment was also served by the numerous opportunities for part-time employment, which paid less, but would have been attractive to the agriculturally based workers seeking to find additional sources of cash income on a more occasional basis. This pattern is well documented in other eastern communities where industry was developing (Bushman 1980:38). Many of these workers boarded with families in company housing, but are

otherwise difficult to trace if they did not (and most did not) continue in a long-term relationship with the company.

Statistics indicate that workers in the powder yard stayed with the company longer than was common in other industries, but many left that hazardous business at a relatively early age (Uminowicz 1979:19). They often took their savings and purchased farms either nearby or farther west (Uminowicz 1979:22), and thus provided a complementary exodus from industry to agriculture to offset the greater flow in the opposite direction. The rural setting of factory villages offered considerable amenities not found in urban settings and garden and grazing space was made available to most any worker, including those living in the "banks" or multi-family apartments, that wanted it (Sisson 1980:6). While boarding was common almost all of the residential units had families as primary occupants (Uminowicz 1979:25). At Eleutherian Mills in 1850, 17 out of 21 households were headed by an Irishman, and served three boarders on the average (Uminowicz 1979:24). Males might be employed at the powder mill, while women and children could generate additional income in the textile mills and in seasonal employment, and the proportion of males was higher in the total population near duPont's factory (Uminowicz 1979:27-28).

Thus there was a relatively stable core population over time, which included a sizable proportion of immigrants; and boarders and a sizable transient element were also components of the demographic mix. The data for all of these groups seem to support the idea that the preferred economic position to be in was that of agriculturalist, since many of the immigrants saved to move out to the farm and many of the transients were temporary refugees from it. Bushman (1980) provides a detailed analysis of the economic conditions that made owning a farm appealing, and here it will suffice to observe that the interpenetration of agricultural and industrial populations and values is well represented in the New Castle County study area.

Material Culture

Technology

The technology of mass production has been mentioned earlier. Developments in this area evolved into what has come to be called the "American System", where identical and interchangeable parts are assembled into useful items such as muskets, clocks, and farm equipment (Heilbroner 1977:45). The concept of an integrated chain of processes running off a common power source, pioneered by Oliver Evans and Samuel Slater, created the means for the factories to create products more efficiently and allowed the diversification and growth of the economy beyond the mere extractive potential of agriculture. The Hagley Museum on the Brandywine in New Castle County provides an excellent presentation of these processes, their development and their consequences. These technologies, by creating a need for wage labor, provided the means for immigrants to move out into the countryside, and for farmers to diversify

their opportunities for income and to hedge against the recurring natural vagaries of their primary occupation.

A gradual increase in scale and complexity of manufacturing processes, particularly after the turn of the twentieth century, and the decline in the use of water power in favor of cheap fossil fuels and electricity brought the demise of the factories on the Brandywine. Except for the facilities that have been restored as museum pieces, the empty mill races and crumbling row house foundations are all that remain of the material culture of industrial technology, but a wealth of these remains may be found in the study corridor.

Domestic

The company housing constructed at the DuPont Mill complex for the mill laborers was presumably built by local craftsmen and, in contrast to the mansions of the mill owners, which ranged from comfortably large to opulent, there was little attempt to make architectural reference to high-style or classical models. Remaining examples and the available photographs, some of which are reproduced in this report, suggest that the common rural house architecture was applied to the single-family construction, and simply expanded in the row house forms, to give the effect of a series of farmhouses joined together by a series of common party walls. The more restricted back lots at the row houses, each with outhouse, shed and sometimes chicken coop, may have been reminiscent of urban conditions (where garden plots and livestock were not uncommon in the nineteenth century: Bushman 1980:42), but beyond the back fence were fields and countryside instead of more rows of tenements. Included in this greater open space were places for workers to raise stock, even if they did not own the pasture, and even farms to buy and till while they remained employed at the factory (Uminowicz 1979:22). Both living quarters and the surrounding landscape in which they were set provided a contrast with the more crowded conditions developing in the urban centers, particularly toward the end of the nineteenth century.

There is little evidence to suggest that the steerage passage of most of the immigrants allowed the transfer of more than the most modest quantity of material possessions from the old world to the new, so the repertoire of household goods accumulated in the laborers homes after they were employed was drawn from the same undifferentiated pool of mass-produced goods that could be found in the neighboring farm houses and urban tenements. There is some indication of self-selected clannishness in the company housing documents - Irish tending to group together in one area, Italians in another - and some attempt may have been made to preserve some of the old country traditions, most likely in diet. Strong pressure to conform to the new culture would surely also have been present, and tendencies in this direction would be present in the material culture, particularly under circumstances where the range of materials available was homogeneous.

An interesting research paper was prepared by Stallings describing the "Workers' Homes and Furnishings in DuPont's Banks, 1870-1920" (1981). She makes references to probate inventories, informant interviews, and to descriptive reports by a female private detective who insinuated herself into workers' homes disguised as a dress cutter) to try to identify those responsible for a series of barn burnings in 1890. Although Stallings detects occasional differences in furnishings based on income differences, in particular the presence or absence of a tea set, the general inventory of goods and furnishings seems not to have varied much. The use of space seems to have been fairly uniform, with the parlour reserved for ceremonial and extraordinary social occasions, and informal social activities making use of the porches. Back yard facilities might include a shed and a chicken house and, while each family had its own outhouse, they might be joined or connected to a common septic tank. She observes that although the plant had its own generator and electric system, this was not extended to the houses until after 1910, consistent with the rural setting (Stallings 1981:9). She suggests that although DuPont workers were relatively well off financially, they seem to have had less in the way of consumer goods and furnishings than urban industrial workers, possibly because of the tenuous nature of powder manufacturing (Stallings 1981:11).

The range of material culture available to the Brandywine worker was not significantly different than his farming neighbors, who shopped at the same local markets and had access to the same urban stores. What he purchased may have been different because of differences in his needs. While the farmer had to purchase all his own equipment, the company supplied the factory worker. But if the farmer's disposable income was reduced by his need for production equipment, the factory worker was often allocating a portion of his into savings so that he could attain the status of property ownership and enjoy the security which the farmer already had.

The industrial worker's income was certainly affected by the larger economic cycles that affected the business that employed him and his family, and his quality of life and material goods would likewise be affected by changes in those cycles. If the powder worker's wife and children were employed at the nearby textile mill, and that business closed, the family income would be reduced. If the business that employed him reduced labor or went out of business he would be forced to move on, lacking the "fall back" position of the farmer who owned his own land and could, if necessary, provide for his own subsistence. The evidence suggests that the laborers ultimate goal was to move on anyway, even if only to a nearby farm. Thus not only did a majority of the population live in rural circumstances until the twentieth century, those that did not found it an attractive alternative. But few would have wanted to give up the quantity and variety of new consumer goods pouring out of the factories, and few passed up an opportunity to improve their economic position in a way that enhanced their ability to acquire them.

Related Research

The resources identified in the study corridor represent historic themes and contexts that have been explored in previous research. In addition to the historical sources cited in the discussion above, a number of archeological studies have been completed in New Castle County that relate to the themes of agriculture and industry. Work by the Hagley Museum continues on properties in the Hagley Yard, and a long-term program of archeological research there will reveal considerable data about both the material culture and the lives of the industrial inhabitants of the Brandywine Valley. Work by Mid-Atlantic Archaeological Research on the Concord Pike (Thomas et al. 1980) provided the initial investigations of the Blue Ball Tavern site and the Philip Husbands house discussed above. Four other residences along Concord Pike are discussed, but the information developed in the report is not sufficient to draw many conclusions about how the properties are related to the historical contexts discussed here.

Several research projects have been completed in downtown Wilmington, Delaware (i.e. Cunningham, et al. 1984, Klein and Garrow 1984, Berger & Associates 1985, and Beidleman et al. 1986) but the majority of the contexts investigated, including the residences, seem to be related to commercial themes rather than those discussed here. The Delaware Department of Transportation and the University of Delaware Center for Archaeological Research have reported on research at four sites in rural New Castle County: The Robert Ferguson Site, the Welsh Tract School Site, the Hawthorn Site and the Wilson-Slack Site (Custer and Cunningham 1986). The Ferguson and Hawthorn sites are residential sites for farmers, and the Wilson-Slack site provided blacksmithing and wheelwright services, as well as milling, to the surrounding agricultural population. These business enterprises depended on the increasing participation of farmers in the cash economy, and the increasing sophistication of the production technology of agriculture. The investigation of a presumed tenant house on the Lancaster Turnpike produced archeological evidence about a rural residential context whose occupants could not be firmly identified (Barse 1985; Taylor et al. 1987), and the excavations of a tavern in the village of Stanton provided information about another rural service facility (Thompson 1984, 1987).

Survey and testing of another highway corridor in Mill Creek Hundred provided another cross-sectional (informal) sample of rural sites (Catts et al. 1986). In this, the well-developed industrial complex found in the Route 141 study was absent, and a detailed comparison of the results of the two studies might (or might not) indicate the effects of that difference. Residences, taverns, smithys and wheelwrights were found along the Limestone Road providing a data set related to the agriculture context described here.

Future research in the area can begin to draw together the data developed so far to begin to define geographic boundaries of these contexts and to define subsets of different kinds of properties within the context. Related questions might include:

1. What is the extent of the market effect of -

   a. The City of Wilmington
   b. The City of Philadelphia
   c. The Brandywine Industrial complex

   on the material culture of rural residences and businesses?

2. Do different kinds of market orientation - dairying vs. gardening vs. differentiated production - affect the material culture of the household in identifiable ways?

3. Is the material culture of the households of farmers who have come out of the mills different than that of those come from indigenous farming traditions?

4. How do toll roads affect property values and the distribution of site types?

These and other more general questions can be refined to provide testable hypotheses that can be addressed by future research and resource management projects. This is desirable so that the ever-increasing quantity of data from properties investigated can be organized into meaningful categories related to larger historical contexts and themes.

Relationship to the Larger Region

The historic contexts outlined here provide us with some insight into the activities of the people who occupied the landscape and their relationships to each other and to the larger society. A considerable amount of the material remains from the period of interest has been lost already, and what remains is indeed a "comprehensive source of information about the past" (Heritage Conservation and Recreation Service 1980:15). The need to preserve some of that information within the study corridor prompted this study. A number of properties that are related to these contexts were identified prior to the initiation of this work, and several more have been located during its completion. These properties provided examples of the kinds of resources which are also located outside the study corridor and thus provide links with the historical context of northern New Castle County as a whole.