INTRODUCTION

This report presents the results of a cultural resources planning study of the proposed relocation of Route 301 in New Castle County, Delaware (Figure 1). The study was conducted between July, 1991 and February 1992 by archaeologists from the University of Delaware, Center for Archaeological Research (UDCAR), at the request of the Delaware Department of Transportation (DelDOT). The report provides planning information for the Route 301 study area in compliance with Section 106 of the National Historic Preservation Act in consultation with the State Historic Preservation Office in the Bureau of Archaeology and Historic Preservation (BAHP). Funding for the project was provided by the Delaware Department of Transportation and the Federal Highway Administration (FHWA).

The study area encompasses a large, roughly triangular region of northern and central New Castle County south of a line running from near Stanton to Ogletown to the Maryland-Delaware boundary just north of Route 2 (Figure 2). The eastern boundary of the study area runs from Stanton to Tybouts Corner and then crosses Route 13 south of Wrangle Hill continuing across the Chesapeake and Delaware Canal past Jamisons Corner to pass south of Middletown intersecting the border with Maryland below existing Route 301. The area is approximately 22.5 miles along its longest axis by 7.7 miles wide at its widest - a total of approximately 128,700 acres. This report considers the entire area with the exception of the National Register Historic Districts of Christiana and Middletown. These areas contain historic sites in concentrated numbers, and were omitted from this study.

The goal of the project was to summarize existing information on known archaeological resources within the study area and to identify areas that are likely to contain significant prehistoric archaeological, historic archaeological, and/or historic standing structures. The project does not determine the significance of particular sites or structures. Rather, it outlines the potential cultural resources that may be encountered within the project area. Field work will be necessary to determine the impact of proposed highway alignments on specific sites and to determine the eligibility of sites for listing on the National Register of Historic Places.

The first section of the report provides an introduction to the environmental setting of the area, and prehistoric and historical background information. The next section of the report summarizes the existing information on the prehistoric and historic resources located within the project area. The cultural context and the quality of the existing data are also addressed. A third section of the report describes development, use, and results of predictive models in the planning process. The next section of the report discusses the potential significance of the known prehistoric and historic resources in the project corridor, and addresses the potential significance of sites that may be discovered based on the applications of predictive modeling. Management zones are developed based on the data base and predictions, and recommendations concerning cultural resource management strategies are provided. The final section evaluates the impacts on archaeological resources of two corridor options under consideration. Maps are included that show documented site locations, predicted site locations, and sensitivity zones.

ENVIRONMENTAL SETTING

The Route 301 study area extends south from the base of the Piedmont Uplands in northern Delaware onto the Upper Coastal Plain (Figure 3). The western portion of the area includes the drainage divide of the upper Delmarva Peninsula. To the north and east the area includes the mid-Drainage zone centered on the head of tide in the major streams flowing east into the Delaware River (Figure 4).

The topography of the north is gently rolling becoming flatter to the south. The highest point in the study area is Iron Hill, a gabbro bedrock body (Spoljaric 1972:11); at 320 feet in elevation Iron Hill rises 240 feet above the surrounding country side. The lowest point, in the Christina River, is less than 10 feet above Mean Sea Level and influenced by tides.

Major drainages in the study area (Figure 4) include the Christina River, which dominates the northern portion of the study area, Red Lion Creek, Dragon Creek, St. Georges Creek - whose course the Chesapeake and Delaware Canal (C&D) now occupies (Snyder and Guss 1974:18), and the upper reaches of Drawyer Creek south of the C&D Canal. The above drainages lead to the east. On Figure 4 the pre-C&D Canal drainages are shown as nearly as

FIGURE 1

Location of Study Area Within the Larger Region

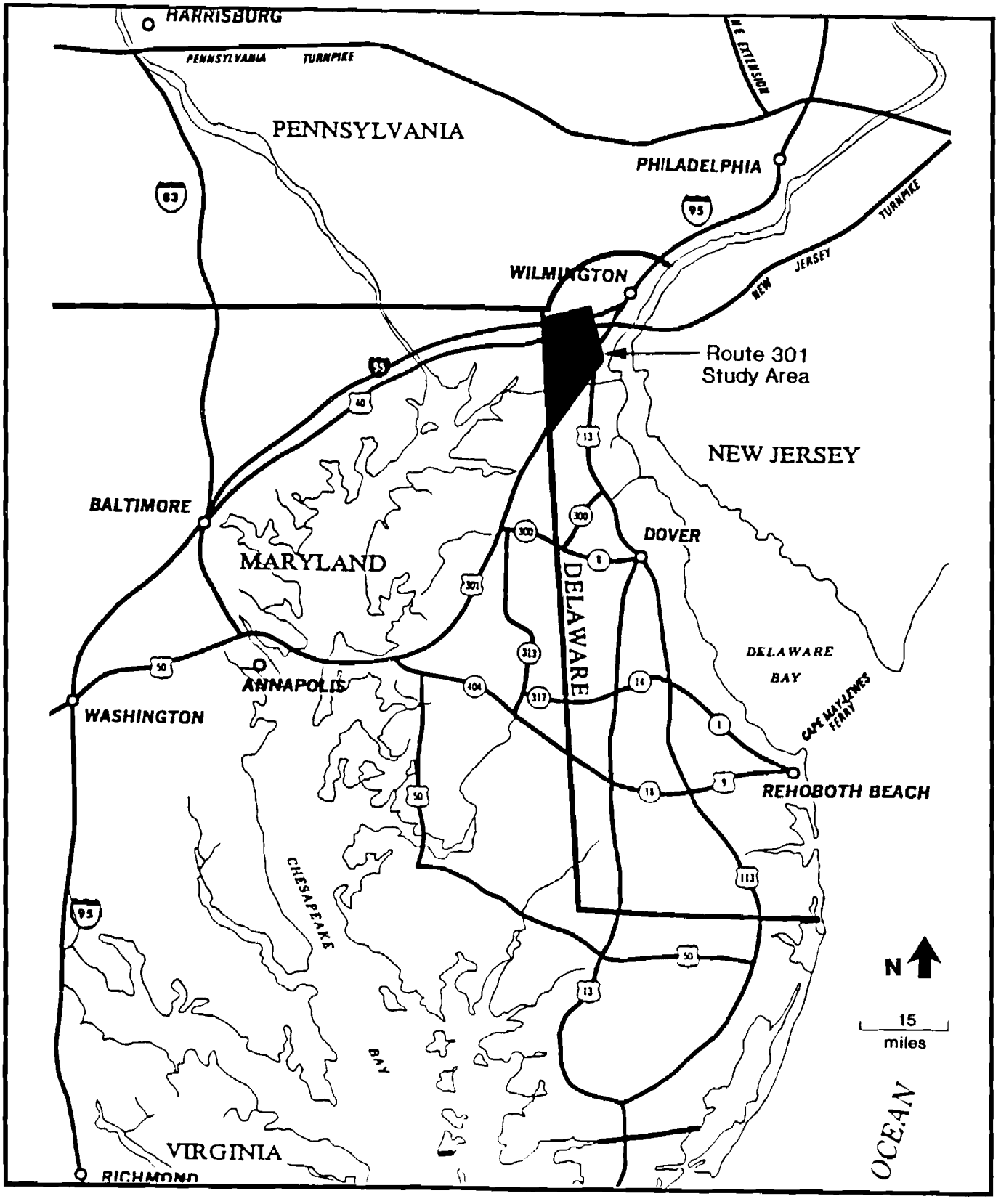


FIGURE 2

Map of the Study Area

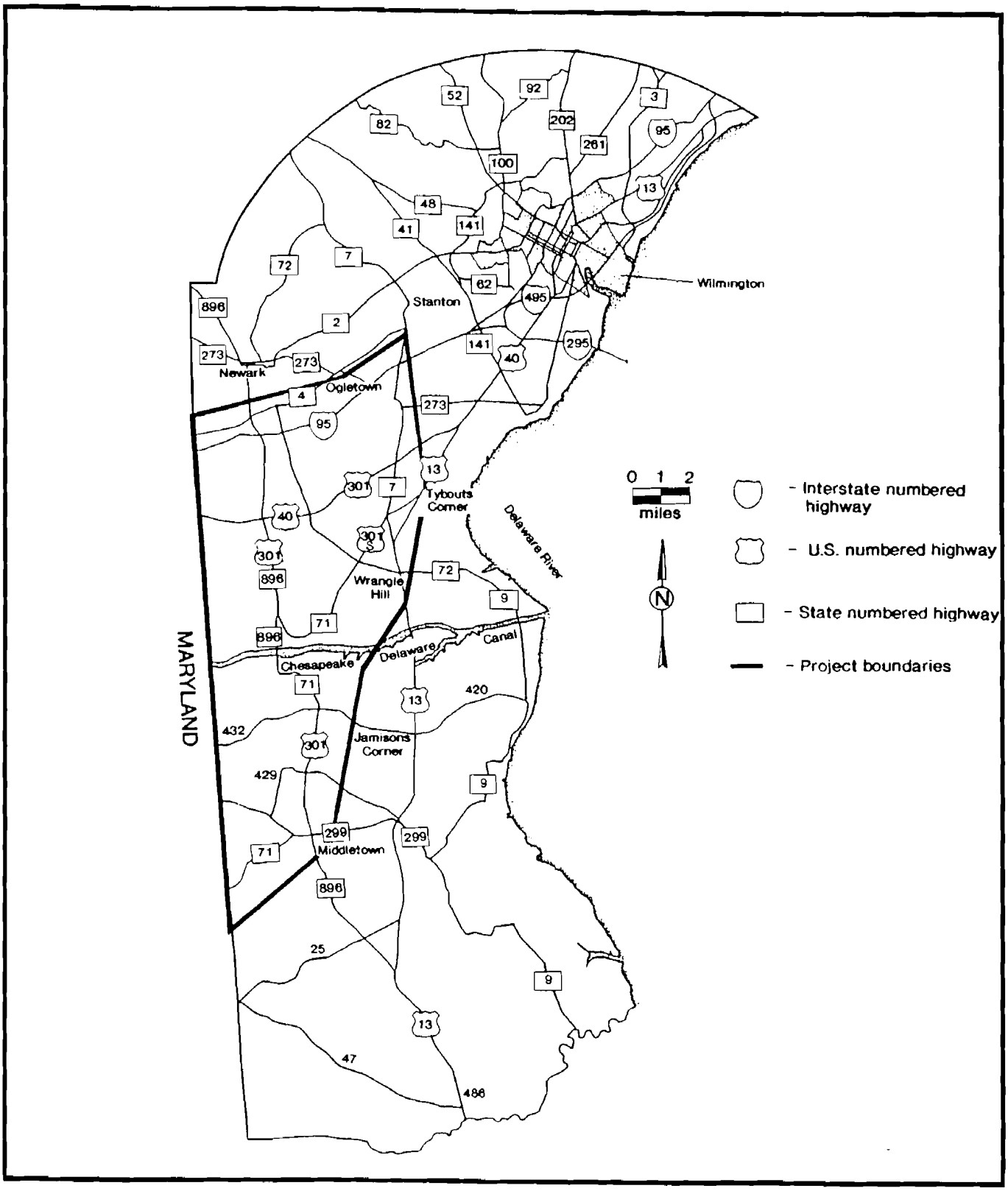
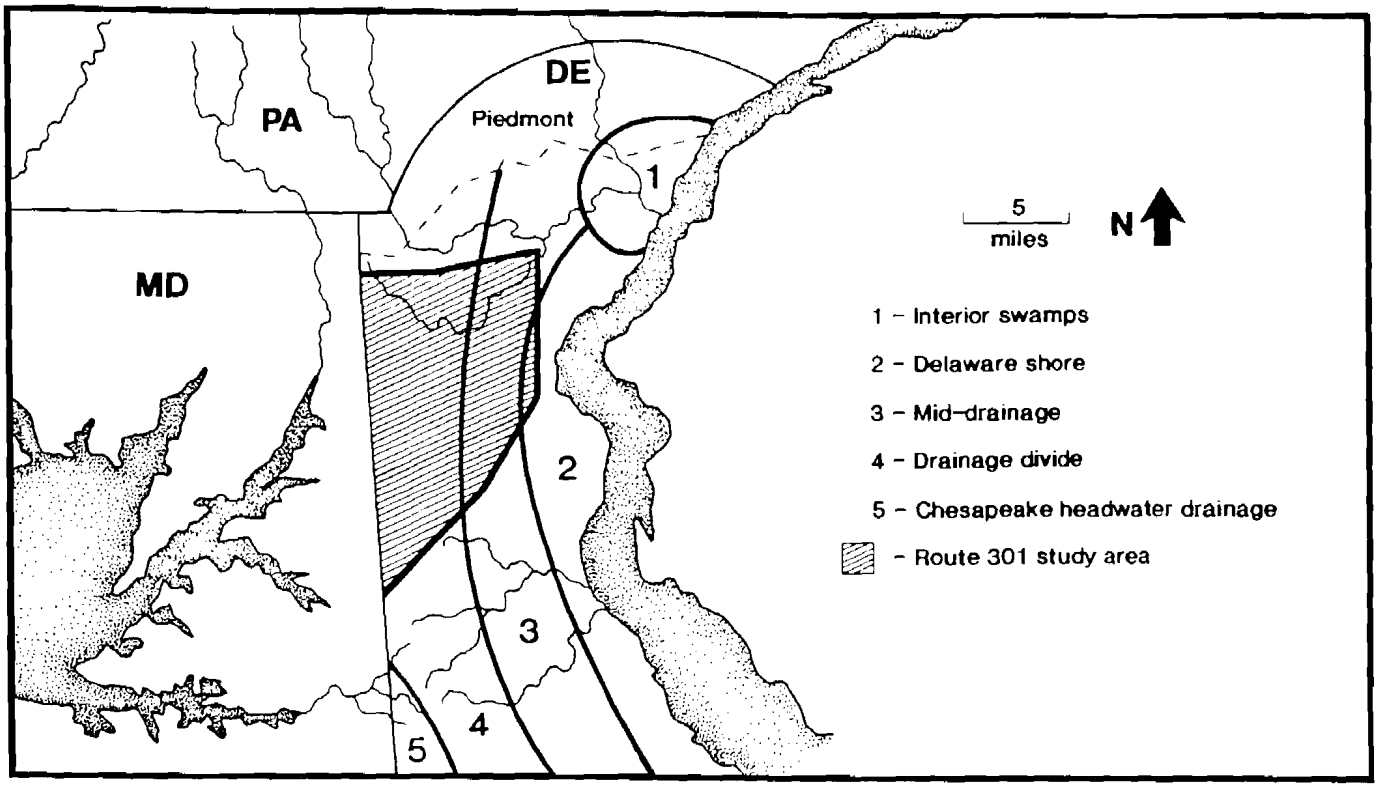


FIGURE 3

Physiographic Setting of the Study Area



possible. Drainages leading to the west into Chesapeake Bay include the upper reaches of Perch, Long, Back, and Great Bohemia Creeks. The eastern end of Back Creek was the point of departure for the C&D Canal.

All of the lakes and ponds in the study area are human-made - either cattle ponds or mill ponds. The largest lake, Lums Pond, is maintained for recreation as a State Park. Wetlands are fairly common in low lying areas along the major drainages and in the Drainage Divide Zone where streams arise. This zone includes areas of poorly drained soils including bay/basin features which hold water at least seasonally.

Soils in the study area have formed on a base dominated by the Pleistocene Columbia Formation of sand and gravel deposited over Cretaceous age silts, clays, and fine sands. In the area of Middletown, Tertiary age silty and glaucanitic sands underlie the Columbia Formation. The Soil Conservation Service (Matthews and Lavoie 1970) define three major soil groups within the Route 301 study area (Figure 5):

1) the Neshaminy-Aldino-Watchung;
2) the Sassafras-Fallsington-Matapeake; and
3) the Matapeake-Sassafras.

The first soil association is centered on the gabbro outcrops of Iron Hill and vicinity. The Neshaminy is well-drained and sometimes very stony, while the Watchung is poorly-drained and clayey although sometimes very stony as well. The Sassafras-Fallsington-Matapeake group is level to gently rolling over a sandy base. The well-drained Sassafras and Matapeake contrast with the poorly-drained Fallsington soils. The Fallsington soils occur in the areas of wetlands discussed above. The lower and eastern two-thirds of the study area are dominated by the Sassafras-Matapeake soil association which is nearly level, well-drained, and medium textured in general. Farming is both intensive and extensive on the third group of soils (Matthews and Lavoie 1970:5).

FIGURE 4

The Regional Drainage Network

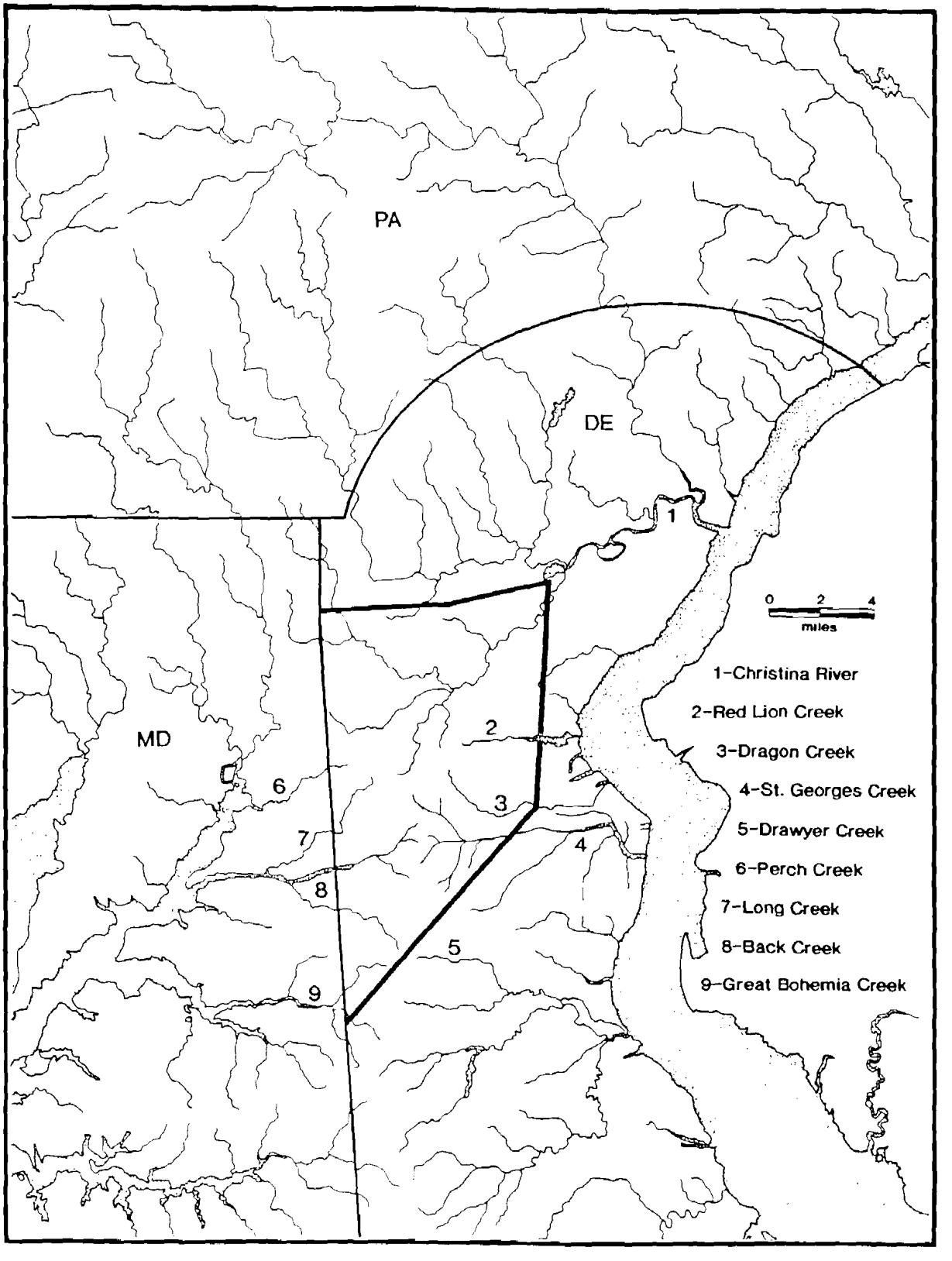
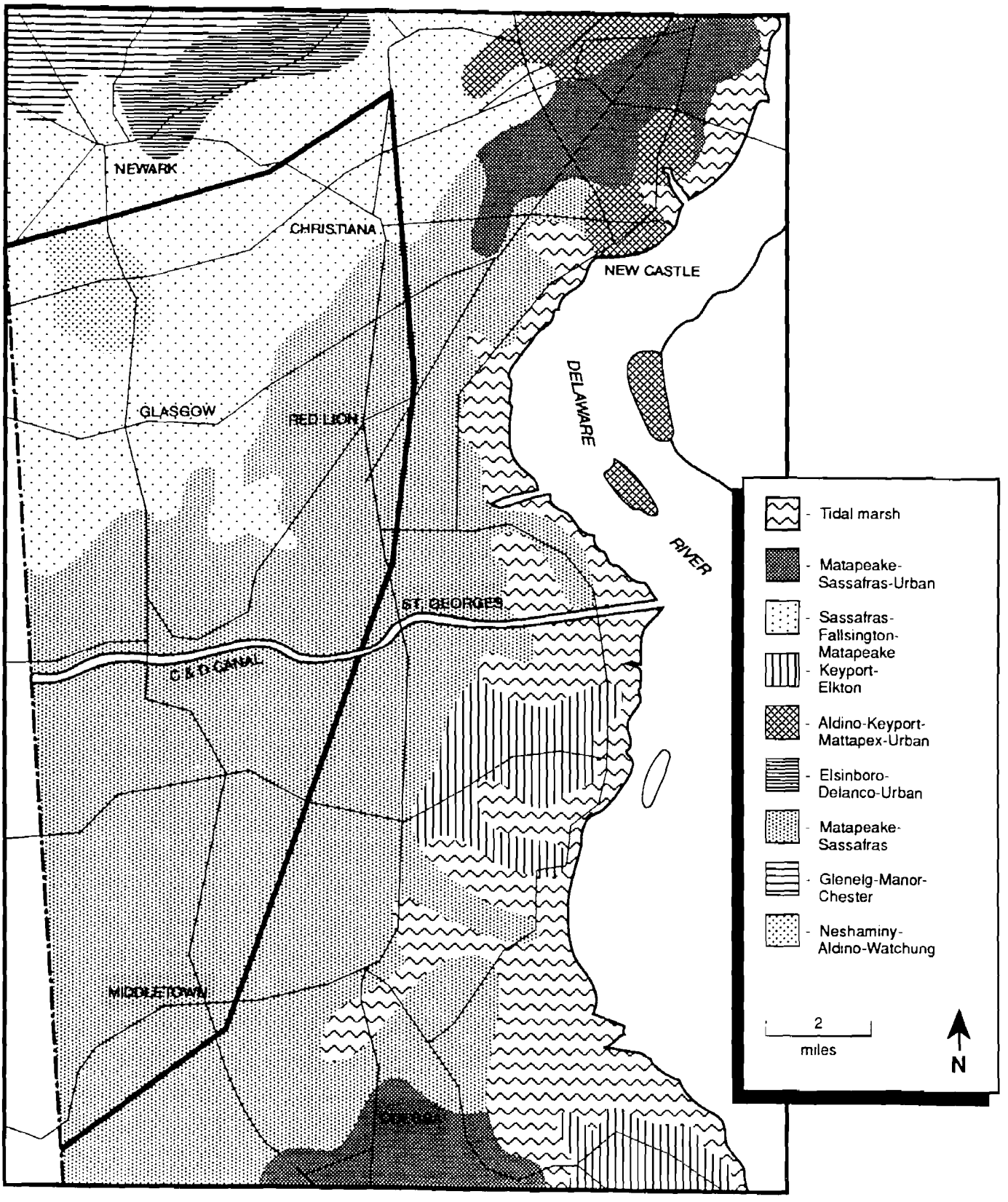


FIGURE 5

Generalized Soils of the Study Area



Present Day/Modern Environmental Setting

Since European colonization of the region, land use in the project area has been primarily agricultural. Dispersed farmsteads ranging in size from 100 to 800 acres were initially established in the early eighteenth century. Although farm sizes have fluctuated, there has been a general trend towards smaller farms (DeCunzo and Catts 1990:67-71). The population of the project area was predominantly involved in agriculture and its supporting occupations, such as milling and blacksmithing, until rather recently. Farming continues to be a major concern for the population south of the C&D Canal although much of the land is now corporately owned. Since the early 1960s the environmental setting north of the C&D Canal has been drastically altered at an increasingly rapid rate through commercial, industrial, and, especially, residential development. Development has adversely affected the cultural resources of the project area and large sections of the proposed study area have been significantly disturbed by new or recent construction (Figure 6).

REGIONAL PREHISTORY

The prehistoric archaeological record of the study area, and the Delmarva Peninsula in general, can be divided into five major periods:

1) the Paleo-Indian Period (c. 12,000 B.C. - 6500 B.C.);
2) the Archaic Period (6500 B.C. - 3000 B.C.);
3) the Woodland I Period (3000 B.C. - A.D. 1000);
4) the Woodland II Period (A.D. 1000 - A.D. 1650), and;
5) the Contact Period (A.D. 1650 - A.D. 1750).

The descriptions of these periods given below are derived from Custer (1983, 1984a, 1989a), and a chronology is shown in Figure 7.

Paleo-indian Period (12,000 B.C. - 6500 B.C.)

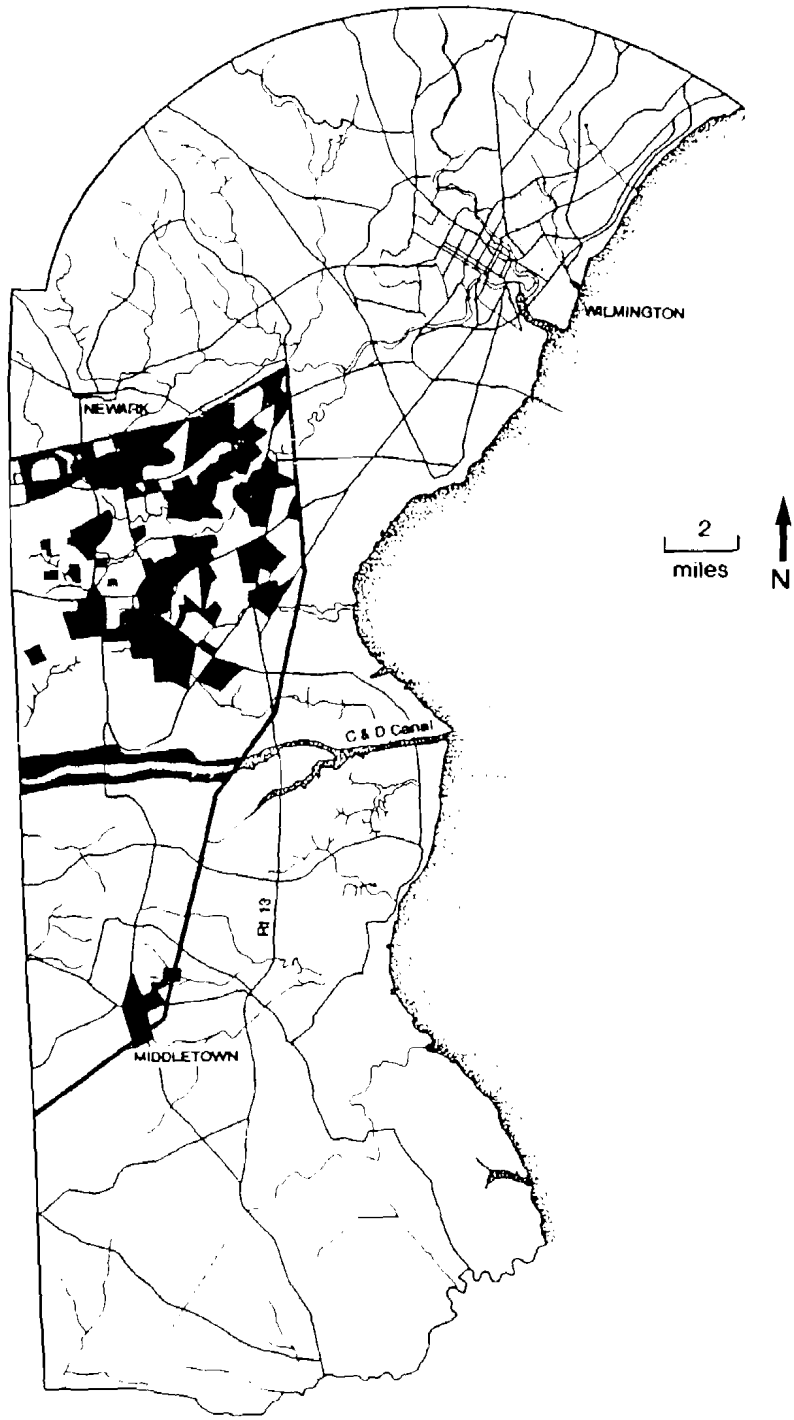
The Paleo-Indian period begins following the recession of the last Pleistocene ice sheet from Eastern North America. A distinctive feature of the Paleo-Indian period is a human adaptation to the cold, and alternately wet and dry, conditions at the end of the Pleistocene and the beginning of the Holocene about 8000 B.C. The Paleo-Indian lifestyle was centered on hunting and gathering. Hunting focused on large prey animals including mastodon, bison, caribou, and moose. A mosaic of deciduous, boreal, and grassland environments would have provided a large number of productive habitats for these game animals throughout northern Delaware. Watering holes would have been particularly good settings for hunting.

Paleo-Indian tool kits were oriented toward procuring and processing animals. Careful resharpening and maintenance of tools was common because of a preference for rare, fine grained, and often colorful, lithic material. Distinctive fluted points, characteristic of the early Paleo-Indian period (Figure 8), show the preference for high quality stone (Custer 1984b). Single or multi-family bands wandering seasonally among game-attractive environments has been hypothesized as the life style of the wide-spread Paleo-Indian cultures of North America. Due to small population sizes and landscape changes over the past 10,000 years Paleo-Indian archaeological sites are relatively rare.

The main types of Paleo-Indian sites known for the study area are quarry reduction camps, base camp maintenance stations, and hunting sites. The riverine settings of the Christina River and its major tributaries would be the expected locations for base camps, while poorly drained interior swamps and bogs would be the foci of maintenance and hunting sites. Bedrock outcrops on and around Iron Hill provided high quality jasper and chalcedony raw material that were preferred for tool manufacture (Custer and Galasso 1980).

FIGURE 6

Heavily Developed Zones Within the Study Area



Areas of heavy development, shown blackened, were determined on the basis of aerial photo maps and USGS topographic maps.

FIGURE 7

Cultural Complexes of Delaware

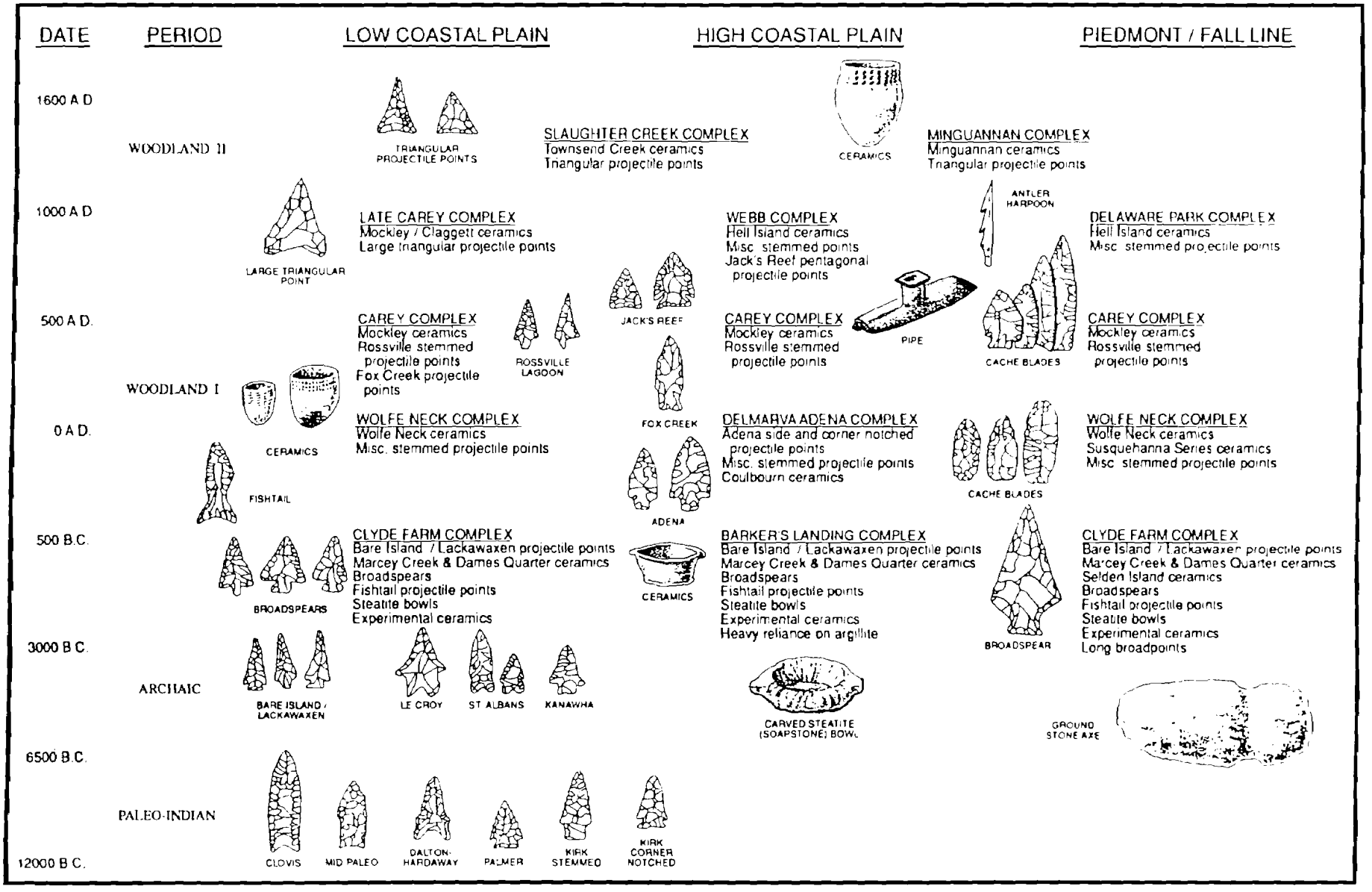
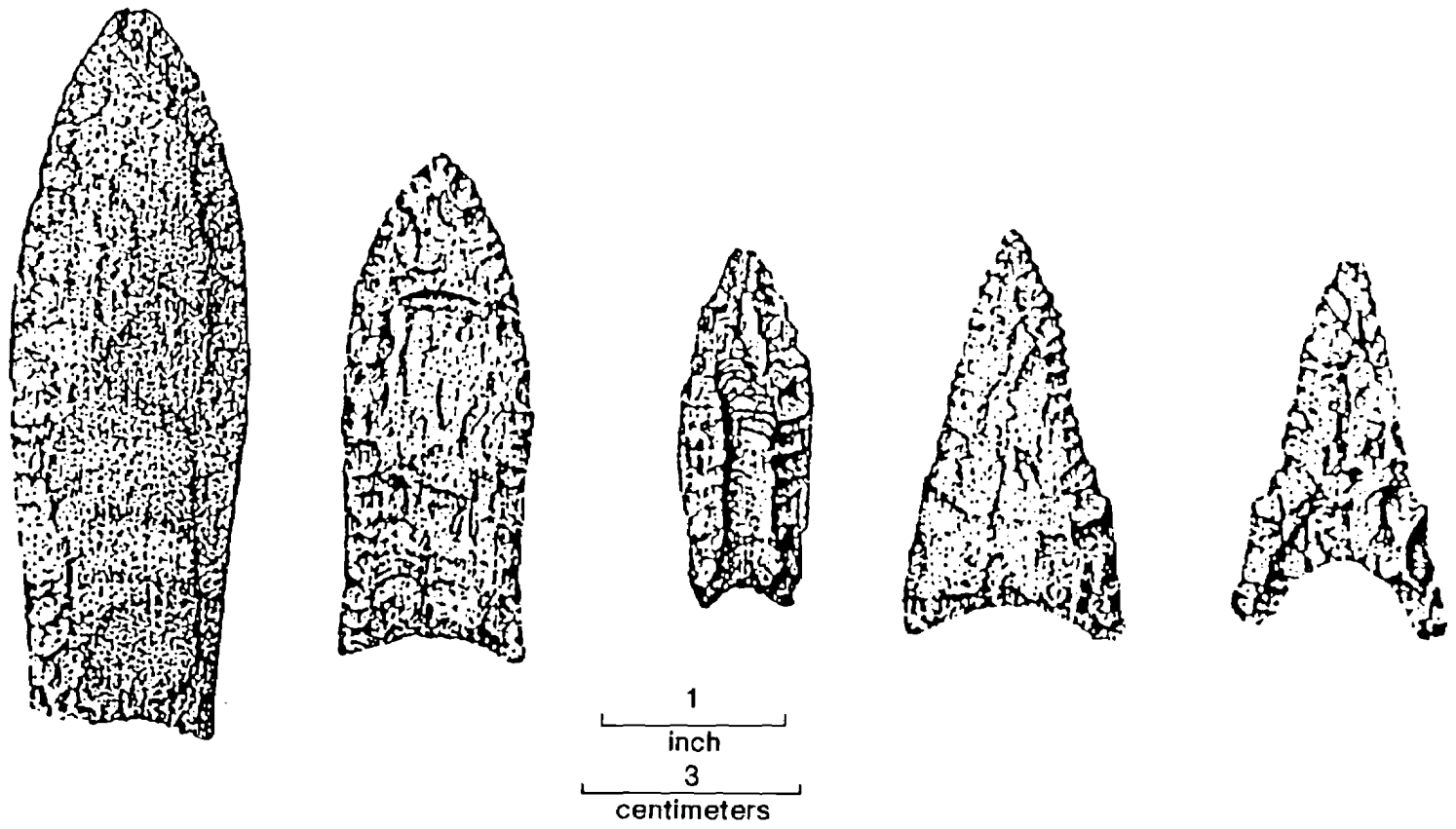


FIGURE 8

Paleo-Indian Fluted Points



Typical Paleo-Indian period tools. The "fluted" point on the left is the oldest, Clovis type. The smaller fluted point, at the center, is some what later in time and similar to Folsom types. On the left is a Dalton- Hardaway type, that has been resharpened. These tools probably served both as projectile (spear) points and as knives. Often the points were placed in a foreshaft that could be detached from the spear for use as a knife.

Archaic Period (6500 B.C. - 3000 B.C.)

During the Archaic Period a series of adaptations to changing Holocene environments occurred. In contrast to the cold climate species that dominated the early post-glacial landscape, mesic forests of hemlock and oak characterized Archaic period environments. A reduction in open grasslands in the face of warm and wet conditions may have contributed to the extinction of many of the grazing animals hunted during Paleo-Indian times; however, browsing species, such as deer, flourished. Human adaptations became more generalized, and foraging for plant food resources was an important activity.

Archaic tool kits were less specialized than the earlier Paleo-Indian tool kits (Figure 9) and included a wide variety of plant processing tools, such as grinding stones, mortars, and pestles. A seasonal, mobile lifestyle exploiting a wide range of resources and settings was probably common. The archaeology suggests that band size probably shifted as resources fluctuated through the year. A recent study of Archaic site distributions on the Delmarva Peninsula (Custer 1986a) found that despite the changes in adaptations between the Paleo-Indian and Archaic time periods, the types of sites chosen for occupation were similar.

Sea-level rise was rapid during the Paleo-Indian and Archaic time periods reducing the size of the Delmarva Peninsula and causing rapid changes in coastal environments (Edwards and Merrill 1977; Belknap and Kraft 1977). Drainage systems were affected by the change in gradient and flood plains built up, burying some evidence of human occupations.

Woodland I Period (3000 B.C. - A.D. 1000)

The Woodland I period has been correlated with a dramatic change in local climates and environments that occurred throughout the Middle Atlantic region (Custer 1984a, 1989a). A continued warm and dry period lasting from ca. 3000 B.C. to 1000 B.C caused the replacement of hemlock-oak forests with dry forests of oak and hickory. Grassland areas may have expanded. Continued sea level rise brought extensive brackish water marshes with high biological productivity to within the vicinity of the present coastline.

Changes in environment and resource distributions led to shifts in the adaptations of prehistoric groups. Important areas for settlements included the major river floodplains and estuaries. Many sizable base camps occupied by large numbers of people occur in many areas of the Delmarva Peninsula. The sites were occupied by many more people than earlier base camp sites and may have been occupied almost year round. The overall tendency during the Woodland I period was toward a more sedentary lifestyle with increasing population densities.

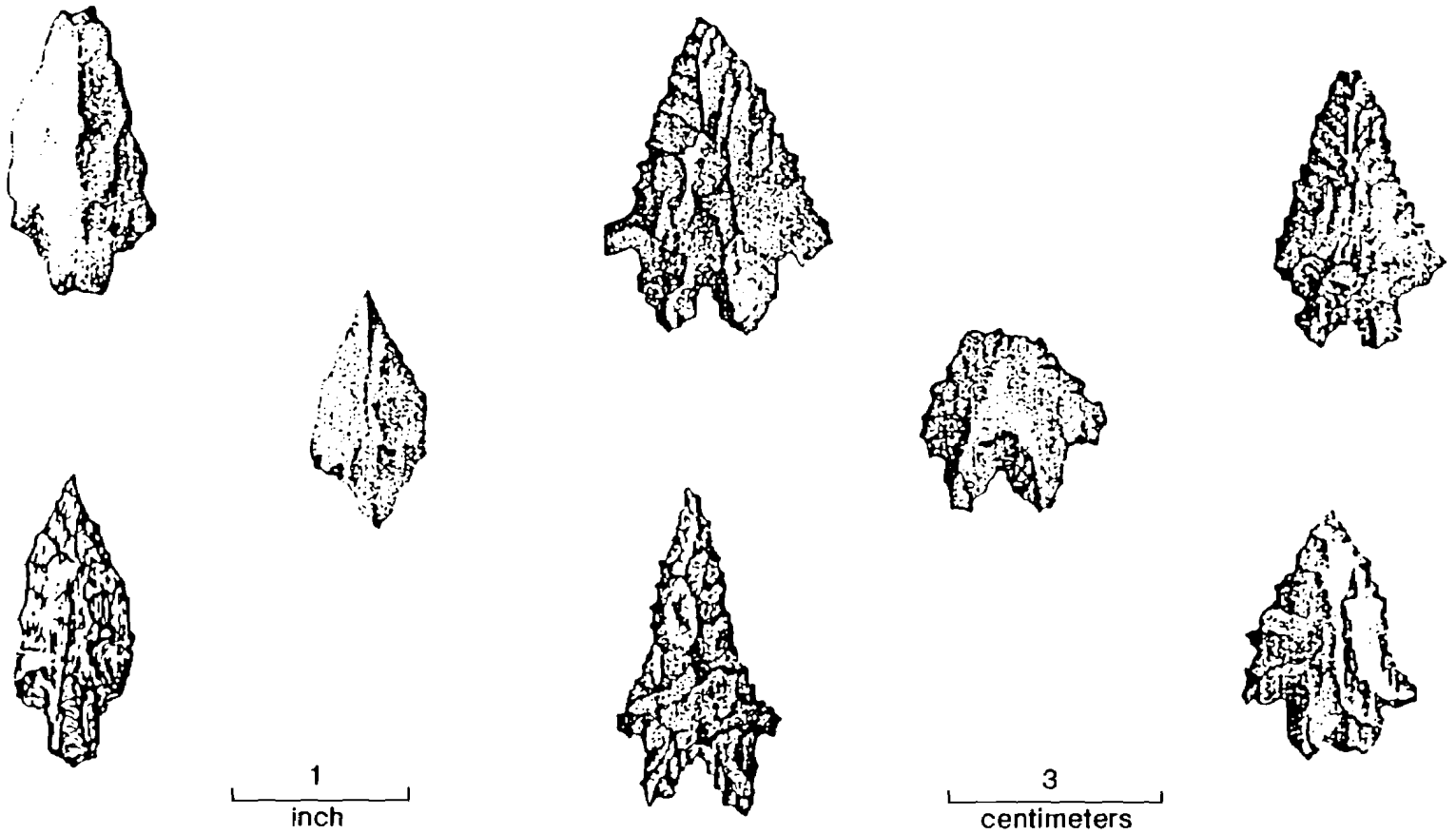
Woodland I tool kits show some minor variations, as well as some major additions, compared with Archaic tool kits. Plant processing tools became increasingly more common indicating intensive wild plant harvesting for food. Chipped stone tools changed little from the preceding Archaic Period; however, broad-bladed, knife-like processing tools increased in number (Figures 10 and 11). Also, the presence of non-local lithic raw materials indicates that regional trade and exchange systems were beginning to develop (Custer 1984c). Soapstone, and then ceramic, containers were also added to the artifact assemblages. More efficient cooking of some types of food was possible and storage of surplus food was also possible with the new technology.

Social organization underwent pronounced changes during the Woodland I period. Relatively sedentary lifestyles and intensified food production, with occasional surpluses, fostered the development of incipient ranked societies (Custer 1982a). One indicator of social stratification is the presence of extensive trade and exchange networks. Caching (storage) of special artifact forms may also signify the development of class differences in the societies.

Woodland II Period (A.D. 1000 - A.D. 1650)

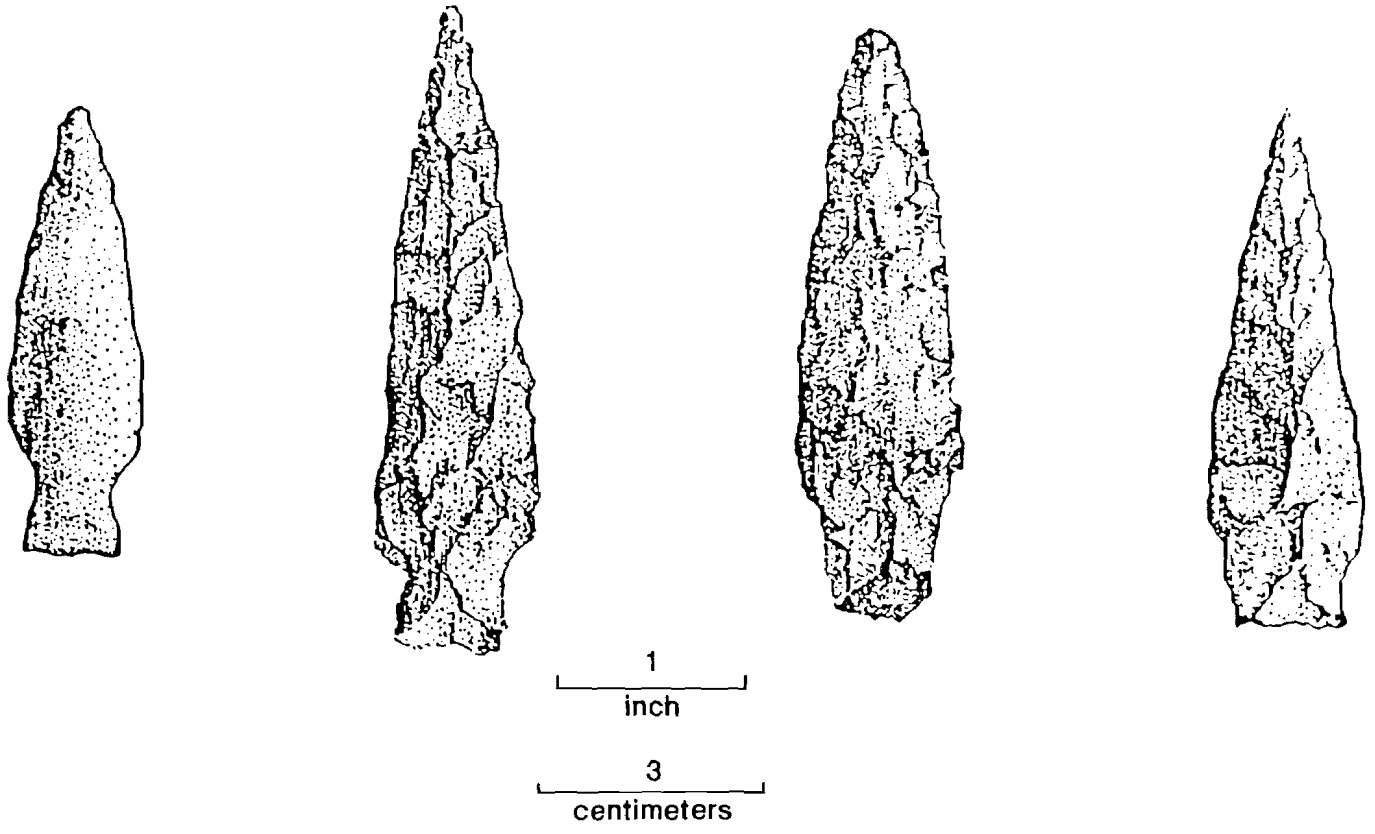
In many areas of the Middle Atlantic, the Woodland II period is marked by the appearance of agriculture and large-scale village life (Custer 1986b). In general, the Woodland II subsistence patterns in northern Delaware are similar to those of the Woodland I period, but with the addition of small amounts of cultivated plants.

FIGURE 9
Archaic Period Points



Archaic period projectile point styles. Smaller projectile points are common during the Archaic period. In part, this reflects the use of spear-throwers (atlatls). The points were tips for smaller, feathered darts, rather than full-sized spears. Some points may also have served as knives and often show signs of resharpening.

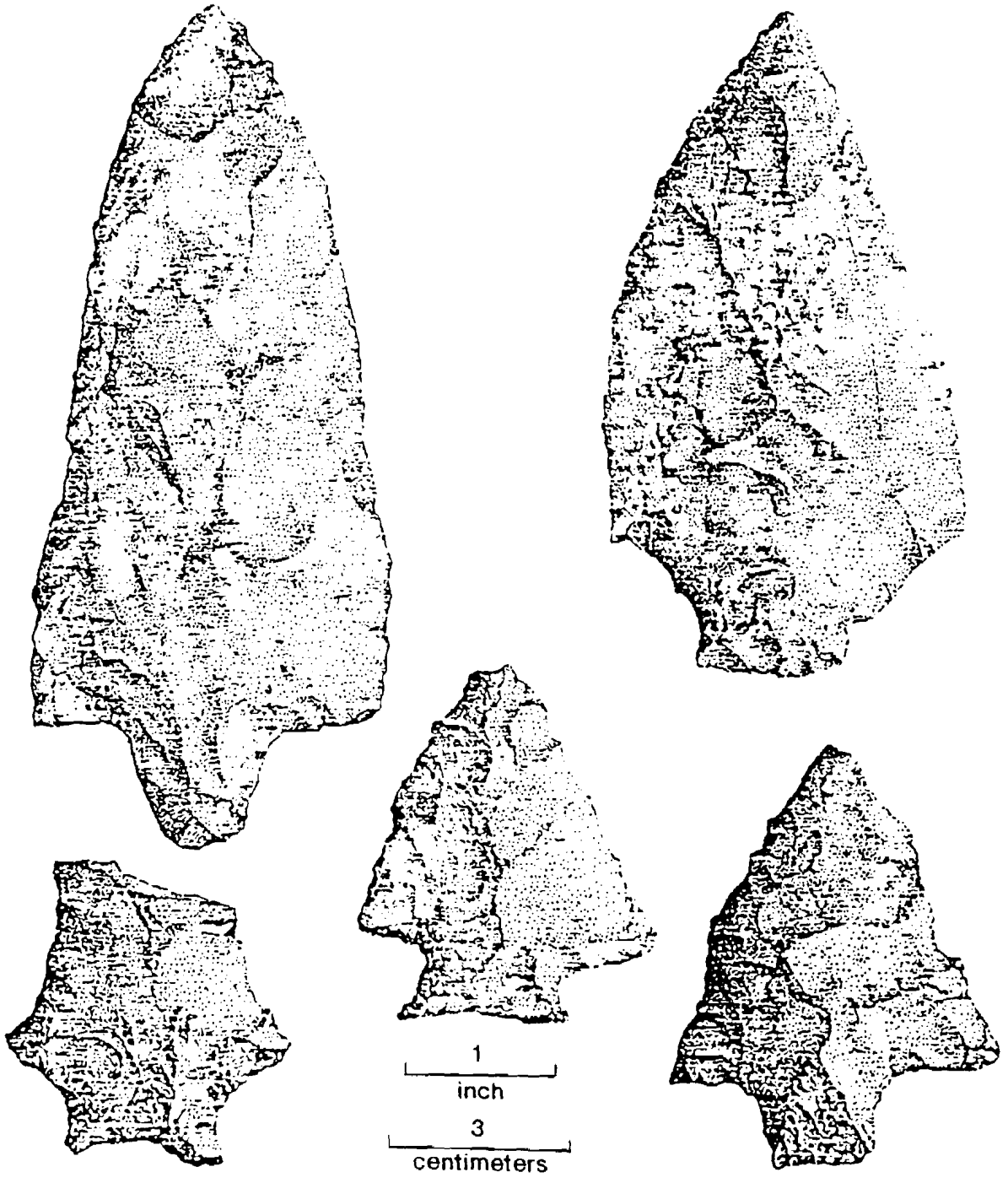
FIGURE 10
Woodland I Projectile Points



Woodland I period projectile points. Stemmed points become more common in the Woodland. The long, slender points here may have been spear points or knives.

FIGURE 11

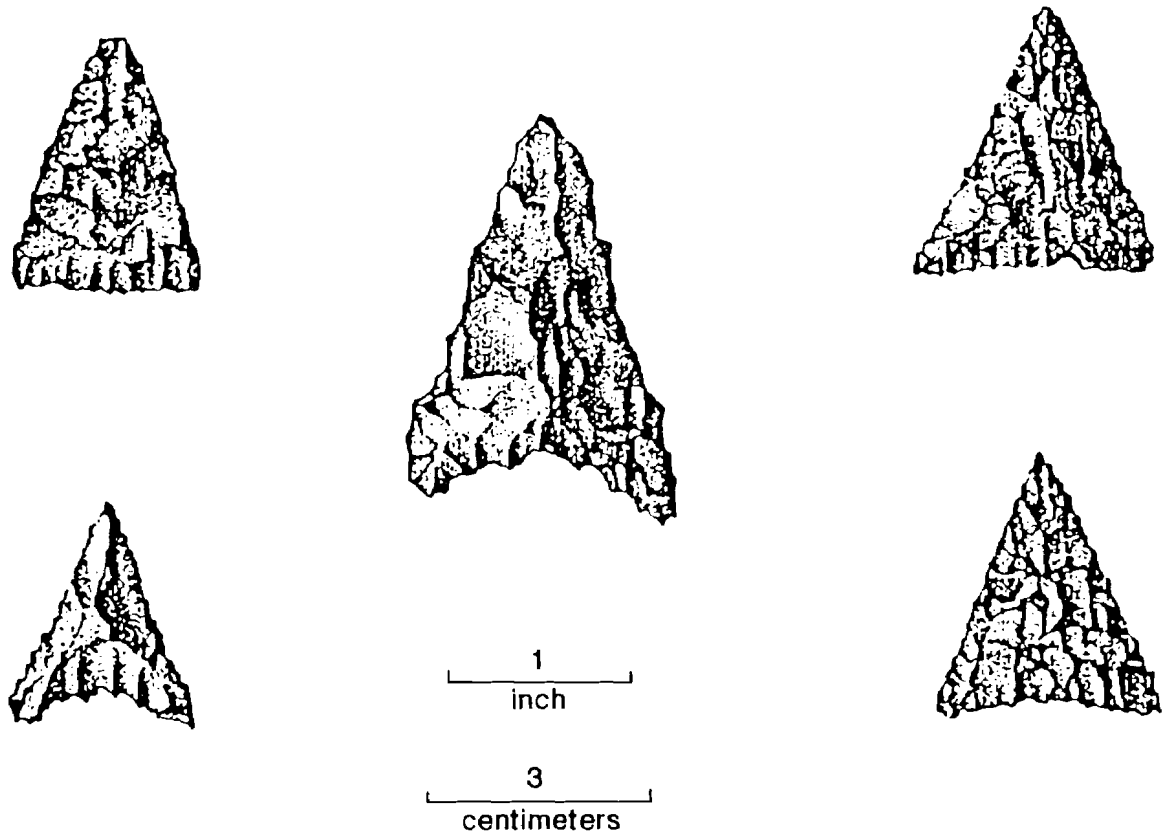
Woodland I Broadspears



Woodland I period broad spear type points. These large, thin points were probably knives and were often resharpened until the blade was very narrow. Sometimes the points were resharpened into drills. Often broad spears are found fire-shattered in cremation burials.

FIGURE 12

Woodland II Projectile Points



Woodland II projectile points. Small triangles are characteristic of the Woodland II period. The first true arrow heads appear in the Woodland II period. Small, light-weight triangles were lashed to the arrow shaft and easy to make from locally available raw materials.

Changes in ceramic technologies and projectile point styles make Woodland II period archaeological sites recognizable. Triangular projectile points (Figure 12) appeared in stone tool kits immediately before the beginning of the Woodland II period and by A.D. 1000, triangular projectile points are the only styles seen in prehistoric tool kits. Woodland II ceramics of northern Delaware are classified within the Minguannan series (Custer 1984a). The distribution of Minguannan pottery is not well established, but it is concentrated in northern Delaware. This is most likely due to a lack of archaeological research in southern New Castle and northern Kent Counties. Townsend ceramics are common in southern Delaware, but apparently do not extend into southern New Castle County. The appearance of more complex decorations including incised lines and cord-wrapped stick impressions distinguish the Woodland II ceramic styles from Woodland I ceramics.

Contact Period (A.D. 1650 - A.D. 1750)

The Contact period, which began with the arrival of the first substantial numbers of Europeans, is an enigmatic portion of the archaeological record of northern Delaware. The time period is poorly-known because only one unequivocal Contact period, Native American archaeological site has been discovered in Delaware (7NC-E-42, see Custer and Watson 1985). In southern Delaware, Contact period occupation has been reported for the Townsend Site (Omwake and Stewart 1963); however, the associations between European and Native American artifacts are problematic (Custer 1984a:177). Nevertheless, numerous Contact period sites are known in southeastern Pennsylvania and on the Maryland Eastern Shore (Davidson 1982; McNamara 1985; Davidson, Hughes, and McNamara 1985). Despite documentary evidence to the contrary (eg. Lindstrom 1925; Dahlgren and Norman 1988) it appears that the Native American groups of Delaware did not interact much with Europeans and, furthermore, local groups were politically dominated by the Susquehannock Indians of southern Lancaster County, Pennsylvania (Kent 1984). However, a reexamination of artifact collections from Delaware (Fithian 1992) found more evidence of Contact period interaction between Native Americans and Europeans than previously thought. The Contact period ended with the virtual extinction of Native American lifeways in the Middle Atlantic area. Only a few, small remnant groups survived.

REGIONAL HISTORY

The following summary of the regional history provides a background of important local and regional events and trends that shaped the development of the area and affected the inhabitants of New Castle County. The historic periods are defined in the State Historical Plan (DeCunzo and Catts 1990). Summaries and descriptions of the regional history are based on the works of Catts et al. (1989a, 1989b), DeCunzo and Catts (1990), Hoffecker (1977), Munroe (1978, 1984), Scharf (1888), and Weslager (1987, 1988).

1630 to 1730: Exploration and Frontier Settlement

Prior to A.D. 1638 only occasional exploratory expeditions up the Delaware River brought Europeans near the study area. Colonization of the region began when the New Sweden Company built Fort Christina in 1638 at the present site of Wilmington with support of the Swedish government. Fort Christina was the first permanent European settlement in Delaware, and became the nucleus of a Swedish and Finnish settlement of farmers and traders known as New Sweden (Weslager 1987).

The Dutch claimed the land from the Schuykill River south by right of prior discovery because the English Captain Henry Hudson had scouted the mouth of Delaware Bay for the Dutch in 1609. So in 1651 the West India Company built Fort Casimir at the present site of New Castle to block Swedish control of the Delaware River. The Swedes responded by capturing Fort Casimir and renaming it Fort Trinity in 1654. A large Dutch military force returned to the Delaware Valley in 1655 and recaptured Fort Trinity and also seized Fort Christina. The Dutch allowed Swedish and Finnish families to remain in the area and observe their own customs and religion.

In 1657, the City of Amsterdam acquired Fort Casimir from the West India Company, and founded a town called New Amstel. The population of New Amstel in 1660 was about 1000 people (Weslager 1987:190). English control of the Delaware River and Bay area began in 1664 when Sir Robert Carr attacked New Amstel on behalf of James Stuart, Duke of York, brother of King Charles the II. Political authority was transferred from the Dutch to

the English, but Dutch settlers who swore allegiance to the English were allowed to keep their lands and personal property with all the rights of Englishmen.

In 1673, during the third Anglo-Dutch War, the Dutch recaptured New Netherlands, including New Amstel. The Dutch returned the New Netherlands to the English in 1674 in exchange for the captured Dutch colony of Surinam. New Amstel became New Castle.

In 1682, William Penn and his representatives were granted rights to the area by the Duke of York, and political and economic control of the Delaware region shifted to Philadelphia, the seat of Penn's colonial government (Munroe 1978). Political relations between the Three Lower Counties (present Delaware) and Pennsylvania went sour, and in 1704 representatives from the Delaware Counties met in a separate assembly. Despite the political schism, economic and social ties linked the Lower Counties with Philadelphia throughout the seventeenth and eighteenth centuries (Munroe 1984).

The early Swedish, Dutch and English immigrants were principally farmers growing tobacco, rye and barley. By the end of the Exploration and Frontier Settlement period, these crops were replaced by the more profitable crop - wheat. Farmers and settlers in the area soon shifted from subsistence to market-oriented agriculture (Hanna 1917; Loehr 1952; Pursell 1958; Hoffecker 1977).

Mills were among the earliest manufacturing complexes in the region (Pursell 1958). Scharf (1888) mentions grist and saw mills at two places within the Route 301 study area before 1730, and many others in the surrounding area. Mills on the Christiana River upstream from the town of Christiana were established by 1705 (Scharf 1888:937), and near Cooch's Bridge at about the same time (Scharf 1888:956). Farmers in the region sent their grains to the local milling centers and from there the wheat flour and bread were shipped to Philadelphia for export to the West Indies, other North American colonies, and southern European countries (Lindstrom 1978; Walzer 1972).

Lumber was another seventeenth-century export from the Three Lower Counties. English settlers, aware of the shortage of lumber in their homeland, took advantage of the virgin forests of the region. The lumber from mills in the Piedmont and the Upper Peninsula also supplied local building materials and fuel needed by the slowly increasing population. Later, chronic shortages of building materials made brickyards another seventeenth century industry. Iron ore mining and smelting were attempted in the Iron Hill area in the northwestern portion of the study area during the seventeenth century. Iron Hill was known as early as 1661 (Scharf 1888:950). Augustine Hermann's map of 1673 shows the location of "Yron Hill" (Figure 13). There was sufficient interest in the deposits to draw a group of Welsh miner/settlers to the area and in 1684 Penn issued a grant for the "Welsh Tract" (Scharf 1888:950). The Abbington Iron Works was operated from 1726 to 1734 (Scharf 1888:951). Thus, Delaware was one of the earliest iron producers in the Middle Atlantic.

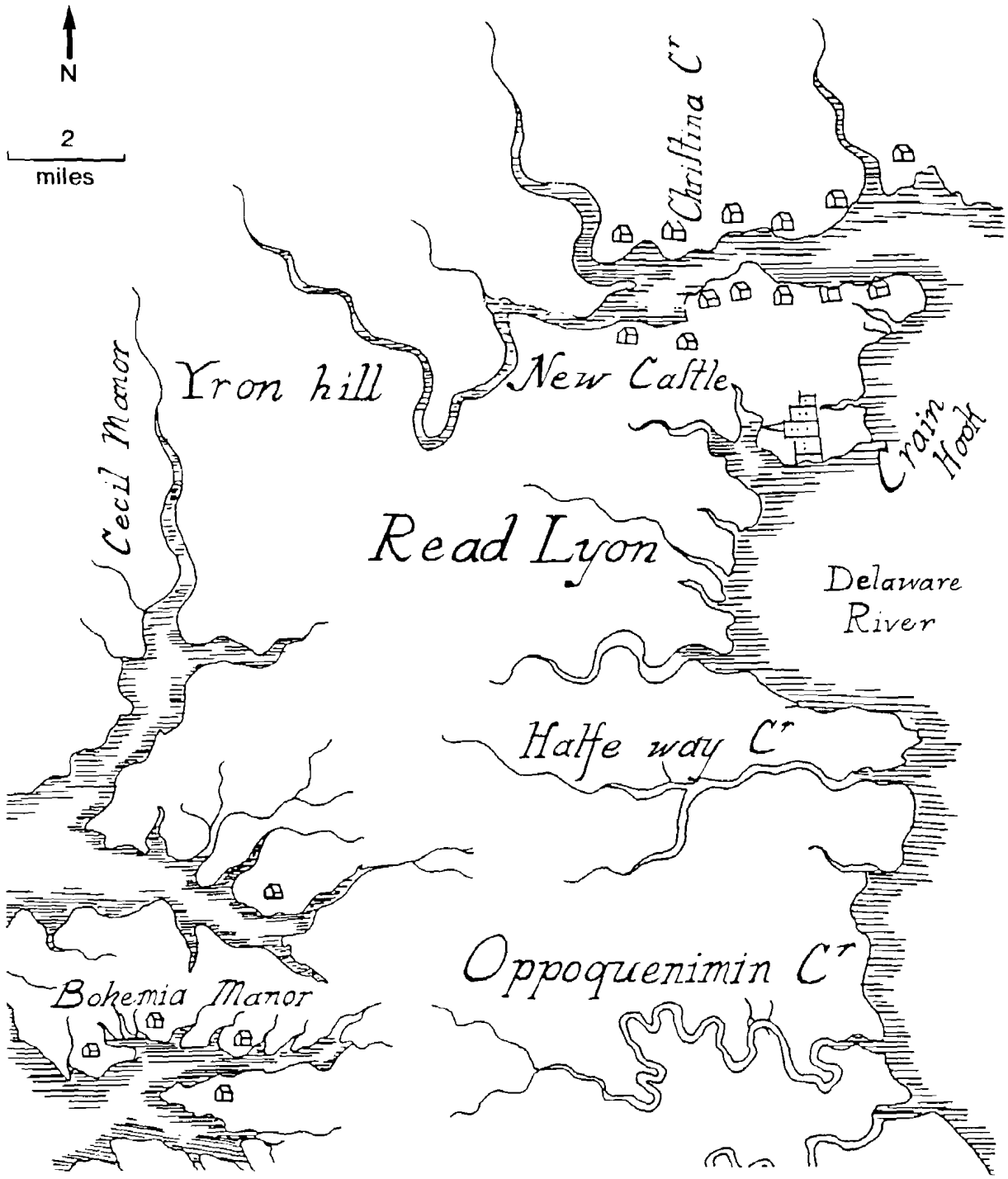
Earliest settlement within the Route 301 study area was probably near Christiana as Swedish and Finnish settlers moved up the river from Fort Christina. However, Weslager (1987) notes that most settlers lived inside Fort Christiana, and that early settlement remained tightly clustered around the fort and spread north along the Delaware River towards Upland (present Chester). Swedish traders, however, made trips by foot into the interior traveling west along "Indian" trails past the Iron Hill area into the Susquehanna drainage in search of beaver pelts.

During Governor Printz's administration (1643-1653) some disgruntled colonists moved west into Maryland. When Peter Rising took over in 1654 he learned that 15 men, some with families, had deserted to Maryland (Weslager 1987:91). Thus, the earliest settlers in the Route 301 area may have been renegades living near the then poorly-defined border between Maryland and Delaware. Scharf (1888:950, 987) notes that some Swedish settlers were dispossessed by the Welsh Tract grant in 1701, and by land grants in St. Georges Hundred about 1675.

The landscape during this time was heavily wooded in a mixture of oaks, walnut, hickory, chestnut, and maple. The area was so wild that the County Court ordered "woolf pits" dug in 1677 and 1678 (Scharf 1888:611). Water travel was the easiest, safest, and most effective means of transport. Overland travel was extremely difficult, because roads were few and very poor.

FIGURE 13

Excerpt of Herman's 1673 Map



Redrafted excerpt from Herman's 1673 map of the Delmarva Peninsula. The map severely distorts the region. Drainages are exaggerated, and the interior areas are devoid of detail. "Yron" [sic] Hill is shown on the map.

The route of "Herman's Cart Road" between Appoquinimink (present Odessa) and Bohemia Manor in Maryland was in use by 1660 when trade with Maryland was authorized by Governor d'Hinoyossa (Scharf 1888:991). Other early roads ran from New Castle to Appoqinimink and Christiana, and from near Ogletown to New Castle (Scharf 1888:413). The settlers of the "Welsh Tract" at Pencader petitioned for a road to Head of Elk in Maryland in 1723.

Small hamlets, established after the English take-over, consisted of a few dwellings and services (blacksmith shops, taverns, and stores), and were almost always situated on a navigable river or stream. The villages of Christiana and Cantwell's Bridge (or Appoquinimink, now Odessa) in the Upper Peninsula were the only hamlets of any size in the area by 1700. Both villages were located on major navigable rivers at the head of tide and on roads.

Early Dutch land grants were commonly in "long lots" extending back from a water course. In the 1680s the Penn government continued issuing long lot grants, but also instituted an irregular "metes and bounds" system. Most farmstead tracts and land grants had frontage on a stream or water course to ensure access to communication and trade (Hoffecker 1977). Lots, parcels, and grants always contained some fresh water source. Penn issued warrants for 62,913 acres (approximately 98 square miles) in New Castle County, or about one-quarter of the total surface area of the county today (Eastburn 1891:193-197).

Dwellings and "plantations" were generally constructed on well-drained soils with small clearings for house sites and fields. Tobacco was the major agricultural crop for most of this period, but later, grain and livestock were important. Such an agricultural economy suggests that plantations of the period would exhibit an intensive use of the land in the immediate vicinity of the dwelling house and outbuildings, with a patchwork of new and old fields surrounding the complex of buildings. It is likely that large portions of the property were kept in woodland or marsh for cattle forage. Based on the results of the Atlantic Coast Comprehensive Survey undertaken in the late 1970s, Wise (1980:4) has postulated that historic sites dating from this time period will be located within 300 feet (100 yards) of the drainage on which they fronted.

Structures present at agricultural complexes dating to this period included small dwellings generally built of wood (frame or log), or rarely, brick. Dwellings were built on a traditional range of plans including hall, hall-parlor, double-cell, cross-passage, and four-room (Herman 1987:27). Foundations were generally earthen and impermanent at the time (Carson et al. 1981; Kelso 1984; Herman 1987:84).

A variety of outbuildings such as kitchens, tobacco and grain sheds, milk houses, barns, smokehouses, and meat houses would have been present on the farmsteads (Herman 1987:61-72). Craft-related buildings, such as ship carpentry and blacksmith shops, were few in number, and were located primarily in the "urban" area of New Castle, and perhaps the smaller hamlets such as Appoquinimink and Christiana.

1730 to 1770: Intensified and Durable Occupation

By the middle of the eighteenth century, population increases and commercial expansion stimulated the growth of towns and the development of transportation and industry in the region. A shift in agriculture from tobacco to grain begun in the previous period continued. Clearing of new areas for cultivation also continued. New areas of settlement required improvements in the transportation network, and colonists began to move inland away from the navigable rivers and streams. Good, productive land was settled first, but as the population grew, marginal property was also occupied.

Large numbers of immigrants passed through Philadelphia between 1725 and 1755, particularly English and Scotch-Irish, heading for Delaware. It was reported, for example, that in 1728 4,500 immigrants, mostly Scotch-Irish, arrived in the Lower Counties (Munroe 1978:161). The majority of these new arrivals were indentured servants, but some were mainland Europeans or African slaves (Munroe 1978:160; Galeson 1984; Bailyn 1986). Immigrants from other colonies, particularly from Maryland's Eastern Shore, also contributed to the population growth of the colony. The population of New Castle County in 1740 has been estimated at about 10,800, not including black slaves, who probably accounted for from one-third to one-fifth of the population, bringing the grand total to approximately 13,000 (Pennsylvania Archives 1891:741-742; Essah 1985). The majority of the immigrants were "dissenters", such as Presbyterians, Quakers, and Methodists, although Anglicans were present as

well (Hancock 1962).

In the southeastern Pennsylvania region, Lancaster, York, Carlisle, Reading, and Wilmington are examples of urban growth based on internal trade (Lemon 1967). On a more local scale, several towns in the Upper Peninsula, such as Christiana, Newport, Cuckoldstown (modern Stanton), Newark, and Cantwell's Bridge (Odessa) were either founded or began to prosper. These places have been termed "commercial towns," - towns that appeared at prominent crossroads or navigation locations, and served as focal points for the local economy and society (Heite and Heite 1986). The town usually consisted of a tavern, a bridge or fording place, a grist mill and/or saw mill, wharves (if on a navigable river), perhaps a store, and domestic houses. None of the towns in northern Delaware were very large. For example, Christiana had about 20 houses, including stores and taverns, a church, and a mill, in 1750 (Catts et al. 1989a:23). New Castle and Lewes were the only real urban centers in the colony.

Wilmington, chartered in 1739, developed into the largest city in Delaware. The town's location was considered to be "one of the pleasantest and most favorable on the whole continent" (Acomb 1958:123). Wilmington soon became a port of entry and a post town, and was an important link in the Philadelphia trading network. The town grew rapidly, from about 600 inhabitants in 1739 to nearly 1200 by the American Revolution (Munroe 1978:160). Wilmington was a receiving and distribution center for local and regional farm produce, brought by water from the small villages of the Upper Peninsula, such as Cantwell's Bridge, Christiana, Newport, Stanton, and St. Georges, or overland from southeastern Pennsylvania (Lemon 1967, 1972).

Waterways continued to be important for transportation and commerce because roads were still limited in number and in poor condition. The few existing roads led to landings on rivers and the Delaware Bay where produce and goods were shipped by cheaper, and more efficient water transport. The Delaware River and Bay served as a major focus of water transportation. For this reason the large port city of Philadelphia, and to a lesser extent Wilmington and New Castle, influenced the Delaware counties throughout and beyond the eighteenth century.

The condition of roads in the colony improved considerably over the course of the eighteenth century, but in some locations they were poor even by contemporary standards (Munroe 1954:137; Gray 1961:309). From Wilmington and New Castle, roads radiated west, south, and north, connecting the Delaware River with the head of the Chesapeake Bay (Head of Elk), Kent and Sussex counties, and southeastern Pennsylvania. The development of the road network in the colony is evident on historic maps of the region (Figures 13-18). The relative importance of water vs. overland transportation through time can be seen in the changing representation of rivers and streams vs. roads on these maps (Figure 19).

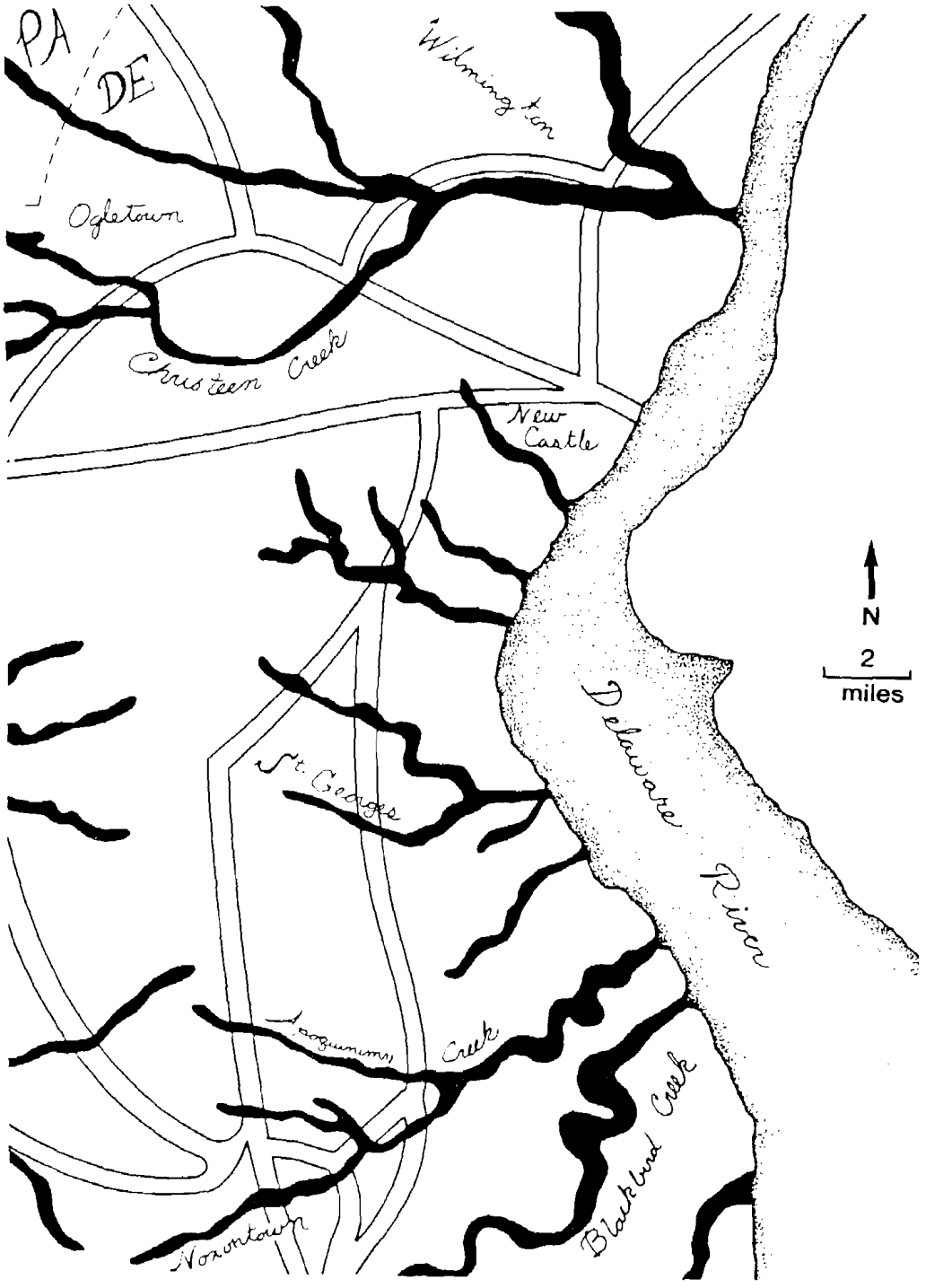
Farming remained the most important activity for between 80 and 90 percent of the colony's population (Egnal 1975:201). Farming in the Piedmont and Upper Peninsula was a combination of mixed livestock husbandry and grain cultivation (Bidwell and Falconer 1941:84). Wheat was the primary grain produced, followed by rye, corn, barley, oats, and garden vegetables. Land use began to change from an intensive to an extensive pattern. By mid-century a system of three-field or four-field rotation was used on the farms of the Upper Peninsula, resulting in yields of from six to twenty bushels of wheat per acre (Lemon 1967; 1972:169; Bausman and Munroe 1946; Strickland 1801). Livestock continued to be important for the colony's inhabitants, and home manufactures were added to the economy by the middle of the eighteenth century (Main 1973; Jordan 1914).

Farm sizes in the Piedmont and Upper Peninsula region were slightly larger than in the previous period, averaging about 320 acres in New Castle County. Properties of 200 to 299 acres in New Castle County were most frequent during this period (DeCunzo and Catts 1990: 67-71). Cleared or cultivated lands averaged between 15 and 20% of the total property.

Farm placements and layout changed as agriculture changed. More and larger fields were needed for grain agriculture, spurring land clearing and shifts in dwelling locations. Starting in the 1740s, Georgian architecture began to appear, and more permanent methods of construction and material types were used (Carson et al. 1981; Herman 1987:26,109-110). Outbuildings reflected the changes in agriculture, with a general disappearance of tobacco sheds, the presence of more durable granaries and barns, and the addition of structures for use in

FIGURE 14

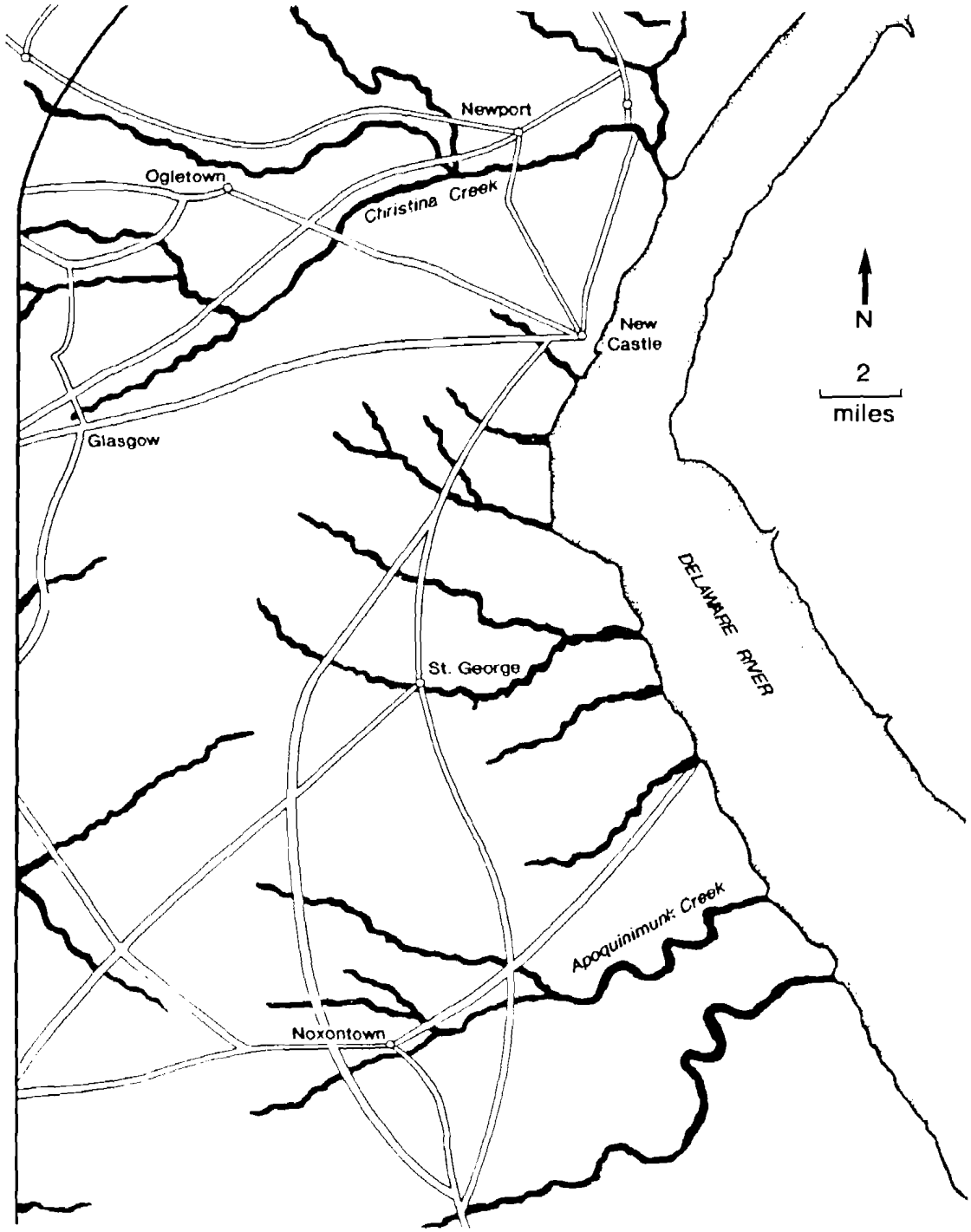
Excerpt of Evan's 1749 Map



Redrafted excerpt from Evans' 1749 map of the region. Notice that drainages are exaggerated and that, although the Route 301 study area can be located on the map, the region is still distorted somewhat. Roads are also exaggerated and few are shown.

FIGURE 15

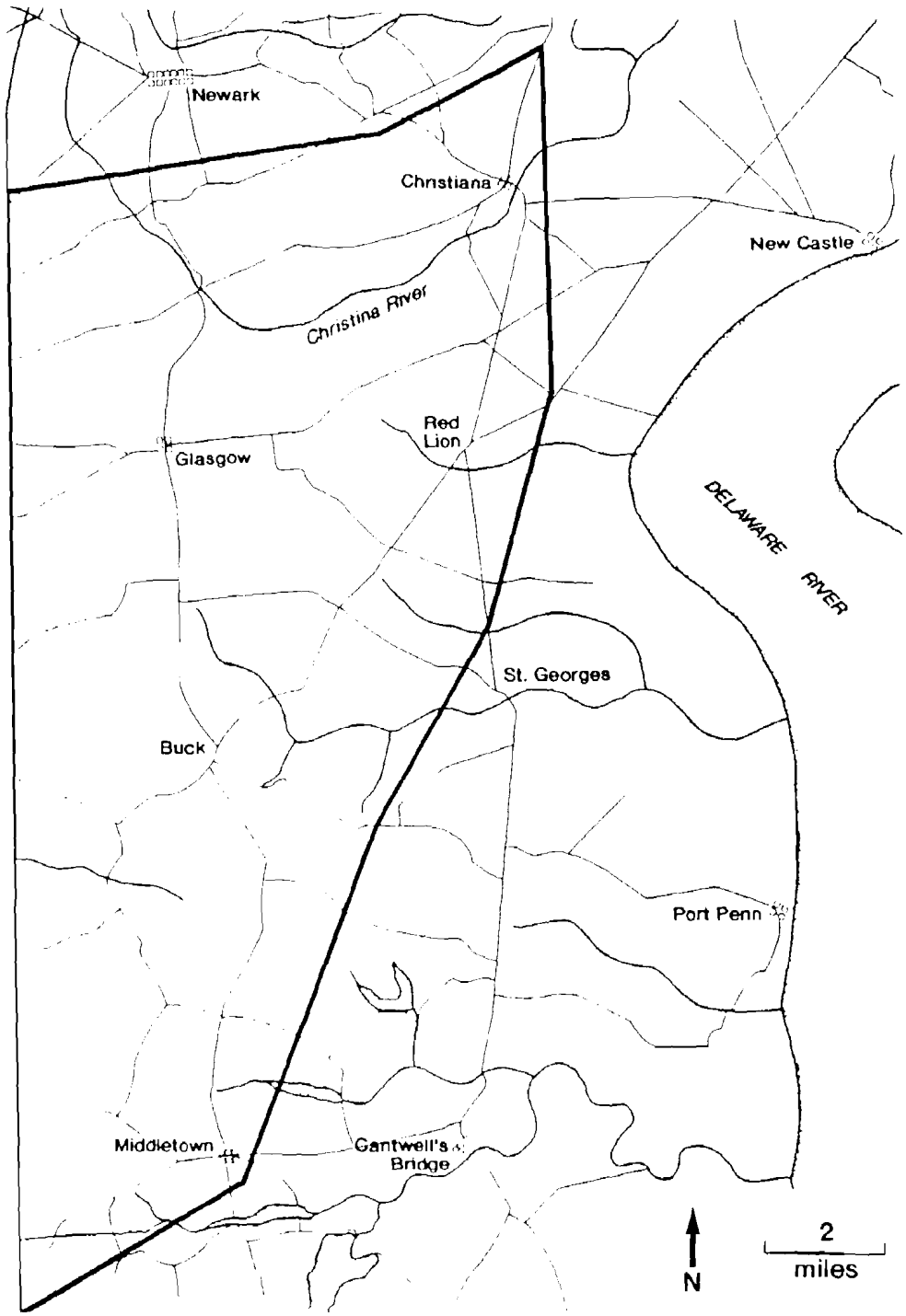
Excerpt of Faden's 1778 Map



Redrafted excerpt from Faden's 1778 map of the region. Distortions made it impossible to overlay the Route 301 study area on the map. Note that drainages are shown more to scale and that roads are more dense.

FIGURE 16

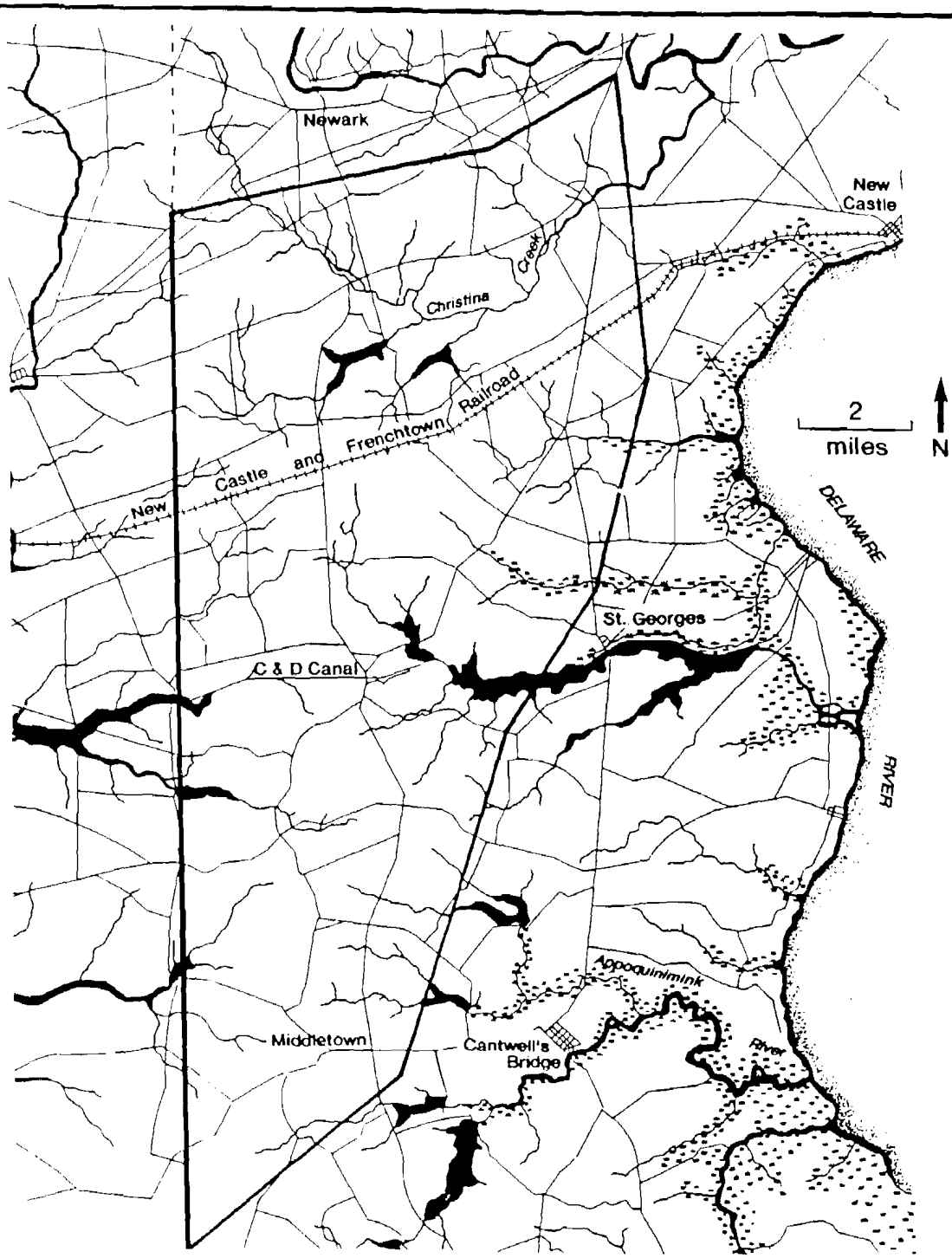
Excerpt of Heald's 1820 Map



Redrafted excerpt from Heald's 1820 map. Drainages are de-emphasized in this map and the road network i the region is much more dense than on earlier maps. The map is also much less distorted than earlier maps.

FIGURE 17

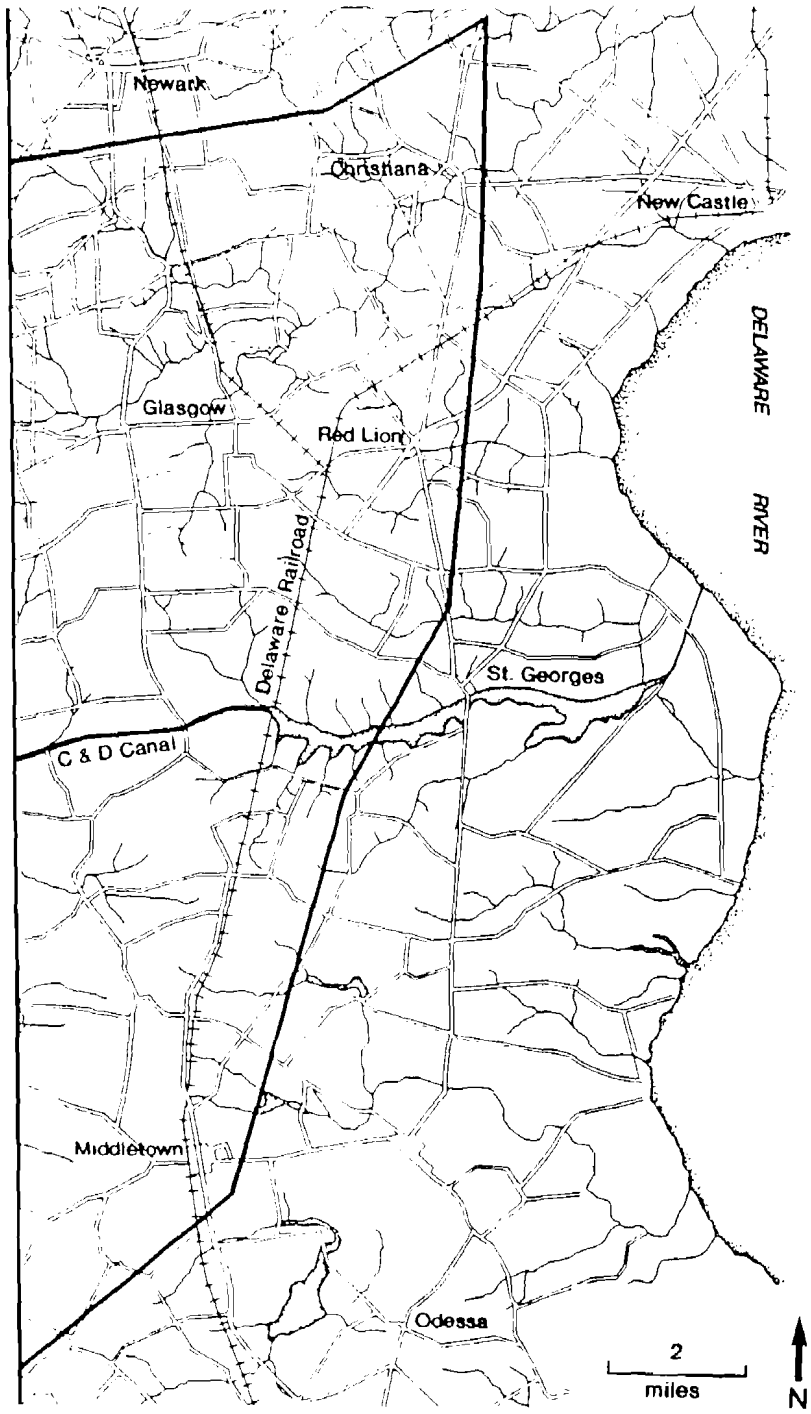
Excerpt of Rea and Price's 1850 Map



Redrafted excerpt of Rhea and Price's 1850 map of New Castle County. Note the accurate representation of drainages, marshes, mill ponds, and roads. The map also shows the two significant advances in transportation for the region - the New Castle and Frenchtown Railroad and the Chesapeake and Delaware Canal.

FIGURE 18

Excerpt of 1914 Farm Journal Map



Redrafted excerpt from the 1914 Farm Journal map of New Castle County. The road network has approached its present density. Drainages are de-emphasized on this map. In contract with earlier maps, the roads are exaggerated.

home manufacturing, such as weaving houses.

The Upper Peninsula and Piedmont regions were commercial farming regions that sold a high proportion of their produce (Main 1973). Good farmland and access to markets were essential to these commercial farming communities. Main (1973) found that a high percentage of wealthy men, artisans, professionals and merchants characterized these communities, rather than large numbers of small farmers.

The land grant patterns of the previous period continued, as large, irregular parcels often bounded by a water course were placed in the interior of the peninsula. The settlement shift was probably due to the change from tobacco agriculture to grain agriculture that occurred in the early eighteenth century in southern Delaware and to the fact that river front property was no longer available (Munroe 1978). Increasing population due to immigration from overseas and overland from the Eastern Shore, also contributed to the change in settlement pattern.

1770 to 1830: Transformation from Colony to State

The American Revolution dominated the social and political scene in the county at the beginning of this time period. The British blockade disrupted the maritime economy along the Delaware River and its tributaries. British warships landed raiding parties that took foodstuffs, livestock, and slaves from the inhabitants. There was social and political unrest in the colony as well, due in part to economic troubles, but also because of Loyalist sympathies.

Several military forces passed through Delaware during the Revolutionary War. In the fall of 1777, a large British and Hessian army landed in Cecil County, Maryland and marched through Newark and Hockessin towards Philadelphia. A small group of continental soldiers and militia engaged this force at Cooch's Bridge (just south of Newark). The Americans were forced to retreat after a brief skirmish, however. The British army of about 17,000 camped nearby for several days, while Americans occupied the areas around Christiana, Stanton, and Newport. Shortly afterwards, the British seized Wilmington, and throughout the winter of 1777-78 control of the town traded hands.

A second major, but brief, campaign affected New Castle County in the summer of 1781, when Washington's army headed south to besiege the British forces at Yorktown. Large numbers of American and French troops passed through the state on the roads leading from Wilmington to Christiana, and from there to the Head of Elk. Earlier the same year, Lafayette's division of 1500 men landed and camped at Christiana, before marching on to Tidewater Virginia.

By 1800 the population of Delaware was 64,273 including slaves and free blacks. Nearly 40% of the total lived in New Castle County (Catts and Decunzo 1990:53). In 1790 fewer than half of the blacks in the state were free, but by 1800 greater than 57% were free. In 1800, free blacks accounted for about 13% and slaves for about 9.5% of the total population of the state (DeCunzo and Catts 1990:53). Free black labor played an more important role in farm production in Delaware as ethical and economic factors reduced the profitability of slavery prior to the Civil War. Following Emancipation, black labor continued to be significant in farm production (Bausman 1933).

Delaware's economy remained agricultural throughout this period. However, a decline in wheat prices and increased competition for good land throughout the Middle Atlantic region was worsened in Delaware by a decrease in land fertility. Wheat was still the dominant crop in the Piedmont and Upper Peninsula, but poor farming, soil erosion, and exhausted land contributed to the economic woes of Delaware farmers.

The rapid growth of the population and the decline of agricultural productivity during the early decades of this period forced many new farmers in Delaware to clear and farm poor quality or marginal land. Many farmers were hard-pressed to turn a profit, and there was a large outmigration during the 1820s and 1830s. Hancock (1947:374) noted that the population of Delaware remained stationary between 1810 and 1820, and only began to rise again after 1840.

As people left Delaware, a labor shortage made farming on marginal and exhausted lands even more unprofitable. In the Piedmont and Upper Peninsula, less productive farms were abandoned and incorporated into

the holdings of wealthier farmers (Herman 1987). By the middle of the nineteenth century "improved land" had increased to over 90% of the property in the Upper Peninsula (Michel 1985). Forests were lumbered off to the extent that saw mills closed (Scharf 1888:939).

Commerce and manufacturing in Delaware were more successful during this period, and "locally from 1790 to 1810, commerce prospered as it never had nor would again" (Welsh 1956). After the Revolution, rapid industrial and urban growth took place in the Piedmont and Upper Peninsula. The loss of jobs in agriculture was partly offset by new sources of income and employment in urban and industrial centers (Taylor 1964a:441; Lindstrom 1979:300). Thus, much of the surplus population that had earlier been farm laborers, tenants, or unemployed, moved into urban and industrial centers where jobs were more plentiful.

The Embargo Act and the War of 1812 stimulated manufacturing in Delaware, especially in textiles. Cotton and woolen mills appeared in the Piedmont and Upper Peninsula regions and prospered. The drainages of Red Clay Creek, White Clay Creek, and Brandywine Creek were harnessed for power (Pursell 1958; Munroe 1979).

New Castle County dominated the other counties in most aspects of manufacturing. Of twenty-seven categories of manufacturers listed for the state in 1810, sixteen, including paper mills, snuff mills, rope walks, and a gunpowder mill, were unique to New Castle County (Coxe 1814). Grist mills produced the greatest value of goods. Iron manufacturing ranked second. Concentration of manufacturing and milling establishments in the Wilmington area was remarkable. Nile's Register (1822:93) reported 99 mills within nine miles of Wilmington in 1815.

Urbanization in New Castle County during the first quarter of the nineteenth century was stimulated by the presence of a transportation network and by agricultural and industrial production. However, most of the towns of importance from the previous period, such as Christiana, Newport, Stanton, Cantwell's Bridge, and Newark, settled originally because of their location on major transportation arteries, continued as principal marketing, milling, and shipping centers for only a brief period into the nineteenth century.

In the first half of the nineteenth century, methods and routes of transportation underwent substantial changes in the Piedmont and Upper Peninsula, as first turnpikes, then canals, and finally railroads were introduced. Throughout the nineteenth century, improvements in transportation were the keys to urban, agricultural, and industrial development as recognized by the national government (Gallatin 1808). The first successful turnpike in Delaware was the Newport and Gap turnpike begun in 1808. By 1815, eight more turnpikes, all passing through parts of New Castle County, had been chartered. Despite the improvements in overland transportation, water travel was still the cheapest, fastest, safest, and most dependable means of transport available during the Transformation from Colony to State (Gray 1961:311).

Dwellings were most commonly log or frame construction. Only a few brick and stone houses were built. Farmsteads averaged a little over 200 acres in the Upper Peninsula. By 1850, wheat cultivation dominated in the Piedmont and Upper Peninsula down to into St. Georges Hundred. Further south wheat farming declined. Dairy farming followed a similar pattern, except that it was more concentrated in the Piedmont (Michel 1985). Farm layout and buildings reflected agricultural developments. In the region of the study area diverse outbuildings and barns, necessary for dairying and grain production, could be found on the landscape (Herman 1988; Garrison 1988).

1830-1880: Industrialization and Capitalization

The Industrial Revolution complicated regional development during this period as great strides in industrialization, urbanization, and transportation took place in northern Delaware (Taylor 1964b; Walzer 1972; Lindstrom 1978, 1979). Philadelphia's economic influence over the region declined in the first half of this period, chiefly due to Baltimore's rise. Also, the demand of foreign markets for Philadelphia's agricultural produce declined. Regional farmers, including those in Delaware, responded by diversifying their production - a strategy made possible in the Peidmont and Upper Peninsula by improved transportation to markets. Dairy farming, some wheat production, and market or truck gardening became fashionable, depending on the section of New Castle County in which a farm was located (Michel 1985).

Economic crises of the first decades of the nineteenth century helped to spur an agricultural revolution in Delaware. The New Castle County Agricultural Society encouraged farmers to use improved drainage techniques, fertilizers, and machinery. As a result, Delaware's Piedmont and Upper Peninsula were among the finest agricultural regions in the United States by 1860. A traveler through the region commented that:

> "the northern portion of this little state is generally a fine tract of country, being highly and skillfully cultivated, and well adapted to the growth of wheat and other grains of superior quality. In a word, this portion of the state presents all that is delightful in agriculture" (Myers 1849:39).

From the 1830s to the 1870s, Delaware was the center for peach production in the eastern United States. Rich soil, favorable climate and rainfall, excellent transportation facilities, and strategic location near large markets made peach production a lucrative enterprise. The Delaware Railroad was essential to the Peach industry after its completion in 1856 (Hayes 1880:20-25). In 1875 the railroad carried 5-6 million baskets of peaches to market. In addition, 905 car loads of berries were carried in 1876 (Hayes 1880:25). A disease known as the "Yellows", however, devastated the peach orchards in northern Delaware by the mid-1870s.

Lindstrom (1978:123) found that in 1820 over 76% of the population in the Philadelphia hinterland were farmers by occupation, but by 1840 the figure had declined to about 70%. The income of Delaware farm owners who were able to remain productive was higher than that of farmers in other areas of the nation. Thus, while many farmers were forced to migrate west or into the cities, or became agricultural tenants, successful farmers reinvested their profits and improved their farms. By 1860, earlier dwellings were being replaced and enlarged by two-story hall-parlor or center-passage, single pile dwellings, with barns, corn cribs, and stables as outbuildings (Herman and Siders 1986:87).

During the middle decades of the nineteenth century, farmers in Delaware specialized in producing corn, dairy products, fruits and vegetables, and lumber. Wheat and livestock production decreased correspondingly (Lindstrom 1978:125). The Piedmont and Upper Peninsula emphasized goods that were desired by nearby urban communities, including perishables such as milk, butter, fruits, and vegetables. The shift from cereal farming to market gardening continued into the twentieth century.

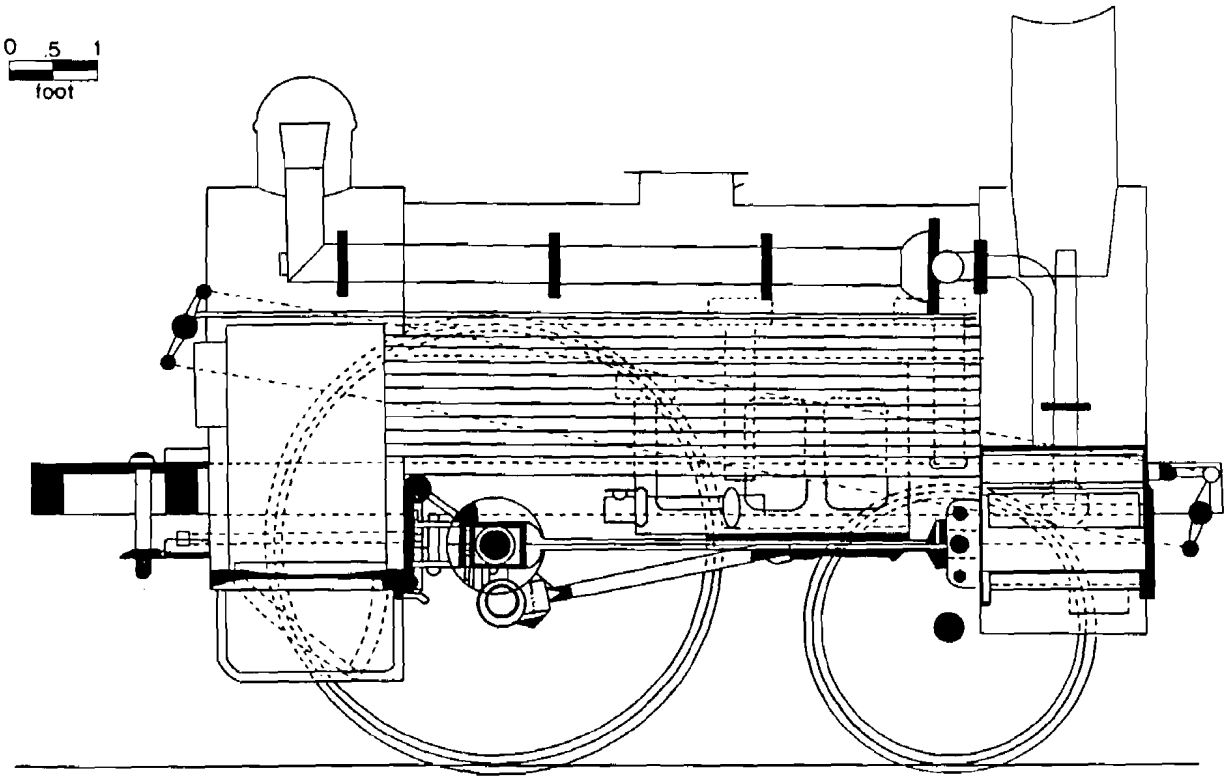
The most significant events to occur within the study area during this period were the arrival of railroads and the construction of the Chesapeake and Delaware Canal (see Figure 17). The New Castle and Frenchtown Railroad Company grew out of the Turnpike Company of the same name opening a railway across the Delmarva Peninsula in 1831 (Griffith 1935; Hayes 1880; Holmes 1961; Watkins 1896). Passengers traveling from Philadelphia to Baltimore connected with steam boats of the Union Line operating on the Delaware River and Chesapeake Bay (Holmes 1961). Initially wooden rails topped with iron strips were lain on stone sleepers. A monument to the railroad in New Castle is constructed from the stones (Griffith 1935) and the ticket office was still standing in 1935. The railroad ran for one year with horse drawn carriages, but steam locomotives built by the famous engineering works of the Robert Stephenson Company in England (Warren 1970; Figure 20) soon replaced horses. The New Castle and Frenchtown Railroad has the distinction of being one of the first railroads to be abandoned in the U.S. when the tracks for the western two thirds of the line were taken up and used to build the Delaware railroad south of Smyrna (Hayes 1880:18; Watkins 1896).

Unlike the railroads which connected Delaware farms and industries with regional markets, the Chesapeake and Delaware Canal bypassed the major centers of northern Delaware's economic life. Original plans for the canal envisioned an eastern terminus in Wilmington or New Castle, thus enhancing the market control and access of these towns (Gray 1959a,b). The present route of the Canal was selected after nearly 50 years of survey, negotiations, false starts, and debate (Gray 1959a,b). Final selection of the present route in 1823, by the U.S. Army Engineering Department, was controversial (eg., Varle 1827), but supported by Philadelphia and Baltimore interests (Gray 1959b).

Construction of the canal began in 1824 and was completed in 1829 with the final excavation of the "Deep Cut" near Summit (Figure 21). Despite the short length of the canal and its few locks, it was one of the most expensive

FIGURE 20

Plans for the Locomotive "Delaware"



An engineering drawing of the locomotive "Delaware" built by Robert Stephenson and Co. of Manchester, England for the New Castle and Frenchtown Railroad in 1831. A second locomotive of this type was also built and called the "Maryland". The famous locomotive "John Bull", now in the Smithsonian Institution American History Museum, was an earlier model built by Stephenson for the Mohawk and Hudson Railroad. Redrafted from an illustration in Warren (1970).

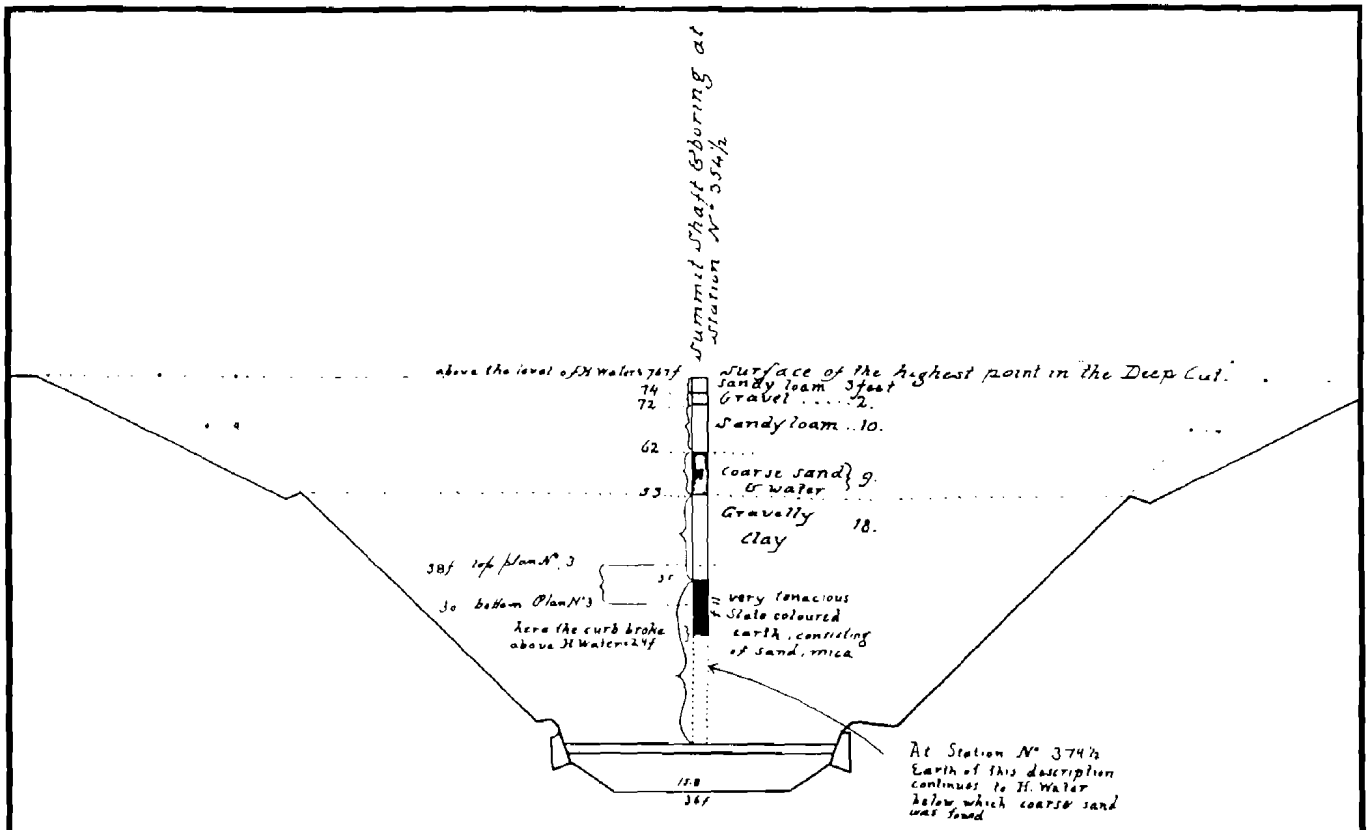
canals of the time (Gray 1960). As many as 2600 workmen labored to dig the canal living in frame shanties or privately owned houses constructed for the purpose.

The canal limited travel between northern New Castle County and the rest of the Delmarva Peninsula because only two roads crossed the Canal at Summit and St. Georges. The Delaware Railroad also crossed the canal. The opening of the Canal led to the abandonment of the western two thirds of the New Castle and Frenchtown Railroad (Holmes 1961), and to the economic decline of the town of Christiana (Catts et al. 1989a:39-40).

Much of the reemergence and success of both industry and agriculture in Delaware can be attributed to the improvement of transportation facilities that began in the 1830's. The Baltimore, Wilmington, and Philadelphia Railroad linked Wilmington and its hinterland with both excellent sources of raw materials and markets for the sale of finished products. The Delaware Railroad connected to the New Castle and Frenchtown Railroad west of Red Lion and passed south into southern Delaware through Middletown in 1857 (Watkins 1896) bringing the rest of Delaware into the economic sphere of Wilmington. Occupying the hinterland around Wilmington was also a

FIGURE 21

Stratigraphic Cross-Section of the "Deep Cut" of the Chesapeake and Delaware Canal



An engineering drawing from the "Deep Cut" section of the C&D Canal near Summit, Delaware. The text describes the sediments encountered in the digging. Redrafted from a copy of the original in the Historic Society of Delaware collections, Wilmington.

sizable population of skilled mechanics and machinists necessary for industrialization. In the Piedmont and Upper Peninsula there were several small enclaves of manufacture and industry, such as the Hagley and Dupont Mills on the Brandywine, and the textile manufacturers located on the other streams of New Castle County.

By the start of the American Civil War there were 380 manufacturers recorded in the U.S. Census in New Castle County. A wide variety of industries were represented including 42 boot and shoe manufactures, 30 flour mills, 19 clothing manufacturers, 16 carriage shops, 13 cabinet and furniture factories, 11 cotton processors, and 10 tin, copper-ware, and sheet-iron factories.

The Civil War had a larger social than economic impact on the lives of Delaware's citizens. During the War, several temporary military encampments for home guard units were placed throughout the state, such as at Brandywine Springs. At the outbreak of the Civil War the population of Delaware stood at 112,216. Nearly 49% resided in New Castle County, including large numbers of Irish and Eastern European immigrants living in Wilmington.

1880-1940: Suburbanization

At the beginning of the twentieth century New Castle County had 59% of Delaware's population, the majority (nearly 70%) living in Wilmington. Many were recent immigrants from Eastern and Central Europe (Hoffecker 1974a). Between 1870 and 1900, the percentage of Delawareans employed in agriculture declined from 39.5% to 26%, while the percentage of persons engaged in industry and manufacturing rose from 23.5% to over 31%. The number of people engaged in trades rose from 8.5% of the total state population to 14% during this period (Reed 1947). The value of manufactured products exceeded agricultural products by an increasing amount, with most of the wealth concentrated in the Piedmont region around Wilmington.

Beginning in the later nineteenth century and lasting into the twentieth, farmers in Delaware focused on the production of perishable crops, and de-emphasized staple crops. A diversity of crops, including tomatoes, apples, potatoes, and truck produce were grown for the markets in New York, Philadelphia, Baltimore, and other cities. Further improvements in transportation throughout the state contributed to the importance of truck crops and dairy products in the late nineteenth century. Growth in truck farming was greatest between 1879 and 1899, when the value of truck and small fruit products rose from $167,000 to $1,231,000, a 457.2% increase in value (Shannon 1945:260). In the Piedmont region farmers still grew cereal crops, but not for export or widespread consumption.

There was a noticeable decline in the size of farms, and total farm acreage (Bausman 1933, 1940, 1941a, 1941b), suggesting that there was a period of farm abandonment and/or readaptation in the beginning of the twentieth century, coinciding with the beginnings of suburbanization in New Castle and Kent counties. Many nineteenth century farmsteads became archaeological sites during this period.

Tenant farming, which had been common throughout all of the preceding periods, became even more prevalent during the late nineteenth century. Large land owners, who increased their holdings during the hard times of the 1820's, leased their lands to tenants. One author likened the farm situation in Delaware in the second half of the nineteenth century to that of the antebellum southern aristocracy. Large farm owners did little labor themselves and required the hired labor to render personal services. "They lived on their farms and personally directed their farm businesses. Some of them owned additional farms which they either 'carried on' or rented to tenants" (Bausman 1933:165). By 1900 over 50% of all the farmers in Delaware were tenants or share croppers. Between 1880 and 1900 this figure represents almost an 8% increase in farm tenancy (Shannon 1945:418). Farm tenancy remained common into the twentieth century.

The pattern and density of settlement in Delaware have been strongly influenced by several factors throughout its history: 1) an agrarian economy; 2) the commodity demands of large markets, first Europe and the West Indies, and then domestic commercial-industrial centers, and 3) transportation facilities. The Dupont Highway, which opened in 1923, linked northern and southern Delaware and helped to complete the shift in agricultural production towards non-local markets and open new areas to productive agriculture. Improved transportation in the twentieth century also brought a decline in the importance of the many small crossroad and "corner" communities, such as Jesterville (Summit) and Bowersville (Kirkwood), that had sprung up in the late eighteenth and nineteenth centuries. These have been replaced by commercial and industrial "strip" development along the major transportation routes throughout the state.

EXISTING DATA BASE

The major source of information on cultural resources used in this study is files and maps maintained by the Delaware Bureau of Archives and Historic Preservation (BAHP). The BAHP files contain data primarily on standing structures, but also include information on both prehistoric and historic archaeological sites. However, these files do not contain information on all historic properties, and the information on archaeological sites is largely from earlier cultural resource management studies of limited coverage (Figure 22 and Table 1).

Previous archaeological studies, inventories, surveys, testing programs, and excavations in and around the Route 301 study area are shown on Figure 22 and listed in Table 1. A portion of the Route 301 study area was covered in the Route 13 study by Custer et al. (1984). The methods and procedures used in this study are based on that