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Author(s): W. Fred Kinsey III

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# 300 YEARS OF PENNSYLVANIA

*W. Fred Kinsey, III*  
NORTH MUSEUM  
FRANKLIN AND MARSHALL COLLEGE

## EASTERN PENNSYLVANIA PREHISTORY: A REVIEW

### INTRODUCTION AND ENVIRONMENTAL CONTEXT

**I**n human terms, certain fundamental considerations or broad themes relative to the human condition apply throughout the world wherever people have chosen to live and for whatever span of time is involved. All peoples must meet their subsistence needs. They must develop a technology in order to secure food, provide shelter and warmth and to protect themselves from the elements. Furthermore, men and women are social and political beings who must arrange themselves into kin, age, status, and political groupings for mutual cooperation, comfort and protection. Finally, all human societies possess a value system and subscribe to some form of religious and supernatural beliefs which support and perpetuate the cultural system.

Current trends in American archaeology use environmental paradigms to explain culture and culture change. For this reason studies of prehistoric cultures normally begin with a reconstruction of the paleoenvironmental record. The relationship between the culture of a human population and its biophysical environment is highly complex. These mutual interactions and dependencies influence the nature of any cultural system and the adaptive strategies employed to insure human survival.

Various environmental factors such as physiography, drainage, soils and climate determine the distribution of plants and animals. These factors in turn play a major role in determining the location of sites of human occupation since proximity to natural resources used as food, fiber, and tools is a vital consideration. Because of these considerations, the story of Pennsylvania prehistory begins with a brief description of the physical and biological setting.

For millions of years glaciation affected the world's land surface and its climate. The Pleistocene, lasting perhaps four million years, is the most recent geologic period during which cycles of glaciation and glacial retreat occurred. The latest 10,000 years of our present era is an interstadial of the Pleistocene that is usually referred to as the Holocene. Since the American continent was inhabited by Indian populations over the past 12 or more millennia, archaeologists are especially interested in the late Pleistocene and Holocene environments, and often engage in interdisciplinary research in Pleistocene geology, pedology, palynology and mammalogy.

Eastern Pennsylvania is considered the lands between the Susquehanna and Delaware watersheds. It lies mostly within three physiographic provinces: Appalachian Plateaus, Ridge and Valley, and Piedmont.<sup>1</sup> However, small portions of the New England Province (herein known as the Reading Prong), the Blue Ridge, and the Coastal Plain are also represented. Each province is defined by certain distinctive characteristics such as structure, land forms and underlying bedrock as well as predominant surficial rocks, soils, vegetation and watercourses. These natural features played a major role in determining and shaping the adaptive strategies of the prehistoric Indian cultures that occupied this vast territory.

The Appalachian Plateaus Province is usually subdivided into the glaciated Low Plateaus section and the Appalachian Mountain section. The southern boundary is defined by the maximum extent of the glacial advance. The strongly faulted and folded Ridge and Valley Province is located in the central part of eastern Pennsylvania. Characteristics of this province are numerous high (rarely exceeding 2100 feet) parallel ridges separated by narrow valleys. Gaps occur where rivers such as the Delaware, Schuylkill, Lehigh, and Juniata, and smaller watercourses have cut through the ridges. The southwest to northeast trending Great Valley is bounded on the north by the Blue Mountain while to the south it merges with the Piedmont.

The Piedmont Province consists of broad shallow valleys and gently rolling low hills with elevations that are seldom greater than 500 feet. The Reading Prong is found in the vicinity of Berks, Lehigh, Northampton, and Bucks Counties while a small representation of the Coastal Plain Province is located in the extreme southeast. The Blue Ridge Province extends northward from Maryland and Virginia as South Mountain, near Chambersburg.

At the beginning of the historic period the Eastern aboriginal forest cover of the Middle Atlantic region was a mixture of hemlock, white

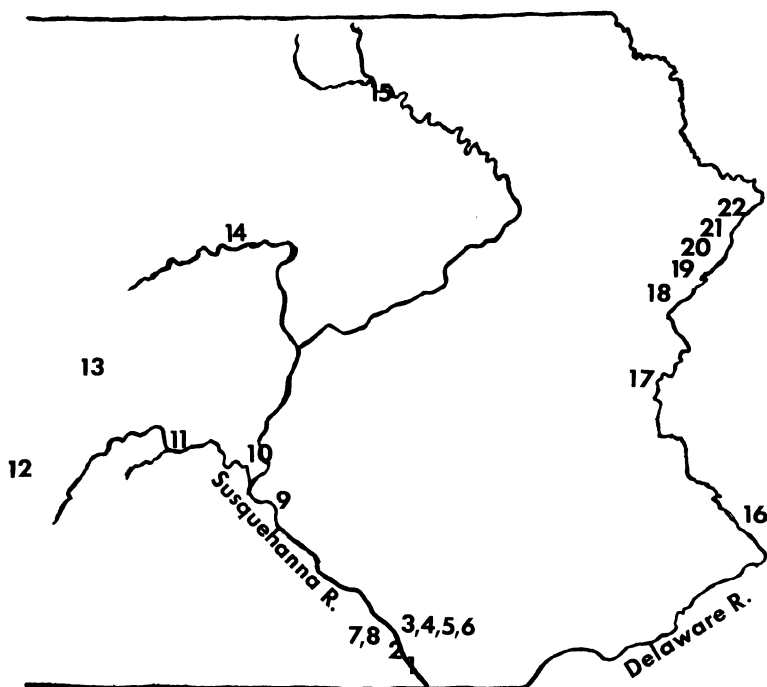


Figure 1

Locations for most of the archaeological sites mentioned in the text: (1) Bare Island; (2) Piney Island; (3) Murry; (4) Strickler-Heisey; (5) Shultz; (6) Washington Boro; (7) Oscar Leibhart; (8) Bert Leibhart; (9) Shoop; (10) Clemson Island; (11) Book; (12) Sheep Rock; (13) Fisher Farm; (14) Bull Run; (15) Wells; (16) Abbott Farm (N.J.); (17) Overpeck; (18) Shawnee-Minisink; (19) Kutay; (20) Faucett; (21) Brodhead-Heller; (22) Zimmermann; (23) Miller Field (N.J.).

pine and northern deciduous hardwoods. An oak-chestnut forest was predominant on the Piedmont and in the Ridge and Valley Province.<sup>2</sup> However, prehistoric environments were not static over the previous dozen or more millennia. Studies of fossil pollen preserved in peat bogs and other settings have shown that vegetational patterns underwent significant changes in response to the general warming trends caused by the retreating glacial ice and fluctuating precipitation.<sup>3</sup>

During late glacial times Pennsylvania vegetation consisted of a mosaic pattern of near tundra conditions of hearty grasses and sedges in open park-like upland areas that coexisted with boreal forest stands of spruce and fir on slopes and lower elevations. As the glacial front moved northward, vegetation became more varied with the spread of deciduous

**Table 1**  
**Climatic Episodes, Radiocarbon Dates, Vegetation, Fauna**

Climatic Episodes	Dates BC	Vegetation	Fauna
Sub-Atlantic humid, cooler	800-AD 1550	temperate deciduous forest: oak, pine, beech, hemlock, chestnut, hickory	modern assemblage: deer, elk, bear, turkey, some bison, small mammals
Sub-Boreal drier, warm	3000-800	northern deciduous forest: oak, beech, hickory, hemlock, birch, maple, chestnut	modern assemblage
Atlantic humid, warm	6500-3000	mixed deciduous hardwood forest: oak, hemlock, beech, spruce, maple, some pine	modern assemblage
Boreal-Pre-Boreal drier, warmer	9000-6500	closed coniferous forest with small deciduous element: pine, spruce, fir, oak, hazel, birch	deer, elk, moose, caribou, with some temperate animals appearing and some Pleistocene megafauna in favored locations
Late Glacial humid, cool	Prior 9000	open boreal woodland: spruce, fir grasses, sedges, boggy plants	mastodon, woolly mammoth, caribou, bison, musk ox, small boreal animals

species such as alder, birch, and willow. By about 6500 B.C., a mixed deciduous hardwood forest existed and oak and hemlock had spread into a variety of upland and lowland settings. The climax of the oak-chestnut deciduous forest was a development of the last 2800 years.

Table 1 is a generalization about paleoenvironmental conditions based upon regional pollen sequences from a variety of environmental settings in eastern Pennsylvania.<sup>4</sup> However, these are only broad-based trends that do not reflect actual localized habitats influenced by micro variations in climate, setting, location, altitude, rainfall and other factors to which individual Indian populations adapted and regularly exploited.

There is ample evidence that North American Indian hunters and gatherers of 12,000 years ago had an adequate food supply since animals of the late glacial period had found congenial habitats in the tundra and grasslands. Herds of cold-adapted species such as mammoth, mastodon, caribou and others were present. Evidence for this derives from several mastodon teeth and a single mammoth tooth found in former bogs and swamps in Lancaster County. Elsewhere, a nearly complete mammoth

was excavated from a bog near Marshalls Creek, Monroe County, and is radiocarbon dated at about 10,100 B.C.<sup>5</sup> Caribou bone, together with the remains of three other cold-weather species (Arctic shrew, northern bog lemming, and Pleistocene brown bat) have been unearthed at the Bootlegger Sink, a limestone sinkhole north of York.<sup>6</sup> These animals accidentally fell into the sinkhole, were trapped and died there. Unfortunately, no human tools are present at any of these sites.

With subsequent warming trends, the cold-adapted animals either died (the fate of many) or gradually moved northward into colder and more suitable environments. Numerous explanations have been advanced to account for the widespread extinctions of large Pleistocene mammals. An extended discussion of this intriguing problem is beyond the scope of the present paper, but a brief consideration is useful. A theory put forward by James E. Moismann and Paul S. Martin holds that overkill by highly efficient Paleo-Indian hunters decimated the herds between about 9500 B.C. and 8400 B.C.<sup>7</sup> The kill was of such magnitude that many species never recovered, and became extinct. A more plausible explanation is that a variety of interrelated factors caused Pleistocene faunal extinctions. Warming trends produced different habitats and a loss in forage due to replacement of herbaceous communities by forest cover. Large, overspecialized mammals forced to compete for a decreasing resource base, became weakened, diseased, and failed to reproduce. Herds were further reduced by human predation.

The surviving animals are the so-called modern fauna including deer, elk, bear, moose, caribou, turkey and small game. The rapid expansion of the nut-bearing deciduous oak, hickory and chestnut forest, about 6500 B.C., provided an abundant food supply for human and animal populations. Additional wild forest products in the form of edible seeds, roots, bulbs and berries were plentiful. The Susquehanna and Delaware Valleys are major flyways for the semiannual migration of large flocks of Canada geese, brant, ducks and other waterfowl. The major rivers and their tributaries teemed with freshwater fish and each spring enormous schools of anadromous saltwater herring, shad and other species made their way up the Delaware and the Susquehanna to spawn. This year-round abundance of varied natural food resources is the reason Joseph Caldwell referred to prehistoric eastern United States as "living country."<sup>8</sup>

From an archaeological perspective, Eastern Pennsylvania is part of the Middle Atlantic Culture Province of the Eastern Woodlands.<sup>9</sup> As such it mirrors the three major periods (Paleo-Indian, Archaic and Woodland) generally used by archaeologists to describe the prehistoric

cultural and chronological stages of the American Indian. A fourth, the Historic Period, is added to deal with the time of European and Indian contact and the resultant social and economic exchange. Archaeologists employ the period concept to express ideas of broad-scale evolutionary development. Periods are characterized by distinct cultural, social, economic and technological achievements and differing adaptations to the natural environment. Although each period shows a certain unity and reflects broad themes relative to the human condition each is actually a partial expression of a long evolutionary continuum. While periods are important organizational devices, they are not to be regarded as rigid and inflexible.

The past 12,000 years or more of American Indian prehistory reveal broad patterns of slow rates of growth and change with intervals of accelerated development. The rate and nature of culture change are topics of considerable interest to archaeologists. Some believe that patterns of cultural growth are best represented by a relatively smooth curve with minor fluctuations. Others view change as step-like with periods of growth followed by a plateau of stability. In the case of complex societies, development is generally seen as rapid expansion followed by a period of maintenance or stability and finally rapid collapse. This latter model fits the Inca, Maya, and Aztec civilizations and other complex cultures of the New World. It may even characterize the culture growth patterns of Pennsylvania's early hunting and gathering groups as well as its early agricultural communities, but the evidence is not as substantial. In favoring this second model we are following the paleoenvironmental archaeologists who hypothesize a step-like model for environmental change.

#### THE FIRST AMERICANS

The American Indian came to the Western Hemisphere from an Asian-Siberian homeland across a Bering Sea land connection which is sometimes referred to as Beringia.<sup>10</sup> Natives of both North and South America are ancestors of Asiatics who migrated eastward, probably following herds of caribou and other migratory land animals during glacial conditions. The movement of people and animals was possible because precipitation became ice, resulting in the lowering of the shallow Bering Sea, thus providing dry land between Siberia and western Alaska.

However, on the American continent, eastern and western ice caps blocked human and animal passage. At times these two masses of land

ice joined and blocked entry but under certain conditions they separated and this produced an ice-free land corridor. Due to low precipitation, the interior plains of Alaska and the Mackenzie River Valley would be free of glacial barriers. This appears to have been the principal corridor through which humans and animals traversed as they gradually dispersed to the non-glaciated parts of the New World.<sup>11</sup>

In order for there to be freedom of movement from Asia to the interior of the American continent, favorable climatic and environmental circumstances had to coincide. Hans Müller-Beck, a Swiss archaeologist, has presented a chronological model for human movement from Asia.<sup>12</sup> Table 2, condensed from Müller-Beck, shows when Beringia and the interior corridor would have been open for human and animal traffic. Most archaeologists believe that several migrations were likely because it is improbable that the Americas were populated by a few bands of immigrants.

The time span for movements of migrant hunters out of eastern Siberia is hotly disputed. Some archaeologists and geologists set a base date at about 12,500 years ago for human entry into nearly all areas of the New World.<sup>13</sup> They believe the most secure evidence for early cultures derives from many excavated sites containing distinctive stone tools found in association with extinct Pleistocene faunal remains. Stratigraphic sequences from many different archaeological sites provide strong support for this hypothesis. The data are validated by numerous radiocarbon dates ranging from about 10,000 B.C. to 8,000 B.C. Other scientists extend the initial human entry into the Western Hemisphere to approximately 20,000 B.C. In support of this contention, they emphasize the wide distribution of early sites and radiocarbon dates extending from Alaska to the extreme southern tip of South America (8700 B.C.), and to Nova Scotia (8700 B.C.). Proponents of this expanded time hypothesis, contend that the broad geographic dispersal

**Table 2**  
**Chronology, Beringia and the Trans-Alaskan Corridor**

Dates (yrs. ago)	Beringia	Trans-Alaskan Corridor
55,000 to 45,000	exposed	open
45,000 to 30,000	CLOSED TO MIGRATION	
30,000 to 25,000	exposed	open
25,000 to 14,000	CLOSED TO MIGRATION	
14,000 to 11,000	exposed	open
post 11,000	CLOSED TO MIGRATION	open



**Table 3. Selected Radiocarbon Dates: Eastern Pennsylvania<sup>1</sup>**

Date	Site	Component
<i>Late Woodland</i>		
A.D. 1480 ± 95	Bull Run	Shenks Ferry
1460 ± 100	Sheep Rock	Owasco or Shenks Ferry
1410 ± 100	Murry	Shenks Ferry
1410 ± 100	Faucett	Munsee Delaware
1400 ± 80	Kutay	Munsee Delaware
1310 ± 120	Faucett	Owasco
1230 ± 100	Bull Run	Shenks Ferry
1070 ± 100	Wells	Clemson Island
980 ± 100	Wells	Clemson Island
<i>Middle Woodland</i>		
790 ± 120	Faucett	Kipp Island
310 ± 200	Shawnee-Minisink	?
385 ± 95	Shawnee-Minisink	?
100 B.C. ± 135	Faucett	Bushkill
400 ± 95	Faucett	Bushkill
<i>Early Woodland</i>		
750 B.C. ± 100	Faucett	Meadowood
810 ± 100	Faucett	Orient
<i>Terminal Late Archaic</i>		
1170 B.C. ± 120	Brodhead-Heller	Early Orient
1280 ± 120	Zimmermann	Early Orient
1440 ± 100	Brodhead-Heller	Normanskill-like
1500 ± 120	Faucett	Perkiomen
1620 ± 100	Brodhead-Heller	Perkiomen
1650 ± 80	Zimmermann	Susquehanna
<i>Late Archaic</i>		
1710 B.C. ± 120	Brodhead-Heller	Lackawaxen
2180 ± 180	Faucett	Lackawaxen
2350 ± 180	Sheep rock	Brewerton
2495 ± 130	Faucett	Lackawaxen
2610 ± 110	Faucett	Lackawaxen
3230 ± 200	Faucett	Brewerton
3620 ± 200	Faucett	Vosburg
<i>Middle Archaic</i>		
4220 B.C. ± 135	Faucett	pre-Vosburg
5100 ± 250	Sheep Rock	Kirk
<i>Early Archaic</i>		
6920 B.C. ± 320	Sheep Rock	pre-Kirk
<i>Paleo-Indian<sup>3</sup></i>		
7360 B.C. ± 1000	Shawnee-Minisink	Clovis
8640 ± 300	Shawnee-Minisink	Clovis
8800 ± 600	Shawnee-Minisink	Clovis
9100 ± 1000	Shawnee-Minisink	Clovis
10,070 B.C. ± 180	Marshalls Creek	mastodon (no associated artifacts)
10,210 ± 180	Marshalls Creek	mastodon (no associated artifacts)

1. Radiocarbon dates are not recalibrated according to bristlecone pine-solar correlations.

2. The Fisher Farm site in central Pennsylvania has provided 9 Late Woodland radiocarbon dates ranging from A.D. 960 ± 90 to 1600 ± 150 and a putative Late Middle Woodland date of A.D. 705 ± 70 (Hatch 1980).

3. For the Meadowcroft Rockshelter in Washington County, Pennsylvania, there are 8 early dates ranging from 10,850 B.C. ± 870 to 17,650 B.C. ± 240 that pertain to a putative pre-Clovis complex.

of early archaeological sites presupposes a long span of time in order for populations to travel, settle and populate remote corners of the hemisphere. A number of radiocarbon dates of 20,000 years and older are offered as evidence for this model.

Any consideration of the earliest stage of Pennsylvania prehistory is inseparable from the broader problem of the antiquity of the Indian on the American continent. There is indisputable documentation that skillful hunters killed and butchered giant woolly mammoth, early bison, caribou and other ice-age fauna as early as 12,000 years ago. The diagnostic time marker is the beautifully made Clovis point, named after the small town of Clovis in western New Mexico where this distinctive projectile point was first discovered. Fluted spearpoints of this type along with bifacially made choppers, knives, drills, scrapers and graters made from fine-grained cryptocrystallines (cherts, flints, and jaspers) have been found in unequivocal association with the remains of extinct animals. Some of these associations are found at numerous locations in deeply buried sites in stratigraphic sequence where they underlie subsequent cultures. The geology, the soils, the paleoenvironmental data, the distinctive artifacts as well as radiocarbon dates place a widely distributed Clovis culture between 9000 B.C. and 10,000 B.C. Later, the Folsom culture and other related and regionally differentiated cultures derived from Clovis provide convincing evidence that hunters of extinct species of bison occupied the high western plains. During this period (9000 B.C. to 8000 B.C.) the East was a probable habitat for caribou and perhaps moose. The distribution of sites with these fluted points which serve as a "fossil index," proves that early hunters inhabited a wide variety of environments throughout the Americas.

In spite of even earlier radiocarbon dates and the extended geographic distribution of these finds, some archaeologists and geologists are reluctant to accept the concept of a pre-Clovis (also referred to as pre-fluted spearpoint or pre-projectile point) culture dating to 20,000 or more years ago. They insist that no sites of this purported antiquity provide positive stratigraphic evidence of a pre-Clovis occupation beneath a Clovis-type level. They also emphasize the fact that supposedly early sites generally lack Pleistocene fauna and appropriate pollen samples associated with indisputable man-made stone tools and acceptable radiocarbon dates.

Probably the strongest evidence for a pre-Clovis culture comes from the Meadowcroft Rockshelter located in Washington County in southwestern Pennsylvania. During the last ten years, archaeologist Dr. James M. Adovasio, University of Pittsburgh, and his associates have

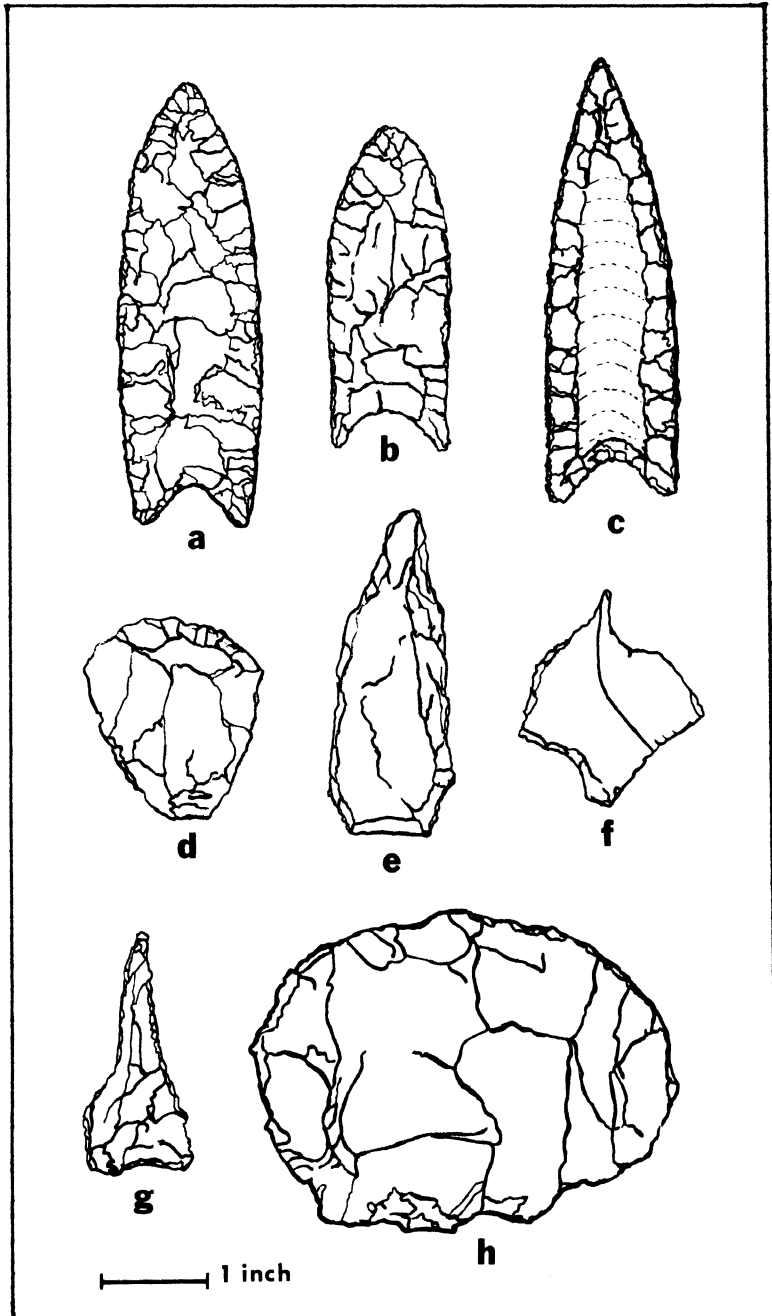


Figure 2  
Paleo-Indian Period artifacts: (a, b) Clovis fluted projectile points; (c) late fluted projectile point; (d) scraper; (e) knife; (f) graver; (g) drill; (h) chopper.

carefully excavated and analyzed the archaeology, geology, soils, fauna, flora, pollen and other data related to this significant and controversial site.<sup>14</sup> Meadowcroft is a deeply stratified (excavated depths range from 70 to 90 cm), multicomponent rockshelter site containing as many as 11 well-defined stratigraphic units spanning as much as 19,000 years of human occupation. All of the major cultural periods recognized in North American archaeology are present.

The lower level of stratum IIa, the deepest and oldest culture-bearing deposit, is the controversial depositional unit relating to Adovasio's proposed earliest human occupation. Some 13 stone tools and 300 or more chips of waste-flaking debris have been found with putative Late Pleistocene flora and faunal remains in association with eight radiocarbon dates from 17,600 B.C. to 11,000 B.C. No spearpoints, no fluted points, and no definitive biface tools were present. These earliest tools are made from weathered chert and consist of flake microblades that are chipped on one side only, along with uniface knives (termed "Mungi knife"). These tools with sharp cutting edges are regarded as generally indicative of activities relating to processing materials such as cutting food, fibers, skins and possibly wood. They are not implements that archaeologists normally associate with hunting.

The interpretations of the Meadowcroft Rockshelter have been challenged mainly on two counts: (1) the reliability of the radiocarbon dates, and (2) the presence of Pleistocene flora and fauna.<sup>15</sup> Details of these discussions and rejoinders are highly technical and a definitive answer to the antiquity of the earliest American Indian cultures is not possible at this time. For the oldest components of Meadowcroft to be widely accepted, additional analysis and supporting data from other sites will be required.

#### PALEO-INDIAN (10,000 B.C. OR MORE TO 8000 B.C.)

Paleo-Indian fluted-point cultures are extremely well documented archaeologically and they are widely distributed throughout North America and at a number of sites in South America. In southwestern United States there are many sites where the killed and butchered remains of Pleistocene animals are found in place with man-made tools. This has fostered two interpretations of long standing. First, that the diet of the Paleo-Indian was mostly the meat of herbivores which fed upon the grasses of the plains. Unquestionably, these large mammals were an important source of protein but it is inconceivable that smaller game and other food resources were shunned. Selective preservation

accounts for this apparent bias; heavy mammoth and bison bone will endure the effects of weathering much longer than the remains of small animals. Second, temporal priority was assigned to western Paleo-Indian over similar manifestations in the East. Eastern Paleo-Indian sites lack the dramatic associations of mammoth and bison; however, this culture is recognized due to the thousands of surface-collected fluted projectile points. In addition to surface distributions, a large number of these sites have been excavated and studied in Nova Scotia, Maine, Vermont, Massachusetts, New York, New Jersey, Virginia, Tennessee, and at numerous other places throughout the East since the 1950's. Radiocarbon dates from these sites are as early as the comparable western dates.

The earliest known human occupation of eastern Pennsylvania coincides with the Late Glacial and Boreal/Pre-Boreal climatic episodes. Vegetation was characterized by a coniferous spruce-pine forest with open grasslands and sedges located in nearby settings. With warmer and drier conditions the coniferous forest expanded while deciduous species increased in lower elevations.<sup>16</sup> Associated animals included extinct Pleistocene megafauna, caribou, musk-ox, and small boreal animals, along with deer, elk and moose.

A number of Paleo-Indian sites have been discovered as a result of systematic surveys for diagnostic fluted points in the Delaware, Susquehanna, West Branch and Allegheny drainages.<sup>17</sup> Distributional studies have shown that river edge settings often were favored habitats for Paleo-Indian hunters; but the sites are not limited to major water-courses; they are also found at interior locations along smaller streams and in the uplands. For example, the Shoop site, an important type site for eastern Paleo-Indian, is located on a hilltop in the Armstrong Valley north of Harrisburg in Dauphin County.

In 1952, John Witthoft, who was then the Pennsylvania State Archaeologist, published a seminal paper on eastern Paleo-Indian based upon his interpretations of the Shoop site.<sup>18</sup> The study utilized a large surface collection because excavation revealed that sub-surface features were absent. Witthoft's analysis identified Clovis-like fluted points, knives, scrapers, blades and other stone tools. The artifacts are made of a distinctive fine-grained material called Onondaga chert that was believed to have been obtained at out-croppings in western New York State. Witthoft described the inhabitants of the Shoop site as "probably the first thin vanguard in the settlement of the Northeast, highly mobile nomadic hunters of large game, contemporary with extinct mammals of the closing Pleistocene. They may not have been many generations away

from the Bering Strait." Furthermore, without the aid of radiocarbon dating, Witthoft postulated that the Shoop site occupation was early in the Paleo-Indian Period and based on typological considerations he dated the artifacts to at least 10,000 years ago. This hypothesis was highly original for Pennsylvania archaeology in the early 1950s.

In restudying Shoop site materials some 15 years later, Dr. Edwin N. Wilmsen has hypothesized that the artifacts reflect woodworking activities and because of the distribution of the surface-collected remains from "hot spots," Wilson believes that the site was occupied on as many as eleven different occasions by the same or related bands of Paleo-Indians.<sup>19</sup> He suggests that Shoop was utilized while the inhabitants made and refitted tools with wooden handles.

Shawnee-Minisink is another notable Paleo-Indian site. Located on a river terrace at the confluence of Brodhead Creek and the Delaware River in Monroe County, the site has natural and cultural stratigraphy. Beginning in the early 1970s, Dr. Charles W. McNett, American University, and his associates have been engaged in an interdisciplinary study that has shed light on early Indian occupations and the related paleoenvironmental record for the Upper Delaware Valley.<sup>20</sup> The archaeologists have unearthed Paleo-Indian artifacts in the deepest level of Zone 4 at a depth of 7 to 9 feet. Especially significant is a natural separation created by nearly three feet of culturally sterile water-deposited soil between the oldest occupational zone and a subsequent Early Archaic component in Zone 2. Evidence for the presence of Late Archaic and Woodland cultures is found in Zone 1, the topmost layer. Stone tools from Zone 4 include Clovis-type fluted points, knife-like blades, cores, choppers and unifacial implements in the form of various types of scrapers used for defleshing hides.

Four radiocarbon dates ranging from 9100 B.C. to 7300 B.C. place the probable time of the earliest occupation to the eighth and ninth millennia before the present era. The presence of tiny fragments of fish bone and wild hawthorn pits suggest that these early Indians engaged in foraging practices as well as hunting. As a base camp Shawnee-Minisink was strategically situated in order to efficiently exploit the surrounding and varied food resources. Nearby were riverine niches with associated aquatic resources, upland slopes with nut-bearing trees, and interior bogs, swamps and lakes with related animal and plant life. A good source of flint is close to the site.

Because of the absence of hard data, any description of Paleo-Indian culture is necessarily sketchy. Very little is known about the physical characteristics of these early Indians. Information regarding the size and

composition of the socioeconomic group, housing, clothing, diet and religious practices must rely upon accumulated sources, inference and educated speculation in order to reconstruct this life style.

Paleo-Indian sites, locations and site function varied according to procurement activities and different seasonal needs. In addition to older evidence that these were highly mobile societies, William Gardner has recently demonstrated that Paleo-Indian bands of the Shenandoah Valley occupied a series of sites serving different needs within a circumscribed area.<sup>21</sup> Base camps were intensively occupied and probably served as a focal point for intergroup social and religious activities. Base camps exhibit a range of tool types, accumulation of lithic debitage and evidence of structures. Locations in close proximity to different natural habitats and quarry sources were favored. Preferred fine-grained lithic materials for producing chipped stone tools were obtained from quarry sites where blocks of raw material were reduced to portable sizes. Another site type is the base camp maintenance and hunting site. These were favored locations along trails, watering spots, swamps, etc. where stone tools relating to the killing and the processing of animal remains are found.

Comments about housing are largely conjectural but the Paleo-Indians certainly possessed structures of some type. Possibly they were portable and easily erected, such as a pole framework covered with animal hides. Warm clothing and foot gear were necessities and must have been fabricated from skins and furs (possibly caribou because of its exceptional warmth), sewed, tied or hooked together. Naturally occurring hematite and red or yellow ochre may have been used as a body paint. The Paleo-Indian diet was probably protein-rich as a result of an apparently heavy dependency upon hunting. Nevertheless, other foods such as fish, bird eggs and gathered wild plants were exploited whenever they were seasonally available. Eastern Paleo-Indian diet of late glacial times may have resembled the food habits of the Eskimo of the interior regions of the sub-Arctic.

It would be erroneous to think of the Paleo-Indians as rude and unskilled primitives. They had, in fact, developed a very effective cultural system that enabled human survival under harsh conditions. They possessed a highly specialized technology that enabled them to adapt to a variety of different environmental conditions. Possibly their socioeconomic group was a band of individuals bound together by kinship, marriage and mutual subsistence needs. Cooperation in hunting and the sharing of food was necessary to ensure survival. Stalking, killing and butchering large herds of animals such as mammoth, bison,

caribou, musk ox and other species were cooperative endeavors requiring skill and organization. Group authority may have been based upon qualities of leadership and the ability to secure game.

Much of the Paleo-Indians' success should be attributed to their highly effective stone tool technology and other implements made of bone, ivory, antler, wood and hide. Unfortunately, only stone artifacts survive. Because of the apparent far-flung distributions of certain distinctive rock types found far from the quarry source in the form of finished tools, it is possible that there were trading networks.

Although there is only slender evidence for many aspects of Paleo-Indian life, these Indians were the precursors who established the foundations for all subsequent New World cultural developments.

#### ARCHAIC PERIOD (8000 B.C. TO 1000 B.C.)

The word "archaic" was used by Dr. William A. Ritchie in 1932 in the descriptive sense of being old in referring to the culture of the Lamoka Lake site of central New York.<sup>22</sup> Before radiocarbon dating many archaeologists perceived of the archaeological record as being relatively flat and undifferentiated, of no great complexity, and having a relatively short time depth. For example, a standard college textbook of a generation ago dated Laurentian and Frontenac (two prehistoric cultures of New York State) at A.D. 300 to A.D. 500.<sup>23</sup> Present dating methods place these complexes in the vicinity of 1700 B.C. to 3000 B.C. Also, archaeological complexes in the Northeast were frequently identified with living ethnographic tribes and were termed "Iroquois" if the remains appeared to be recent or "Algonquian" if they were considered old.<sup>24</sup>

As a simple definition, the Archaic is the middle period of the cultural trinity. It follows the Paleo-Indian fluted-point hunters of cold-adapted Pleistocene fauna and precedes the settled Woodland village horticulturalists and ceramists. The following are a few characteristics of the Archaic.

The Archaic was a post-Pleistocene adjustment to warmer and drier trends as a result of the northward retreat of the glacial front. Water levels were lowered and formerly submerged river and lake shorelines were exposed. Forest types changed from spruce-fir of the Late Glacial Period to pine-oak-hemlock and the eventual climax of the deciduous broadleaf oak-chestnut-hickory forest, the latter being a mixture of hardwoods and conifers depending upon altitude, latitude, exposure, soils and other factors.<sup>25</sup>



Probably Archaic societies were organized as bands that anthropologists define as the basic socio-political unit. Band members shared a common heritage, language and a hunting and foraging territory. Individuals were bound together by marriage, kinship and the need to share and cooperate in the food quest. Subsistence was based upon a balance of hunting, fishing and collecting. Modern game animals were present with elk, white-tailed deer, bear and turkey important sources of protein. Other foods included aquatic resources such as fish, shellfish, turtles, shore and wading birds. Some hardwood trees were nut producers and provided mast for deer as well as direct foods for the Indian population. Forest undergrowth consisted of shrubs and bushes which yielded a variety of berries, fruits and other edibles.

The Archaic has been characterized as a period of "settling in" with hunting and foraging territories being more circumscribed.<sup>26</sup> Local food resources were emphasized as they came into season, forest products such as wood, fibers and reeds were used for crafted goods, and locally available lithics were exploited for the production of stone tools. Taken as a whole, Archaic Indian populations made significant varieties of corner-notched, side-notched, and various shouldered and stemmed projectile points. Knives, drills, scrapers and biface choppers were other functional forms of chipped-stone tools used by the Archaic Indians.

About the middle of the Archaic a new category of stone tools appeared that facilitated adaptation to the expanding hardwood forest, and made possible the utilization of a greater variety of foods and certain forms of hunting techniques. These were ground-stone tools, including axe, celt, adze, milling stone, muller, pestle and spear-thrower. They were made by a time-consuming method of pecking and grinding with grit and water used as an abrasive. Milling stones, mullers and pestles were especially effective in reducing wild vegetal foods to a paste-like consistency and then cooked as a stew or fashioned into biscuit-like foods. Liquid-tight baskets and wooden bowls might have been used in association with hot-rock cooking. The spear-thrower was an important innovation as a hunting device.

Because of heavy forest cover and the difficulty of slaying animals as large and as swift as elk and deer with a spear, Archaic Indians were probably skillful trackers. Once they succeeded in striking and wounding an animal, the shoulders or barbs of the spear point served to hold the projectile in the flesh and the hunter could follow the blood trail and dispatch the wounded animal after it had weakened.

It seems certain that Archaic Indians possessed wooden implements,

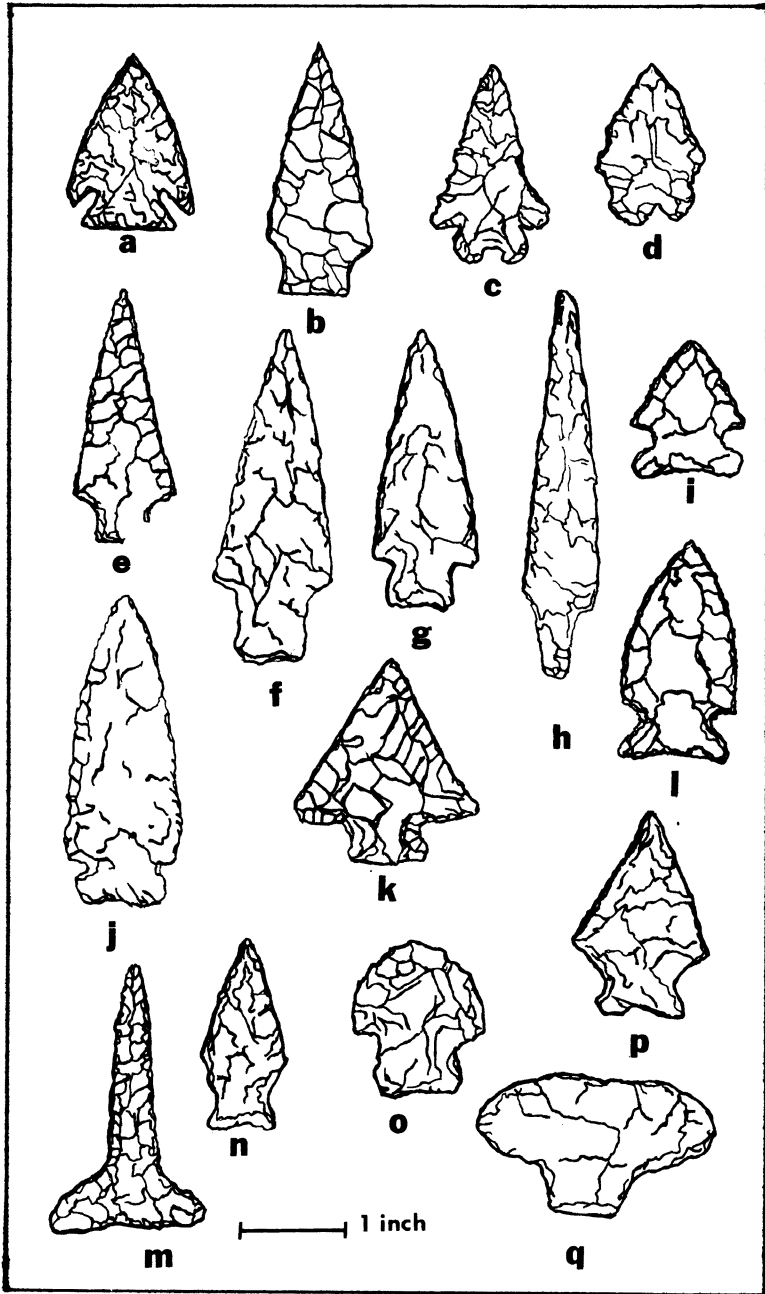


Figure 3

Archaic Period artifacts: (a) Palmer projectile point; (b) Kirk projectile point; (c, d) bifurcate-type projectile points; (e-h) Piedmont stemmed-type projectile points; (i-k) side-notched projectile points; (l) Perkiomen broadspear; (m) Susquehanna broadspear; (n) drill; (o) Orient fishtail point; (p, q) scrapers.

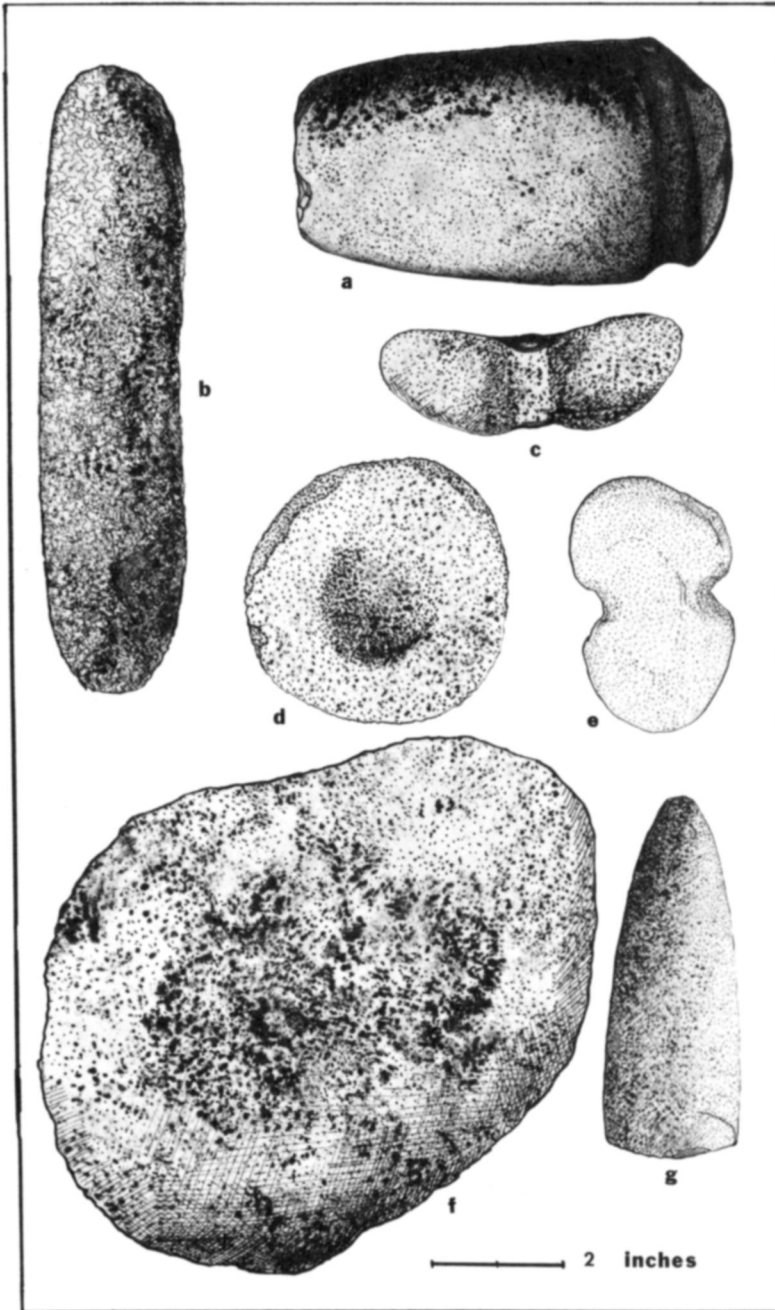


Figure 4

Archaic Period ground stone tools: (a) grooved axe; (b) pestle; (c) spearthrower weight; (d) pitted muller; (e) notched netsinker; (f) milling stone; (g) celt.

fabrics, sandals, nets, bags, clothing of hides, cordage and other perishable items. Unfortunately, these rarely survive in the archaeological record. There is very little hard evidence for housing; however, it is likely that they built different types of structures such as bark-covered "wigwams" and pole and hide shelters. Dwellings depended upon permanency of the settlement, availability of materials and the composition of the socio-biological group requiring shelter.

Information about the Archaic Period derives from several sources. Excavation of Archaic components within stratified multi-component sites is especially important. In spite of the fact that the Archaic endured for a long span of time and that sites of this affiliation are the most common, *in situ* evidence for this long cultural sequence is somewhat limited. Most of the known and registered Archaic sites in the Pennsylvania Historical and Museum Commission's site survey files are surface sites. They are usually represented by a scatter of non-diagnostic flakes, chunks of raw material, a few bifaces in different stages of reduction and several broken projectile points. Generally, these sites are interpreted as small-group, seasonal-hunting stations or as temporary camps reflecting short-term visits and forays from a larger base camp. Stalking or pursuing game, tool-kit refurbishing and maintenance, and possibly the processing of wood and fiber artifacts are postulated activities.

Excavated sites in Pennsylvania such as Meadowcroft,<sup>27</sup> Sheep Rock,<sup>28</sup> Piney Island,<sup>29</sup> Bare Island,<sup>30</sup> Brodhead-Heller,<sup>31</sup> Faucett,<sup>32</sup> Shawnee-Minisink,<sup>33</sup> Zimmermann,<sup>34</sup> and several others<sup>35</sup> have provided important information about the Archaic Period. No one site reveals the complexity that represents the wide range of Archaic culture. Intersite and interregional comparisons are used to establish area-wide chronologies.

Valuable information about the Archaic has been gleaned from typological and distributional studies of diagnostic surface-collected projectile points. These show range, environmental setting and lithic preferences. Distributional studies have demonstrated that Archaic Indians occupied almost every conceivable niche, including river islands, open sites along major rivers, streams, creeks, springs, rockshelters, hilltop and saddle locations. However, valuable information has been lost as a result of indiscriminate surface hunting by relic collectors.

Another important source of knowledge derives from comparing data from one area to similar data from surrounding areas. Comparisons with archaeological complexes from New York, New Jersey, Virginia, North Carolina, and elsewhere have yielded especially significant data.

The Early Archaic subperiod (8,000 B.C. to 6,500 B.C.) exhibits both

continuities and discontinuities with the preceding Late Paleo-Indian phase. The climatic episode is called Pre-Boreal/Boreal and was characterized by warmer and drier conditions. Spruce and fir continued to flourish while deciduous species of alder, oak, and birch increased. Modern animal species were present. Dr. William Gardner's research in Virginia shows that the cultural trends established during the Paleo-Indian Period continued through the Early Archaic.<sup>36</sup> Subsistence, site location and function, group size, adaptive strategies and most of the tool types and lithic preferences were similar. One distinctive difference was the use of small, thin, corner-notched projectile points with serrated edges. This type is called Palmer. Later in the subperiod, larger projectiles with serrated edges appeared and these are called Kirk points. Palmer and Kirk types were made by Indians who continued the Paleo-Indian practice of using fine-grained cryptocrystallines for the production of chipped-stone tools. Access to suitable quarry materials was an important factor in the selection of certain site locations.

Diagnostic Palmer and Kirk points are found in deeply stratified deposits in the North Carolina Piedmont,<sup>37</sup> and in the Shenandoah Valley. Although these early Archaic types are not frequently found in stratified deposits or in surface contexts in the Northeast, a few Kirk-like points have been excavated in the Early Archaic levels of Shawnee-Minisink, on the New Jersey side of the Delaware and in the deepest levels of the Sheep Rock shelter in Huntingdon County, Pennsylvania. To some, this suggests low-population density, cultural stability and southeastern contacts. Perhaps the Early Archaic aboriginal population was about the same as Paleo-Indian. Some scientists have argued that the early post-glacial coniferous forest had a low carrying capacity for both animal and human populations. Others dispute this proposition, but the fact remains that Early Archaic complexes are better known and more widely distributed in the Southeast.

Toward the middle of this subperiod a distinctive new projectile style, the bifurcate point, appears on a number of surface sites. St. Albans and Lecroy types date to between 7,000 B.C. and 6,000 B.C. at the St. Albans site on the southern Allegheny Plateau in West Virginia.<sup>38</sup> Bifurcate points are undated for Pennsylvania and other parts of the Northwest.

For the Middle Archaic (6,000 B.C. to 4,000 B.C.) the climate classification changes from Boreal to the Atlantic episode which was warm and moist. The latter lasted for about 2500 years and graded into the warm and drier Sub-Boreal episode. During the Atlantic, pine declined along with birch and willow, while beech, oak, and hemlock

reached a maximum. Mammalian populations increased as stands of nut-bearing trees expanded into new zones.<sup>39</sup> Certain projectile points resemble the Stanly point found at sites on the North Carolina Piedmont while in Massachusetts and eastern New York, a nearly similar type is referred to as Neville.<sup>40</sup> These broad-blade and broad-stemmed projectile points are regional expressions of the same theme.

Present evidence for the Early and Middle Archaic in Eastern Pennsylvania is relatively sparse and is based upon the presence of diagnostic projectile points that originate elsewhere. These early examples—Palmer, Kirk, bifurcate types and Stanly-Neville—and the complexes they represent, are better known in the southeast and along the southern Allegheny Plateau. Eastern Pennsylvania and the Commonwealth as a whole have not shown any evidence for the presence of a distinctive regional cultural tradition during the early Archaic subperiods. The absence of significant physiographic barriers east of the Appalachian chain encouraged the movement of people and promoted relatively unrestricted interaction of traits and shared ideas. The Southeast, the Middle Atlantic and the Northeast were part of a large interaction sphere. Fairly uniform cultural manifestations were present within this large interregional area at any given time during the two subperiods. This statement is not intended to wholly exclude instances of regional variation. The proposition merely asserts that the cultural complexes are more nearly similar than dissimilar. A south-to-north time slope has been suggested but until more radiocarbon dates become available for the Northeast, this point remains unproven.

The Late Archaic subperiod dates from about 4,000 B.C. to 2,000 B.C. and this was a time of dynamic change. With the warmer and drier conditions of the Atlantic and Sub-Boreal episodes, hardwoods (hickory, beech, and oak) increased, resulting in mixed deciduous and coniferous forests.<sup>41</sup> There was a rise in the abundance of most wild forest foods, small mammals, and deer. Local Indian populations had become regionally distinctive. Certain projectile types and materials are characteristic of subregional areas; however, traits are not exclusive and they are shared with adjacent areas.

A large and distinctive group of projectile points with relatively long and narrow isosceles triangular blades (length is 2 to 2.5 times greater than width) appears and these are part of the Piedmont Archaic assemblages in Eastern Pennsylvania.<sup>42</sup> They have narrow stems or tangs that vary from expanded to straight to tapered. Piedmont Archaic projectile points include named types such as Bare Island, Poplar Island, Long and a variety of descriptive designations, including

straight-stemmed, expanded-stem and tapered-stem. Many projectile points show evidence of having been reworked and used as substitutes for specialized knives, drills and scrapers which are not common. Rough percussion-chipped, hand-size choppers occur in many assemblages. Lithic preferences vary from subarea to subarea with quartz, quartzite, siltstone, argillite, rhyolite and chert popular materials in the Lower Susquehanna. High-grade cryptocrystallines were generally shunned. Ground stone tools include pestles, mullers, milling stones, spear-thrower weights (generally a small-winged form), grooved axes, celts and adzes. Netsinkers, hammerstones and pitted stones are present. Soapstone bowls were a late development and appeared by the end of the subperiod.

Rock hearths, 2 to 3 feet in diameter, are features of the Piedmont Archaic riverine base camps at the Faucett, Byram and other sites in the Delaware Valley.<sup>43</sup> Components and sites associated with the Piedmont Archaic are found throughout the Susquehanna and Delaware Valleys, the Lower Hudson Valley, tidewater Maryland and Virginia, the Delmarva Peninsula and elsewhere in the Middle Atlantic Region. In addition to excavated assemblages there are numerous surface collections in public institutions and in private collections related to this tradition.

The Terminal Late Archaic (2000 B.C. to 1000 B.C.) is the final Archaic subperiod and is also included within the Sub-Boreal climatic episode. The Terminal Late Archaic is represented by the distinctive Lehigh, Perkiomen and Susquehanna broadspear complexes and several other manifestations. These cultures are recognized by diagnostic broad-blade projectile point types. Related assemblages include large crescent-shaped scrapers, drills and gravers made from reworked and reshaped projectile points, flake cutting tools, notched netsinkers, axes, celts, milling stones, mullers, hammerstones, pitted stones, whetstones and a few steatite bowls. Indian life style during this subperiod was similar to the traditional pattern established during earlier Archaic times and site locations are found in similar environmental settings. Some archaeologists group these complexes under the descriptive term Broadspear Tradition.

Chronological priority is generally assigned to the Lehigh complex which is followed by Perkiomen and Susquehanna, although there is evidence that they overlap chronologically, geographically, and technologically. Lehigh and Perkiomen reveal strong distributions along Delaware River and its major tributaries, whereas Susquehanna is

concentrated in the Juniata and Susquehanna River Valleys. Argillite and jasper were favored for the chipped-stone tools of the Lehigh complex, jasper was the principal lithic for Perkiomen, while rhyolite was preferred for Susquehanna broadspears.

For several reasons, I do not use the designation "Transitional Period" favored by some archaeologists to categorize and to identify the Terminal Late Archaic. In terms of adaptive strategies, the differences between Paleo-Indian, Archaic, and Woodland are large scale. Subsistence is one of a number of characteristics where distinctions between the three major periods are of a high order and are qualitatively different. From 2000 B.C. to 1000 B.C. there is no evidence that a major shift in subsistence practices has taken place. Except for the introduction of stone-bowl technology, there is no other innovation noted in the archaeological record during this time span. Stone-bowl utilization is not a development of sufficient importance to warrant creating a separate major period. In other words, there is no event or concept having sufficient impact upon these aboriginal cultures that would elevate this subperiod to full-period status. Another reason for avoiding the term transitional is the obvious fact that cultures are never static and are always in a state of transition.

Because of its extremely well-dated chronological position and the presence of ceramics in its later phase, the Orient culture was the bridge between the Terminal Late Archaic and Early Woodland.<sup>44</sup> This culture complex dates from about 1300 B.C. to 600 B.C. and its diagnostic fishtail-style projectile points derived from Perkiomen and Susquehanna are widely distributed in coastal New York, southern New England, eastern Pennsylvania, New Jersey, the Delmarva Peninsula and tidewater Maryland and Virginia. In the Upper Delaware Valley where the Orient complex is well known, there are early preceramic components between 1200 and 1300 B.C. and later components associated with cord-marked pottery dating to 800 B.C.

#### WOODLAND PERIOD (1000 B.C. TO A.D. 1550)

The Woodland Period is identified with the essentially modern conditions of the Sub-Atlantic climatic episode, the climax deciduous hardwood forest and modern faunal associations. Usage of the term "Woodland" is cultural and chronological and takes its name from the Woodland Conference held at the University of Chicago in the early 1940s. Because of vast differences in the related prehistoric cultures extending from west of the Mississippi to the east coast, there are different viewpoints as to exactly what constituted Woodland. However,



it is generally recognized as the end product of a cultural continuum beginning more than 12,000 years ago and terminating with European discovery and settlement in the 16th and 17th centuries.

In very broad terms, the Woodland Period is distinguished from the preceding Archaic by three fundamental themes: (1) settled village life; (2) horticulture to agriculture; and (3) ceramics. These innovations did not arrive full-blown; they are foreshadowed by Late Archaic trends beginning as early as the second and third millennia B.C., but there is no broad consensus regarding the place of dispersal for these traits.

Sedentism in the form of large semi-permanent villages becomes possible when there is a reliable year-around food supply made available through harvest, preservation and storage technology. For the eastern United States, prehistoric plant domestication and cultivation are poorly understood. Cultivation of native plants such as sunflower, goosefoot, pigweed, marsh elder, and others predates the introduction and spread of maize, squash, pumpkin, and gourd horticulture from Mesoamerica. Evidence for maize is equivocal, but incipient horticulture appears to have taken place by the middle of the first millennium before the present era. However, an intensification of food production and surplus as a result of the gradual shift to larger scale agriculture did not occur until about A.D. 1000.

In the Middle Atlantic states, fired-clay vessels were contemporary (ca. 1200 B.C.) with stone bowls made of a soft mineral called talc, soapstone, or steatite. In eastern Pennsylvania, early ceramics are thick-walled, straight-sided, flat-bottom vessels that are poorly fired and usually contain large fragments of talc mixed with the clay as temper or a binding agent. This pottery-making tradition appears to have been influenced by the fiber-tempered wares of the Southeast, dating about 2000 B.C., and the local stone-bowl technology. Other early pottery (800 B.C. to 1000 B.C.), has cord-marked interior and exterior surfaces with a rounded or conical bottom.<sup>45</sup> Cord-marked



Figure 5  
Soapstone bowl (left) and early ceramic soapstone tempered vessel.

pottery appears to have priority in New York State and in the Great Lakes Region. Presumably it was introduced into eastern Pennsylvania from the New York area through the dissemination of the Orient and Meadowood cultures during the Early Woodland subperiod.

These Woodland characteristics were not the product of revolutionary-like events which produced a dramatic transformation of the character of prehistoric American Indian society. Some archaeologists consider the Early and Middle Woodland subperiods as continuations of the cultural patterns of the Late Archaic, but with the addition of certain new traits.<sup>46</sup> As evidence, they cite similarities in settlement patterns and site function. Base camps continue to be in riverine settings while temporary camps used for hunting and the harvesting of wild plants are found in a variety of ecological settings at inland and in upland locations near potable water. Utilization of rock shelters as seasonal and transitory camps for food procurement activities is also noted for Early and Middle Woodland complexes.

Several factors have inhibited the discovery of Early and Middle Woodland occupations in Pennsylvania.<sup>47</sup> One is the affinity of these sites to the same places as Late Archaic sites and the similarity of the stone tool technology to the tool kits of the Late Archaic. Another factor is that much attention has been directed to the Ohio Valley where easy-to-recognize earthen burial mounds were constructed as part of the mortuary practices of Adena and Hopewell cultures. These cultures honored elite dead with elaborate tombs accompanied by a rich assortment of non-utilitarian status and ritual objects. Raw materials for many of these objects were derived from sources far from the Ohio Valley. Materials were obtained by expeditions to those areas or through an elaborate trade network. Socioeconomic differences between the entombed and other members of the society were inordinate.

Eastern Pennsylvania lacks these flamboyant and easily discernible burial mounds, but there are scattered examples of diagnostic Adena and Hopewell artifacts. In the past archaeologists have postulated that areas east of the Appalachians had a lower demography due to the attractiveness of the Ohio Valley Adena and Hopewell to "outsiders." This is surely not the case because within the last decade, numerous cultural expressions extending from southern New England through the Delaware, Susquehanna, and West Branch Valleys to tidewater Virginia and Maryland have been recognized.<sup>48</sup> These cultural complexes were adapted to the food resources found in various environmental settings that include freshwater ponds, streams, large rivers, coastal bays, and tidal estuaries. A series of radiocarbon dates place these

manifestations between 800 B.C. to A.D. 600. For the Delaware Valley, the Bushkill complex (480 B.C. to 100 B.C.) was first recognized in stratigraphic context at the Faucett site by a comprehensive inventory of stone tools relating to hunting, fishing, and processing activities while implements such as pitted mullers, pestles, grinding stones, etc. reflect plant food preparation. A circular pattern of postmolds (approximately 30 feet in diameter) may possibly be the outline of a house. Ceramics characterized by net markings, fabric impressions, cord, dentate stamping, and other forms of decoration, occur in substantial quantities. Food resources were derived from white-tailed deer, other mammals, fish, aquatic species, and seasonally available plant foods including nuts. Evidence of this complex is found at culturally related sites along the main stem of the Delaware and its tributaries with examples of Bushkill artifacts present throughout the greater Susquehanna Valley.

The Late Woodland subperiod from A.D. 1000 to the time of European contact is a period of significant change resulting from an intensification of pre-existing traits. After the end of the Hopewell culture in the Ohio Valley, an impressive culture called Mississippian rapidly took shape in the Mississippi Valley. It is characterized by large earthen mounds serving as platforms for religious temples and other important structures associated with large, well-planned and populous towns located along major watercourses on fertile bottomland. Some of these towns were encountered and described by Hernando DeSoto when he explored the southeast in the early 1540s.

Mississippian Indians were intensive agriculturalists who supplemented a basic diet of corn, beans and squash with game secured by bow and arrow and other means. Political organization was a chiefdom consisting of several related towns governed by a single hereditary chief and council. Mississippian cultures were rich in material culture. They were skillful potters, usually decorating their clay vessels with painted designs and symbols or with intricate incised curved lines. They were also expert workers in bone, stone, and shell. This culture did not reach the Northeast; consequently archaeologists use the term Late Woodland in reference to the contemporary non-Mississippian cultures of the East. Archaeologists generally consider Late Woodland societies to be at the tribal level of socio-political organization. Tribal organization is an association of a large number of kinship segments, each composed of different families usually tracing descent through a common lineage. Exogamous clans are a feature of tribal society. In terms of subsistence, political organization, and material culture there are similarities

between Mississippian and Late Woodland; however, the distinctions are of scope and elaboration. The latter is a much "diluted" version of the former, but this is an over-simplification. In eastern Pennsylvania (and elsewhere) the principal theme of the Late Woodland subperiod is regional differentiation.

The so-called Clemson Island culture, discovered on the Susquehanna River island of the same name, located north of Harrisburg, is the earliest of these regional manifestations. In 1929, archaeologists Robert W. Jones and Junius Bird excavated the Clemson Island site and the Book site in Juniata County along with several lesser sites.<sup>49</sup> Clemson Island and Book were two very low circular mounds (8 inches high by 40 feet in diameter) containing secondary and disarticulated burials, fireplaces, ceramics, smoking pipes, triangular arrow points and other discarded material remains. Knowledge of this culture has progressed surprisingly little since the initial discovery more than fifty years ago. Today the Clemson Island culture is radiocarbon dated A.D. 1000 and is known to be distributed primarily in the middle and upper Susquehanna, the Juniata and the West Branch valleys. It is recognized by simple decorated cord-marked and fabric-marked ceramics with a rounded or conical base.<sup>50</sup> Clemson Island is contemporary with Owasco, a similar and much better known New York State culture. The origins and the ultimate fate of the Clemson Island culture are ambiguous. Some authorities postulate an independent origin for Clemson Island while others believe it was derived from Owasco. The most generally accepted explanation for its termination is that it evolved into Shenks Ferry. There are two reasons for this hypothesis: (1) Shenks Ferry origins are obscure and by default Clemson Island is the most likely antecedent; and (2) it is unlikely that these two cultures would have occupied the same territory at the same time.

Based upon observations drawn from data from the Fisher Farm site in Bald Eagle Valley, Centre County, Dr. James Hatch postulates that Owasco, Clemson Island, and Shenks Ferry constitute an overlapping continuum.<sup>51</sup> Accordingly, he suggests that potters from a single village might simultaneously decorate their ceramics in two distinctly different ways. Hatch's hypothesis needs to be tested. For example, ceramics from the large single component Murry village show very little stylistic variation within the same series.<sup>52</sup>

In spite of the relatively recent date, the wide distribution, and the large number of Clemson Island sites, there is very little hard data on subsistence, settlement patterns, village layout, social and political

organization and ideology. The culture is an enigma and much research needs to be done in order to understand the nature of its role during the Late Woodland subperiod.

Shenks Ferry (A.D. 1100 to 1550) takes its name from cultural remains discovered in Lancaster County in 1930 near an old Susquehanna River ferry service terminal.<sup>53</sup> Distinctive incised and cord-decorated Shenks Ferry ceramics have been found over a geographical area that is similar to the Clemson Island distribution, but with a notable concentration in Lancaster County. Based upon a flurry of research activities over the past dozen or so years and other work of a generation ago, Shenks Ferry has been shown to be a cultural manifestation of central and southcentral Pennsylvania.<sup>54</sup> Apparently certain influences were derived from the Fort Ancient and Monongahela Indians of western Pennsylvania and Ohio and possibly other characteristics can be traced to the Virginia-Carolina Piedmont area. An older and less tenable hypothesis is that the Shenks Ferry were Piedmont Siouan Indians who migrated from present-day Virginia and North Carolina. The current model holds that an in-place culture complex evolved from small scattered horticultural, hunting and fishing hamlets located along the main stem of the Susquehanna, North and West Branch valleys into larger and well-planned agricultural villages with other settlements located along tributary streams.

Late Shenks Ferry sites appear to be represented by two distinct but related settlement types. There are large semi-permanent sites contemporary with associated smaller and temporary camp sites. The former are year-round agricultural villages while the latter are recurrent short-term utilizations of small sites for seasonal food procurement needs. Rock shelter sites also reflect transient and specialized requirements.

Some archaeologists hypothesize that by the middle of the 16th century Shenks Ferry culture had come under increasing pressure as a result of Susquehannock incursions into the Lower Susquehanna Valley launched from their New York State-Iroquois homeland. This conflict caused Shenks Ferry groups to band together into larger and more easily defended stockaded villages. The Murry site in Washington Boro, Lancaster County with an estimated population of 500 to 600, represents this period.<sup>55</sup> The village, nearly 500 feet in diameter, was surrounded by a doubled walled stockade and held two concentric rows of houses (each house measured approximately 24 feet by 12 feet) for a total of 52 dwellings. Evidence of a large circular public structure was found in the center of Murry Village.

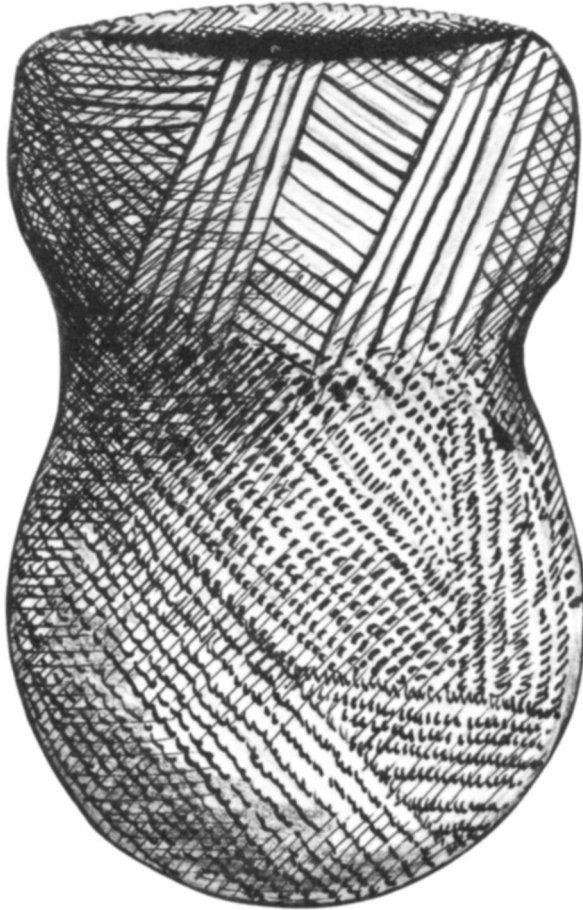


Figure 6  
Late Shenks Ferry ceramic vessel.

By the latter half of the 16th century, Shenks Ferry culture came to a rather abrupt end. Probably a portion of these Indians were absorbed into the newly established Susquehannock communities while others were dispersed among other native groups.

The proposed Tocks Island Dam and Reservoir produced a spate of government-funded research during the 1960s and 1970s.<sup>56</sup> Much of this work deals with the Protohistoric Delaware (A.D. 1400 to 1550). Intensive archaeological excavations were undertaken on both sides of the Delaware River extending from the Water Gap to Port Jervis. In

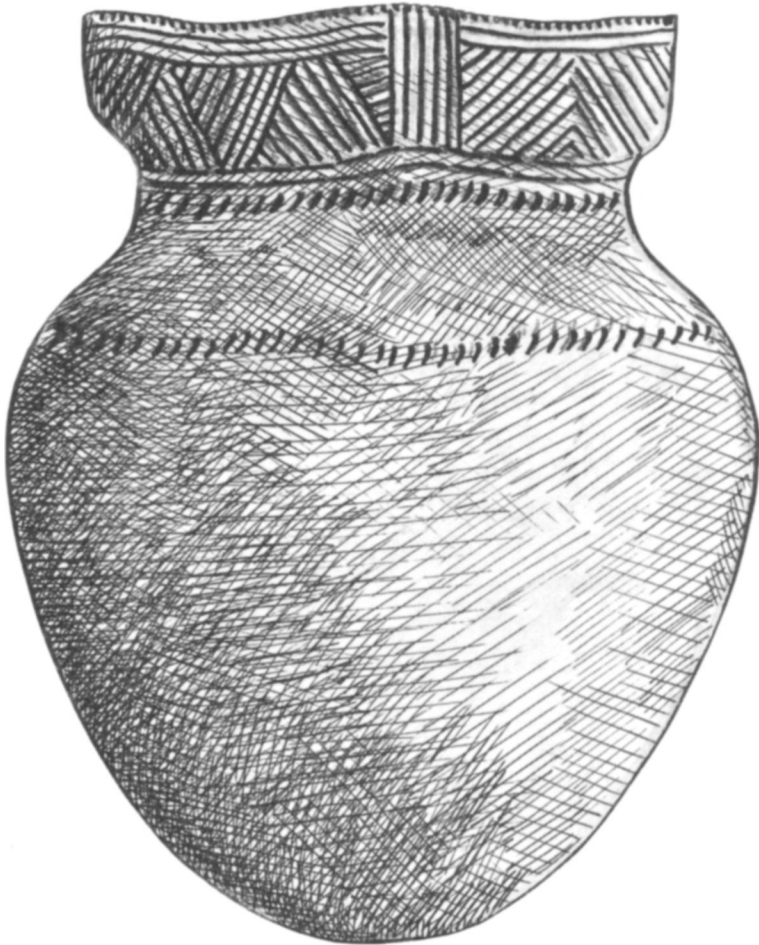


Figure 7  
Mohawk-Iroquois type ceramic vessel.

addition to establishing a long regional sequence, this work has identified specific problems relating to the Late Woodland subperiod. It has shown that important cultural influences were derived from outside the area during early Late Woodland, and this takes the form of the Owasco culture, which is ancestral to Iroquois in New York State. The culture is conspicuous throughout the region and is recognized at numerous sites by ceramics with linear cord decorated motifs on low collars and rims. After A.D. 1400, many sites such as Faucett, Kutay and others yielded

evidence of intensive occupations by makers of well-made eastern Iroquois-like ceramics. These are collared vessels with incised linear and rectilinear designs which are nearly identical to Mohawk-Iroquois. Numerous excavated protohistoric sites are located on the flood plain. They are multi-lineage, dispersed horticultural communities and evidently defense was not a factor because there is no evidence for stockaded villages. Present at all sites are concentrations of refuse-filled pits containing varying amounts of organic food remains, fresh water mussel shell, discarded stone tools, sherds and other debris. Typical pits are 2 to 3 feet in diameter and about 3 to 4 feet deep. They served the same function as the foot cellar on a 19th-century farmstead. House patterns are not common, but based upon evidence from the Miller Field site in New Jersey,<sup>57</sup> dwellings appear to have been parallel-sided with rounded ends, bark-covered and range in size from 25 by 15 feet to 60 by 20 feet. The entrance was on the long side. Unlike the Iroquois longhouses, ends were rounded and the structures are considerably smaller than New York longhouses of the same period.

Protohistoric settlements in the Upper Delaware Valley are identified as Munsee or the northern division of the Delaware Indian nation (a.k.a. Lenni Lenape). These sites are scattered throughout the valley floor with many being semi-permanent year-around habitations while smaller sites may have been occupied during the spring, summer and early fall. Within a short distance of the river there is diverse topography and varied habitats and it is likely that these environments were utilized for the seasonal exploitation of food resources. Although there is evidence for the use of upland rock shelters, there is an insufficient number of these small shelters to have accommodated the populations from the horticultural villages during a period of dispersal.<sup>58</sup> Rock

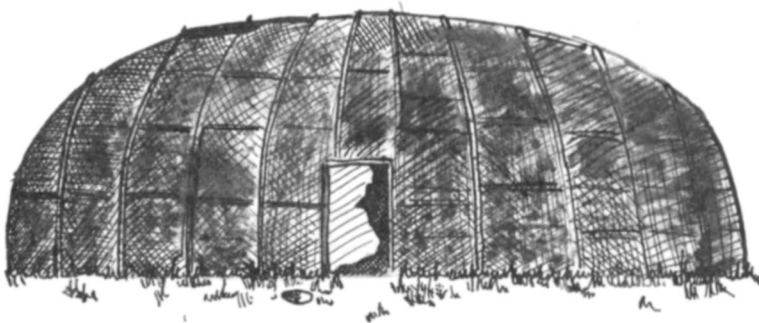


Figure 8  
Typical protohistoric Delaware bark-covered house.



shelters were capable of housing a few male hunters, and it is possible that these shelters were used as seasonal hunting camps.

Major unresolved problems relative to the Late Woodland and the protohistoric in the Upper Delaware Valley concern external relationships, cultural and linguistic affiliations. In central and eastern New York State the Owasco culture contributes (through an intermediate stage) to the development of the Iroquois culture and the five tribal divisions. At the same time, Delaware Valley Owasco gives rise to Munsee Delaware through a similar intermediate stage. Iroquoian is the linguistic stock of the Iroquois while the Delaware Indians spoke Algonquian—two mutually unintelligible languages. There is the paradox of a common ancestral culture producing two different cultures with different linguistic affiliations. Herbert C. Kraft, Seton Hall University, recognizes this improbable situation and proposes a solution that emphasizes the differences between Delaware Valley and New York Owasco. Kraft believes these differences warrant creating a new culture concept based upon Delaware Valley Owasco traits that he terms “Pahaquarra.”<sup>59</sup> He postulates that Pahaquarra is ancestor to historic Munsee Delaware. In certain respects Kraft may be correct, but the basic problems are not so easily solved.

South of the Water Gap, protohistoric remains found along the river and its tributaries in New Jersey and Pennsylvania may be identified as Unami Delaware, the central division of the historic Delaware Nation.<sup>60</sup> Currently there is very little published data on settlements and village patterns for this area. Most of the information is derived from ceramic descriptions and relationships of materials recovered from the Overpeck site<sup>61</sup> in Bucks County and the large Abbott Farm site<sup>62</sup> complex near Trenton. Work at the latter was part of a Works Project Administration Program from 1936 to 1941 while Overpeck was dug in 1947 and again from 1963 to 1967.

Nearly anything that is written about the archaeology of the Lower Delaware Valley will be dated and superceded as a result of a large and intensive archaeological program now underway in the vicinity of Trenton. A huge mitigation effort, supported with federal and state funds, is designed to recover data from National Register sites before the construction of two interstate and two state highways dooms these sites. Dr. R. Michael Stewart, field archaeologist for this project, has made several preliminary interpretations about Late Woodland and protohistoric for the area.<sup>63</sup> Dr. Stewart believes the shift from a heavy reliance on hunting and collecting to fairly intensive cultivation is late (after ca. A.D. 1400) and this reinforces a similar hypothesis for the Upper

Delaware. He reports that site locations change from semi-permanent settlements near marshes where the associated animal and plant food resources could easily be harvested, to semi-permanent sites on the fertile flood plains of the Delaware and nearby creeks.

A broad range of ceramic types were found at Overpeck and at sites associated with the Abbott Farm complex. Influences from above the Water Gap take the form of Owasco, Mohawk-Iroquois-like, and Munsee ceramics; Clemson Island, Shenks Ferry, and early Susquehannock sherds are derived from the Susquehanna Valley; and there are ceramic types in the form of Townsend wares from the Delmarva Peninsula. There is also a distinctive regional ceramic tradition present that began as early as Middle Woodland and is represented by incised zone decorations on collarless vessels. It remains to be demonstrated as to whether or not the zone-decorated ceramics can be identified linguistically as Algonquian and culturally as Unami. The role of outside influences in the Lower Delaware Valley is a fertile field for further research—do these influences represent trade, social contact, intermarriage or other forms of interaction?

#### HISTORIC PERIOD (POST A.D. 1570)

Beginning about 1575 and lasting for approximately 100 years, the Susquehannock Indians played a pivotal role in Pennsylvania's colonial history. From stockaded and well-fortified populous villages astride the Susquehanna River in Lancaster and York Counties, the Susquehannocks were a buffer against Maryland settlers during the Maryland-Pennsylvania border dispute. They also withstood Seneca and Mohawk incursions from the north and supplied European merchants on the Delaware with valuable peltry, especially the coveted beaver fur.

Since there are numerous written records pertaining to the Susquehannocks, this topic falls within the Historic Period and it might not be included in a review of Pennsylvania prehistory. However, Susquehannock history is presented here because it provides an example of how archaeology and history have combined to produce a model for Susquehannock studies.

Nearly five decades of institutional archaeological investigations aided by important contributions from avocational archaeologists and a growing body of historical research have produced a substantial corpus of data.<sup>64</sup> Present evidence shows that Susquehannock culture developed in New York State. The Susquehannocks were an Iroquoian-speaking

group who evidently split from the main body of the Iroquois and settled in Washington Boro, Lancaster County by 1575. In the process they displaced the resident Shenks Ferry population. The Engelbert site near Binghamton, New York, several 16th-century village sites in Bradford County, Pennsylvania, and other sites along the Upper Susquehanna testify to this southward thrust.

The actual cause or causes of the Iroquois-Susquehannock schism is not known. Possibly the Susquehannocks were never fully integrated with the Iroquois; perhaps they withdrew because of internal pressures. Other plausible causes include the desire for access to areas where the important fur-bearing animals had not been heavily exploited, a need for new and better agricultural lands and the desire for a strategic location close to European trading centers on the Delaware.

It is unlikely that Susquehannock culture developed out of Shenks Ferry and there are a number of reasons for this statement. In terms of material culture (especially ceramics), burial customs, house types, village organization, settlement patterns and human physical types, Shenks Ferry and Susquehannock are two very different cultures. In spite of Captain John Smith's claim that the Susquehannocks "seemed like Giants to the English," there is evidence that Susquehannock males averaged 62 to 64 inches in height while female stature was a few inches less.<sup>65</sup> As an average, the Shenks Ferry Indians were only slightly taller and more robust than their Susquehannock protagonists.

Extensive archaeological investigations and research carried out over many years by the Pennsylvania Historical and Museum Commission, the North Museum, Franklin and Marshall College, and the Pennsylvania State University have demonstrated that a three-phase Susquehannock sequence exists in the Lower Susquehanna Valley. These are: Shultz Phase (1575 to 1600), Washington Boro Phase (1600 to 1625), and Strickler Phase (1640 to 1675). The Shultz and Washington Boro Phases are each represented by a major stockaded village or town while the Strickler Phase consists of three villages. The Strickler-Heisey site is located at the southern end of Washington Boro, and the Oscar and Bert Leibhart sites are on the west side of the river at Long Level. Population estimates for the largest sites range from about 2,000 to 3,000 people. The walled villages enclosed associated house and community patterns. Villages have at least two or three burial plots which apparently reflect the nature of Susquehannock society and its clan-based organization.

Although the assigned dates may appear to be finely drawn, they are based upon various lines of evidence including historical documentation and the analysis of large collections of native ceramics. Crucial informa-

tion has been provided by studies of the diverse European trade items found as burial offerings. These are correlated with similar artifact finds from other historic sequences such as the Seneca in western New York.

The Susquehannocks followed the aboriginal pattern of periodically moving their villages to new and nearby locations. After several years of farming, soil productivity was exhausted and other resource needs were also depleted. Under these conditions it was probably more efficient to relocate a whole village rather than travel increasingly greater distances to fertile fields and for fuel, fiber and other requirements.

Archaeological evidence from the Shultz, Strickler and Leibhart sites reveals that the customary house type was a bark-covered longhouse measuring some 80 to 92 feet long by 20 to 25 feet wide. Internal arrangements feature a central aisle with fireplaces flanked by raised sleeping arrangements and storage areas.

Analysis of midden deposits evince that Susquehannock subsistence was a combination of farming (with the mainstays being corn, beans and squash), hunting, fishing, collecting wild forest products and fresh water mollusks. In an important study of animal bones from the large Washington Boro village midden, 48 different species of mammals, birds, reptiles, amphibians and fish were identified. These remains represent an estimated 36,196 pounds of meat; however, only three species (deer, elk and bear) provided 90% of this food and deer accounted for slightly more than half of the total.

Seasonal change greatly influenced Susquehannock life. Crops were planted, tended and harvested according to the season. Wild plant and animal foods were collected and harvested as they became available. The presence of mature antlers in the midden demonstrate that hunting was primarily a late fall and winter activity. The Iroquois observed various first-fruit ceremonies and festivals relating to the planting and the ripening of different foods, and the week-long Mid-Winter Festival involving renewal and the rekindling of longhouse fires was their most important ceremony. Presumably, the Susquehannock ceremonial cycle had similar features.

By the middle of the 17th century, European trade had made a profound impact upon Susquehannock culture. Native material culture was rapidly being replaced by machine-made items with an accompanying dependency upon European trade. Stone tools had given way to steel axes, hoes, knives and other implements. Flintlock muskets were favored over the bow and arrow and brass kettles were more popular than native-made ceramics. Glass beads were an important item of apparel. The traditional subsistence modes of farming, hunting, trap-

ping and fishing were greatly disrupted by trade, long-term intermittent warfare, colonial politics and land disputes. Exposure to European diseases for which the Susquehannocks had acquired no natural immunity had a devastating effect.

By 1675, the Susquehannock culture was shattered and their numbers were greatly reduced by losses in warfare and disease. They moved to Maryland and for about five years they lived at the confluence of the Piscataway Creek and the Potomac River, but in 1680 the Susquehannocks returned to the Lower Susquehanna Valley where they settled in Manor Township, Lancaster County. Thereafter, they are referred to as the Conestoga Indians. The span from 1680 to 1763 has been called the Refugee Complex in order to accommodate various displaced Indian groups such as Delaware, Shawnee, Nanticoke, Conoy and others who settled on the Susquehanna frontier during the first half of the 18th century.<sup>66</sup>

#### SUMMARY

The prehistory of eastern Pennsylvania is inseparable from the broad cultural and historical developments of the Middle Atlantic Region and eastern United States as a whole. Pennsylvania was first inhabited by bands of cold-adapted immigrant hunters from Trans-Siberia at least as early as 12,000 years ago. Some archaeologists choose to extend the earliest dates for the American Indian to about 20,000 years ago. As environmental conditions ameliorated, the Indians utilized new adaptive strategies in the form of new technologies and social organization. This permitted efficient exploitation of a variety of different animal species and wild forest products. By the time of European contact and settlement, semi-permanent agricultural villages at the tribal level of organization were extant in Pennsylvania.

#### NOTES

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