CHAPTER II
REGIONAL AND HISTORICAL BACKGROUND

A. THE ST. JONES RIVER

1. The River Today

The St. Jones River flows for about 35 kilometers (21 miles) across central Delaware, from its source in the swamps along the drainage divide of the Delmarva Peninsula to its mouth in the tidal marshes along Delaware Bay. The course is essentially northwest to southeast. The river is tidal from Dover down to the bay, about half of its total length. Above Silver Lake, an old mill pond in Dover, the river flows through a swampy floodplain. Below Silver Lake, the ancient floodplain has been drowned by sea-level rise, and as it flows toward the bay the river is bordered by increasingly broad marshes. Most of the St. Jones's tributaries enter from the west; rain water falling only a few hundred meters east of the river flows east toward the bay through a series of small streams, such as the Little River, Muddy Branch, and Dyke Branch. The mouth of the St. Jones is only 1 kilometer (0.6 mile) from the mouth of the Murderkill River, a stream of similar size that flows southwest to northeast. Only a few thousand years ago the two streams joined before entering the bay, and they are often spoken of as a single system.

Almost the entire Delmarva Peninsula is part of the Coastal Plain, so the whole length of the river flows through Coastal Plain environments. The fall from the source of the river to sea level is only 18 meters (60 feet). There is very little exposed bedrock anywhere along the St. Jones. Instead, the local geology consists of a mantle of Pleistocene sediments over Miocene marine deposits, predominantly sandy silts but also including some sandstone (Pickett and Benson 1983). The Pleistocene mantle, known as the Columbia Formation, consists mostly of sands and gravels deposited over the past few million years by glacial outwash. The Columbia Formation averages about 6 meters (20 feet) thick within the St. Jones drainage. In places the Columbia Formation sands have been formed into dunes, now mostly inactive. Otherwise the terrain is gently rolling.

Throughout the drainage, areas of well-drained and poorly drained soil intermix. Poorly drained soils predominate along the peninsular drainage divide, where the river's source lies, and just east of Dover, where the St. Jones drainage is divided from those of Muddy Branch and Dyke Branch. Before historic land clearing, the well-drained soils supported oak-hickory forest. The poorly drained lands supported more diverse forest communities that included red maple, sweet gum, sycamore, willow, elm, pine, and cherry, and other trees. These poorly drained forests shaded into swamps dominated by cypress trees. Within the poorly drained areas were numerous small, freshwater wetlands, which supported diverse plant communities (Brush 1997). Among the wetland plants that we know were of interest to Native American peoples were cattail, marsh elder, amaranth, pigweed (*Chenopodium*), grape, blueberry, and buckwheat. At the time of European contact, the dominant land herbivore in all these forests was the white-tailed deer; other common mammals were bear, wolf, fox, beaver, raccoon, opossum, rabbit, and gray squirrel.

Along the river are at least three distinct wetland communities. Near its source the river is bordered by freshwater swamps and poorly drained woodlands essentially identical to those found on all poorly drained soils in the vicinity. The middle reaches of the river, from Dover down to Barker's Landing, are oligahaline (very slightly salty) and support communities known as transition marshes. These marshes include cattails, arrow arum, pickerel weed, marsh mallow, wild rice, and some salt-tolerant species such as big cordgrass. Many of these plants provided food for prehistoric peoples, and this stretch of the river, the "Mid-Drainage Zone," may have been the most food-rich environment in the Coastal Plain. The Puncheon Run Site is located in the Mid-Drainage Zone, as are a number of other large prehistoric sites. The transition marshes also support a rich animal life, including beavers, otters, raccoons, several turtle species, and large numbers of muskrats. Below Barker's Landing the river valley broadens, the water becomes brackish, and the river is bordered by large tidal marshes dominated by salt-tolerant species such as salt-marsh cordgrass and giant reed grass. These tidal marshes offered less in the way of plant food for prehistoric peoples, but before the river was clouded by silt and other forms of pollution they supported large beds of oysters and numerous other estuarine animals. This Delaware Shore Zone does not contain as many archaeological sites as the Mid-Drainage Zone.

One special feature of the St. Jones River in historic times was a large stand of American lotus (*Nelumbo lutea*) growing between Dover and Puncheon Run. American lotus has large, showy flowers, and it is rare east of the Appalachians. In the 1800s the "lotus lilies" of the St. Jones were a major tourist attraction, and in prehistoric times their roots and seeds may have been important food sources. It is not known why isolated populations of American lotus are present in some parts of the east, but it is possible that the plant was intentionally introduced by Native Americans because of its food value.

A number of fish species lived in the St. Jones River before it was modified by damming and siltation. In the upper, freshwater portions, brook trout and bullhead catfish were among the year-round residents. The lower, brackish portions supported white perch, yellow perch, Atlantic croaker, and weakfish. More important, from the point of view of prehistoric peoples, were the anadromous and catadromous fish that appeared predictably in the river at certain times of the year. Anadromous fish, such as Alewife, menhaden, gizzard shad, sturgeon, and striped bass, live most of their lives in salt water but return to fresh water to breed. In the spring these fish filled the rivers of eastern North America, their numbers dazzling the early European explorers. William Priest described "prodigious shoals" of shad coming up the Delaware past Philadelphia, and William Byrd wrote that in Virginia, when the herring were spawning, "all streams and waters are completely filled with them, and one might believe, when he sees such terrible amounts of them, there was as great a supply of them as there was water" (Pearson 1972:761, 834). The only important catadromous fish in the St. Jones is the American eel; catadromous fish breed in salt water but live most of their lives in fresh water, and in the fall many American streams were crowded with eels making their way out to sea to breed.

2. The Ancient River

People have lived along the St. Jones River for at least 9,000 years, and during that time the river has changed in ways that have had important consequences for those living along its banks. The most important change has been the steadily rising sea level, which has transformed what was a small, freshwater river 10,000 years ago into a tidal estuary. Sea level in the Delaware Bay has risen about 25.5 meters (84 feet) in the past 12,000 years. The rise did not happen suddenly, at the end of the ice age, but has been gradual and seems to be still occurring. Sea level has risen about 12.5 meters (41 feet) in the past 6,500 years, about 3.4 meters (11 feet) in the past 3,000 years, and about 0.8 meter (2.6 feet) in the past 1,000 years (Kraft and John 1978). For the vicinity of Bowers Beach, at the mouth of the St. Jones, the effects of this rise have been closely studied. Kraft and John (1978) showed that in late Pleistocene times what are now the lower reaches of the St. Jones and Murderkill rivers were steeply incised, with very narrow floodplains. These two rivers joined just east of Bowers Beach, and together formed the largest tributary on the lower reaches of the Delaware. By 6,500 years ago, a finger of estuary had crept up the St. Jones/Murderkill to their confluence, but the modern courses of both rivers were still free of tidal influence. It was only between 6,500 and 3,000 years ago that the lower St. Jones became an estuary.

A closer look at the middle reaches of the St. Jones was provided by geological borings adjacent to the Carey Farm Site (Pizzuto 1996). The oldest radiocarbon date obtained from peat samples in that location was 3,430±90 years BP, so there does not seem to have been an estuary until around 1500 BC. Prior to that time, the St. Jones was a freshwater river bordered by a floodplain that was dry for at least part of the year (preventing the buildup of peat deposits). Between 1500 BC and around AD 800, the river was a slightly brackish estuary with large areas of open water, bordered by emergent wetlands. Based on the Carey Farm data, the very extensive marshes of the current river seem to have developed slowly, as silt and peat built up in the river, raising the level of the shallower portions.

After the rising sea level, the factor that has caused the greatest changes in the St. Jones River has been the activities of humans. The impact began in prehistoric times, with the clearing of fields, the burning of forests during communal deer hunts, and the encouragement of beneficial plant species like amaranth, holy grass, and possibly American lotus. Although these Native American practices may have had important impacts on the upland forests, their effect on larger rivers was very limited compared to that caused by European settlers. The large-scale clearing and plowing of fields led to rapid erosion and massive siltation, clogging many rivers, including the St. Jones.

Historically, the most radical alterations of the natural course of the St. Jones River were made between 1885 and 1936 by the U.S. Army Corps of Engineers, with major effects on the river system (United States House of Representatives 1907, 1937). In order to improve navigation, the channel was deepened, and the river was straightened by the digging of eight "cutoffs." Cutoff Number 2 was dug through the peninsula on which the Puncheon Run Site is located, no doubt destroying part of the site (Figure 3). The old point of the peninsula was left as an island in the center of the river. Archaeological testing on this island failed to locate any archaeological remains or even any undisturbed soils, the island having been heavily disturbed during the dredging and channelizing

operations. Straightening the channel would have had a pronounced effect on the tidal flows, allowing increased amounts of salt water to flow up the river, which in turn may have had a significant impact on the vegetation in the riverine marshes. In particular, the large population of American lotus that once grew just below Dover has shrunk drastically, and in 1999 only a few dozen lotus plants could be observed in one sheltered cove.

B. ARCHAEOLOGY ALONG THE ST. JONES

A large amount of archaeological work has now been carried out in central Delaware, particularly in the St. Jones River drainage. It is therefore possible to place the Puncheon Run Site in a detailed regional context and identify its place in the local settlement system (Figure 4). Major excavations have been conducted at the Carey Farm Site, the Island Farm Site, and the Hickory Bluff Site (Custer et al. 1996; Petraglia et al. 2002). The small Blueberry Hill Site has been thoroughly investigated Heite and Blume 1995). The cemetery at the Island Field Site (Custer et al 1990; Thomas 1974; Thomas and Warren 1970) has been excavated, along with some other, non-mortuary features, and a salvage excavation was carried out at the St. Jones Adena Site (De Valinger 1970; Thomas 1970, 1976). Limited testing has been conducted at the Barker's Landing Site.

Data are also available from other sites not actually located within the St. Jones drainage but quite close to it. Sites 7K-C-360 and 7K-C-365 (Riley, Watson, and Custer 1994) were excavated in the State Route 1 corridor just northeast of Dover, and major excavations were carried out at the Leipsic and Pollack sites on the Leipsic River, about 12 kilometers (7.5 miles) from the Puncheon Run Site (Custer et al. 1994; Custer et al. 1996) . Ten features have been excavated at the Hughes-Willis Site on the Little River just east of Dover (Thomas et al. 1975). Limited excavations have also been performed at several sites on the Murderkill River, including Coverdale Farm (Custer 1984a), Robbins Farm, and the Holleger Site. (The are no reports on the Robbins Farm and Holleger Sites, but the notes and artifacts are kept at the Delaware State Museum.)

A number of archaeological surveys have also been conducted in the area. The State Route 1 corridor, which passes just east of Dover, has been thoroughly investigated since the mid-1980s, and a reconnaissance level survey was done west of Dover along an earlier proposed route for this highway. Several borrow pits and wetland replacement areas associated with the State Route 1 project have also been thoroughly surveyed. A detailed survey has been performed on St. Jones Neck, southeast of Dover along the north bank of the St. Jones, and some survey has been conducted on the south bank of the St. Jones, and along the Murderkill. Killens Pond State Park, on the upper Murderkill, has been surveyed, and test excavations have been conducted at several sites in the park. Amateur collectors have been very active in the area, and some of their collections have been catalogued, providing yet more information.

1. The Carey Farm and Island Farm Sites

The Carey Farm and Island Farm sites together stretch for more than 1 kilometer (0.6 mile) along the east bank of the St. Jones, about 1.5 kilometers (1 mile) south of Puncheon Run. Carey Farm is much larger than Island Farm and had long been known to collectors. Carey Farm was first

professionally explored in the 1970s by the Delaware Bureau of Archaeology. At that time several pit features were dug, including one that produced the only direct subsistence data (oyster shell, animal bones, seeds, and nuts) yet recovered from a Woodland I site in central Delaware. The site was listed in the National Register of Historic Places, but no report of the work was written at that time. Very extensive excavations were undertaken at both the Carey Farm and the Island Farm sites between 1989 and 1991 by the University of Delaware as part of the State Route 1 project, and the findings were analyzed together (Custer, Watson, and Silber 1996). Almost 2,000 features were excavated, and more than 58,000 artifacts were recovered. Both sites had long occupation periods. The 302 projectile points recovered included late Paleoindian (Early Archaic) Kirk points through Woodland II triangular points, and among the 5,329 ceramic sherds were examples of almost every type known in the region, from Early Woodland Marcey Creek, to Woodland II Townsend and Minguannan.

The most common ceramic type at both sites was Mockley (313 vessels), which was made across most of the first millennium AD , followed by Hell Island (76 vessels), dated to AD 600 to 1000 (Dent 1995:238). Thirteen of the 15 radiocarbon dates from features also fall into this range, between AD 100 and 1000, indicating that this was the period of most intensive site use. A number of earlier vessels were also found, especially Wolfe Neck (72 vessels) and Coulbourn (34 vessels), both dating to between 700 BC and AD 1 (Griffith 1982), and a smaller number of vessels (32 total) of Townsend, Minguannan, and other Woodland II types. The majority of the projectile points on the sites were either stemmed (151 specimens) or side-notched (32 specimens). (Forty-seven specimens were not typed at all.) These points, most of them made from locally available chert and jasper cobbles, were mostly rather small, and they could not be placed into any defined diagnostic types; both stemmed and side-notched types seemed to have been used throughout the Woodland I period. The only other common types at the site were teardrop points (10 examples) and triangular points (28 examples). Six points were identified as broadspears, although they were generally smaller than the broadspears found in Pennsylvania, and two were fish-tailed. Fox Creek and Jack's Reef points are common on sites from the first millennium AD in the Middle Atlantic region, including some sites in Delaware, but both were rare at Carey Farm and Island Farm; only four Jack's Reef points and a single Fox Creek point were found. Therefore, the projectile points were not very useful for dating the occupations at the site.

Of the 1,912 features excavated at these sites, 835 were reported to be cultural in origin. The remainder were thought to be natural disturbances. The cultural features included a large number of the controversial "D-shaped" or semicircular features considered by Custer to be internal storage pits from small, semisubterranean houses. Other archaeologists think that most of these pits are tree falls or other natural disturbances. Cylindrical or basin-shaped storage pit features were also found, including at least one cluster of pits dating to Woodland I times (Figure 5). Parts of a human burial were found in one of these round pits; the pit contained Mockley ceramics and the fill was radiocarbon dated to 1,560±60 BP, or circa cal AD 535.

A cache of argillite bifaces was found in a cylindrical storage pit near the center of the Carey Farm Site. These bifaces were similar to those that have been found at other caches in the region, including the nearby Kiunk Ditch cache (Custer 1984a), and these rough bifaces seem to have been

the form in which argillite was brought to the St. Jones from sources around the falls of the Delaware River near Trenton. The fill of this feature was radiocarbon dated to about AD 1200, but the investigators thought this date too recent for such a cache and rejected it. Otherwise argillite was a minor constituent in the artifact assemblage, making up 7 percent of the projectile points found on the site.

A number of small utilized flakes, many made of jasper, were also recovered from these sites. The small size of these flakes suggests that they were hafted onto some type of tool. One possibility is that they were mounted on a spear or harpoon used for fishing (Figure 6).

A large amount of soil from features was processed by flotation to recover organic remains, but very little information on prehistoric subsistence was recovered. Although the small sample of the site excavated in the 1970s included a feature rich in faunal and floral materials, no other such features

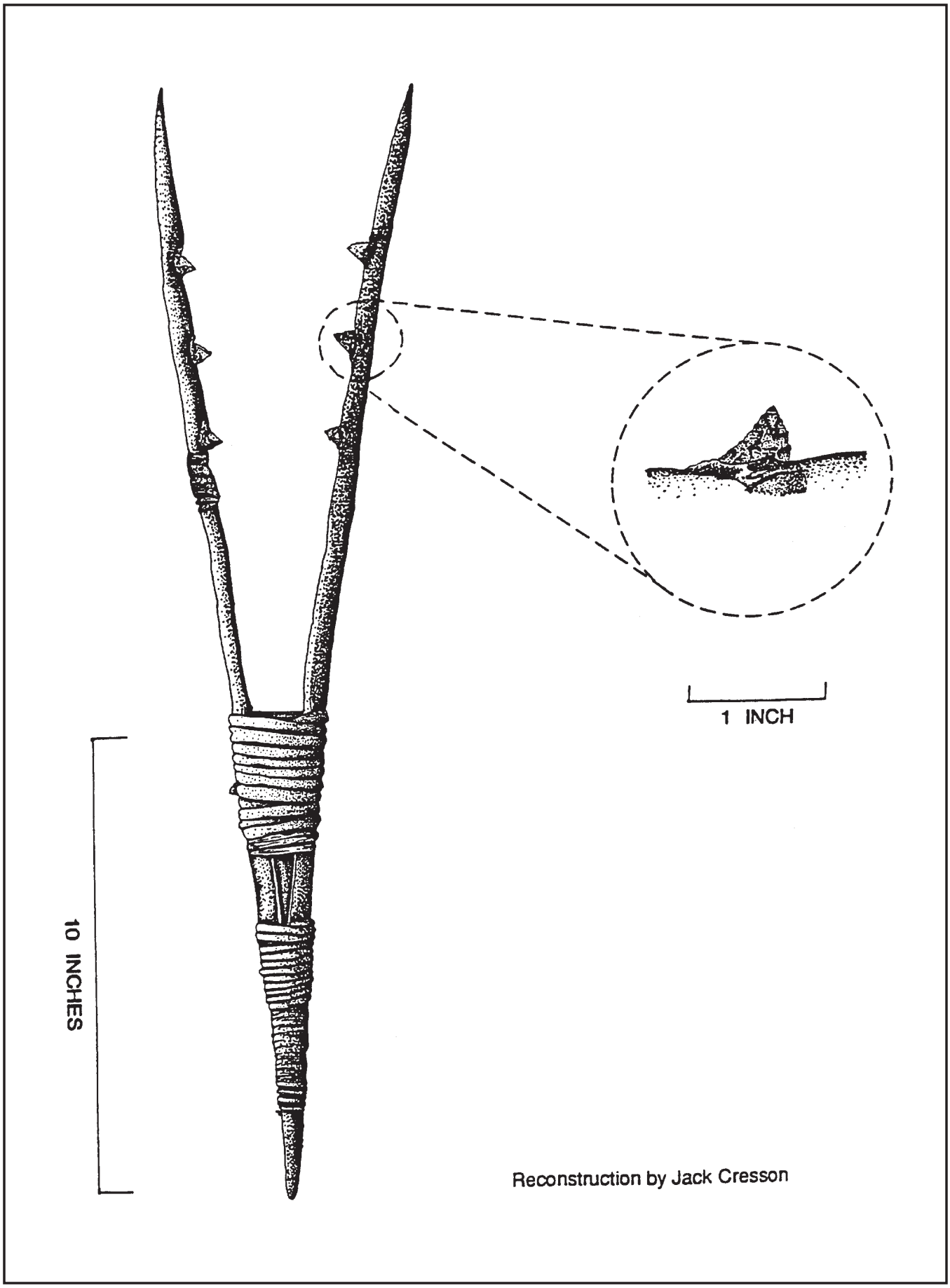

FIGURE 6: Reconstructed Fish Spear or Harpoon, with Small Utilized Flakes *SOURCE: Custer, Watson, and Silber 1996*

were found. No animal bones were found in the 1989-1991 excavations, and the floral collections were all small and contaminated with modern seeds.

2. The Hickory Bluff Site

The Hickory Bluff Site was located directly across the St. Jones River from the Puncheon Run Site in a wooded area 6 meters (20 feet) above the river at the top of a moderately steep bluff. Phase II testing and the Phase III excavation of one part of the site were carried out in 1995 by HRI (Liebknecht et al. 1997). The testing showed that the part of the site closest to the bluff edge was very well preserved, possibly unplowed, and contained large numbers of prehistoric artifacts. The pottery recovered was predominantly of two types, steatite-tempered Marcey Creek (1200 to 800 BC) and clay-tempered Coulbourn (500 BC to AD 1), although a few sherds of other varieties were also found. Mockley and Hell Island wares, which were the most common types at the Carey Farm and Island Farm sites, were rare at Hickory Bluff, so apparently the site was not much used during the period AD 100 to 1000. Most of the stone material was jasper, chert, and quartz derived from local cobbles, although a small amount of argillite, rhyolite, ironstone, and Iron Hill jasper was also found. Diagnostic projectile points included small stemmed varieties, expanding-stemmed specimens, teardrop points, an Adena corner-notched point made of Flint Ridge chalcedony, and a single Fox Creek point.

HRI's Phase III block excavation exposed a cluster of intersecting pit features identified as pit houses, following the interpretation suggested by Custer (1994). These features were roughly rectangular or oval and measured 4 to 5 meters long and 3 to 4 meters wide (13 to 16 feet and 10 to 13 feet). They were predominantly shallow, with a deeper section in one end that was interpreted as an internal storage bin. There was no evidence of hearths in these "structures," and the artifacts in the feature fills were a mixture of different periods. Within the shallow portion of one of these pits was a stack of clay-tempered ceramic sherds, possibly a stockpile intended to be ground up and used as temper in new vessels. Mechanical removal of the plowzone from a long strip extending away from the bluff (the corridor for a proposed drainage ditch) showed that at least 70 of these pits were present, and that some were up to 100 meters (300 feet) from the bluff edge, in an area with very few prehistoric artifacts.

Extensive Phase III excavations at the Hickory Bluff Site were carried out by Parsons Engineering-Science, Inc., at the same time as the excavations at the Puncheon Run Site. More than 800 1x1-meter units were excavated, and more than 85,000 artifacts were recovered. More than 100 pit features were identified on the site. Only a few of these were wide, shallow pits like those identified by HRI as pit houses; most were narrower and deeper, more like the storage pits at Puncheon Run. The function of most of these pits has not been determined. Forty fire-cracked rock features, probably the remains of hearths, were also found (Petraglia 2000; Petraglia et al. 2002; Rutherford and Knepper 2000).

Parsons' excavations at Hickory Bluff produced evidence of occupation in all periods from late Paleoindian (Palmer points) to Woodland II, with the bulk of the material dating to between 2,800 and 1,000 years ago. The most common type among the 250 projectile points were the small,

contracting-stemmed points, called pebble points, that are very common in central Delaware. Other types included broadspears, teardrop forms, side-notched forms, and Adena-related points made of exotic cherts. The ceramic assemblage was particularly rich, with more than 8,000 sherds recovered and dozens of different vessels identified (Robertson et al. 2000). More than half of the sherds were clay- or sherd-tempered wares, primarily Coulbourn but with some Nassawango, dating to between 500 BC and AD 200. The second most common type was Marcey Creek, one of the largest collections ever of this ware, indicating occupation between 1200 and 800 BC. A number of different grit-tempered ceramic wares were found, including sherds of the classic Wolfe Neck type, sherds that may be Hell Island, and sherds that most closely resembled Pope's Creek ceramics from the Chesapeake region. Fragments of steatite bowls indicate occupation in the second millennium BC, and sherds of Mockley and Townsend ceramics indicate occupation in later periods.

Evidence pointing to ritual behavior was also found on the site. Three artifacts of interest in this regard were two fragmentary gorgets that could have been related to Adena cultures and an ulu, or semicircular knife, made of ground slate (Egghart and Shields 2000). Two small caches of artifacts were recovered from pits that had been capped with heavy stones, and the excavators suggested that these were ritual deposits.

3. The Blueberry Hill Site

The Blueberry Hill Site was located on a sandy bluff overlooking the confluence of Maidstone Branch and Fork Branch, which meet to form the St. Jones River about 8 kilometers (5 miles) north of Puncheon Run. At this point the St. Jones is a small, non-tidal river running through a swampy valley. The site was excavated in 1991 to 1992 by Heite Associates (Heite and Blume 1995) and gave evidence of sporadic occupation from late Paleoindian to historic times. The site was small, and unlike the larger sites lower on the river, such as Hickory Bluff and Carey Farm, Blueberry Hill did not experience a major intensification of use in the Woodland I period. Such intensive Woodland I occupation seems to have been associated with the estuaries in the tidal stretches of the river.

The Blueberry Hill Site had been plowed, but excavation showed that beneath the modern topsoil an older surface had been buried by wind-blown sand, deposited between 10,000 and 8,000 years ago. The earliest deposits were recovered from these unplowed contexts, but very few artifacts were found in these deeper levels. The artifacts in the late Paleoindian or Early Archaic sand stratum included two Palmer points, three bifurcate-based points, several other bifaces, a small grinding stone, and five utilized flakes (Figure 7). A handful of artifacts were found in even deeper levels, which may have dated to Clovis (Paleoindian) times. Artifacts from the upper strata (the plowzone and some amorphous pits) included small amounts of several ceramic types, stemmed, side-notched, and corner-notched points, a drill, nine utilized flakes, and a single triangular arrow point.

4. The Barker's Landing Site

Barker's Landing is located about 8 kilometers (5 miles) south of Puncheon Run, where U.S. Route 113 crosses the St. Jones. Only limited work has been conducted on the site by professional

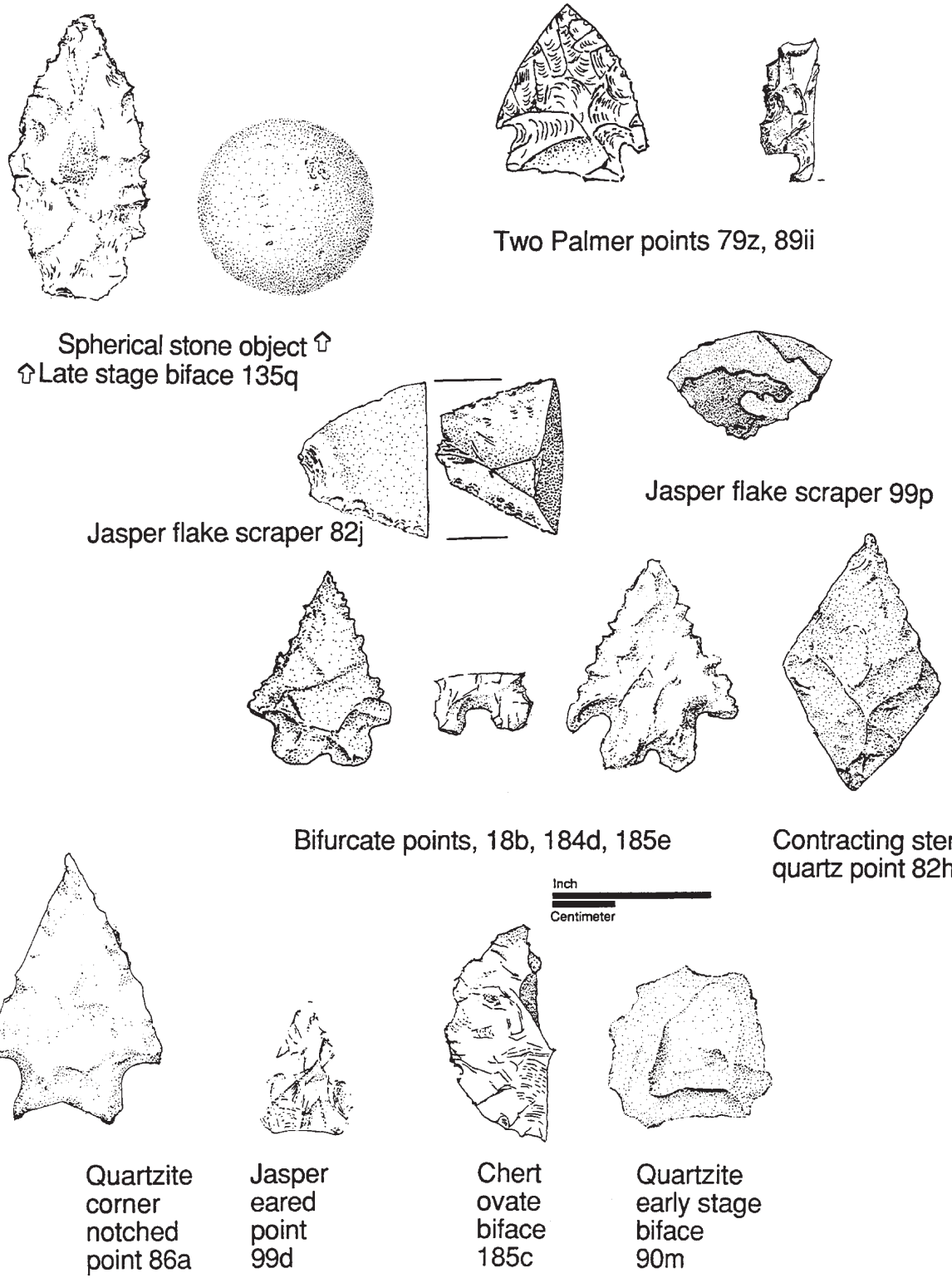

FIGURE 7: Artifacts from Blueberry Hill Prehistoric Site, Zone II

SOURCE: Heite and Blume 1995

archaeologists. This work, carried out in 1975 by the Delaware Archaeological Bureau, consisted of a controlled surface collection and limited plowzone stripping (Custer 1984a). No storage pit features were found in the stripped area, just shallow basins interpreted as hearths. The site is most remarkable for the very large amount of argillite present. More than 80 percent of the stone tools found during the surface collection at the Barker's Landing Site were made of this material. Argillite is not available on the Delmarva Peninsula; the nearest source is in the vicinity of Trenton, New Jersey. Another 12 percent of the tools were made of rhyolite, also an imported stone. Based on ceramics and soapstone bowl fragments, the site seems to have been occupied in the earlier Woodland I (Late Archaic and Early Woodland) period, from about 2000 to 500 BC. Custer defined a culture which he called the Barker's Landing Complex based largely on the finds from this site and Coverdale Farm, a site on the Murderkill River, whose stone tool assemblage is also dominated by argillite and rhyolite.

5. The Hughes-Willis Site

The Hughes-Willis Site is located just east of Dover on the Little River, about 2 kilometers (1.2 miles) from Puncheon Run. The site was identified by amateur collectors, and small-scale excavations were carried out in 1971 by the Delaware Archaeology Section and the Kent County Archaeology Society under the direction of Ron Thomas (Thomas et al. 1975). The excavations focused on features that were visible as dark spots on the surface of the plowed field. Ten features were excavated. Although the surface collection showed that the site had been occupied in the Archaic and Woodland I periods, nine of the ten features contained Townsend pottery and therefore dated to the Woodland II period. The features consisted of shallow basins and deeper, cylindrical pits. The pits contained numerous artifacts and quantities of Townsend pottery, as well as deer bones and charred hickory nuts. Analysis of seven deer skulls showed that the deer had been killed in the late fall or winter, when hickory nuts are also available, so the site was probably a fall hunting camp.

6. The Leipsic Site

The Leipsic Site , located on the Leipsic River about 13 kilometers (8 miles) north of Puncheon Run, was excavated in 1990 by the University of Delaware as part of the SR 1 project (Custer, Riley, and Mellin 1996). At that time an area of about 8,000 square meters (2 acres) was investigated, and 358 features were excavated. Most of these features were the controversial "D-shaped" pits, which were interpreted by the investigators as the remains of semisubterranean houses. About 20 round storage pits were also found. The main occupations of the site took place in the Woodland I and Woodland II periods, although five Kirk corner-notched points dating to the late Paleoindian period (ca. 8000 to 7000 BC) and five possible Archaic (ca. 6500 to 3000 BC) points were found.

Coring near the site showed that at this location the Leipsic River was a freshwater, non-tidal stream until about AD 1400, when the valley was drowned by rising sea levels (Rogers and Pizzuto 1994). For much of the site's history, therefore, it was located near a small river bordered by narrow bands of swamp and marsh. Not surprisingly, the site produced much less evidence of Woodland I occupation than sites in estuarine environments such as Carey Farm, Island Farm, and Hickory

Bluff. Woodland I pottery was particularly scarce, a total of fewer than 60 sherds for types dating to before AD 600. For the period after AD 600, the evidence increases, including 200 sherds of Hell Island pottery (AD 600 to 1000) and 309 sherds of Woodland II varieties such as Townsend and Minguannan. Sites that may have seen much more intensive occupation in the Woodland I period have been identified by survey about 3 kilometers (2 miles) down the river, where estuarine environments were present in Woodland I times (Custer et al. 1986a).

Interestingly, one of the most common ceramic types (Figure 8) at the site was similar to Clemson Island ware (166 sherds), a type native to the Susquehanna River basin in Pennsylvania. These sherds, which are tempered with chert and decorated with punctate designs, date to between AD 600 and 1200 (Stewart 1988). Similar sherds have been identified at the Island Field Site and a few other locations on the Delmarva Peninsula, suggesting that some people may have come to Delaware from the Susquehanna Valley, or that there was movement back and forth between the two regions.

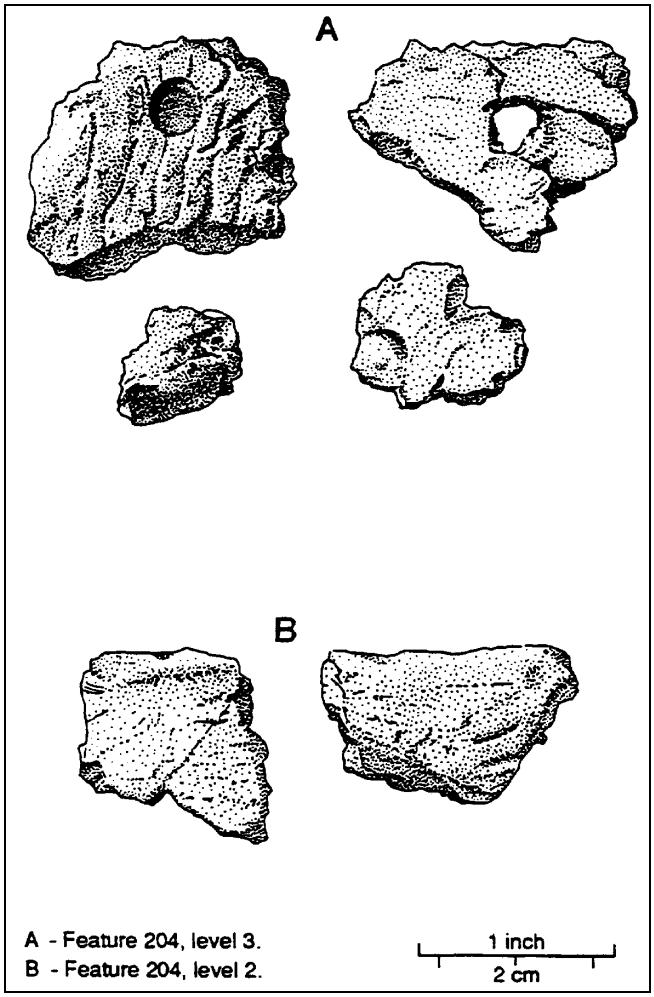

FIGURE 8: Clemson Island-like Ceramics from the Leipsic Site
SOURCE: Custer, Riley, and Mellin 1996

7. The Pollack Site

The Pollack Site was located across the Leipsic River from the Leipsic Site, on a peninsula at the confluence of the Leipsic River and Allston Branch (Custer et al. 1994). Although the site filled the entire 10-hectare (25-acre) peninsula, the excavations focused on several smaller areas of high artifact density; the bulk of the artifacts were found at Area B, along the Leipsic River, and Area C, at the point of the peninsula. These areas closely resembled the Leipsic Site in that most of the features uncovered were semicircular pits and the artifact totals were rather low. Most of the ceramics recovered were Woodland II varieties, and 22 triangular points were among the finds. However, the majority of the projectile points were Woodland I types, mostly stemmed, and there were also late Paleoindian Kirk and Palmer points and Archaic Stanly points. As at the Carey Farm, Island Farm, and Leipsic sites, extensive flotation of pit fill soils recovered very little evidence of prehistoric subsistence.

8. The Air Base School Site

The Air Base School Site is located on the St. Jones River about 3 kilometers (2 miles) south of Puncheon Run. Most of the artifacts from the site were collected by H. Geiger Omwake, an amateur collector active from the 1940s to the 1960s. A brief inspection of this collection, which is kept at the Dover Air Force Base, shows that it includes a large number of points and potsherds and one very large three-quarter-grooved ax. A majority of the projectile points are stemmed and side-notched varieties made from pebble cherts and jaspers. However, there are also about 15 stemmed points made of argillite, all with wide, squared bases, as well as three argillite early-stage bifaces. These argillite artifacts are similar to those associated with the Barker's Landing Complex, as defined by Custer (1989). Pottery from the site includes Coulbourn and Wolfe Neck sherds, and steatite fragments were also found. Limited subsurface testing carried out in 1996 by MAAR Associates recovered small amounts of grit- and shell-tempered ceramics, together with lithic debitage, most of it jasper and chert from local cobbles, but including 15 argillite flakes (Thomas 1996).

9. The Coverdale Farm Site

The Coverdale Farm Site is located on the Murderkill River near Frederica, 16 kilometers (10 miles) south of Puncheon Run and 8 kilometers (5 miles) upriver from the Delaware Bay. The site is in the Mid-Drainage Zone, surrounded by brackish tidal marshes but quite close to large areas of transition marsh. It is quite large, extending over an area of 28 hectares (70 acres). The artifacts from the site all come from surface collections made by amateurs. The collection in the Delaware State Museum, donated by three different collectors, consists of a handful of shell-, grit-, and clay-tempered potsherds and 282 stone artifacts, including 194 projectile points (Custer 1984a). Of the projectile points, 60 are argillite (31 percent), as are 32 of the 70 (42 percent) other bifaces that were found. Most of the argillite points (Plate 5) are stemmed varieties, about 20 wide enough to be considered broadspear points. Rhyolite makes up another 12 percent of the collection. The pentagonal argillite bifaces, diagnostic artifacts of the Barker's Landing complex (see Plate 5), are virtually identical to Susquehanna broadspear preforms found in West Virginia (Fiedel and Galke 1996), Pennsylvania, Connecticut (Pfeiffer 1984), and Maine (Bourque 1995). Associated dates throughout this range cluster tightly around 3700 to 3300 BP (2200 to 1500 cal BC) (see Appendix O, figure 19).

Particularly notable is the large amount of ground stone in the collection (Plate 6). The artifacts include a large metate and at least three dozen manos or grinding stones, some of them as much as 30 centimeters (1 foot) long and weighing more than 10 kilograms (22 pounds). Some of the examples showed very heavy wear. A number of three-quarter-grooved axes and two well-made celts are also present.

Coverdale Farm was one of the sites used by Custer (1989) to define the Barker's Landing Complex, but the very interesting collection raises many interpretive problems. The large number of argillite points with square or expanding stems certainly suggests that the Coverdale Farm Site was most intensively occupied in the 3000 to 500 BC period, and there are also several pieces of steatite in

PLATE 5: Argillite Bifaces from the Coverdale Farm Site (7K-F-1). Artifacts on far left and far right are the distinctive Barker's Landing forms.

the collection. However, other periods are also represented. The collection includes at least two Adena corner-notched points made of Flint Ridge chalcedony (Plate 7) and several excellent rhyolite examples of Fox Creek points. In addition, a number of the other rhyolite and argillite points are lanceolate forms that could date to almost any period. The association of the large number of grinding stones with the Barker's Landing Complex (3000 to 500 BC) is therefore problematic, and the interpretation of the site remains uncertain.

10. State Route 1 Survey

New State Route 1 passes just east of Dover, and during the survey of the highway corridor a number of sites were found within 10 kilometers (6 miles) of Puncheon Run (Riley, Bachman, et al. 1994). Most of this area drains eastward, through Dyke Branch, Muddy Branch, and Little River, which empty directly into the Delaware Bay. The area is therefore not within the St. Jones drainage basin, but its proximity to Puncheon Run makes it relevant to this study. The area is swampy and contains many small streams. Small prehistoric sites were found on almost every piece of well-drained ground within these swamps. Two of the sites, 7K-C-360 and 7K-C-365, were excavated (Riley, Watson, and Custer 1994). Both were located on small knolls or rises, surrounded by swamps, and both were occupied in the Archaic and Woodland I periods. Both yielded a variety of tool types, including projectile points, scrapers, and grinding stones, but few features or ceramics. Site 7K-C-365 included a reduction area where tools were made from quartzite cobbles.

11. St. Jones Neck Survey

PLATE 6: Ax and Large Grinding Stone (Mano) from the Coverdale Farm Site (7K-F-1)

St. Jones Neck is on the north bank of the St. Jones River near its mouth. Archaeological survey of this area, which includes the Dickinson Plantation, was organized by the Delaware State Historic Preservation Office and carried out by volunteers from the Kent County Archaeological Society. All of the survey was conducted in the late 1970s by surface inspection in plowed fields, under good conditions. About 25 prehistoric sites were identified, dating to all periods of prehistory. Site forms were filled out for the sites, and the property was nominated to the National Register of Historic Places, but no detailed report of the survey was ever prepared. An inspection of the collections from this project, kept at the Delaware State Museum, revealed important differences between these sites and the large excavated sites in the Mid-Drainage Zone. Very few small stemmed points, the dominant type at Puncheon Run and Carey Farm, were found at the St. Jones Neck sites. In fact, bifaces were not common at all, and roughly two-thirds of the diagnostic bifaces were small triangular points. Most of the ceramics were small crumbs, but the identifiable specimens appeared to be predominantly shell-tempered Townsend or Mockley ware. In general, the recent inspection suggested that these sites dated primarily to the Woodland II and very late Woodland I (later Middle Woodland) periods. Although some of these sites were directly across the estuary from Barker's Landing, the vast majority of the stone material was local chert, jasper, and quartz, with only a few argillite artifacts.

12. U.S. Route 13 Planning Survey

In the early 1980s, during the early stages of study for the highway that eventually became State Route 1, the University of Delaware conducted a reconnaissance-level archaeological survey covering large parts of Kent County (Custer et al. 1986a). Among the targeted areas were four parts of the St. Jones drainage: along Cahoon Branch and Maidstone Branch, both northwest of Dover, and around Wyoming Lake and Derby Pond southwest of Dover. Other survey areas close to Puncheon Run included areas along the Leipsic River, along Dyke Branch, Muddy Branch, and Little River east of Dover, and along Double Run and Spring Run, tributaries of the Murderkill

PLATE 7: Artifacts Associated with the Delmarva Adena Occupation of the Coverdale Farm Site (7K-F-1). Adena point (left) and bifaces made of Flint Ridge chalcedony. Third and fourth from left appear to be Snyders points, generally found in post-Adena Hopewellian contexts in the Midwest.

River located southwest of Dover. The survey was conducted by surface inspection, often under poor visibility conditions. Hundreds of sites were defined, many of them on the basis of fewer than 10 artifacts, which limits the usefulness of much of the data. But some sites were collected more intensively, so that their functions and occupation dates can be determined at least roughly. Large base camps were found only along the rivers and larger streams, particularly adjacent to tidal estuaries. Some sites identified as "base camps" were also found near stream intersections with access to large interior wetlands, but these interior sites were smaller than those on the tidal rivers. The small sites found in other locations were considered "procurement stations." The investigators also made inventories of several private collections, which provide very good data on several sites.

13. The Deneumoustier Site

One of the private collections inventoried by University of Delaware researchers during their planning survey merits a special discussion. This is the Deneumoustier Site, which is located 8 kilometers (5 miles) northwest of Dover along the far upper reaches of Fork Branch, a small tributary of the St. Jones. From her garden along the creek, which measured about 30x70 meters (100x230 feet), Mrs. Deneumoustier had collected nearly 600 artifacts, including 443 diagnostic projectile points. The projectile points date to all periods from the late Paleoindian to the Woodland

II. The early diagnostics include one Dalton point, two Palmer points, 23 Kirk corner-notched points, and 26 Kirk stemmed points. The Archaic period is represented by 33 bifurcate-based points and six Stanly/Neville points. The collection includes more than 300 Woodland I points, including nine broadspears, two Fox Creek points, one Jack's Reef point, 38 corner-notched points, five Adena stemmed points, and more than 200 points of various other stemmed types. There are also 28 triangular points representing the Woodland II period. Mrs. Deneumoustier mainly collected projectile points, but the collection also includes 126 other bifaces, three scrapers, six drills, two other flake tools, three pestles, two celts, one three-quarter-grooved ax, four full-grooved axes, and two atlatl weights ("bannerstones"). The recovery of this extensive collection from a site on such a small stream is quite remarkable. There is no obvious reason why so many prehistoric people would have visited the site over a period of 9,000 years; the site is not at a major stream junction like most of the other known interior "base camps," so it does not fit with the current environmentally based settlement models. It may simply have been the most convenient place to camp while hunting in the nearby wetlands, or it may have had some special sacred or commemorative significance that was honored through many generations.

C. THE PREHISTORY OF THE ST. JONES DRAINAGE

1. The Paleoindian and Archaic Periods, 10,000 to 3000 BC

Only limited evidence of occupation before 3000 BC has been found in the St. Jones drainage. Before the stream valley was drowned by rising sea water, the St. Jones was a small river without any great attraction for prehistoric peoples. Cores taken near the Carey Farm Site dated the inundation of the valley at that point to around 1600 BC (Pizzuto 1996). Before that time the St. Jones was a freshwater, non-tidal stream, much like it is today north of Dover. The rich marshlands that provided so many resources did not develop until after that time. Also, many early sites may have been located in the floodplain, in which case they would now be below sea level.

Nonetheless, a number of projectile points and other stone tools dating to the late Paleoindian (or Early Archaic) and Archaic periods have been reported along the St. Jones, including Palmer, Kirk, and bifurcate-based points. Clovis points have been found in Delaware, particularly in the swamps of the mid-Peninsular drainage divide, but none have yet been reported from the St. Jones drainage. Kirk points, which Custer (1989:88) assigns to the period from about 8000 to 6500 BC in Delaware, are particularly well represented from St. Jones sites; nine were found at the Carey Farm and Island Farm sites, three at Puncheon Run, and no less than 49 at Deneumoustier. No features dating to these periods have been reported, nor any major sites with definable Paleoindian, Early Archaic, or Middle Archaic components. At the large sites on the lower St. Jones, the Paleoindian and Archaic artifacts have all been found in plowzone or other disturbed contexts, mixed with later materials, making any analysis difficult. The most intensively investigated Paleoindian component in the drainage was at Blueberry Hill, where Palmer, Kirk, and bifurcate-based points were found in a stratum that had been buried by wind-blown sand. The tools recovered from the late Paleoindian strata were mostly bifaces, leading the investigators to believe that the earliest use of the site was as a hunting station. A wider variety of tools was found with the bifurcate-based points in the upper part of the sand. The excavators suggested that the site evolved from being primarily a hunting camp around 8000 BC to a mixed-use, hunting and gathering camp by 6000 BC.

The scarcity of late Paleoindian and Archaic sites along the St. Jones is explained in part by the greater dispersion of sites from these periods in surrounding areas. The most readily identifiable artifacts from these periods, Kirk, Palmer, and bifurcate-based points, have been found at numerous small sites associated with freshwater wetlands. Besides the component investigated at Blueberry Hill, Archaic components have been identified at Sites 7K-C-360 and 7K-C-365A, both northeast of Dover (Riley, Watson, and Custer 1994), and at the Deneumoustier Site near the headwaters of the St. Jones. These sites were located on small sandy rises surrounded by swamps, with access to both food resources and sources of cobbles for making stone tools. All three sites were occupied in later periods as well, and the artifact deposits are mixed, so it is difficult to interpret the Archaic component. However, the artifact assemblages included a variety of chipped-stone tools, both formal and expedient, and grinding stones.

Surveys around Dover, and in the Smyrna and Blackbird areas, 25 kilometers (16 miles) to the north, have located numerous small prehistoric sites associated with bay/basin ponds and other small wetlands (Bedell 1996a, 1996b; Bedell et al. 1997; Custer et al. 1986b). At most of these sites the only finds were fire-cracked rock, debitage, and expedient tools made from local cobbles. However, the recovery of Archaic and late Paleoindian points from some of these sites shows that the sites were used in those periods. In this area, the archaeological pattern for the Paleoindian and Archaic periods is one of many small sites and no very large ones. The people of the Paleoindian and Archaic periods were evidently highly mobile, traveling in small groups and staying for short periods at a number of small sites. Such a settlement pattern of highly mobile hunting and foraging behavior is sometimes called *diffuse*, in contrast to a *focal* pattern in which people spend much of their time at a few central base camps.

Virtually no direct evidence of Paleoindian or Archaic subsistence practices has been found in Delaware, but the evidence of stone tools indicates hunting (spear points) and plant gathering (grinding stones). There is no evidence of hierarchical social organization in this early period, or of trade. Projectile points made of non-native stones, especially rhyolite, are regularly found on the St. Jones River, but it is thought that these points were carried into the region by people whose regular wanderings took them into the Pennsylvania mountains where rhyolite is quarried. The many similarities in projectile point forms and other technologies throughout the Northeast are generally explained by the high mobility of these peoples, which occasionally brought groups into contact throughout the region.

2. The Woodland I Period, 3000 BC to AD 1000

The Woodland I period, as defined by Custer (1989, 1994), encompasses what are commonly called the Late Archaic, Early Woodland, and Middle Woodland periods in the surrounding region. According to Custer, these divisions obscure the broad commonalities in prehistoric cultures throughout this time span. Broadly speaking, Woodland I peoples were hunter-gatherers who increasingly focused their economy on rich environments such as estuaries and other large wetlands. Sites from this period are generally more common, and larger, than those from earlier periods, especially along tidal rivers like the St. Jones. This evidence suggests greater efficiency in the exploitation of subsistence resources and substantial population growth. A greater variety of tool types is found, including increasing numbers of groundstone axes and adzes, which may have been

used in the manufacture of dugout canoes, and grinding stones, which may indicate greater use of plant foods. After 2000 BC, there is evidence of increased reliance on stored food in the form of storage pits. After 1600 BC, the presence of large bowls carved out of steatite imply increased consumption of boiled foods; they may have been used in the context of ceremonial feasts that reinforced prestige-based hierarchies (Fiedel 2001; Klein 1997, Sassaman 1999,). The stone bowls have been viewed (e.g., Ritchie 1965) as markers of a "Transitional" period between the Late Archaic and Early Woodland. Ceramic pots began to be produced in the region around 1200 BC, presumably in imitation of Southeastern pottery, which preceded the Mid-Atlantic wares by a millennium. This event has traditionally been used to divide Archaic from Woodland cultures, but Custer considers it only an extension of the increased emphasis on storage that had begun hundreds of years earlier. It is noteworthy that some of the earliest Mid-Atlantic ceramic vessels, of the Marcey Creek type, not only imitate the flat-bottomed, tub-like shape of the steatite vessels, but even include crushed particles of steatite as temper. This suggests that they were both functional and conceptual replacements for stone vessels, which may have become too costly owing to breakdown of regional exchange networks.

Sites from the Woodland I period are much larger than those from earlier times, and many archaeologists believe that people were becoming more sedentary in this period, spending larger amounts of time at base camp sites along estuaries and large rivers. However, the increasing site size is really the only evidence of increasing sedentism in Delaware, and the evidence suggesting changes in subsistence strategy is equally weak. In other parts of North America, settlement pattern and subsistence studies draw on large bodies of faunal and floral remains, but such remains are found only rarely in Delaware. There is little information on the seasons when sites were occupied, the resources exploited from the sites, or many other crucial matters. The possible changes in lifeways in the Woodland I period of Delaware therefore remain poorly understood.

In the St. Jones drainage, there is strong continuity in the use of the larger sites throughout the Woodland I period. All of the larger sites are along the river. All of the large sites that have been excavated (Carey Farm, Island Farm, Hickory Bluff, and Puncheon Run) yielded evidence of occupation in all the major divisions of the Woodland I period, as did the smaller Blueberry Hill Site. Most of the other small sites that have been identified in the region are known only from surface collections, which makes it difficult to specify their periods of occupation. Sites dating to all parts of the Woodland I were identified on St. Jones Neck, but the components dating to the late Woodland I (Middle Woodland) and Woodland II periods seem to have been larger than those dating to earlier periods, suggesting that use of the Delaware Shore Zone may have been more intensive during later prehistoric times. One site that may have had a shorter occupation period is the very unusual Barker's Landing Site, where occupation was limited to the period from 2000 to 500 BC.

a. The Barker's Landing Complex, circa 3000 to 500 BC

In the early Woodland I or Late Archaic period, a distinctive culture appeared in central Delaware that Custer has called the Barker's Landing Complex. The Barker's Landing Complex of the St. Jones River drainage shares most characteristics with the cultures of the surrounding region, which Custer calls the Clyde Farm Complex. Along the St. Jones and Murderkill rivers, as with all the tidal rivers of the Delmarva Peninsula, the evidence of human occupation is much greater for this

period than for earlier periods. The slow drowning of the river valleys created rich estuarine environments, and dependence on such environments seems to have been increasing throughout the Middle Atlantic region. Prior to the excavations at the Puncheon Run and Hickory Bluff sites, few intact features or living surfaces dating to before 1200 BC had been found along the St. Jones River. Many of the projectile points dating to this period are stemmed varieties that continued to be used until around AD 1000, making it difficult to identify preceramic Barker's Landing components from surface collections. However, finds of steatite bowl fragments, fishtail points, and broadspears at sites such as Carey Farm and Barker's Landing suggest increasing activity in Late Archaic times. The evidence becomes much stronger with the introduction of pottery because early pottery types such as Marcey Creek and Selden Island are common throughout the St. Jones drainage.

The Barker's Landing culture is distinguished from the Clyde Farm Complex of northern and southern Delaware by its increased use of imported stone, especially argillite. The closest argillite sources to the St. Jones valley are around Trenton, New Jersey, 110 kilometers (70 miles) away, and argillite is such a soft stone that it is not found in river cobble form. As the distance to its source area is not so very great, some argillite is found on archaeological sites throughout the Delmarva Peninsula. Generally, however, no more than 5 to 15 percent of the bifacial tools on sites in the region are made of argillite. The amount of argillite debitage is generally even less, suggesting that argillite tools were made near the source and carried down the peninsula in finished or nearly finished form. At the Barker's Landing Site on the St. Jones River, however, argillite made up 80 percent of the stone artifacts recovered, including a majority of the debitage. Another 12 percent of the artifacts from the site were made of rhyolite, which had to be imported from even farther away, in the Pennsylvania mountains. At the Coverdale Farm Site on the Murderkill River, 40 percent of the stone artifacts were argillite, and 16 percent were rhyolite. About 15 argillite stemmed points were found at the Air Base School Site, along with some rough bifaces. In addition, at least two caches of crude argillite bifaces have been found in the region, one at the Kiunk Ditch Site and one at the Carey Farm Site. The heavy use of argillite at these central Delaware sites and the presence of the biface caches suggests that cargoes of argillite bifaces were brought directly to the area, probably on canoes. The bifaces were cached until needed, and then made into finished tools.

Custer defined Barker's Landing as a regional culture dominant throughout the St. Jones and Murderkill drainages. Further investigations in the St. Jones drainage, especially at the Carey Farm and Island Farm sites, suggest that the regional pattern is more complex than Custer initially supposed. At Carey Farm, argillite and rhyolite made up a very small part of the artifact collection. Even points found with Marcey Creek and Selden Island ceramics (1200 to 800 BC) were made primarily from pebble jasper, chert, and quartz. One cache of argillite bifaces was found, but there was little argillite debitage on the site. Argillite use in the St. Jones drainage as a whole certainly never reached the levels observed at Barker's Landing or even at Coverdale Farm. Perhaps those sites functioned as distribution nodes for these imported items. Control of long-distance trade is often cited as a factor in the rise of chiefdoms, but there is at this time insufficient evidence to speculate on the political structure of central Delaware in the second millennium BC and the possible role of imported goods in that system. It is also possible that the Barker's Landing Complex was a rather short-lived phenomenon, so that the distinctive pattern of argillite and rhyolite use was confined to a relatively brief interval of the 3000 to 700 BC period.

The nature of the Barker's Landing Complex, specifically the political or economic system it represents, is not clear. An interesting parallel to the distribution of argillite on the St. Jones River is provided by the distribution of Abbott Zoned Incised ceramics on the James River in Virginia (McLearen 1992). The Abbott ceramics apparently derive from the middle Delaware Valley, especially around Trenton, New Jersey, where they were made in later Middle Woodland times. They are rather common on a small group of sites at Tar Bay on the James River, just downstream from the fall line, and they have been found in small quantities on several sites in central Virginia. There has been speculation that these imported wares indicate the presence at Tar Bay of what Sahlins (1963) described as a local Big Man, who achieved prominence by redistributing goods within and between communities.

b. The Delmarva Adena Complex, 500 to 1 BC

The Delmarva Adena Complex is a localized manifestation of the spectacular Adena mortuary cult which was centered in the Ohio Valley. Burial cults, such as those associated with the Glacial Kame, Lamoka, and Old Copper cultures, had developed in many parts of eastern North America in the Late Archaic period. In the Adena heartland, one version of these cults developed into a spectacular ritual complex. Large burial mounds were built, some of them arranged within sacred precincts defined by earthworks (Dragoo 1963). The burials within those mounds commonly contained a special combination of grave goods, including shell beads, carefully made bifaces and points of specially chosen stone, copper ornaments, smoking pipes made of Ohio firestone, and objects of unknown function such as small stone pyramids and hemispheres. Isolated Adena or Adena-related ceremonial centers have been found at several places east of the Appalachians, including the western shore of the Chesapeake Bay (Ford 1970), the central Delaware Valley (Kraft 1970), and on the Delmarva Peninsula. These eastern manifestations consist of burials or caches containing large arrays of Adena artifacts, often mixed with artifacts more typical of the local culture. Mounds are not typically found, but in a few cases there are clear traces that the burials were contained in some sort of sacred precinct.

The Delmarva Adena Complex is limited to the St. Jones and Murderkill drainage basins in Delaware and a few areas in Maryland. In these areas, Adena-related ceremonial sites have been found, and a few Adena artifacts, such as corner-notched points made of Flint Ridge chalcedony, have been found on other sites. The exotic items from the burial sites include leaf-shaped bifaces made of Flint Ridge chalcedony and other cherts imported from the Ohio Valley, tubular pipes made of Ohio pipestone, slate gorgets, copper beads, and birdstones. Other objects found with the burials include locally made points, celts, spearthrower weights ("bannerstones"), and quantities of red ochre. Ceramics are rarely found, and never in quantity. Some burials are cremated, while others are not. The burials are always too few to represent the entire population, but on the other hand do include women and children, leading some archaeologists to suspect that they represent ranked societies with hereditary status. Custer calls these "mortuary-exchange" sites, emphasizing the presence of imported items in the burials.

The Delmarva Adena sites identified to date include the Frederica Adena Site and the Killens Pond Adena Site, both on the Murderkill River, and the Sandy Hill and Nassawango Adena sites in Maryland. One of the most important Delmarva Adena mortuary-exchange sites is the St. Jones Adena Site, located about a kilometer (half a mile) downstream from Puncheon Run. The site was hurriedly excavated in 1960 after it had been discovered during borrow pit excavations. At least 50 people had been buried there, many with very few grave goods. In his re-analysis of the finds, Thomas (1976) identified six different "loci" from which finds came, each apparently representing a burial pit. The pits were irregular and measured up to 9x14 feet, or 2.5x4 meters. All were less than 1 meter (3 feet) deep. In some of these pits large caches of leaf-shaped bifaces, quantities of copper beads, and other artifacts were found. Charcoal from one of the pits yielded a radiocarbon date of about 450 BC. In addition to a number of classic Adena spear points and knives beautifully made of Ohio Valley materials, the site produced a large cache of lanceolate knives made of milky quartz. Isolated Adena-related artifacts have been found at other sites nearby, including points made out of Flint Ridge calcedony at St. Jones Neck and Carey Farm and two gorgets at Hickory Bluff.

If we ignore the spectacular mortuary/exchange sites, the culture of central Delaware in the Delmarva Adena period is very similar to the Wolfe Neck Complex of northern and southern Delaware, as well as the preceding Barker's Landing culture. No great changes in the way of life seem to have taken place. The economic focus continued to be on the exploitation of estuaries and other large wetlands, where the larger sites were located. Ceramics became increasingly common; Stewart (1992:7) argues that although ceramics had been known in the Middle Atlantic region for centuries, it was only after 500 BC that they became the "mainstay of Native American container technology." New types of ceramics were developed, including clay-tempered wares such as Coulbourn and Nassawango and grit-tempered ceramics such as Wolfe Neck. The most common projectile points continued to be the same stemmed varieties that had been in use in the region for at least 3,000 years, so it remains difficult to identify sites of this period on the basis of surface collections. Major components of this period were found at the Carey Farm and Island Farm sites, including more than 100 ceramic vessels of the Wolfe Neck and Coulbourn types, and at Hickory Bluff. The closest available data on subsistence practices for this period come from the Wilgus Site in southern Sussex County, where a shell midden with a radiocarbon date of 290 BC has been partially excavated (Custer et al. 1983). The midden consisted largely of clam shells. Flotation samples from the midden yielded deer and turtle bone primarily, as well as some muskrat, raccoon, and catfish. A number of charred *Amaranthus* and *Chenopodium* seeds were also found. Because the oyster shells in the midden appeared to have been harvested in late winter to early spring, the excavators believed that the seeds, which are available for harvest in late summer, were stored until they were needed to help the inhabitants through the lean early spring period.

Within the St. Jones drainage, there is evidence that occupation significantly intensified in the Delmarva Adena period. Wolfe Neck and Coulbourn ceramics are much more common than the earlier ceramic varieties. The "feature clusters" identified at the Carey Farm and Island Farm sites, and at the Leipsic and Pollack sites, all date to Delmarva Adena or later times. However, part of the explanation for the increasing number of finds may be that ceramics were becoming more common; in the absence of diagnostic locally made projectile points for this period, ceramics are almost the only artifacts that can be used to distinguish Delmarva Adena from Barker's Landing sites.

The relationship between the Delmarva Adena culture and the Adena homeland in the Ohio River Valley is not understood. Because non-ritual aspects of life seem to have been little changed, and at any rate seem to remain firmly rooted in local traditions, a large-scale migration of people from the Ohio Valley seems unlikely. The Adena burial cult appears to have traveled separately, as a religion or an ideology, and to have been taken up by certain groups on the Delmarva Peninsula. We do not know what ideas about death and life are represented by the imported goods in the Adena burials. The social system expressed in the mortuary pattern seems a little more accessible, as the burials appear to represent a developing elite class that marked its status with imported goods and elaborate rituals. We also do not know what the Delaware Adena leaders sent in return for the goods they imported; no items traceable to the Delmarva Peninsula are found on Adena sites in the Ohio Valley. The traded goods must, therefore, have been perishable, perhaps something like the turkey feather cloaks that so impressed John Smith (1986[1608]:115) and other European explorers of the Chesapeake region. Certainly the many imported items in evidence represent many hours of effort to find or make whatever was traded in exchange. To acquire their finery, therefore, the local elite class must have had control of a great deal of labor.

Because Delmarva Adena mortuary sites are so rare, and because they are sometimes located away from habitation sites, it is difficult to speculate on the significance of their placement in the landscape. However, those that have been found are in essentially the same area as sites of the earlier Barker's Landing Complex: the St. Jones and Murderkill drainages in Delaware and the Choptank and Pocomoke drainages in Maryland. Given the state of our knowledge, it is impossible to say what sort of continuity is involved, but there are certainly parallels. In both systems, imported items are found concentrated at certain sites, but are also distributed to some extent in the area around those foci. Custer (1989:273) suggests that "the distinctive social environment that had been established in central Kent County at the end of the Barker's Landing Complex set the stage for the acceptance of these exotic artifacts, their incorporation into the ideotechnic and sociotechnic symbol system, and their use as grave furniture." Future research may allow us to examine this idea more fully.

c. The Carey Complex, 1 BC to AD 600

The Carey Complex again shows great continuity with the preceding Delmarva Adena and Clyde Farm complexes. The only major change in settlement systems is the disappearance of Adena-related mortuary sites. The decline of ritual systems employing imported goods seems to reflect regional, Middle Atlantic trends, since there is evidence of declining trade in most parts of the region (Stewart 1992). However, long-range interactions of other types persisted. After AD 100 shell-tempered Mockley pottery was introduced in Delaware, becoming dominant in coastal areas. This ceramic ware appears to have been developed in the southern Chesapeake region and to have spread from there up the coast to southern New England. Central Delaware is therefore clearly within a broad interaction sphere that included the entire Middle Atlantic coast.

Sites yielding Mockley pottery are common throughout the St. Jones drainage, especially along the lower reaches of the river. All of these sites were also occupied during the preceding periods. The most important site is Carey Farm, where hundreds of features and more than 500 ceramic vessels dating to this period were found (Custer, Watson, and Silber 1996). One pit feature at the site,

radiocarbon dated to AD 200±90, contained well-preserved organic remains. This pit yielded hickory nuts, seeds, and a wide variety of faunal remains. Species represented included deer, beaver, box turtle, diamond-back turtle, dog, muskrat, turkey, woodchuck, and oyster. Based on these data, the site was interpreted at that time as a winter camp. A large, nearly complete Mockley pot was found in a similar pit. The size of this pot, and some other partial examples, coupled with the lack of soot on these vessels and the presence of mending holes on at least one, suggests that they were primarily used for storage instead of cooking. One human burial was discovered in another round pit, apparently a storage pit that was reused as a grave.

Because of the large number of pit features and the large number of pottery vessels, the Carey Farm Site may be the best candidate for designation as a base camp yet identified in the St. Jones drainage. Certainly it saw a large amount of use, especially in this period. However, even at Carey Farm, the evidence for long-term, semisedentary occupation is far from conclusive. The site as a whole was very large, extending over more than 4.5 hectares (11 acres), but throughout most of this area the artifact density was quite low. The 719 "cultural" features excavated at the site included 588 "house related" pits, a type of pit that many archaeologists do not consider a cultural manifestation. The other features consisted of 60 shallow basins, 30 deep basins, and 24 "silos," representing 2,000 years of occupation. The largest feature cluster identified at the site was scarcely bigger than the one found at Puncheon Run, which was certainly not part of a base camp. The excavators suggested that the site was probably never occupied by more than four to six families at one time. Since Carey Farm is one of the largest sites of this period in the region, this analysis suggests that people of the Carey Complex rarely gathered in groups much larger than 30 to 40 people.

d. The Webb Complex, AD 600 to 1000

The Webb Complex, like the Delmarva Adena Complex, is a local, central Delaware phenomenon distinguished from neighboring cultures only by the presence of elaborate mortuary sites. Custer designates the culture in the rest of the Delmarva Peninsula during this period the Late Carey Complex. The distinguishing marks of the Late Carey Complex are new ceramic types, especially Hell Island, and Jack's Reef projectile points. Mockley ceramics and stemmed projectile points continued in use, however, so many Webb Complex sites may be indistinguishable, on the basis of surface collections or limited excavations, from earlier Carey Complex sites.

The most important mortuary site of the Webb Complex is Island Field, located on an island of dry ground within the tidal marshes at the mouth of the St. Jones River (Thomas 1974; Thomas and Warren 1970). At least 150 people were buried in this cemetery between AD 300 and 1200, primarily in the AD 500 to 800 period. A wide variety of burial practices was used, including flexed burials, extended burials, redeposited cremations, and in-place cremations. The burials included men, women, and children. The large amounts of oyster shell on the site led to excellent preservation of bone in the graves, and a number of bone tools and implements were identified among the grave goods, including antler harpoons and flint-knapping tools and bone awls. Other items included steatite platform pipes, celts, pestles, and large, pentagonal bifaces made of imported cherts. The number and type of grave goods varied widely, suggesting status differences. Interestingly, the flint-knapping tools and the large bifaces were mostly recovered from the graves of two adult women.

Analysis of the skeletons from the site showed that the population was healthy, with little evidence of either anemia or infectious disease (Custer et al. 1990). The population did, however, show a high incidence of dental caries (cavities), the highest ever recorded for a population of North American hunter-gatherers and above even the mean for agricultural populations. Dental caries indicate a diet high in carbohydrates, and it is unusual for a population of hunter-gatherers to have as carbohydrate-rich a diet as a maize-growing people. Custer suggests that the people buried at Island Field had been eating wild rice, but starchy marsh roots as a constituent of the diet is another possibility.

The objects found in the graves at Island Field seem to be most closely related to cultures in New York, Ohio, and Michigan, and the use of so many different burial techniques in a small cemetery has parallels in eastern Pennsylvania. The location of the site in an exposed spot near the shore of the Delaware Bay suggests openness to outsiders and outside influences. Island Field may be said to represent the return to central Delaware of the association between long-distance trade, mortuary ceremonialism, and the presence of a special status group entitled to elaborate burial that had characterized the area in Delmarva Adena times. Fiedel (1990) has suggested that the Late Carey Complex and the Webb Complex represent the arrival in Delaware of the speakers of Algonquian languages, which probably originated in the area north of Lake Ontario. Studies of the rates at which languages change, a field called glottochronology, suggest that the break between eastern Algonquian languages, such as Lenape and Nanticoke, and the languages of the Algonquian homeland occurred between AD 200 and 800. The connection between the Webb Complex burials at Island Field and cultures to the northwest may be particularly significant in this context.

e. Woodland I Subsistence

The direct evidence regarding subsistence practices during the Woodland I period is weak throughout the Middle Atlantic region, especially on the Coastal Plain, and the only information for the St. Jones drainage comes from one feature, a pit at Carey Farm. Data from other areas must be used to generate any sort of picture, and even so, much remains to be learned. Because of the acidity of Delaware's soils, preserved bone is found only in shell middens and shell-filled features; and shell midden deposits may not represent what was eaten throughout the year. Where preserved bone has been found, a wide variety of species are represented. Deer is the most common terrestrial animal, followed by turtle. Raccoon, beaver, and muskrat have also been identified. Oysters are the most common marine species; fish, clams, and whelks are also found. Studies from middens in the Chesapeake region also show that a wide variety of animals were eaten, particularly deer and oysters; some Chesapeake sites also indicate frequent consumption of turkey (Potter 1993:72, 112). Some archaeologists think that anadromous fish were a key resource in this period, and the large sites on the Delaware River at Abbott Farm, near Trenton, New Jersey, have been interpreted as spring camps for catching and processing the fish that made their way up the river to spawn (Cavallo 1982). However, there is little direct evidence of heavy reliance on anadromous fish in Delaware.

Plant food remains at Woodland I sites include a variety of wild species. Nuts, including hickory, butternut, and acorns, were certainly eaten, but there is no evidence indicating extensive use of this resource. The small seeds that are so important in models of subsistence in the Midwest—amaranth, pigweed (*Chenopodium*), sumpweed, and so on—have been identified on Delaware sites, but not

in large quantities. Most of the seeds that have been found do not appear to have been modified by cultivation. A small group of sumpweed seeds that did appear to have been enlarged by selective breeding was recovered from the Three Guys Site in Sussex County, but most of these seeds (10 of 13) were found in features radiocarbon dated to Woodland II or historic times (LeeDecker et al. 1996). The discovery of seeds harvested in late summer in contexts with oyster shells harvested in late winter suggests that the seeds were stored for later use. Historic Indian groups made extensive use of edible roots found in estuarine marshes, but there is no direct evidence for their use in earlier periods.

f. The Woodland I Settlement System

The generally accepted models of Woodland I development in the Middle Atlantic region depict a transition from a "diffuse" pattern of hunting and gathering by highly mobile Archaic groups to a more sedentary pattern "focused" on riverine or estuarine settings (Custer 1989, 1996; Mouer 1991). These descriptions of settlement patterns and lifeways are based on ethnographic studies of living hunter-gatherer groups, which have documented a range of different strategies. The archaeological correlates of these different strategies seem clear in theory. A "diffuse" pattern ought to leave a large number of very similar sites where people camped during their wanderings. A "focal" or "logistic" pattern ought to leave at least two kinds of distinctly different kinds of sites: "base camps," where people lived for as much as months at a stretch, performing a wide variety of different activities, and "procurement sites," used by foraging or hunting parties during brief expeditions. A close look at the archaeological record of the St. Jones drainage basin shows the great difficulty of relating these models to the archaeological record in all its complexity.

In central Delaware, Woodland I peoples certainly showed a preference for living along the tidal stretches of the rivers, where these models place their base camps. The largest and richest sites are all directly adjacent to the rivers or their estuaries. Where there has been adequate survey, the banks of all of central Delaware's tidal rivers, from the Mispillion to the Smyrna, seem to be lined with Woodland I sites. Models originally proposed by Thomas et al. (1975) and further developed by Custer (1989) suggest that the largest base camp sites will be located near the freshwater/salt-water interface, with access to both brackish estuaries downstream and fresh water or oligahaline marshes upstream. The Carey Farm, Island Farm, Hickory Bluff, and Puncheon Run sites all conform to these models, as do the Robbins Farm, Coverdale Farm, and Holleger sites on the Murderkill River, and the Mispillion Site on the Mispillion River. However, sizable sites are present in other zones as well. In southern Delaware, numerous Woodland I shell midden sites have been found along brackish estuaries. Within the St. Jones drainage, a large group of sites is present on St. Jones Neck. Much less is known about sites in the Delaware Shore Zone, primarily because no roads have been built through these sites that would require archaeological excavation, but it does appear that they are smaller than the sites in the Mid-Drainage Zone. The preference of Woodland I peoples for living near the freshwater/salt-water interface seems to be undeniable, but it can hardly be considered absolute.

It must also be noted that there is no sign of a decrease in activity at the many small sites associated with freshwater wetlands. In central Delaware, Woodland I sites are more common than Archaic sites in every environmental niche: along small streams, adjacent to bay/basin ponds, on rises

surrounded by swamps. A "focal" model of Woodland I society suggests that sites in these environmental zones should be "procurement stations" or "processing sites," but some of these sites actually yield evidence of many different activities. Blueberry Hill, on the upper St. Jones River, and 7K-C-365A, on a rise in a swamp, both yielded a wide range of tools, including projectile points, knives, scrapers, utilized flakes, and grinding stones, as well as ceramics. No ceramics and few flake tools were collected at Deneumoustier, another site associated with freshwater wetlands, but groundstone axes, pestles, drills, and numerous bifaces were found. Therefore, while Woodland I peoples may have spent more time in camps along estuaries than Archaic peoples did, they continued to range across the landscape, regularly using camp sites in a wide variety of settings. Large storage pits, considered to be a distinguishing characteristic of base camps, have been found on rather small, upland sites, such as Lums Pond and Dragon Run B (Kellogg et al. 1994; Petraglia et al. 1998).

The evidence for a "focal" pattern of living in the Woodland I period, as opposed to the "diffuse" pattern that prevailed in the Archaic, is actually not very strong. Woodland I sites with diverse tool assemblages, ceramics, and storage pits are distributed across the landscape in a considerable variety of settings. Sites are particularly common around small, freshwater wetlands, indicating what Custer (1996:208) described as "intensive use" of these environments. Woodland I peoples obviously continued to range widely, camping in numerous settings away from the main rivers. The arguments made for increasing sedentism in the Late Archaic of the American Bottom area of Illinois, to take one example, emphasize both the increasing size of the large sites near marshy lakes and the relative lack of contemporary materials in other environments nearby (Emerson and McElrath 1983).

The data from the large sites along the estuaries also do not conclusively demonstrate that they were base camps occupied for extended periods. In particular, there is very little evidence of structures. The presence of structures requiring a significant investment to build is one of the main criteria used to define base camps in other parts of North America (Brown and Vierra 1983; Mouer 1991; Winters 1969), but no widely accepted Woodland I houses have been reported in Delaware. Only one Woodland I post house has been identified in the state, at the Hockessin Valley, and this identification is not entirely convincing (Figure 9). Most of the discussion has focused on pit houses. Several fairly plausible pit house features have been identified. For example, Feature 94 at the Delaware Park Site, a saucer-shaped pit measuring 3.48x3.68 meters, with a depth of 0.92 meter, a central hearth, and a radiocarbon date of 1850±100 BC, seems a good candidate (Thomas 1981). However, these features are rare, and none have been found in the St. Jones drainage. The identification by Custer of numerous semicircular or "D-shaped" pits as the basements of pit houses is not generally supported. (Even if these features are related to houses, they still cannot be used to distinguish base camp sites because they have also been found on many small sites with no evidence of long-term occupation.) The large "base camp" sites along the St. Jones therefore have no indisputable evidence of structures, no features other than storage pits and small hearths, which are also found on smaller sites, and no striking differences in their artifact assemblages. The differences between these large sites and the many smaller sites found near freshwater wetlands seem to be a matter of degree, not kind. A diffuse pattern of movement among a number of camps in different environments, none occupied for much longer than the others, fits the evidence as well as a focal model does.

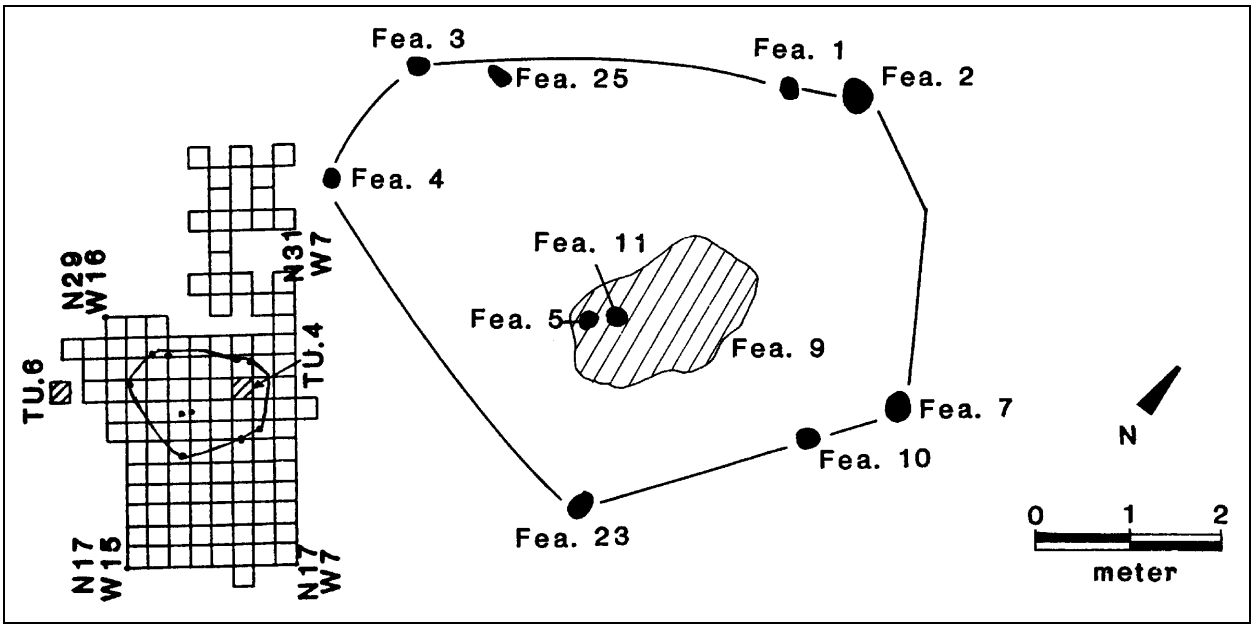

FIGURE 9: Hockessin Valley Site House Pattern *SOURCE: Custer and Hodny 1989*

There is little direct evidence indicating the time of year when sites in various environments may have been occupied. Oysters that are well enough preserved for a study of their seasonality seem mostly to have been harvested in the late winter and early spring. Ethnohistorical evidence also points to oysters as a late winter to early spring "survival food." Camps on the lower reaches of the St. Jones may, therefore, have been occupied in late winter. Frequent winter rains and slower evaporation would also have reduced one of the main problems of living in this environment, the shortage of fresh water. Site 7K-D-47 on St. Jones Neck, where oyster concentrations were visible in the plowzone, may be such a late-winter site, and Carey Farm was used during the late winter. On the other hand, the Woodland II shell midden at Indian Point in southern Delaware seems from other evidence to have been associated primarily with a summer occupation, and John Smith (1986[1608]:116) observed that the seventeenth-century Virginia Algonquins gathered oysters in the summer months, so summer use of sites containing oyster concentrations is also possible.

The spring spawning runs of anadromous fish are generally thought to have been important resources for prehistoric peoples. Protein residues from anadromous and catadromous fish were detected on stone tools from the Puncheon Run Site, but not in overwhelming quantities, and no net sinkers or other fishing implements were found, so evidence for a major reliance on these fish is still lacking. Sites located where the river constricted to a manageable width, for example, Puncheon Run and Hickory Bluff, may have been spring fishing stations. Shell middens along the Rappahannock River in Virginia, which contained Mockley ceramics, seem to have been used between April and June, when the fish would have been running (Potter 1993). Historic Indian groups harvested the roots of marsh plants such as pickerel weed, arrow arum, and golden club, which are now common in the middle reaches of the St. Jones, from Carey Farm up to Dover. In the seventeenth century, these roots were gathered in summer (Smith 1986[1608]:116).

There is no direct information on what resources were exploited from the numerous smaller sites around freshwater wetlands. The swamps and freshwater marshes of Delaware were rich in natural resources, including deer, smaller mammals, waterfowl, turtles, frogs, and a great variety of plant life. Studies in the Smyrna area have shown that the sites around seasonal wetlands, such as bay/basin ponds, do not extend to areas that dry up in the summer, suggesting that the sites were occupied when water was present, that is, in late fall, winter, or spring (Bedell 1996a). Certainly these sites could have been hunting stations, used for hunting both deer and small mammals; since wet forests had much more undergrowth than forests situated on well-drained land, they were preferred by deer, especially during the winter and summer. Evidence suggests that the New England Algonquins dispersed into smaller groups to hunt deer in the late winter, and such hunting activities by small groups would produce sites like those found around Delaware's small wetlands (Flannery 1939:77). Another possibility is that visitors were harvesting greens and herbs, such as skunk cabbage or pokeweed, that sprout in early spring. Or, they may have been harvesting seeds or nuts available in the fall. The calculations made by Thomas et al. (1975) show that plant resources could be found year round in these environments, but that the yields were highest in late summer to late fall.

The complexity of the archaeological record therefore seems to argue against a simple model of the seasonal movements of prehistoric people in Delaware. The very large number of sites yielding evidence of intensive occupation seems to argue against a focal model, with people spending large parts of the year at a single base camp. On the other hand, the environments around the larger sites on the middle reaches of the river yielded rich resources in several seasons—fish in spring and fall, roots in summer, seeds in late summer, and waterfowl in winter—and they may have been used at all of these times. It should not be assumed that a site that has yielded evidence of occupation in three distinct seasons must have been occupied for nine months of the year (Bernstein 1993:143); such evidence could just as well derive from three separate visits to the site, each lasting only a few days (Nassaney and Lopinot 1986). The historic Indians of Virginia inhabited their villages in some part of every season, but they nevertheless spent much of their time elsewhere, especially in the summer and after the harvest (see below). Variations in the yield of resources from year to year also have to be taken into account. Shortfalls in preferred foods caused by drought, flood, or other adverse conditions may have been counterbalanced by greater reliance on less favored items, or by wandering further afield.

One resource that figures in some models of prehistoric settlement but can be ruled out as a major factor in the St. Jones drainage is stone for tools. The most readily abundant raw material for stone tool manufacture was local cobbles. These cobbles are embedded in the Columbia Formation, which underlies all of the central and southern Delmarva Peninsula, so they are very widely distributed, but generally accessible only in stream cuts. Easily accessible gravel bars may have been a factor in the placement of some sites, but only in the short range, that is, affecting the decision to camp on one side of the stream rather than another. No stone source in central Delaware was sufficiently superior to draw visitors from long distances away. The stone that may have had some impact on people's movements came from outside the immediate region, especially argillite from New Jersey and rhyolite from Pennsylvania or Maryland. This stone may have been procured in trade or acquired during forays to the sources; either way, it did not much influence the choice of camping areas along the St. Jones.

Because central Delaware has a long history of spectacular mortuary sites employing objects obtained by long-distance trade, and because of the evidence of an earlier focus on imported argillite, during the Barker's Landing period, the effects of non-economic factors on the settlement system of this region must also be considered (Hodder 1990). The two sites that stand out as unusual in this regard are Barker's Landing and Island Field. The Island Field Site yielded evidence of habitation as well as the remarkable cemetery, and Custer classifies it as a base camp. However, its location—on a small island without fresh water—is unusual for a base camp. Certainly the site's ritual importance, and its convenient location for access by water to the Delaware Bay, may have been factors in drawing people to the spot. The Barker's Landing Site is also well placed for waterborne commerce; it is now the lowest spot on the St. Jones where the main river channel is adjacent to fast land, with no intervening marsh, and it may have been a good landing in earlier times as well. The most striking fact about the archaeology of the site is not so much the presence of a large quantity of argillite as the absence of other kinds of stone. Work at other sites nearby has shown that throughout the Barker's Landing period tools made from local pebble cherts and jaspers were used for most purposes. Very little such stone was found at Barker's Landing. It is possible that the site's ritual or political importance precluded its use for normal, day-to-day activities. Another possible explanation is that there was simply so much argillite at the site that this material was used for purposes that elsewhere would have been served by other materials.

3. The Woodland II Period: The Slaughter Creek Complex

a. Woodland II on the St. Jones

Major changes took place in the Middle Atlantic region during Woodland II or Late Woodland times, from around AD 1000 to European contact. Agriculture based on corn, beans, and squash was introduced; this subsistence change was accompanied by a major change in settlement pattern, as large, permanently occupied villages appeared, sometimes protected by palisades. At about the same time or slightly earlier (ca. AD 800), notched projectile points were replaced everywhere by triangular points, which signal the introduction of the bow and arrow. This shift in weapon systems may also be an indicator (along with the palisades) of intensified warfare. Ceramic styles also changed significantly, with the appearance of collared vessels and incised decorations.Although most of these ancillary cultural developments are evident in the Late Woodland archaeological record of the Mid-Atlantic and Northeastern coastal plains (e.g., the Slaughter Creek Complex in Delmarva), the evidence for agriculture is generally very scarce (Custer 1989:329). It has even been suggested to account for this that native peoples along the east coast only began intensively cultivating maize in response to European contact in the seventeenth century. Although the scarcity of maize in the archaeological record stands in sharp contradiction to European explorers' descriptions of extensive cornfields, the discussion that follows assumes that the Algonquian-speaking inhabitants of the Delmarva coastal plain were as aware of the advantages of maize cultivation as their relatives in Virginia and North Carolina. Speculatively, one could propose that earlier excavation techniques were not appropriate for recovering small items such as the remains of corn; however, Custer (1989:329) notes that items smaller than corn cobs were recovered from earlier excavations, and so, if corn had been present, it would have been reported. Perhaps the absence of maize in the recovered archaeological record to date can be attributed instead to failure to discover major Woodland II village sites, which may have been located mainly where European

farmers subsequently settled and thereby obliterated archaeological evidence of previous Woodland occupation.

In southern Delaware a number of large sites dating to the Woodland II period have been found, including the Slaughter Creek, Townsend, and Mispillion sites. In central Delaware evidence of Woodland II occupation is much sparser. Woodland II arrow points have been found on most sites in the region, as have Woodland II Townsend and Minguannan ceramics. However, the Woodland II occupations of all the major sites on the St. Jones River are smaller than those of the Woodland I, and few features dating to this period have been found. In the sixteenth century central Delaware seems to have been a sort of "buffer zone" between the populous Sickoneysincks, who had villages near Lewes, and the Lenape, whose principal settlements were around Wilmington or Philadelphia, and a similar pattern may have prevailed throughout the Woodland II period. One notable Woodland II occupation has been excavated at the Hughes-Willis Site, just east of Dover on the Little River. Excavations by the Kent County Archaeological Society at the site exposed 10 pit features, nine of them dating to the Woodland II period (Thomas et al. 1975). Another fairly significant Woodland II occupation was recorded during the St. Jones Neck survey at Site 7K-F-86, near the mouth of the St. Jones. Even these sites, however, seem to be much smaller than the Woodland II sites in the southern part of the state.

b. The Woodland II Settlement System

Woodland II peoples were agricultural, and their fields were located near their villages. However, these peoples were not entirely dependent on farming, and they did not live in their villages year round. The Algonquin-speaking tribes, including the inhabitants of Delaware, divided the year into five seasons. As recorded by John Smith (1986[1608]:112) in Virginia, "their winter some call *Popanow*, the spring *Cattapeuk*, the sommer *Cohattayough*, the earing of their Corne *Nepinough*, the harvest and fall of leafe *Taquitock*."

The Indians depended on different foods in different seasons. The first harvests of corn and beans came in August, and the harvest continued through October. It was during *Taquitock*, from August to October, that most of the Indians' feasts and celebrations were held, beginning with the "Feast of the Green Corn." Life was focused on the village in this period, and the whole community would have been together. After the harvest the whole village, or at least its able-bodied members, might go on a journey of several days to good hunting grounds, since regular hunting had by this time greatly reduced the deer populations around the villages. Isaack de Rasieres (1909:108), writing about the Indian women near New York, observed the following: "The grain being dried, they put it into baskets woven of rushes or wild hemp, and bury it in the earth, where they let it lie, and go with their husbands and children in October to hunt deer, leaving at home with their maize the old people who cannot follow."

After the great deer hunts of the fall, some people may have returned to their villages, where their stores of grain were, but others may have dispersed into smaller groups to pursue the deer. This was the pattern among at least some of the New England Algonquins (Wood 1865:106) and among the Lenape of the New York area. The Lenape, after their communal hunts, dispersed to hunting lodges on grounds considered the private property of each individual family (Newcomb 1956:22).

Cattapeuk or spring began with the first fish runs in March. The fish runs were a vital resource for the Indians; as John Smith (1986[1608]:116) wrote, "in March and Aprill they live much upon their fishing wires." Where people lived at this time depended on whether their main villages were well situated for fishing. At least some people in New York left their villages and moved to the coast to fish (Denton 1845:7), and Wood (1865:106), writing about New England, mentioned that Indians were always moving their houses, "sometime to hunting places, other times to fishing places, after that to a planting place, where it abides the longest." We know that in some areas, such as on the Columbia River and other rivers in the American northwest, good fishing stations were treasured property handed down in certain families, and some evidence suggests that fishing weirs were also private property among the Powhatans of Virginia (Pearson 1972:236; Rountree 1989:35). Therefore, communities may have dispersed during the fishing season too, as people without control over fishing weirs near their villages journeyed to other streams for their fishing.

Algonquian Seasons
Popanow (winter); November to March
Cattapeuk (spring); began with first fish runs in March
Cohattayough (summer)
Nepinough (earing of corn)
Taquitock (harvest); August through October

Planting season began in April and continued until June. Many people must have returned to the villages at this time to put their crop in the ground; however, planting was primarily women's work, and since the fish runs continued through May, some men may have continued to fish. As Smith (1986[1608]:116) wrote, "to mend their diet, some disperse themselves in small companies, and live upon fish, beasts, crabs, oysters, land Tortoises, strawberries, mulberries, and such like." The possible separation of men and women at this season raises an important point in the study of settlement patterns, that is, whether some sites were occupied by single-sex or age-specific groups. Most archaeological discussion of "fission-fusion" patterns in the Middle Atlantic region seems to assume that when communities split up, they divided into families. However, division by sex or age was also recorded by observers of historic Indians. Isaack de Rasieres' observation that old people stayed in the villages when most of the community went on fall hunts has already been mentioned. War parties were made up only of men, and under certain circumstances hunting or fishing parties may also have been all male. All female groups may have gathered shellfish or plants. Nor was obtaining food the only reason people split off from the main group; certain Native American rituals required that communities divide by age and sex. For example, the initiation ritual of the young men practiced among the Virginia Algonquins required that they go off into the woods with certain older men who would instruct them and subject them to ordeals (Strachey 1953:99).

In the village, during planting season, people lived "most of acornes, walnuts, and fish" (Smith 1986[1608]:116). The heavy reliance on nuts gathered during the fall points to the importance of food storage in these societies. Later on in the summer, Smith observed, the Indians lived mainly on tuckahoe, a root gathered in marshes; but he did not say if tuckahoe gathering was done around the village or required travel.

There is no evidence of villages or agriculture on the St. Jones, so all of the sites would have been seasonally used camps or procurement sites. The one site in the area which has yielded good

subsistence information, Hughes-Willis, conforms well to this pattern (Thomas et al. 1975). Ten pit features were excavated at the site, nine dating to the Woodland II period. Almost all of the bone recovered from the site was deer. (However, preservation conditions were only fair, so the small bones from smaller animals may well have disintegrated.) Seven well-preserved deer skulls or skull fragments were found, five with hardened antlers (October to December) and two that had recently dropped their antlers (December to January). Small amounts of turtle bone were also found. Almost all of the plant remains were hickory nuts. The site seems to have been used by people who left their villages after the harvest for the annual deer hunt, and the large numbers of hickory nuts may indicate what the women were doing while the men were killing deer. A wide variety of stone tools were found at the site, including arrow points, stone knives of several shapes, scrapers, a drill, a chopper, pitted stones, and hammerstones. The pitted stones and hammerstones may have been used in processing nuts. A large amount of fire-cracked rock was also found, as well as at least 82 vessels of Townsend pottery, which indicates that these Indians did carry some of their pots with them during fall hunting trips.

One other Woodland II site in Delaware that has yielded subsistence data is Indian Landing in southern Sussex County. Nine Woodland II pit features were excavated on the site by the Delaware Archaeology Section (Thomas et al. 1975). The pits were full of shells, predominantly oyster but also clam, whelk, scallop, striated mussel, and snail, as well as one crab claw. The shell created good conditions for the preservation of bone, and a large number of small bones were found. The bones included 913 from turtles, 378 from deer, and 95 from small mammals, such as raccoons, squirrels, dogs, and a rabbit. There were also 372 bird bones, including turkey, goose, duck, and small birds. The deer skulls suggested that they were killed in mid- or late summer. There were also 529 fish bones, including eight stingray tail spines and two shark vertebrae. Stingrays only live in the shallow waters of Indian River Bay in the summer, and scallops are also most readily available in the summer months. Very few plant remains were found. A summer occupation, focusing on gathering shellfish, supplemented by hunting and fishing, is clearly indicated at Indian Landing. Again, the site fits into the model presented by John Smith, as a summer hunting and gathering camp where small groups of people camped for some days or weeks while waiting for the corn to ripen.

Stone tools were not nearly so common at Indian Landing as they were in the features at Hughes-Willis. The Indian Landing sample included only two arrow points and one other point (compared to 11 arrow points and 7 others at Hughes-Willis), only two knives (compared to 15), and seven other tools (compared to 49). There were no hammerstones or other cobble tools, and there was very little debitage or fire-cracked rock. There was a larger sample of bone tools, including shuttles and needles apparently related to weaving or basket-making. Indian Landing is, in this respect, quite like the Townsend Site, a Woodland II village near Lewes (Omwake and Stewart 1963). Although that site had an area of several acres, and 90 pit features were excavated, only 43 projectile points were found, 13 on the surface and 30 in the pits. Only a handful of other chipped-stone tools were found at the Townsend Site. Seventeen pitted stones were recovered, along with eight grinding stones (abraders), one adze, one celt, and six hammerstones. The variety of bone implements was much greater, including more than 280 specimens. In Woodland II times, projectile points and stone knives may have been primarily used at hunting sites, much less so at agricultural villages or shellfish-gathering sites. A site like Deneumoustier, with its hundreds of bifacial tools, may, then, have been predominantly a fall hunting and nutting station, while the Leipsic Site, which yielded

around 150 Woodland II potsherds and only two arrow points, may have been a summer plant-gathering or spring fishing camp.

Despite the scarcity of cultivated plant remains, the Delaware archaeological evidence suggests that the people of the Woodland II period may have followed a settlement pattern similar to the one John Smith (1986[1608]) and observers recorded for the Indians of Virginia. Agricultural villages were inhabited by some people year round, and by most people at planting time (mid-April to mid-June), harvest time (August to October), and in mid-winter. After the harvest, most of the village traveled to hunting grounds for the annual deer hunt; to judge from the Hughes-Willis Site, nuts were also harvested on these expeditions. In summer, some people would have stayed in the village to mind the corn, but others would have traveled, possibly for rather short periods, to camps located near shellfish beds, stands of edible plants, or other important resources. In early spring, some people may have traveled to good fishing locations.

Although Woodland II people built villages and planted crops in specific, favored locations, they still ranged through the entire landscape. They were as much at home in the forests, swamps, and marshes where they spent much of their time hunting and gathering as in their cornfields. Some evidence of their travels survives at sites like Hughes-Willis and Indian Landing, which were places where people camped during seasonal forays. These examples show that recognizable archaeological sites, complete with pit features, could develop at such hunting and gathering camps. All of the Woodland II sites along the St. Jones River were probably seasonal, short-term hunting and gathering camps of this type.