

THE LATE WOODLAND PERIOD IN
NEW JERSEY (ca. A.D. 1000 - 1600)

by

Herbert C. Kraft and R. Alan Mounier

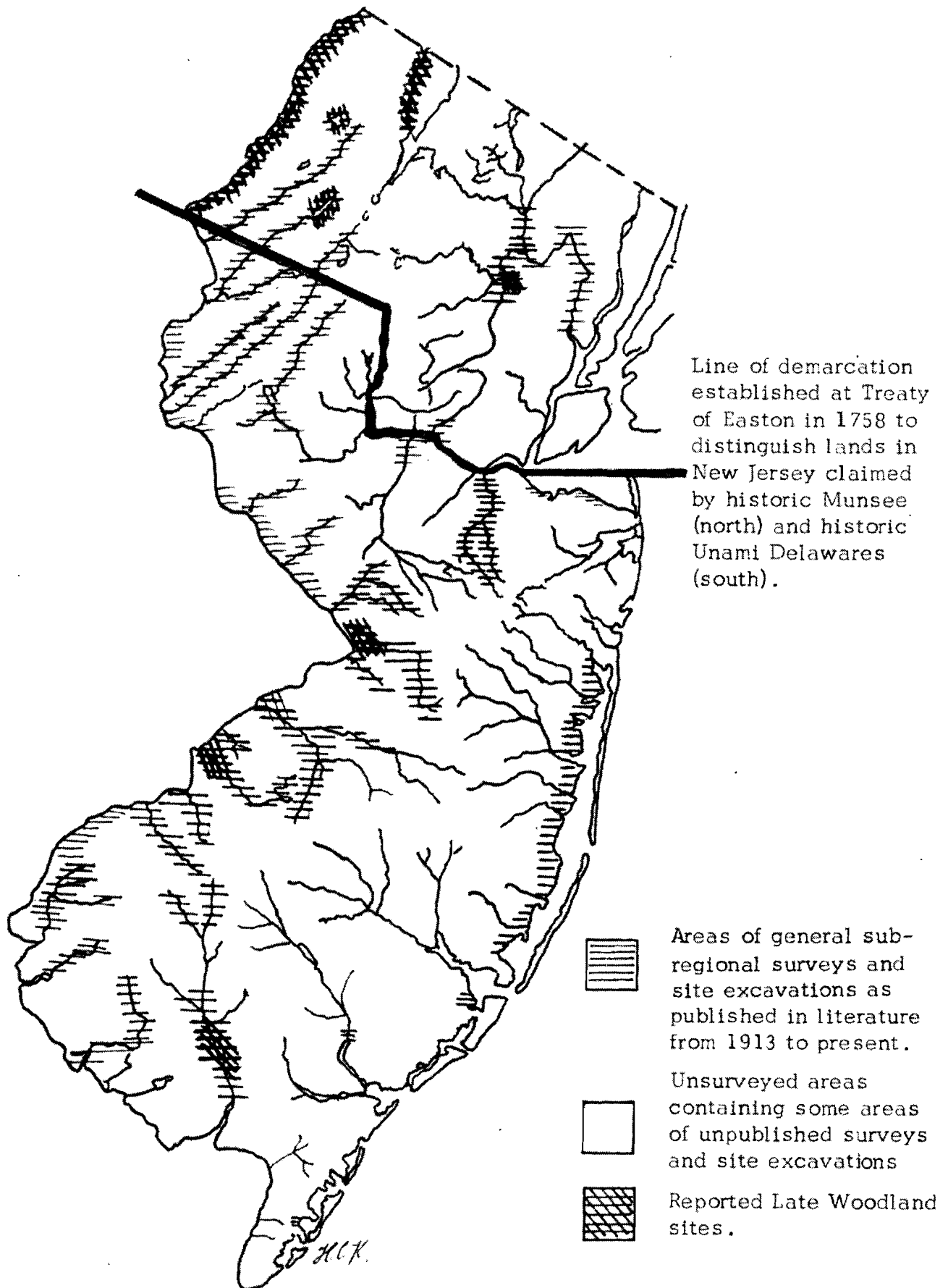
Introduction

Six centuries, more or less, from Middle Woodland times to the coming of European traders and settlers, encompass the Late Woodland Stage or Period. During this time (ca. A.D. 1000 A.D. - 1600), it appears that the entire region now identified with New Jersey, eastern Pennsylvania, southern New York, and the northern portions of Delaware and Maryland, was the homeland of the ancestral Lenni Lenape, or Delaware Indians, as these people came to be known by the Euro-Americans (Newcomb 1970:1-5; Kraft 1974; Weslager 1972; Snow 1978:59; Goddard 1978),

From ethnohistoric records, it may be inferred that these people were not a tribe in the political sense (Lindstrom 1925:128-130; Holm 1834:133; Goddard 1978:213), and they were apparently not very numerous. Mooney (1928:4) and Kroeber (1939:140) estimate that there were 8,000 Lenape in 1600 A.D. Most of these Indians were living in small, dispersed, and essentially autonomous groups - a condition that can be substantiated archeologically (Kraft 1975, 1978).

In historic times, the Delawares were divided into two major linguistic and cultural groups, a dichotomy that continues to this day among the living descendants of the earlier inhabitants of New Jersey. By the seventeenth century, the Delaware proper, sometimes called the Unami Delaware, claimed most of the central and southern portion of the state; a related Munsee Delaware-speaking people were located in the northern section spilling over into Pennsylvania and New York. This territorial division between the historic Munsee and Unami Delaware "nations" was made explicit at the Treaty of Easton (October 23, 1758), at which time the former territorial boundaries of each group were reaffirmed (Map 1). The Minisink, Pompton, and other "Munsee" Delaware claimed all the land from the then border:

... between the provinces of New York and New Jersey, and down Hudson's River, to the mouth of Raritan up the same to Alametung Falls, on the north branch of Raritan River, thence on a straight line to Paoqualin Mountain, where it joins on Delaware River, and thence up the Delaware to Cushytunk ... (Smith 1765:475; Kraft 1977, 1978).

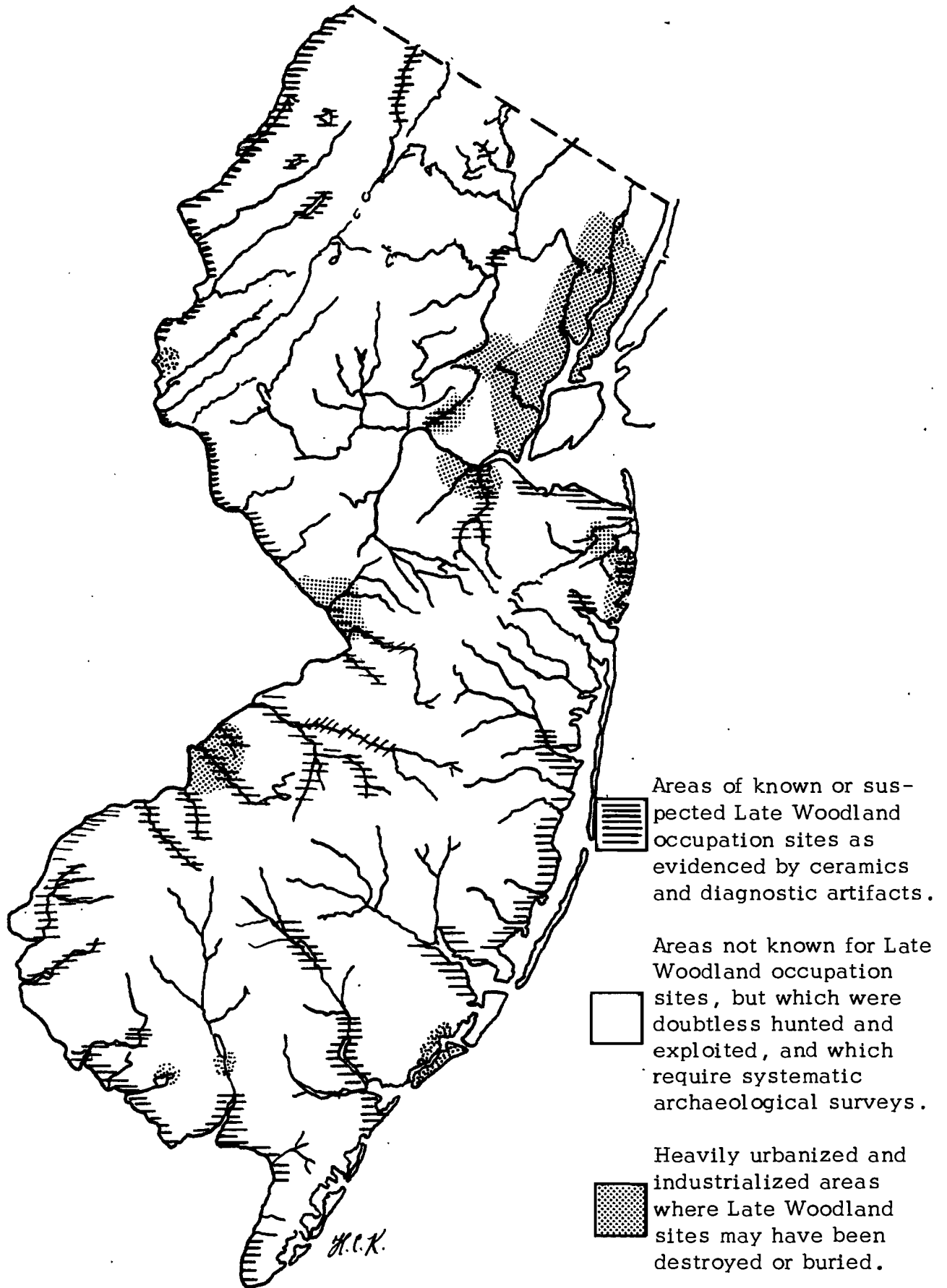


Map 1. Areas in N.J. reported in past surveys and/or excavations. It is important to note that most surveys only rarely attributed sites to specific periods. Those sites with reported Late Woodland manifestations are indicated.

The remaining land south of this Raritan River divide was claimed by the Unami Delawares. This historic territorial division is congruent with the linguistic differences (Goddard 1978) and cultural differences (Kraft 1974:30) manifested in the archeological and ethnographical records concerning the northern and southern Delaware peoples.

The Late Woodland Period is a time of intensive occupation and gardening along major riverine sites, and of selective seasonal exploitation of interior and coastal hunting-gathering sites. Numerous lithic and ceramic artifacts attest to trade and culture contact with peoples from throughout New Jersey, east to Staten Island and Long Island (Jacobson 1980; Levine 1978), west to the Susquehanna Valley (Witthoft and Kinsey 1959), and north into the Mohawk Valley and other parts of New York (Ritchie 1969; Kinsey et al. 1972; Kraft 1972).

An adequate comprehension of the Late Woodland Period in northern and southern New Jersey is hampered, however, by several factors: 1) Archeological excavations of Late Woodland sites have been confined mostly to the Delaware River Valley north of the Delaware Water Gap (Kinsey et al. 1972; Kraft 1975, 1978) and to certain riverine sites on the Inner Coastal Plain, and on or near the Maurice River (Cross 1941, 1956; Mounier 1972, 1972a, 1974). Virtually no Late Woodland Period sites have been scientifically excavated and reported from such major drainage systems as the Hudson, Passaic, Hackensack, Raritan, Musconetcong, Manasquan, or Mullica Rivers, for example; 2) Many areas which are known to have been Late Woodland or Contact Period Indian village sites were situated on lands which also appealed to later White settlers and to commercial interests. Such sites are now covered over by sprawling urban centers such as Camden, Trenton and New Brunswick, by industrial and port facilities of northeastern New Jersey opposite Manhattan and Staten Island, and by certain seaside communities (Map 2). Sites are also buried under refuse and landfill, like those beneath the Meadowlands Sports Complex and the Newark International Airport. The latter sites, although beyond archeological reach at the present time, are, in fact, sealed-in; hence, they may be preserved for future archeologists; 3) The ethnohistoric literature relating to the indigenous peoples of New Jersey during the early contact years is meager and superficial when compared with the eye-witness accounts dealing with the Huron, Iroquois, or Powhatan Indians, for example. Moreover, such early references as "Robert Evelyn's Indian Tribes and Place-Names of New Albion" (Weslager 1954), or seventeenth century maps like the "Caerte vande Svydt River in Niew Nederland" (Dunlap and Weslager 1958) or the "Novi Belgii Novaeque Angliae ..." by Nicolas J. Visscher (1656), leave much to be desired both in terms of accuracy and information.



Map 2. Presently known loci of Late Woodland sites, or areas seriously suspected to have had Late Woodland occupation.

The physiographic provinces and subprovinces in New Jersey, which are to be addressed in this paper, have already been defined by the authors (see Archaic section of this volume, and Map 3). It is important, however, to reaffirm that the division between the northern portion and the southern three-fifths of the state is not altogether arbitrary since the geographical boundary between the coastal plains, as demarcated by the Raritan River, and the northern provinces coincides quite clearly with documented cultural and linguistic boundaries in Late Woodland and early historic times as well (Smith 1765:473; Goddard 1978; Kraft 1977:3-6).

Among the elements to be considered in this section are: 1) the lithic, ceramic, and organic artifacts and features which are diagnostic of the Late Woodland Period and which help to differentiate the Late Woodland Period in northern and southern New Jersey; 2) the nature and distribution of Late Woodland sites; 3) the culture history and chronology of the Late Woodland Period as it is perceived presently, 4) the kinds and quality of past archeological activities relating to this period; 5) the biases and limitations of past research; and 6) the kinds of information and research needed to insure the intelligent and responsible management of Late Woodland and other archeological resources.

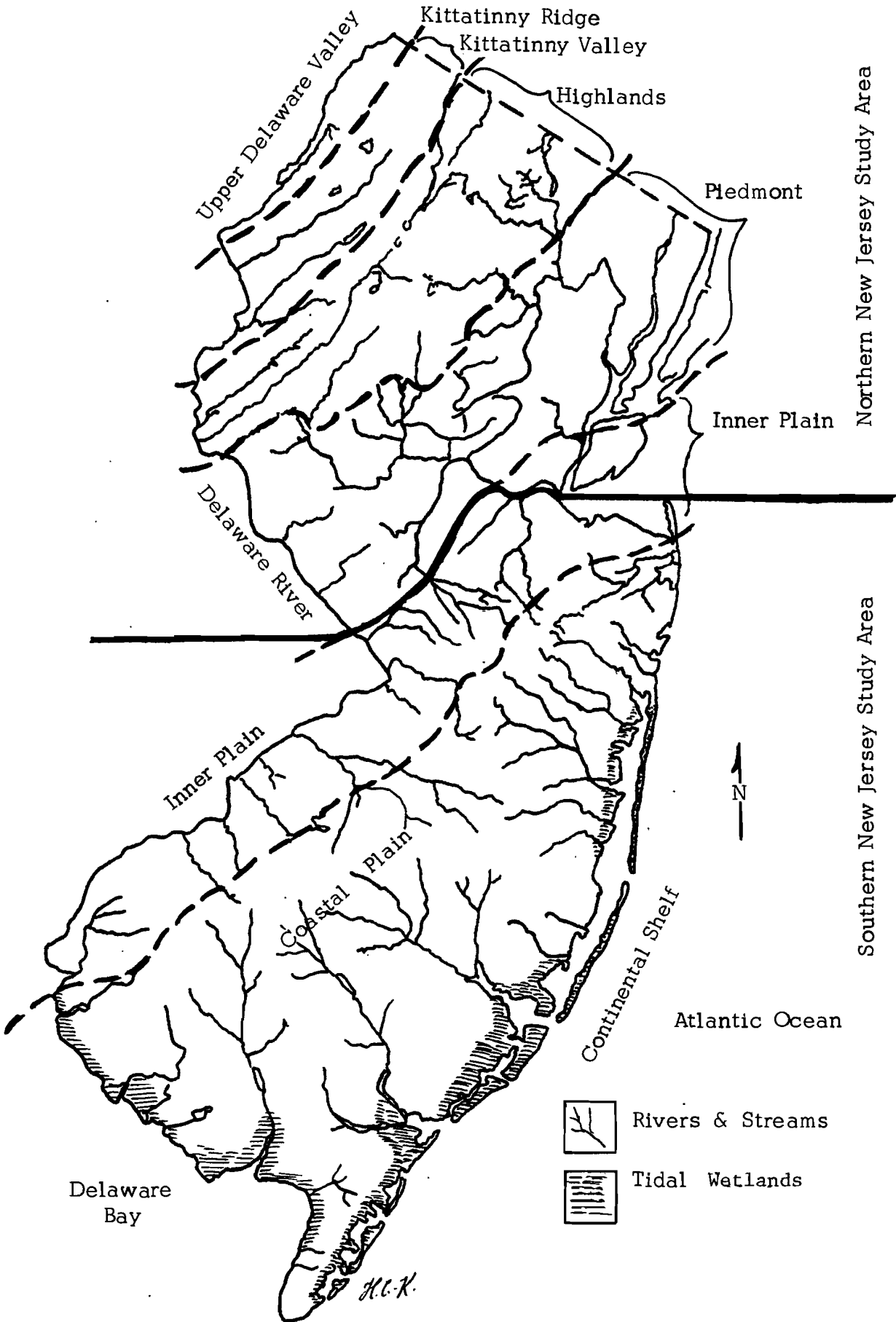
The Late Woodland Period in Northern New Jersey

by
Herbert C. Kraft

Preface

The aboriginal peoples who, in late prehistoric times, occupied most of northern New Jersey, Manhattan and Staten Island, western Long Island, southeastern New York, and northeastern Pennsylvania were a branch of the Lenni Lenape or Delaware Indians who spoke a Munsee dialect of the Eastern Algonquian language. This Munsee dialect is distinct from the Unami dialect spoken by most of the Indians who inhabited central and southern New Jersey. It also differs from Mahican and the languages of southern New England and eastern Long Island (Goddard 1978:213).

Differences between the indigenous people of northern and southern New Jersey are also evident in their respective ceramic traditions and apparently, even in their diverse burial practices. Moreover, it is reported that some Unami-speaking Delawares, as for example the Sankhikans, were enemies of the Munsee speakers of the northern and circum-Manhattan areas (de Rasieres 1909:103-140; de Laet 1909:45; O'Callaghan 1853:367; Goddard 1978: 215). It is not surprising, therefore, that the line of demarcation which separated the historic Munsee and Unami territories at the Treaty of Easton in 1758 followed cultural, linguistic, and political lines



Map 3. Physiographic subprovinces and principal riverine systems in N.J. The arbitrary division between the Northern and Southern study areas is indicated.

which were probably already well established by Late Woodland times. This judgement has archeological support since it can be demonstrated that material remains (ceramics, in particular) found on Late Woodland sites in northern New Jersey are comparable with artifacts from Late Woodland sites found in the Hudson and Mohawk Valleys of New York (Ritchie 1969; Kraft 1975b; Lenig 1965). By contrast, the artifacts and ceramics from many central and southern New Jersey sites demonstrate affinities with Late Woodland traditions extending south into the Delmarva Peninsula (cf. Cross 1941 Pls. 10, 12, 14b, 22, 23; Omwake and Stewart 1963; Lopez 1961). It is to be expected, of course, that examples of both northern and southern pottery vessel types as well as a certain mixture of socio-cultural traits will occur with greater frequency on sites which are in some proximity to both culture areas, as for example Staten Island (Jacobson 1980) and sites on the Navasink Highlands.

The Upper Delaware River Valley--the territory of the historic Minisink Indians--has been the scene of most archeological excavations pertaining to the Late Woodland Period in northern New Jersey. The artifacts and features recovered from these sites have been abundant and informative but not very distinctive. In fact, it is sometimes difficult to distinguish some of the lithic and ceramic artifacts in the Minisink area from those found on Owasco and Proto-Iroquoian sites in New York (Ritchie 1969:272-300; Kraft 1975:59-61, 1977, 1978). This apparent similarity in culture traits raises interesting questions concerning contact and interaction among these diverse people.

In upper New York, the Owasco people are identified as the ancestors of the historic Iroquois. However, it is quite apparent that these Owasco had no genetic relationship to the Lenape peoples of northern New Jersey or southeastern New York since the latter spoke an Algonquian language and had a different sociopolitical system (Fenton 1971:129-139; Brassler 1971:64-66; Goddard 1978).

In more than a decade of archeological work in the Upper Delaware River Valley, this author has come to recognize the need to employ terms which clearly set apart the archeological and cultural identity of the prehistoric Late Woodland inhabitants in northwestern New Jersey from the Owasco-Iroquois people of upper New York whose archeological remains sometimes bear a superficial similarity. The terms which this author has employed for the early part of the Late Woodland Period in the Upper Delaware River Valley are "Pahaquarra Culture" (representing the time from ca. A.D. 1000 - 1350), and a later, protohistoric and early historic "Minisink Culture" dating from ca. A.D. 1350 - 1600 (Kraft 1974:33-46, 1975:59-61; Griffin 1978:271-272; Snow 1978:62-63).

The term "Minisink Culture" is germane for the Minisink Indian branch of the Lenape/Delaware who occupied the northwestern portions of New Jersey, northeastern Pennsylvania, and adjacent lands in New

York. However, when interests extend across all of northern New Jersey and the circum-Manhattan areas in late prehistoric times, a more encompassing term is required in order to include the ancestral Hackensack, Raritan, Aquakanonk, Tappan, Pompton, and other Lenape/Delaware bands who occupied these lands (Swanton 1952:49; Ruttenger 1872). Henceforth, this author will employ the term "Proto-Munsee" as an all embracing cognomen. By extension, a comparable term should be employed when referring to the collective Late Woodland bands in southern New Jersey - the ancestral Sankhikan, Navasink, Assiscunck, Rancocas, Schackamaxon, Yacomanshaghking, Eromiex, Narraticon, Mantese, Siconesse, Sewaposee and Kechemeché, for example. For this collective group, the term "Proto-Unami" is proposed.

Late Woodland Cultural-Historical Reconstruction: Northern New Jersey

THE PAHAQUARRA CULTURE (ca. A.D. 1000 - 1350)

The Pahaquarra Culture is documented from many sites on both sides of the Delaware River above and, to a lesser extent, below the Delaware Water Gap. The people who are representative of this culture seem to have lived in small unfortified hamlets consisting of one or more biological or extended families. Some of their houses were oval but most appear to have been round-ended long-houses with the doorway on one of the long sides (Kraft 1970, 1970a, 1975:75-86, 1978:20-23). Archeological and ethnographic evidence indicate that such lodges were constructed with both an inner frame, upon which the bark shingles were tied, and an outer frame to lend additional stability. The postmold patterns of such houses, excavated to date, describe structures measuring from 18 to 60 feet in length and up to 20 feet in width, with benches or sleeping platforms along one of the long sides, and one or more partitions (Kraft 1970a).

House posts and timber for other purposes, including fire wood, were cut by means of a celt or ungrooved axe (Fig. 1 i-l). The grooved axes of earlier times had long since been abandoned. Chisels (Figure 1 m) and wedges made from elongated river pebbles, and whetstones (Figure 1 p) made from fine grained silt-stones were part of the builder's and woodworker's toolkit, as were drills, scrapers, and knives.

All of the excavated house patterns have one or more deep storage pits inside the structures near one or both ends. Presumably, nuts, berries, dried fish or meat, and certain cultivated foods were cached in these storage cellars for use in the winter when similar storage pits outside of these houses were covered over with snow.

Pits of various sizes and configurations are abundant on all Late Woodland sites. Some of these pits are simple saucer or bowl-shaped depressions, presumably used as fire pits or for the

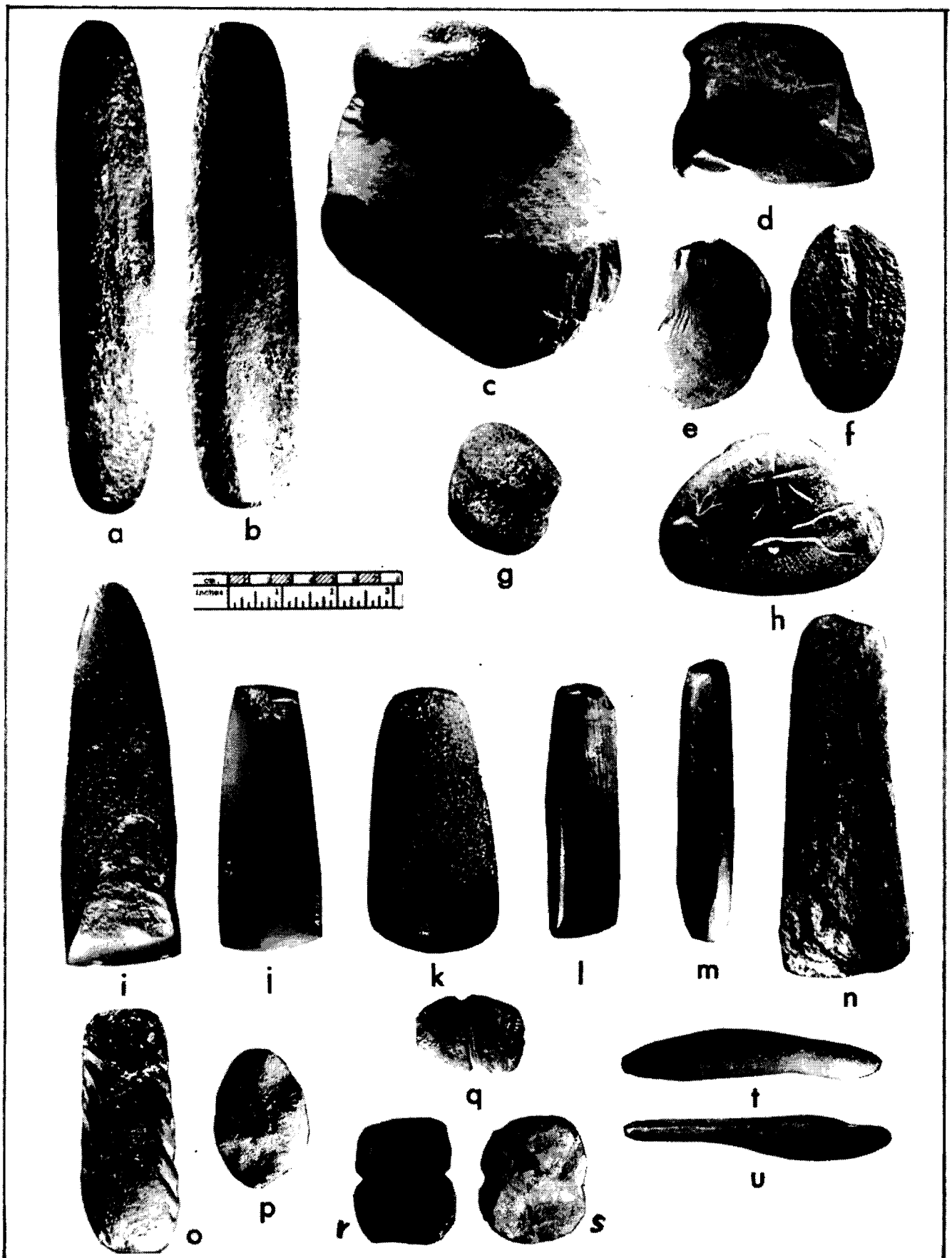


Fig. 1. Artifacts of the Late Woodland Period, a,b, roller and mano-like pestles; c, pitted muller and milling stone; d, ground slab knife; e,f, teshoas; g, grooved hammerstone or maul; h, ground knife adorned with incised petroglyphs; i-l, ground celts; m, ground chisel; n, chipped sandstone hoe blade; o, sinew stone; p, whetstone; q-s, trimmed netsinkers; t,u, elongated pebble tools. (Collection of Seton Hall University). All items from the upper Delaware Valley.

disposal of refuse. Storage pits are usually much larger, depending upon the stability of the soils into which they were dug. Some of the storage pits dug by the Minisink Indians in the Upper Delaware River Valley measured up to 98 inches in depth and more than 60 inches in diameter. The usually flat bottoms of such pits were sometimes covered with marsh grass or bark, and charred food remains are found occasionally in such associations.

The cultivation of domesticated plants such as maize, beans, squash, pumpkins, tobacco, and possibly sunflowers began sometime during the Late Woodland Period (Ritchie 1969:276). Remains of corn, beans, and cucurbits have been recovered from pits attributable to the Minisink Culture in the Upper Delaware Valley (Kraft 1975: 155, 158, 1978:28-45). There is, however, no unequivocal evidence that such plants were also being grown during the earlier Pahaquarra times. Ethnographic records indicate that the men helped to clear the land by burning the trees and shrubs, and then prepared the soils but the farming itself was done by the women. Simple hoe blades of stone have been found (Figure 1 n), although similar garden tools made from the scapulas or antlers of deer or elk, and wooden dibbles, may have decayed without trace.

Gardening contributed very significantly to the nourishment of the population, and indeed, may have permitted an increase in the size of the group; nonetheless, hunting and gathering were still important. Men were now using the bow and arrow almost exclusively, the arrow being tipped with broad, triangular points of the Levanna type (Figure 2 a-g).

It is reasonable to suppose that snares and traps were used as well. On sites where the preservation of faunal remains is good, archeologists have found the remains of numerous animals that have been butchered and eaten. Deer, elk, and bear provided the most meat per animal but turtles, frogs, and birds of various kinds were eaten. Dogs were also eaten, either out of necessity or on ceremonial occasions (Kraft 1978:31-33). Little, if anything, was wasted; bones were cracked open to extract the marrow, and then they were often oiled to extract bone grease (Leechman 1951:355-356; Kraft 1978:42). Turtle shells were made into cups and rattles; long bone splinters were used as skewers for eating (Webb 1946:285-286; Winters 1969: 50-51; Kraft 1974a, 1978:70-71) or as awls (see Figure 2 z-aa). Some bones were also made into tools and ornaments (Figure 2 n and bb; Kraft 1978:70-72).

Stone tools used in butchering included the ubiquitous teshoas (Figure 1 e-f) which were large cobble flakes that could be used as knives, choppers, or scrapers (Kraft 1966, 1975:102-106). Flake knives, hammerstones, and anvilstones and, of course, ceramic pots, were in common use by this time (Figure 3). Not infrequently, a triangular arrowhead might be pressed into service as a knife or reamer or, when such a point was inbedded into a handle, its base could serve as a most efficient scraper (Figure 2 k-m). These were resourceful people!

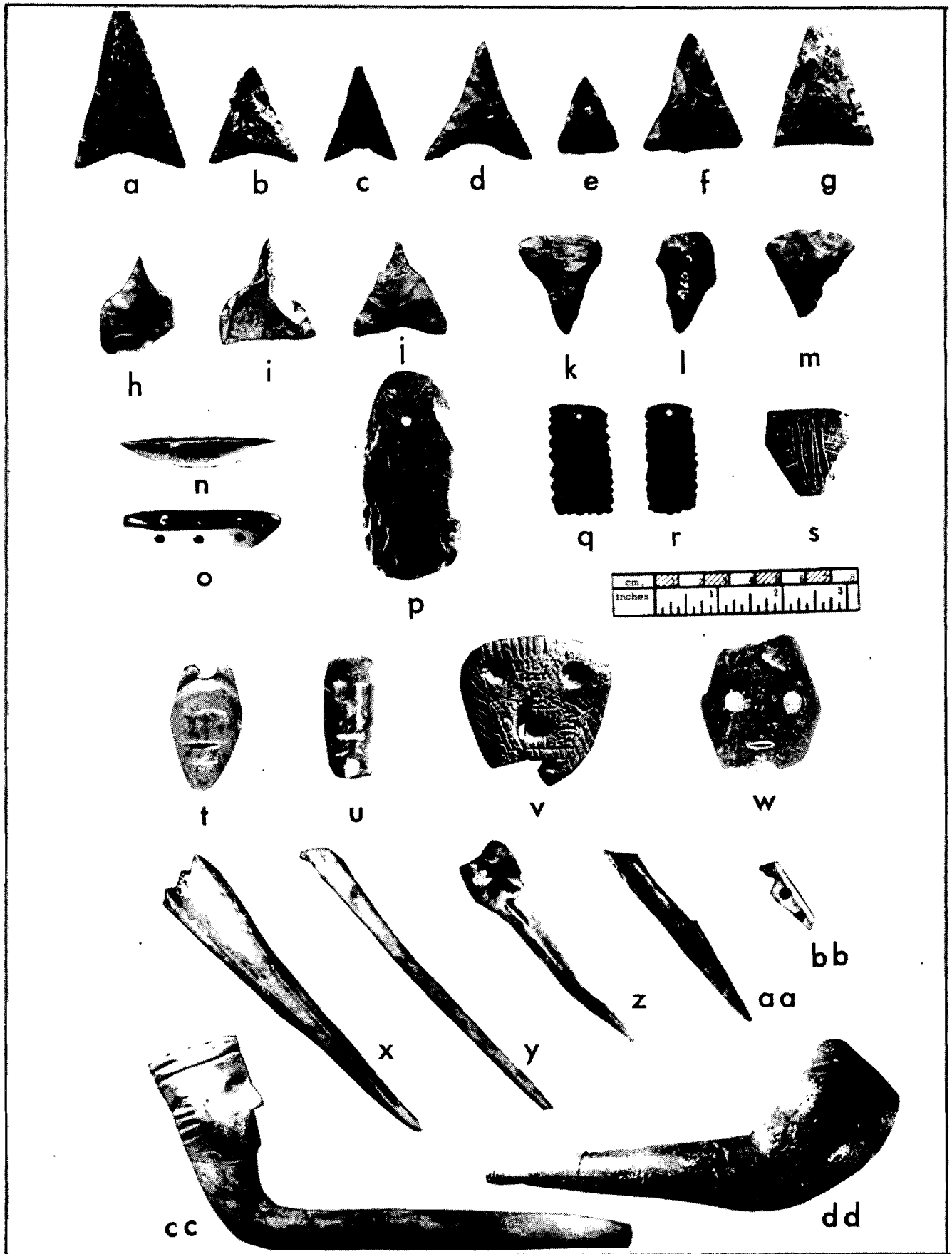


Fig. 2. Artifacts of the Late Woodland Period. a-g triangular projectile points; h-j gravers or perforators; k,m, scrapers; l, strike-a-light; n,o, canoe-shaped artifacts of unknown use; p-r, perforated pendants; incised slate object; t, horned human effigy pendant; u-w effigy pendants; z-aa splinter awls or skewers of bone; bb, fragment of bone whistle; cc, effigy tobacco pipe of clay; dd, clay tobacco pipe. Items n,u,v,cc Collection of F. Dayton Staats, all others Seton Hall University. All collected in upper Delaware Valley.

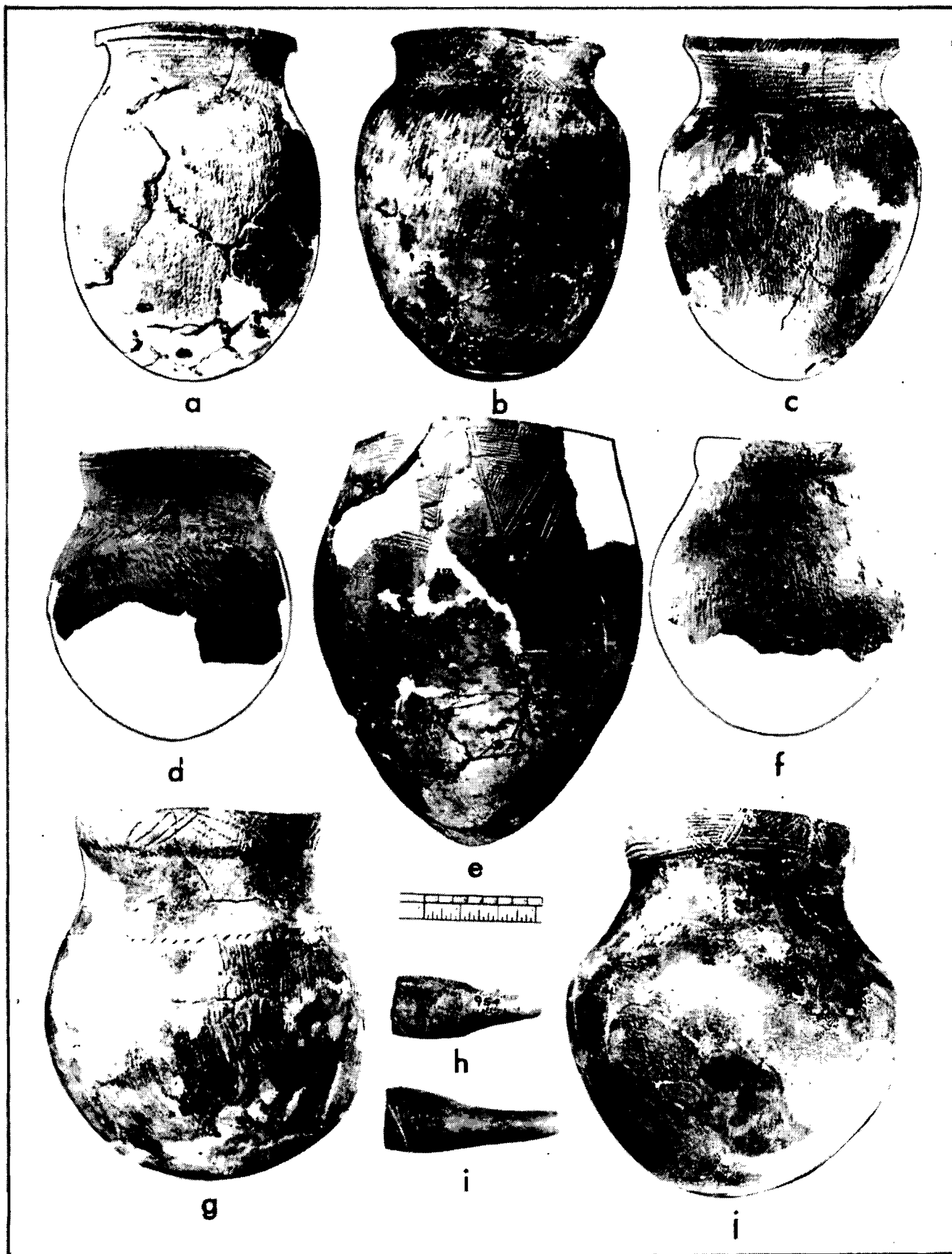


Fig. 3. Ceramic artifacts from the Late Woodland Period - Pahaquarra Culture.
 a,c, Owasco Corded Horizontal vessels; b, Owasco Herringbone pot; d, Owasco Corded Collar (Kelso Corded); e, Indian Head Incised (?) vessel; f, Castle Creek punctate vessel; g,j, Oak Hill Corded vessels; h,i, pottery tobacco pipes. Items a,c,e,g,h,i, collection of F. Dayton Staats, all others collection of Seton Hall University. Items h,i, larger than scale.

Fishing was a major occupation on Late Woodland riverine sites, especially when anadromous fish, such as shad, were making their annual spawning runs upstream. Fishing during such times doubtless required the cooperation of all adults and grown children because fish weirs had to be built and maintained, and gill nets or seines of considerable size, weighted with notched pebble netsinkers (Figure 1 q-s), had to be employed to round up a catch. Bone fishhooks, fish gorges, and harpoons such as are found on Owasco-Iroquois sites in New York are almost never found on New Jersey sites; although, the antler harpoons found on the Abbott Farm Site below Trenton are an exception (Cross 1956:Plate 29). Such bone fishhooks and other gear may simply not have survived in New Jersey's highly acidic soils or perhaps, they were not used by the local people.

Freshwater mussels were gathered from the rivers. Thousands of discarded shells have been found in many of the pits and middens on the river terraces. Large cobble-lined hearths and rock-filled platforms suggest the use of smoking and drying areas in the preparation of mussels and fish for subsequent storage (Kraft 1978:37-38).

Canoes were used for fishing and for transportation on the rivers. There was no suitable birch bark in the area, as was employed for canoe building farther north, but elm bark may have been an acceptable substitute. Large logs were hollowed out for dugout canoes and some of these dugouts have been found preserved in the muck at the bottom of several lakes in New Jersey.

Before the coming of the Europeans, life was apparently quite peaceful. There is very little evidence of violent death, and no defensive palisades or fortifications enclosed the Indian settlements. The burials which have been encountered during excavations are generally tightly flexed or folded together, and placed in shallow, bark-lined graves. Grave goods were not usually placed with the inhumations of the Late Woodland Period. Apparently, cemeteries were not set aside for the interment of the dead; instead, the graves were scattered here and there throughout the site. The Delaware seemingly did not fear the departed, and occasionally, these Indians even disinterred the skeleton of a loved one, bundled it up, and transported it for burial at a new location or, perhaps, at an ancestral site. Cremation, although practiced in the Terminal Archaic and Early to Middle Woodland Periods, ceased by Late Woodland times.

The ceramics of the Pahaquarra Culture are among its more distinctive and diagnostic artifacts. Vessels, almost identical with those from Owasco sites in upper New York, were molded with an egg-shaped or globular body and a collarless, usually outflaring rim. The bodies of such pots were invariably roughened with cord markings, while the neck, upper rim, and lip were ornamented with cord-impressed linear designs (Fig. 3 a-c). Slips and surface colors were not used, and the vessels were fired above ground; no kilns are known to exist.

Pottery vessels of the Pahaquarra Culture varied in size from so-called "toy pots" no larger than present-day whiskey glasses, to community-type vessels having a capacity of up to twenty gallons (Kinsey et al. 1972:379). Most vessels, however, had a volume of about one to three gallons.

Certain pottery forms and designs diagnostic of other culture areas, as for example Clemson Island, Overpeck, Bowman's Brook (Figure 3 e), Van Cortland Stamped, and Riggins Fabric Impressed, to name but a few, have been excavated from Pahaquarra sites in northwestern New Jersey (cf. Jones 1931; Lucy 1959; Smith 1950; Cross 1956:150, 153; Staats 1974; Kraft 1975b). These culture traits suggest trade, exogamous marriage, or other forms of inter-cultural activities with regions that were quite distant in all directions.

Smoking was well established by Pahaquarra times. Tobacco pipes were carved out of stone but most were modeled in clay. The early styles have a nearly straight or obtuse angle between bowl and stem and are simply decorated. The later pipes are often elegantly designed (Figure 3 h-i).

Sometime between A.D. 1300 and 1350, the collarless cord decorated pots were gradually replaced by pots having low to medium high collars, some of which were decorated with cord impressions, others with interrupted linear incisions of punctates (Figure 3 d, f, g, j). Still later, such collared vessels were decorated with incised geometric patterns. The appearance of these incised collar decorations serves as a convenient, albeit arbitrary, transition into the latter part of the Late Woodland Period in northern New Jersey.

THE PROTO-MUNSEE CULTURE (ca. A.D. 1350 - 1600)

Just as the Iroquois are believed to have evolved out of the preceding Owasco base in upper New York, so also did the Minisink evolve from the earlier Pahaquarra in the Upper Delaware River Valley where this cultural manifestation is perceived most clearly (Kraft 1974:43, 1975:59-61). The Minisink were, however, only one of several Munsee-dialect speaking Algonkian Delawares who lived in northern New Jersey (Goddard 1974:103-107, 1979:72-73). Other groups who may have spoken this dialect are known from historic records to have lived in the area north of the Raritan River claimed by the historic Munsee at the Treaty of Easton. These groups included the Aquackanonk, Hackensack, Weckguasgeek, Tappan, Pompton, and probably the Raritan in northern New Jersey as well as the Waranawonkong, Wawarsink, Mamekoting, Catskill, Haverstraw, Reckgawawanc, and Waoranic, among others, in southern New York, and certain different bands in northeastern Pennsylvania (Swanton 1952:49).

Archeologically and historically speaking, little is known about the prehistoric and early historic Indian groups who lived in the region east of the Minisink territory. Incredibly, not a single

Late Woodland site has been scientifically excavated and reported in this vast area of northcentral and northeastern New Jersey! However, ethnohistoric accounts reveal that bands, such as the aforementioned, were small and politically independent. There was no such thing as a confederation or tribe until after these people had been forced from their traditional homelands in northern New Jersey and southern New York. It was only in the 18th century that the term "Munsee" or "Munsee Delaware" was applied to the remnant bands who coalesced with the Minisinks as they too were being forced westward out of the New Jersey. In fact, the term "Munsee" first appeared in Pennsylvania records in 1727 (Hunter 1974, 1978). For this reason, a term such as Proto-Munsee is more appropriate when addressing the Late Woodland Delaware Indian populations who lived in northern New Jersey from ca. A.D. 1350-1600.

In reconstructing the lifeways of the Proto-Munsee peoples in Late Woodland times, it is helpful to note that the contemporary Iroquois of upper New York and the inhabitants of the Susquehanna Valley in Pennsylvania (Kinsey 1977) were building large villages, and that numerous houses were clustered within palisaded or stockaded enclosures. Some early maps, as for example the Nicholas Vissher map (1656), Hugo Allard map (1673), and John Seller's map (1675), contain the same illustration of a square palisaded village enclosing 12 rectangular houses in two neat rows, and a circular stockade enclosing six rectangular houses (Kraft 1977:7-11). Cartographers and historians agree that such illustrations on early maps all too frequently represented attempts by map makers to fill in space concerning which they had little information, and also to add interest to their cartographic landscapes. Some writers have uncritically accepted such illustrations as evidence that the Minisink and other Lenape Indians had fortified towns (cf. Philhower 1953; Goddard 1979:218-219). In fact, there is no archeological evidence that the Delaware Indians ever lived in sizeable villages or within stockaded or palisaded fortifications. The limited historic and archeological evidence suggests that the Minisink Indians - the only ones for whom there is any direct archeological evidence - lived in small hamlets consisting of one or a few round-ended longhouses without fortifications of any kind (Kraft 1970, 1975: 75-82, 1978:20-23). It is a tragedy that no one has located or excavated any of the historic sites of the Hackensack bands at Pavonia, or the village sites of the Raritans, Pomptons, and others. Today, such sites may have been destroyed by urban construction.

The longhouse patterns that have been excavated and recorded in the Upper Delaware River Valley differ in several respects from the typical longhouses of the Iroquois in upper New York. The Minisink longhouses were round-ended with a single entrance at the side, whereas those of the Iroquois were rectangular with entrances at both ends. The interior arrangements were also different

(ibid.). Such longhouses in northern New Jersey measured from 18 feet to 60 feet in length and up to 20 feet in width. Evidence suggests that these houses were the dwelling places of a single biological family or an extended family in the case of a larger house.

Hunting, fishing, gathering, and gardening continued in the tradition of the earlier Pahaquarra Culture but now such cultivated plants as maize, several varieties of beans, squash and pumpkin, tobacco, and possibly sunflowers were standard crops. There were no domesticated draft animals; hence, all work had to be accomplished by humans. The hoe, made from a flat stone or the shoulder blade of a deer or elk mounted onto a handle, and a wooden digging stick or dibble were the principal gardening tools. Unfortunately, only the stone hoe blades have survived (Figure 1 n).

Harvested crops were often dried and placed in baskets or pots stored within the bark house or cached in deep storage cellars located within or outside the house (Kraft 1975:75-86). Such storage pits, some of which measured 5 feet to 6 feet in diameter and up to 8 feet in depth, were lined frequently with bark or grass and were used for several seasons or until the walls weakened; they would then be filled with refuse and sealed over. Refuse pits are often very informative, containing as they do the remains of meals (bones of identifiable animals with butchering marks, mussel shells, and the charred remains of corn, acorn or other vegetable foods), broken pots, discarded stone tools, and charcoal from the fire hearth. The latter can be radiocarbon dated, and thus provides the archeologist with a fairly useful means of dating a site or an assemblage of artifacts.

Late Woodland artifacts found on numerous sites throughout northern New Jersey consist of the following:

1. Hunting Weapons. The bow and arrow is the weapon of choice. The arrows are armed invariably with triangular projectile points (Figure 2 a-g). Snares, traps, and deadfalls are recorded in the ethnographic literature but archeological evidence for such devices is unattainable because they were constructed above ground and with perishable materials.
2. Butchering and Hide Preparing Tools. These tools include knives made from teshoas (Figure 1 e-f), large flakes, chipped bifaces, or slabs of stone with ground edges (Kraft 1975:101-107 and Figure 1 d). Skins or hides were processed with scrapers made from fine grained stone, unifacially flaked, and with the use of bone beamers. Bones were usually broken open to extract the marrow; anvilstones, hammerstones (Figure 1 g), pitted stones, and heavy choppers were used for this purpose. Many bone fragments were placed in pots and cooked for the extraction of bone grease (Leechman 1951:355-356; Kraft

1978:42). Sinew, for use in bow strings or for sewing, was prepared with a sinew dresser (Figure 1 o), and bone needles for sewing have been found on some sites (Cross 1956:Plate 29a).

3. Fishing. The procurement of fish was a major industry in Late Woodland times. Nets of considerable size were woven from Indian hemp and other natural fibers, and were weighted with net-sinkers made from flat river pebbles. Chipped rectangular slabs were notched on opposite sides to permit their being tied as weights to the bottom of seines, gill nets, or casting nets (Figure 1 q-s). Fish weirs, made by placing rocks and boulders in the river in such a manner as to create a V-shaped funnel, enabled the aboriginal fisherman to "herd" schools of fish into an enclosure from which they would be easily extracted. Such weirs, coupled with the use of nets, were especially useful when anadromous fish, like the shad or eel, were migrating uprivers to their spawning grounds (Kraft 1978:37-38).
4. Plant Food Processing Tools. These tools included stone knives and choppers for cutting and shredding. Mortars and pestles, or milling-stones and mullers, were employed for grinding dried grain, seeds, nuts, berries, roots, and other foods to make fine or coarse flour for bread or gruel (sapan), and possibly a form of pemmican (Figure 1 a-c).
5. Cooking. Cooking in pots, roasting, or baking was done over an open fire or in a stone-lined fire pit or hearth. Such hearths frequently contain broken and discarded stone artifacts, bone, and charcoal which can be radiocarbon dated. Vessels associated with cooking included a variety of shapes and sizes of clay pots (Figures 3 and 4), bowls made from turtle shell carapaces and gourds, and wooden bowls and ladles; the latter are known only from historic specimens and ethnographic references. Eating utensils included a skewer or single tined "fork" made from a sharply pointed bone (Figure 2 z-aa).
6. Woodworking and Domestic Tools. The celt or ungrooved axe (Figure 1 i-k) was the principal heavy tool used during this period. Stone chisels made from elongated river pebbles (Figure 1 l-m), graters, perforators, and drills made from durable fine grained cherts, abrading stones, whetstones and shaftsmoothers made from coarse-grained stone, as well as the ubiquitous teshoas, choppers, and flake knives were also used regularly for a variety of purposes.
7. Ornaments. Items of personal adornment are found infrequently. Small ear or neck pendants (Figure 2 p-r) and an occasional bone or antler comb have been recovered. Tobacco pipes, used by both men and women, were decorated by means of incised lines, and occasionally by means of carvings or sculptures on the bowl (Figure 2 cc, dd). Human faces, when they occur on tobacco pipes, usually face the smoker. The same may be said of human faced pendants which were suspended upside down so that they look up at the wearer (Kraft 1975a and Figure

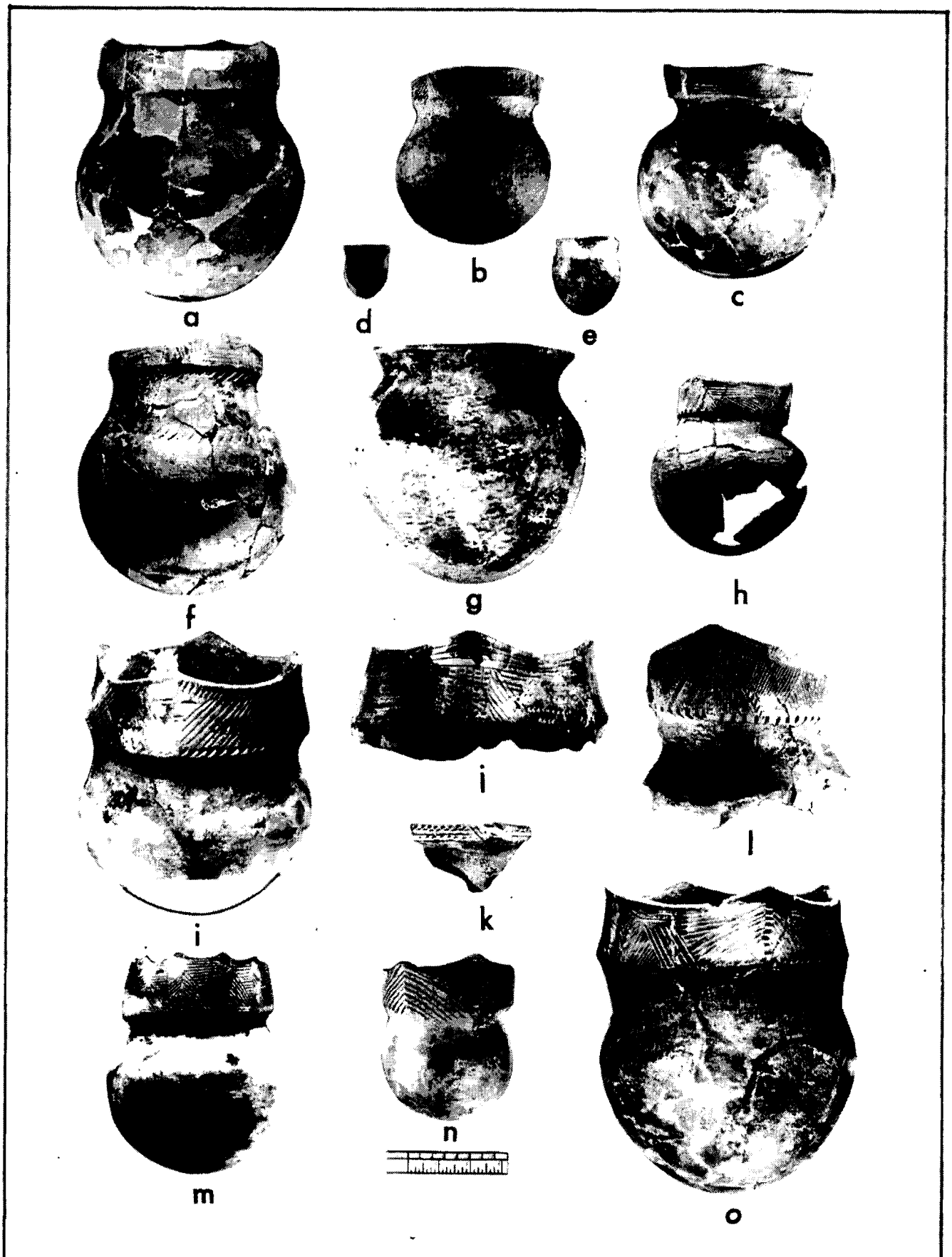


Fig. 4. Pottery vessels of the Late Woodland Period - Minisink Culture of the upper Delaware Valley. a,b, Chance Incised vessels; c, Deowango Incised vessel; d,e, small cups or "toy pots"; f, possible Cayadutta Incised vessel; g, untyped terminal Late Woodland collarless vessel; h, possible Garoga-like vessel; i,j,l, m,n,o, "Munsee Incised" vessels, k, Otstungo Notched rim sherd. Artifacts i,k, have effigy faces impressed into the collar and rim. Artifacts b,f,i,o are from collection of F. Dayton Staats, all others Collection of Seton Hall University.

2 u, v). Such effigy faces, simply designed with only two eyes and a mouth, appear with some frequency on Munsee incised and other Late Woodland pottery (Kraft 1975:141, 144; Smith 1950:191; Figure 4 k, l).

8. Petroglyphs. Carvings on stone are rare in New Jersey but a few carvings on large boulders or rock ledges have been found. These petroglyphs usually consist of stick figures or outlined figures (Kraft 1969, 1974; Lenik 1973:57-59).

The three areas in which the northern New Jersey, Proto-Munsee Delawares differ from their southern, Proto-Unami counterparts have already been noted, i.e. dialect, pottery, and burial orientations. The linguistic differences have been addressed by Ives Goddard (1974, 1979). These language or dialect differences continue to this day.

The pottery of the Proto-Munsee people is best known from excavations of Minisink Indian sites in the Upper Delaware Valley, although specimens of similar form and design have been found elsewhere in northern New Jersey. Ceramic vessels of this time period generally have smooth, globular, or elongated bodies with medium to high collars. Decorations are incised into the rim, collar, and shoulder of the pot, and consist of triangular and linear geometric patterns in complicated interrelationships. The Proto-Unami pottery from sites in central and southern New Jersey is usually bag or hornet's nest-shaped, and without collars (Figure 3 e).

During the latter part of the Late Woodland Period, effigy faces begin to appear on Minisink and Proto-Munsee pottery vessels and pipes. Such effigies, like those on pendants, are simple facial abstractions: two eyes and a mouth impressed or incised into an otherwise plain surface. These faces may represent the "Living Solid Face" of Mesinghalikun, a deity who watched over the game animals and who also saw to it that the hunter obtained sufficient food to satisfy the needs of his family (Kraft 1968: 50-51; Speck 1931:41).

Similar effigy faces were pecked into large cobbles; these may indicate a possible masking complex such as the historic Lenape or Delaware Indians are known to have had and which the Iroquois still employ in their False Face Society rituals. Such effigy faces may be all that remain in New Jersey of the formative Big House Ceremony (Speck 1931; Goddard 1979).

The burial patterns of the Late Woodland Proto-Munsee Delawares are of special interest because the majority of skeletons are oriented with their heads to the southwest or west. In the central and southern portions of the state, by contrast, there appears to be a tendency to favor an eastern orientation. This preferential

burial orientation continues among the present day Delawares who favor burial with the head to the east, and the Munsee who still bury their dead with the head to the west (Dean 1978:7; Kraft 1975:90; Goddard, personal correspondence). According to Harrington (1921:132), the historic Munsee believed that "the Sun and everything else goes towards the west, even the dead when they die", and "the land of the spirits lies in the Southwest, in the country of good hunting" (ibid:54).

The deceased were usually placed in shallow, bark-lined graves. The body was more or less tightly flexed or folded with the knees drawn up and arms crossed over the chest or bent with the hands at or near the face. Grave offerings are seldom placed with the dead; an occasional individual might, however, be accompanied by a clay pot (presumably containing food), a tobacco pipe, or a celt (i.e. hatchet). The practice of bundle burial or reburial is observed occasionally (Kraft 1974a:29, 1979:59-95), but cremation is no longer practiced.

An examination of the skeletal remains suggests that the prehistoric Proto-Munsee Delaware were remarkably free from serious injury or disease (Hrdlicka 1916; Clabeaux 1972, 1978). Tooth decay and dental abscesses were common, probably due to the starchy maize diet, and arthritis is evident on some of the skeletal vertebrae. Infant mortality was high and life expectancy was short; few people lived much beyond 35-40 years of age (Hrdlicka 1916; Kraft 1978:52).

The exploratory visits of Verrazano in 1524 and Estevan Gomez in 1525 appear to have had little effect upon the northern New Jersey Indians; however, Hudson's voyage in 1609 effectively opened the area to European traders and settlers. The period which follows is referred to as the "Contact Period".

The Late Woodland Period in Southern New Jersey

by
R. Alan Mounier

The Late Woodland Period begins about 1000 A.D. and continues to the time of European intrusion in the 17th century. European settlement in southern New Jersey lagged by decades behind exploration. However, by the middle of the 17th century, European explorers, traders, and military personnel had made significant inroads, both on the Atlantic coast and in the Delaware Valley (Jameson 1908; Johnson 1911, 1925, Myers 1912; Weslager 1961, 1967, 1972). By this time, native culture in a purely aboriginal state had ceased to exist. Thus, many postulated Late Woodland characteristics represent projections from the historical record.

Patterns of Late Woodland life developed as an out-growth of cultural adaptations that began in Early Woodland times. While there is a demonstrable continuity in certain aspects of material culture between earlier and later Woodland representations, current evidence suggests that Late Woodland cultural adaptations diverged somewhat from earlier ones. The principal indicators of this cultural change are: 1) an apparent population increase over former times; 2) the occupation of larger sites with food-storage facilities; and 3) the rise of local or subregional ceramic styles. These changes may be due to the introduction of maize cultivation beginning about 1000 B.C., and to a related process of settling into permanently occupied territories and/or sites.

In southern New Jersey, the Late Woodland populations, like their historic successors and probable descendants, are thought to have comprised a number of relatively small bands made up of related families which communally claimed and occupied recognized territories (Wallace 1947; Gruber 1957; Weslager 1972). Some archeologists have advanced the idea that these territories can be broadly identified on the basis of artifact traits, especially stylistic embellishments on ceramic vessels (Cross 1953:7; Lopez 1961:31; Witthoft n.d.).

A mixed foraging and farming economy has been postulated. While some settlements may have been occupied permanently or for extended periods of time, it is supposed that others were used seasonally as a broad spectrum of resources became available. The pattern that emerges is one of efficient adaptation to an essentially modern environment with few resources being overlooked. The prevailing model of early historic Delaware settlement suggests that the population, while tied to a given territory, was committed to an exploitative regime which required flexibility and a considerable degree of group mobility (Wallace 1947). This putative settlement model has been tacitly accepted by archeologists for years as an accurate interpretation of Late Woodland culture throughout New Jersey (Cross 1965; Weslager 1972).

The surviving material expressions of Late Woodland cultures in southern New Jersey are limited, as a rule, to non-perishable items of stone and fired clay. Most organic material seems to have disappeared as a result of exposure to the elements and as a result of physical effects from farming and other post-deposition disturbances. However, at some locations such as the Riggins Farm Site in Cumberland County, favorable local conditions have led to the preservation of a variety of bone implements as well as organic refuse (Curbishley 1954).

Characteristically, Late Woodland components in southern New Jersey contain one or more related ceramic types, clay tobacco pipes in a range of styles, a preponderance of small triangular projectile points, small scrapers, and other chipped stone implements of flinty materials (McCann 1950; Cross 1953:7; Mounier,

1974: 37-38). Celts (ungrooved axes) of ground stone occur with some frequency along with polished stone ornaments which are generally classed as "pendants".

In contrast to the Late Woodland pottery of other regions such as the Delaware Water Gap area, much of the Late Woodland ceramics in southern New Jersey show a conservative adherence to forms developed earlier in the Woodland Period. Their origins appear to have been unadorned ovoid or conoidal pots that were textured frequently on either or both the exterior and interior surfaces with impressions of cordage, nets, or fabrics. Initially, stylistic or decorative embellishments were few; such applications appear to have increased through time, giving rise to regionally and culturally distinctive styles. Undecorated utilitarian wares persist, however, throughout the entire sequence.

The most distinctive and best known Late Woodland ceramic types on the coastal plains of New Jersey include Overpeck Incised, Bowmans Brook Incised, and Riggins Fabric-Impressed. Overpeck Incised vessels have an elongated body with conoidal or somewhat rounded bases. The necks are slightly concave and terminate in gently everted rims (see Staats 1974:5). The pottery is coarse with relatively large aplastic inclusions of sand and rock. The exterior surfaces are cord-marked and are often smoothed over. Decoration was accomplished by shallow incisions with a blunt instrument, sometimes complemented with punctations. The decorative motifs include herringbone, triangles, ladders, cross-hatching, and oblique bands of horizontal lines in combinations of complicated designs (Cross 1953:8, 1956:153-154). The type was first defined by Witthoft at the Overpeck Site in Bucks County, Pennsylvania. Witthoft (n.d.) and Lopez (1961:31) associate it with the Unami in eastern Pennsylvania and adjacent central New Jersey. In form and decoration, it bears certain similarities to the Bowmans Brook Incised and Riggins Fabric-Impressed types. Cross (1956:184) estimates that Overpeck Incised pottery first appeared during the 10th century A.D.

Bowmans Brook Incised, named by Smith (1950:192-193) for a site on Staten Island, is another Late Woodland ceramic type which possesses an elongated, conoidal form. The rim is usually straight or insloping. While a few vessels exhibit corded bodies, the surfaces are generally smooth inside and out. As in the Overpeck Incised type, a decoration consists of broad lines of incising, applied to the rim and upper third of the body. Motifs include complex, but carelessly arranged, plats which comprise triangular, rectangular, and herringbone patterns. According to Smith (1950:193), the Bowmans Brook type is found on sites throughout western Long Island, the adjacent mainland, Staten Island, and into New Jersey whence the type is thought to have originated. Smith (1955:5) places the introduction of the Bowmans Brook Incised type at approximately 700 A.D., while Cross's (1956:184) estimate is

about two centuries later. Although the evidence is by no means overwhelming, Bowmans Brook pottery, along with Overpeck Ware, survived through Late Woodland times. Both Witthoft (n.d.) and Lopez (1961:31) attribute Bowmans Brook and Overpeck Incised pottery to the historic Unami of central New Jersey, Staten Island, and eastern Pennsylvania. Typical specimens are illustrated by Smith (1950:Plate 8, Figure 8), Cross (1956:Plate 37a), and Staats (1974: Figure 1 a).

Riggins Fabric-Imprinted is a very common pottery type in southern and central New Jersey. It was recognized and defined as a result of excavations at the Riggins Farm in Cumberland County (Cross 1941:52; McCann 1950:315) where it occurs with a variety of other artifact types which together comprise the so-called Riggins Complex. Riggins Fabric-Imprinted is a relatively hard, well-made, and durable ware which is distinctive because of these qualities and because of the prominent impressions of twined or wickerweave fabrics which were applied to the exterior of the vessels. A great deal of Riggins Fabric-Imprinted pottery is unadorned. Decoration is limited frequently to cord-markings applied transversely or parallel to the lip or rim. Less often, decoration includes single cord impressions or hollow reed punctations in simple linear designs. Incised motifs, executed with a blunt stylus, include pendant triangles, ladders, filled X's, or nested squares. Decoration is restricted to the neck or rim but occasionally extends down over the shoulder or (rarely) over most of the body. Similarities in form, composition, and decoration between the Riggins Ware and other types from the coastal plains of New Jersey and adjacent states have been observed by a number of scholars (Cross 1953:10; 1956:151; Lopez 1961:21; Blaker 1963:32; Witthoft 1963:63; Salwen and Ottesen 1972:16).

Riggins Fabric-Imprinted ceramics have been retrieved from late prehistoric or proto-historic contexts or sites throughout southern and central New Jersey (Cross 1941, 1953:9-10, 1956:150-151; McCann 1950, 1975; Mason 1957:11; Mounier 1972, 1972a, 1974, 1975, 1978, n.d.). Like the Bowmans Brook and Overpeck Incised pottery, Riggins Fabric-Imprinted has been equated with the historic Indian populations in the areas where it occurs most abundantly (McCann 1957; Lopez 1961:31). Although the association of this ceramic type with an ethnohistorically known band has never been demonstrated, the type does occur in late contexts on a number of southern and central New Jersey sites (McCann 1957). At the Fralinger Site in Cumberland County, Riggins Fabric-Imprinted pottery occurred in stratigraphic association with triangular points and objects of European manufacture (Mounier 1974:34-35). Nearby, at the Bevan Site, radiocarbon analysis of wood charcoal collected from a refuse pit which also contained the partial remains of a Riggins Fabric-Imprinted vessel, yielded a date of 1015 A.D. \pm 80 years (Mounier 1978:17). This date appears to represent the early end of the temporal span for the Riggins Fabric-Imprinted type which Cross (1956:184) places at about 900 A.D.

It is supposed that the simple rim-decorated vessel from the Bevan Site represents an incipient stage in the stylistic development of the Riggins type which seems to exhibit a fairly broad range of vessel forms and decorative motifs (Mounier n.d.). If this assumption should prove to be correct, the development of Riggins ceramics would parallel the progressive stylistic efflorescence demonstrated in ceramic sequences elsewhere in the Northeast at about the same time (e.g. the Owasco-Iroquois continuum beginning about 1000 A.D. in New York, see Ritchie 1969). It might be anticipated that the rise of regional ceramic styles illustrates the consolidation of local populations in regionally distinct social groups. It may also indicate a shift from an economy based principally upon hunting and gathering to one in which the cultivation of plants came to have greater significance.

Elements of the Late Woodland subsistence economy are suggested by organic refuse, when preserved. Comestibles are represented by clam and oyster shells, deer and small animal bones, and the hulls of hickory and other nuts. Although the practice of horticulture has been inferred from the ethnohistoric record (Johnson 1925; Myers 1970), no direct archeological evidence of this practice has been detected in southern New Jersey. This lack of evidence probably relates, in part, to adverse soil conditions but may also be due to the use of gross excavation techniques which characterized much of the earlier archeological work in this region. The discovery of botanical specimens might be anticipated from pits or hearths where the process of carbonization might lead to their preservation, or from shell middens where soil acids have been significantly reduced or neutralized. The use of the bow and arrow in hunting is implied by the presence of numerous small points on Late Woodland sites, and the existence of a wide range of perishable cordage and textiles is amply demonstrated by impressions on ceramic vessels.

Direct evidence of housing has not survived, and if historic accounts (Myers 1970) prove to be correct, the prehistoric Indians probably did not go to much trouble to provide durable shelters except in winter. Again, it is possible that the negative evidence regarding Late Woodland house patterns in southern New Jersey may result from insufficiently sensitive excavation techniques.

Little is known about the physical attributes of the Late Woodland Indians in this area because human skeletal remains from this era are few. Those which have been discovered, under more or less controlled conditions, have not been attributed to any particular culture (Cross 1941; Clabeaux 1972). When found, such remains tend to be fragile and fragmentary due to exposure to soil acids, the action of roots, burrowing mammals, and modern agricultural practices. Most frequently, human interments involved the burial of the corpse in a flexed posture, generally without accompanying grave goods. Burials may occur as isolated finds or in cemeteries.

Mounier (1978:16-17; 1974a) reported upon the discovery of a late prehistoric or very early historic cemetery along Raccoon Creek near Swedesboro, Gloucester County. The cemetery was unusual in that material of European derivation was included with one of the graves, while all of the graves adhered to the prehistoric mode of burial in flexed postures. These circumstances suggested a very late prehistoric or protohistoric age for the cemetery. Unfortunately, the site had been disturbed by heavy earthmoving equipment in the process of a commercial development, and before the site could be adequately examined, a large part of it had been destroyed. Research into the ethnohistoric identity of the people buried there has never been completed.

Culturally, the Late Woodland groups occupying southern New Jersey appear to have been aligned more closely with the other coastal populations in the Mid-Atlantic area than with those groups who inhabited the more northerly physiographic provinces. Evidence in support of this conclusion comes not only from archeology but from ethnohistory and linguistic analysis as well. The division between the lands claimed by the Unami and their Munsee neighbors to the north has been made manifest in a number of historical documents (such as the Treaty of Easton of 1758) and in recurrent references to the Delaware and Munsee as discrete socio-political entities (Smith 1765:455-483; Speck 1931:15; Goddard 1974; Hunter 1978:21; Kraft 1975:59-61, 1978:1-4).

The great numbers of Late Woodland sites in southern New Jersey and the immense volume of artifactual remains of this period indicate strong native populations late in the precontact era. However, few aboriginal sites of the early historic period have been identified despite the fact that this area was infiltrated by Europeans by the middle of the 17th century. The lack of aboriginal sites is taken as evidence of a population collapse among the native inhabitants early in the period of initial contact. This postulated decline has been attributed to epidemic diseases of European origin against which the native population had no immunity.

It is also possible that the absence of historic sites in southern New Jersey reflects the displacement of the native population into marginal areas as a result of competition from Europeans for more favorable lands in the Delaware Valley and certain stretches of the Atlantic shore (see Williams and Kardas, this volume). Since most archeological studies in southern New Jersey have concentrated upon the Delaware slope, it is possible that refuge areas upon the Outer Coastal Plain have been overlooked. For whatever reason, it is clear that native groups occupying much of southern New Jersey in Late Woodland times failed to survive the European onslaught with cultures and populations intact.

Although there have been a number of archeological surveys and investigations over the years in southern New Jersey, very little attention has been given to questions relating to the Late Woodland

Period. Much of the Late Woodland cultural reconstruction is based upon ethnohistorical inference and ethnographic analogy (Wallace 1947; Weslager 1972). Despite the weaknesses inherent in the data presently at hand, it is clear that Late Woodland populations lived close to the land and exploited its resources efficiently. Most of the recognized Late Woodland sites are situated along streams or other bodies of water in a range of ecological situations. The repeatedly observed association of site locations and certain characteristic ecological settings gives a measure of predictability to the patterns of site distribution. The habitats occupied by Late Woodland populations are indicated on Maps 1 and 3.

Frequently, sites occupied by people of the Late Woodland Period also provide evidence of occupation by earlier aboriginal groups as well as by historic populations. Generally, archeological sites on the coastal plains of New Jersey are unstratified, and a certain amount of mixing of cultural remains from different periods of time is common. However, single component Late Woodland sites and similar closed components in stratified contexts are not unknown (Skinner and Schrabish 1913:55; Weslager 1939; Mounier 1974).

To project from recent archeological research in the Maurice River drainage, it would appear that Late Woodland sites cluster along river systems and form a graded series ranging from very substantial habitations along the main trunk to smaller campsites at the river mouths and in their headwaters. A number of coastal occupations have also been observed (Mounier 1974, n.d.a.).

Since comparative studies are lacking, it is unclear whether this pattern may be applied to all portions of southern New Jersey. There is evidence, for example, of very large sites well upstream in the headwaters of Rancocas Creek. It may be that regional, or even local, diversity in resource distribution has resulted in a variety of Late Woodland settlement systems. For much of southern New Jersey as well as the adjoining portion of neighboring states, the distribution and content of Late Woodland sites has been poorly researched, much less analyzed (Smith 1950; Schmitt 1952; Omwake and Stewart 1963; Salwen 1968; Salwen and Ottesen 1972; Thomas et al. 1975).

While riverine sites are the best known and most numerous of Late Woodland occupations, other habitats were also exploited. Coastal sites on the Delaware Bay (Weslager 1939; Mounier 1974a) and along the bays behind the barrier islands on the Atlantic shore have been observed (Wooley 1948; Mounier 1977). Other sites may well be associated with springs or other hydrologic features but like Late Woodland settlement in general, these features have never been studied adequately.

The exploitation of thermokarst basins (Bonfiglio and Cresson 1978.) appears not to have been a significant focus of Late Woodland ecological adaptation. Thermokarst basins are peculiar features

associated with peri-glacial and early post-glacial environments. These depressions supported a varied flora and fauna and, therefore, proved attractive to peoples of the earlier Archaic Period. By Woodland times, many of these basins had filled with sediments or otherwise had become less attractive to the native population.

Coastal sites are useful for the integration of archeological data because such sites frequently contain small, discrete, temporally specific assemblages with well preserved faunal materials and occasionally, human skeletal remains. The occurrence of refuse deposits containing mollusc shells, animal bones, and other organic materials (such as antler and bone artifacts) is a fairly common situation on coastal sites. However, as work or processing stations, such locations tend not to produce great quantities of artifacts and have been, to a large extent, ignored by archeologists in the past. Thus, very few have been excavated or reported. A great many coastal sites have been lost to erosion and/or submergence as a consequence of rising sea levels (Mounier n.d.a.). The presence of inundated archeological deposits makes even routine investigations exceedingly difficult.

In addition to riverine and coastal locations, Late Woodland materials occur occasionally as scattered or isolated finds with no readily apparent association with existing hydrologic features, landforms, or natural resources. Upon analysis, such locations may show a correlation with now relict geomorphic structures, drainage networks, or resource bodies such as quarried stone (Mounier 1979). Since such sites are generally discovered by chance, they number among the least well known and most poorly represented of Late Woodland occupations.

The chronology as it applies to the Late Woodland in southern New Jersey has been interpreted in light of a very few locally derived radiocarbon age estimates and by extrapolation from better dated sequences from northern New Jersey and from adjoining states. For example, charcoal associated with an early example of Riggins Fabric-Imprinted pottery from a site in the Maurice River tidewater area yielded a date of 1015 A.D. This date conforms well with the recorded beginnings of the Late Woodland Period in the Upper Delaware Valley and New York by the second millenia of the Christian era. Considerably more research will be required before the Late Woodland sequence in southern New Jersey can be well understood or refined.

Within the southern New Jersey area, a number of Late Woodland cultural complexes have been identified or suggested. Archeologically, these complexes are represented by internally consistent and repetitive assemblages of artifacts, the most diagnostic of which are pottery and ceramic smoking pipes. The stylistic and decorative attributes of these wares appear to indicate the existence of localized bands of communities sharing a group identity and territory.

For example, the Riggins Complex (McCann 1950, 1957; Cross 1953:7) is concentrated in southwestern New Jersey, principally in the Cohansey Creek and Maurice River drainages and those of nearby creeks. The elements of the Riggins Complex include ceramic vessels of the Riggins Fabric-Impressed and Plain types, the Indian Head Incised type (a variety of Riggins Ware, see McCann 1950:315; Cross 1953:7), plain and decorated tobacco pipes, small equilateral triangular points (frequently of locally obtainable Cohansey quartzite), and a variety of chipped stone implements of flinty materials.

Sites of the Riggins Complex are best known in riverine settings, though few have been reported in print (Cross 1941:44-52; McCann 1950; 1957). The full range of ecological settings for sites of this complex has never been explored, but in addition to stream-banks, other sites have been observed on the upland bordering the Delaware Bay Wetlands (Cross 1941:47-49) and upon islands in the midst of the salt meadow (Mounier n.d.a.).

The internal composition of Riggins Complex sites is in need of serious study. At the Riggins Site, Cross (1941:50-52) found no pits or other features, largely because the excavations were limited to the margins of cultivated fields. However, subsequent digging by George Woodruff revealed numerous storage/refuse pits which contained greasy black soil, artifacts, and well preserved faunal remains (Curbishley 1954). Test excavations on an island in the tidal marsh near Fortescue, Cumberland County, resulted in the discovery of Riggins ceramics in a midden deposit with oyster shells and a broad range of animal bones which included the remains of deer, small mammals, and turtles (Mounier n.d.a.).

This site, by the circumstances of its setting, was limited in size to an area probably not in excess of two acres. Other sites, which have yielded Riggins ceramics in volume, are known to occupy upwards of 20 acres (Cross 1941:49-50, 231). Whether any large sites were ever entirely occupied at a given time is doubtful, but it is clear that they represent settlements of substantial size and complexity.

Other Late Woodland complexes based upon similar configurations of artifact assemblages have been identified or adumbrated in the Maurice River (Mounier 1974:37-38) and Rancocas Creek watersheds and elsewhere in southern New Jersey (Witthoft n.d.). It has been suggested that these complexes represent the prehistoric cultures of the aboriginal groups encountered by Europeans at the time of contact (McCann 1950:321; Lopez 1961:31). These groups were probably immediately ancestral to the bands of Unami Delaware who occupied southern New Jersey in early historic times (Goddard 1978).

Many phenomena relating to the late prehistoric culture history of southern New Jersey and other aspects of Late Woodland life in this region remain to be explored. The framework and details of late prehistoric subsistence/settlement strategies, cultural ecological adaptations, social organization, networks of transportation, communication and exchange, among others, all require additional thought and investigation.

Problems and Prospects in Late Woodland
Period Archeology in New Jersey

by
Herbert C. Kraft
and
R. Alan Mounier

As a result of federal funding for the Delaware Water Gap National Recreation Area and proposed Tocks Island Dam projects, more archeological sites relating to the Late Woodland Period have been excavated and reported from this small sector in northwestern New Jersey than from all of the remainder of the state (Kinsey et al. 1972; Kraft 1970, 1975, 1977, 1978). In fact, the only other sites excavated by professionals in all of northern New Jersey are the badly disturbed Stepple Site in East Hanover, Morris County (Morris 1957) and some previously dug and inadequately reported rockshelters such as the Bevans Rock Shelter (Schrabisch 1915:31-34; Cross 1948) and the Todd Rock Shelter (Schrabisch 1917:57; Cross 1941:143-149).

The Archaeological Survey of the State of New Jersey (Skinner and Schrabisch 1913) and other regional surveys (Schrabisch and Spier 1915; Schrabisch 1917) which were sponsored by the New Jersey Department of Conservation and Economic Development, as well as the Indian Sites Survey which was sponsored by the Division of Professional and Service Projects of the Work Projects Administration (Cross 1941), did little more than sample some sites, make brief comments concerning the kinds of artifacts to be found, and then provide more or less detailed locations for these sites. This information contributed little to our understanding of prehistory but did provide a roadmap for subsequent depredations by surface collectors and "pot-hunters". The central and southern portions of New Jersey did not fare much better, although more sites, principally along rivers in the central and western parts of the state, were excavated and reported, at least briefly, in Cross (1941). Vast portions of the Outer Coastal Plain - including much of Cape May peninsula, the middle reaches of the Atlantic Coast, and the Pine Barrens - were not surveyed (see map of New Jersey showing Indian Sites in Cross 1941, and Skinner and Schrabisch 1913).

In the years following these surveys, a number of colleges, universities, and private individuals have taken an occasional interest in southern New Jersey archeology (Kier 1953; Kier and Calvery 1957; Gruber 1957; Gruber and Mason 1956; McCann 1950, 1957; Caesar 1963; Ashman 1970; Mounier 1972, 1972a, 1974, 1975; Blenk 1977; Cavallo and Mounier 1980). Most of the activities by academic institutions have involved single site explorations, often undertaken as a field school for students. These efforts have not been sustained for more than a few seasons, and the results have been of mixed quality. Moreover, many site excavations, even those by public institutions such as the New Jersey State Museum, have not been reported adequately, and in some cases, they have not been reported at all.

The inadequacy of knowledge concerning various aspects of Late Woodland cultural development throughout New Jersey relates to a paucity of scholarly inquiry on the one hand, and to a virtual absence of public awareness and/or concern. Strong public support and funding for sustained archeological programs has never been displayed in New Jersey.

Despite the uneven quality and biases of early survey efforts, the observed patterns of archeological site distribution (Map 2) have assumed a certain degree of academic reality; that is, certain portions of the state, particularly the southern and northcentral areas, are believed by many to have been either sparsely occupied or totally uninhabited during Late Woodland times. Although it is probable that differences in environmental quality between physiographic provinces or ecological zones would have led to dissimilar patterns of cultural-ecological adaptations in prehistoric times, the distortion of present perceptions concerning the distribution of aboriginal populations and sites as a result of sampling bias cannot be ruled out.

Since only a limited range of ecological situations was explored in earlier archeological investigations, the quality of survey results may be called into question, even in areas where the survey efforts are relatively intense as in the Passaic Valley, Rancocas Creek, Pennsauken Creek, and Crosswick Creek drainages. The procedure of looking for sites principally upon high ground adjacent to watercourses has skewed the results of sampling because sites in other settings have been routinely ignored. Recent research by Cavallo and Mounier (1980), to cite one example, indicates that past investigations underrepresented not only the frequency of archeological sites on the Outer Coastal Plain but also the ecological diversity demonstrated in the choice of site locations.

Conceptually, another shortcoming arises from the fact that individual sites formerly comprised the basic unit of archeological inquiry and inference. Thus, the possible systematic relationship among sites in a regional context has been overlooked. Consequently, the structure and operation of aboriginal subsistence and settlement systems of all time periods remain essentially undefined.

Even considering the numerous cultural resource survey reports generated in recent years (Chesler and Richardson 1980; Dzamba 1981), it must be admitted that most of the literature, with the possible exception of that pertaining to the Upper Delaware River Valley, has a fairly limited utility. Certainly, the published listing of all known prehistoric sites grossly underestimates the actual number of sites known to farmers, collectors, and other interested parties. Yet, the community of professional archeologists, with very few exceptions, has not labored greatly at securing information from farmers and collectors concerning such sites. As a result, the single most important source of information concerning the location and significance of archeological sites in New Jersey has not been tapped effectively.

The current state of prehistory in New Jersey is such that large gaps - physical, conceptual, and cognitive - exist. Even though certain areas (the Upper Delaware Valley and the Abbott Farm Site, for example) have received considerably more attention than others, it is fair to say that no major area in New Jersey has been studied adequately by current standards.

The seriousness and complexity of the archeological problems are heightened by the realization that a great number of sites, from all periods, have been and continue to be destroyed by human and natural agencies. Increasing population growth has caused rapid and largely uncontrolled urban development and expansion into rural areas. The attendant loss of cultural resources coupled with the ongoing destruction and degradation of archeological sites as a result of desultory excavation by collectors and curio seekers has also increased enormously in recent years.

The longer there is a lack of good information about the number, distribution, and physical extent of prehistoric cultural resources, the more vexing will become the tasks of preserving, conserving, and managing these resources. Well planned, non-exclusive regional surveys will be necessary if adequate inventories and assessments of sites are to be secured. Adherence to a strategy of non-exclusion will insure that all ecological settings will be investigated irrespective of any anticipated results from the survey (King 1978).

There is an immense area within New Jersey which remains essentially unknown archeologically. Cost effective techniques of surveying large tracts must be developed and implemented. Furthermore, the design and testing of theoretical models for predicting site occurrences, density, and function should be fostered. The successful development of such models will entail the participation of an interdisciplinary team of specialists concerned with achieving a regional synthesis of paleo-cultural and paleo-environmental

data. The creation of subsistence/settlement models pertaining to the Late Woodland Period as well as to other cultural horizons is greatly needed.

It is imperative that all existing collections, excavated as well as surface collected, be examined, catalogued, and recorded. The reliability of information thus obtained must also be assessed.

The development of theoretical models, regional surveys, and analyses of local collections should be balanced by controlled archeological excavations of selected sites. Such excavations will be necessary in order to test and refine conceptual models and to obtain data concerning the definition of discrete cultural assemblages, their temporal sequence, and geographic range.

Observations and Needs Concerning Late Woodland Remains in New Jersey

The Coastal Areas

Ethnohistoric records (Wroth 1970; Juet 1959; Weslager 1961, 1967) indicate that the coastal areas were inhabited by Late Woodland people, some of whom accumulated shell middens such as those at Tottenville, Staten Island (Skinner 1932: 13ff; Jacobson 1979) and at Tuckerton (Cross 1941:39, 40). Many shell middens, located on tidal marshes along the generally lowlying coastal margin, have been flooded over as the ocean level advanced; others have been destroyed as bathing beaches and ocean resorts have been established. In addition to fluvial damage, the entire northeastern New Jersey coastal region, from Alpine to the Raritan Bay, consists of marine docks, rail, and industrial facilities. These commercial constructions and the summer resorts along the Outer Coastal Plain have destroyed many, if not most, prehistoric and early historic sites. There are, however, numerous coastal wetlands and estuarine marshes which have been landfilled, as for example, the Sandy Hook Bay area near Belford (Kraft 1977a). In such areas and along the undeveloped southern New Jersey coast and Delaware Bay littoral, there may yet exist a number of Late Woodland sites.

Not a single Late Woodland housepattern or village site has been discovered or excavated anywhere on the New Jersey coast including the Delaware and Raritan Bays. In fact, there is no information on the kinds, sizes, or shapes of the houses, or the kinds of settlements employed by the late prehistoric Indians who lived here before, or at the time of, European exploration.

It is not known how extensively these people exploited the marine and estuarine resources and if, in fact, Late Woodland people from the interior parts of New Jersey did make annual migrations to the shore in quest of shellfish, as has been alleged (Philhower n.d.:7). Coastal and estuarine environments were certainly different, and called for different adaptive and exploitative methods; yet, it remains for the archeologists to discover and explicate these cultural lacunae.

The Piedmont, Highland, and Intermountain Areas

It has been noted that the riverine, marsh, lake, and spring sites throughout this vast region, as well as certain hilltop sites, were occupied intensively during the long Archaic Period. During the Late Woodland Period, by contrast, only occasional triangular arrowheads and some pottery sherds are found, indicating small band habitation.

One can only speculate concerning why this region apparently had little appeal to the Late Woodland Indians. Today, there are excellent farmlands in places that were formerly marshlands, as for example, the Bog and Vly Meadows, and the Great Meadows or Great Piece Meadows. However, such marshes had to be drained before they could be converted into productive agricultural soils. The Indians, lacking the technology to drain the marshlands, located their gardens on well drained floodplains. In other areas, such as the lands immediately south of the Raritan River, red shale outcrops are found at, or very close to, the surface. Today, farmers cultivate crops on such rocky soils because the tractor or earlier horse-drawn plows and harrows were able to break up the shale to produce a mantle of soil. The Indians did not have the necessary technology or the draft animals to cope with such rocky soils. Without irrigation, such lands are too droughty for the growing of maize or corn which was, of course, the principal crop of the Late Woodland Indian. For the Indians of pre-contact times, marshlands, woodlands, and rocky fields were suitable only for hunting and gathering, as they had been for millenia; this probably accounts for the presence of arrowheads and a general absence of horticultural and domestic implements.

No one has yet found evidence of a Late Woodland housepattern in the Piedmont or Highlands areas, and it is just recently (June 1980) that one of the authors (Kraft) discovered three round-ended longhouses at Swartswood Lake in the Intermountain subprovince. Bark lodges and small Late Woodland settlements must have been established on many lacustrine sites throughout this vast region. Private collectors know of "triangular point and pottery sites"; yet, not a single Late Woodland site has been competently excavated and reported in the Hackensack, Passaic, Raritan, Wallkill, or Musconetcong drainage systems. The Piedmont, Highlands, and Intermountain areas remain virtually unknown in terms of Late Woodland Period settlements and adaptations.

The Delaware Valley

This magnificent valley provided for the needs of many Late Woodland Indians. The occasional over-bank floodings enriched the soils and provided the primitive gardeners with almost stone-free soil that could be tilled with crude hoes and dibbles. The broad river yielded a variety of fish in great abundance, especially

at spawning times, and fresh water mussels were there for the gathering. The nearby woods provided firewood, building materials, and a generous supply of acorns, hickory nuts, butternuts, and chestnuts, as well as berries. Game animals provided meat, skins, and pelts as well as bone and sinew for tools.

Upper Delaware River Valley sites have provided the archeologists with the only real data concerning the social, economic, material, religious, and aesthetic achievements of the Late Woodland people. Something is known about their stature and general health from an examination of skeletal remains. By an examination of their refuse, archeologists know what they fished, hunted, and planted. The level of their technology is inferred from the stone tools and pottery vessels that have survived. Insights into their religious and magical beliefs have come from their graves and grave goods, and from their stone and clay effigies (Kraft 1966, 1968, 1969, 1970, 1970a, 1972, 1974a, 1975, 1977, 1978; Kinsey 1972; Marchiando 1972).

The Inner Coastal Plain

The seventeenth century map (ca. 1629) "Caerte vande Svydt River in New Nederland" (Dunlap and Weslager 1958) and Robert Evelyn's letter of ca. 1641 (Weslager 1954) identify numerous Indian villages along the New Jersey side of the Delaware River extending up to modern Trenton. To the best of our knowledge, no attempt has been made to locate, identify, or excavate any of these known Late Woodland/Early Contact Period sites. Not a single Indian house-pattern is known from throughout this area, and except for the Abbott Farm Site (Cross 1956), no significant Late Woodland excavation has been undertaken or reported.

This area, along with the Outer Coastal Plain, is critical to an understanding of the Late Woodland, i.e. Proto-Unami, lifeways. Kraft has suggested that significant differences exist between the northern and southern Late Woodland Indians, differences that warrant separate identities (i.e. "Proto-Munsee" and "Proto-Unami"). These differences are manifested in the dialect spoken in each area (Goddard 1978:213), in the pottery styles produced by the two peoples and apparently, even in burial practices. If these and other differences in the archeological composition of Late Woodland sites in northern and southern New Jersey are real, then archeologists will be able to enhance our understanding of these Proto-Munsee and Proto-Unami peoples who were, in fact, the ancestors of the historic Munsee and Unami Delaware. Only careful research with selective and controlled excavations of Late Woodland sites located on the Inner and Outer Coastal Plains can verify or gainsay these hypotheses.

Research Questions

Additional research questions and conceptual issues relevant to the Late Woodland Period in New Jersey are:

1. The development of local pottery sequences and chronologies;
2. Paleoenvironmental reconstructions of habitats based on selective coring and pollen analysis (e.g. Russell n.d.). Knowledge concerning such early environments will aid in predicting the kinds of animals which may have lived in and off such botanicals, and thus suggest patterns of exploitation and land utilization by the resident Late Woodland Indians;
3. The distribution of Late Woodland populations, particularly with reference to disparate environments within and across major physiographic provinces. Examples would be adaptations in the Delaware River Valley vs. the Outer Coastal Plain, or lacustrine environments in the Piedmont;
4. The design and testing of predictive models concerning site locations, subsistence, and settlement systems, and Late Woodland social and political organizations, etc;
5. The design and testing of functional site and artifact typologies with respect to Late Woodland occupations;
6. The interpretation of culture change within the Woodland Period generally;
7. The relationship between Late Woodland groups in northern and southern New Jersey with each other, and with other neighboring peoples; and
8. The changing pattern of Late Woodland life as a result of European contact.

Needless to say, a great deal of research and spade work needs to be done if such questions are to be investigated. While research into these problems is of great interest to archeologists, the benefits will accrue to all parties interested in responsible and competent management of New Jersey's dwindling cultural resources.

REFERENCES CITED

- Abbott, Charles C.
 1881 Primitive Industry. George A. Bates Publ. Salem, Massachusetts.
- Ashman, Fred R.
 1970 The Madison Site. Bulletin of the Archaeological Society of New Jersey 25:5-9. Trenton.
- Black, Glenn A.
 1954 An Archaeological Consideration of the Walam Olum. In Walam Olum or Red Score: The Migration Legend of the Lenni Lenape of Delaware Indians, pp. 292-348. Indian Historical Society, Indianapolis.
- Blaker, Margaret C.
 1963 Aboriginal Ceramics. In The Townsend Site Near Lewes, Delaware, edited by H. Geiger Omwake and T. D. Stewart, pp. 14-39. The Archeolog 15. Sussex Society of Archaeology and History. Seaford, Delaware.
- Blenk, Michael
 1977 The Lerro Farm Site. Bulletin of the Archaeological Society of New Jersey 34:14-32.
- Bonfiglio, Anthony, and John H. Cresson
 1978 Aboriginal Cultural Adaptation and Exploitation of Periglacial Features in Southern New Jersey. Paper presented at a meeting of the Archaeological Society of New Jersey.
- Brasser, T. J. C.
 1971 The Coastal Algonkians: People of the First Frontier. In North American Indian in Historical Perspective, edited by Eleanor B. Leacock and Nancy O. Lurie, Random House, New York.
- Caesar, Margaret
 1963 The Pedericktown Site, Salem County, New Jersey: A Surface Collection. Bulletin of The Archaeological Society of New Jersey 21. Trenton.
- Cavallo, John A., and R. Alan Mounier
 1980 A Regional Predictive Survey of the New Jersey Pinelands - Phase I. Report to the New Jersey Pinelands Commission, New Lisbon, New Jersey.

- Chesler, Olga and Dorothy Richardson
 1980 Annotated Bibliography of Cultural Resource Survey Reports Submitted to the New Jersey State Historic Preservation Officer through December 31, 1979. Office of Cultural and Environmental Services, New Jersey Department of Environmental Protection, Trenton.
- Clabeaux, Marie Striegel
 1972 Osteological Evidence of Disease in the Indians of New Jersey. Bulletin of the Archaeological Society of New Jersey 28:19-27. Trenton.
- 1978 An Evaluation of Skeletal Material from the Bell Philhower Site. In The Minisink Site: A Reevaluation of a Late Prehistoric and Early Historic Contact Site in Sussex County, New Jersey, edited by Herbert C. Kraft, pp. 98-99. Archaeological Research Center, Seton Hall University, South Orange.
- Cross, Dorothy
 1941 The Archaeology of New Jersey. Vol. I. Archaeological Society of New Jersey and New Jersey State Museum, Trenton.
- 1948 The Bevans Rock Shelter. Bulletin of the Archaeological Society of New Jersey 1:13-22. Trenton.
- 1953 Delaware and Related Horizons in New Jersey. Bulletin of the Archaeological Society of New Jersey 6:7-11.
- 1956 Archaeology of New Jersey: The Abbott Farm. Vol. II. Archaeological Society of New Jersey and New Jersey State Museum, Trenton.
- 1965 New Jersey's Indians. Report No. 1. New Jersey State Museum, Trenton.
- Curbishley, David L.
 1954 Bone and Antler Implements from New Jersey. Bulletin of the Archaeological Society of New Jersey 8:13-22.
- Dean, Nora Thompson
 1978 Delaware Indian Reminiscences. Bulletin of the Archaeological Society of New Jersey 34, South Orange, New Jersey.
- Dunlop, A. R. and C. A. Weslager
 1958 Toponymy of the Delaware Valley as Revealed by an Early Seventeenth Century Dutch Map. Bulletin of The Archaeological Society of New Jersey 15 and 16, Trenton.

- Dzamba, Nancy
1981 Annotated Bibliography of Cultural Resource Survey Reports Submitted to the New Jersey State Historic Preservation Officer from January 1980 through February 1981. Office of Cultural and Environmental Services, New Jersey Department of Environmental Protection, Trenton.
- Fenton, William N.
1971 The Iroquois in History. In North American Indians in Historical Perspective, edited by Eleanor B. Leacock and Nancy O. Lurie, Random House, New York.
- Funk, Robert E.
1976 Recent Contributions to Hudson Valley Prehistory. Memoir 22, New York State Museum, Albany.
- Goddard, Ives
1974 The Delaware Language, Past and Present. In A Delaware Indian Symposium, edited by Herbert C. Kraft, Anthropological Series 4: 103-110, Pennsylvania Historical and Museum Commission, Harrisburg.
1978 Delaware. In Handbook of North American Indians, edited by William C. Sturtevant, Northeast 15: pp. 213-239. Smithsonian Institution, Washington, D.C.
1979 Delaware Big House Ceremonial. In Native North American Spirituality of the Eastern Woodlands, edited by Elizabeth Tooker, pp. 104-124. Paulist, New York.
- Griffin, James B.
1978 The Midlands and Northeastern United States: In Ancient Native Americans, edited by Jesse D. Jennings, pp. 226-239. W. H. Freeman & Co., San Francisco.
- Gruber, Jacob W.
1957 Problems and Prospects in the Archaeology of Lower Delaware Valley. Pennsylvania Archaeologist 27 (3-4): 119-126.
- Gruber, Jacob W. and Ronald J. Mason
1956 Temple University Excavations at Buri, Burlington County, New Jersey. Bulletin of the Archaeological Society of New Jersey 12:9-22.
- Hall, Marvin D., Jr.
1970 An Indian Site at French's Pond, Waterloo, Sussex County, New Jersey. Bulletin of the Archaeological Society of New Jersey 25: 10-14. Trenton.

- Harrington, Mark R.
 1921 Religion and Ceremonies of the Lenape. Indian Notes and Monographs, Museum of the American Indian, Heye Foundation, New York.
- Heye, George G. and G. H. Pepper
 1915 Exploration of a Munsee Cemetery Near Montague, New Jersey. Contributions of the Museum of the American Indian, Heye Foundation 2(1). New York.
- Holm, T. C.
 1834 A Short Description of the Province of New Sweden. Memoirs of the Historical Society of Pennsylvania, edited by P.S. DuPonceau 3(1).
- Hunter, William A.
 1974 A Note on the Unalachtigo. In Delaware Indian Symposium, edited by Herbert C. Kraft. Anthropological Series No. 4, pp. 147-152. Pennsylvania Historical and Museum Commission, Harrisburg.
- 1978 Documented Subdivisions of the Delaware Indians. Bulletin of the Archaeological Society of New Jersey 35: 20-40. South Orange.
- Jacobson, Jerome
 1980 Burial Ridge, Totenville Staten Island, N.Y. Staten Island Institute of Arts and Sciences, New York.
- Jameson, J. F.
 1908 Narratives of New Netherlands. Charles Scribner's Sons, New York.
- Johnson, Amandus
 1911 The Swedish Settlements on the Delaware. Appleton Century, New York.
- Johnson, Amandus (trans.)
 1925 Geographia Americae, with an Account of the Delaware Indians, Based on Surveys and Notes Made in 1654-1656 by Peter M. Lindestrom. Swedish Colonial Society, Philadelphia.
- Jones, Robert W.
 1931 The Clemson Mound. Fifth Annual Report, Pennsylvania Historical Commission, pp. 89-111. Harrisburg.
- Juet, Robert
 1959 Juet's Journal: The Writings of Robert Juet, edited by Robert M. Lunny, New Jersey Historical Society, Newark.

- Kier, Charles F.
 1953 The Wood's Mill Site, Salem County, New Jersey. Bulletin of the Archaeological Society of New Jersey 6:1-4, Trenton.
- Kier, Charles F., Jr. and Fred Calverley
 1957 The Raccoon Point Site, An Early Hunting and Fishing Station in the Lower Delaware Valley. Pennsylvania Archaeologist 27(2)61-118. Aliquippa.
- King, Thomas
 1978 The Archaeological Survey: Methods and Uses. Heritage Conservation and Recreation Service, U.S. Department of Interior, Washington, D.C.
- Kinsey, W. Fred, III, et al.
 1972 Archaeology in the Upper Delaware Valley (with contributions by Herbert C. Kraft, Patricia Marchiando, and David J. Werner). Pennsylvania Historical and Museum Commission, Anthropological Series No. 3, Harrisburg.
 1977 Lower Susquehanna Valley Prehistoric Indians Science Press, Ephrata, Pennsylvania.
- Kraft, Herbert C.
 1966 Teshoas and Elongated Pebble Tools. Bulletin of the Archaeological Society of New Jersey 23:1-6. Trenton.
 1968 The Religion of the Delaware Indians. The Bulletin of New Jersey Academy of Science 13(1):47-49. New Brunswick.
 1969 There are Petroglyphs in New Jersey. Bulletin of the Archaeological Society of New Jersey 24:13-16. Trenton.
 1970 The Miller Field Site: Warren County, New Jersey: Part I. The Archaic and Transitional Stages. Seton Hall University Press, South Orange.
 1970a Prehistoric Indian Housepatterns in New Jersey. Bulletin of the Archaeological Society of New Jersey 26:1-11, Trenton.
 1972 Archaeological Evidence for a Possible Masking Complex among the Prehistoric Lenape in Northwestern New Jersey. New York State Archaeological Association Bulletin 56:1-11, Rochester.
 1974 Indian Prehistory of New Jersey. In Delaware Indian Symposium, edited by Herbert C. Kraft. Anthropological Series No. 4. Pennsylvania Historical and Museum Commission, Harrisburg.

- 1974a Feast of the Dead. Bulletin of the Archaeological Society of New Jersey 31:29, South Orange.
- 1975 The Archaeology of the Tocks Island Area. Archaeological Research Center, Seton Hall University, South Orange.
- 1975a Upside-Down Pendants. Bulletin of the Archaeological Society of New Jersey 32:33. South Orange.
- 1975b The Late Woodland Pottery of the Upper Delaware Valley: A Survey and Reevaluation. Archaeology of Eastern United States 3(1). Eastern States Archaeological Federation, Attleboro, Massachusetts.
- 1977 The Minisink Settlements: An Investigation into a Pre-historic and Early Historic Site in Sussex County, New Jersey. Archaeological Research Center, Seton Hall University, South Orange.
- 1977a Archaeological and Historical Cultural Resources Survey of the Proposed Naval Fuel Farm Site, Belford, Monmouth County, New Jersey. Report submitted to the U.S. Department of the Navy.
- 1978 The Minisink Site: A Reevaluation of a Late Prehistoric and Early Historic Contact Site in Sussex County, New Jersey. Archaeological Research Center, Seton Hall University, South Orange.
- Kroeber, Alfred L.
 1939 Cultural and Natural Areas of Native North America. University of California Publications in American Archaeology and Ethnology 38. Berkeley.
- Laet, Johannes de
 1909 From the New World by Johan de Laet, 1625, 1630, 1633, 1644. In Narratives of Netherland, 1609-1664, edited by J. Franklin Jameson, Charles Scribner's Sons, New York.
- Leechman, D.
 1951 Bone Grease. American Antiquity 16(4): 355-356.
- Lenig, Donald
 1965 The Oak Hill Horizon and its Relation to the Development of Five Nations Iroquois Culture. Research and Transactions of the New York State Archaeological Association 15(1). Buffalo.
- Lenik, Edward J.
 1973 The Rock House Petrolyph. Pennsylvania Archaeologist 43(3-4): 57-59.

- Levine, Gaynells (editor)
 1978 The Coastal Archaeology Reader. Vol. II. Suffolk
 County Archaeological Association, Stony Brook.
- Lindestrom, Peter
 1925 Geographia Americae with an Account of the Delaware
 Indians Based on Surveys and Notes Made in 1654-1656.
 Translated and edited by Amandus Johnson. The Swedish
 Colonial Society, Philadelphia.
- Lopez, Julius
 1961 Pottery from the Mispillion Site, Sussex County,
 Delaware, and Related Types in Surrounding Areas.
Pennsylvania Archaeologist 31(1):1-38.
- Lucy, Charles
 1959 Pottery Types of the Upper Susquehanna. Pennsylvania
 Archaeologist, 29(1): 28-37. Gettysburg.
- Mac Cleod, William C.
 1928 The American Indian Frontier. Alfred A. Knopf, New
 York.
- Mason, Ronald J.
 1957 New Jersey State Museum Excavations at the Stepple
 Site, Morris County. Bulletin of the Archaeological
 Society of New Jersey 14:1-20. Trenton.
- McCann, Catherine
 1950 The Ware Site, Salem County, New Jersey. American
 Antiquity 15:315-321.
- 1957 Six Late Sites in Southern and Central New Jersey.
Bulletin of the Archaeological Society of New Jersey
 13:1-10.
- Mooney, James
 1928 The Aboriginal Population of America North of Mexico.
 In Smithsonian Miscellaneous Collections, edited by John
 R. Swanton, Vol. 80, No. 7. Washington, D.C.
- Mounier, R. Alan
 1972 An Archaeological Survey of the Union Lake Area,
 Millville, New Jersey. The Vineland Historical Maga-
 zine XLIX(1). Vineland Historical and Antiquarian
 Society, Vineland, New Jersey.
- 1972a The Blue Hole Site. Bulletin of the Archaeological
 Society of New Jersey 29:14-27.
- 1974 Archaeological Investigations in the Maurice River
 Tidewater Area, New Jersey. Man in the Northeast
 7:29-56.

- 1974a An Archaeological Survey of a Section of the Pureland Industrial Park, Logan Township, Gloucester County, New Jersey. Unpublished Report submitted to Landtect Corporation, Philadelphia, Pennsylvania. (1974).
- 1975 The Indian Head Site Revisited. Bulletin of the Archaeological Society of New Jersey 32:1-14.
- 1977 A Stage I Archaeological Survey of Portions of Eagleswood Township, Ocean County, New Jersey. Report to Eagleswood Township Municipal Utilities Authority.
- 1978 Two New Radiocarbon Dates for New Jersey. Pennsylvania Archaeologist 48(1-2): 16-19.
- 1979 A Stage I Archaeological Survey of Portions of Northern Burlington County, New Jersey. Report to Northern Burlington County Regional Sewerage Authority, Bordentown, New Jersey.
- n.d. Archaeological Investigations in the Maurice River Tidewater Area, New Jersey. Unpublished Master's Thesis. Memorial University of Newfoundland, St. John's, Newfoundland., Canada. Copy on file with New Jersey State Museum. Trenton.
- n.d.a. The Muddy Island Site. Manuscript on file with the author.
- Myers, Albert Cook (editor)
- 1912 Narratives of Early Pennsylvania, West Jersey and Delaware. Charles Scribner's Sons, New York.
- 1970 William Penn's Own Account of the Lenni Lenape or Delaware Indians. Middle Atlantic Press, Somerset.
- Newcomb, William W., Jr.
- 1970 The Culture and Acculturation of the Delaware Indian. University of Michigan, Museum of Anthropology, Anthropological Papers, No. 10. Ann Arbor.
- O'Callaghan, Edward B. (editor)
- 1853 Documents Relative to the Colonial History of the State of New York: Procured in Holland, England, and France, by John R. Broadhead. Vol. 1. Weed Parsons Publishers, Albany, New York.
- Omwake, H. Geiger, and T. Dale Stewart
- 1963 The Townsend Site Near Lewes, Delaware. The Archeologist 15:1-69. Sussex Society of Archaeology and History. Seaford, Delaware.

- Philhower, Charles A.
 1957 The Indians about Lake Hopatcong. Bulletin of The Archaeological Society of New Jersey 13: 1-20. Trenton.
- n.d. Indian Lore of New Jersey. Know Your State Series., Department of Conservation and Economic Development, Trenton.
- Rasieres, Isaack de
 1909 Letters of Isaack de Rasieres to Samuel Blommaert, 1628. In Narratives of New Netherland, 1609-1664, edited by J. Franklin Jameson. Charles Scriber's Sons, New York.
- Ritchie, William A.
 1958 An Introduction to Hudson Valley Prehistory. New York State Museum Science Service Bulletin, No. 372. Albany.
- 1969 The Archaeology of New York State (revised edition), Natural History Press, Garden City.
- Russell, Emily, W. B.
 n.d. Vegetation of Northern New Jersey before European Settlement. American Midland Naturalist (in press).
- Ruttenber, Edward M.
 1872 History of the Indian Tribes of Hudsons River. J. Munsell, Albany.
- Salwen, Bert
 1968 Muskeeta Cove 2: A Stratified Woodland Site on Long Island. American Antiquity 33:322-340.
- Salwen, Bert and Ann Ottesen
 1972 Radiocarbon Dates for a Winsor Occupation at the Shantok Cove Site, New London County, Connecticut. Man in the Northeast 3:8-19.
- Schmitt, Karl
 1952 Archaeological Chronology of the Middle States. In Archaeology of Eastern United States, edited by James B. Griffin, pp. 59-70. University of Chicago Press.
- Schrabisch, Max
 1917 Archaeology of Warren and Hudson Counties. Report of the Department of Conservation and Development, State of New Jersey. Bulletin 18. Trenton.
- Schrabisch, Max, and Leslie Spier
 1915 Indian Habitations in Sussex County, New Jersey (by Max Schrabisch) and Indian Remains near Plainfield, Union County and along the Lower Delaware Valley (by Leslie Spier). Geological Survey of New Jersey Bulletin 13. Trenton.

Skinner, Alanson

- 1909 The Lenape Indians of Staten Island. In The Indians of Greater New York and the Lower Hudson, Anthropological Papers, American Museum of Natural History, pp. 3-62, New York.
- 1932 The Indians of Manhattan Island and Vicinity. American Museum of Natural History, Guide Leaflet Series. No. 41. New York.

Skinner, Alanson and Max Schrabisch

- 1913 A Preliminary Report of the Archaeological Survey of the State of New Jersey. Geological Survey of New Jersey. Bulletin No. 9. Trenton.

Smith, Carlyle S.

- 1950 The Archaeology of Coastal New York. Anthropological Papers of the American Museum of Natural History 43(2). New York.
- 1955 Revised Chronology for the Archeology of Coastal New York. Bulletin of the Nassau Archaeological Society 1(1):4-5. Sea Cliff, New York.

Smith, Samuel

- 1765 The History of the Colony of Nova-Caesaria, or New Jersey. Reprinted by the Reprint Company. Publ. Spartansburg, S.C. (1975).

Snow, Dean R.

- 1978 Late Prehistory of the East Coast. In Handbook of North American Indians 15:58-69 Smithsonian Institution. Washington, D.C.

Speck, Frank G.

- 1931 A Study of the Delaware Indian Big House Ceremony. Publications of the Pennsylvania Historical Commission, Vol. 2. Harrisburg.

Staats, F. Dayton

- 1974 A Fresh Look at Bowmans Brook and Overpeck Incised Pottery. Bulletin of the Archaeological Society of New Jersey 30:1-6.

Swanton, John R.

- 1952 Indian Tribes of North America. Bureau of American Ethnology, Bulletin 145, Smithsonian Institute, Washington, D.C.

Thomas, Ronald, et al.

- 1975 Environmental Adaptation on Delaware's Coastal Plain. Archaeology of Eastern North America 3:35-90.

- Wallace, A. F. C.
 1947 Woman, Land and Society: Three Aspects of Aboriginal Delaware Life. Pennsylvania Archaeologist 17 (1-4):1-35.
- Weslager, C. A.
 1939 An Aboriginal Shell Heap Near Lewes, Delaware. Bulletin of the Archaeological Society of Delaware 3(2):3-8.
- 1954 Robert Evelyn's Indian Tribes and Place Names of New Albion. Bulletin of the Archaeological Society of New Jersey 9: 1-14. Trenton.
- 1961 Dutch Explorers, Traders and Settlers in the Delaware Valley. University of Pennsylvania Press.
- 1967 The English on the Delaware, 1610-1682. Rutgers University Press, New Brunswick, New Jersey.
- 1972 The Delaware Indians, A History. Rutgers University Press, New Brunswick, New Jersey.
- Witthoft, John
 1963 General Interpretations. In The Townsend Site Near Lewes, Delaware, edited by H. Geiger Omwake and T. Dale Stewart, pp. 59-69. The Archeolog 15. Sussex Society of Archaeology and History. Seaford, Delaware.
- 1979 Lecture to Southern New Jersey Chapter of the Archaeological Society of New Jersey. Medford, New Jersey.
- n.d. Manuscript on Pottery Types. On file with New Jersey State Museum. Trenton.
- Witthoft, John, and W. Fred Kinsey (editors)
 1959 Susquehannock Miscellany. The Pennsylvania Historical and Museum Commission. Harrisburg.
- Wroth, Lawrence C.
 1970 The Voyages of Giovanni da Verrazzano 1514-1528. Yale University Press, New Haven.