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Article Summary: Middle Woodland people who appeared in the region by A.D. 1 were the earliest pottery-makers in Nebraska. Late Woodland people used bows and arrows rather than lances. Living in semi-permanent villages, they cultivated corn and other food plants.

Cataloging Information:

Geologic Time: Early Woodland Period, Middle Woodland Period, Late Woodland Period

Woodland People: Hopewell people (Kansas City), Keith phase people (Nebraska), South Platte people (Nebraska, Colorado, Wyoming), Valley phase people (Nebraska, Iowa, South Dakota)

Nebraska Archeological Sites: Schultz site (Valley County), Woodruff Ossuary (Harlan County), Feye and Lawson sites, Loseke Creek (Platte County); Walker Gilmore site, Sterns Creek (Cass County), Great Oasis sites (Minnesota, Iowa, Nebraska, South Dakota)

Keywords: Hopewell Mound, burial cult, trade network, projectile points, radio carbon dates, shells, bow and arrow, corn

Photographs / Images: Valley Phase and Loseke Creek ceramics; typical Early Potters village of thatch- or hide-covered huts; Great Oasis pot (Stanton County); a member of a WPA crew examining a pot from the Schultz site; map of Middle Woodland cultures in Nebraska; jewelry of the Early Potters; proton magnetometer scan of an 800-year-old Village Farmer house (Sarpy County); bone hide-working tools recovered from an Early Potters site (Valley County); ground stone axe used by Woodland people for breaking and chopping wood; map of Late Woodland cultures in Nebraska; 1939 WPA crew at an excavated house floor at the Schultz site; Early Potters projectile points

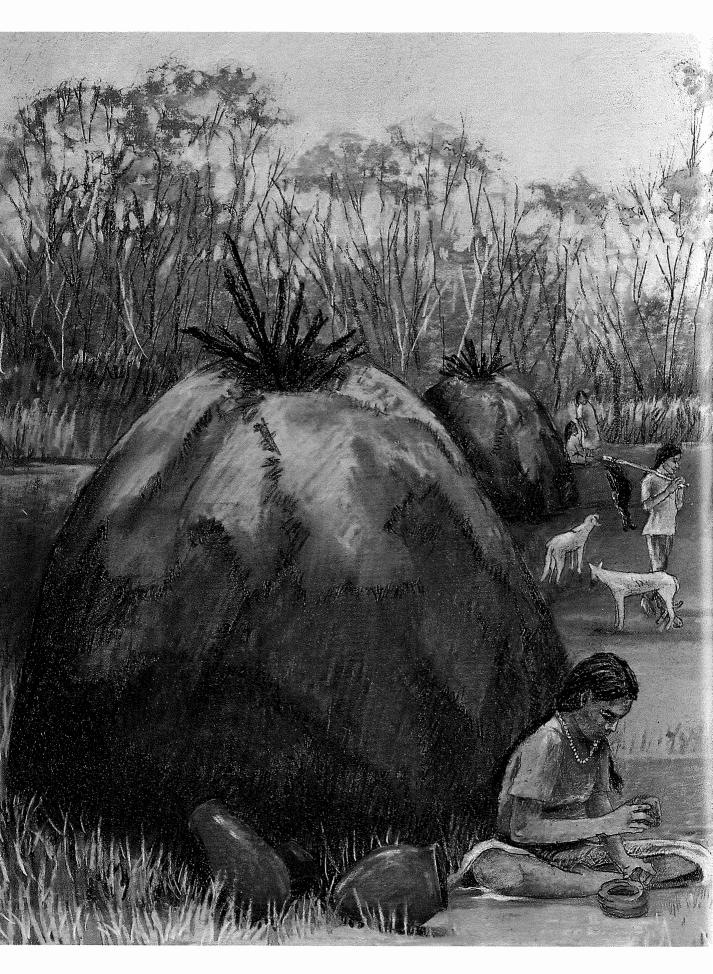


PART FIVE

CROPS AND VILLAGES

Nomadic ways of the Big Game Hunters and Foragers gave way to permanent communities with substantial shelters and large populations. Technological advances include the bow and arrow, pottery and agriculture.

Valley Phase (long pot) and Loseke Creek ceramics.





CHAPTER TEN

The Early Potters

Emerging Technologies



Great Oasis pot, Stanton County

By John Ludwickson and John R. Bozell Curators of Anthropology, Nebraska State Historical Society

ABOUT 2,000 YEARS AGO, or perhaps a century or two earlier, people living in the Nebraska region began to make pottery, a significant technological innovation that signals the beginning of the Woodland cultural tradition. The Woodland period may have been accompanied by a population increase, technological innovations such as the bow and arrow, ceremonial elaboration and domesticated food plants grown in gardens.

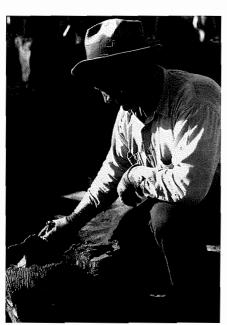
The closest associations with that pottery are ceramics in eastern and central North American Woodland areas, connections so clear that archaeologists now routinely accept the name "Plains Woodland" for the people who made those pots. Although the Woodland period lasted less than 1,500 years, it is divided into early, middle, and late segments. Early Woodland artifacts have not been found west of the Missouri River.

Middle Woodland and Trade Contacts

In Nebraska, the earliest known pottery-making people are of Middle Woodland affiliation and appear in the region by A.D. 1. Middle Woodland pottery is typically thick, built in the shape of an elongated bag with a pointed base and no distinct shoulder or rim. The pots were built of clay slabs, shaped and thinned by rolling the surface with a circular cord-wrapped stick. Decoration, including incised lines, round indentations or bulbs and notches made with a cord-wrapped stick, was applied to the rim and body. Projectile points are large, indicating that the bow and arrow was not yet in use. Principal weapons were probably darts or lances.

In the Midwest, Middle Woodland is distinguished by the Hopewell mound burial cult and trade network. Hopewell is characterized by the elaborate,

A typical Early Potters village of thatch- or hide-covered huts rests on a floodplain.



A member of a 1939 Works Progress Administration crew examines a 1,500-year-old pot from the Schultz site in Valley County.

ritualized burial of chiefs or priests who may have presided over village life and coordinated a far-flung trade network that stretched from the Rocky Mountains to the Atlantic Ocean and the Gulf of Mexico. Hopewell outposts are found on the Plains, but not in Nebraska. Evidence of Hopewell influence occurs in the Kansas City, Missouri, area. Burial mounds with Hopewell connections also were found along the Red, James and Missouri rivers of North and South Dakota in the "Sonota" (South, North Dakota) burial complex.

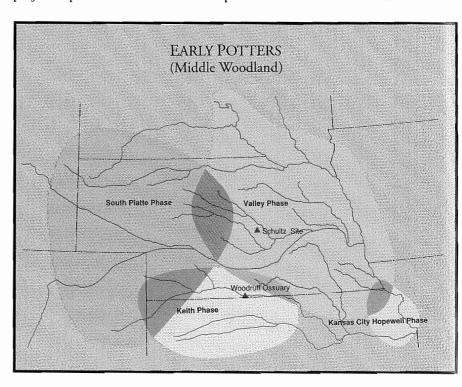
Kansas City Hopewell probably was a local population of Hopewell people — either immigrants or converts — who collected and transported goods such as flint and obsidian, grizzly bear teeth and claws, and bison meat from the mountains and Plains to the Hopewell core in Illinois and Ohio. The people supported themselves by growing corn and other crops and by hunting. Although those Hopewell people expanded up the Kansas River as far as the Republican's mouth, their interests were clearly centered in the Kansas City region. The sparse evidence of Hopewell culture in Nebraska argues against wide expansion, but its indirect influence may have been far greater.

The Sonota people may well have been local middlemen in the distribution of goods from the northern Plains. Such trade to the east was probably by overland trails that bypassed Nebraska. The collapse of Hopewell in the east was followed by the disintegration of those relationships in North and South Dakota and in Kansas City, with succeeding Woodland archaeological remains becoming increasingly localized.

At the same time the comparatively sophisticated Hopewell people lived in the Kansas City area, people of the much less advanced Valley phase lived throughout eastern and central Nebraska, western Iowa and South Dakota from A.D. 0 to A.D. 500. Their stone, bone and ceramic artifact inventories are sparse and appear impoverished compared to the Kansas City Hopewell. There is very little evidence of gardening in Nebraska Valley phase sites, and abundant remains of bison, deer, elk and other game suggest that those people were subsistence hunters and gatherers.

Another Nebraska Middle Woodland expression is the Keith phase, centered in the Republican River drainage. Keith people made large stone projectile points for use on lances or spears. But their arsenal also included

Middle Woodland cultures ranged across Nebraska 1,500 to 2,000 years ago.





small, often serrated points, the first evidence of the bow and arrow in Nebraska. Keith phase craftsmen also developed an impressive bone tool technology. Their pottery, however, was very simple, roughened with cords and rarely decorated.

Although radiocarbon dates suggest a Late Woodland time period for Keith, A.D. 400 to A.D. 800, it is clearly Middle Woodland in character. A few Keith phase houses have been excavated along Medicine and Red Willow creeks in southwestern Nebraska. As with the Valley phase houses, they were simple huts suggesting only seasonal occupancy.

Even less is known about the South Platte people of the late Middle Woodland expression. They lived in western Nebraska, eastern Colorado and Wyoming from about A.D. 500 to A.D. 1000. South Platte people may have been the direct descendants of local Late Archaic people who adopted pottery-making technology. Although of clear Middle Woodland inspiration, South Platte pottery is a local reinterpretation with, perhaps, some slight influence from Rocky Mountain sources, such as the Shoshonean pottery.

South Platte people probably lived in social groups no larger than several families, sharing open campsites and using skin tents for shelter. They also used natural shelter, such as Ash Hollow Cave in the North Platte Valley.

Where the Middle Woodland people came from and what became of them remain mysteries. Some might have survived and developed into the later Late Woodland or Village Farmer cultures, they may have been absorbed by later cultures, or they may have left the region.

Western Nebraska Middle Woodland people may have been Late Archaic people who developed a "Woodland" veneer by adopting ceramics. It seems likely that we can also trace these people into the succeeding era at the Chadron State Park site, for example, where South Platte pottery and pottery reminiscent of later people were found together.

Jewelry of the Early Potters included this shell bead necklace from Hitchcock County, a deer skull ornament and bone beads from Valley County.

LEARNING WITHOUT DIGGING

By John Weymouth, Professor of Physics, University of Nebraska-Lincoln

The need to understand archaeological sites without digging is becoming more urgent as urbanization and agriculture threaten more and more irreplaceable areas. Learning without digging is also important because excavation of an archaeological site destroys it for future studies when new technology that could vield more information might become available. As a result, archaeologists are adapting geophysical exploration techniques based on variations in electrical resistivity of soils or on magnetic anomalies of the site. Another technique, using reflected radio signals, is called ground penetrating radar.

Resistivity Prospection

One of the older techniques of examining without digging uses electrical resistance measurements. Electrical resistance is a measure of the inability of a conductor — the soils in this case — to conduct electrical current. The electrical conductivity and resistance

of soils is determined by the water and ionic content as well as by their porosity.

Changes in the resistivity of soils can be caused by features such as foundations, wells, trash middens, storage pits and hearths. Soil resistivity is measured by inserting four probes into the ground. Two of the probes inject a current into the soil while the other two measure the potential difference. or voltage, between them

The most common configuration of probes is called the Wenner array in which the four probes are inserted in a straight line and equally spaced at about each

grid point on the site. The test results are then plotted on line profiles or contour maps in order to identify significant regions. When the probes are further separated, more of the vertical volume is included in the test. Thus some information can be obtained on the depth of a feature.

Another way to measure the same soil property is with an electromagnetic conductivity meter. This device has two coils, one that emits a radio signal and one that receives it. The properties of the signal are changed by the intervening soils. The conductivity, and therefore the resistivity, of the soil is determined from the nature of the received signal. Again

separation of the coils.

Magnetic Prospection

Geophysicists have used sensitive magnetometers for many years to measure the strength of the earth's magnetic field. Portable proton magnetometers were developed in the mid-1950s, and shortly thereafter the first archaeological application was locating buried kilns in England.

Measurements of the total magnetic field of the earth can give information on subsurface soils because soils contain various iron minerals, some of which are slightly magnetic. Human activities and natural processes can alter some of those minerals and therefore their magnetic state. The magnetic field of the earth induces magnetization in those minerals and, if there is a localized concentration of minerals, magnetization creates a weak local magnetic field in addition to the external field

25 East

Proton magnetometer scan shows magnetic disturbances associated with an 800-year-old Village Farmer house in Sarpy County.

of the earth. Sensitive instruments measure the small local contribution to the total field, allowing the magnetic anomalies of the site to be identified.

Human activities that heat soils or cause chemical changes of magnetic minerals in humic soils increase their magnetization. Thus, magnetic anomalies may show burned house roofs, fired kilns and hearths, ditches filled with topsoil and storage pits or middens filled with organic-rich topsoil. Foundations and cellars on historic sites can be located and, of course, ferrous metal objects can cause strong anomalous signals.

The diagram above is a magnetic contour

the effective volume is determined by the map of data obtained with proton map. netometers over a Nebraska phase Indian house on the Patterson site between Lincoln and Omaha. The area surveyed was 20 meters by 20 meters. The strong local anomalies at N25E22, N37E28 and N40E33 were caused by near-surface iron objects. The strong low region centered at N32E26 was caused by a depression left by an unknown pot hunter digging at the site.

The more extended low region three meters east of the pot hunter's hole reflects the edges of the house. The slightly higher region between those low regions, centered at N31E27, was caused by a fire hearth and storage pit. The high region centered at N25E27 was over a midden rich in artifacts.

Ground Penetrating Radar

A method long used by engineering geophysicists, ground penetrating radar, is now gaining popularity in the archaeological

community. If a high frequency radio signal is directed down into the earth some of the signal will return as an echo off places in the soil where electrical properties of the soil change abruptly. By timing the echo it is possible to obtain information on the depth of the zone causing it.

Traces of past human activity that can be revealed through the use of radar include foundation walls and floors, compacted or stone roads and earthen features, such as a mound with a compacted floor. Ground penetrating radar works well in dry sandy soils but not as well in moist clay soils because those

soils absorb more radiation.

In operation the send-receive transducer is slowly dragged across the site on a series of parallel routes. The data can be displayed as a series of vertical traces on paper or on a screen.

Summary

The archaeological community throughout the world is becoming increasingly aware of the potential for obtaining subsurface information about archaeological sites using nondestructive techniques. The necessary equipment, originally taken directly from the field of exploration geophysics, is now being designed and refined specifically for the requirements of archaeologists.



The Schultz Site

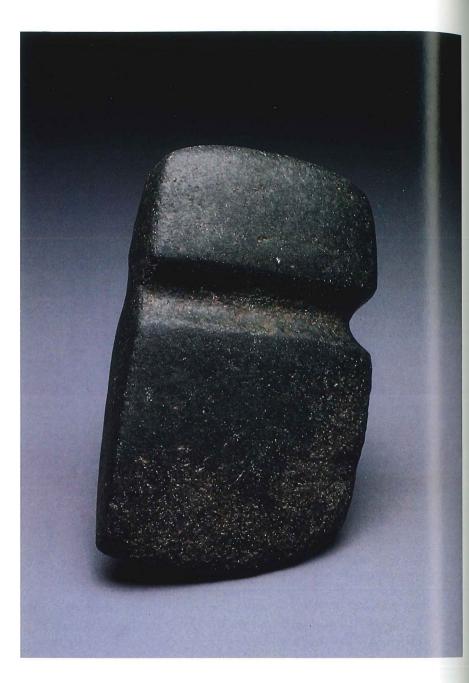
The Valley phase was named for Valley County, the location of the Schultz site, which the Nebraska State Historical Society excavated in 1939 to learn more of pre-Village Farmer cultures. This site and others like it yielded the first evidence of a semi-sedentary lifestyle in the central Plains.

The Schultz site included about 10 shallow basins 10 to 30 feet in diameter, apparently hut foundations. These dwellings probably consisted of a frame of light poles covered with thatch or hides. Most had central fireplaces and some were associated with shallow storage or refuse pits, but none showed evidence of an entryway. The site may have been a winter village occupied by a group of families several years in a row. A smaller Valley phase site in Gosper County produced the remains of a house with considerable burned clay suggesting thatch and mud plaster construction.

Schultz site pottery is abundant and relatively thick-walled and elongated, with pointed bases. The pottery bears a striking resemblance to a utilitarian Hopewell type and its Kansas City version, suggesting an indirect influence on the Nebraska people. A variety of stone scrapers, knives and projectiles was recovered. Most of the points were large, indicating continued use of darts and the atlatl. Many buffalo toe bones with drilled holes were found in the excavations, but their function is uncertain.

Bison hunting supplied most of the food for Valley phase people, judging from bones found at the Schultz site, although the remains of deer and antelope also were recovered. A few mussel shells, bird bones and small mammal bones are present. At other Valley phase sites, antelope bones are predominant, which suggests that the Valley phase people were able to adapt to whatever resources were available locally.

Bone hide-working tools were recovered from a site in Valley County occupied by Early Potters 1,500 to 2,000 years ago.



Woodland people made stone axes by pecking and grinding river cobbles. The groove extending only three-quarters of the way around is typical of the Woodland period. Ground stone axes probably were used for breaking and chopping wood.

The Woodruff Ossuary

In 1946, Smithsonian Institution archaeological crews excavated a Middle Woodland cemetery on the Nebraska-Kansas border prior to construction of Harlan County Reservoir. The graves are associated with the Keith phase and date to about A.D. 600. Evidence from Woodruff, where archaeologists discovered a large basin containing multiple burial pits, suggests that Keith phase mortuary practices featured elaborate social relationships. This type of cemetery, called a communal ossuary, probably was used repeatedly by various Keith groups.

Some individuals were buried with generous offerings, including hundreds, even thousands, of simple mussel shell disc beads, exotic conch shell artifacts imported from the Gulf of Mexico, carefully made gypsum or calcite beads and other valuable items. One boy's grave was heaped with mussel shell beads, wealth (if that is what the beads signified) he could not possibly have earned during his short life. Perhaps he was given an elaborate burial because he had been born to a family of high status.

Late Woodland Experimentation and Expansion

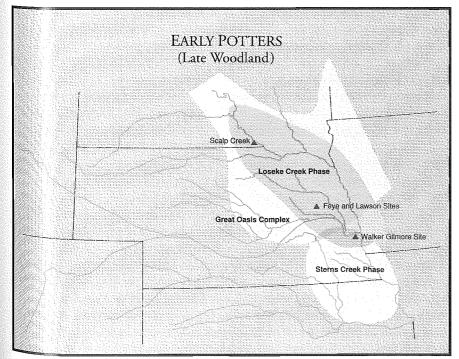
While Middle Woodland culture was gradually spreading westward, the people of eastern Nebraska and adjacent areas of Iowa and South Dakota were adopting other ideas from the Midwestern Woodland hearth, perhaps brought to them by immigrants about A.D. 600 or A.D. 700. Those innovations included new concepts in ceramic vessel form and decoration and the replacement of the lance and atlatl with the bow and arrow.

The potters of the time began impressing jar rims with twisted cords to produce elaborate geometric designs. Rather than making the bag- or bullet-shaped pots with pointed bases of Middle Woodland design, they began making containers approaching true jars, with rounded bodies, sloping shoulders and distinct rims. This new pottery, half as thick as Middle Woodland ceramics, was formed by modeling the vessel from a single lump of clay rather than the several clay slabs used in Middle Woodland pots. The walls were thinned by stamping the exterior with a flat, cord-wrapped paddle, producing a lighter food storage container and a more efficient cooking vessel.

Late Woodland pottery was a great improvement over the older forms, but it fell short of being the optimum ceramic vessel. Perhaps food preparation techniques were in transition as well. Although Late Woodland jars are thin walled (thus thermally efficient) and moderately spacious, they appear frail and the material is too friable, or "soft," to withstand the constant reheating needed to simmer or boil tough-hulled food such as corn or beans.

The bow and arrow rapidly replaced previous hunting systems such as the atlatl and the lance. Arrows were smaller than lances and spears and, therefore, quicker to make and easier for hunters to carry. But increased range and accuracy was the most important feature of the new weapon. By the end of the Middle Woodland period and continuing through the Late Woodland period, projectile points are smaller, thinner and, for the first time, true arrowheads.

Charred seeds discovered in archaeological excavations, including domestic plants such as corn, beans, squash, sunflowers and gourds, were known to Plains Indians since Middle Woodland times but were rarely used until about A.D. 900. Well into the Late Woodland period the population had increased



Late Woodland cultures lived in Nebraska 1,000 to 1,500 years ago, most in the eastern and northeastern parts of the state.

and had become strongly oriented to river and stream valleys. The Late Woodland people living in valleys increased their use of domesticated plants and set the stage for a major focus on corn agriculture in the later Village Farmer period. However, the question of which came first, population increase or agriculture, is not yet answered satisfactorily.

The Late Woodland period in Nebraska is divided into three phases: Loseke Creek, Sterns Creek and Great Oasis. Loseke Creek sites are most common, occurring throughout the eastern half of the state. They are also the earliest Late Woodland sites and may have been related to remnant Valley phase groups. Sterns Creek and Great Oasis sites are somewhat younger, but overlap late Loseke Creek developments. Sterns Creek sites seem to be restricted to the southeastern quarter of the state and may be associated with complexes in Kansas and Iowa. Great Oasis manifestations occur in northeastern and north-central Nebraska. Each phase is distinct, perhaps representing a separate migration of people into the area or a separate episode of adopting ideas from people outside the region.

The few Great Oasis sites in Nebraska fit into a widespread distribution from southeastern Minnesota, central South Dakota and northwestern Iowa. Northeastern Nebraska falls about in the center of the pattern. One northwestern Iowa Great Oasis site is a true village with as many as 25 substantial rectangular houses. It may be a very late example, however.

Almost all Great Oasis sites include many large-capacity storage pits, far larger than Loseke Creek pits. This suggests food surpluses. Without much doubt, Great Oasis people were successful corn gardeners, as demonstrated by charred plant remains from sites in central Iowa and from the Bill Packer site in Sherman County.

Elaborate shell ornaments, including *Anculosa* snail shell beads from the Ohio River basin, accompany most Great Oasis burials, evidence of regional trade among groups of the period.

Great Oasis pottery is among the finest on the Plains-Prairie border; it is well made and decorated elaborately and with great precision. Similarities are apparent between the finely incised Great Oasis decoration and Loseke Creek cord-impressed decoration, but they are not identical. Great Oasis pottery is likely the forerunner of Village Farmer pottery in the South Dakota region. Great Oasis culture is certainly the apex of Late Woodland and demonstrates a degree of continuity between preceding and succeeding events.

Relationships of Woodland sites with the East are fairly clear, but whether that is evidence of the diffusion of ideas, the actual migration of people or a combination is not clear. Great Oasis is a fairly distinct connection between Woodland and later village dwellers north of Nebraska. Yet, Woodland should not be viewed merely in terms of historical transitions. Woodland adaptations were ingenious solutions to living on the plains and prairies and possess an integrity of their own.

The Feye, Lawson and Scalp Creek Sites

The Feye and Lawson sites on Loseke Creek in east-central Nebraska and the Scalp Creek site in south-central South Dakota are three nearly completely excavated villages of the Loseke Creek phase. At each site, archaeologists excavated village features. They also found cord-impressed, decorated pottery as well as some undecorated pottery, stone arrow points, knives, hammers and cutting and perforating tools made of bone. Although archaeologists found no obvious gardening tools, a small amount of recovered corn suggests domesticated garden crops were a part of the diet. Although there is some evidence of corn in Kansas City Hopewell sites, this is the earliest evidence of corn in a



A 1939 Works Progress Administration crew pauses on an excavated house floor at the Schultz site in Valley County.



Nebraska Woodland site. Scrap bone is scarce at the Feye and Lawson sites, suggesting that hunting provided a smaller portion of the diet than at Middle Woodland sites.

The Walker Gilmore Site

The Late Woodland Sterns Creek phase is not well understood since only two sites have been reported and excavated. One, the Walker Gilmore site on a short Missouri River tributary in Cass County, is among the most important in eastern Nebraska. It was excavated several times by the University of Nebraska. The Walker Gilmore site is deeply stratified, showing successive periods of occupation separated by flood-deposited silt and soil washed from a hill above. Because of radiocarbon dates as late as A.D. 1100, some archaeologists contend that Sterns Creek people and Village Farmers may have inhabited some eastern Nebraska creek valleys contemporaneously.

University crews found no corn at the Walker Gilmore site, but they did recover squash or gourd seeds. Deer bones were abundant, suggesting that venison was the principal component of the diet, but smaller mammals and migratory birds also were eaten. Curious patterns of post remnants were found at the Walker Gilmore excavation. They are very long and narrow, almost cigar-shaped, and are interpreted as the remains of racks used to dry meat.

The Walker Gilmore site yielded a fairly abundant and diverse collection of artifacts. Pottery, made of sandy paste, was thin with modest decoration. Arrow points are generally quite small, which suggests the complete adoption of the bow and arrow. Sewing and hide-working tools fashioned from animal bone slivers also were common.

By the close of Late Woodland times, Indians were increasingly using the bow and arrow, making pottery, growing crops and living in semi-permanent villages. The stage was set for probably the most important period in Nebraska archaeology — the Village Farmer tradition.

These Early Potters projectile points may illustrate a transition in weapon technology. The smallest point (right) is probably an arrow point, while the rest are probably spear points. About 1,500 years ago, the bow and arrow was rapidly replacing the atlatl and lance.