

The Immense Journey



The sky wheeled over me. For an instant, as I bobbed into the main channel, I had the sensation of sliding down the vast tilted face of the continent. It was then I felt the cold needles of the alpine springs at my fingertips, and the warmth of the Gulf pulling me southward. Moving with me, leaving its taste upon my mouth and spouting under me in dancing springs of sand, was the immense body of the continent itself, flowing like the river was flowing, grain by grain, mountain by mountain, down to the sea.

—Loren Eiseley, *The Immense Journey*, 1957, on floating down the Platte River toward the Missouri River

In Memory of Kathleen “Kathy” Kahue

Cover. Karl Bodmer's 1833 painting of the loess bluff at Sioux City.

The Immense Journey

Loess Hills Cultural Resources Study

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Prologue



Known as one of North America's natural treasures, the Loess Hills is also one of our country's archaeological gems. This unique landscape harbors hundreds of well-preserved earth lodge dwellings and palisaded vil-

lages built by ancestral Plains Indians. The descendants of these early Iowa farmers were first described in the journals and accounts of 18th- and 19th-century travelers and explorers. Celebrated artists, such as Karl Bodmer and George Catlin, forever fixed the vibrant life ways of these people in our mind's eye.

The historical legacy of the Loess Hills lies in a rich archaeological record that boasts hundreds of late

prehistoric Glenwood house lodges in the south and palisaded Mill Creek villages in the north. These two very different ancestral Plains Indian cultures provide unparalleled opportunities to explore 300 years of cultural diversity linked to landscape. Archaeological events in the region are also tied to the struggle for Native Indian rights—guiding the country along a course ultimately leading to the protection and reburial of American Indian human remains.



George Catlin.

The University of Iowa's Office of the State Archaeologist conducted a study in 2008 and 2009 to identify important

cultural resources in the Loess Hills on behalf of the National Scenic Byway Council led by Golden Hills RC&D, a nonprofit or-

ganization serving western Iowa. This research made important new discoveries that clearly demonstrated the national significance of many sites. A partnership among local communities, landowners, and the interested public created plans for the ongoing protection, preservation, and interpretation of these wonderful resources.



Engagement: Communities Come Together



Before any professional archaeologist ever set a well-worn boot heel in Iowa's Loess Hills, area residents, relic hunters, and antiquarians pioneered the region's archaeology. Landowners and collectors filled boxes and frames with masses of stone points and pottery and dug into house depressions and village mounds. The arrival of Charles R. Keyes and Ellison Orr, appointed to conduct the first statewide archaeological survey in the 1920s, elevated these endeavors to site recording. The two relied on local residents, such as Paul Rowe in Mills County, and organizations, like the Sioux City Academy of Sciences, for information about collections and sites. These efforts produced a basic understanding of the area's prehistory and drew the interest of professionals. Later the Sanford Museum in Cherokee and both the Northwest Chapter and the Paul Rowe Chapter of the Iowa Archeological Society made significant contributions to Loess Hills' archaeology.

financed, constructed, and continue to maintain both the earth lodge and the nearby museum. Here most of the Rowe collection, one of the largest and most comprehensive of any from the central Missouri valley, is displayed.

Recognizing the valuable knowledge and generous enthusiasm of area residents, the Loess Hills Cultural Resources Study began with a series of community meetings intended to outline the project and engage public input. A community symposium hosted in Glenwood drew archaeological experts from Wichita to Washington, D.C., who shared their knowledge of the late prehis-

This kind of personal commitment and continuing interest has inspired many communities to find ways to advance the area's early history and to share it with others. This is perhaps nowhere better demonstrated than in the replica earth lodge and related artifact exhibits in the Mills County Historical Museum in Glenwood. Inspired by the carefully documented artifact collections of Paul Rowe and his colleagues, such as D.D. Davis, grass roots efforts



Paul Rowe.



toric period of the southern Loess Hills. The questions posed at this event guided subsequent research.

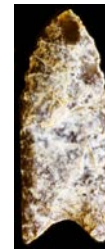
One of the most satisfying aspects of the Loess Hills project was meeting with landowners and collectors. Farmers proudly shared stone spear points found in their gardens, while others displayed collections containing hundreds of items families had been accumulating for generations. Seasoned collectors described sites excavated by amateurs in the 1950s and 1960s, whose previous existence was unknown. This information provided clues to find buried intact sites and helped the archaeologists learn how prehistoric people utilized the landscape. As a result, more than a dozen new, possible lodge locations came to light.



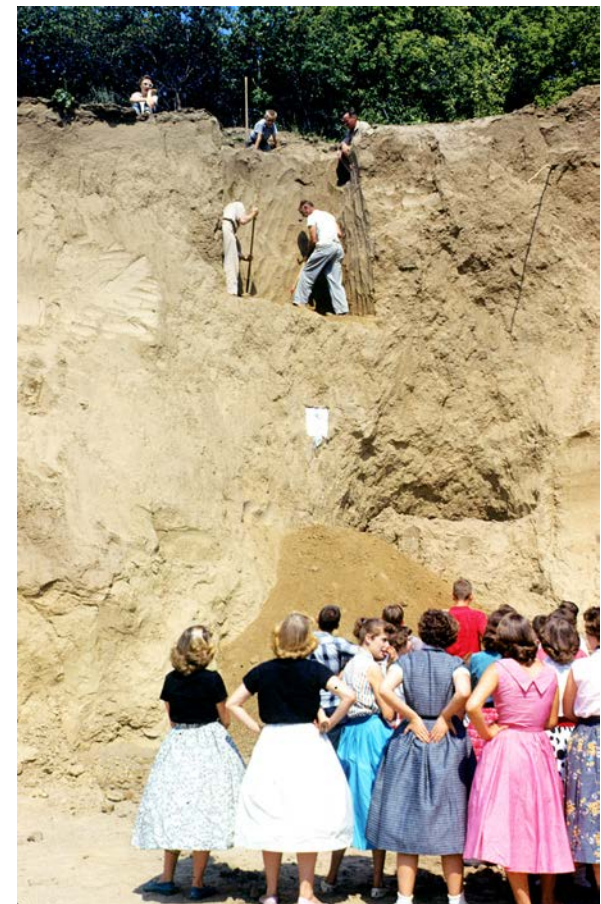
Prehistoric Sampler

The Loess Hills National Scenic Byway follows the Missouri valley traversing some 220 miles from Plymouth County in the north to Fremont County in the south. As a boundary region between the short grass plains and tall grass prairies and positioned along a major interior river corridor, the region is a place of deep history and rich archaeology. Since the end of the last great Ice Age, people have

called the Loess Hills home. Transportation corridors over land and along waterways, breathtaking vistas, diverse biological communities, narrow canyons, well-drained slopes, springs, and rich agricultural soil explain why people have been coming to the region for as long as humans have inhabited North America.



The area's prehistoric archaeology includes over 1,500 known sites found across seven counties and spanning more than 12,000 years of human history. Highlights include the earliest stone weapons lost or discarded by Paleoindian hunters, the oldest known Native American cemetery in Iowa, multitudes of late prehistoric agricultural communities, and the ephemeral settlements of displaced tribes. It is the late pre-



Excavation of the Turin site, Monona County, Iowa's oldest known cemetery.



House floor plan, excavated lodge, Mills County.

historic period, however, that stands out, offering the visitor a spectacular and contrastive view into the lives of ancestral Plains Indians.

Of all the known sites scattered throughout the seven Loess Hills counties, a major-

ity are prehistoric houses—earthen lodges—occupied between A.D. 1000 and 1400, and antecedent to the 19th-century villages described and illustrated centuries later by Meriwether Lewis, William Clark, George Catlin, and Karl Bodmer. What the cliff dwellings of the ancestral Pueblo peoples are to Southwestern archaeology, the lodges of ancestral Plains villagers are to Midwest and Plains archaeology—the seminal moment for the emergence of the first sedentary farming societies.

Archaeologists estimate that as many as 1,000 earth lodge dwellings once covered the hills and valleys in the southern Glenwood locality, all within a 10-mile radius of the confluence of the Platte and Missouri

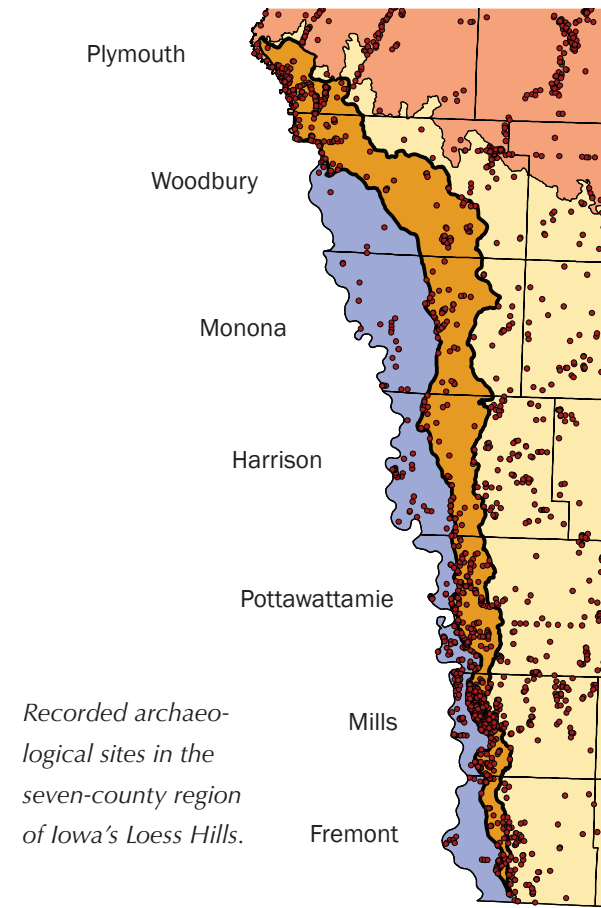
“What the cliff dwellings of the ancestral Pueblo peoples are to Southwestern archaeology, the lodges of ancestral Plains villagers are to Midwest and Plains archaeology—the seminal moment for the emergence of the first sedentary farming societies.”

rivers. At the northern end of the Loess Hills where the Big Sioux and Missouri rivers meet is another focal point for a late prehistoric settlement called Mill Creek.

Although the numbers of known sites in the Big Sioux locality are overshadowed by the astonishing number of dwelling sites in the south, the compact, fortified Mill Creek villages formed virtual mini-tells similar to ancient Mesopotamian mounds. And like their Near Eastern counterparts, Mill Creek villages developed as palimpsests of village debris and mud-walled houses that over time elevated the surrounding flat valley floor 6–10 feet.

While both Mill Creek and Glenwood people lived in semipermanent communities, grew corn, and developed a rich material culture, they were distinct societies based on other fundamentally different characteristics.

One of the most important was community planning. Mill Creek villages were nucleated and fortified while Glenwood settlements were dispersed and unfortified. Both Mill Creek and Glenwood people maintained contacts with distant communities, including those on the Plains to the west and the Mississippi drainage to the east. Both groups appear to have left the region at slightly different times between A.D. 1200–1400.



Recorded archaeological sites in the seven-county region of Iowa's Loess Hills.

Why these people chose to make this unique region home, whether they interacted, what circumstances shaped their different experiences, and why they both abandoned the Loess Hills are just a few of the important questions that guided the recent study. In all their material richness and diversity, these early farming societies are nationally significant because of the unparalleled opportunity they pose to explore the varied life ways of ancestral Plains Indians on the eve of Euroamerican contact.

Jewels in the Crown



Mill Creek pottery.

In the extraordinarily rich artifacts recovered from dozens of Mill Creek and Glenwood sites, we recognize objects familiar to the Plains Indian village way of life as it persisted for almost a millennium. The hide, feathers, wood, quill work, cloth, and sinew that comprised the tools, clothing, and ornaments of these early people have long since perished. Nevertheless, surviving items in stone, bone, pottery, and shell offer a well-rounded view of prehistoric technology and a glimpse into a rich symbolic and ceremonial life.

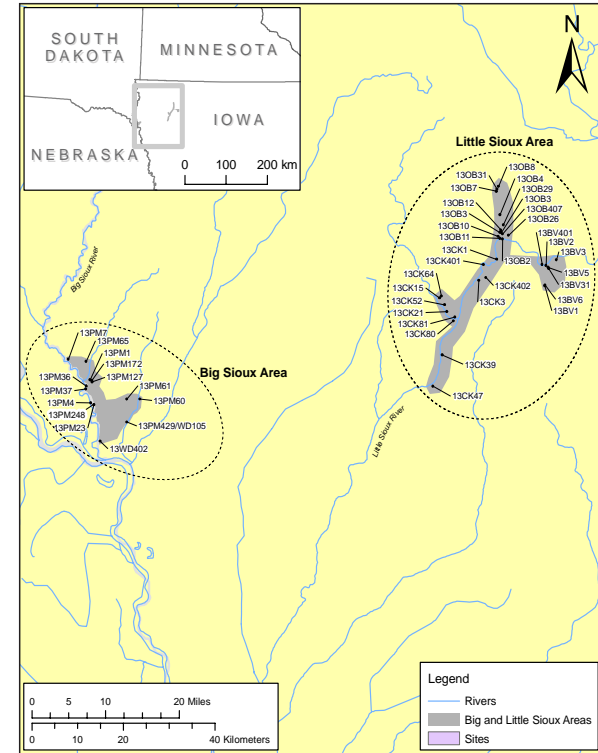
These were settled agrarian communities, and like any town or farmstead that persists over the decades, they permanently imprinted the landscape with the remnants of houses, fortifications, cemeteries, fields, and the ordinary detritus of daily life. Mill Creek peoples were focused bison hunters and horticulturalists. Their tightly spaced lodges within fortified villages and extensive middens suggest long-term, sedentary occupations lasting decades. The large

numbers of bison bones found in the villages of these pedestrian hunters indicate direct access to the herds. Village fortifications hint at anticipated external threats. Mill Creek was involved with early Mississippian trade from the east through Cahokia—North America's largest prehistoric metropolis

at the mouth of the Missouri River. They were also positioned between Plains peoples to the west and emerging Oneota societies to the east—people who would soon follow them.

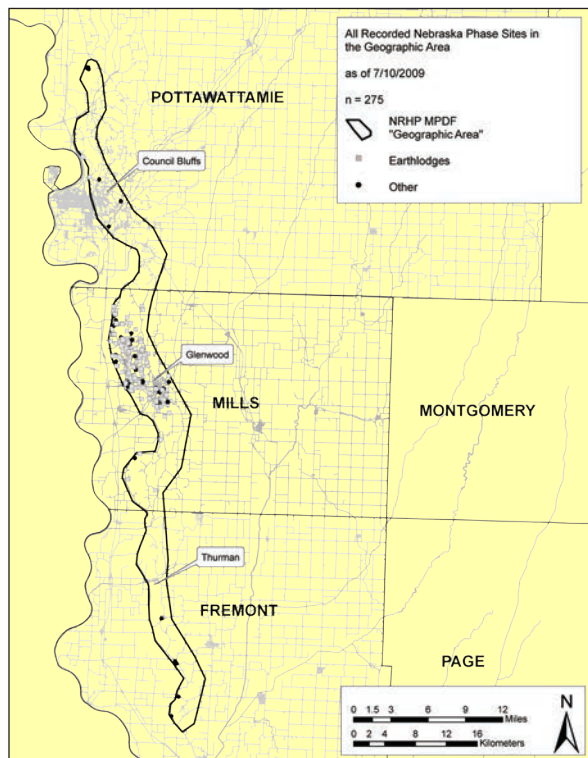


Bird's-eye view of a fortified Mill Creek village.



Location of Mill Creek sites in northwest Iowa. The Loess Hills study identified 14 villages and burial sites in the Big Sioux locality.





Location of Glenwood sites in southwest Iowa. The Loess Hills study confirmed at least 298 lodges at 275 sites in a three-county area.



Glenwood pottery.



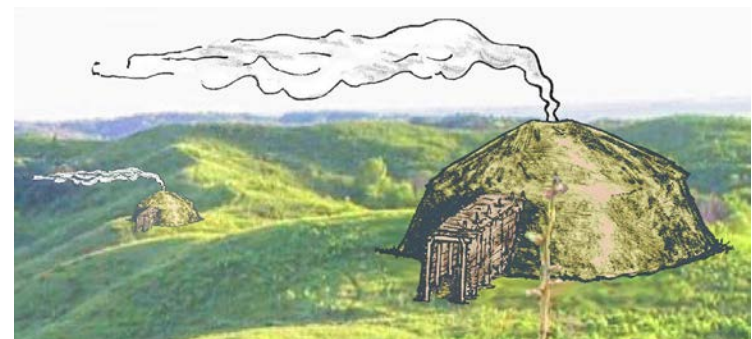
Glenwood people built widely dispersed, unfortified homesteads located immediately south of the Mill Creek culture area, and they largely, if not entirely, postdate the Mill Creek occupation. Glenwood communities appear to have had a very broad diet, harvesting some large game but also apparently foraging for anything edible. Artifacts in these sites suggest a relationship with later Mississippian and Oneota groups.

Mill Creek lasted for 100 to 200 years as a participant in the Mississippian trade emanating through Cahokia. By the time Cahokia waned, diminished bison herds coupled with competition from neighboring groups, likely created a decline in large game. With timber resources exhausted, this may explain the disappearance of the Mill Creek culture, leaving an open and depleted landscape whose fringes were utilized by Glenwood foragers.

Glenwood people may have survived, without competition from other groups, in a region with little large game and a low human population for nearly two centuries. They too then disappeared or were perhaps absorbed by developing Oneota societies.

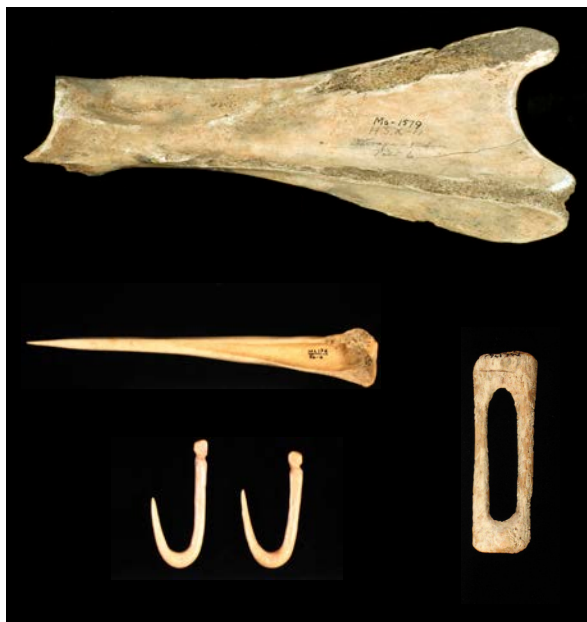
Mill Creek villages were likely organized along social and kinship lines different from those of the scattered Glenwood homesteads. And, each society had access to and utilized resources in distinct ways. On the face of it, however, their everyday tools seem remarkably similar.

Artist's reconstruction of two Glenwood lodges.





Complementary large and small bone tools from Mill Creek (above) and Glenwood (below) sites. Top to bottom: scapula hoe, awl, fish hook, and fish hook blank.



More fanciful items also suggest some affinity. Clay pot handles: Mill Creek (top) Glenwood (bottom).



Items are not to scale.



Chipped and ground stone artifacts from Mill Creek (left) and Glenwood (right) sites appear almost identical. Top to bottom: arrowheads, scrapers, arrow shaft abraders, and axes.



Other Mill Creek and Glenwood artifacts are distinctly different. These differences reflect access to specific raw materials, variations in manufacturing techniques, the nature and timing of external contacts, and cultural preferences and traditions.



A small handful of exquisitely beautiful bone, antler, and shell items, perhaps offers clues to the aesthetics, ceremony, and ideology of these early communities. They also suggest directions of trade.



Archaeological Discoveries: What Did We Find?



Archaeology always begins with questions. The recent Loess Hills study set out both to determine the scope of archaeological resources in the seven-county area and to answer a very basic question—do important, intact Late Prehistoric earth lodge sites still exist? If all of the sites that make Loess Hills' archaeology unique were documented and excavated in the early and mid-20th century, what is left to discover or rediscover? Has development, erosion, looting, plowing, and terracing destroyed or damaged all sites?

To find out the answers in the time allotted for the project, the research team conducted a selective survey of the region, visiting 34 sites including 13 previously recorded ones. These 13 were chosen for a revisit because state records indicated that they might still be intact and because their owners permitted access.

Working quickly, often with the help of local collectors including members of the Iowa Archeological Society, archaeologists visited site locations,

inspecting the surface for artifacts. They probed the ground with soil corers and augers looking for buried items and signs of prehistoric features such as pits and hearths. Often these visits proved disappointing. Sites were gone or irreparably disturbed. Fortunately, others remained intact, holding promise for revealing their secrets of the past. Despite more than a century of archaeological work in the area, landowners and local collectors showed the team several brand new sites never before recorded.

Test excavations at four Mills County lodge sites—three on private property north of Glenwood and one at Pony Creek Park—uncovered intact deposits containing buried hearths, artifact scatters, house floors, and the pattern of lodge walls and support posts. And, mapping the geographical location of all Glenwood sites revealed an intriguing new pattern.

Auger testing, survey, and remote sensing investigations at the Kimball Village site north of Sioux City produced tantalizing results. There is now no



question that this Mill Creek village contains deeply buried layers, stacked one above the other, and important clues to community planning, layout, and defense.

Sadly, many Late Prehistoric earth lodges in the Loess Hills are now known to have been destroyed. Despite this loss, the archaeological research demonstrates that intact sites still exist, buried beneath the surface and containing a wealth of important information.

Lost and Found Lodges

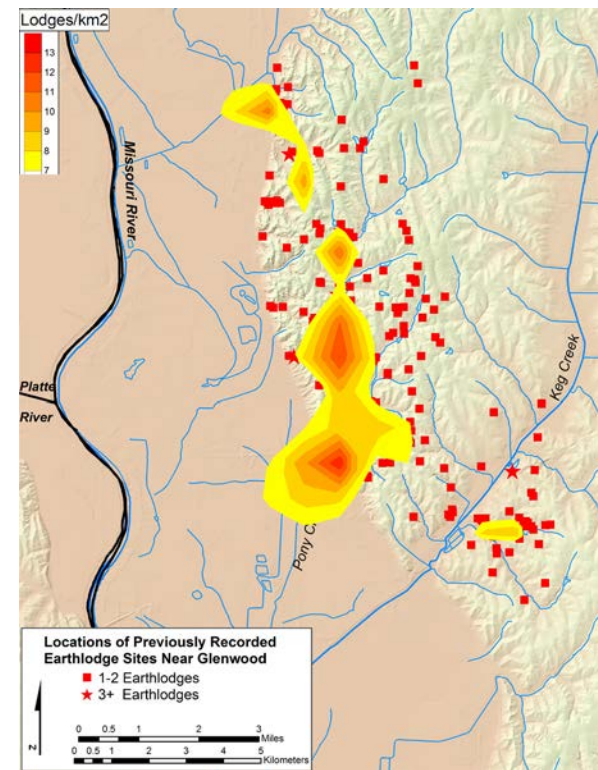
Prior to field research, archaeologists compiled a list of previously recorded earth lodge sites in the Loess Hills. The number varied from 280 to more than 300 due to the inconsistent way sites were mapped

and recorded over the past 100 years. The original number of lodges was certainly higher, but many were destroyed by erosion, plowing, and development before they could be recorded. Likewise, other lodges may lie deeply buried in the Missouri River floodplain waiting to be discovered. For most sites, almost no information about their current condition exists.

Using old field notes and comparisons with modern aerial photographs, the study prepared a list of potentially intact lodges, and landowners were contacted for permission to visit sites. The survey also focused on sites in state and county parks which tend to be less developed.

Initial results varied. At Mile Hill Lake Park in Mills County, earthmoving activities had badly disturbed previously recorded lodges. Only a few out-of-place artifacts remained. An initial visit to West Oak Forest Park (13ML652) near Glenwood, revealed no evidence of earth lodges. A second visit, this time in the company of an experienced collector who knew where to look, disclosed a lodge once recorded but incorrectly mapped. The location of a large Indian mound at West Oak Forest Park was also accurately mapped.

Fifty or 100 years ago many earth lodges still had surface depressions, a low spot marking where the lodge once stood.



Today almost no lodges have depressions—erosion, plowing, and silting have caused the depressions to disappear. The primary way to find buried lodges is through soil coring. After a lodge was abandoned by its residents, it gradually accumulated fill as the walls and roof disintegrated and collapsed into the house basin. Today, the presence of fill denotes the existence and extent of the lodge.

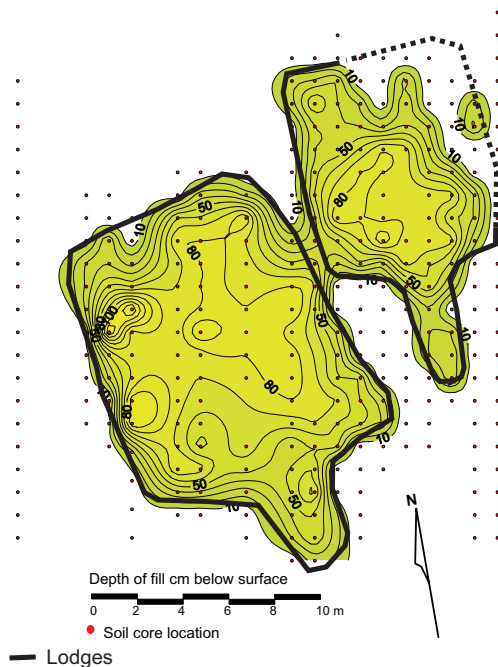
In an area where they suspected a lodge, the research team took soil cores at regular intervals, usually 15 feet apart, to search for signs of house fill. The metal corer is about an inch wide and can extend 5 feet



deep. When suspected lodge fill was encountered, it was probed at closer intervals to estimate the lodge's shape and dimensions. The soils in the core were analyzed to determine what types of soil filled the lodge and how deep the fill extended into the house basin. A hand auger was sometimes used to recover artifacts from a larger, 8-inch-wide auger hole.



Sometimes soil coring, if done at a close interval, could reveal the detailed shape of the lodge. Coring a 1-meter grid over the Woodfield Earth Lodges site (13ML102)



produced a surprising result. It was actually two lodges, a very large lodge to the southwest, and a smaller one to the northeast. Plowing had eaten away the northeast edge of the smaller lodge.

Exploring Lodges through Excavation

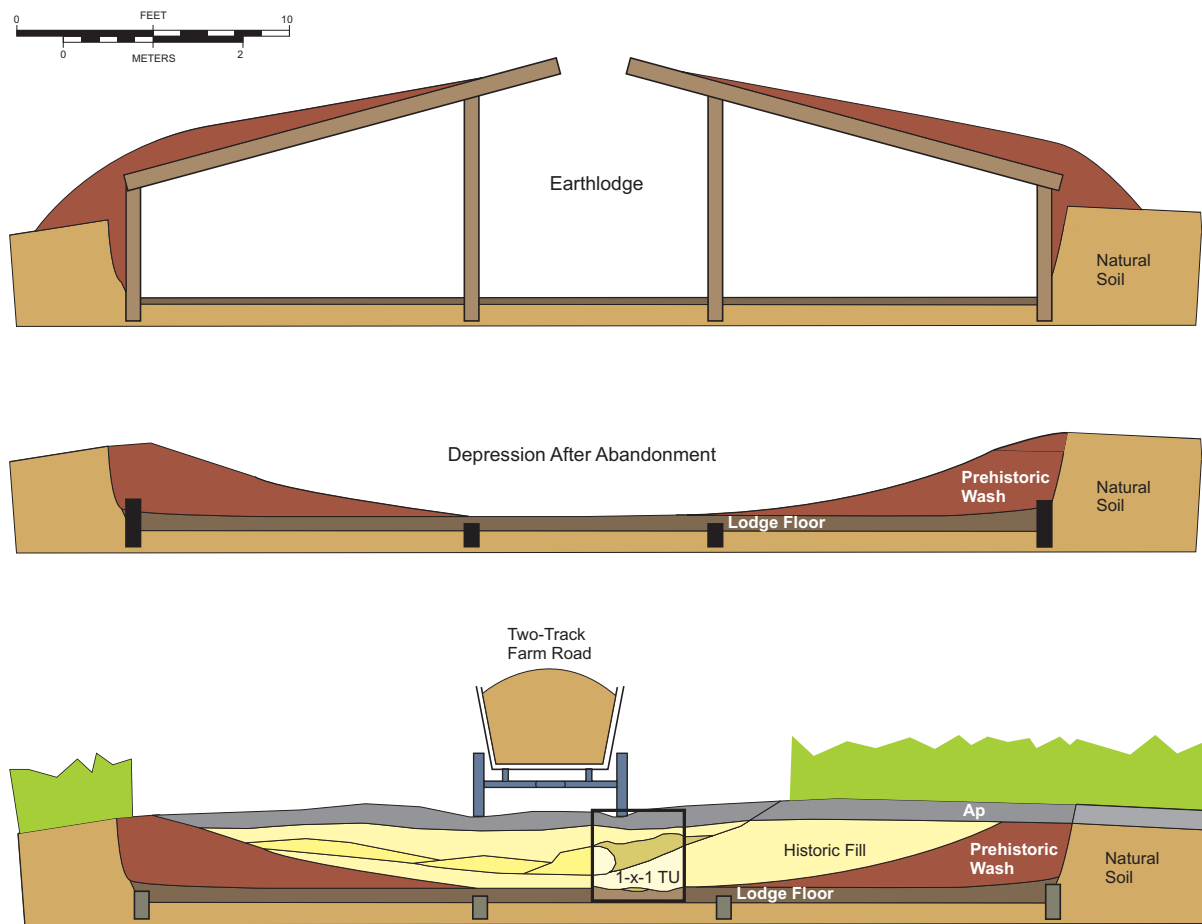
After confirming lodges through soil coring, the archaeologists conducted excavations—sometimes beneath tents sheltered from winter field conditions. The twin lodges at the Woodfield Earth Lodges site and a nearby lodge, site 13ML98, were each explored with a 1-meter square test unit.

Archaeologists hand-dug test units in 5- or 10-centimeter-thick increments or levels, with all soil carefully screened through wire mesh to recover small artifacts and bones. Larger artifacts and features such as hearths, pits, and artifact scatters were mapped in place. Soil samples were collected from features and processed through a water flotation machine to retrieve tiny seeds and bones—evidence of prehistoric diet.

The fill above the northeast lodge floor at the Woodfield Earth Lodges site contained large, charred timber chunks, evidence that the house had burned. The pottery found in this lodge represented a style archaeologists think is older than the ceramics found in the southwest lodge. This indicates that people lived in the northwest lodge first. The larger southwest lodge contained no evidence of burning, but also produced fewer artifacts, demonstrating that the residents lived here for a shorter time.



At 13ML98, north of the twin lodges on the same ridge, excavation revealed an interesting soil filling the prehistoric house basin. The soil in the west half of the test unit was dry and compact, while that in the east half was moist and soft. Comparison with aerial photos from the 1930s showed that an old field road once crossed the center of the lodge. The lodge depression was apparently filled in during the early 20th century to accommodate the road. This road explained the difference in the soil fill. The dry soil in the west half of the test unit lay beneath the field road and was compacted from the weight of heavy wagons.



The Davis Oriole Earth Lodge site (13ML429), discovered in the 1960s by D.D. Davis at Pony Creek Park, proved to be mis-mapped, and it was only after the area was peppered with soil cores that the lodge was rediscovered. Soil cores and auger tests showed the lodge intact. A test excavation unit revealed the side wall of the lodge. Archaeologists could “read” the soil layers in the lodge wall to figure out the complex history of the house’s construction, occupation,



abandonment, and post-occupation filling. This was the first time in Iowa that such an evaluation of the soils in the side wall of an earth lodge was made. It demonstrated that the builders dug the lodge deeper than the floor, and that soil had washed in, probably after a rain storm, covering the bottom of the lodge. Charcoal bands seen in the side walls probably represent locations where the original wattle-and-daub wall (a timber frame and mud plaster structure) once stood.

A few fire-cracked rocks, burned earth, charcoal, and pottery marked the location of a very small hearth on the inside edge of the lodge, perhaps where someone kept a pot warm.

A tiny, carved shell bead found in the hearth probably fell from the clothing or jewelry of the person tending the fire.

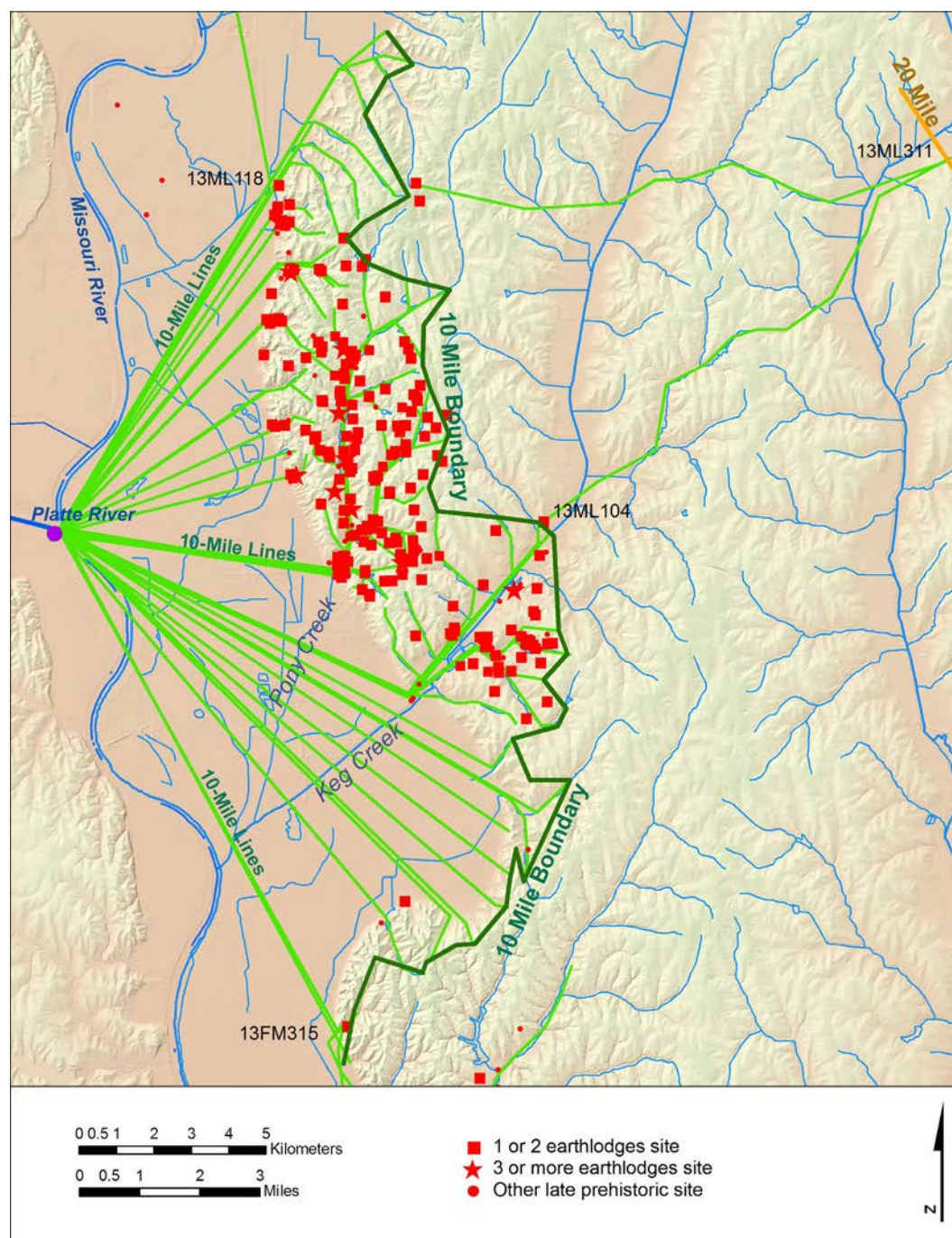


Ten Miles from the Platte: Why Here?

Between A.D. 1200 and 1400, Indian people of the Nebraska phase of the Central Plains tradition occupied southwestern Iowa. Central Plains tradition sites extend from Kansas across Nebraska to Iowa. These sites are common throughout eastern Nebraska and up and down the Missouri River bluffs. In Iowa archaeologists refer to them as the Glenwood culture. The Nebraska phase people in southwest Iowa built some 300 earth lodges in a geographical cluster centered on the lower parts of Pony Creek and Keg Creek in Mills County. The density of lodges in this comparatively small area at the very edge of the Central Plains tradition has interested archaeologists for more than a century.

By mapping Central Plains earth lodge sites in southwest Iowa, an interesting pattern emerges. Glenwood sites are widely dispersed across the landscape but the vast majority occur within 10 miles of the Platte River, as measured via a straight line across the Missouri River floodplain and following the stream valleys into the Loess Hills. Tracing an outline of the limits of the 10-mile radius shows that this is effectively the limits of Glenwood earth lodge sites in Iowa, with a few additional lodges spaced up and down the east side of the Missouri bluffs.

If Glenwood represents the spread of the Central Plains tradition eastward, why does it cluster around the mouth of the Platte? Earlier studies typically looked only at the location of sites not their geographical limits. The recent study showed that although Glenwood lodges occupy all landforms within this area, their builders did have preferences. Living in close proximity to the mouth of the Platte appears to have been an important one. And, earth lodges are not distributed evenly across the region. The highest density of lodges per square kilometer occurs along Pony Creek.





The exact configuration of the Missouri floodplain in prehistoric times is unknown. In general, floodplains cannot be crossed as straight lines by either canoe or on foot. So the actual distance traveled across the floodplain was unquestionably longer. It is clear, however, that the vast majority of Glenwood occupants were within an easy day's travel to the Platte.

The reasons for the proximity to the mouth of the Platte are unknown. Perhaps this distribution sup-

ports the idea of Glenwood as Central Plains "colonists" who built their houses relatively close together for communication and defense in a new territory. The position of Glenwood lodges within eyeshot of one another meant that people could have assembled quickly in times of crisis. The location might represent an attempt to control traffic and trade at the important juncture of the Missouri and Platte rivers. Perhaps the Glenwood area is a winter home for people who spent the warm part of the year hunting

on the Plains and floated winter stores of meat and hides to their houses at the mouth of the Platte.

Archaeologists do not as yet know if all or most Glenwood earth lodges were occupied at the same time; radiocarbon dates cannot sort this out. Many sites are undoubtedly missing or unknown, especially in the Missouri floodplain where most were likely destroyed by the notoriously violent "Mighty Mo" or lie buried beneath flood deposits.

Archaeology often creates more questions than it answers. It is clear that Glenwood people preferred living near the mouth of the Platte, but the reasons for this still leave the experts scratching their heads. By creating a geographic information system model archaeologists were able to explore additional factors that may have influenced where the Glenwood people decided to construct their homes.

New Investigations at Kimball Village: What Lies Beneath

Fortified Mill Creek villages dotted northwest Iowa 900 years ago as clusters of tightly spaced earth lodges protected by ditch and wooden stockade defenses. One of the most impressive and best preserved is the Kimball Village site (13PM4) on the Big Sioux River a few miles northwest of its confluence with the Missouri. You can drive by the site today, but if you did, you'd probably wonder where it was.

Looking west towards the Big Sioux, the Kimball site appears as a gentle rise in a modern farm field.



The rich diversity of artifacts from Kimball Village and other Mill Creek sites offers the best one could hope for when studying prehistoric village life.



Ellison Orr's excavations at Kimball Village, 1939.

That rise is actually an artificial “tell,” built up over the years by successive occupations of villagers who constructed timber and mud-walled houses whose slow disintegration raised the natural terrace more than 8 feet. The considerable middens—trash piles—left by village residents also contributed to the site’s “rise” on the landscape. Covering about an acre, the village may once have contained over 20 lodges.

Earlier investigations in 1939 by Ellison Orr and in 1963 by the University of Wisconsin-Madison,

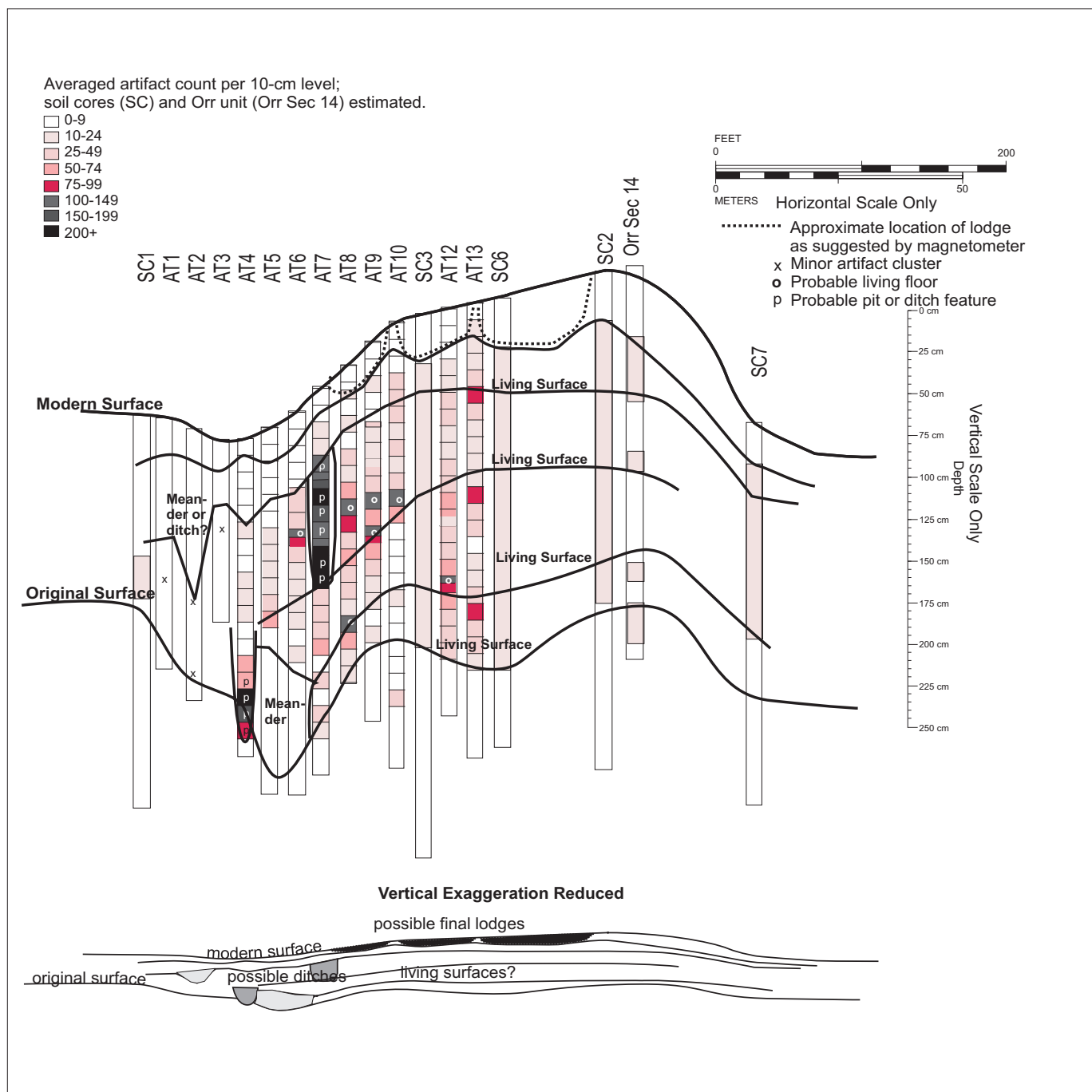
focused on recovering evidence that might reveal who lived at the site, how long, what kind of artifacts they made, and whether the Iowa climate contributed to the settlement’s occupation and eventual abandonment. Orr’s excavations alone recovered more than 9,000 stone, bone, shell, and pottery artifacts.

In 2009 as part of the Loess Hills study, an archaeology team set out to explore the layers of soil between the base and surface of the artificial Kimball mound. They wanted to answer two important questions, “Was this village fortified like other Mill Creek settlements, and are there still intact deposits at the site?”

The team used auger tests, soil cores, and state-of-the-art geophysical devices. Auger tests and soil cores were taken at 16-foot intervals across the length of the mound, carefully noting the soils and artifacts encountered. Not surprisingly, the soils proved extremely complex, with numerous clusters of artifacts and soil horizons observed. A possible hearth identified in one soil core, along with several pits may represent evidence for a fortification ditch that once encircled the village.

One of the auger tests recovered nine polished shell beads made from the freshwater rock snail called *Leptoxis*. The nearest habitat for *Leptoxis* is the Mississippi valley. The Kimball villagers established trade with people hundreds of miles away.



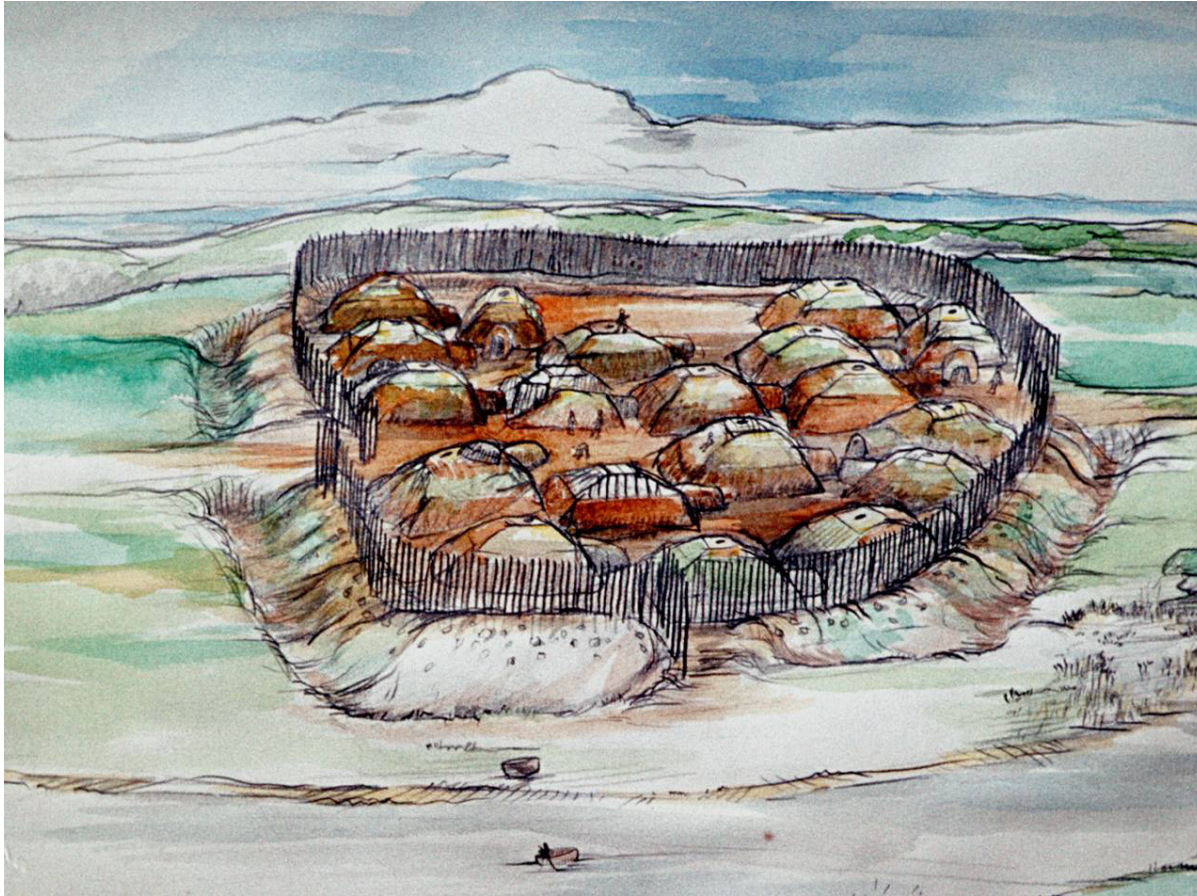


Styles of prehistoric pottery and other artifacts changed over long periods of time just as we see changes in modern technology. The hundreds of pottery fragments recovered from top to bottom at Kimball Village actually appear very similar with few changes, evidence suggesting that the village was occupied for a comparatively short time, perhaps only a few generations. Once the inhabitants exhausted nearby resources such as timber, they likely would have moved to a new spot.

The limited test investigations at Kimball, lasting only a week, produced some interesting results. The site appears to be far more complex than first reported. The soils above the base of the mound contain soil horizons and artifact concentrations suggesting the site was rebuilt several times, each time raising the village a foot or two higher.

To enhance the limited field study, a specialized team from the University

Stratigraphic profile, Kimball Village, 2009. Shows site deposits still intact and evidence for rebuilding.



Artist's reconstruction of a Mill Creek village with ditch and palisade.

of Arkansas surveyed the Kimball Village with an array of geophysical equipment—including magnetic gradiometry, electrical resistivity, and ground penetrating radar. Such instruments allow archaeologists to “see” below the surface and detect potential irregularities that might be signs of buried house floors, hearths, pits, and walls.

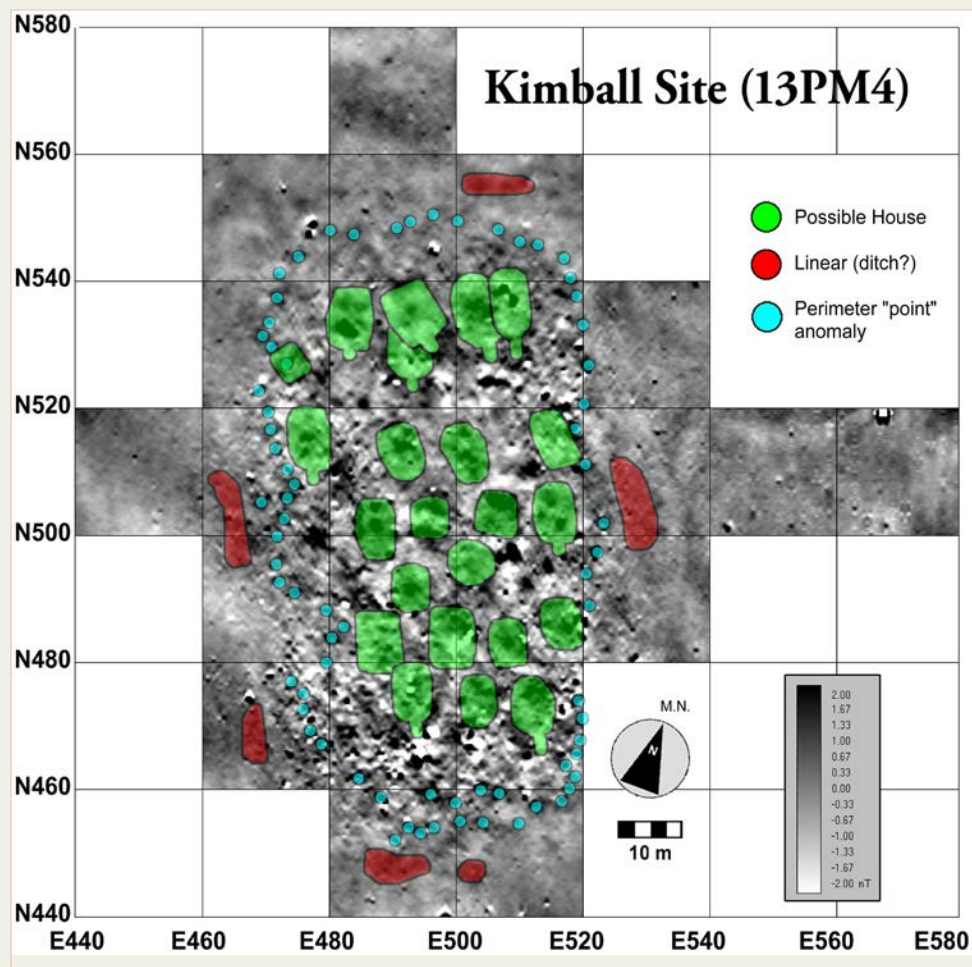
The magnetic gradiometry produced outstanding results revealing regularly-spaced, contrasting areas about the correct size for lodges. This indicates the presence of as many as 20 houses, exactly the number predicted by Ellison Orr’s first work at the site. Around the perimeter of the possible houses, a number of regularly spaced anomalies also hint at the presence of a defensive stockade or small pits.



Two types of magnetic gradiometers in use at the Kimball Village site. Above, Bartington 601 dual fluxgate. Below Geoscan Research FM256 fluxgate.



There is no question that the Kimball Village preserves a wealth of important information about early Plains village life. It is probably the earliest, best preserved site of the Middle Missouri tradition. Sites of the Middle Missouri tradition extend across the northern Prairie-Plains and include all the Mill Creek sites in both the Big and Little Sioux localities.



Most geophysical survey techniques involve the use of instruments which work in one of two ways. Either they measure distortions of the earth's magnetic field created by buried features such as hearths, pits, and house floors, or they pass various kinds of energy through the ground in order to detect such features. The data are collected with the instruments and then transferred to a portable

computer. Maps are produced which display the locations of the features.

Electrical resistance transmits a low voltage current into the soil via inserted metal probes. The ability of buried materials to resist the electrical current provides the basis for resistivity survey. Buried materials resist electricity generally as a

consequence of their moisture content. Buried foundations and stone walls may be more resistant to an electrical current while ditches, pits, and metals more easily conduct.

Conductivity. Although conductivity instruments are generally less sensitive than resistance meters to the same phenomena, they do have a number of unique properties. For one, they do not require direct contact with the ground and, hence, can be used in conditions unfavorable to resistance meters. They also have greater speed, and unlike resistance instruments, can respond strongly to metal—a disadvantage when a site contains extraneous metal items not related to the original inhabitants.

Magnetic gradiometry. Buried materials often produce slight distortions of the earth's magnetic field. These distortions appear as "hot spots" or anomalies detectable with an instrument known as a magnetometer or gradiometer. After establishing a grid of transects at a site, the archaeologist passes the magnetometer over the surface obtaining measurements at regular intervals.

Magnetic susceptibility. Iron minerals within the soil can be altered through biological decay and burning which can enhance the magnetic susceptibility of the soil. Field equipment can be used to measure the magnetic susceptibility allowing zones to be mapped which may indicate areas of potential archaeological activity.

21st-Century Technology Meets the 13th Century

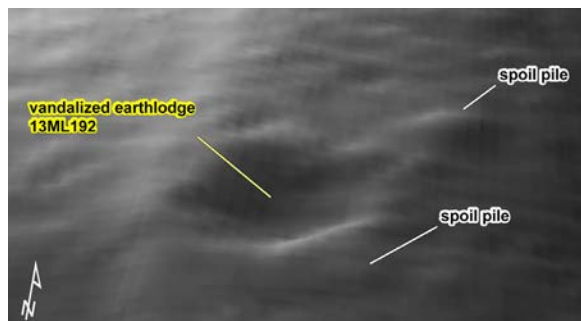
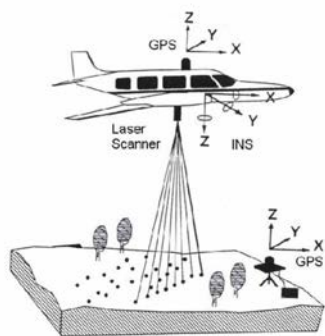
During the summer of 2009, 21st-century technology encountered the 13th century in western Iowa, and the results are outstanding. Airborne Light Detection and Ranging (LiDAR) is a remote sensing technology used to gather elevation data over a large area. Iowa is one of the first states to have LiDAR, and the Loess Hills study represents the first use of LiDAR to detect late prehistoric lodge sites.

Picture an aircraft mounted with a device that scans the ground surface with an invisible laser.

Like sunlight, the laser light can filter between tree branches and sometimes through leafed-out tree canopy.

The elevation of an object or the surface is determined by the time it takes the laser pulse to reflect back to a sensor on the plane. The elevation data includes tops of buildings, tree branches, cars, and, in this instance, the subtle depressions created by well preserved earth lodges in Mills and Pottawattamie counties!

Some of the southwest Iowa sites had escaped the attention of collectors and archaeologists for over 100 years. LiDAR was able to detect lodges due to the slight elevation differences created by the house depressions and because laser light is reflected less



intensely from the moist, organic-rich soil within the house depressions. As a result the depressions appear darker than the surrounding surface.

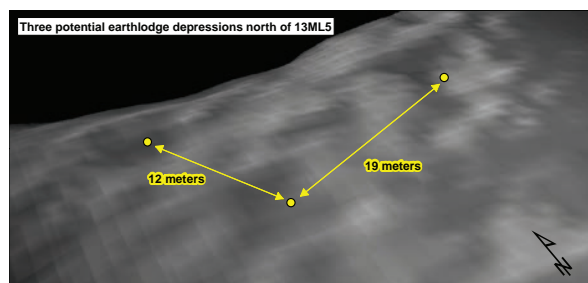
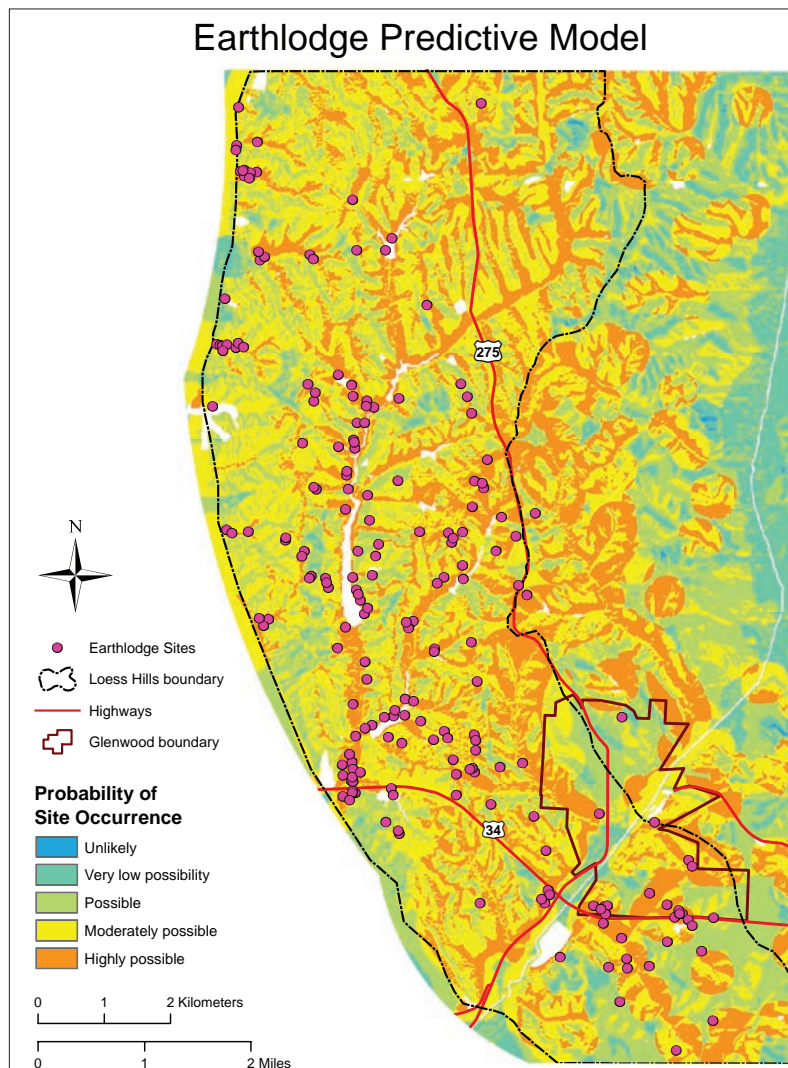
Using a geographic information system (GIS), maps of soils, topography, and archaeological sites were layered atop one another and linked to a computer database of information about each of these features. LiDAR images, manipulated by a GIS, enhanced the view of features not obvious from ground level. These images revealed:

- 129 lodge depressions at 73 sites (previously only 86 lodges were recorded at these sites),
- 66 potential new lodge depressions,
- 8 lodge sites never precisely located, and
- 20 lodge sites previously identified only as artifact scatters.

The efficacy of LiDAR in locating sites not only surpassed expectations but provided new insights into the arrangement of Glenwood earth lodges. In the course of the study, a dozen suspected lodges were found to be paired depressions similar to the twin lodges at site 13ML102.

Taking a GIS a step farther, archaeologists used the layers of information about site locations such as proximity to streams, slope, and soil type, to model the environmental preferences Glenwood people may have had in selecting areas for habitation. The goals of the study were to explore on what kind of land lodges are usually found, and what kind of land Glenwood people preferred when deciding where to build. A GIS allowed the study to compare and calculate the values to study the relationship between lodges and the landscape.



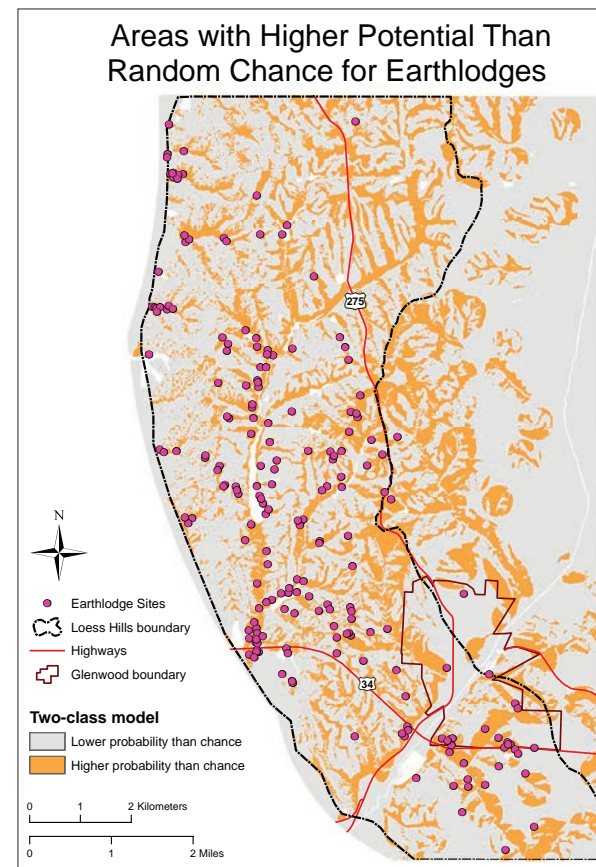


Glenwood culture was agrarian and the people lived in houses that were partially subterranean. From these clues, variables such as a soil's erodibility (house walls and crops should not slump) and solar insulation (crops need good sunlight) could be tested to see if they affected lodge placement. Other factors reflected more universal preferences. People generally like living on relatively flat surfaces, not slopes, and shelters usually face away from harsh winter winds. Did the location of lodges relate positively to such variables?

The results of the modeling not only provided answers about which environmental settings were chosen or avoided by Glenwood people in situating their houses, but also produced a map showing where there would be high to low potential for finding a lodge site. Now we know that

Glenwood people:

- built on slopes as steep as 15 degrees,
- avoided flat open terrain and built within 1300 feet of perennial streams,
- preferred slopes that received the most sunlight during the growing season, and
- preferred areas with neutral to acidic soils.



Understanding these settlement preferences provides insight into the nature of the Glenwood culture. The last two strongly suggest that houses were built close to fields, something previously suspected but now supported by the new evidence.

While the high percentage of destroyed Glenwood sites in the Loess Hills is lamentable, the results of both LiDAR and modeling indicate that many more sites exist. And now we have clues where to look!

Collections' Study: Something New from Something Old

When Ellison Orr excavated the Kimball Village site (13PM4) in 1939, he recovered over 9,000 items from more than 2,000 square feet of the site including 4 prehistoric houses. His estimates and recent geophysical survey suggest that the remnants of at least another 16 houses still exist. Imagine the wondrous information they might contain!

The artifacts from Kimball Village or any of the Mill Creek or Glenwood lodges represent the best that could be hoped for from 600–900 year-old communities. All the detritus of everyday life remains—some of it intentionally left behind as trash—along with other items lost or forgotten including possible ceremonial objects. Most of these materials have had only minimal study.

Mass of charred corn recovered from a Loess Hills earth lodge offers evidence for crops grown by early farmers and provides material for a radiocarbon date.



To document the research potential of these collections, the recent Loess Hills project conducted a number of specialized analyses on materials previously excavated at Mill Creek and Glenwood sites. The results surprised the experts and demonstrate that older collections can still produce answers about the origins and challenges of a new agrarian way of life on the eastern Plains.

Pottery and Radiocarbon Dating

Thin cross-sections made from pottery pieces—pot

sherds—recovered from five different Glenwood lodges were examined with a polarizing optical microscope. A geologist analyzed the thin sections to identify and characterize the mineral grains in the clay as well as the clay matrix itself. All compared favorably with clay deposits available in Mills County. This evidence strongly suggests that these sherds came from vessels that were manufactured locally not brought from elsewhere as previously suspected. Glenwood potters were not just receiving ideas from other communities but contributing to regional developments in technology such as pottery making.



A study of other Glenwood vessels shows that some closely resemble Mississippian pottery dating between A.D. 1200 and 1350 at the Cahokia World Heritage site in current East St. Louis, Illinois. Cahokia, with its flat-topped earthen mounds, enormous palisade and plazas, and dozens of houses and public buildings, represents the largest prehistoric community in North America. Some Mill Creek vessels, by contrast, are Mississippian copies or actual trade pots brought from the Cahokia area almost two centuries earlier than those found in Glenwood sites. Other Glenwood pottery resembles Oneota ceramics which become common throughout Iowa and much of the Midwest after A.D. 1200.



Re-analysis of all available radiocarbon dates from Glenwood and related sites on the Plains, also part of the Loess Hills study, supports conclusions about the age of Glenwood as suggested by the pottery cross-dating. Glenwood culture apparently spanned a period of A.D. 1200–1400 in southwestern Iowa, beginning later and lasting longer than Mill Creek.

More Connections: Pipestone

Figuring out the source of materials used by ancient people tells us where and how far they had to travel to acquire desirable raw material or with whom they might have traded. Among the artifacts found in earth lodge sites throughout the Loess Hills are pipes, pendants, and small animal-shaped objects fashioned from red pipestone. As part of the recent study, many of the pipestone items from Mill Creek and Glenwood collections were subjected to a specialized analysis to determine the source of this raw material.

On the face of it, red pipestone, no matter where it comes from, appears similar. In fact depending on its source, pipestone has a unique mineral composition or fingerprint. Using a portable infrared mineral analyzer (PIMA), geologists and archaeologists were able to determine the original source of 76 pipestone artifacts from Mill Creek and Glenwood sites. All but six were made of catlinite, derived from the famous deposits at Pipestone, Minnesota, which are still quarried today by descendant peoples.

The PIMA analysis shows us how important the Minnesota pipestone was to Mill Creek and Glenwood



people. Even so, since five of the pipestone items probably came from sources in Kansas, and one piece of pipestone scrap from a Glenwood site possibly came from Wisconsin, we know that their owners traveled or traded in other directions as well.

George Catlin's 1836 sketch of the pipestone quarries in southwestern Minnesota.





Making a Living

Animal bones, charred seeds, and artifacts tell us about prehistoric diet, economy, and environment. The recent Loess Hills study gave researchers an opportunity to review and conduct new analyses of these materials from existing collections. Especially important were materials from Wall Ridge (13ML176), a Glenwood lodge. The site was excavated in 1984 prior to its destruction for use as a highway barrow. It is, in fact, the only Glenwood house site carefully excavated with stratigraphic control from the modern surface to the lodge floor and subfloor pits. Analysis of the recovered data has been an ongoing project ever since.

Wall Ridge sits on the western border of the Loess Hills which serve as the eastern valley wall of the Missouri Valley. With the bones of more than 100 vertebrate and invertebrate species recovered in excavation, the Wall Ridge fauna offers a “time capsule” of the local and regional animal communities

living near, and used by, the site’s residents.

The primary source of animal protein at Wall Ridge came from three large mammals—bison (*Bison bison*), elk (*Cervus elaphus*), and deer (*Odocoileus* sp.). There were, however, fewer of these species present at 13ML176 than found at

other Glenwood sites. In contrast aquatic animals were abundant—nearly 13,000 fish bones representing at least 21 varieties and about 400 individual fish alone! Over half of these were species of catfish, but others included gar, sturgeon, paddle fish, and smaller varieties such as suckers and sunfish. The identification of mussel shells and many shore birds underscored the extent to which the Wall Ridge residents depended on aquatic resources.

Taken together, this most recent analysis suggests that Wall Ridge differs markedly in the array of aquatic species such as birds, fish, and mussels when compared to Glenwood sites located inland along the nearby Keg and Pony Creek drainages. It is evident that this lodge was situated by the occupants to take advantage of locally available animal resources within both the Loess Hills and the Missouri floodplain.

The broad array of animals eaten, and the fewer numbers of large mammals present, also hint at the possibility that the Wall Ridge hunters were experiencing a period of large game depletion during the site’s occupation. Understanding whether this was

actually the case may ultimately help explain why Glenwood people abandoned southwestern Iowa.

While the Wall Ridge faunal study suggests that fewer numbers of large game were hunted by the residents, there is no question that people there were process-

ing these animals for meat and hides. A pilot microwear study was conducted on a sample of stone scrapers from Wall Ridge and two other Glenwood houses using an optical microscope. The results revealed the presence of the kind of polish along the tool edges consistent



with their having been used against a soft material. Experimental studies have demonstrated that such a pattern typically results from hide working. Analysis of similar scrapers from a Mill Creek site produced comparable results. Unambiguous traces of hafting on many of these scrapers, also visible under the microscope, shows that some would have been bound into a handle.

Over 60 percent of the chipped stone tools from Wall Ridge were made of chert that came from within a 50-mile radius of the site. Lesser numbers were made of materials transported from sources 145 miles to the southwest. Does the location of the chert sources



Bone awl.

also suggest the direction and distance Glenwood people might have traveled to hunt large game?

Could Glenwood and Mill Creek people have been preparing and trading dressed and perhaps painted or quilled hides with Mississippian and other groups? Red ocher, or iron oxide pigment, and ash residue remained on some of the scrapers suggestive of coloring used in decorating hides. Sharpened bone awls—probably hide working tools—also occur in profusion at these sites.

Choice of Diet

Ongoing paleobotanical study of charred seeds and other plant remains from earth lodge sites indicates that both wild and cultivated plants provided more than half the required daily caloric intake for Glenwood and Mill Creek peoples. Identified crops include the indigenous weedy annuals of marshelder (*Iva annua*), sunflower (*Helianthus annuus*), goosefoot (*Chenopodium berlandieri*), little barley (*Hordeum pusillum*), and wild cucurbit (*Cucurbita pepo* var. *ovifera*); introduced crops of maize (*Zea mays*), squash (*Cucurbita pepo*), and beans (*Phaseolus vulgaris*); and the probable crops of maygrass (*Phalaris caroliniana*) and erect knotweed (*Polygonum*



Starchy seeds and greens of chenopod or goosefoot, a crop grown by ancient lowans.

erectum). This evidence, together with the gardening tools and storage pits found in the house sites themselves, demonstrates the importance of farming to these early Plains people.

Despite what we already know about such crops, the potential exists for additional research on plant remains and on the economic significance of agriculture itself. Such study would help better refine the nature of the cultivated varieties and their relative importance over time and among settlements. In

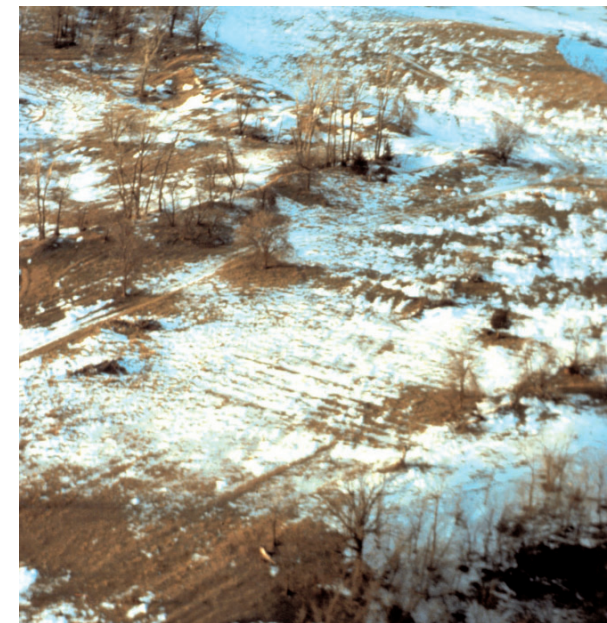


Carbonized food residue on a pot sherd, a clue to ancient diet.

addition, the full extent of wild seeds, nuts, and roots selected and utilized by Mill Creek and Glenwood peoples is unknown. Such research has the potential to offer a better and more comprehensive understanding of prehistoric Plains plant use as well as contribute to contemporary issues of agricultural sustainability.

The results of these brand new studies are preliminary in nature. They underscore, however, the potential that existing collections have to contribute to a more refined and detailed understanding of the economy, social interaction, community structure, external contacts, and material culture of these early sedentary Plains communities.

Litka site, a Mill Creek garden and the only known prehistoric field on the Plains.



Historic Gateway



Imagine a great number of cabins and tents, made of the bark of trees, buffalo skins, coarse cloth, rushes and sods, all of a mournful and funeral aspect, of all sizes and shapes, some supported by one pole, others having six, and with the covering stretched in all the different styles imaginable, and all scattered here and there in the greatest confusion, and you will have an Indian village. (Father Pierre-Jean De Smet quoted in The Life of Father De Smet, 1915:83 by E. Laveille)

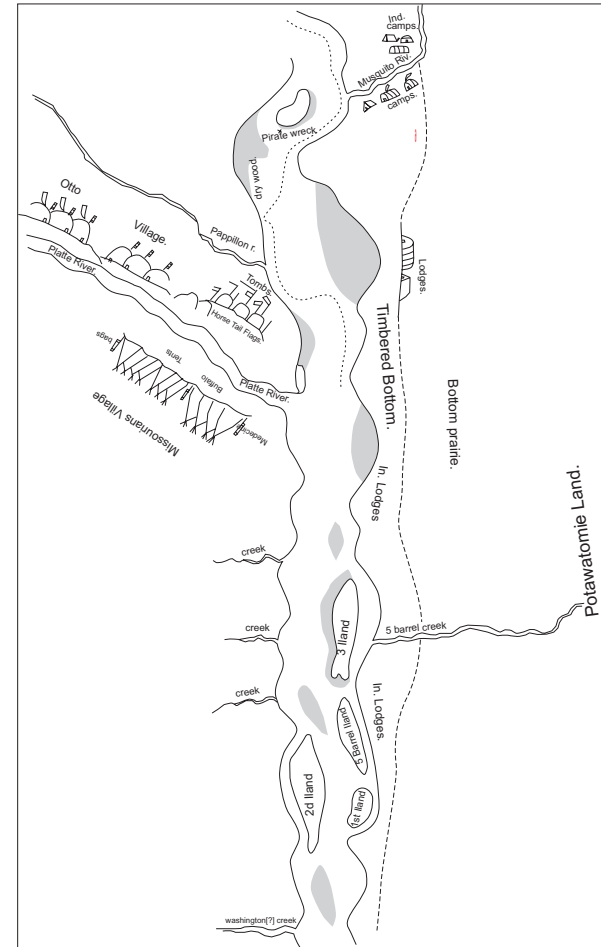
Dipping and curling along the western edge of Iowa, the Loess Hills National Scenic Byway follows the Missouri River north paralleling the

Lewis and Clark Trail. Today the Byway offers some of the same sights and scenes, relatively unchanged, first witnessed by the famous party in 1804. Sergeant Charles Floyd, the only fatality of the Corps of Discovery, lies buried on a bluff in the Loess Hills in today's Sioux City, Iowa. In 1960 a monument erected near his burial place became the first declared U.S. National Historic Landmark.

A few decades after the Corps of Discovery expedition, westward expansion ushered in waves of missionaries, traders, artists, and settlers, some of whom left behind maps and

drawings of Euroamerican and Native Indian settlements. One such document was an astonishing 1839 map of the Missouri River prepared by Father Pierre-Jean De Smet.

Born in Belgium in 1801, De Smet immigrated to the U.S. in 1821 and began his work as a Jesuit missionary first in Maryland and later in Florissant near St. Louis, Missouri. In 1838 he helped found St. Joseph's Mission built to serve the



Potawatomi who had recently been removed to the Council Bluffs area. The priests of St. Joseph's took over the abandoned Council Bluffs blockhouse, a small military post constructed earlier in the year by the U.S. government to protect the Potawatomi from rival tribes. De Smet served at St. Joseph's for less than two years before transferring in 1840 to what is now Montana to work with the Sioux and Flatheads.



De Smet's biography and letters document the dangers and hardships of life in Iowa in the 1830s. It is, however, his remarkable map of the Council Bluffs area, rediscovered in the course of the recent Loess Hills study, which offers clues to the original location and descriptions of Indian settlements, trading houses, and other features including tombs and a shipwreck.

Although De Smet mapped the course of the Missouri River from the Big Sioux to below the mouth of the Platte, he only depicted cultural features in the southern reaches of this territory. And while his work was crude, the approximate location of both the natural and cultural features he drew can be inferred by aligning with more recent maps and by comparison with the archaeological site file at the University of Iowa. A number of historic Indian sites recorded in the site file appear to match those portrayed by De Smet.

In 1853 Mormon migrants also passed through the Loess Hills area, and their camps are an important part of the historical and archaeological inventory. Attracted to the rich agricultural potential of the Missouri valley, a group of Mormons split from the main wagon train and camped in an area known as Preparation Canyon, now a state park in Monona County. Some continued their trek west, but others chose to settle in the Loess Hills.

In 1859 Abraham Lincoln ascended the hills at Council Bluffs to scout locations for the First Transcontinental Railroad completed in 1869. Council Bluffs later became the eastern terminus for the 1,774-mile-long rail line joining the Midwest to the Pacific Ocean.

In 1865 the Steamboat Bertrand sank just 20 miles north of Omaha, Nebraska, en route from St. Louis carrying supplies to the goldfields of Montana,

depositing a treasure trove of information on 19th-century life for archaeologists to uncover a 100 years later. Today the Steamboat Bertrand Collection, housed at the DeSoto Bend National Wildlife Refuge, represents the only public collection of excavated cargo from a sunken steamboat. The U.S. Fish and Wildlife Service maintains this Loess Hills related collection under the *Preserve America* mandate that focuses attention on nationally significant archaeological resources.

Steamboat Bertrand under excavation in DeSoto Bend National Wildlife Refuge in 1969.



Protecting Ancient Human Remains: A Tale of Three Sites



Siouxland Sand and Gravel site.

American Indian sites in Iowa, particularly burial mounds, drew the early interest of antiquarians and would-be archaeologists, and before the close of the 19th century looting and exploration had destroyed many. By the 1960s the practice of exhibiting human skeletal remains in museums ran headlong into American Indian activism. Protecting the physical remains and the spirits of the ancestors represented both a sacred trust and a challenge in the pursuit of equal rights and self-determination for American Indian people.

Inadvertent discoveries of human remains at three locations in the Loess Hills in the early 1970s propelled Iowa to become the first state in the Nation to provide legal protection for all human remains regardless of age or origin found on public or private land, and for the reburial of native Indian remains. This offered a model for legal changes in other states, ultimately presaging the 1990 passage of the federal Native American Grave Protection and Repatriation Act (NAGPRA).

U.S. Highway 34 crisscrosses east-west through the southern Loess Hills. In the early 1970s, archaeological investigations conducted in tandem with road construction near Glenwood encountered several burial sites. Although the remains of Euroamerican settlers disinterred from one pioneer cemetery were quickly reburied, those of an American Indian found in the same site were boxed up and shipped to a lab for study. Outraged over this unequal treatment, Maria Pearson (Running Moccasins), a Yankton Sioux, appealed to Iowa's Governor Robert Ray. His support, and the overwhelming consensus among the Iowa public



that Native American remains should be treated in the same fashion as those of non-Indians, led the Iowa legislature in 1976 to pass a protective burial law.

At the Siouxland Sand and Gravel site (13WD402) north of Sioux City, quarry operators in 1972 accidentally unearthed human burials. American Indian Movement activists, local museum officials, law enforcement, and archaeologists converged on the

site. Unfortunately, dissenting viewpoints and armed confrontation produced a standoff resulting in the destruction of important cultural information from a burial complex where as many as 200 individuals may have been interred.

Marine shell artifacts and pottery found with the dead indicated that their owners, possibly late prehistoric residents of nearby Mill Creek communities, had traded with Mississippian people hundreds of miles to the east and south. Recently, the Iowa Natural Heritage Foundation purchased remaining portions of the Siouxland Sand and Gravel cemetery and surrounding areas to incorporate into Stone State Park.



Base of an imported, incised, egg-shell thin vessel from 13WD402.

The 1975 discovery of human burials in the borrow area for the new Lewis Central School, just outside Council Bluffs, again engaged law enforcement, Indian activists, and archaeologists. The new State Archaeologist, Duane Anderson, contacted Maria Pearson for advice and assistance. She served as a liaison with other Indian leaders who agreed to the removal and reburial of the remains by a local undertaker. On learning that the disinterments would take place via bulldozer and backhoe, the Indian leaders chose archaeologists to remove the remains using hand tools instead. Indian leaders also permitted a physical

anthropologist to briefly examine the remains near by the site prior to their reburial.

This event marked a turning point in Indian-archaeologists relations. The procedures followed in this case to identify, analyze, and report the discoveries set a precedent for the legal process still used in Iowa for the handling and reburial of ancient human remains.

While the history of disease, injury, diet, population demographics, social alliances, and warfare may be written in the bones of ancient peoples, the study

Lewis Central School site.





of such remains also speaks to sacred places and cultural values, both past and present. Prior to the passage of Iowa's reburial laws, this kind of study rarely took place. A case in point is the Turin site, the earliest dated burials known in Iowa, accidentally uncovered in the 1950s. Despite their significance for our understanding of the Middle Archaic, a poorly known prehistoric period on the eastern Plains, and the nationwide media coverage this discovery precipitated, the remains were not analyzed and the results not published until the 1980s.



Iowa's current legal requirement to examine and report on all such materials before they are reburied considerably increases our knowledge about ancient peoples. In addition, the Loess Hills discoveries and the events which followed showed the country that American Indians and archaeologists could collaborate in a respectful relationship to achieve common goals.

Maria Pearson, who remained an active and vocal campaigner for Indian rights and the protection of indigenous burial remains until her death in 2003, worked with other American Indian organizations to press for a federal repatriation law. The result was NAGPRA adopted in 1990. She also helped draft the World Archaeological Congress 1989 Vermillion Accord, a document promoting mutual respect between archaeologists and indigenous peoples. Often referred to as the "Founding Mother of the modern Indian repatriation movement," and "the Rosa Parks of NAGPRA," her efforts embodied the concept that "while we cannot remake the past, we can all

Maria Pearson.



endeavor to learn about the past as understood from different perspectives, and resolve to work for a better future that will be more inclusive of diversity and sensitive to group and individual identities” (David M. Gradwohl, *Journal of the Iowa Archeological Society* 52:26).

Maria emphasized that human remains needed special attention and that the principles of respect and fair treatment must apply to Indian burials and skeletal remains. She helped archaeologists realize that they were not the only stewards of the past. Indian people, too, are concerned about ancient sites, not just as sources of information but as places where the ancestors lived, worshiped, and were laid to rest. These places still resonate with living people.

The University of Iowa’s Office of the State Archaeologist working with its Indian Advisory Council and affiliated tribes continues to endeavor to protect ancient burials in Iowa. In 2004 in partnership with 21 federally-recognized tribes, Iowa led the nation in developing a NAGPRA process to expedite the reburial of culturally unidentifiable human remains found within the state. Through collaborative efforts among a public that values the past, landowners who practice a stewardship ethic, supportive descendant groups, and cooperative agencies and organizations, Iowa remains a national leader in burial protection.

The recent Loess Hills study contacted the Pawnee Nation of Oklahoma and the Three Affiliated Tribes—Mandan, Hidatsa, and Arikara Nation—groups believed to have a historical relationship with the

late prehistoric communities of the Loess Hills. The voices of these descendant peoples can bring a more inclusive perspective to the interpretation and stewardship of the area’s deep past.

Protection of Ancient Burials in Iowa



Burials Program
Office of the State Archaeologist
The University of Iowa

OSA Indian Advisory Council
Donald Wanatee (Meskwaki)
Royal Nahno-Kerchee (Comanche, Meskwaki)
Howard Crow Eagle (Navajo, Sioux)

John F. Doershuk, State Archaeologist
Shirley Schermer, Burials Program Director

Summer 2009

The Vermillion Accord on Human Remains. Adopted in 1989 at the World Archaeological Congress Inter-Congress, South Dakota, USA

1. Respect for the mortal remains of the dead shall be accorded to all, irrespective of origin, race, religion, nationality, custom and tradition.
2. Respect for the wishes of the dead concerning disposition shall be accorded whenever possible, reasonable and lawful, when they are known or can be reasonably inferred.
3. Respect for the wishes of the local community and of relatives or guardians of the dead shall be accorded whenever possible, reasonable and lawful.
4. Respect for the scientific research value of skeletal, mummified and other human remains (including fossil hominids) shall be accorded when such value is demonstrated to exist.
5. Agreement on the disposition of fossil, skeletal, mummified and other remains shall be reached by negotiation on the basis of mutual respect for the legitimate concerns of communities for the proper disposition of their ancestors, as well as the legitimate concerns of science and education.
6. The express recognition that the concerns of various ethnic groups, as well as those of science are legitimate and to be respected, will permit acceptable agreements to be reached and honored.

Descendant Voices

—Wynema Morris
Independent Scholar
Omaha Tribal Member

Thanks to archaeology, Plains Indian tribes can look to the distant past and feel a strong sense of kinship and identity with those people of long ago. The recent Loess Hills study of Glenwood and Mill Creek sites shows continuity between these earlier residents and various Plains tribes today. It is the earth lodge dwelling in particular that makes that

connection. While this does not relate to every Plains tribe, it does lend credence to those claiming certain areas of the state of Iowa as their ancestral home lands.

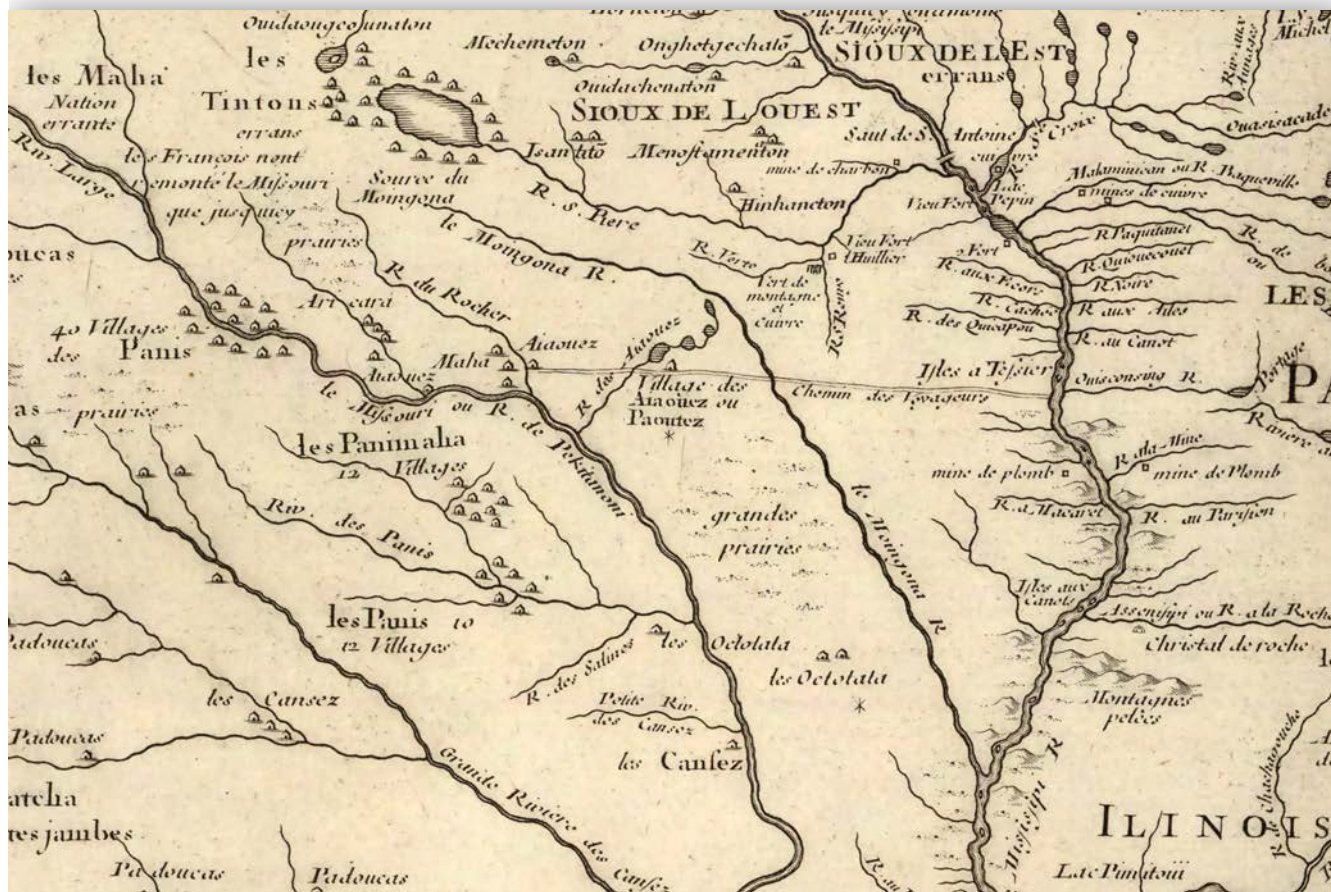
Among these is the Umonhon*—Omaha Tribe—a Dhegiha-Siouan-speaking people now located on a small reservation in northeastern Nebraska and western Iowa. Tribal memory claims that the Umonhon People migrated westward following buffalo herds to their present-day Iowa and Nebraska region. On the

Iowa side, this would place them in and around the Loess Hills. Chiwere-Siouan-speaking Ioway, Oto, and Missouri; a number of Dakota-Siouan bands; and the Pawnee who spoke a Caddoan language represent other peoples living in this same region. Land was claimed by one tribe or another based on continuous usage—occupation and hunting—and by warfare.

We cannot confirm that the builders and occupiers of the Mill Creek and Glenwood earth lodge dwellings were the direct ancestors of the Umonhon People or any other Plains tribe. The best one can do is to find the common connections with the past—the tradition of earth lodge building being one of them. We will look at a year in the life of the Umonhon circa A.D. 1500 as a good example of earth lodge builders and dwellers.

For the Umonhon, earth lodge dwellings were built as a part of the life way of a hunting and somewhat agrarian tribe. Being somewhat agrarian meant the Tribe planted primarily maize along with other foods such as squash and beans. These were harvested after the great summer buffalo hunt, and the harvesting was left to the women. Women were responsible for bringing in the produce from their own small garden plots. While the great hunt was the main tribal enterprise, nothing precluded individual families from

1718 map, Guillaume Delisle, depicts location of the Maha—Omaha—and other resident people including the Aiaouez (Ioway) near the confluence of the Missouri River and Big Sioux (here R. du Rocher).





Left. Historic Pawnee earth lodge village of 1871. Below. Detail of Pawnee earth lodge.



augmenting that diet from time to time with other fresh game, fish from the rivers, and wild fowl. Altogether, the diet of the early buffalo-hunting Umonhon appears to be rather balanced.

This annual economic cycle exemplifies the dual nature of the tribal life way which was both sedentary and on the move pursuing the buffalo herds. The Umonhon People developed very sophisticated forms of social and political structures in order to maintain their survival as a tribe. As such, each year they lived in a strict formal manner during the buffalo hunt and in a more relaxed, informal manner shortly thereafter.

It was as part of this more informal manner that the earth lodge dwelling plays a dominant role. Because

earth lodges were more permanent, they were used primarily during the cold winter months. During this time, families, relatives, and, perhaps, even close friends tended to gather in various areas to live in close proximity to one another. In the earth lodge configuration, the entrance to the dwellings could face any direction. That is, the location of the entrance was not dictated by the strict formality during the summer hunt which required the entrance to the tipi dwelling to face east. And, unlike tipi living, more than one nuclear family could live in an earth lodge.

It was during this time that the tribe broke into smaller social groups of family, relatives, and friends. This

was when they could literally choose their neighbors. Choosing one's neighbor also extended to the earth lodge dwelling itself, whose residents included at least one nuclear family, perhaps grandparents from both sides of the house, and a favorite cousin, uncle, or aunt. Living arrangements would be close but not necessarily cramped. Because it was by choice, getting along with one another was probably easier than the formal lifestyle of tipi dwelling while on the hunt.

Generally, within the tribe itself, usage of certain areas was never contested. If a family or groups of people left vacant the area they had occupied a year earlier, then others would come and simply take it over. It was the same with the women's garden plots. Year after year, if a woman used a certain plot of land as the garden for her family, then it was considered hers. If it appeared that she had abandoned it, then it was taken and used by others.

During times of peace without consideration for defense, earth lodge dwellings could be built in favorite areas where other smaller game was plentiful and water was readily available—despite its having to be hauled. It would be the opposite during times of inter-tribal warfare when fortification was a definite consideration. At times when life was very dangerous, uncertain, unpredictable, and unforgiving, protection of the family was paramount. The building of a lodge would have fallen upon the male members of the families living in the lodges. Again, unlike tipi dwelling, where the tipi and everything in it belonged to the women of the tribe, the earth lodge dwelling was the construction domain of the men.

The memories and stories told among the various tribes recall times from their collective past. Living as a tribe, both as hunters moving about on the Plains during the summer and as settled people living in the earth lodge dwellings during the winter, memories would be relayed in stories, legends, and myths. Certainly, the ability to build an earth lodge dwelling would be a skill that was most necessary and passed along from generation to generation.

Constructing an earth lodge remained a skill well into the early 1900s, long after the Umonhon were firmly settled within the land base strictly prescribed in the last treaty of 1854. By this time, all tribal people lived in houses built upon their allotted lands and scattered throughout the reservation. Gone forever were the summer buffalo hunts, tipi, and earth lodge living.

The writer's father, who was born in 1909, however, tells a story involving an earth lodge. Despite no longer living in them, they appear to have been built for other purposes. In this particular instance, the earth lodge was used by various medicine men or shamans, in which to practice their skills.

My father said he was about eight years old when he and two playmates watched one of the medicine men enter a nearby earth lodge. Becoming curious, even knowing who the man was, the young boys decided to spy upon his activities. The boys crept silently up to the lodge and found a small crack in the outer wall. Digging as silently as they could, they created a small peephole that allowed them to see

inside. As each boy took his turn, he gave a silent cry and fled the area immediately.

Being the last and now only boy to take his turn at the peephole, my father wondered what was so scary as to frighten his playmates away. Peering into the earth lodge, at first he saw only a small fire in the middle of the lodge. After his eyes adjusted, he said he was staring directly into the eyes of a grizzly bear! The bear was standing upright and "dancing" to and fro when it turned toward the peephole and stared directly back at my father. Of course, he now understood that this is what had frightened his playmates and sent them scurrying away so suddenly, and he followed suit. After all, they had seen a man enter the lodge and now in his place was a bear!

Although this story sounds incredible and echoes the shape-shifting stories among most American Indian



tribes, its outcome illustrates the tangible reality of the incident to the people involved. Upon returning to the safety of his home, my father told no one of his escapade. The next day, however, one of the village leaders came to visit his grandparents who raised him. They were told what had happened and then



fined. The recompense went to the medicine man who had informed the village leader. Needless to say, my grandparents were very upset with my father.

This story and many others suggest that some earth lodge dwellings continued to be used as ceremonial centers. In 1978 the Umonhon built their last earth lodge dwelling upon their He'dewachi dance grounds. He'dewach was the dance to give thanks for a successful hunt. Traditionally, it was the last large social gathering of the Umonhon after the summer buffalo hunt. It served as a social marker ending the formal tipi dwelling time and signaling that people

been constructed "correctly". To see and actually enter an earth lodge such as the one constructed in 1978 was an amazing experience. It was larger than what most pictures reflect and actually appeared to be comfortable. Covering the doorway would have been a large buffalo hide to keep out cold winter air. A fire pit built in the very center afforded both light and warmth to cold winter days and nights. The fire would have functioned as the cooking hearth as well. Sleeping and lounging areas surrounded the fire place. Despite the informality of earth lodge living tribal people and visitors were encouraged to enter and exit the dwelling in a clock-wise manner.

could now go to their earth lodge dwellings for the remainder of the year until the flowering of certain plants the following spring marked the cycle of the summer hunt again.

The dwelling was built primarily from memory, and only after it was completed, did the Omahas call in the "experts" from one of the nearby colleges to confirm that it had

This last earth lodge dwelling built by the Umonhons, although indeed very sturdy, gradually decayed from lack of interest and use by the tribal people. Today, it is difficult to see the outline of the exact spot of its construction.

This chapter started out thanking archaeology for the studies done in unearthing these ancient dwellings. Although it is difficult to link the distant past to current tribes today, the tie remains due to the tradition of some Plains Indian peoples in constructing earth lodges. To claim earlier earth lodge dwellers as the direct ancestors of these specific tribes is too uncertain, but remnants of this past perhaps can be gleaned by observing and learning from those tribes today. Archaeological discoveries in collaboration with tribal knowledge more richly informs this effort, and gives the people of Iowa a reason to be proud of our collective past.

*Where the author has used the term Umonhon, it must be clarified that this could have included people from the other related Dhehiga-speaking tribes—Ponca, Quapaw, Kansa, Osage, and Umonhon. According to various Umonhon elders, the Oto and Ioway would also be included in this grouping. By the time of the Lewis and Clark expedition in 1804, however, the Ioway and Umonhon were long separate tribes that often warred upon each other. Only the Ponca and the Umonhon appeared to have maintained close ties and often intermarried with one another. Yet, there is a story told by the Ioway that they are the ones to have given the Umonhon people their name. It bespeaks of a time when the Ioway were considered part of this larger grouping of Dhegiha-speaking peoples.

Architectural Gems



Knox Church, Sidney vicinity, Fremont County. Rural, abandoned wooden church eligible for the National Register of Historic Places.

A limited survey conducted along the Byway through the seven counties of the Loess Hills identified 139 buildings or properties as having historical or architectural interest. Of these, 13 have already been nominated to the National Register of Historic Places. Examples include the William Haner Polygonal Barn near Pisgah, Mann School No. 2 near Moorhead, and the Tabor Antislavery Historic District in Tabor. With additional study, others could be nominated. Such places relate to important historical themes in Loess Hills' history including the Lewis and Clark expedition, westward rolling frontier, Underground Railroad, growth of railroads, rise and demise of towns, western Iowa agriculture, and state and county government and services.

School houses, churches, farmsteads, bridges, highways, railroad depots, grain elevators, barns, commercial buildings, and homes—some still occupied, others long abandoned—extend Loess Hills his-

tory to the present. Such properties illustrate trends in agriculture, industry, and urban development, and reflect the personal story of important figures and events.

The following specific buildings or properties identified in the survey offer just a sampling of the architectural gems recommended for additional study.



Left. Holly Springs gym and auditorium, Woodbury County. This education facility suggests both architectural interest as a late “PWA Moderne” building (a variant of Art Deco) and historical interest as a remnant of the Holly Springs community, and perhaps, the effects of school consolidations.



Left. Argyle Street potential residential district, Hamburg, Fremont County. Several blocks of this Hamburg residential district spanning a century from 1850 to 1950, show promise as a historic district.



Right above. Tabor Congregational Church, Fremont and Mills counties. An 1870s church notable for both architecture and history, and featured in A. T. Andreas’ Illustrated Historical Atlas of the State of Iowa, 1875.



Left. Farmstead, Belvedere Township, Monona County. This historic farmstead dates at least to the 1890s and has an impressive set of barns including an extended monitor-roof hay barn with pass-through side sheds for livestock.

Below. Old Lincoln Highway, Honey Creek vicinity, Pottawattamie County. A cluster of older highway features in this general vicinity may be associated with the historic route of the Lincoln Highway, America's first transcontinental road.



Left. Logan potential commercial district, Harrison County. Two dozen commercial buildings, one currently on the National Register of Historic Places.





Brick and stone homes of Thurman, Fremont County. Vernacular masonry houses like this one are common in this small town. They date from 1840 to 1870 and have architectural interest.

*Pisgah potential commercial district, Harrison County.
Pisgah's main commercial district today shows the effects of the arrival of the automobile in the early 20th century and improvements to the highway through town. It also contains historic buildings from an earlier era that revolved around the railroad and a less mobile local population.*





Missouri Valley potential commercial district, Harrison County. One of the larger communities along the Loess Hills Byway, Missouri Valley's Main Street district appears vibrant today.



Octagonal barn building, Tabor, Fremont County. Intriguing large wooden building with eight irregular sides and capped with a monitor roof suggests both historical and architectural significance.

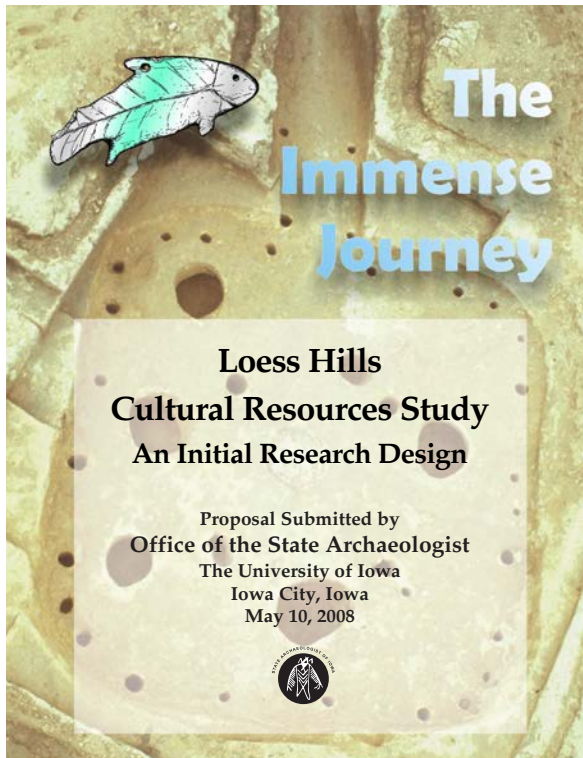


Greek Revival house south of Thurman, Fremont County. This fine example of a Greek Revival-style house, dating to 1861, is clearly eligible for the National Register of Historic Places.

“The Brick,” Moorhead, Monona County. An impressive town founders’ residence from the 1870s.



The Way Forward



The Loess Hills Cultural Resources Study and the partnerships created among local residents, descendant communities, landowners, researchers, and many organizations, energized efforts to preserve, protect, and interpret the Loess Hills National Scenic Byway's historic legacy. Brand new signs now draw visitors into the pre-historic world of early Mill



Creek farmers and showcase the area's contributions to the protection of ancient cemeteries such as Turin.

When the Sioux City Public Museum completed its facility in 2011, displays highlighting 13 millennia of human history in the Loess Hills opened to the public. A new interpretive center in Mills County may soon join its northern cousin, offering a window into the world of 13th-century communities in southwestern Iowa.



Archival research, collections' study, architectural and archaeological field surveys, excavation, and the application of state-of-the-art technology have established a solid case for the national significance of cultural resources along the Byway. As a result, and thanks to cooperating landowners, the West Oak Forest earth lodge site (13ML652) near Glenwood and the Kimball Village (13PM4) north of Sioux City are on their way to being listed on the National Register of Historic Places (NRHP), America's heritage honor roll. The Davis Oriole site (13ML429) at Pony Creek Park in Glenwood, already on the NRHP, has also been nominated for National Historic Landmark status.

While listing on the NRHP does not confer unlimited protection for sites, and landowners are always encouraged to preserve these important places through their own efforts, potential damage to an NRHP site resulting from federally funded construction must now be considered and mitigated. In addition, a

landowner may seek certain grant monies on behalf of such properties and, in some cases, may receive tax credits. For more information on the NRHP visit <http://www.nps.gov/nr/>.

The project finale coincided with perhaps one of the most rewarding outcomes for the many individuals and organizations who have labored for decades for the interpretation, preservation, and protection of endangered archaeological sites. On October 22, 2009, 917 acres south of the Glenwood

Boundary of new State Preserve at Glenwood, lower right.





Resource Center in Mills County, transferred by the Iowa State Legislature from the Department of Human Services to the Iowa Department of Natural Resources, was dedicated as Iowa's ninety-sixth—and largest—archaeological preserve. Since 1965 the Iowa Preserves System has offered the highest level of state protection for Iowa's natural and cultural heritage. The new preserve contains 109 archaeological sites, 27 of them prehistoric Glenwood earth lodges.

The Archaeological Conservancy, a national organization dedicated to acquiring and preserving the best of our country's remaining archaeological sites, became a new partner for the Loess Hills and Iowa. Early in 2010, it announced plans to acquire the Woodfield Earth Lodges site (13ML102)—the twin lodges first excavated by the project in 2009. This would be Iowa's very first Conservancy-protected site!

For those who wander the Loess Hills National Scenic Byway, the end of this study is only the beginning of a new visitor experience—time travel. The plans established for the future protection, management, and interpretation of the area's extraordinary cultural heritage promise to draw the past well into the future for decades to come.

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