

Volume 43

2022

Contents

*What's the Point? A Flintknapper's Perspective on Late Archaic
Corner-Notched Points*

Anthony Miles

*The Positive Side of Negative Results: Plant Microfossil Analysis of
an Early Ceramic Vessel*

Robert J. Hoard, Crystal A. Dozier, and Jennifer Banks

The Wullschleger Site (14MH301): More than Half a Century of Searching

Christine D. Garst

*Oneota Pioneers: Cache Pits and Settlement at the White Rock Site (14JW1),
Lovewell Locality, North-Central Kansas*

Brad Logan

*Examination of Ceramic Vessel Sherds from the Kermit Hayes No. 2 Site (14RC13),
a Little River Focus Site in Rice County, Kansas*

Timothy K. Perttula

Gunflints in the Kansas Historical Society's Archeological Collections

Christine D. Garst

*From Gripper Snappers to Isinglass: A Summary of the 1988 and 1990 Kansas
Historical Society's Archeological Investigations at Constitution Hall (14DO321)*

Christine D. Garst

Jacob V. Brower and the Beginnings of Archeological Field Survey in Kansas

Michael R. Penrod

The
KANSAS
Anthropologist

Journal of the Kansas Anthropological Association

KANSAS ANTHROPOLOGICAL ASSOCIATION

P.O. Box 750962, Topeka, KS 66675-0962; www.katp.org

The Kansas Anthropological Association is the oldest amateur archeological organization in the state. Its membership is made up of individuals and institutions interested in the prehistoric and historic peoples of the area. The objectives and goals of the Association are the preservation and interpretation of archeological and ethnographic remains within the state; the scientific study, investigation, and interpretation of archeological remains and ethnographic materials; the publication and distribution of information concerning Kansas archeology and ethnology; and the development and promotion of a greater public interest and appreciation for the heritage of the state. Members are required to sign a code of ethics.

Types of memberships and dues:

Individual	\$27.00	Institution/Agency	\$30.00
Family	\$30.00	Life	\$400.00
Contributing	\$40.00	Student	\$5.00

Applications for membership and dues should be address to the treasurer at the address listed below. Memberships begin on January 1, and annual dues are payable at that time. The student membership does not include publications.

OFFICERS OF THE KANSAS ANTHROPOLOGICAL ASSOCIATION

President: Tim Weston, [REDACTED]
First Vice-President: Morris Floyd, [REDACTED]
[REDACTED]
Second Vice-President: Beth Good, [REDACTED]
[REDACTED]
Secretary: Melanie Naden, [REDACTED]
Treasurer: Melonie Sullivan, [REDACTED]
Historian-Recorder: Mary Conrad, [REDACTED]
[REDACTED]
Journal Editor: Virginia A. Wulfkuhle, [REDACTED]
[REDACTED]
Newsletter Editors: C. Tod and Wendi Bevitt, [REDACTED]
[REDACTED]
Immediate Past President: Kent Sallee, [REDACTED]
[REDACTED]

PUBLICATIONS

Each year members receive four issues of the *Kansas Anthropological Association Newsletter* (ISSN 1069-0360) and one journal, *The Kansas Anthropologist* (ISSN 1069-0379). All members and interested individuals, professional or amateur, are invited to submit material to the editors. Journal abstracts are posted on the KAA web site at www.katp.org. Back issues of the newsletter or journal, if available, may be ordered from the Historian-Recorder at the address listed above. Prices are furnished upon request.

CONTENTS

What's the Point? A Flintknapper's Perspective on Late Archaic Corner-Notched Points	Anthony Miles	1
The Positive Side of Negative Results: Plant Microfossil Analysis of an Early Ceramic Vessel	Robert J. Hoard, Crystal A. Dozier, and Jennifer Banks	7
The Wullschleger Site (14MH301): More than Half a Century of Searching	Christine D. Garst	11
Oneota Pioneers: Cache Pits and Settlement at the White Rock Site (14JW1), Lovewell Locality, North-Central Kansas	Brad Logan	24
Examination of Ceramic Vessel Sherds from the Kermit Hayes No. 2 Site (14RC13), a Little River Focus Site in Rice County, Kansas . .	Timothy K. Perttula	60
Gunflints in the Kansas Historical Society's Archeological Collections . .	Christine D. Garst	63
From Gripper Snappers to Isinglass: A Summary of the 1988 and 1990 Kansas Historical Society's Archeological Investigations at Constitution Hall (14DO321)	Christine D. Garst	75
Jacob V. Brower and the Beginnings of Archeological Field Survey in Kansas	Michael R. Penrod	108
Book Reviews	C. Tod Bevitt Jim D. Feagins	199
About the Authors		135
Addendum to 2021 Kansas Anthropological Association Members		138
2022 Kansas Anthropological Association Members		139

WHAT'S THE POINT? A FLINTKNAPPER'S PERSPECTIVE ON LATE ARCHAIC CORNER-NOTCHED POINTS

ANTHONY MILES

Overland Park, Kansas

The Archaic period in North America saw the introduction of many new projectile point styles. Corner-notched points from the Middle Archaic through Woodland periods exhibited many variations. For archeologists attempting to define named types, these artifacts can blend together, especially when they have been extensively reworked. A knowledge of flintknapping, which is a form of experimental archeology, can greatly aid in differentiating one type from another. The observations in this paper are offered from the perspective of a flintknapper, who experiments with notching techniques that could be a key to distinguishing among point types.

Flintknapping has been an interest of mine for years. I was five years old when I found my first “arrow-head,” a broken Dickson made of heat-treated Reed Springs chert (Ray 2016:84–87). However, it was another 18 years before curiosity drove me to take up knapping as a hobby. The different shapes and flake patterns had always fascinated me, and I am not sure why it took me so long to try my hand at it.

Prior to becoming a flintknapper, I searched the same site, with permission, after every heavy rain to collect artifacts that had washed out. This site yields quite a few Late Archaic to Woodland corner-notched projectile points. Some specimens are pristine, and others are so heavily reworked that they are a fraction of the size they were when new. The more extensively reworked they are, the more they begin to look the same, even when one may be thousands of years older than the one next to it. I thought that replicating what I found might give me more insight into typology. This paper contains some of my observations as a flintknapper regarding a few corner-notched point types, as well as thoughts on how they were manufactured.

Before going any further, I will say that I do not knap with traditional tools very often. I prefer to use copper implements, which are cheaper, easier to come by, and last much longer before needing to be resurfaced (Figure 1). Antlers and hammerstones that Native Americans used tend to wear out too quickly for my liking. That said, the strategy is the same. While this is a topic all its own, the only

major difference between a traditional tool kit and a copper tool kit is the way in which a knapper prepares striking platforms on the objective piece.

Two of the most common point types that I find are best classified as Williams and Kings. Once they have been heavily reworked after dulling or fracturing, both closely resemble a Snyders point (Figure 2), and this is where typology of corner-notched points can become very confusing. Ray (2016:35) suggests an age range of 250 before Common Era (B.C.E.) -500 Common Era (C. E.) for Snyders points. Most examples of Snyders have blades that are excurvate, i.e., curved outward or away from central part. However, the blade may be straight on a resharpened specimen (Ray 2016:33). The blades on most Williams and Kings points are straight to only slightly excurvate and, depending on the amount of resharpening, the three types can blend together.

What helps to distinguish among them is the V-shaped notching. Snyders have broad V-shaped notches that enter from the corners. The notches are usually, although not always, fairly wide. As a result, the notches appear slightly higher on the blade than either the Williams or Kings. On a heavily reworked Snyders point, it is common to see pressure flake scars on the upper portion of the notch where it meets the blade and on the stem. These result from the flintknapper going in with a pressure flaker to trim the edges so that the notch can be advanced as well as to intensify the V-shape.

Figure 1. My main flintknapping tools are two sizes of pressure flakers (1/4 and 1/8 inch), a flat notcher, and three sizes of boppers (3/4, 1, and 1 1/4 inch). Boppers come in various handle lengths. The stubby ones work best for me, as I find them much more accurate than longer handled ones.

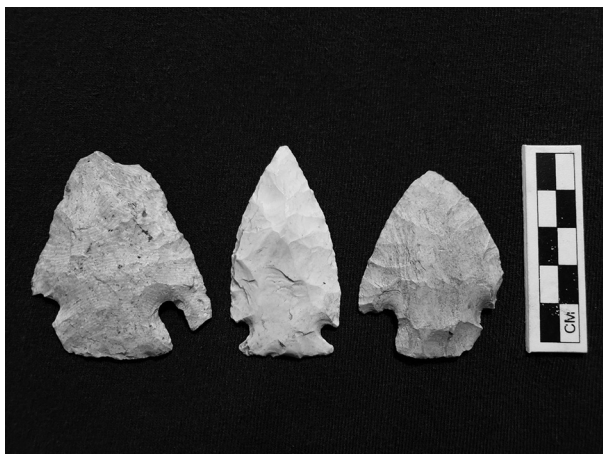


Figure 2. From left to right: Williams, Kings, and Sneders. A Williams point missing both barbs could easily mimic a Sneders point.

One final common attribute on Sneders points is they usually have pronounced points on both sides of the stem. A Kings point commonly has these, but the notches are often nowhere near as broad as those of a Sneders. Notches on Kings points tend to be rounded as opposed to V-shaped and sit lower on the point, too. Williams points can have V-shaped notching, but usually the notches are rounded off or U-shaped like a Kings. Due to their somewhat deep notching, a Williams can easily look like a resharpended Sneders due to the straighter blade. Again, the major difference is the notching angle. Williams points were often notched at relatively

steep angles and lack finer pressure retouch due to the narrowness of the notch. A flintknapper cannot get in there to do a lot of clean up with pressure due to the risk of snapping off the barb. The stem is typically a lot straighter on this type as well. Anything that looks like pressure retouch is likely remnants of using a punch to advance the notch, and the flakes scars are almost always stacked vertically for the whole length of the stem until the knapper achieved the desired depth. Additionally, pointed stem edges are almost always absent on a Williams as a result of deep notching and the angle from which it was done. Like both Williams and Kings points, the widest part of Sneders is usually at the barbs.

Williams is one of my favorite artifacts to find; their shape especially appeals to me. Although not commonly referenced in archeological literature, two somewhat outdated sources that do discuss the Williams point propose very broad chronological ranges for the type. Suhm and Jelks (1962:259) claim that Williams occurred from 4000 years B.C.E. to 1000 C.E. Waldorf and Waldorf (1987:124) assign dates of 1000 B.C.E.–1000 C.E. The source I trust the most is Jack Ray's *Projectile Points in Missouri and Portions of Adjacent States*. In this more recent reference, Ray (2016:46) goes into a much deeper analysis of the Williams type and provides a more concise date range: approximately 2250–1550 B.C.E.

Williams is best described as a broad point with deep U- to V-shaped notches, long stems, and

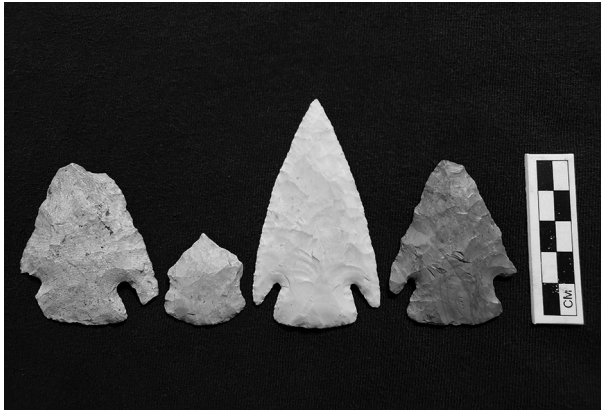


Figure 3. Examples of Williams points. The second point from the right is my attempt at replicating the point on the far right. These are tricky to make due to their width and how thin they usually are. The heavily reworked point just left of mine can be classified as a Williams by observing the base. While it has been rounded off, possibly due to breakage, the flake scars from notching are identical to the two more intact points. The angle of the stem is the same as well.

prominent barbs (Ray 2016:45; Figure 3). Nearly every Williams specimen I have seen was produced from heat-treated material. That is not to say that all Williams points were, but heat treatment seems to have been a common practice for the type. Ray (2016:46) confirms this: “Heat treatment was integral to the manufacture of Williams points . . . practically all finished bifacial tools made from Burlington chert in the Williams component of the Big Eddy site and Williams points from the lower Sac River valley had been heat treated (Ray 1998a:Table 9.12, 2005:310).”

Native American flintknappers who created these points did not seem to favor any special flaking patterns or biface thinning strategies to manufacture their preforms. Both percussion and pressure flaking sequences appear random. In other words, the knapper set up striking platforms wherever it was necessary or convenient to remove high spots and produce a preform thin enough to notch. The Williams preform is a broad triangle, usually with a convex base, although I have seen some with flatter bases. Snyders preforms are very similar; in fact, a knapper could fashion either type from the same shape of preform. However, based on my experience and observation of real examples, finished Snyders points are generally thinner.



Figure 4. Middle stage biface of heat-treated Keokuk chert, showing thinning flakes removed from the base and corners. Large percussion flakes were removed from the sides last to thin out the middle. The next few passes of percussion need to be slightly more strategic in order to remove the remaining high spots before switching to pressure.

The first step in making a preform for either of these point types is to select the right sized rock. The rock needs to be fairly wide and preferably of material that is relatively free from inclusions, such as seashells or fossils. As a biface is thinned, these inclusions cause weak spots, increasing the chance of breakage. Heat-treated chert is even better as longer flakes are easier to accomplish due to how glassy the stone becomes after prolonged exposure to heat. Raw stone can be used, provided it is of high quality.

The key to developing these broad leaf-shaped bifaces is removal of thinning flakes from the corners as well as from the base early in the reduction process (Figure 4). This can be quite tricky. Since these points are generally on the thin side and rather wide, proper biface support is critical during percussion flaking, especially as the piece becomes thinner. The knapper has to drive long percussion flakes past the center of the biface to thin it. This requires striking platforms to be hit swiftly and with a lot of force. End shock is usually where failure occurs with this shape. Breaks of this kind commonly happen near the center if the knapper strikes from the base or tip without the opposite end supported properly. To avoid this, the knapper must keep a hand situated along the edge to absorb the shockwave



Figure 5. An authentic Kings point from my personal collection (center) next to ones I made (right and left).

generated by percussion. This does not apply only to wide triangular preforms, but to chipped stone reduction in general. Following percussion flaking, apparently Native American flintknappers mainly used pressure flaking to trim the biface into its final shape and form a sharp edge.

Kings points can easily mimic both Williams and Snyders, especially once they reach the exhausted stage or after being resharpened to the extent that the barbs become obliterated. These points are not very big. Ray (2016:25) describes them as small to medium in size with wide, deep corner notches, expanding stems, and Late Archaic age of approximately 1850 to 1050 B.C.E. I have observed that the stem is often relatively short, and stem corners tend to terminate in points (Figures 5 and 6). Stems on resharpened specimens may appear more blunted from breaking and being reworked. Another common characteristic is pressure flaking along the long axis of the blade, which often removes the majority of percussion flake scars (Ray 2016:26). In contrast, Snyders and Williams points were manufactured primarily using percussion flaking (Justice 1987:201). As to be expected, variations do occur. Some Kings points are notched more narrowly than others and exhibit more evidence of percussion flaking. While still somewhat broad, they tend to be slimmer than Williams or Snyders. As is the case with many other Late Archaic points, heat treatment is common with Kings.

Once I started flintknapping, I began to exam-



Figure 6. Another example of a Williams point. The point on the right is made of heat-treated Florence A chert from south-central Kansas. In north-central Oklahoma this same material is commonly referred to as Kay County chert. If the point were complete, it may have resembled my reproduction on the left.

ine heavily reworked points and imagine what they looked like when new (Figures 7 and 8). I pay the most attention to notching because I think that notch angles and widths reveal a lot. My notching method employs flattened copper wire mounted in a handle and a wooden block with a rubber pad on top for support. The added support of the block allows me to create greater force, which in turn produces a bigger flake. Larger flake removals in turn allow the notch to be more easily advanced into the biface.

Notching can be accomplished with a flattened piece of antler, but only to a certain extent. The deeper into the notch, the more difficult it becomes to pressure notch as the antler is too soft. Native Americans most likely did their notching with a punch. Punch notching is a form of indirect percussion where a small sliver of bone or antler and some form of paddle are used. The sliver of bone or antler is carefully placed on the platform and then hit with the paddle. Punching can be very risky. If the punch is hit too hard, there is the chance of sending a shock wave up the vertical axis of the point, leading to breakage. Stems also can be broken off



Figure 7. Another example of a Kings point (right) next to one I made (left). The authentic one has been subject to a lot of reworking due to use wear and/or impact fractures.

more easily this way. Punch notching takes a lot of patience. While I use it on occasion, that technique is still a work in progress for me.

Finding literature that discusses notching is somewhat difficult. Justice (1987:201) proposes that indirect percussion was used during the notching process of Snyders points, along with pressure retouch to clean up the notch and form its final shape. Most of what I know regarding notching is through personal communication with archeologists and fellow knappers and my own experimentation. Kings is a very good type on which to learn notching; the notches are relatively easy to drive in with a small pressure flaker. I start the notches by rounding the corners and then etch in a “C” shape around 45 degrees from the base. From there, I continue using down and inward pressure to continue advancing the notch until reaching the desired depth.

Snyders is made very similarly with the exception of a wider preform and broader V- to U-shaped notches. On the other hand, a Williams is notched more steeply. Notches on these points begin at the corners. I start notching by etching in a “C” shape with a pressure flaker at the corners of the base. I then switch to a flat notcher and advance upward, while very slightly curving in toward the center of the point. Notching this deeply requires careful platform preparation. A bad flake removal or too



Figure 8. This illustration shows what the point from the previous picture may have looked like when it was new in comparison to how it evolved from reworking. Although it looks very similar to a Williams type, there is a good chance it is a Kings point due to the angle from which the notch was started. The sides of the base would have both come to sharp points, and the point itself is thin. Both of these are common characteristics of a Kings. The other side of the stem likely came to a point as well but has been rounded off from reworking.

much pressure can cause a barb or base to break off. Another issue common with deeper notching is stalling of the platform. This happens when it becomes too steep to keep advancing. Once this happens, there is not much that can be done to save it.

Flintknapping is an art form that takes years to master, and I am nowhere close to doing so (Figure 9). My goal is not to make perfectly flaked oversized points, but rather ones of typical size and flake patterns similar to those that could be found at an archeological site. This paper is based purely on my observations from studying the originals out of curiosity and having a genuine interest in archeology. Although flintknapping is not strictly archeology, I believe that anyone interested in North American prehistory could benefit from knowing a little about it. It can answer many questions about how something was manufactured or used. For instance, I have learned that a lot of the broken pieces I have found were not broken from stream tumbling, but rather from a bad hit or flaw in the stone. I personally enjoy looking at these as much as I do any other lithic artifact because it shows that even the

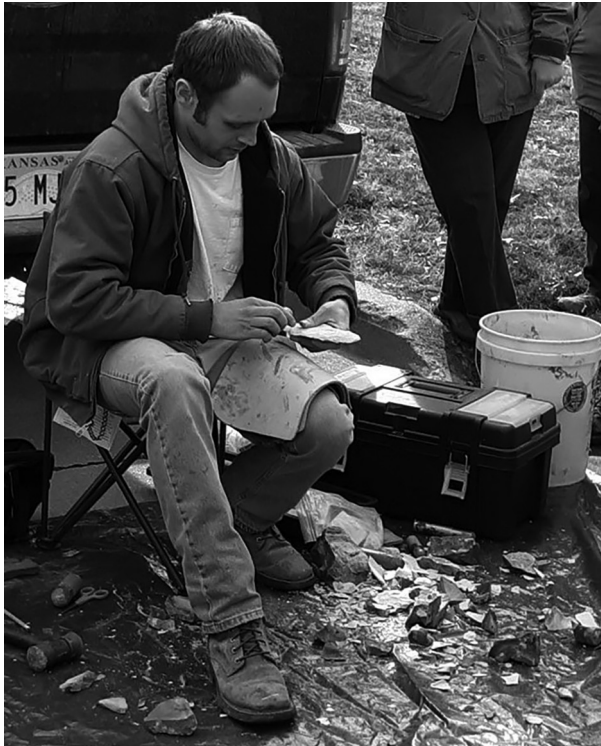


Figure 9. Flintknapping demonstration for the Kansas Anthropological Association in February 2020. I was making a biface out of raw Burlington chert. The shattered rock on the groundcloth was from a nodule that proved to be full of cracks caused by repeated freezing and thawing. When struck, the nodule broke into chunks.

masters of this art form had their bad days. In a way, it connects me to a knapper who lived thousands of years ago. I see his broken biface and think to myself, “I know just how you felt. I hate it when that happens.”

REFERENCES CITED

- Justice, Noel D.
1987 *Stone Age Spear and Arrow Points of the Midcontinental and Eastern United States*. Indiana University Press, Bloomington.
- Ray, Jack H.
2016 *Projectile Points Types in Missouri and Portions of Adjacent States*. Special Publication No. 10. Missouri Archaeological Society, Missouri State University, Springfield.
- Suhm, Dee Ann, and Edward B. Jelks
1962 *Handbook of Texas Archaeology: Type Descriptions*. Special Publication No. 1. Texas Archeological Society and Bulletin No. 4, Texas Memorial Museum, Austin.
- Waldorf, D.C., and Valerie Waldorf
1987 *Story in Stone: Flint Types of the Central and Southern U.S.* Mound Builder Books, Branson, Missouri.

THE POSITIVE SIDE OF NEGATIVE RESULTS: PLANT MICROFOSSIL ANALYSIS OF AN EARLY CERAMIC VESSEL

ROBERT J. HOARD

Kansas Historical Society

CRYSTAL A. DOZIER

Wichita State University

JENNIFER BANKS

Wichita State University

The beginning of plant cultivation in Kansas prehistory is not well documented for the western plains of Kansas. The recovery of an Early Ceramic Keith phase (~200 to 1200 C.E.) pot presented the opportunity for analysis to determine if domesticated plants were cooked in the pot, which has a radiocarbon age of 1142 ± 44 RCYBP (about 800 C.E.). Analysis of two sherds from the pot produced no evidence of domesticated plants remains. While disappointing, this lack of evidence for cultivated plant use is important; it is the first data set of this type that suggests Keith phase people did not cook domesticated plants. Analysis of more Keith phase vessels is needed confirm or refute these results.

In a recent volume of *The Kansas Anthropologist*, Debi Aaron and Robert Hoard wrote articles about a broken and partially reconstructed pottery vessel, associated with the remains of a person from 14GT310 in Grant County, southwest Kansas (Aaron 2020; Hoard and Aaron 2020). This vessel is important because it is one of the few restorable vessels from the Early Ceramic period in the High Plains. Residue from the vessel was submitted for a radiocarbon assay that returned a radiocarbon age of 1142 ± 44 RCYBP. The calibrated date range is A.D. 778–986; the median date is A.D. 895 (Calib 7.1 html; Stuiver et al. 2021).

In two other publications (Hoard and Bozell 2016; Hoard et al. 2017) Hoard and others argued that the Early Ceramic period on the High Plains is important in Kansas prehistory because the number of recorded sites increased significantly and technology developed rapidly and in multiple directions during that time. People started making pottery and using the bow and arrow. Archeological investigations have uncovered house floors, indicating that people were beginning to settle down a little. The idea of being more settled, coupled with the manu-

facture of pottery and rapidly increasing population, implies horticulture. Plentiful evidence of this transition in eastern Kansas (Adair 2006:256–257; Logan 2006:86) and of horticulture on the Plains appeared in the subsequent Middle Ceramic period (see Roper 2006 for a summary of the Middle Ceramic Central Plains tradition), suggesting that horticulture might have started on the High Plains during the Early Ceramic period. Powell's analysis of plant remains from the Kraus I site (14EL313) recovered macro-remains and phytoliths of maize, directly dated to 1016 ± 24 B.P., as well as little barley, which may represent a domesticated native plant (Hoard et al. 2017:81–94).

The vessel from 14GT310 offered another opportunity to see if people were cooking domesticated plants in clay pots during the Early Ceramic period. Aaron's reconstruction of the pot base showed that there was a boil line, i.e., a darker area at the lower quarter of the container that represents where some liquid and presumably solid material were left to boil so that, when the contents were removed, a line remained. Something was cooked in this pot. What was it?

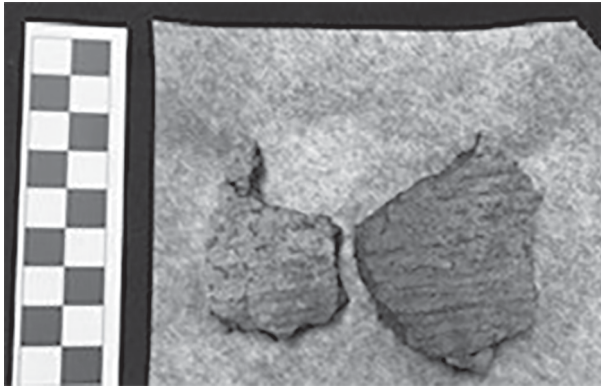


Figure 1. Sample 2 prior to analysis.

One way to find out is microfossil analysis. Two sherds from the 14GT310 pot were analyzed for microfossil traces by Crystal A. Dozier, Jennifer Banks, and Elayne Howard of Wichita State University's Archaeology of Food Laboratory. This work was financed by the Kansas Anthropological Association's John Reynolds Memorial Research Fund and the Kansas Historical Society. The goal was to search for remains that would indicate the cooking of plants in the pot, especially native domesticates like little barley. Microfossil analyses of this nature can recover microscopic pieces of plants that are resistant to decay, such as pollen grains or starch granules.

The sample processing procedure was modified from Dozier et al. (2020). Maintaining no contamination is an important part of microfossil analysis, as some starch and pollen grains are airborne (Laurence et al. 2011). The samples were photographed on starch-free paper, noting their color and temper type. Under sterile conditions, using a water trap for potential airborne microparticles, the sherds were rinsed in distilled water with a soft, sterile toothbrush. The two sides were cleaned separately. A tablet of tracer spores *Lycopodium*, a rare arctic plant, was added to the rinse water to determine if any microfossils survived the processing regime, as well as to establish microfossil concentration. Samples were washed twice with a 5 percent sodium hexametaphosphate (Calgon) solution to remove excess clay particles. The rinses were concentrated into 3 mL test tubes by centrifuge. The samples were then mounted onto glass slides with a 50/50 distilled water to glycerin mounting medium. Contamination from the extraction process was con-



Figure 2. Elayne Howard characterizes Sample 2 prior to analysis.

sidered to be low, with no airborne starch recovered during the extraction process (Banks and Dozier 2021; Banks, Howard, and Dozier 2021).

Twelve slides from the inside and outside of both sherds were examined, using a binocular microscope at 10–60x magnification. Unfortunately, microfossil recovery from the sherds was low. The first sherd had only one starch granule on the inside and eight fungal spores on the exterior. The second sherd had one starch granule and six pollen grains on the interior. The outside yielded much more, although largely highly degraded: 5 starches, 6 pollen, 77 plant fibers, and 30 fungal spores. Unfortunately, the low recovery of starches prohibited secure identification of particular plants, especially since the diverse indigenous starchy taxa have yet to be described.

Low recovery could be related to the pot's use—possibly nothing starchy or with plant flowers was cooked in it. Other explanations include extreme washing after initial recovery (don't scrub your artifacts too well, folks) or depositional context, i.e., all traces were scoured away or microorganisms, such as bacteria, ate the pollen and starch.

The objective of this analysis was to find remains



Figure 3. Jennifer Banks centrifuges the residues from Sample 1 to prepare for microfossil analysis.

of early native domesticated plants or even maize remains, because many characteristics of the Early Ceramic period point to incipient horticulture. The results do not support that hypothesis, which is disappointing. However, the absence of plant remains in one early pot might reveal something after all. First, just because this pot did not have plant remains does not mean that all High Plains Early Ceramic pots will not have them. Second, two sherds from one pot is an extremely small sample. Many more sherds from other High Plains Early Ceramic sites could be examined. Third, the pot could have served some other interesting purpose. It could have been used to process pigment or to boil or render fat from meat. A protein residue analysis might shed light on the latter proposition. Furthermore, this artifact accompanied a human burial. In other words, the pot may have served a function entirely different from cooking.

Several more questions may be answered by this pot. Perhaps negative evidence is not negative at all but a springboard for further, larger, more focused studies that may lead to questions and answers not previously considered.

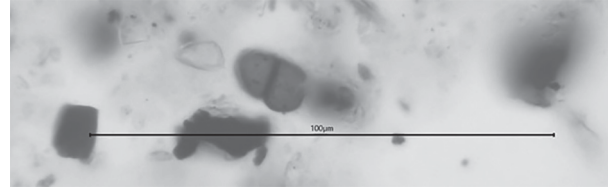


Figure 4. Dyad fungal spore from Sample 2.

REFERENCES CITED

- Aaron, Debi L.
2020 Pottery Reconstruction. *The Kansas Anthropologist* 41:11–19.
- Adair, Mary J.
2006 Paleoethnobotanical Research in Kansas. In *Kansas Archaeology*, edited by Robert J. Hoard and William E. Banks, pp. 248–263. Kansas State Historical Society, Topeka, in conjunction with University Press of Kansas, Lawrence.
- Banks, Jennifer, and Crystal A. Dozier
2021 Ceramics Microfossil Report: KSHS Sample 1. Archaeology of Food Laboratory, Fairmount College of Liberal Arts and Science, Wichita State University. Submitted to Robert Hoard, Kansas Historical Society, Topeka.
- Banks, Jennifer, Elayne Howard, and Crystal A. Dozier
2021 Ceramics Microfossil Report: KSHS Sample 2. Archaeology of Food Laboratory, Fairmount College of Liberal Arts and Science, Wichita State University. Submitted to Robert Hoard, Kansas Historical Society, Topeka.
- Dozier, Crystal A., Doyong Kim, and David H. Russell
2020 Chemical Residue Evidence in Leon Plain Pottery from the Toyah Phase (1300–1650 CE) in the American Southern Plains. *Journal of Archaeological Science: Reports* 32 (August): 102450. Electronic document <https://doi.org/10.1016/j.jasrep.2020.102450>.
- Hoard, Robert J., and Debi L. Aaron
2020 Description and Evaluation of Three Reconstructed Keith Phase Ceramic Vessels. *The Kansas Anthropologist* 41:20–23.
- Hoard, Robert J., and John R. Bozell
2016 The Forrest Site, 14PA303: A Keith Phase Component in Pawnee County Kansas. *Central Plains Archaeology* 15:1–88.

- Hoard, Robert J., John R. Bozell, and Gina S. Powell
 2017 The Kraus 1 Site (14EL313): Investigations by the
 2015 Kansas Archeology Training Program Field
 School. *The Kansas Anthropologist* 38:19–113.
- Laurence, Andrew R., Alston V. Thoms, Vaughn M. Bryant,
 and Cassandra McDonough
 2011 Airborne Starch Granules as a Potential Contamination
 Source at Archaeological Sites. *Journal of Ethnobiol-*
ogy 31(2):213–232.
- Logan, Brad
 2006 Woodland Adaptations in Eastern Kansas. In *Kansas*
Archaeology, edited by Robert J. Hoard and William
 E. Banks, pp. 76–92. Kansas State Historical Society,
 Topeka, in conjunction with University Press of Kan-
 sas, Lawrence.
- Roper, Donna C.
 2006 The Central Plains Tradition. In *Kansas Archaeology*,
 edited by Robert J. Hoard and William E. Banks, pp.
 105–132. Kansas State Historical Society, Topeka, in
 conjunction with University Press of Kansas, Law-
 rence.
- Stuiver, M., Reimer, P.J., and Reimer, R.W.
 2021 CALIB 8.2 [WWW program]. Electronic document
<http://calib.org>, accessed November 16, 2021.

THE WULLSCHLEGER SITE (14MH301): MORE THAN HALF A CENTURY OF SEARCHING

CHRISTINE D. GARST

Kansas Historical Society

Little was known about the Wullschleger site (14MH301) in Marshall County until the artifact collection was examined during a curation upgrade at the Kansas Historical Society. Three separate donations, accumulated more than a hundred years ago and donated in 1960, 1961, and 1987, comprise the 14MH301 assemblage. A few scant records document the circumstances of their collection. This report shares that information and sheds light on the people who lived at the Wullschleger site.

During a routine examination of archeological collections at the Kansas Historical Society (KSHS) around 2010, several boxes labeled 14MH301 were opened and the contents “excavated.” The artifacts that came to light sparked interest in all who viewed them and led to this report. In one box was decorated pottery, in another were Munkers Creek-like chipped stone tools, and in yet another was pipe-stone. The intriguing artifacts generated searches of site records and donation files, only to find that almost nothing had been written about the site or its material culture.

This situation seemed a shame and brought to mind an article by KAA member Rose Marie Wallen (2012) in *The Kansas Anthropologist* with a similar theme: an orphan collection languishing on a shelf until an enterprising researcher came along to study it and share the information with others. Even so, several years passed before time and circumstances allowed investigation of the 14MH301 artifacts and what they might reveal about the site.

The story really began with Otto J. Wullschleger (1886–1961), a life-long resident of Marshall County, Kansas. According to his obituary (Find A Grave 2020), “An ardent enthusiast in historic items, he gathered a vast collection of Indian artifacts in more than half a century of search” Wullschleger (Figure 1) was indeed an avid collector and in two separate donations gifted KSHS with his Marshall County collections, including 1,048 artifacts from the Wullschleger site (14MH301). An additional 18 artifacts from 14MH301 were

donated in 1987 by the Nebraska Historical Society and are combined in this summary (Table 1).

SITE SETTING

Roscoe Wilmeth, the first archeologist at the KSHS and later the first state archeologist, recorded Wullschleger site information on an index card. Wilmeth (1960) visited the Marshall County site in 1960 and identified it as a multicomponent village site that yielded artifacts associated with “... Woodland, Central Plains, Questa, Lower Loup (?), & possibly others.” At that time he noted that the Wullschleger site was “disturbed only by cultivation and one test by owner (Otto Wullschleger), who donated more material.” While “abundant surface material” existed in the collections, no surface indication of a site remained in 1960. Wullschleger reported that lodge circles had been visible in the past. Wilmeth’s site report did not address the extent of the site, other than section, township, and range, nor were any artifact concentrations discussed.

The Wullschleger site is situated

The site has been cultivated for decades. Thirteen other archeological sites are located within about a mile radius of the site in the Robidoux Creek drainage and are cultivated. Eight of these were described as having a light scatter of artifacts, mainly lithics. Three sites, 14MH115, 14MH116, and 14MH123, are to the



Figure 1. Otto Wulschleger in 1960 or 1961.

southeast in the same quarter section as 14MH301. 14MH115 was characterized as a Central Plains tradition (CPT) site with three distinct artifact concentrations. Nearby is 14MH116, a light scattering of flakes with burned earth eroding out of the terrace on which it sits. To the south 14MH123 was interpreted as a collapsed house, surrounded by a scatter of debitage and cultural debris. Finally, in his index card system Wilmet (1960) recorded the Wanklyn site (14MH338) and noted that the field was “littered with flint spalls.”

Thus, the picture is of multiple sites, ranging from small artifact scatters to habitation sites along a 2-mile stretch of Robidoux Creek. Perhaps many of these were CPT farmsteads, as defined by Roper (2006), rather than a series of small villages. The farmsteads might have formed a community, if occupied at the same time, or been an example of a group or groups of people accessing an abundant region periodically. The Wulschleger site is in the middle of this cluster. Artifacts from the other sites were not available for examination, so it is difficult to ascertain if all locations were occupied at the same time by the same people. One can surmise that something drew human populations to this area, and it may well have been the resources: water and arable land for gardening or farming, wood, plants to gather, animals to hunt, and chert for tool making. The Wulschleger site is in the Flint Hills, an ecoregion with outcrops of Permian cherts of varying quality that stretches from Marshall County southward to Kay and Osage counties in Oklahoma.

Table 1. Artifacts by Class and Count.

Artifact Class	Count
Ceramics	189
Chipped stone tools	661
Ground stone tools	21
Battered stone and debitage	57
Culturally transported, modified, and non-modified rocks	20 (139.2 g)
Modified bone and shell	2
Fauna	6
Historic artifacts	3
Other artifacts	3
Total	962

Table 2. Ceramic Temper by Count and Percentage.

Temper	Count	Percent of Identified Temper Types
Sand and/or grit temper	188	97.4
Shell temper	3	1.6
Undetermined temper	2	1.0
Totals	193	100.0

ARTIFACTS

Ceramics

There are 189 pottery sherds in the 14MH301 collection: 38 rim sherds and 151 body sherds. In most sherds the temper is identifiable (Table 2), and the majority have sand and/or grit temper. A very few sherds have some hematite inclusions that may have been naturally occurring. One low-fired rim sherd may be part of a small pinch pot, while the rest of the rims are likely from jars.

Surface treatment was distinguished in 178 rim and body sherds. Cordmarked sherds predominate ($n = 90$, 46.7 percent), followed by 52 (26.9 percent) sherds with smooth surfaces. A single sherd appears to be burnished, and 35 sherds are smoothed-over cordmarked. Brush marks are visible on either the exterior or the interior of several sherds. Three body sherds (Figure 2) have crack-lace holes, indicating that they may have been repaired. A plain handle and a strap handle (Figure 3), decorated with punctates and incised lines, are attached to rim sherds.



Figure 2. Pottery from 14MH301 with crack-lace holes. Courtesy of kansasmemory.org, Kansas Historical Society.

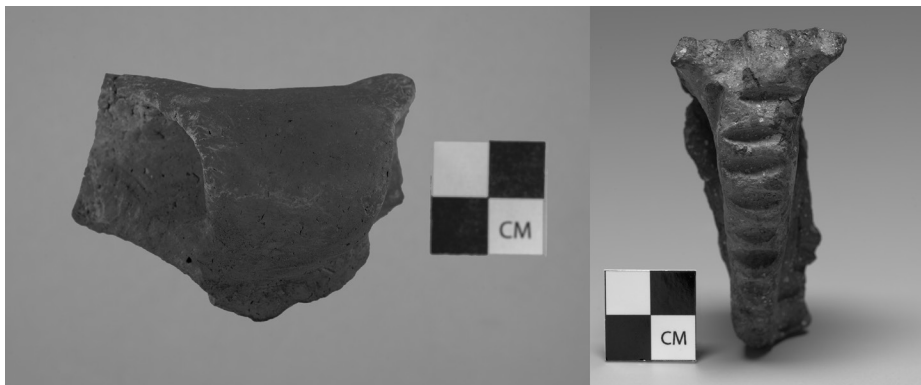


Figure 3. Ceramic handles. Courtesy of kansasmemory.org, Kansas Historical Society.

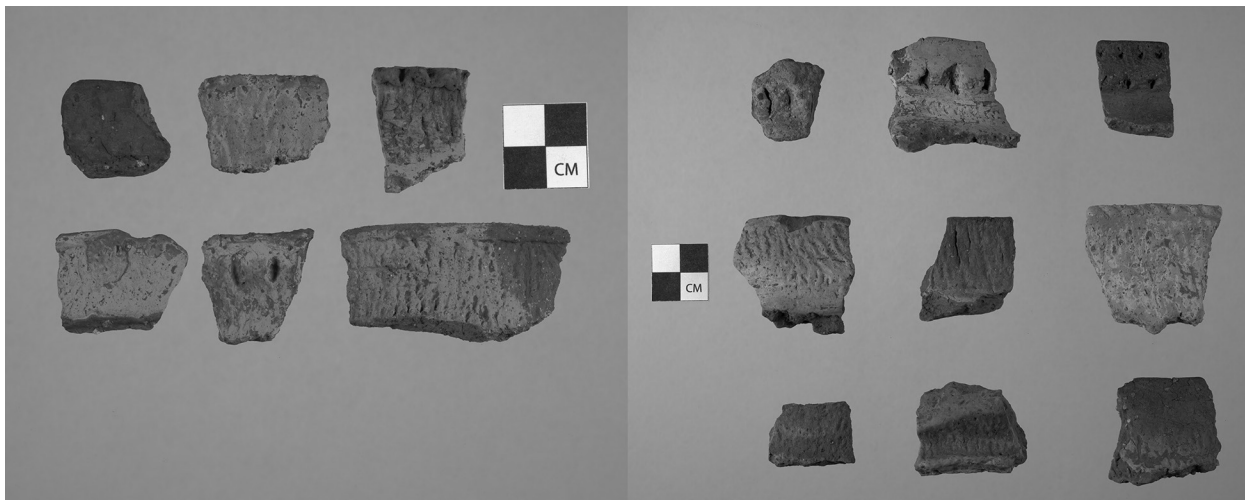


Figure 4. Rim sherds. Courtesy of kansasmemory.org, Kansas Historical Society.

Four rims are either thickened or collared, and many others have thickened rims (Figure 4). Most of the pottery decorations are on the lips or rims and consist of punctates, incised lines or tool trails, oblique incised lines, slash punctates, and chev-

rons (Figure 5). One body sherd is rocker stamped. Roper (2006) characterized CPT pottery as generally grit- or sand-tempered (though some sites in the east have shell temper), predominately cordmarked globular vessels. Rims can be collared or a variation

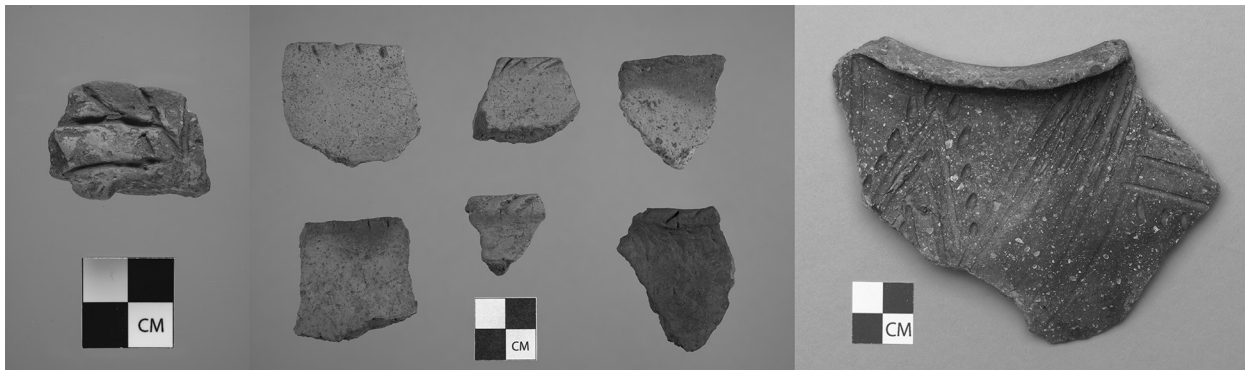


Figure 5. Examples of different decorations on rim sherds. Courtesy of kansasmemory.org, Kansas Historical Society.

called thickened or wedge lip, and decoration generally is confined to the lip/rim area. This accurately describes most of the pottery from the Wullschleger site.

A very few sherds do not fit well with the definition of CPT pottery and may represent vessels that were traded into the region. A body sherd with sand temper and rocker stamping sticks out like the proverbial sore thumb, as do two decorated rim sherds and a handle of Oneota pottery. Rocker stamping or rocker marking on pottery is a technique that uses a tool to incise a design with a back-and-forth (rocker) motion. Logan (2006) noted that zones of rocker marking point toward pottery made during the Kansas City phase by people of the Kansas City Hopewell variant (250–400 C.E.). A single sand-tempered body sherd with rocker stamping is part of the Wullschleger donation, but generalizing on the basis of one specimen is problematic. While the rocker-marked sherd resembles Kansas City Hopewell ceramics, no other evidence exists at the site to indicate a Kansas City Hopewell occupation. Wilmeth (1960) may have been referring to this sherd when he identified “Questa” (Cuesta) as one of the occupations at 14MH301.

Three sherds are decorated Oneota-style pottery. A grit-tempered rim sherd has three nested chevrons below the lip. A strap-style tapering handle (Figure 3) is tool impressed with 10 horizontal lines. Five tool-trailed lines extend to the body of this sherd near the base of the handle. A rim and shoulder sherd with shell temper and punctates on the lip is decorated with zones of oblique lines, separated by a zone of nested chevrons with a border of slash punctates (Figure 5). These ceramic attributes

compare well to Oneota pottery from White Rock phase sites in Jewell and Mitchell counties and the Leary site (25RH1), straddling the state line in Richardson County, Nebraska, and Brown County, Kansas (Ritterbush 2006). Punctate borders embellishing chevrons or groups of parallel lines, alternating parallel lines, and nested chevrons are horizon markers of the Oneota Middle (Developmental) Horizon I, 1200–1400 C.E. (Boszhardt 1998). The small sample size of three sherds makes it difficult to generalize; however, it seems that Wullschleger site residents might have traded with neighbors to the west or east (Figure 6). Additional ceramic artifacts can be viewed by accessing Kansas Memory and querying “14MH301.”

Chipped Stone Tools

In the 14MH301 donations 661 artifacts are classified as chipped stone tools (Table 3). Lithic materials represented are obsidian (1), quartzite (1), chalcedony (2), Smoky Hill silicified chalk (5), and unidentified cherts (72). All other chipped stone tools are made of local cherts from the Flint Hills region.

As chipped stone artifacts generally begin with a core, it is surprising that only one exhausted core was recognized. After working with the collection for some time, it is tempting to think, “Surely Otto Wullschleger would have picked up any cores on the site,” but that single core may reflect collector bias. Alternatively, it may signal that initial reduction of chipped stone tools took place away from the site. However, there are many bifaces and biface fragments ($n = 192$) that could have provided mate-

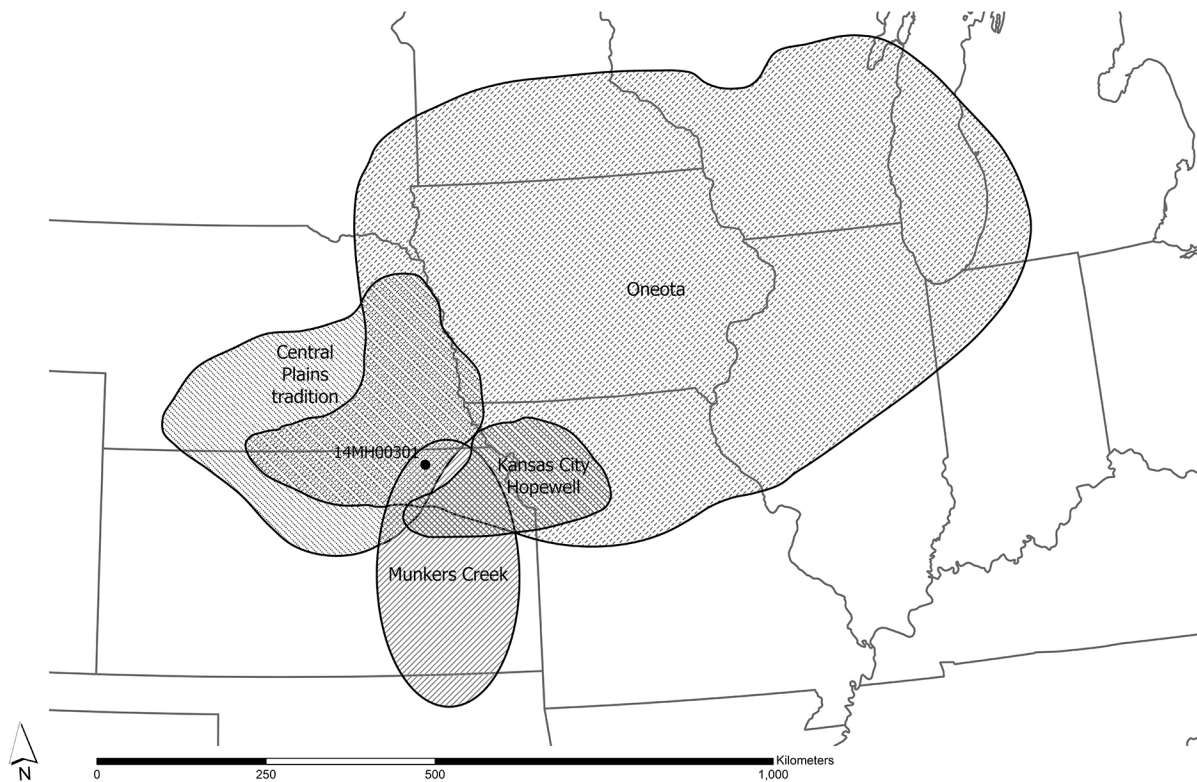


Figure 6. Approximate boundaries of Central Plains tradition, Oneota, Kansas City Hopewell, and Munkers Creek regions in relationship to 14MH301. Adapted from (Brooks 2012; Logan 1998; Theler and Boszhardt 2006; and Waggoner and Hoard 2008).

rial for additional tool manufacture (Figure 7). A few bifaces show thermal alteration, and 58 have cortex on one or more surfaces. One biface has a burin or graver-like point on one edge, and another has a possible notch at the base. Twenty-five additional bifaces may be knives. It was decided to consider these as bifaces rather than speculate about tool function.

Knives account for 23.3 percent ($n = 154$) of the chipped stone (Figure 8). Twenty-two knife fragments are thermally altered, and 33 retain some cortex. Four knives have notches at the base that may have aided in their hafting, and two others are alternately beveled. Two knives are made of Smoky Hill silicified chalk that outcrops in western Kansas and Nebraska, and the rest are local Flint Hills cherts. It would be interesting to learn how close the parent source or sources of the Flint Hills cherts are to 14MH301, but that is beyond the scope of this report. Three knives (Figure 9) resemble Munkers Creek knives and bifaces from the William Young

Table 3. Chipped Stone Tools.

Tool	Count
Core	1
Bifaces	205
Bifaces, knives, or preforms	26
Knives	153
Modified flakes and notched tool	33
Adzes, axes, and celts	7
Gouges	2
Gravers	6
Drills	23
Scrapers	42
Projectile points	163
Total	661

site (14MO304) in Morris County (Figure 10). However, several other knives/bifaces (Figure 11) also resemble Munkers Creek-like knives and bifaces: rather chunky with a blunted base, curved or straight sides, and a silica polish created by con-



Figure 7. Bifaces. Courtesy of kansasmemory.org, Kansas Historical Society.



Figure 8. Knives. Courtesy of kansasmemory.org, Kansas Historical Society.

tact with plants. The term Munkers Creek describes a hunting and gathering economy by people living in or near the Flint Hills region 6,250 to 4,850 years ago (Robert J. Hoard, personal communication January 9, 2020).

Thirty-two flakes show modification on one or more edges. One of these is an obsidian flake (Figure 12), but most are made from local cherts. Several retain some cortex, and two show thermal alteration. Six chipped stone artifacts are graters. Five of these are made of local Flint Hills chert (two with cortex), and one is thermally altered. Most of the drills are made from local cherts, and most have expanding bases (Figure 13). Many scrapers, most made of local chert, were recovered. A few are shown in Figure 14, and more can be viewed by visiting Kansas Memory and querying “14MH301.” Nearly one-fifth ($n = 9$, 21.4 percent) of the scrapers have cortex, but only two are thermally altered, one of which had been reworked from a parallel-stemmed dart point. Thirty-six chipped stone tools are suggested to be preforms, arrow point preforms of indeterminate affiliation or age, and one preform that might have been for a large side notched dart

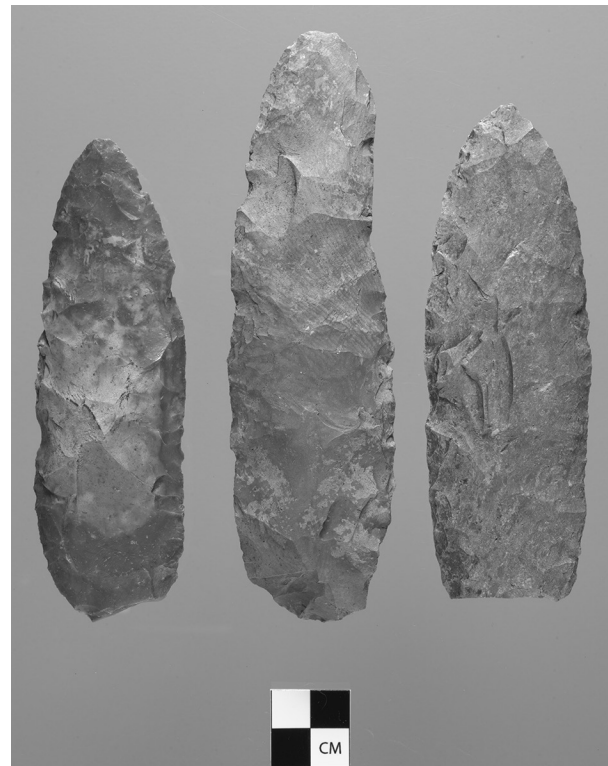


Figure 9. Knives or bifaces. Courtesy of kansasmemory.org, Kansas Historical Society.

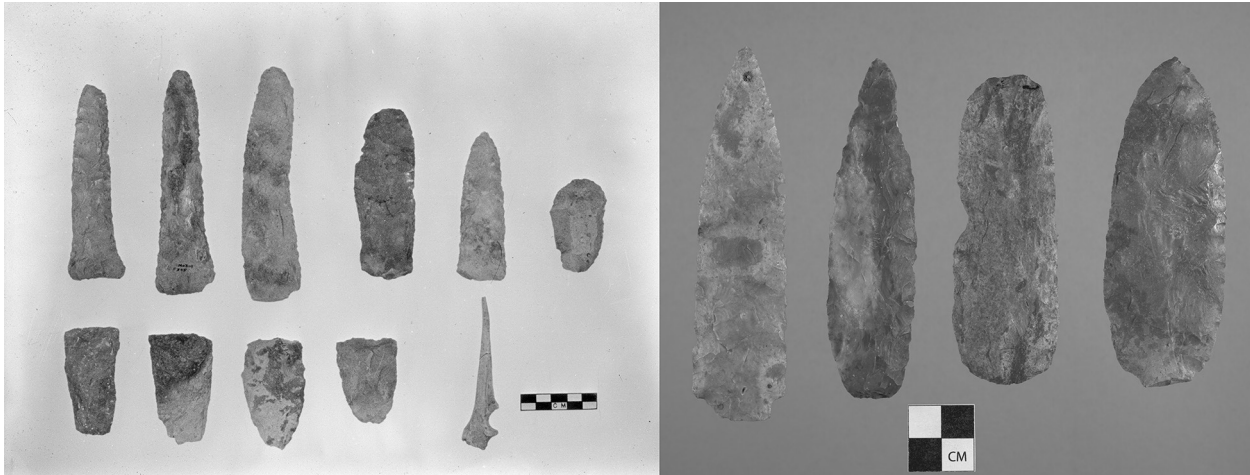


Figure 10. Munkers Creek knives, gouges, awl, and bifaces from William Young site (14MO304). Courtesy of kansasmemory.org, Kansas Historical Society.



Figure 11. Knives, some of which are Munkers Creek-like. Courtesy of kansasmemory.org, Kansas Historical Society.

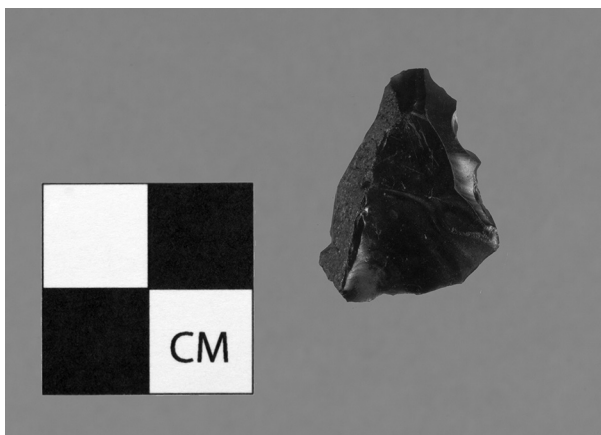


Figure 12. Obsidian modified flake. Courtesy of kansasmemory.org, Kansas Historical Society.

point. Finally, one chipped stone tool with notches does not fit well into these categories and is designated a “notched tool.” Additional chipped stone tools can be viewed by accessing Kansas Memory and querying “14MH301.”

Projectile points comprise nearly one-fourth of the chipped stone tools ($n = 163$, 24.7 percent), 95 of which are dart points, including contracting, expanding, and parallel-stemmed forms (Figure 15). Eight dart points have cortex on one or more sides, and 18 appear to have some thermal alteration. Several projectile points are identified as Munkers Creek dart points (right side Figure 15). Corner-notched, side-notched, basal-notched and triangular arrow point styles ($n = 68$) are also present (Figure



Figure 13. Drills. Courtesy of kansasmemory.org, Kansas Historical Society.

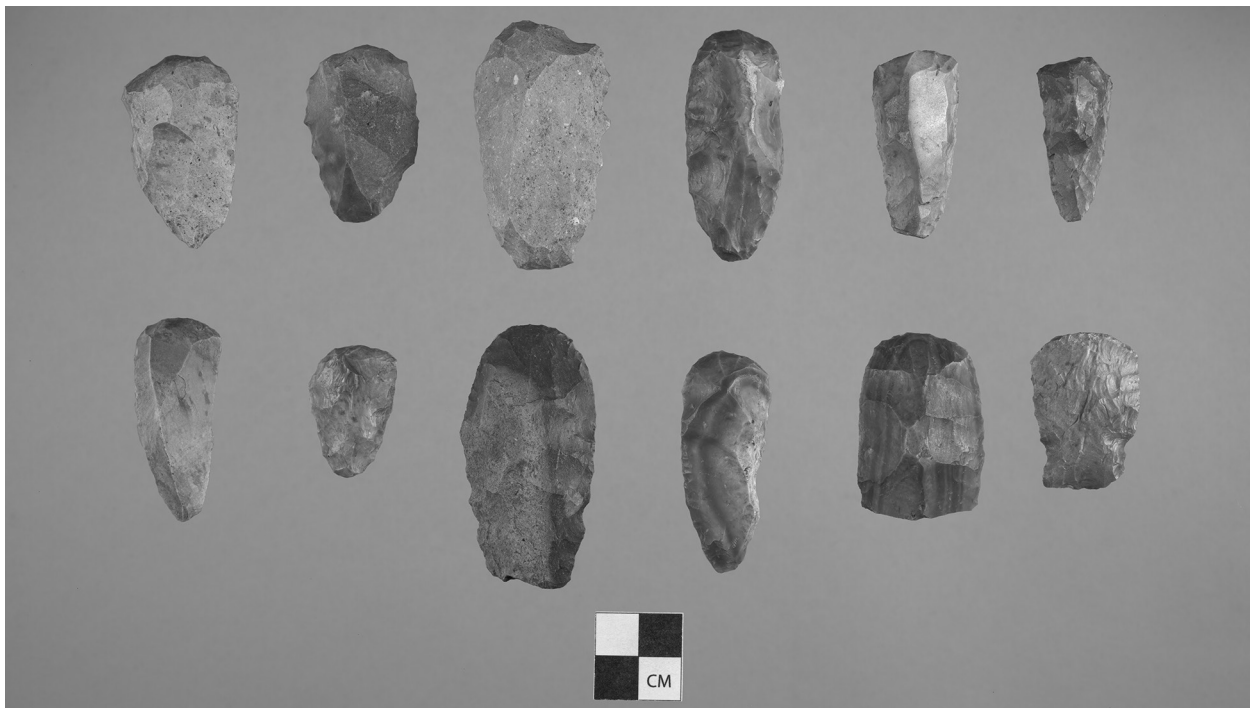


Figure 14. Selected scrapers. Courtesy of kansasmemory.org, Kansas Historical Society.

16). Three corner-notched points, two side-notched points, two notched point fragments, and one triangular arrow point are thermally altered. Four retain some cortex.

Chipped stone woodworking tools are represented by one possible adze, four axes, two possible celts, and three possible gouges. None of the gouges exhibit polish, but all have angled ends like Munkers Creek gouges. Two of the axes (Figure 17) are like those of the Munkers Creek type axes docu-

mented by Witty (1982) at the William Young site.

Ground Stone Tools

The collection contains 21 ground stone artifacts. One is a nutting stone, meant to hold a nut in place while the shell is cracked. Another is a $\frac{3}{4}$ -grooved maul, used as a hammer. There are four axes (Figure 18), one of which appears to be an axe preform as the shape was only roughed out.



Figure 15. Dart points. Courtesy of kansasmemory.org, Kansas Historical Society.



Figure 16. Arrow points. Courtesy of kansasmemory.org, Kansas Historical Society.



Figure 17. Axes from 14MH301 (left and center) and from 14MO304 (right). Courtesy of kansasmemory.org, Kansas Historical Society.

Two quartz fragments appeared to have some preliminary shaping, and a hematite fragment (Figure 19) of unknown function has striations on its surface and is polished. A pipestone fragment is deeply incised on one surface, and another is shaped and polished, similar to the treatment of hematite described above (Figure 20 left and right). Their functions are unknown.

A possible grinding slab and six manos (Figure 21) came from the Wullschleger site. Two of the

manos have battered ends and edges. Finally, three sandstone abraders were identified. Additional ground stone artifacts can be viewed by accessing Kansas Memory and querying “14MH301.”

Battered Stone and Debitage

One hammerstone shows battering along the edges and possible stains on one end. Of 56 pieces of debitage, four are blades and the rest are flakes or shat-



Figure 18. Grooved axes. Courtesy of kansasmemory.org, Kansas Historical Society.



Figure 20. Modified pipestone (left and right) and unmodified pipestone (center). Courtesy of kansasmemory.org, Kansas Historical Society.

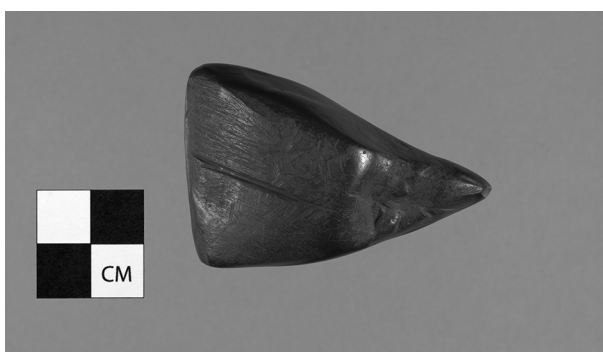


Figure 19. Modified hematite. Courtesy of kansasmemory.org, Kansas Historical Society.

ter. Unsurprisingly, the majority of these are local cherts from the Flint Hills region.

Small amounts of non-local materials, such as chalcedony, basalt, petrified wood, and Smoky Hill silicified chalk, were recognized in the debitage. These materials suggest trade with CPt or Oneota groups to the west or perhaps visits to the source areas by Wullschleger site people.

Rocks: Culturally Transported, Culturally Modified, and Non-Modified Rocks

Donated collections often contain rocks that fall into several categories: non-local rocks transported into the area; rocks modified by fire, testing, burnishing, or some other alteration; and rocks naturally present. The 14MH301 assemblage has four artifacts, a piece of basalt and three pieces of petrified wood, likely transported from stream deposits in the western part of the state or from the Rocky Mountain region (Kansas Geological Survey 2017). A fragment of unmodified pipestone (Figure 20 center) may have been traded into the area or naturally deposited nearby in glacial till (Kansas Geological Survey 2004).

Two specimens show evidence of heating, five chert examples show possible wear or chipping along the edge as though they were tested for knapping, and six stones are possible burnishing stones (Figure 22). It is difficult to establish whether a stone was used to burnish pottery surfaces or if it had



Figure 21. Manos. Courtesy of kansasmemory.org, Kansas Historical Society.

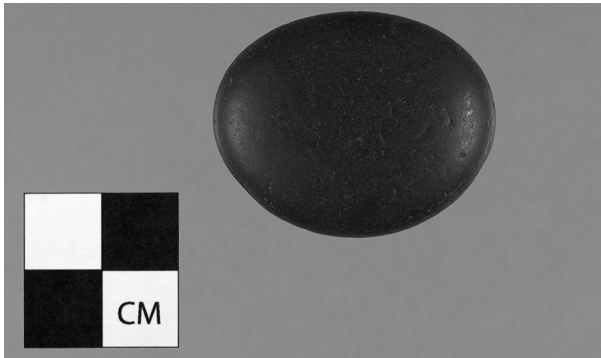


Figure 22. Possible burnishing stone. Courtesy of kansasmemory.org, Kansas Historical Society.

been worn smooth by stream or river action. Four other rocks may be natural occurrences. Additional rock artifacts can be viewed by accessing Kansas Memory and querying “14MH301.”

Modified Bone and Shell

The collection includes a modified bone and a modified shell. The bone (Figure 23) is shaped into a side-notched projectile point. It might be prehistoric or a modern reproduction. The shell (Figure 23) is a thick bivalve with a hole drilled in the center.

Fauna

A few faunal remains are mostly from surface proveniences and could well be more recent than the rest of the collection. They are bison or cattle teeth, two long bones from a large mammal, and a possible beaver mandible.

Historic Artifacts

Three artifacts date to the Historic period (post 1630 in Kansas). A blue glass bead (Figure 24) is of European or European-American manufacture. It was traded into the area from American Indian or European-American sources.

An unusual lead artifact with interior rings and a crimped exterior was identified, after consultation with the HISTARCH listserv (Garst 2020), as a hollow point bullet that expanded or mushroomed. Finally, a small fragment of a red brick was recovered. With so few artifacts from this period, it is difficult to make inferences.

Other Artifacts

Three artifacts did not readily fit into the above categories and so were identified as “other artifacts.” This classification encompasses two fossils and a fragment of daub with clear stick and grass impressions (Figure 25). The latter artifact suggests that wattle and daub structures might have been present at the site, although the premise relies on a single example. Additional survey at 14MH301 might reveal a clearer picture of the number and location of structures.

CONCLUSIONS

When Roscoe Wilmeth visited the Wullschleger site in 1960, he labeled it a multi-component village site. The intervening years have brought changes in how archeologists view characteristics

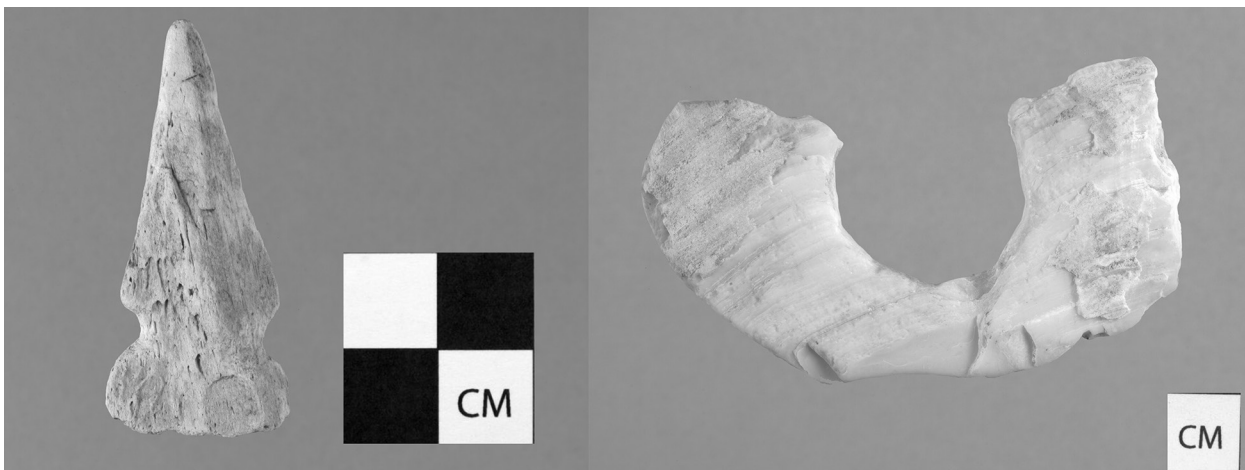


Figure 23. Possibly modified bone and modified shell. Courtesy of kansasmemory.org, Kansas Historical Society.

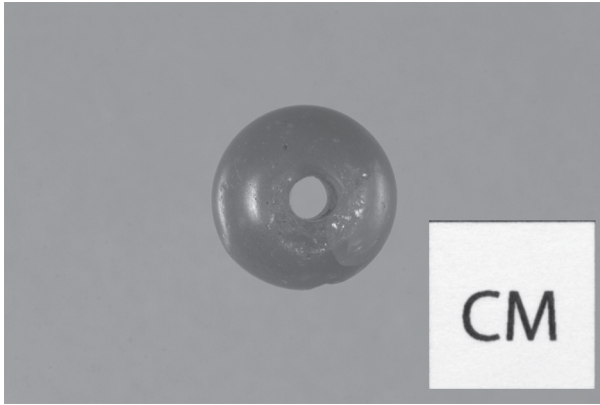


Figure 24. Blue glass trade bead. Courtesy of kansasmemory.org, Kansas Historical Society.

used to define a site as a village, a hamlet, or a farmstead. Otto Wullschleger mentioned that numerous lodge circles had been visible at one time, and perhaps this led Wilmeth to designate it as a village. However, current evidence argues that 14MH301 may represent a small hamlet of several houses or farmsteads, occupied not only by CPT people but also by earlier groups, such as Munkers Creek folk, or by contemporary neighbors, like the Oneota. The once visible “lodge circle” remnants may have been shelters occupied seasonally for varying lengths of time by different groups. The artifact assemblage and the manner in which it was collected do not allow for in-depth discussion of who occupied what portion of the site and when. The artifacts do indicate a substantial site, much busier than neighboring sites with simple lithic scatters. Numerous examples of multiple pottery vessels and chipped stone tools, along with heavy, inconvenient-to-transport artifacts, such as ground stone axes and manos, attest that the Vermillion River watershed provided a refuge for people to settle for a while, acquire resources, and trade with neighbors.

Artifacts collected are predominantly those of the CPT, occurring ca. 900 to 1450 C.E. Given the site location, this is not surprising. In addition, evidence exists of an earlier Archaic-period occupation by residents who made distinctive Munkers Creek artifacts (6250–4850 B.C.E.). The Wullschleger site may be one of the northernmost expressions of that culture. Arrow point styles range from those typical in the Early Ceramic period (1–1000 C.E.) to the Late Ceramic period (1500–1800 C.E.), signal-

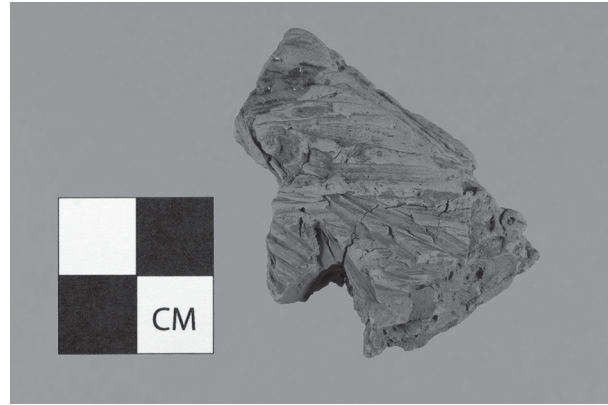


Figure 25. Daub fragment showing grass impressions. Courtesy of kansasmemory.org, Kansas Historical Society.

ing that the area was visited periodically throughout these times. Obsidian and possibly Oneota and Kansas City Hopewell-like pottery are evidence of trade. Several pieces of pipestone may have been traded into the region or deposited by glaciers nearby to the east.

No longer an “orphan” collection sitting unreported on a shelf, the Wullschleger site information can join the increasing body of knowledge that voices the story of Kansas history. That narrative does not begin with the plow or the potter, nor does it end with the toolmaker or the tractor. It is an ongoing chronicle of human survival, adaptation, and the struggle to make a living.

ACKNOWLEDGMENTS

Processing and care of the donated artifacts was largely accomplished by KSHS lab volunteers: Jim Roberts, Sharon Sage, Sharon McKinney, Steve Hamilton, and Sue Smith. Inspiration for the study was due to the enterprising work of Rose Marie Wallen. Much of this paper was written at my home during the COVID-19 crisis, during which Robert Hoard and Katrina Ringler provided copies of material that I was unable to access. Sherri Chaturvedi transformed numerous map references (Brooks 2012:Figure 2.1; Logan 1998:Figure 1; Theler and Boszhardt 2006:Figure 1; Waggoner and Hoard 2008:Figure 3) into a single illuminating map. Brad Logan graciously reviewed an early draft and asked tough questions that changed this document from a summary into a report. As always,

without Virginia Wulfkuhle's patient answering of questions and expertise in editing, this would have been a lesser article.

REFERENCES CITED

Boszhardt, Robert F.

- 1998 Oneota Horizons: A La Crosse Perspective. *The Wisconsin Archeologist* 79(2):196–226.

Brooks, Brittany A.

- 2012 Nebraska Phase Occupational History through the Study of Various Taphochronometric Indicators. UNL Digital Commons, University of Nebraska, Lincoln. Electronic document <https://digitalcommons.unl.edu/anthrotheses/20>, accessed May 27, 2020.

Find A Grave

- 2020 Memorial 61771748 Otto J. Wulschleger. Electronic document <https://www.findagrave.com/memorial/61771748/otto-j-wulschleger>, accessed May 4, 2020.

Garst, Christine

- 2020 Re: Unknown Metal Object. Electronic-mail list message <https://lists.asu.edu/cgi-bin/wa?A0=histarch>, accessed May 22, 2020.

Kansas Geological Survey

- 2004 Marshall County Geohydrology. Electronic document http://www.kgs.ku.edu/General/Geology/Marshall/06_geol3.html, accessed May 4, 2020.
- 2017 Kansas Rocks and Minerals. Electronic document http://www.kgs.ku.edu/Publications/Bulletins/ED2/03_rocks.html, accessed May 1, 2020.

Logan, Brad

- 1998 The Fat of the Land: White Rock Phase Bison Hunting and Grease Production. In *Plains Anthropologist* 43(166):349–366. Electronic document https://www.researchgate.net/figure/Location-of-the-White-Rock-phase-core-area-stippled-and-other-western-Oneota-sites_fig1_285097877, accessed May 27, 2020.
- 2006 Woodland Adaptations in Eastern Kansas. In *Kansas Archaeology*, edited by Robert J. Hoard and William

E. Banks, pp. 76–92. University Press of Kansas, Lawrence.

Theler, James, and Robert Boszhardt

- 2006 Collapse of Crucial Resources and Culture Change: A Model for the Woodland to Oneota Transformation in the Upper Midwest. Electronic document https://www.researchgate.net/figure/Extent-of-the-Driftless-Area-effigy-mounds-and-Oneota-cultures-in-the-Upper-Midwest_fig1_261285556, accessed May 27, 2020.

Ritterbush, Lauren

- 2006 Late Prehistoric Oneota in the Central Plains. In *Kansas Archaeology*, edited by Robert J. Hoard and William E. Banks, pp. 151–164. University Press of Kansas, Lawrence.

Roper, Donna C.

- 2006 The Central Plains Tradition. In *Kansas Archaeology*, edited by Robert J. Hoard and William E. Banks, pp. 105–132. University Press of Kansas, Lawrence.

Waggoner, Tricia, and Robert J. Hoard

- 2008 Salvage Excavations of Archeological Material from Archeological Site, 14LN344, Linn County, Kansas Wetland Mitigation Site A. Electronic document https://www.researchgate.net/publication/324088580_Salvage_Excavations_of_Archeological_Material_From_Archeological_Site_14LN344_Linn_County_Kansas_Wetland_Mitigation_Site_A/, accessed May 27, 2020.

Wallen, Rose Marie

- 2012 Making Sense of the Nutter Site (14CD480): A Cautionary Tale. *The Kansas Anthropologist* 33:69–84.

Wilmeth, Roscoe

- 1960 Site information index cards. Cards on file at Archeology Office, Kansas Historical Society, Topeka.

Witty, Thomas A.

- 1982 *The Slough Creek, Two Dog and William Young Sites, Council Grove Lake, Kansas*. Anthropological Series No. 10. Archeology Department, Kansas State Historical Society, Topeka.

ONEOTA PIONEERS: CACHE PITS AND SETTLEMENT AT THE WHITE ROCK SITE (14JW1), LOVEWELL LOCALITY, NORTH-CENTRAL KANSAS

BRAD LOGAN

Kansas State University

Oneota groups from Siouan-speaking populations, probably centered along the lower Missouri River, migrated to the Lovewell locality along White Rock Creek, a tributary of the Republican River, in north-central Kansas during the late thirteenth century A.D. Deep, capacious storage pits at some sites in that locality, particularly the White Rock site, and their contents reflect prolonged settlement. Varied artifacts discarded in two pits at that site are described as their assemblages support Oneota affiliation (ceramic attributes), east-west movement or exchange (lithic raw materials, including Niobrara jasper and Flint Hills cherts), and a subsistence base of gardening and bison hunting (modified and unmodified faunal remains). That bison attracted people prior to and after Oneota occupation is evident in at least one Woodland-age component and two lodge sites of the Central Plains tradition at other Lovewell sites, as well as Kitkahahki and Cheyenne activities in and near the locality during historic time. American settlers extirpated bison from the area during contested periods of settlement A.D. 1868–1870, bringing a radically new lifeway to the Lovewell locality.

This article describes two large cache pits and their contents at the White Rock site (14JW1; Figures 1–2) at Lovewell Reservoir, which inundates a reach of White Rock Creek in Jewell County, Kansas. In conjunction with more readily available data from other pit features summarized herein (Logan 1995; Neuman 1963; Rusco 1960), they are interpreted as evidence of prolonged occupation by White Rock phase migrants, perceived as pioneers of the Oneota tradition, attracted to the Lovewell locality by extensive herds of bison that also favored it (Logan 1995, 1998a; Ritterbush 2002; Ritterbush and Logan 2000). Information from the pits, numerous at the site in general and at others of the White Rock phase in the locality, reflects a focal subsistence pattern regarding that animal (Logan 1998b; Ritterbush 2002). Vast herds apparently frequented the Lovewell locality, perhaps seasonally, and the greater area that encompassed the east-flowing stream and its parent, the Republican River, that parallels it 6 miles (9.65 km) to the north, as well as the mixed grass prairie that dominated their interfluvium. There is also evidence, albeit less focused,

of bison utilization at Lovewell sites by preceding Woodland and Central Plains tradition (CPT) peoples (Logan 2011a; Ritterbush and Logan 2006, 2009a). The abundance of bison was also a major factor for settlement by Pawnee groups, specifically the Kitkahahki, of two major sites near the locality during the late eighteenth and early nineteenth centuries and for wide-ranging hunts by Siouan-speaking tribes, including the Cheyenne and Oto, some that reacted violently to American settlement from 1868 to 1870. In short, bison in this part of the central Great Plains served as a magnet of varying attraction to indigenous and migrant populations throughout much of the prehistoric ceramic age and historic period.

The two features of concern here were excavated during testing projects in 1993 and 2009 under the author's direction while he was at the University of Kansas (KU) and Kansas State University (KSU), respectively. Prior descriptions have languished in technical reports ("gray literature"), submitted to the Nebraska-Kansas Office of the Bureau of Reclamation (NKAO-BoR) that funded the projects

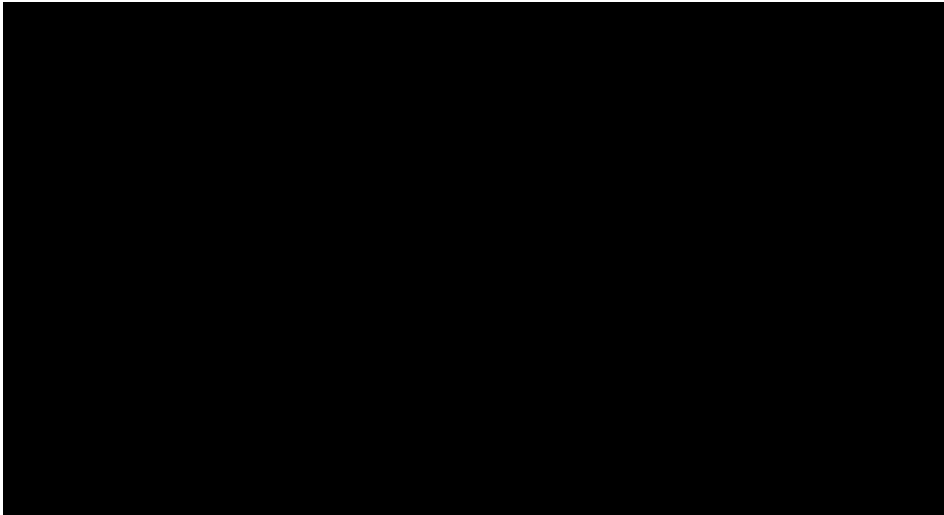


Figure 1. Locations of White Rock and other late prehistoric-age sites at Lovewell Reservoir.

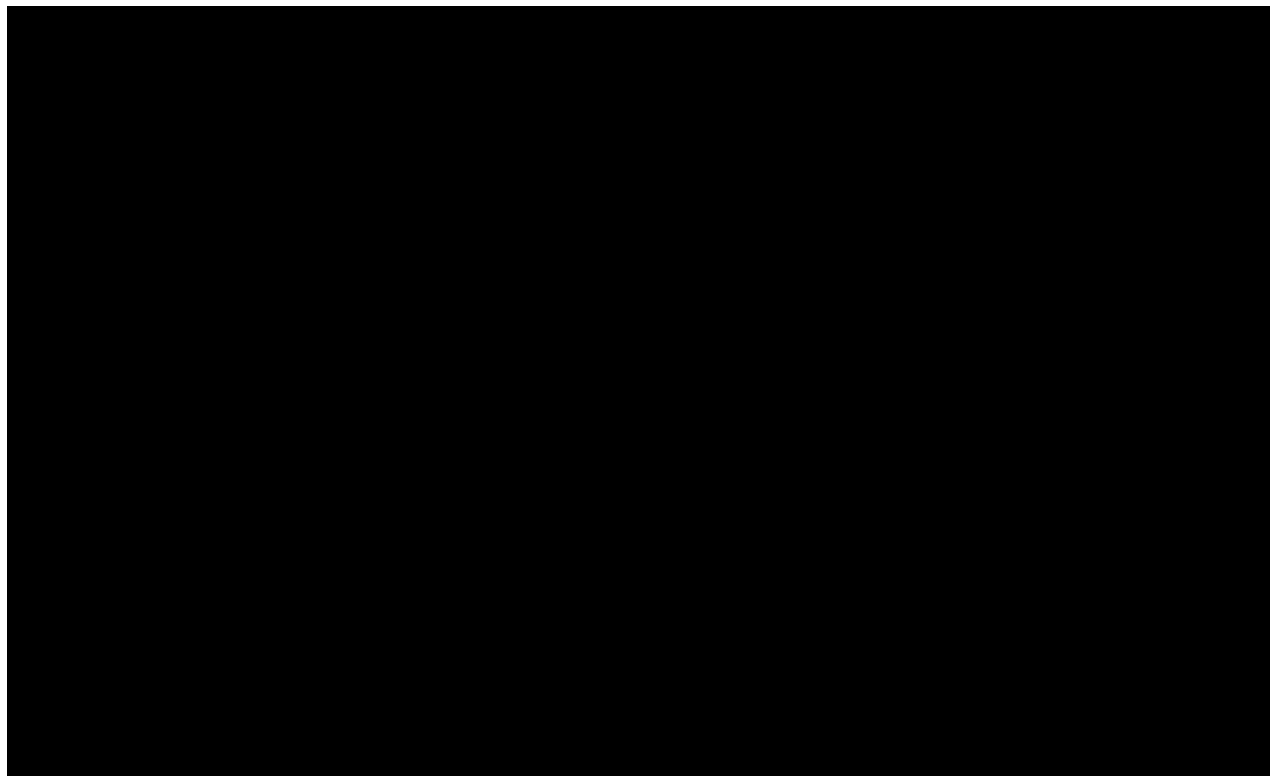


Figure 2. Aerial view of the White Rock site on Pawnee Point, showing its relationship to the CPt house sites of Windmill Creek and Phil.

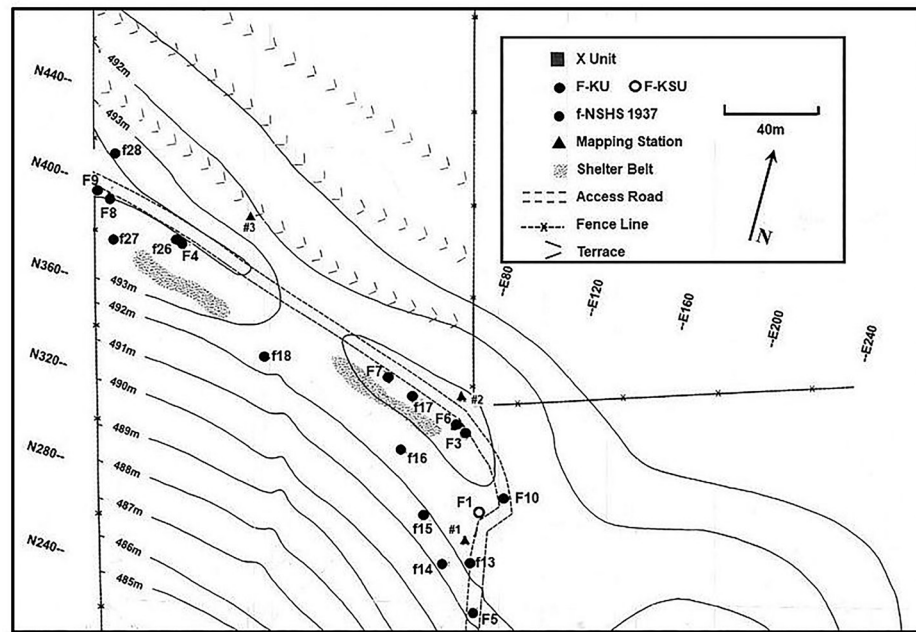
(Logan 2010a; Logan and Banks 1994). This article makes the detailed description and interpretation of the pits and their contents more widely available.

WHITE ROCK SITE (14JW1)

White Rock is on a northwest-southeast-oriented upland ridge named Pawnee Point (though there is

no evidence of Pawnee activity there) on the north side of the eponymous stream (Figures 1–3). The earliest professional investigations were by the Nebraska State Historical Society (NSHS) in 1935 and, more extensively, in 1937. Information from these was used by Rusco (1960) in her M.A. thesis that defined the complex, known in the Midwestern Taxonomic System as the White Rock aspect. The site

Figure 3. Map of a portion of the White Rock site, showing the relationship of features and excavations of the Nebraska State Historical Society (f-NSHS 1937), Kansas Archaeological Field School (F-KU), and Kansas State University Salvage Project (F-KSU). Modified from Logan (1995:Figure 3.2.)



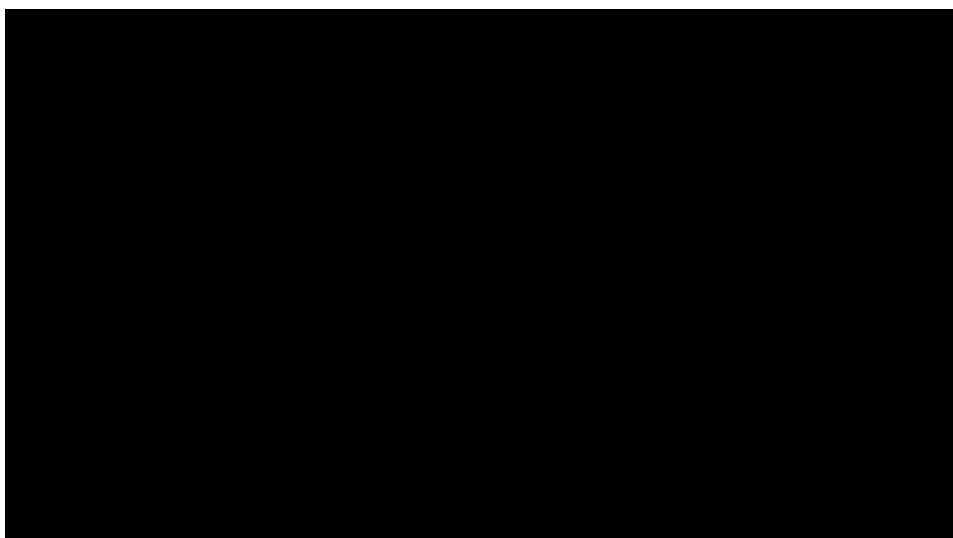


Figure 4. Dr. Lauren Ritterbush stands where artifacts were eroding from the drainage ditch along the access road across Pawnee Point. Eli Logan holds a GPS receiver at the estimated location of F10 of the KAFS-1994 investigation (see Figure 3). This photo was taken on October 1, 2005. On October 4, 2008, more artifacts were found along the ditch, and evidence of unsanctioned digging was discovered a few meters beyond Lauren.

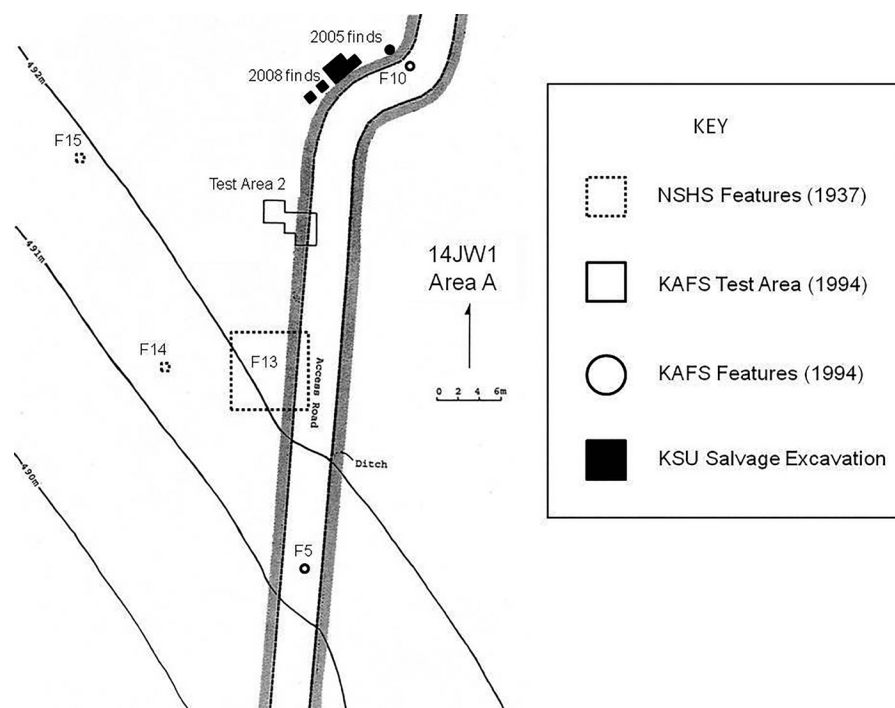


Figure 5. Area A of the White Rock site, showing the location of the 2009 excavations with respect to find spots of 2005 and 2008, as well as previous excavations.

Creek (14JW34) and 14JW8, the latter one of several sites recorded as part of the greater Warne site (Figure 1; Logan 2006). In 2004 the author directed extensive fieldwork at the Montana Creek East (14JW46) and Phil (14JW48) sites, the former of late prehistoric age but undetermined cultural affiliation (Logan 2011a; Ritterbush and Logan 2006, 2009a) and the latter a CPT house site (Logan 2008, 2011b). During both projects the White Rock site was visited to check the access road for exposure

of any cultural features and material. More opportunistic stops were made by the author and Dr. Ritterbush on October 1, 2005 and October 4, 2008 to examine access road ditches. During the first assessment artifacts were found in the vicinity of KU-10 (Figures 4–5): 14 body sherds, 12 pieces of debitage, 18 bone fragments, 7 burned limestones, and 1 unburned limestone. The later inspection on a return from the Plains Anthropological Conference in Laramie, Wyoming, led to discovery of more

artifacts eroding from the same area and evidence of unauthorized digging into the side of the ditch a few meters to its south. A rim sherd, 14 body sherds, and 12 pieces of debitage were collected at that time. Following this trip, the author recommended to the NKAO-BoR that salvage excavations be undertaken to recover material endangered by these activities. This recommendation led to exploration of the area by KSU in 2009, resulting in discovery of the pit feature referred to here as KSU-1 (Logan 2010a).

The following section provides summary data on all pit features recorded at 14JW1. Subsequent sections describe KU-4 and KSU-1, two of the largest caches at the site, and interpret them with respect to the settlement-subsistence pattern of the White Rock phase.

SUMMARY OF PIT FEATURES AT THE WHITE ROCK SITE

While several pits have been excavated at 14JW1, only those dug by KU in 1993 and KSU in 2003, referred to here as KU-4 and KSU-1, benefited from meticulous documentation of large, relatively intact caches. Those by the NSHS in 1935 and 1937 were described briefly by Rusco (1960:49–54) and again by Neuman (1963:263–265). The latter provided a concise description of the single cache pit excavated there during SI-RBS investigations prior to reservoir construction and inundation.

Data from five pits salvaged during the KAFS-1994 were described and interpreted in a report available at the KU and KSU libraries (Logan 1995). KU-10, a shallow (ca. 10 cm) basin filled with highly fragmented bison bones and interpreted as a boiling pit (Logan 1998b), is not discussed here. All had been impacted by unmonitored road construction, and with the exception of KU-4 and KU-5, most of their fill had been removed at that time. Thus, their complete form is not readily inferred. KU-5, exposed in what was then the center of the road, was relatively complete though its upper portion had been removed to an unknown extent by grading. Thus, KU-4 and KSU-1 are not only among the largest and deepest pits at the White Rock site but are its most well-documented caches. Table 1 presents the dimensions and comments for all storage features.

KU-4

Discovery, definition, and excavation, including piece plotting of larger items and collection of all fill for subsequent flotation at KUMA, occurred May 3–4 and May 31–June 3, 1993. The feature was discerned in the ditch on May 3 as black (10YR2/1) to dark brown (10YR3/3), loose silty soil (A horizon), measuring 92 cm long and 10–29 cm below the surface (Figure 6). It was within a matrix of yellowish brown (10YR4/4), more compact clayey silt (B horizon). Another feature, KU-3, was similarly recognized about 100 m to its south (Figure 3). Most of the fill of KU-3 had been destroyed, and the portion recovered for flotation was slightly less than 5 gallons (18.9 liters). It yielded a relatively modest assemblage of 41 body sherds (21.0 g), an end scraper (8.9 g), edge modified flake (1.4 g), 44 pieces of chipped stone debris (17.5 g), bone (84.1 g), burned limestone (1.3 g), sandstone (2.3 g), burned earth (.6 g), and charcoal (.4 g). At KU-4 the sod was removed to reveal the orifice of a more substantial pit (Figure 6). Plow scars that crossed the top of the fill signaled that its upper portion had been slightly disturbed.

On May 3–4 the upper 46 cm (10–56 cm below surface) of KU-4 was excavated as a single level on the assumption from its shallow appearance in the ditch profile that it did not extend very deeply. At 45–50 cm it began to bell outward, suggesting greater depth. A core, extracted from the center with an Oakfield tool, indicated a potential depth of more than a meter. Upon return to the site on May 31, it was decided to excavate the feature in 10-cm levels from the arbitrary depth of 56 cm below surface. At about 80 cm its walls began to taper inward, reaching a relatively flat base at 1.06–1.10 m (Figure 7). The maximum diameter was 1.51 m. Figure 8 shows cross sections of the pit, drawn along the dimension of maximum internal diameter (116° east) and perpendicular to it (206° east).

Although the feature was not excavated by natural stratigraphy, some variation in its fill was noted. The predominant dark brown soil occasionally was mottled with the yellowish brown clayey silt of the B horizon. At 66 cm the center consisted of a more homogeneous dark brown fill, surrounded by mottled dark brown and yellowish brown soil. A rodent burrow, culturally sterile and filled with sterile light

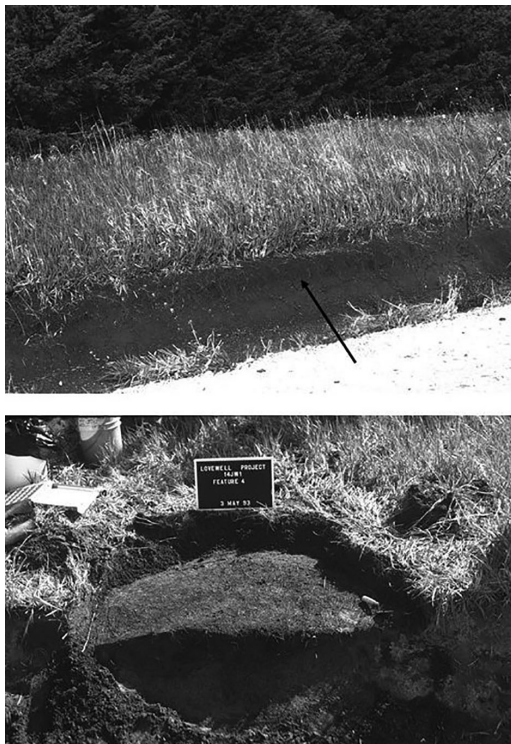
Table 1. Data on Pit Features at White Rock Phase Sites in the Lovewell Locality. Dimensions in meters, converted from tenths of feet for NSHS and from inches for SI-RBS.

Institution	Feature number	Width 1	Width 2	Base width	Depth	Form	Comments
NSHS	2	No data			No data	No data	"Shallow, refuse filled" (Rusco 1960:50)
NSHS	14	1.04			1.19	1.00	Belled
NSHS	15	0.91			0.21	Basin	Burned earth at base
NSHS	16	0.76		0.46	0.68	Basin	
NSHS	17	0.85		1.10	0.99	Belled	
NSHS	19	0.61			0.24	Cylindrical	
NSHS	26	0.52			0.21	Basin	
NSHS	27	0.46			0.21	Basin	
NSHS	28	No data			No data	Basin	
SI-RBS	8	0.72		0.58	0.91 *	Belled	"Main cache diameter" 0.89
KU	3	0.50		0.20	0.50	Basin?	Most of fill removed by ditch
KU	4	1.29	1.18 **	1.51 ***	1.06–1.10	Belled	Small portion of orifice removed by ditch
KU	5	1.08	1.20	NA	0.53	Basin	Sides taper inward to form bowl shape
KU	6	1.25	?	NA	0.35	Basin	More than half removed by ditch
KU	8	1.10	?	?	0.49	Basin	About half removed by ditch
KU	9	?	?	0.70	0.82	Belled	Most of pit, including orifice, removed by ditch
KSU	1	0.95	0.93	~0.50	1.25	Belled	Depth includes pocket cache at base

*Excludes basal pocket cache.

**Extrapolated perpendicular to Width 1; ditch removed some fill.

***Maximum width 21 cm above base.



brown silt, was noted in the northeastern quadrant, and it extended beyond the pit's base in that direction.

KU-4 contained a rich and varied assemblage of ceramics, formal and informal chipped stone tools, chipped stone debris, ground stone tools, burned and unburned bone (most of bison and some modified for and from tool use), burned and unburned limestone, burned earth, and charcoal. Figure 7 shows the pit at various stages of excavation with some cultural material in situ. Larger artifacts, particularly sherds, chipped and ground stone tools, and bone, were selectively removed during excavation. Table 2 presents their counts and mass. The feature produced 110 flotation samples, demonstrating an approximate volume of 550 gallons (2,082 liters). All fill was floated with an SMAP model device, and the heavy fraction was sorted. Table 3 displays the quantity and mass of this material by level.

Figure 6. (left, above) KU-4 exposed in the drainage ditch; below) plan view of KU-4 after sod removal.

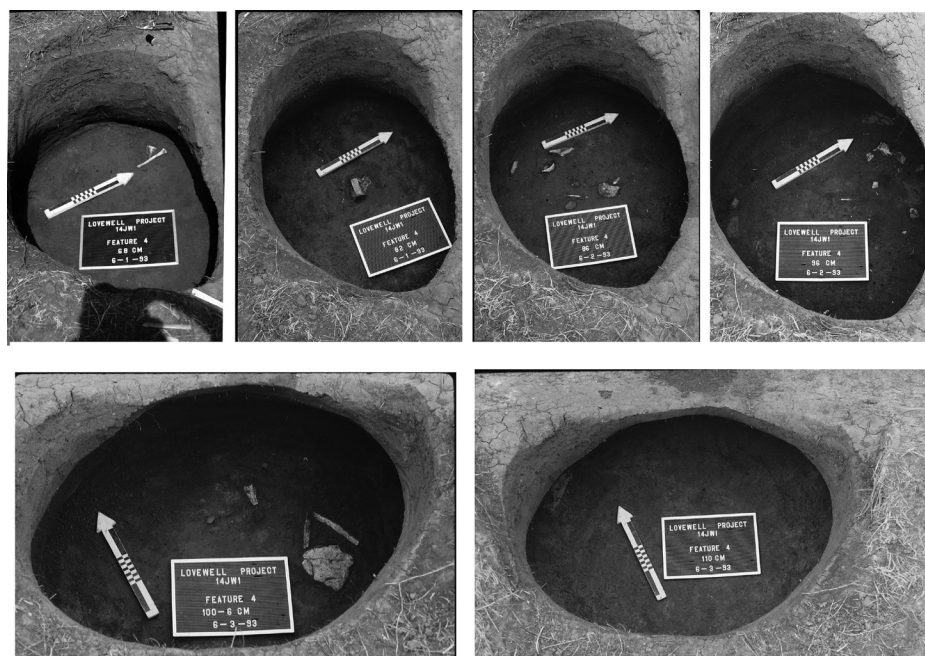


Figure 7. KU-4 at various stages of excavation; upper row, left to right) 68 cm, 82 cm, 86 cm, and 96 cm; lower row, left to right) 100–106 cm and completed at 110 cm.

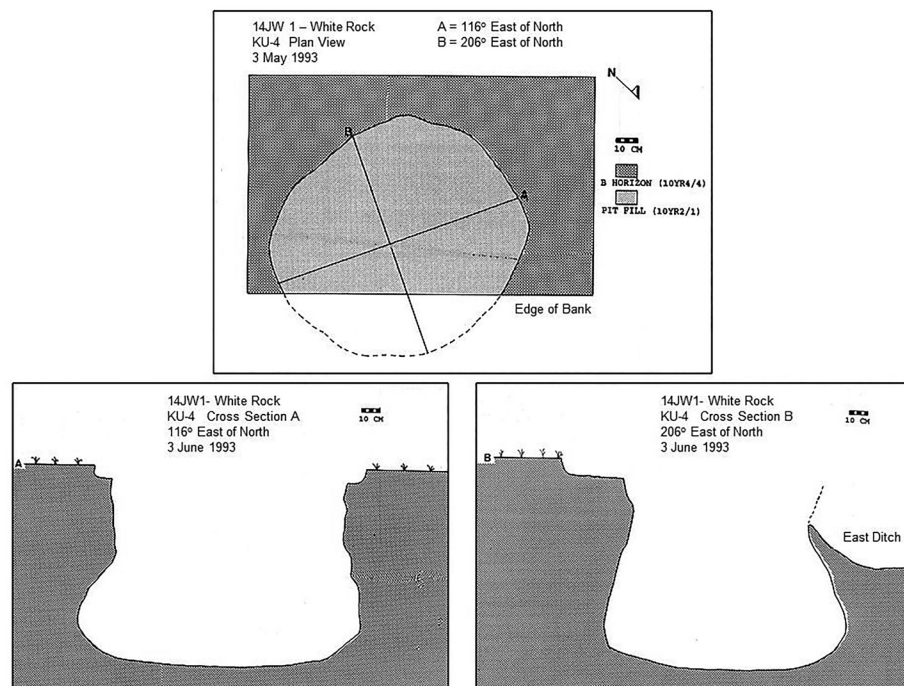


Figure 8. Plan view and cross sections of KU-4.

Counted items total 7,339 with a mass of 6,697.6 g. Uncounted matter, which includes burned and unburned bone, burned and unburned limestone, burned earth, and charcoal, has a mass of 6,775.2 g. Thus, the total mass of cultural material from KU-4 is 13,472.8 g (29.7 lb). Ceramics, stone tools, and

bone are described after discussion of two radiocarbon dates.

RADIOCARBON DATES

Two charcoal samples from the pit were submitted to different laboratories for standard assays, accel-

Table 2. Plotted Artifacts from KU-4 by Count and (Mass). Mass (g) of most cultural material is rounded to zero.

Material type	Level 1 (10–56 cm)	Level 2 (56–66 cm)	Level 3 (66–76 cm)	Level 4 (76–86 cm)	Level 5 (86–96 cm)	Level 6 (96–106 cm)	Totals
Rim sherd	1 (5.9)	1 (3)	3 (29.0)	5 (84.0)	7 (86.0)	5 (128)	22 (335.9)
Body sherd	17 (51.0)	11 (60)	13 (64.0)	10 (88.0)	39 (268.0)	21 (134)	111 (665.0)
Arrow point	0 (0.0)	1 (1)	1 (1.0)	0 (0.0)	2 (2.0)	0 (0)	4 (4.0)
Biface fragment	1 (2.6)	1 (3)	1 (37.0)	0 (0.0)	0 (0.0)	1 (21)	4 (63.6)
Knife fragment	1 (18.3)	0 (0)	1 (19.0)	0 (0.0)	0 (0.0)	1 (21)	3 (58.3)
End scraper	0 (0.0)	0 (0)	0 (0.0)	1 (4.0)	1 (11.0)	2 (27)	4 (42.0)
EMF*	1 (0.7)	0 (0)	2 (4.0)	2 (13.0)	3 (24.0)	1 (8)	9 (49.7)
EMB*	0 (0.0)	0 (0)	1 (6.0)	0 (0.0)	1 (2.0)	11 (90)	13 (98.0)
Chipped stone debris**	22 (40.6)	9 (38)	12 (36.0)	6 (153.0)	27 (108.0)	10 (173)	85 (546.6)
Core	0 (0.0)	0 (0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (45)	1 (45.0)
Mano	0 (0.0)	0 (0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (934)	1 (934.0)
Grinding stone	0 (0.0)	0 (0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (3,231)	1 (3,231.0)
Abrader	0 (0.0)	0 (0)	0 (0.0)	0 (0.0)	1 (64.0)	0 (0)	1 (64.0)
Burned limestone	(108.3)	(106)	(124.0)	(16.0)	(698.0)	(1,796)	(2,848.3)
Burned bone	(0.0)	(3)	(1.0)	(0.0)	(0.0)	(0)	(4.0)
Bone	(219.0)	(9)	(236.0)	(121.0)	(939.0)	(1,249)	(2,773.0)
Fossil bone	(0.0)	(59)	(0.0)	(0.0)	(122.0)	(0)	(181.0)
Daub/burned earth	(0.0)	(0)	(3.0)	(0.0)	(17.0)	(0)	(20.0)
Charcoal	(0.0)	(0)	(0.6)	(1.2)	(9.8)	(1)	(12.6)

*Edge modified flake/blade.

**CSD tabulated by flakes, blades, chips, chunks, and shatter in Logan and Banks (1994).

erator mass spectrometry (AMS) dating at that time being cost prohibitive for the contract's budget. A composite sample of 18 g of wood charcoal, picked from 56–96 cm, was submitted to Beta Analytic, Inc. The date returned is 710±70 B.P., C¹³ (-24.7) corrected to 720±70 B.P. or A.D. 1230. Calibration (Calib 8.1) yields one sigma date ranges (probability) of A.D. 1227–1248 (16 percent), A.D. 1252–1306 (63.2 percent), and A.D. 1363–1385 (20.8

percent). A second composite sample of 18 g of wood charcoal, picked from throughout the fill, was sent to the University of Texas-Austin Radiocarbon Laboratory. The date returned is 500±40 B.P., C¹³ (-24.6) corrected to 510±40 B.P. or A.D. 1440. Calibration (Calib 8.1) yields a one sigma date range of A.D. 1404–1440 (100 percent). Statistical comparison of these dates to the AMS assay obtained from KSU-1 and discussion of their implications

Table 3. Artifacts from Flotation of KU-4 Fill by Count and (Mass [g]).

Material type	Level 1 (10–56 cm)	Level 2 (56–66 cm)	Level 3 (66–76 cm)	Level 4 (76–86 cm)	Level 5 (86–96 cm)	Level 6 (96–106 cm)	Totals
Rim sherd	5 (27.9)	0 (0.0)	1 (5.4)	0 (0.0)	0 (0.0)	4 (15.6)	10 (300.0)
Body sherd	990 (708.6)	136 (18.0)	221 (64.2)	330 (131.9)	464 (369.6)	278 (167.2)	2419 (1,459.5)
Arrow point	4 (3.6)	0 (0.0)	0 (0.0)	2 (1.0)	3 (1.1)	0 (0.0)	9 (5.7)
Biface fragment	2 (4.6)	1 (2.0)	0 (0.0)	0 (0.0)	1 (1.1)	0 (0.0)	4 (7.7)
Knife fragment	2 (9.2)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	2 (9.2)
End scraper	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (1.1)	1 (1.1)
EMF*	3 (6.4)	0 (0.0)	0 (0.0)	1 (1.0)	0 (0.0)	1 (1.0)	5 (8.4)
EMB*	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (<0.1)	0 (0.0)	1 (<0.1)
Flake	180 (235.7)	11 (4.2)	26 (23.0)	91 (65.7)	135 (130.2)	63 (80.6)	506 (539.4)
Chip	2,577 (113.4)	420 (14.5)	647 (22.7)	991 (36.9)	1,130 (60.0)	801 (40.1)	6566 (287.6)
Chunk	1 (10.0)	0 (0.0)	0 (0.0)	0 (0.0)	2 (11.6)	1 (2.5)	4 (24.1)
Shatter	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.8)	0 (0.0)	1 (0.8)
Blade	1 (5.0)	1 (3.6)	0 (0.0)	0 (0.0)	1 (<0.1)	0 (0.0)	3 (8.6+)
Burned limestone	(76.9)	(0.1)	(0.1)	(0.1)	(5.0)	(14.9)	(97.1)
Limestone	(14.0)	(1.1)	(1.8)	(7.2)	(9.9)	(4.7)	(38.7)
Burned bone	(3.5)	(2.9)	(1.3)	(6.8)	(8.1)	(7.3)	(29.9)
Bone	(25.1)	(20.5)	(18.8)	(27.0)	(112.0)	(71.4)	(299.9)
Burned earth	(244.9)	(45.1)	(39.3)	(29.9)	(34.2)	(21.9)	(415.3)
Charcoal	(24.1)	(2.2)	(3.4)	(7.3)	(10.0)	(8.4)	(55.4)

*Edge modified flake/blade.

for the timing of Oneota migration to the Lovewell locality are presented in the Discussion section of this paper (compare Logan 2010b).

CERAMICS

KU-4 yielded 32 rim sherds with a total mass of 384.8 g. Of these, 26 are large enough for description, and 10 cross-mend to form 4 rims, providing a sample of 20 specimens. They represent at least 12 vessels, described according to their attributes and

by numbers that correspond to their appearance in Figures 9–13.

Rim No. 1. The largest vessel section is made up of 3 rim sherds, the biggest comprising 11 cross-mends of which 4 are part of the rim. The latter were recovered from Levels 1, 4, 5, and 6 (Figure 9), a distribution that suggested natural displacement by rodent burrowing or perhaps discard of a broken vessel on the slope of an accumulating cone



Figure 9. Sherds of Rim #1 from KU-4. Interior view in upper set.

of deposition. Another portion of the jar consists of two mended fragments and a large strap handle, all from Levels 5 and 6 (Figure 9). These sherds represent a shell-tempered vessel with a high (maximum height = 38 mm) straight rim that tapers from a round 3-mm-thick lip to an 8-mm-thick shoulder. The lip interior is decorated with a series of evenly spaced tool impressions, most oriented oblique to the mouth. The rim had sufficient arc to accurately determine a mouth diameter of 26 cm. The interior surface ranges from yellowish brown to light gray and exhibits fine striations from brushing or scraping. A gray exterior slip mostly had exfoliated to reveal a light yellowish brown surface.

The jar's shoulder flares almost perpendicularly from the base of the rim, where it is 7 mm thick, and curves gently to form what was likely a globular body. At the break lowest on the body, the vessel wall is only 3 mm thick. The shoulder bears broad (4 mm) trailed lines divergent from a trailed line along its junction with the rim. The trailing was done with an instrument, such as a reed, that left longitudinal striations. The strap handle was molded to the vessel from a point a few millimeters below the lip, where it is 81.5 mm wide, to the shoulder, where it is 54 mm wide. The attachment is somewhat crude; rough strips of clay were poorly molded to the handle interior for extra support. The handle is 6–9 mm thick.



Figure 10. a) Two sherds of Rim #2; b) rim and shoulder sherds of Rim #3.

Rim No. 2. Two rims from Levels 4 and 6 display attributes so identical that they are judged to be sherds from the same vessel (Figure 10). Tempered with sand, they are straight, about 26 mm high, and 6–11 mm thick. Interior and exterior surfaces are dark gray to very dark gray (10YR3-4/1). The lip is decorated with a series of closely spaced, oblique tool impressions, each 4.5 mm wide, that terminate on the interior surface in a form indicating that the tool had a flat end. The vessel's mouth diameter was about 26 cm.

The shoulder of the vessel, insofar as it is represented on these pieces, is decorated with a series of shallow trailed lines, about 5.5 mm wide and 8–11 mm apart. Four such lines are seen on one sherd and three on the other. The latter also has a loop handle, measuring 8.3 mm wide and 10–13 mm thick, decorated with four tool impressions, each about 4 mm wide and spaced at 4-mm intervals perpendicular to the handle. The appendage had been molded to the vessel from a point about 11 mm below the lip to a spot a few millimeters below the neck.

Rim No. 3. A single rim, a cross-mend of two fragments, comes from a vessel with distinctive

Oneota-like attributes (Figure 10). Three cross-mended body sherds form the angled (115°) shoulder of what is considered the same vessel, although they do not articulate with the rim. The specimens were recovered from Levels 1, 2, and 6.

The vessel was tempered with sand and fired to a predominately black color. The straight rim, only 4 mm thick and 13 mm high, is decorated with adjacent oblique tool impressions just inside the lip. The mouth diameter is 14 mm. A delicate loop handle, 5–6 mm in cross section, is molded to the vessel from a point 6 mm below the lip to a position on the shoulder about 6 mm below the neck. The 4.5-mm-thick shoulder of the rim exhibits a series of closely spaced convergent incised lines. The body sherds have a comparable decorative treatment, restricted to the shoulder, in a set of two converging series of parallel incised lines that form a chevron that terminates at the base of the angled shoulder. Nested within the chevron is a single short incision. The wall thins from 5 to 2 mm toward the base of the vessel.

Rim No. 4. This sherd from Level 3 is straight to slightly inverted, 23 mm high, with black exterior and black, gray, and yellowish brown interior surfaces (Figure 11a). The rim tapers toward the lip from 6 to 4.5 mm in thickness. The only decoration is on the remnant of a 40-mm-wide strap handle, molded to the rim just below the lip: a series of five incised lines at 5-mm intervals. The handle is only 2.8 mm thick at the break. The vessel from which the fragment came was tempered with shell and had an estimated 26 mm mouth diameter.

Rim No. 5. This rim, represented by four sherds that consist of two pairs of cross-mends from Levels 1, 4, and 5, is straight, measures 28 mm high, and tapers in thickness toward the lip from 7.5 to 6.0 mm (Figure 11b). The shoulder flares perpendicularly to the rim. The lip is decorated with a series of adjacent tool impressions, measuring about 7 mm long and 3 mm wide. The small remnant on one specimen displays three incisions perpendicular to the neck; the other piece bears two parallel incisions. Both shell-tempered sherds are yellowish brown with black fire clouds. The vessel's mouth diameter was estimated at 26 cm.

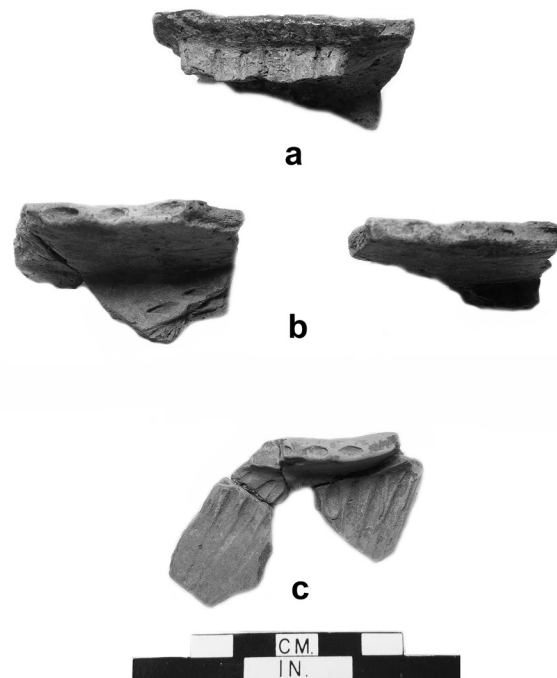


Figure 11. a) Rim #4, b) Rim #5, and c) Rim #6.

Rim No. 6. Two non-mending fragments with common attributes comprise this rim. One is from Level 3; the other, a cross-mend of a rim and three body sherds (Figure 11c), is from Levels 3 and 4. Both are sparsely tempered with sand and have brownish yellow (10YR6/2) interior and exterior surfaces. The shoulder of the larger sherd is grayish brown (10YR5/2). The straight rim is 13 mm high and 7 mm thick. The vessel is estimated to have had a mouth diameter of 18–20 cm. The lip is flat and decorated with a series of adjacent shallow oval tool impressions, each about 2.5 mm wide and 6 mm long. The shoulder, which forms an angle of 112° with the rim, is decorated with adjacent roughly parallel trailed lines, each a maximum of 3 mm wide. The shoulder thins from 7 to 4 mm from the neck.

Rim No. 7. A single plain rim sherd from Level 2 is ~ 4 cm² in surface area and shell tempered with interior and exterior surfaces of light yellow brown (10YR6/4). The specimen is straight or slightly inverted, about 16 mm high, thinning 6–5 mm toward a flat lip that bears a single tool impression parallel to the vessel's surface. The latter is 3 mm wide and 11 mm long. Vessel mouth diameter cannot be estimated.

Rim No. 8. This straight shell-tempered sherd, found at 56 cm below surface, has black interior and exterior surfaces, encrusted with carbonized material yet to be analyzed for residue. The rounded lip of the small fragment exhibits two crenelations (Figure 12a). The interior is decorated with three oblique trailed lines, each 4 mm wide. The exterior surface has a low-relief (ca. 1-mm) tab or extrusion, measuring 11 mm long and less than 1 mm high, located about 15 mm below the lip and about 6 mm above the small shoulder remnant. Maximum rim height is about 25 mm, thickness is 7 mm, and mouth diameter cannot be determined.

Rim No. 9. Comparable to Rim No. 8, this specimen from Level 5 came from a vessel that was tempered with crushed shell. It is straight with a perpendicular shoulder and has a rounded lip with tool impressions. Its interior surface is decorated with oblique trailed lines, 4 mm wide (Figure 12b). Like Rim No. 8, it has a low-relief tab, formed by pinching. As it is not part of a repeated pattern, this attribute appears incidental rather than decorative or functional. It is 15 mm long and placed 24 mm below the lip and just above the shoulder.

The rim thickness varies considerably on either side of the break. On what is believed to be the more characteristic profile, it is 5 mm thick (6 mm at the shoulder). However, its maximum thickness is 10 mm on both rim and shoulder. This strengthening of the vessel wall, in conjunction with a pronounced upturn of the shoulder and a distinctive break at the lip on the exterior and interior surfaces, indicates that the vessel once possessed a handle. Mouth diameter cannot be determined accurately but exceeded 16 cm. Interior and exterior surface colors range from pale brown to very pale brown (10YR6/3 to 10YR7/4). The shoulder remnant bears a trace of an oblique trailed line.

Rim No. 10. Represented by two sherds from Levels 5 and 6, this rim is sand-tempered, straight and decorated on the interior surface at the lip with a series of short (11 mm), oblique tool impressions, 4 mm wide and 4–5 mm apart (Figure 12c). The form of the impressions signals the use of a dowel-like tool with a straight beveled end. The rim is 5 mm thick and 23 mm high. A horizontal but discontinuous trailed line occurs at the base of the rim on the

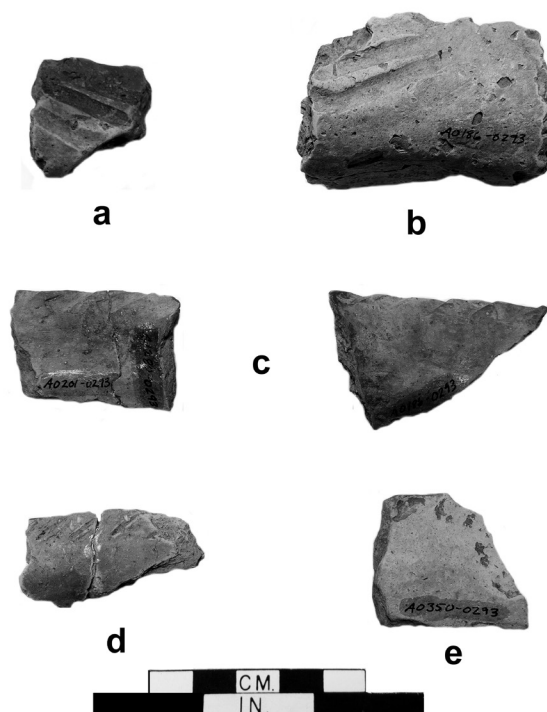


Figure 12. a) Rim #8, b) Rim #9, c) Rim #10, d) Rim #11, and e) Rim #12. All views are of decorated interior surfaces.

exterior surface. The smaller fragment has interior and exterior surfaces that are very dark gray to very dark grayish brown (10YR3/1-2). The larger piece has an identical range in interior color, but the exterior ranges from dark grayish brown (10YR4/2) to light yellowish brown (10YR6/4). A mouth diameter of 12 cm is estimated.

Rim No. 11. Represented by two specimens from Levels 3 and 6, this rim is relatively short (18 mm) with a rounded lip and sand temper. Decoration consists of trailed lines 2 mm wide on the sharply flaring shoulder and a series of crudely executed short (10 mm) oblique incisions on the interior surface just below the lip (Figures 12d and 13). Both surfaces are predominately light yellowish brown (10YR6/4) on the larger fragment and dark grayish brown (10YR4/2) on the smaller, although both show the same range. Rim thickness is variable (4–8 mm) but is thickest only in a small bulging area on one profile of the larger sherd. Maximum shoulder thickness is 7 mm; mouth diameter is estimated as at least 20 cm.

Rim No. 12. Represented by two fragments from Levels 1 and 4, the paste of this sherd was tempered with fine sand and shell. Both portions are straight with a maximum thickness of 7 mm. Rim height is best measured on the sherd shown in Figure 12e, which is the only one with a trace of the shoulder; it is 26 mm high. Decoration is limited to oblique tool impressions on the interior surface just below the rounded lip. Only one impression is present on each remnant. That on the smaller is poorly preserved; on the larger it is 5 mm wide. Interior and exterior surfaces are predominately brownish yellow (10YR6/6) with traces of grayish brown and light brownish gray (10YR4-5/2) on the exterior of the larger piece. Mouth diameter cannot be determined.

Body sherds. KU-4 body sherds total 2,530 (2,124.5 g). Though these have not undergone detailed analysis, the rims just described are sufficiently characteristic of diagnostic attributes of pottery from the pit. The sample is gratifying, not only in its unusually large number compared to ceramic sherds from other White Rock features, but also in the size of individual and cross-mended specimens; many have more than 10 cm² of surface area, which is generally greater than most found at sites of the White Rock phase (Blakeslee et al. 2001; Logan 1995; Marshall 1969, 2008; Neuman 1963; Ritterbush 2001; Rusco 1960). The two biggest sections from the same shell-tempered vessel total more than 120 cm² in this regard. One of these is a cross-mend of two fragments from Level 5; the other, of five sherds from Levels 2, 3, and 5. These are 4 mm thick. Exterior surface colors are black (10YR2/1) and light yellowish brown (10YR6/4) with the former color predominant. The interior color ranges are identical, though the larger piece is nearly all the lighter color, and the smaller is nearly all the darker. Like the rims, the dark burnished exteriors, evidence of shell tempering, and thin vessel walls of these body sherds exemplify Oneota pottery.

Several body sherds exhibit trailed lines, two of which warrant description. One, composed of two cross-mended fragments from Level 6, bears an incised chevron design that encloses a set of short vertically oriented tool impressions, truncated by the remnant's fracture at an angled shoulder (Figure 13, left). Another displays a zoned series of vertically oriented incised lines at 2-mm inter-



Figure 13. above) Rim #11, exterior surface on the left and interior surface on the right; below) decorated body sherds.

vals, intercepted by a single oblique line (Figure 13 right). These specimens are comparable in surface color, a light yellowish brown to brownish yellow (10YR6/4-6), the lack of any apparent temper, and maximum thickness of 5 mm. Another plain body sherd bears low knobs that may have been decorative.

The frequency of shell-tempered ware in KU-4 is notably higher than what White Rock phase literature suggests is common. Wininger and Logan (1995:63–64) provide a comparable analysis of ceramics from the KAFS-1994. Six vessels, represented by rims, were shell-tempered, and five were tempered with sand, the aplastic material considered typical of Walnut Decorated Lip ware (Rusco 1960:30–32). One rim was tempered with both shell and sand.

Shell-tempered pottery was recovered in very low frequency from the four type sites described by Rusco (1960:34, 65). None of the 37 rims, 716 body sherds, and 2 handles from the Green Plum site (25HN39) was tempered with shell. Only one of 17 rims, 459 body sherds, and 2 handles from Blue Stone (25HN45) was so tempered. Glen Elder (14ML1) provided 228 rims, 2,499 body sherds, and 3 handles, and 14JW1 produced 217 rims,

1,880 body sherds, and 17 handles, yet these sites yielded only 37 and 20 shell-tempered body sherds, respectively.

Ritterbush (2001) reanalyzed this last assemblage, examining a slightly smaller sample of 2,136 specimens, which included 10 that had been held by the University of Michigan Museum of Anthropology and transferred to the NSHS in 1939. Sherds with “illegible or missing catalog numbers” were excluded (Ritterbush 2001:10). She found evidence of shell temper in 630 (29.5 percent), sand in 1,179 (55.2 percent), both aplastics in 126 (5.9 percent), and bone in three (.1 percent); 198 (9.3 percent) were indeterminate. She noted the higher frequency of shell tempering, characteristic of Oneota pottery in the tradition’s heartland, than observed by Rusco and asserted that it was “likely due to the method of data collection and present knowledge that shell temper may be visible as platy voids rather than as actual pieces of crushed shell” (Ritterbush 2001:12). While that may have been the case, the attribution of “voids” to shell temper that may have been lost on firing or leached by acidic soils was recognized in Steed-Kisker phase ceramics by Wedel (1943) and should have been known to Rusco. The frequency of shell temper established by Ritterbush is more in line with those from KU-4. She (Ritterbush 2001:13) argued that the “differences in frequency, form, and density of shell temper between the White Rock and other Oneota site ceramics likely reflect an adaptive response to life in the Plains as bison hunters and farmers.”

The SI-RBS work at three White Rock phase sites in the Lovewell locality provided a smaller but comparable sample of such ceramics. Of a dozen rims and 176 body sherds from 14JW1 in 1956, only 1 rim and 3 body sherds were shell tempered. Intermill (14JW201; note that Neuman mistakenly referred to Intermill as 14JW202, but Fenenga and Cooper [1951] had assigned that number to the nearby historic site of Ruben and 14JW201 to Intermill) yielded a dozen rims and 161 body sherds. Only two rims and nine body sherds were tempered with shell. Of the 138 rims, 3,957 body sherds, and 2 appendages from Warne (14JW2), 15 rims, 142 body sherds, and 2 appendages were shell tempered (Neuman 1963:206, 272, 281–282).

Marshall (1969:39–49, 2008:75–82) included a low frequency of shell-tempered pottery in his sam-

ple of Walnut Decorated Lip ware. His sample of 187 rims, 1,136 body sherds, and 15 handles combined material collected from the Glen Elder site by the NSHS in 1937 with that recovered by the University of Nebraska-Lincoln in 1963. Of those specimens 3 rims, 15 body sherds, and 2 handles were shell-tempered. Note that Marshall’s (1969, 2008) proposal that shell tempering and other attributes of some of the 14ML1 ceramic assemblage are indicative of a historic Kansa origin for the White Rock culture has been critically discounted by Ritterbush and Logan (2009b).

While a relative frequency analysis of temper in the overall KU-4 ceramic assemblage has not been done, it probably would support the ratio represented by the rim sherds. The high frequency of shell-tempered vessels in the pit can be interpreted in several ways. If it does not accurately represent the overall proportion of tempering agents employed at the site or by ceramists of the White Rock phase in general, it might reflect use by a particular group of Oneota migrants, perhaps true pioneers. Alternatively, it might result from discard of several trade vessels, a hypothesis that could be tested with petrographic analysis. It might indicate occupation when shell tempering was incorporated more frequently, a hypothesis testable by seriation analysis of temper in sherds from other White Rock features. Obviously, the assemblage and the problem on which it bears deserve closer scrutiny (compare Ritterbush 2001).

LITHIC TOOLS

Formal stone tools from KU-4 fairly represent the variety found at White Rock phase sites. They include arrow points (12), end scrapers (5), a preform, knives (7, of which 2 are beveled), bifaces (7), an abrader, a mano, and a grooved grinding stone/anvil (Figures 14–16; Table 4). Twenty-nine of the chipped stone tools are Niobrara jasper from sources just west of the Lovewell locality; five are Permian cherts from the Flint Hills farther east. Given outcrops of limestone and chalk members of the Niobrara formation throughout western and northern Jewell County, the nearest source of Niobrara jasper was probably within a day’s distance upstream along White Rock Creek, though a specific source has yet to be located (Stein 2006). The presence of two jasper cores in KU-4 (Figure



Figure 14. above) Arrow points from KU-4; below) end scrapers from KU-4



Figure 15. Chipped stone tools from KU-4. Specimens on the left are beveled knives, that at upper right is a biface fragment, and that at lower right is a retouched flake. The upper two are Niobrara jasper; the lower two are Permian chert.



Figure 16. Ground stone artifacts from KU-4. Above is sandstone abrader; below left, mano; and below right, grinding stone with stained concave surface. The latter has been ground or pecked on the edges, shown here above and below the stone, perhaps to facilitate anchoring it during use. All of these artifacts are unwashed to enable microscopic analysis of residues.

17) substantiate this. Any source of Permian chert must have been at least 90 km east of the Lovewell locality (Stein 2006).

Apparent from the KU-4 stone tools are several aspects of White Rock lithic technology that had not been noted by researchers prior to the analysis of stone tools from the 1993 investigations in the Lovewell locality. The assemblage displays evidence of a bifacial reduction sequence, paired with a blade technology. Expedient tools, such as edge-modified blades, are prevalent and probably played an important role in White Rock lithic technology (Figure 18). Indeed, these may reflect the mobility of White Rock phase bison hunters, traveling between outcrops of Niobrara jasper to the west and Permian cherts to the east of the Lovewell locality. Predominance of the former is obvious in KU-4, where all but one of the 28 edge-modified (i.e., expedient) tools are of that material. The near absence of such tools made from the gray Permian cherts likely testifies to the greater distance to sources of that stone. Expediency in stone tool production also is pronounced in the arrow points; all are unnotched, and most exhibit minimal lateral retouching (compare Padilla and Ritterbush 2005).

Not found in the pit are examples of the large ovate bifaces discovered in caches at the Warne sites

Table 4. Data on Chipped Stone Tools from KU-4.

Catalog number	Level-piece plot number	Type	Portion	Material	Length (cm)	Width (cm)	Thickness (cm)	Mass (g)	Blank type	Break type proximal	Break type distal
A0142	1	KN	CO	PM	4.74	3.69	0.95	18.0	FK		
A0147a	1	BF	ED	NJ	3.93	1.09	0.77	2.6	UN		
A0147b	2	PP	BB	NJ	1.54	1.40	0.26	1.0	FK		SN
A0154	2	BF	MD	NJ	0.93	2.95	0.88	3.0	UN	SN	PV
A0163	3	PP	CO	NJ	2.45	1.52	0.25	1.0	FK		
A0164	3	BF	DI	NJ	5.39	5.48	1.40	37.0	FK	PV	
A0165	3	KN	BB	PM	6.80	3.44	0.58	19.0	FK		HI
A0179	4	ES	CO	NJ	2.75	2.19	0.66	4.0	BL		
A0188a	5	PP	BB	NJ	2.24	1.24	0.25	1.0	FK		IP
A0188b	5	PP	CO	NJ	2.16	1.65	0.27	1.0	FK		
A0189	5	ES	CO	NJ	5.02	1.56	1.27	11.0	BL		
A0203	6	BF	DI	PM	4.24	4.09	1.16	21.0	FK	SN	
A0204	6	KN	MD	NJ	5.61	3.75	0.75	21.0	FK	HI	PV
A0205a	6	ES	CO	NJ	5.49	2.36	0.94	14.0	BL		
A0205b	6	ES	CO	NJ	4.48	2.94	0.83	13.0	FK		
A0220	1-1	KN	ED	NJ	2.93	1.88	0.62	3.4	FK	IN	
A0302a	1-10	PP	TM	NJ	2.48	1.63	0.19	1.0	FK		IP
A0302b	1-10	PP	BA	NJ	1.40	1.97	0.26	1.0	FK		SN
A0302c	1-10	PP	TP	NJ	0.44	0.38	0.10	0.0	UN	SN	
A0338	1-13	KN	ED	NJ	1.97	2.37	0.63	3.6	FK		
A0539	1-31	BF	PR	NJ	1.23	1.98	0.43	1.0	UN		HI
A0596	1-36	KN	DI	PM	3.60	2.72	0.61	5.8	FK	SN	
A0668	2-4	BF	MD	PM	2.02	3.09	0.56	2.0	FK	OP	IN
A0956	4-10	PP	TM	NJ	2.97	1.47	0.20	0.8	BL		IP
A0970	4-11	PP	TP	NJ	1.16	0.79	0.17	0.2	FK	SN	
A0993	4-13	KN	ED	NJ	2.10	2.43	0.46	1.0	FK	HI	
A1064	5-2	PP	TP	NJ	1.04	0.73	0.21	0.5	UN	PV	
A1086	5-4	PP	TP	NJ	1.38	1.24	0.27	0.3	FK	HI	
A1138	5-8	BF	ED	NJ	3.45	0.87	0.49	1.1	FK	IN	
A1192	5-12	PP	TB	NJ	1.49	1.25	0.21	0.3	FK	PV	
A1332	6-9	PF	CO	NJ	2.23	1.50	0.43	1.6	FK		
A1356	6-11	ES	ED	NJ	2.33	1.29	0.31	1.1	FK	SN	

Key

<i>Type</i>	<i>Portion</i>	<i>Material</i>	<i>Blank type</i>	<i>Break type: proximal or distal</i>
BF-biface	BA-base	NJ-Niobrara jasper	BL-blade	HI-hinged
ES-end scraper	BB-base and blade	PM-Permian	FK-flake	IN-indeterminate
KN-knife	CO-complete		UN-unknown	IP-impact
PF-preform	DI-distal			OP-outré passe
PP-projectile point	ED-edge			PV-perverse
	MD-midsection			SN-snap
	PR-proximal			
	TB-tip and blade			
	TM-complete less tip			

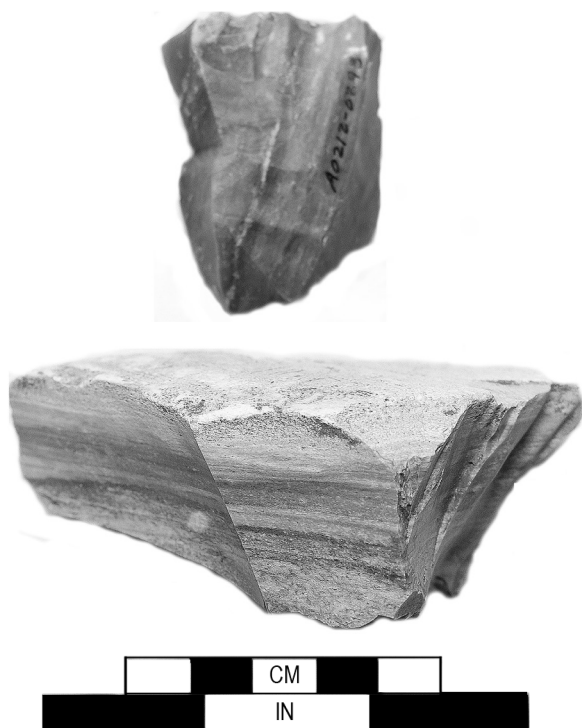


Figure 17. Cores of Niobrara jasper from KU-4.

(Figure 19) (Neuman 1963; Logan 1995, 1998a; Logan and Banks 1994:31; Padilla and Ritterbush 2005). These large specimens initially may have served as flake cores but, as reduction continued, were adapted for hoes or heavy duty cutting and chopping tools. Upon further reduction, they may have been transformed into more refined bifacial tools or possibly blade cores.

It is unclear whether Permian cherts were obtained through seasonal excursions to the Flint Hills or through trade, but both options may have played a role in their acquisition. Padilla and Ritterbush (2005) analyzed a sample of 963 stone artifacts from 14JW1, and their study reinforced the preliminary observations made by Logan and Banks (1994:39) on the KU-4 assemblage. Their findings are discussed in a separate section of this article.

The sandstone abrader (Figure 16) attests arrow shaft production. It likely is made of Dakota sandstone that is easily obtained from numerous sources in the Smoky Hills, including the Lovewell locality. The mano and grinding stone (Figure 16) are of glacially derived quartzites, probably from the Dissected Till Plains region of northeastern Kansas and southeastern Nebraska. Their presence may signal the origin of White Rock phase groups among an Oneota population in that region along the Missouri River or to continued contact and exchange with it. The grinding stone differs from metates used for plant food processing in that the surface with the concavity caused by grinding is relatively small, is discolored to a black tone by whatever substances were processed, and two sides of the object were ground or pecked to form broad shallow notches. This “grooved” attribute, more common on tools of metamorphic stone, such as axes or mauls, may in this instance have been done to anchor the stone to the ground with stakes, though this is speculative. Both the grinding stone and mano stay unwashed for residue analysis.



Figure 18. Retouched or edge-modified blades from KU-4. The specimen at the right end of the upper row is Permian chert; all others are Niobrara jasper.



Figure 19. Large biface-core of Niobrara jasper recovered from the surface at 14JW24 during the 1993 project.

FAUNAL REMAINS

Bones, particularly the more numerous bison elements, from KU-4 were analyzed in the technical report by Anderson (1994). In that report interested readers can find more a detailed description of the remains summarized here (Table 5).

Other than bison, the only animals recognized are softshell turtle (*Trionyx sp.*) and canid, probably domestic dog (*Canis familiaris*), represented by an atlas vertebra, right tibia, and metapodial (Figure 20). Figure 7 shows the canid tibia and turtle carapace in situ at depths of 68 cm and 100–106 cm, respectively.

One bone, cross mended from specimens recovered from Levels 2, 4, 5, and 6, is clearly not evidence of subsistence (Figure 21). Identified as proboscidean by the late Larry D. Martin, curator of vertebrate paleontology at the University of Kansas Museum of Natural History (personal communication 1993; compare Anderson 1994:57), it is evidence of site occupants gathering fossil faunal remains that still erode from Pleistocene deposits along White Rock Creek (Holen 1996, 2007; Holen et al. 1995; Holen and Talley 2003), including those near the southern edge of 14JW1 (Logan et al. 1991). Given its mineralized state, it possibly was collected for use comparable to that of a stone tool. The smooth non-cancellous surface of the mended piece is concave and might have served as a grinding platform, though this is not discernible. Judging from the damage to one end, employing it as a wedge is an alternative inference.

Table 5. Identified Bison Remains from KU-4.

Element	Side	MNI	NISP
Nasal	R	1	1
Nasal	L	1	1
Frontal	R	2	2
Frontal	L	1	1
Maxillary molar	?	1	1
Mandible	R	1	1
Axis		1	1
Thoracic vertebra		1	1
Sacrum		1	1
Scapula	R	4	10
Scapula	L	5	11
Scapula	?	1	9
Rib		1	4
Humerus	R	1	1
Humerus	L	1	1
Ulna	R	1	2
Ulna	L	1	1
Radius	L	1	1
Metacarpal	L	1	1
Metacarpal	R	1	1
Trapezoid carpal	?	1	1
Scaphoid	R	1	1
Semi-lunate	R	1	1
Pyramidal	R	1	1
Os crochu	R	1	1
Capitato-trapezoid	R	1	1
Femur	R	1	2
Metatarsal	L	1	1
Phalange 1st		1	1
Phalange 2nd		1	2
Phalange 3rd		1	1
		5	65

The dependence on bison for subsistence, indeed evidence in support of White Rock phase focal hunting of that animal (Logan 1998b), and for tools is reflected in the assemblage of 65 identified bones from KU-4. Though relatively few, considering the potential number of bones from a single bison, those discarded in the pit after it had served its primary function for storage, incorporate cranial, axial, and appendicular elements (i.e., skeletal components that support and constitute the appendages) of at least five animals (Table 5). A large portion of the frontal and nasals of a single skull was uncov-



Figure 20. Canid atlas vertebra, metapodial fragment, and right tibia. The tibia is shown in situ in KU-4 at depth of 68 cm in Figure 7.

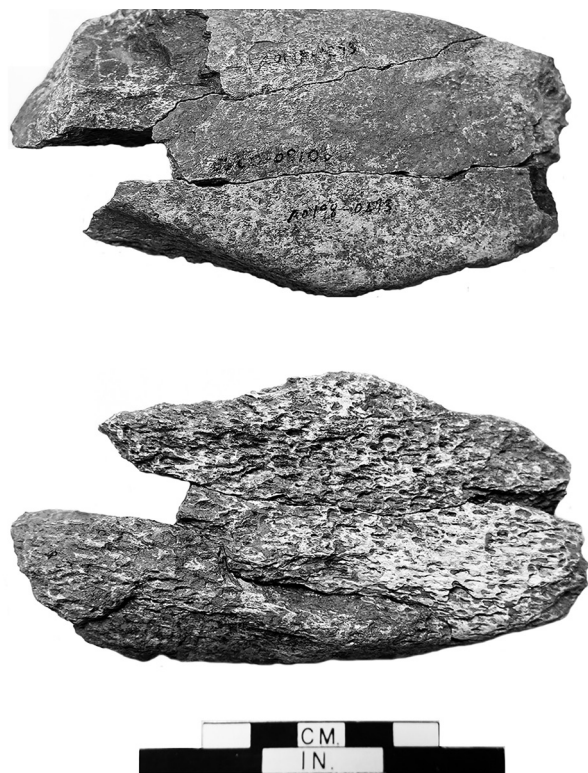


Figure 21. Refitted proboscidean bone fragment from KU-4. The lower view shows cancellous surface.

ered near the base of the pit, as were a modified rib (described below) and partial scapular spine, the latter indicative of several specimens recovered at 100–106 cm below surface (Figure 7). Other cranial parts comprise a mandibular fragment and maxillary molar. Scapular pieces constitute glenoids found at depths of 68 cm and 82 cm (Figures 7), as well as



Figure 22. Bison axis from KU-4.

blade portions and several items modified from use as gardening tools, described below. Appendicular bones include both upper (humerus, ulna [Figure 7 at 86 cm], radius, and femur) and lower (podials, metapodials, and phalanges) elements. Axial parts are an axis from which the dorsal surface had been removed (Figure 22), a thoracic vertebra segment, and the aforementioned modified rib.

Modified Bone. As is characteristic of 14JW1 as a whole and other sites of the White Rock phase, scapular pieces are predominant, and modifications to these attest their popularity as gardening implements (compare Logan 1995, 1998b) (Table 6). These consist of a complete hoe, several segments of scapular blades with beveled edges from hoe use, and a modified blade with a sharpened edge and notch to facilitate gripping for manipulation as a “squash knife.” The hoe exhibits tell-tale modifications, such as a hole on the dorsal surface near the glenoid that may have been made for or by hafting and removal of the spine and dorsal face of the posterior border (Figure 23). It lacks the proximal end where polishing or beveling might have been. Other scapular components, likely hoe fragments, include glenoid, posterior border, and proximal portions (Figures 24–25). One partial glenoid (Figure 24, center) had been cut longitudinally across the ventral surface. The dorsal face of seven proximal pieces had been removed; four of them are beveled from use-wear, and the others display this modification on their anterior margins. KU-4 yielded other smaller proximal fragments that also exhibit polish or beveling (Figure 25).

Two scapular specimens show modification for cutting tools, generally referred to as “squash knives.” The dorsal portions of their posterior

Table 6. Scapular Pieces from KU-4.

Scapular portion	Side	MNI	NISP
Glenoid	R	4	4
Glenoid	L	2	2
Spine	R	1	1
Spine	L	1	1
Anterior ridge	R	1	1
Posterior to spine	L	3	3
Posterior border - proximal	R	3	3
Posterior border - distal	L	2	3
Posterior border - proximal/medioproximal	L	5	5
Medial/lateral face	?	1	9
Composite	R	4	10
Composite	L	5	11
Composite both		5	30

borders had been removed by cutting; arc-shaped secondary margins were made, and beveling and polishing demonstrate their purpose for cutting soft substances, such as vegetables. One has a notch that clearly was made for a finger of the hand to facilitate grasping (Figure 25).

Two proximal ulnae appear to have served as picks, perhaps also related to gardening. The olecranon process (i.e., prominent bony projection at the elbow) of one has a hole that may have been made by or for hafting (Figure 26).

The rib in situ at the base of the pit (Figure 7) bears nine lines incised transversely across the external surface of one end and a notch made for or from grasping at the other. Longitudinal striations on the external surface may have been made incidental to use of the specimen, though the nature of that function is unknown (Figure 27).



Figure 23. Bison scapula hoe with hole from hafting from KU-4.



Figure 24. Bison glenoids from KU-4.



Figure 25. Modified bison scapular pieces. The specimen at upper center is shown in situ in KU-4 at depth of 82 cm in Figure 7. Fragment at lower center might have been used as a squash knife.



Figure 26. Bison ulna with hole perhaps from hafting for use as a pick from KU-4.



Figure 27. Scored bison rib from base of KU-4.

KSU-1

The pit feature described in this section was designated KSU-1 to distinguish it from others excavated during projects conducted by the University of Kansas. KSU students found it during excavations of the vandalized area on May 18–22, 2009, with final work on the feature on May 29. Excavations consisted of seven 1 by 1-m units, laid out parallel to the road in the vandalized area (Figures 4 and 28). These were dug in 10-cm levels, fill was screened through ¼-inch mesh hardware cloth, and artifacts with any dimension >2.5 cm were piece plotted. In



Figure 28. View south toward the reservoir of excavation on May 19, 2009. Test unit 6 is in the foreground.

addition, two partial (1 by .7 m) units were excavated to complete exposure of the cache pit, excavation and documentation of which then consumed the balance of the time allotted for the project. Figure 29 shows the relationship of the excavation units, KSU-1, and piece-plotted artifacts. Table 7 presents the number and/or mass of material from each unit by level.

An increase in the quantity of artifacts was noted in the more northeastern units, particularly from those in XU1-2 to XU4. This was probably due to the more frequent disposal of debris in and around KSU-1, though some sediment may have been lost from the XU1-2 area through erosion. The latter units are slightly lower in elevation with respect to the others and would have been subject to more runoff during periods of precipitation. Indeed, XU1 had a very thin A horizon, which explains its excavation to a depth of only 10 cm. In order to salvage cultural material from the side of the drainage ditch beyond the excavation, the author scraped the loose soil from the slopes adjacent to units 4, 5, and 6 and screened it. That less systematic method yielded one body sherd (4.6 g) adjacent to XU4; two flakes (1.6 g) near XU5; and three body sherds (1.4 g), two flakes (2.1 g), and a bone fragment (2 g) at XU6.

The frequency of piece-plotted artifacts increased in the same units. Indeed, only a single item, a bone scrap, was plotted in XU2 and none in XU1. Among

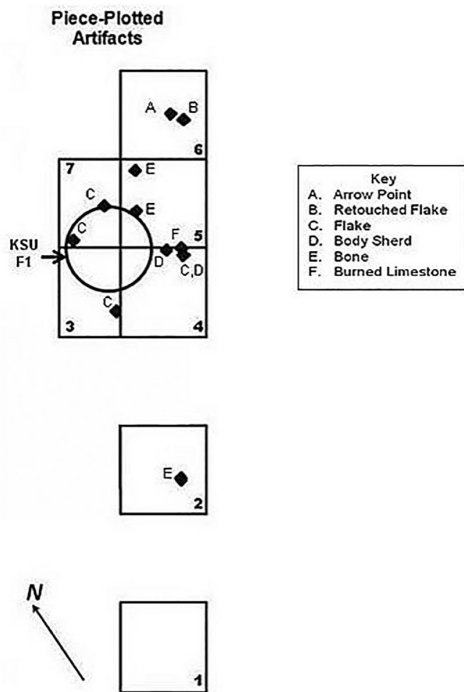


Figure 29. Plan map of test units dug in 2009, showing location of KSU-1. All except test units 3 and 7 are 1 x 1 m. The bison scapula in Figures 30 and 31 is the bone shown at the edge of the feature in test unit 5.

those mapped in the other units were nine in the vicinity of the pit that was exposed during excavation of XU3-5 and 7. These were bison scapula fragments, perhaps part of a hoe, the glenoid portion of which may have been lost to pre-reservoir plowing (Figure 30). Their vertical orientation and breakage into two conjoinable segments suggested dislocation (Figure 31). From its depth (29 cm below unit mapping datum) and proximity to KSU-1, it might have been within the agriculturally disturbed portion of that pit. Bison scapulae are the most frequently recovered elements at 14JW1 and indicate the importance of gardening in Oneota subsistence in this locality (Logan 1998b). Another bison bone, a partial proximal epiphysis of a metatarsal, was plotted in XU5 beyond the feature and at shallower depth (17 cm). In XU6, the northernmost unit excavated, two objects were plotted, including an unnotched arrow point. The damaged base of a side-notched projectile point came from the second level of XU4 (Figure 32).

KSU-1 was distinguished as a darker stain within a matrix of lighter B horizon soil at a depth of 22 cm in the northern corner of XU4. In order to com-

Table 7. Cultural Material from KSU-2009 Test Units by Count and (Mass [g]). *

Test unit	0–10 cm	10–20 cm	20–30 cm	Number of piece plots	Totals
1	9 (6.6)	—	—	0	9 (6.6)
2**	35 (10.6)	83 (37.2)	22 (13.7)	1 (12.6)	141 (74.1)
3	25 (9.4)	95 (48.0)	70 (49.8)	1 (9)	191 (116.2)
4***	88 (32.3)	144 (67.8)	19 (13.7)	5 (24.9)	256 (138.5)
5	93 (48.2)	114 (70.6)	—	1 (20.9)	208 (139.5)
6**	63 (30.4)	121 (57.3)	4 (1.5)	2 (4.9)	190 (94.1)
7	23 (10.1)	40 (25.5)	128 (53.9)	2 (14.8)	183 (99.9)
Totals	336 (177.1)	563 (327.9)	241 (163.5)	12 (181.2)	1,176 (683.6)

*Non-plotted material, shown in columns 2-4, includes pottery, chipped stone tools and debris, retouched flakes, and historic artifacts.

**Unit excavated to 25 cm.

***Unit excavated to 23 cm.



Figure 30. Bison scapula vertically displaced in test unit 5 near the edge of KSU-1.

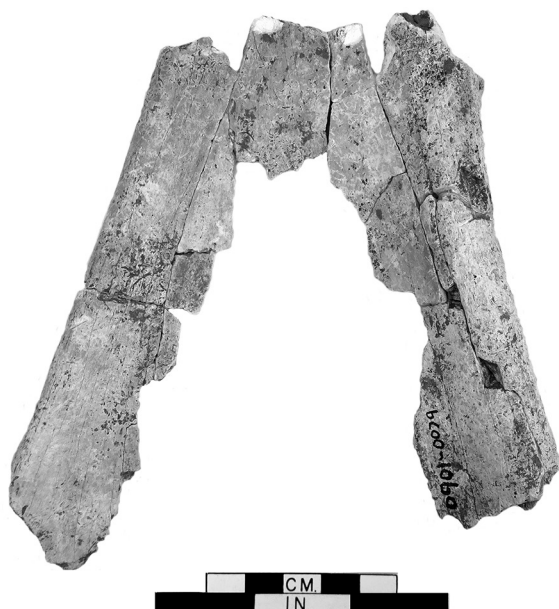


Figure 31. Bison scapula refitted from pieces shown in Figure 30.

pletely expose it in plan view, adjacent units XU3 and XU7 were laid out and excavated to 30 cm and 28–30 cm, respectively. (The northwestern portion of XU7, beyond KSU-1, was dug to only 20 cm below the unit datum.). More artifacts were collected during excavation in those parts of the units

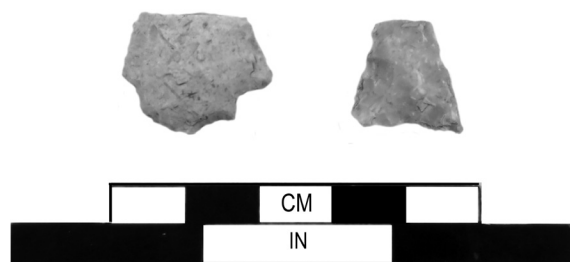


Figure 32. left) side-notched projectile point; right) unnotched arrow point. The location of the latter in test unit 6 is shown in Figure 29.

that encompassed the feature. In plan view KSU-1 was roughly circular, measuring 93–95 cm in diameter (Figure 33).

The pit was cross sectioned by removal of the fill from the portion in XU4-5, during which the first documented piece of obsidian at the White Rock site was found in the upper 10 cm of fill. Like flakes of this volcanic glass from the Warne sites (14JW8, 14JW24; Logan et al. 2001) it bears the geochemical signature of the Malad, Idaho, source. Given the small size of the specimen, Richard Hughes (2009) relied on integrated net peak intensity data rather than the conventional non-destructive energy dispersive x-ray fluorescence method to make this determination (Logan 2010a:Appendix 2).

Complete removal of the fill revealed a pit 1.25 m below the surface, one of the deepest features documented at 14JW1. Body sherds, bone, burned limestone, and an alternately beveled knife of Niobrara jasper (Figure 34) were discovered in situ during the cross-sectioning process. Table 8 presents the



Figure 33. Plan view of KSU-1 at definition.



Figure 34. Views of KSU-1 during excavation, showing at left a) body sherd, b) bone splinters, and c) burned limestone; at right) beveled knife fragment.

material class and mass of 46 piece-plotted items from KSU-1; their coordinates appear in Logan 2010a:Appendix 3. Other cultural material from the fill, all of which was floated with a Dausman Flote-Tech machine, is displayed in Table 9.

In cross section the pit depicted an asymmetrical profile (Figures 35–36). Its orifice may have been as shallow as 22 cm below surface, but it was not recognized in the northern units until 30 cm below their southwest corners and 36 cm below

the northwest corner of XU7, which was used as depth reference for piece plots, etc. This variance in depth reflects the slope of the roadside berm: lower toward the road ditch and higher toward the old field. Probing with an Oakfield tool established its depth, where a yellowish-brown (10YR5/3-4) horizon was found below the darker fill. Creators had dug the pit well into that soil, its side mottled with darker brown (10YR3-4/3) silt loam of the A horizon. Its irregular sides confirmed bioturbation to some extent. The upper wall sloped toward what might have been an original basin ~50–60 cm deep, perhaps subsequently expanded below a “lip,” leaving a roughly “hour-glass” profile, to a base into

Table 8. Mass (g) of Uncounted Cultural Material* from KSU-2009 Test Units.

Test unit	0–10 cm	10–20 cm	20–30 cm	Totals
1	4.5	—	—	4.5
2**	4.2	7.6	1.2	13.0
3	8.6	3.3	20.2	32.1
4***	1.7	10.2	1.2	13.1
5	1.2	8.0	—	9.2
6**	4.3	6.4	0.0	10.7
7	5.0	1.1	7.5	13.6
Totals	29.5	36.6	30.1	96.2

*Includes burned earth, burned limestone, bone, shell, and charcoal.

**Unit excavated to 25 cm.

***Unit excavated to 23 cm.

Table 9. Plotted Artifacts from KSU-1 by Count and Mass.

Class	Count	Mass (g)
Body sherd	22	137.8
Chipped stone tool	2	25.6
Chipped stone debris	7	44.1
Bone	12	89.9
Burned limestone	2	48.5
Burned earth	1	6.8
Ground stone	1	197.0
Sandstone (abrader?)	1	208.1

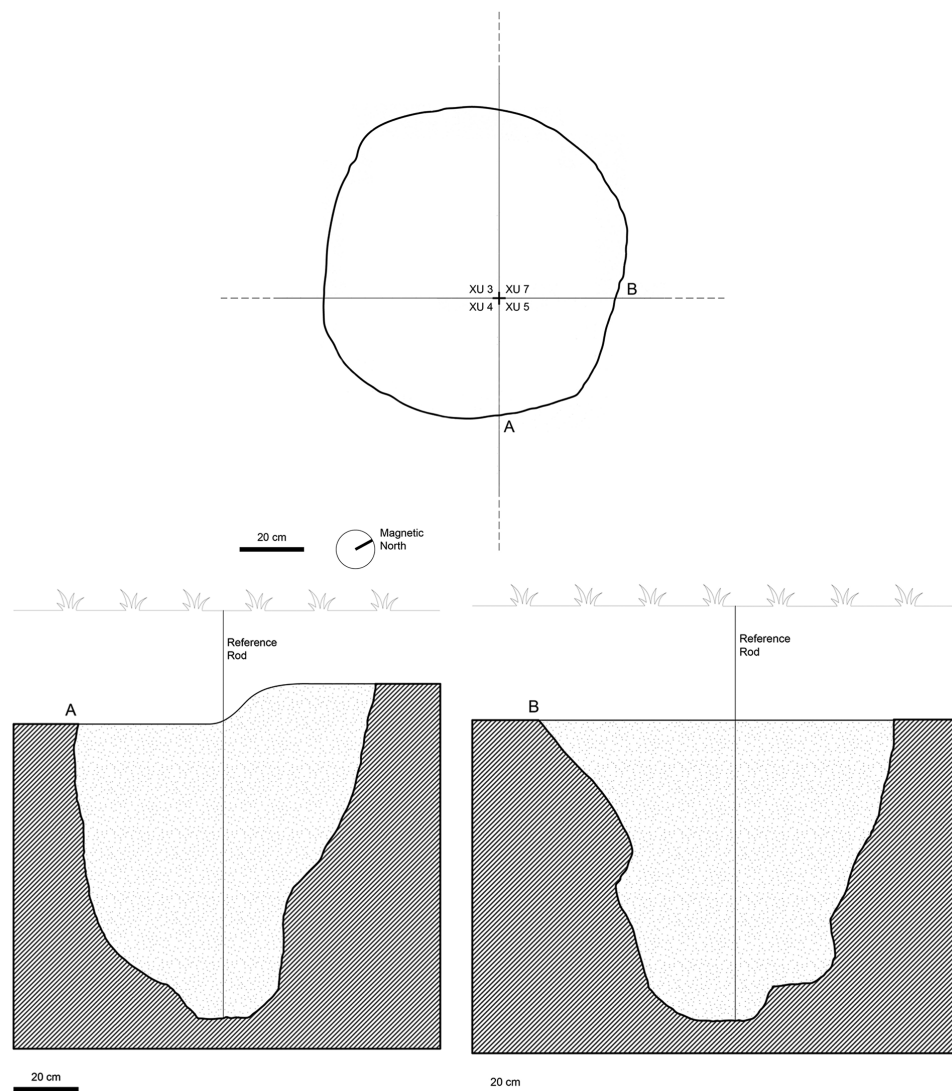


Figure 35. Plan view and cross sections of KSU-1.

which a small “pocket” cache had been dug. The latter attribute is comparable to that evident in the belled pit excavated by the SIRBS in 1956 (Neuman 1963:Plate 46). The pocket contained a horizontal krotovina that was about 3 cm in diameter and filled with charcoal-flecked ash. In contrast to the more classically bell-shaped KU-4, KSU-1 appears like a somewhat misshapen funnel when viewed from above.

To determine if a meaningful pattern existed in the distribution of cultural material within the pit, piece-plotted artifacts were used as proxies, as all other artifacts had been removed with the fill without regard to horizontal or vertical position. Figure 37 shows the distribution of plotted artifacts in plan and vertical views (i.e., projected on these planes).



Figure 36. KSU-1 completed at 125 cm.

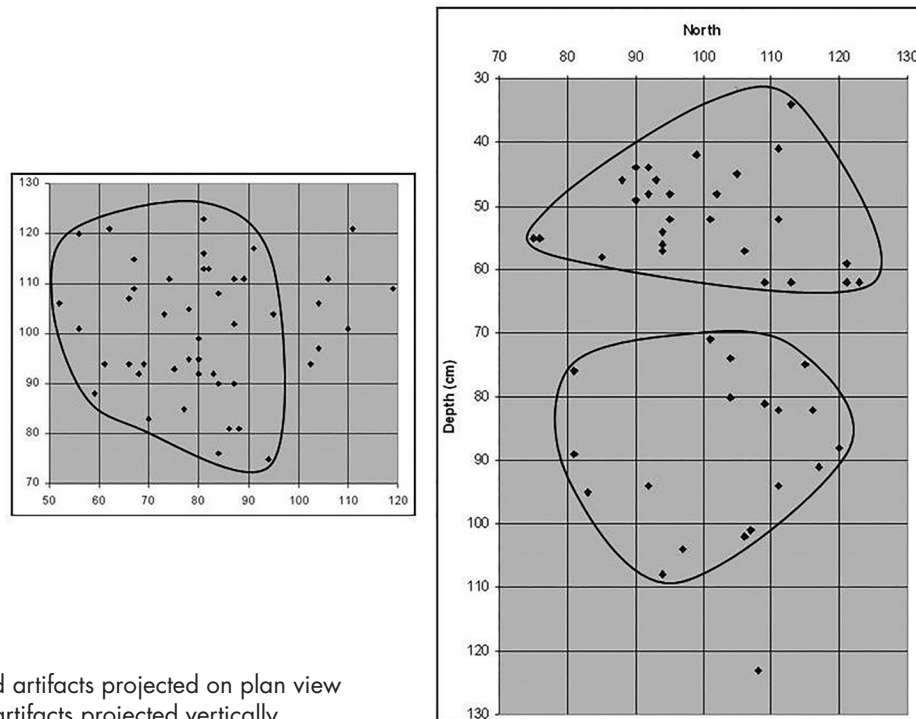


Figure 37. left) piece-plotted artifacts projected on plan view of KSU-1; right) piece-plotted artifacts projected vertically.

This representation demonstrates that most (37 of 46 or 80 percent) of these items occurred in the western 60 percent of the feature, that is, from 50 to 92 cm east, according to the grid. No pattern is apparent from north to south. The clustering of artifacts in the western portion might indicate more consistent disposal from one direction, perhaps the sweeping of debris from the western side. Conversely, had trash been tossed into the pit, this distribution might suggest such action from the opposite (eastern) side. If the former practice predominated, additional excavation away from the road and drainage ditch could be rewarded by discovery of greater quantities of cultural material.

The vertical distribution of plotted artifacts revealed two distinct clusters: one of 27 items in the upper ~30 cm (i.e., from 34 to 62 cm) and the other of 18 objects from -71 to -108 cm. Only a single specimen, a flake, occurred near the base at 123 cm. While this may reflect three episodes of filling with the more recent (i.e., upper) two separated by a gap of 9 cm, this distribution is more likely due to the pit's shape, with the broader upper portion serving as a greater catchment than the lower part.

Despite its relatively great volume, comparable to that of KU-4, KSU-1 was not a catchment for

much cultural debris. In addition to the piece-plotted artifacts, its floated fill yielded a modest amount of relatively small detritus. For example, body sherds average .5 g in mass, and debitage, nearly all tertiary debris, averages less than .1 g per flake. Sherds and chipped stone debris, which account for most of the sorted material, were passed through nested sieves for size comparison (Table 10). The numbers for each of the first four size grades of pot-

Table 10. Artifacts from Flotation of KSU-1 Fill by Count and Mass.

Class	Count	Mass (g)
Rim sherd	2	3.1
Body sherd	289	136.8
Handle	1	2.2
Chipped stone debris	1,143	95.9
Burned limestone	—	6.0
Bone	—	66.7
Ground stone	8	4.1
Charcoal	—	38.1
Ash	—	0.9
Burned earth	—	3.9
Totals	1,443	585.2

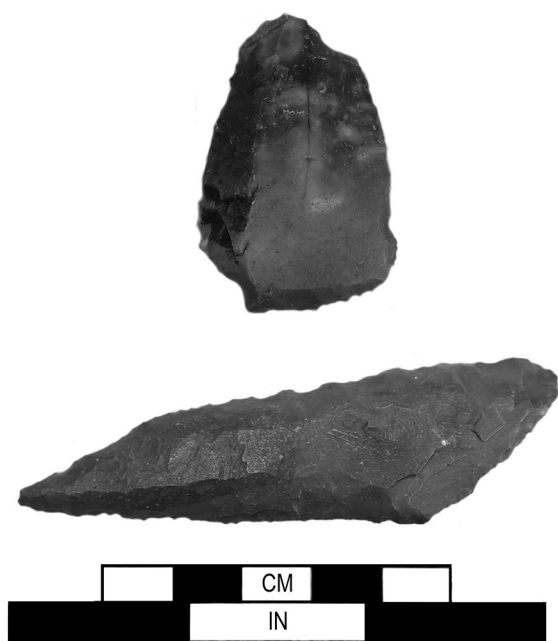


Figure 38. End scraper and beveled knife fragment from KSU-1.

tery are similar, and the mean mass (~1.5 g) of the largest grade is still small. Similarly, for debitage the mean mass (1.13 g) of the largest grade is small. However, the numbers increase notably for all but the smallest grade, reflecting the high frequency of tertiary flaking debris in the pit fill. In sum, KSU-1 did not serve as a place of discard for primary or secondary reduction debris.

Chipped stone tools were limited to the aforementioned knife and a Permian chert end scraper (Figure 38). All pottery is characteristic of Walnut Decorated Lip, the diagnostic ware of the White Rock phase. Only 25 sherds are of sufficient size for analysis. Of these six are shell tempered, the shell having leached, leaving vacuoles; 17 have sand temper; and 2 have no visible aplastic additives. Two of the shell-tempered fragments are decorated with three oblique parallel trailed lines. Two sand-tempered sherds have two parallel oblique trailed lines; in one of these the lines terminate at a horizontal trailed line, and in the other the broader trailed lines terminate above three broad horizontal trailed lines (Figure 39, left). A third sand-tempered piece bears the terminus of a single trailed line. One of the untempered sherds is from the shoulder of a decorated vessel; it exhibits eight oblique parallel incised lines that oppose three similar lines (Figure 39, right).



Figure 39. Decorated body sherds from KSU-1.

KSU-1 contained few identifiable bones, but these follow the pattern of those found elsewhere at 14JW1 and other White Rock phase sites in that they are bison and canid (Logan 1998b). The former animal is represented by nine specimens: a first phalange, two cranial (frontal) fragments, a proximal left metatarsal, a diaphysal portion of a metacarpal, a sesamoid, and three scapular pieces (Figure 40). The only canid bone is the glenoid and upper blade of a right scapula (Figure 40). Six diaphysal splinters, identified as large mammal, are likely bison.

RADIOCARBON DATE

Charcoal was noted in greater abundance in the lower portion of KSU-1. A few large pieces were recovered and foil wrapped for possible radiocarbon dating, but flotation yielded other “nugget”-sized fragments and many smaller ones. While the total mass was rather small (38.1 g), the larger chunks were more than sufficient for AMS dating.

One chunk with a mass of 400 mg from the final flotation sample, gathered from the base of the pit, was submitted to the National Ocean Sciences AMS facility. The resulting assay of 775 ± 30 rcybp ($\delta^{13}\text{C}$ -24.66; OS-74659) calibrates (Calib 8.1) to a two sigma range of A.D. 1221–1279, the earliest assay yet obtained from a White Rock phase site (Logan 2010a, 2010b). The assay must be considered tentative, given the potential for this sample to encounter the “old wood” problem, that is, dating of the inner portion of timbers that do not accurately reflect the time of feature use. Dating of annual plant remains or bone would provide the basis for more reliable



Figure 40. left to right) bison cranial fragments (interior views), canid scapula, and bison first phalange.

Table 11. Pottery and Chipped Stone Debris from KSU-1 by Size.

Class	Count	Mass (g)	Size grade (inches)
Sherds	61	90.8	0.371
	62	31.1	0.263
	70	14.0	0.185
	64	4.9	0.131
	35	1.3	0.065
Chipped stone debris	41	46.4	0.371
	55	16.9	0.263
	103	12.5	0.185
	201	9.6	0.131
	726	10.4	0.065
	17	0.1	<.065

inference. The implications of this date are discussed in the following section.

DISCUSSION

Both cache pits are among those with the greatest volume recorded at 14JW1. With others documented

there and at the Warne sites, they demonstrate either prolonged or periodic occupation in the Lovewell locality. The greater likelihood of the former is suggested by the profusion of bone tools employed in gardening that must have occurred in the immediate area. Indeed, bison scapulae that obviously were modified as hoes or squash knives are among the most ubiquitous faunal remains recovered at White Rock phase sites in the locality. These indicate that farming was part of the subsistence activities there, and, while evidence of maize is sparse, the few pieces collected to date confirm cultivation of that plant (Rusco 1960:50). While no maize has yet been found in either of the pits discussed here, flotation samples from them and other features excavated at the site under the author's direction merit more than his cursory examination for plant remains. While initial Oneota presence in the locality may have been limited to hunting of bison by parties that originated at sites in the Missouri River area, such as Leary (23RH1) or Dixon (13WD8; Fishel 1999), evidence for gardening that incorporated tilling, planting, tending, harvesting, and storing plant foods attests a commitment to longer-term residence. Clearly the site's Oneota pioneers were determined

to exploit the location for more than a seasonal stay.

Interpretation of prolonged settlement of White Rock phase sites differs from the explanation of Blakeslee and others (2001), based on their analysis of data from Glen Elder, another type site of the culture (Rusco 1960). They attributed that site, described as a short-term bison hunting camp, to fall or early winter occupation. They noted “a relative lack of in-ground storage facilities [that] distinguishes it from most Oneota villages” (Blakeslee et al. 2001:100–101), a characteristic that also differs from the White Rock and Warne sites in the Lovewell locality. One could as easily attribute Glen Elder to bison-hunting forays that began at Lovewell sites rather than at others in the Missouri River area far to the east. Unlike White Rock, Glen Elder was completely destroyed by dam construction, precluding more exploration there. Despite the apparent lack of caches, it is intriguing that the 14ML1 faunal assemblage was not only dominated by bison bones, but also by scapular pieces, which were the most abundant elements ($n = 274$). Of the latter 14 are glenoids that yield an MNI of 8 bison (Blakeslee et al. 2001:97–98). This suggests that gardening might have occurred in that area as well. See Ritterbush (2002, 2006) and Ritterbush and Logan (2000) for other critiques of their interpretation.

As for the White Rock phase settlement pattern in the locality, unlike that of the preceding CPT community represented by the Phil and Windmill Creek (14JW49) sites (Logan 2008, 2011b), upland ridges were preferred. The Bergstrom site (14JW17), with remains of both CPT and Oneota activities, is an upland exception for the former culture (Logan 2010a). In a region where generally sheltering woodland was restricted to lowlands and grassland ridges were exposed during cold seasons, White Rock preference for the latter would argue for warm season residence. On the other hand, a unique bison bone boiling pit at 14JW1 implies reliance on meat-poor elements typical of cold weather behavior (Logan 1998b). More evidence of seasonality at White Rock phase sites is needed to verify a hypothesis of multi-season occupation at the Lovewell locality.

As to the question of when a pioneering Oneota group settled the Lovewell locality, if accurate,

statistical analysis of all radiocarbon dates from White Rock phase sites indicates presence during the late thirteenth century, earlier than that of western Oneota sites (e.g., Ashland [25SD147], Dixon, Leary, Swantek [25PT111]) that might otherwise have been candidates for places of origin (Logan 2010b). When the single AMS assay on a sample of wood charcoal from KSU-1 was statistically compared to other radiocarbon dates from White Rock phase sites in the Lovewell locality, it resulted in revision of the author’s original postulated temporal placement of the phase from ~A.D. 1300–1450 to ~AD 1270–1289 (Logan 2010b:289). However, while the assay may be *precise*, because it is based on the inner portion of a burned timber, it may not be *accurate* regarding its time of use, which might have been later. Resolving the problem of the temporal span of the White Rock phase at the Lovewell locality within the late prehistoric period requires the acquisition and interpretation of more data.

BISON—THE LOVEWELL LOCALITY LODESTONE

Bison roaming in the Lovewell locality were a primary attraction for groups other than those of the Oneota tradition, as substantiated to varying extent from at least the Woodland period. Test excavations at the Montana Creek East site provided a small (2 m²) window into what is currently the only documented settlement of that time. (Russell Mound [14JW207] on the south side of the reservoir may represent Woodland mortuary activity, although Neuman [1963] attributed it to Middle Ceramic time [compare Logan 1990:117].) The Woodland component at Montana Creek East is in a buried A horizon at a depth of ~70–90 cm. It yielded several bison bones, including a femoral shaft segment, two scapula blade pieces, two poorly preserved fragments of a rib blade, and a longer well-preserved rib with a series of cut-marks from a large bison (Ritterbush and Logan 2006:29–37). Other faunal remains are canid and a deer antler pedicle (knapping tool?). More extensive excavation in that area of the site likely will discover additional evidence of bison procurement.

The upper component at Montana Creek East produced 919 identified bison bones from a minimum number of 47 animals. The statistically sig-

nificant predominance of humeri, femora, and tibiae with spiral fracturing is indicative of marrow processing by an unidentified late prehistoric group (Logan 2011a; Ritterbush and Logan 2006, 2009a). The assemblage has potential to provide complementary evidence of western Oneota reliance on bison with that from the White Rock and Warne sites. For example, despite the large number of individual bison, identified scapular pieces were notably scarce, representing only nine animals (Ritterbush and Logan 2009a:224), whereas that is the most frequent element at the White Rock and Warne (specifically 14JW2) sites. One could have inferred that scapulae were schlepped to these ridge-top settlements for modification as gardening implements. However, the predominance of pottery of an unidentified ware at Montana Creek East precludes confident assignment to Oneota occupation. If that site reflects preference for bison by a different but contemporary group, it only reinforces interpretation of that species as a magnet during late prehistoric time.

While faunal remains at sites occupied by CPT peoples throughout the region manifest a diffuse pattern in contrast to the focal nature of subsequent Oneota migrants (Brown 1982; Bozell 1991; Koch 1995; Koch et al. 1999; Mick 1983; Roper 2006), procurement of bison in the Lovewell locality is evident at the Phil and Windmill Creek sites, both short distances from White Rock (Figure 2). The predominance of scapular pieces, clearly used as hoes, at the Phil site follows the pattern at many CPT sites, which suggests that they may have been the object of trade or scavenging rather than hunting (Logan et al. 2011). However, a cache pit at the Windmill Creek site yielded numerous fragmented appendicular elements that attest marrow processing, bone boiling, or both (Logan 2007).

That historic Pawnee, particularly the *Kitkahahki*, were attracted to the area by bison is obvious in faunal remains at two major villages: the Hill site (25WT1; also known as the Pike-Pawnee National Historic Landmark) on the Republican River 19.2 miles (30.9 km) northwest of the White Rock site (Hill 1927; Ludwickson 1994; Munday 1927) and Kitkahahki Town (14RP1; also known as the Kansas Monument site and the Kansas Pawnee site) at the confluence of the river and White Rock Creek 12.15 miles (19.6 km) due east of it (Adair and Hofman

2021; Adair et al. 2007; Roberts 1978; Wedel 1936, 1959). Permanent occupation of both villages by populations greater than any preceding them in the region is demonstrated by numerous lodges: more than 100 at the Hill site and at least 25 at Kitkahahki Town, with associated storage facilities with volumes comparable to or greater than those at the White Rock site. The social organization of the Kitkahahki made it possible for residents of these settlements to conduct well-controlled hunting expeditions to procure many bison that, in conjunction with a farming economy based on maize, beans, squash, and other plants, facilitated prolonged occupation. Among resources that attracted herds of bison in the vicinity of Kitkahahki Town, as well as White Rock Creek in general, Adair and Hofman (2021:115–116) point to saltwater marshes near Jamestown and Tuthill, located 15 and 20 miles (24.1 and 32.2 km), respectively, south and southeast of that site. While these natural features may well have attracted bison, the number and variety of bones (e.g., cranial, axial, and appendicular) at sites of the White Rock phase and at Montana Creek East in the Lovewell locality suggest that they were hunted nearby. It is unlikely that pre-equestrians would have hauled meat- or fat-bearing elements such a distance.

Dependence on bison by later Indigenous Peoples in the Lovewell locality is easily inferred, if not ethnographically documented, from historic accounts of American settlement there that describe a series of “depredations” by tribes identified as Cheyenne. These occurred from 1868 through early 1870 during what a near-contemporary narrative described as four attempts at American settlement, the last finally displacing indigenous groups (Winsor and Scarbrough 1878). These accounts reflected then-prevalent intolerance of Indigenous Peoples, perceived as “savages” whose only motives for committing “massacres” were inherent barbarism. Ironically, as his name was given to the small town now attached to the reservoir and an archeological locality, American settler Tom Lovewell might have been the source of several of these stories. Misperceptions of American contact with indigenous groups in the area persist, as exemplified by Alleman’s (1995) novelized account of Lovewell’s involvement in these events. According to that author’s acknowledgments, the “saga” he relates

“is based in part on *The Lovewell Family*, compiled by Gloria G. Lovewell of Lakeside, Oregon [and] much of her information is based on notes kept by Orel Jane Lovewell,” Tom’s wife, and the “family records of Mrs. Walter Poole, a granddaughter.” A more dispassionate objective interpretation of actions perpetrated by people of both cultures is that the Cheyenne considered American intrusion in the area a threat to their subsistence in particular and their lifeway in general. Indeed, some clashes during this period occurred when American bison-hunting parties encountered Cheyenne apparently preparing for that same undertaking (Winsor and Scarbrough 1878:4–18).

While cultural collisions occurred at various locations in what is now Jewell County, including the aptly named Buffalo Creek, Limestone Creek, and Republican River, most centered on White Rock Creek and its tributaries, Johns Creek and Montana Creek. One such instance resulted in archeological documentation of a small cemetery, which appears on the USGS Webber 7.5’ topographic map, as the grave site of victims of one such tragedy (Hedden and Logan 1992:56–57). It involved a Mrs. Sutzer, her unnamed son (Warren 1997), Erastus Bartlett, and Nicolas Ward. They were taken by a party of Cheyenne from their cabins near the small settlement of Ruben (also known as Rubens and Reuben) at the mouth of Johns Creek and “massacred.” According to the account of Mr. Ward’s son, who escaped, his father was asked by a Cheyenne if the gun he was using to hold Mr. Ward at bay “would kill a buffalo,” tragically invoking the name of the animal that then, as long before, figured prominently in human activity along White Rock Creek. When Mr. Ward answered in the affirmative, the Cheyenne shot him to death (Winsor and Scarbrough 1878:6). Structural remnants of Ruben that were recorded as 14JW202 (Fenenga and Cooper 1951) were noted during archeological survey in 1991 (Hedden and Logan 1992:57). A historical marker along the road entering Oakhill Recreational Area a half mile west of the grave site attributes this depredation to a party of Pawnee and Oto. The cemetery, recorded at that time as 14JW37, was described by the marker as the place of interment of those victims and John Dahl, who was killed by Cheyenne in 1869 (Hedden and Logan 1992:56–57; see Winsor and Scarbrough 1878:12–13 for the death of Dahl). In the 1930s

Mrs. Martin Dahl informed Ellen Morlan Warren (1997:4, 6) that “the unmarked graves of those earlier Indian victims, Nicholas Ward, Erastus Bartlett, Mrs. Sutzer and her son, are in the Dahl pasture,” curiously not mentioning the grave of John Dahl.

Reminiscences by American settlers of encounters with indigenous groups must be taken with the caveat that they are dramatized oral history, reflecting cultural prejudices and misapprehensions. Interpreted objectively in the broader perspectives of anthropology and environmental history, the mid-nineteenth-century skirmishes in the Lovewell locality are indicative of the pressure felt by bison-hunting equestrian cultures, reacting with violence to intrusions on their hunting grounds. For the Cheyenne these are bracketed temporally by battles on the Solomon River in 1857 and at Summit Springs in 1869 (West 1998). The Cheyenne lifeway rested on a fragile resource base of potable water, timber for fuel, and grass for horse fodder that was distributed patchily and seasonally throughout the mixed and short grass prairies of the central Plains (Logan 2000). Essential to both horse and bison, these islands in a sea of grass were threatened by waves of Americans attracted by different cultural magnets: the discovery of gold in Colorado in 1859 and the offer of arable land by the Homestead Act in 1862. After the Civil War these diminishing refugia, of which the Lovewell locality was one, were inundated.

In the context of the clash of cultures in the Lovewell locality that involved Siouan- and English-speaking peoples from 1868 to 1870, it is appropriate to recognize late prehistoric Oneota migrants to that area as pioneers as well. While evidence is lacking of contact between the Oneota and CPT families that occupied lodges at the Phil, Windmill Creek, and Bergstrom sites during the thirteenth century, one cannot rule out the possibility that CPT people also had to contend with aggressive intruders who threatened their distinct culture, one based on family-centered settlements or “farmsteads” and a more diffuse form of subsistence (Logan 1998a, 2010a, 2011b; Ritterbush and Logan 2000; Roper 2006:120). The cultural discord of the historic period along White Rock Creek was, in fact, the final cycle of exploitation by different cultures of its potential for farming and bison hunting. From at least late prehistoric time to the mid-

nineteenth century, it attracted a variety of pioneers, some of whom like the White Rock Oneota settled for perhaps a few years and others who put down roots for the long term. Within a few years the final settlers extirpated the bison that for centuries had made the Lovewell locality a lodestone and established a radically new way of life.

ACKNOWLEDGMENTS

Not surprisingly, given the time that has passed since the 1993 projects, I owe thanks to some who helped analyze the material recovered then and who have long since moved on to make significant contributions in their fields. I am particularly grateful to William E. Banks, then a graduate student in anthropology at KU and now research director at the Centre National de la Recherche Scientifique in Bordeaux, France, and Robert P. Anderson, an undergraduate participant in the 1994 field school at Lovewell Reservoir and now professor of biology at the City College of New York. Will not only helped in the field during the 1993 project but also drafted the maps and feature plans and analyzed the chipped stone tool assemblage for the technical report. Rob analyzed the KU-4 faunal remains to earn graduate student credit for his role in the KAFS-1994. I am particularly grateful to Eli Logan for drafting the plan view and cross sections of KSU-1 (Figure 35).

My thanks to those who helped in the field during the 1993 project (Figure 41): Bill Angelbeck, Chris Raymond, and Robert Rothman then of KU and

Richard Beatty, Myra Geisen, and Bob Blasing of the NKAO-BoR; and to those who participated during the 2009 project as KSU undergraduate students: Patrick McClung, Victoria Rau, Cody Underwood, and especially Frank Webber, who devoted an extra day in the field to help me complete excavation of the pit feature and floated its fill.

I am grateful to Mary J. Adair, recently retired as senior curator of the Archaeology Division at the University of Kansas Biodiversity Institute, and to Sandi Olsen, also recently retired, who was chief curator there at the time I was pulling together this article. They located the artifacts from the 1993 and 2009 investigations at 14JW1, making them available for my review. Sandi, in particular, facilitated my photographing them at Spooner Hall. I still appreciate Bob Blasing and Bill Chada, successive NKAO-BoR archeologists, who supported the investigations in the Lovewell locality, which resulted in the findings of this article. Thanks also to Catherine Griffin of that office for her diligent search, albeit in vain, for the original 1994 report in the McCook, Nebraska, office and to the NKAO-BoR for permitting publication.

REFERENCES CITED

- Adair, Mary J., and Jack L. Hofman
2022 The Growth of Pawnee Archaeology. In *People in a Sea of Grass: Archaeology's Changing Perspective on Indigenous Plains Communities*, edited by Matthew E. Hill, Jr., and Lauren W. Ritterbush, pp. 98–117. University of Utah Press, Salt Lake City.

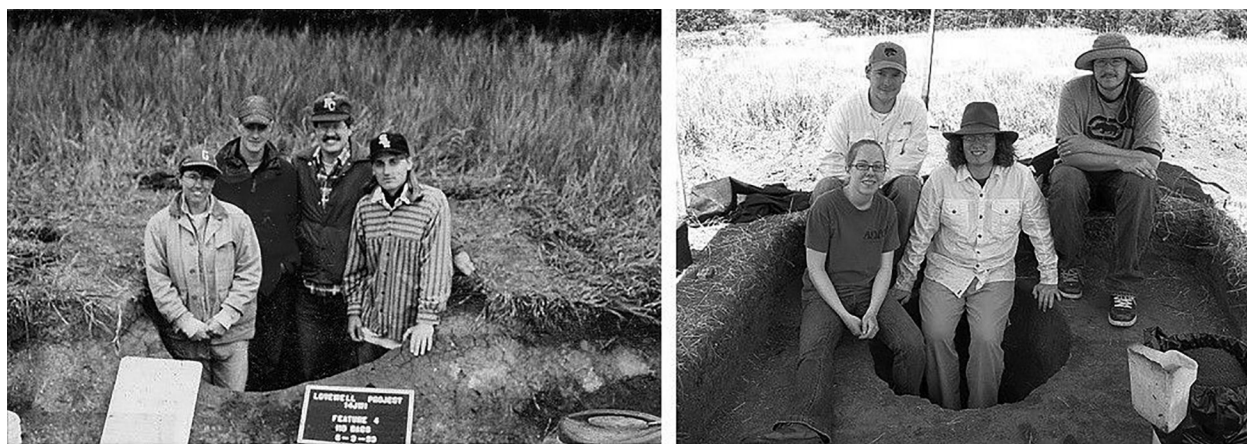


Figure 41. (left) excavators of KU-4, left to right: Myra Geisen, Will Banks, Brad Logan, and Bill Angelbeck; right) excavators of KSU-1, clockwise from upper left: Cody Underwood, Frank Webber, Patrick McClung, and Victoria Rau.

- Adair, Mary J., Donna C. Roper, and Jack L. Hofman
2007 *Kitkahahki Archaeology: Investigations at the Pawnee Indian Village, 14RP1*. *Current Archaeology in Kansas* 7:40–52.
- Alleman, Roy V.
1995 *The Bloody Saga of White Rock*. Capper Press, Topeka, Kansas.
- Anderson, Robert P.
1994 Faunal Analysis of Feature 4, 14JW1. In *White Rock Revised: Archaeological Investigations at the Warne and White Rock Sites, Jewell County, Kansas, 1993*, by Brad Logan and William E. Banks, pp. 56–67. Project Report Series No. 85. Museum of Anthropology, University of Kansas, Lawrence.
- Blakeslee, Donald J., Michelle Peck, and Ronald A. Dorsey
2001 Glen Elder: A Western Oneota Bison Hunting Camp. *Midcontinental Journal of Archaeology* 26(1):79–104.
- Bozell, John R.
1991 Fauna from the Hulme Site and Comments on Central Plains Tradition Subsistence Variability. *Plains Anthropologist* 36(136):229–253.
- Brown, Marie E.
1982 Cultural Behavior as Reflected in the Vertebrate Faunal Assemblages of Three Smoky Hill Sites. Unpublished Master's thesis, Department of Anthropology, University of Kansas, Lawrence.
- Fenenga, Franklin, and Paul A. Cooper
1951 *Appraisal of the Archeological and Paleontological Resources of the Lovewell Reservoir, Jewell County, Kansas*. Missouri River Basin Survey, Smithsonian Institution, Washington, D.C. Mimeographed report on file, Museum of Anthropology, University of Kansas, Lawrence.
- Fishel, Richard L.
1999 *Bison Hunters of the Western Prairies: Archaeological Investigations at the Dixon Site (13WD8), Woodbury County, Iowa*. Report No. 21. Office of the State Archaeologist, University of Iowa, Iowa City.
- Hedden, John G., and Brad Logan
1992 Description and Results of Field Survey. In *Archaeological Survey of Lovewell Reservoir, Jewell County, Kansas, 1991*, by Brad Logan and John G. Hedden, pp. 29–59. Project Report Series No. 77. Museum of Anthropology, University of Kansas, Lawrence.
- Hill, A. T.
1927 Mr. A. T. Hill's Own Story. *Nebraska History Magazine* 10(3):162–167.
- Holen, Steven R.
1996 The Lovewell Mammoth: A Late Wisconsinan Site in North-Central Kansas. *Current Research in the Pleistocene* 13:69–70.
2007 The Age and Taphonomy of Mammoths at Lovewell Reservoir, Jewell County, Kansas, USA. *Quaternary International* 169–170:51–63.
- Holen, Steven R., Ralph G. Corner, and Rolfe D. Mandel.
1995 A Late Farmdalian-Woodfordian Fauna from Lovewell Reservoir, Jewell County, Kansas. *Current Research in the Pleistocene* 12:98–99.
- Holen, Steven R. and R. H. Talley
2003 The April Fools' Mammoth Site (14JW101), Lovewell Reservoir, Jewell County, Kansas. Archaeological Series Technical Report No. 2002–03. Denver Museum of Nature and Science, Denver, Colorado.
- Hughes, Richard E.
2009 Letter Report No. 2009–52, 16 June. Geochemical Research Laboratory, Portola Valley, California.
- Koch, Amy
1995 The McIntosh Fauna: Late Prehistoric Exploitation of Lake and Prairie Habitats in the Nebraska Sand Hills. *Plains Anthropologist* 40:39–60.
- Koch, Amy, Trisha Nelson, and John R. Bozell
1999 Modified and Unmodified Fauna. In *Archeology of the Patterson Site: Native American Life in the Lower Platte Valley A.D. 1000–1300*, by John R. Bozell and John Ludwickson, pp. 71–84. Nebraska State Historical Society, Lincoln. Submitted to Nebraska Department of Roads, Lincoln.
- Logan, Brad
1990 The Richland Crematorium: New Evidence of Plains Woodland Mortuary Practices in the Central Plains. *Plains Anthropologist* 35(128):103–124.
1993 *Archaeological Investigations in Lovewell Reservoir, Jewell County, Kansas-1992*. Project Report Series No. 79. Museum of Anthropology, University of Kansas, Lawrence.
1995 *Phasing in White Rock: Archaeological Investigation of the Warne and White Rock Sites, Lovewell Reservoir, Jewell County, Kansas, 1994–1995*. Project Report Series No. 90. Museum of Anthropology, University of Kansas, Lawrence.

- 1998a Oneota Far West: The White Rock Phase. *The Wisconsin Archeologist* 79(2):248–267.
- 1998b The Fat of the Land: White Rock Phase Bison Hunting and Grease Production. *Plains Anthropologist* 43(166):349–366.
- 2000 Review of *The Contested Plains: Indians, Goldseekers, and the Rush to Colorado* by Eliot West. *Plains Anthropologist* 45(172):218–220.
- 2006 *Archaeological Investigations at the Johns Creek and Warne Sties, Lovewell Reservoir, Jewell County, Kansas-2003*. Department of Sociology, Anthropology, and Social Work, Kansas State University, Manhattan. Submitted to Nebraska-Kansas Area Office, Bureau of Reclamation, McCook, Nebraska.
- 2007 *Windmill Creek: National Register of Historic Places Evaluation of a Central Plains Tradition House Site, Lovewell Reservoir, Jewell County, Kansas-2006*. Department of Sociology, Anthropology, and Social Work, Kansas State University, Manhattan. Submitted to Bureau of Reclamation, Nebraska-Kansas Area Office, Grand Island, Nebraska.
- 2008 *The Phil Site: Excavation of a Central Plains Tradition House, Lovewell Reservoir, Jewell County, Kansas-2004*. Department of Sociology, Anthropology, and Social Work, Kansas State University, Manhattan. Submitted to Bureau of Reclamation, Nebraska-Kansas Area Office, McCook, Nebraska.
- 2010a *Archeological Investigations at the White Rock (14JW1) and Bergstrom (14JW17) Sites, Lovewell Reservoir, Jewell County, Kansas-2009*. Department of Sociology, Anthropology, and Social Work, Kansas State University, Manhattan. Submitted to Bureau of Reclamation, Nebraska-Kansas Area Office, McCook, Nebraska.
- 2010b A Matter of Time: The Temporal Relationship of Western Oneota and Central Plains Traditions. *Plains Anthropologist* 55(216):277–292.
- 2011a *Archaeological Salvage Investigation of Montana Creek East (14JW46), Lovewell Reservoir, Jewell County, Kansas-2010*. Department of Sociology, Anthropology, and Social Work, Kansas State University, Manhattan. Submitted to Bureau of Reclamation, Nebraska-Kansas Area Office, Grand Island, Nebraska.
- 2011b The Phil Site (14JW48) and the Central Plains Tradition at Lovewell Reservoir, Jewell County, Kansas. *The Kansas Anthropologist* 32:32–115.
- Logan, Brad, and William E. Banks
1994 *White Rock Revised: Archaeological Investigations at the Warne and White Rock Sites, Lovewell Reservoir, Jewell County, Kansas, 1993*. Project Report Series No. 85. Museum of Anthropology, University of Kansas, Lawrence.
- Logan, Brad, John R. Bozell, and Carl R. Falk
2011 Faunal Analysis. In *The Phil Site (14JW48) and the Central Plains Tradition at Lovewell Reservoir, Jewell County, Kansas*, by Brad Logan, pp. 91–102. *The Kansas Anthropologist* 32:91–102.
- Logan, Brad, and John G. Hedden
1992 *Archaeological Survey of Lovewell Reservoir, Jewell County, Kansas, 1991*. Project Report Series No. 77. Museum of Anthropology, University of Kansas, Lawrence.
- Logan, Brad, Richard E. Hughes, and Dale R. Henning
2001 Western Oneota Obsidian: Sources and Implications. *Plains Anthropologist* 46(175):55–64.
- Logan, Brad, Larry D. Martin, and Jack F. Neas
1991 Late Pleistocene *Hemiauchenia* in North Central Kansas. *Current Research in the Pleistocene* (8:97–99).
- Ludwickson, John
1994 Historic Indian Tribes: Ethnohistory and Archaeology. In *The Cellars of Time: Paleontology and Archaeology in Nebraska*. NEBRASKAland Magazine 72(1):134–145.
- Marshall, James O.
1969 *The Glen Elder Focus: The Cultural Affiliations of Archaeological Material from the Glen Elder Site, 14ML1*. Department of Anthropology, University of Nebraska, Lincoln. Submitted to Midwest Region, National Park Service, U.S. Department of the Interior, Lincoln, Nebraska.
- 2008 A Return to Glen Elder: Cultural Affiliations of Archaeological Material from the Glen Elder Site (14ML1). *The Kansas Anthropologist* 29:60–93.
- Mick, Linda S.
1983 An Ecological Evaluation of Faunal Diversity in the Central Plains Tradition. Unpublished Master's thesis, Department of Anthropology, University of Nebraska, Lincoln.
- Munday, Frank J.
1927 The Record of the Pike Expedition. *Nebraska History Magazine* 10(3):168–192.
- Neuman, Robert W.
1963 *Archaeological Salvage Investigations in the Lovewell Reservoir Area, Kansas*. River Basin Survey Papers No. 32. Bulletin No. 185. Bureau of American Ethnology, Smithsonian Institution, Washington, D.C.

- Padilla, Matthew J., and Lauren W. Ritterbush
 2005 White Rock Oneota Chipped Stone Tools. *Midcontinental Journal of Archaeology* 30(2):259–298.
- Ritterbush, Lauren W.
 2001 Temper in White Rock Ceramics. *Current Archaeology in Kansas* 2:7–14.
 2002 Drawn by the Bison: Late Prehistoric Native Migration into the Central Plains. *Great Plains Quarterly* 22(4):259–270.
 2006 Late Prehistoric Oneota in the Central Plains. In *Kansas Archaeology*, edited by Robert J. Hoard and William E. Banks, pp. 151–164. University Press of Kansas, Lawrence.
- Ritterbush, Lauren W., and Brad Logan
 2000 Late Prehistoric Oneota Population Movement into the Central Plains. *Plains Anthropologist* 45(173):257–272.
 2006 *The Montana Creek Sites: Archaeological Investigations at Lovewell Reservoir, Jewell County, Kansas-2004*. Department of Sociology, Anthropology, and Social Work, Kansas State University, Manhattan. Submitted to Bureau of Reclamation, Nebraska-Kansas Area Office, McCook, Nebraska.
 2009a A Late Prehistoric Bison Processing Camp in the Central Plains: Montana Creek East (14JW46). *Plains Anthropologist* 54(211):217–236.
 2009b No Thread of Evidence-White Rock, Western Oneota, and the Kansa: Comments on “A Return to Glen Elder” by James O. Marshall. *The Kansas Anthropologist* 30:27–40.
- Roberts, Ricky L.
 1978 The Archaeology of the Kansas Monument Site: A Study in Historical Archaeology on the Great Plains. Unpublished Master’s thesis, Department of Anthropology, University of Kansas, Lawrence.
- Roper, Donna C.
 2006 The Central Plains Tradition. In *Kansas Archaeology*, edited by Robert J. Hoard and William E. Banks, pp. 105–132. University Press of Kansas, Lawrence.
- Rusco, Mary K.
 1960 *The White Rock Aspect*. Note Book No. 4. Laboratory of Anthropology, University of Nebraska, Lincoln.
- Stein, C. Martin
 2006 Kansas Lithic Resources. In *Kansas Archaeology*, edited by Robert J. Hoard and William E. Banks, pp. 264–282. University Press of Kansas, Lawrence.
- Warren, Ellen Morlan
 1997 *White Rock Historical Sketches*. Reprinted 1 February 1997. Superior Publishing Company, Inc., Superior, Nebraska. Originally published 31 August 1933, Superior Express, Superior, Nebraska.
- Wedel, Waldo R.
 1936 *An Introduction to Pawnee Archeology*. Bulletin No. 112. Bureau of American Ethnology, Smithsonian Institution, Washington, D.C.
 1943 *Archeological Investigations in Platte and Clay Counties, Missouri*. Bulletin No. 183. United States National Museum, Smithsonian Institution, Washington, D.C.
 1959 *An Introduction to Kansas Archeology*. Bulletin No. 74. Bureau of American Ethnology, Smithsonian Institution, Washington, D.C.
- West, Eliot
 1998 *The Contested Plains: Indians, Goldseekers, and the Rush to Colorado*. University Press of Kansas, Lawrence.
- Winger, Derek C., and Brad Logan
 1995 Ceramic Assemblage. In *Phasing in White Rock: Archaeological Investigation of the White Rock and Warne Sites, Lovewell Reservoir, Jewell County, Kansas, 1994–1995*, by Brad Logan, pp. 56–64. Project Report Series No. 90. Museum of Anthropology, University of Kansas, Lawrence.
- Winsor, M., and James A. Scarbrough
 1878 History of Jewell County, Kansas, with a Full Account of the Early Settlements and Indian Atrocities Committed Within Its Borders. Diamond Printing Office, Jewell City, Kansas. Electronic document, <https://archive.org/details/historyofjewellc00wins>, accessed March 15, 2021.

EXAMINATION OF CERAMIC VESSEL SHERDS FROM THE KERMIT HAYES NO. 2 SITE (14RC13), A LITTLE RIVER FOCUS SITE IN RICE COUNTY, KANSAS

TIMOTHY K. PERTTULA

Archeological & Environmental Consultants, LLC, Austin, Texas

A small sample of slipped or filmed ceramic vessel sherds, collected from the Kermit Hayes No. 2 site (14RC13) in Rice County, Kansas, is discussed. The site, with a council circle, is an important ca. A.D. 1450–1700 Little River focus component of the Great Bend Aspect in the Little Arkansas River valley in central Kansas. Of the nine examined sherds, one is identified as a Geneseo Red Filmed body sherd, but the other eight have either a white slip or a white film. The form and function of the white slipped/filmed vessels are not known, but they are rare, given that Wedel (1959) did not mention any white slipped or white filmed sherds in his description of more than 4,800 sherds from the Geneseo series ceramics from other nearby Little River focus sites. A few white slipped/filmed ceramic sherds have been identified by Susan Vehik at the Thompson site (14RC9). Wedel noted that the local Geneseo series types are sand tempered, and crushed sandstone and gypsum also were used. The white slipped/filmed sherds from the Kermit Hayes No. 2 site have the same temper composition as the Geneseo series types, and these white slipped/filmed sherds were apparently made locally by the same Little River focus potters that made Geneseo Plain, Geneseo Simple Stamped, and Geneseo Red Filmed.

The author recently examined nine distinctive ceramic vessel body sherds from the Kermit Hayes No. 2 site (14RC13) in Rice County, Kansas. The site, which contains a council circle, is an important ca. A.D. 1450–1700 Little River focus component of the Great Bend aspect in the Little Arkansas River valley in central Kansas (see Hoard and Banks 2006; Vehik 2021; Wedel 1959).

Little River focus ceramics comprise the Geneseo series, defined by Wedel (1959:233–241), including Geneseo Plain, Geneseo Simple Stamped, and Geneseo Red Filmed. These types have a sand-tempered paste, although more recent analyses of ceramic sherds from several Little River focus sites in Rice County suggested that these wares had stream-rolled sand, crushed sandstone, and gypsum temper inclusions (Susan Vehik, personal communication January 23, 2022). With the exception of a patchy red filmed body sherd (.411; see Figure 1, bottom row, left) from a Geneseo Red Filmed vessel, all of the other eight sherds have either a white slip or a white film on one or both sherd surfaces (see Figure 1); the sherds do not have glazes

or paint. Wedel (1959) made no mention of white slipped or filmed sherds in his classic analyses, but Vehik (personal communication January 23, 2022) identified a few sherds with a white slip/film on interior or exterior surfaces in the Little River focus Thompson site (14RC9) ceramic assemblage. They were from vessels tempered with sand, sandstone, and gypsum, suggesting that they were locally manufactured.

A distinction is made between filmed and slipped vessel sherds, whether sherds have a red or white film or slip. A film is applied to a dry vessel surface after the initial surface finish has dried. The film may be spotty, does not adhere very well to the vessel surface, and may be easily flaked or worn off during vessel use. Slips are distinguished by their color, textural difference, and thickness on a leather-hard vessel surface, and the slip adheres well to vessel surfaces; slipped vessel surfaces may be burnished. Slips are likely to be a different color from the body of the vessel.

The one Geneseo Red Filmed sherd (2020.A.60) has a coarse sand and rock-tempered paste. There



Figure 1. Selected sherds from the Kermit Hayes No. 2 site in the KSHS holdings. Top row: white slipped; bottom row: red filmed (left) and white filmed (right). Courtesy of Kansas Memory, Kansas Historical Society, <https://www.kansasmemory.org/item/50941>.

are patchy areas of red film on the interior sherd surface. It is not from a smoothed or burnished vessel. The sherd came from a vessel that was fired in a reducing environment and cooled in the open air (see Teltser 1993:Figure 2f). The body wall thickness is 7.5 mm.

Details on the white slipped/filmed body sherds from 14RC13 are provided in Table 1. The sherds appear to be from at least two different vessels. All the sherds have the same coarse sand and crushed rock temper, are from vessels fired in a reducing

environment and cooled in the open air (see Teltser 1993:Figure 2f-g), and are thin walled. One white slipped vessel sherd is only 3 mm thick, while the others have a mean thickness of $6.36 \pm .12$ mm (Table 1). Half of these sherds display evidence of smoothing on interior or exterior surfaces, and one white filmed sherd has parallel scrape marks on its exterior surface that suggest an initial attempt to burnish the vessel.

Five of the sherds have a white or a yellowish-white slip, 100 percent on their exterior surfaces and 80 percent on their interior surfaces. The remaining three sherds have a white film, 100 percent on their exterior surfaces and 67 percent on their interior surfaces.

What is to be made of the white slipped/filmed sherds from the Kermit Hayes No. 2 site? The form and function of the vessels are not known. They seemingly are rare, given that Wedel (1959) does not mention any white slipped or white filmed sherds in his description of more than 4,800 sherds from the Geneseo series ceramics from other nearby Little River focus sites. Vehik (personal communication January 23, 2022) identified a few white slipped/filmed ceramic sherds at the Thompson site. Wedel (1959:235) noted that the local Geneseo series types are sand tempered, and Vehik (personal communication January 23, 2022) indicated that temper inclusions also include crushed sandstone, and gypsum. The white slipped/filmed sherds from 14RC13 have the same temper composition as the

Table 1. White filmed and white slipped body sherds from 14RC13.

Specimen Number	Temper	Firing Conditions*	Surface Treatment	Thickness (mm)	Decoration
60	sand/rock	F	interior smoothed	6.3	exterior white slipped, sooted or smudged; interior white slipped
260	sand/rock	F	interior smoothed; exterior scraped	6.4	exterior white filmed
261	sand/rock	F	exterior smoothed	6.4	interior/exterior white filmed
266	sand/rock	F	—	6.2	interior/exterior filmed
348	sand/rock	F	—	3.0	interior/exterior slipped
414	sand/rock	F	—	6.7	interior/exterior slipped
495	sand/rock	G	interior smoothed	6.3	exterior white slipped; interior smudged
776	sand/rock	F	—	6.2	interior/exterior yellowish-white slipped

*F and G = fired in a reducing environment and cooled in the open air. See Teltser (1993:Figure 2).

Geneseo series types, and thus these white slipped/filmed sherds apparently were made locally by the same Little River focus potters who made Geneseo Plain, Geneseo Simple Stamped, and Geneseo Red Filmed. Petrographic analysis of samples of the white slipped/filmed and other Little River focus ceramic types likely would ascertain whether the white slipped/filmed ceramics are indeed of local manufacture or not. Petrographic analysis also could be used to determine the mineral composition of the white slip/film.

ACKNOWLEDGMENTS

I appreciate the opportunity provided by Christine Garst of the KSHS Archeology Lab to study the white slipped/filmed ceramic sherds from the Kermit Hayes No. 2 site. I also want to thank Dr. Susan Vehik, who shared her knowledge concerning the ceramic sherds she had studied of various Little River focus sites in Central Kansas.

REFERENCES CITED

- Hoard, Robert J., and William E. Banks (editors)
 2006 *Kansas Archaeology*. Kansas State Historical Society, Topeka, in conjunction with University Press of Kansas, Lawrence.
- Teltser, Patrice A.
 1993 An Analytic Strategy for Studying Assemblage-Scale Ceramic Variation: A Case Study from Southeast Missouri. *American Antiquity* 58(3):530–543.
- Vehik, Susan C.
 2021 Little River Focus, Council Circles, and Tubular Marine Shell Beads. Paper presented at the 2021 Plains Anthropological Conference.
- Wedel, Waldo R.
 1959 *An Introduction to Kansas Archeology*. Bulletin No. 174. Bureau of American Ethnology, Smithsonian Institution, Washington, D.C.

GUNFLINTS IN THE KANSAS HISTORICAL SOCIETY'S ARCHEOLOGICAL COLLECTIONS

CHRISTINE D. GARST

Kansas Historical Society

This paper presents a compilation of data relating to gunflints held in the archeological collections of the Kansas Historical Society (KSHS) as of 2021. Where known, site information, material origin, and gunflint measurements are noted.

A fascination for and appreciation of gunflints drove the compilation of the gunflint data presented here. Many gunflint reports focus on a single site or a series of related sites. This study examines a single institution's gunflint collection.

After researching the topic and much trial and error, the author decided that the easiest method of sharing the information was through a table (Appendix) with a brief discussion to follow. Measurements were taken in metric system, using electronic calipers. As color is often in the eye of the beholder, a Munsell soil color chart was used to standardize the various colors.

Use of a gunflint is essential for creating a spark needed to light the gunpowder in flintlock muskets and pistols. The gunflint is held in place by screws on the hammer. When the trigger is pulled, it moves the hammer and gunflint down to strike the iron frizzen, creating a spark that falls into the exposed gunpowder in the flash pan, igniting the powder and firing the lead bullet (Figure 1). Gunflints also can be used as strike-a-lights with a steel to light a fire. By the early to middle nineteenth century, firearms increasingly employed a percussion cap system, and gunflint usage declined. However, the technology did not disappear immediately, as demonstrated by the recovery of a flintlock mechanism at the 1864 Mine Creek Civil War Battlefield.

Gunflints generally are square to rectangular in shape. By description of manufacture, styles range from D-shaped gunspalls, square gunspalls, square blade with one or two dorsal arrises, Native made, and strike-a-lights to those expediently made and ill-shaped. The Native-made variety often includes a material choice.

Materials used to manufacture the gunflints in the KSHS collection vary from local cherts and experimental materials, such as glass, to flints from France and England. Only some of the local cherts can be identified (Figure 2), although many are Flint Hills region cherts (Figure 3). Examples from France generally are recognized by their honey yellow or blonde color (Figures 4–6). According to Kenmotsu (1990:345), French gunflints were the most common in America from 1675 to approximately 1800. Quarries in England began production in 1790 and surpassed the French commercial enterprise. Flint deposits in Suffolk County, predominantly in the Brandon area, are typically dark gray to black (Figure 7). Numerous countries in Europe and Asia also manufactured gunflints but not in quantities equal to France and England.

For references to details about gunflint technology, raw material sourcing, historical context, chronology, and general information, see Smoke Pfeiffer's (2015) bibliography. For additional images of gunflints in the KSHS collections, please visit the Kansas Memory webpage at <https://www.kansasmemory.org/>.

DISCUSSION

The Appendix lists 216 gunflints in the KSHS collections. Most were found in the eastern third of the state. This may reflect the greater population in that region at the time gunflints were in use. The sample comprises 145 (67.4 percent) English gunflints and 44 (20.5 percent) French gunflints. Twenty-six (12.1 percent) are made of materials from other sources. Below is a brief overview of those sites with both

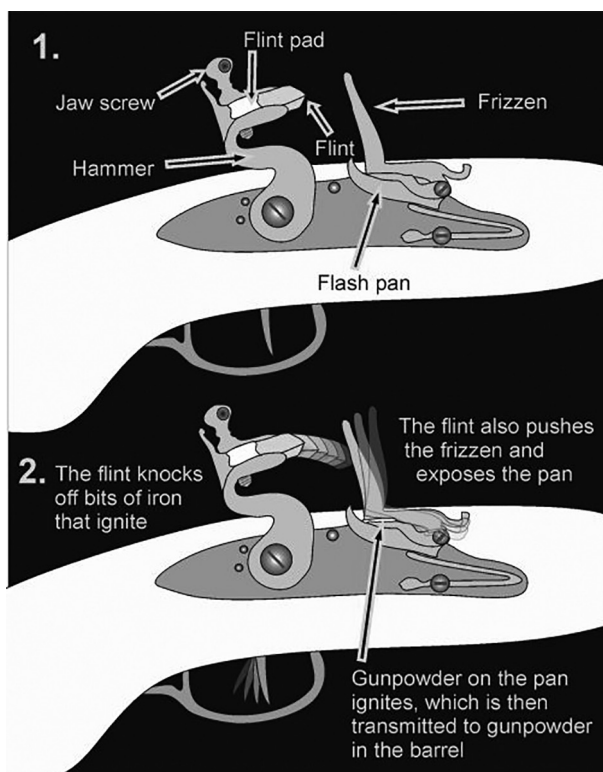


Figure 1. Diagram of a working flintlock, created by Todd Kristensen (2019).

gunflints and associated dates or date ranges, summarized from the KSHS site files.

14BT404 (Dismal River complex–Historic period): The Wells site is situated on Walnut Creek, a tributary of the Arkansas River, in Barton County. The site has Late Ceramic (A.D. 1650–1750) and Historic period artifacts, surface collected and donated to the KSHS. One definite and two possible gunflints came from the site.

14DO324 (1869–1950s): The Union Pacific Railroad Depot site is near the Kansas River in Douglas County. In addition to artifacts associated with the depot, commercial, and residential buildings, the collection includes a small prehistoric assemblage, possibly flood deposited. Two gunflints were recovered.

14DP2 (circa 1718–1749): The Doniphan site in Doniphan County was a large Kansa village. The site appears on Delisle's 1718 map (the earliest identifiable village site) and was visited by Etienne Veniard de Bourgmont in 1724. A single gunflint was found by a collector and donated to the KSHS.

14EK302 (Early Ceramic–Historic period): 14EK302 is a multicomponent site in Elk County along the Elk River. It has Early to Middle Ceramic

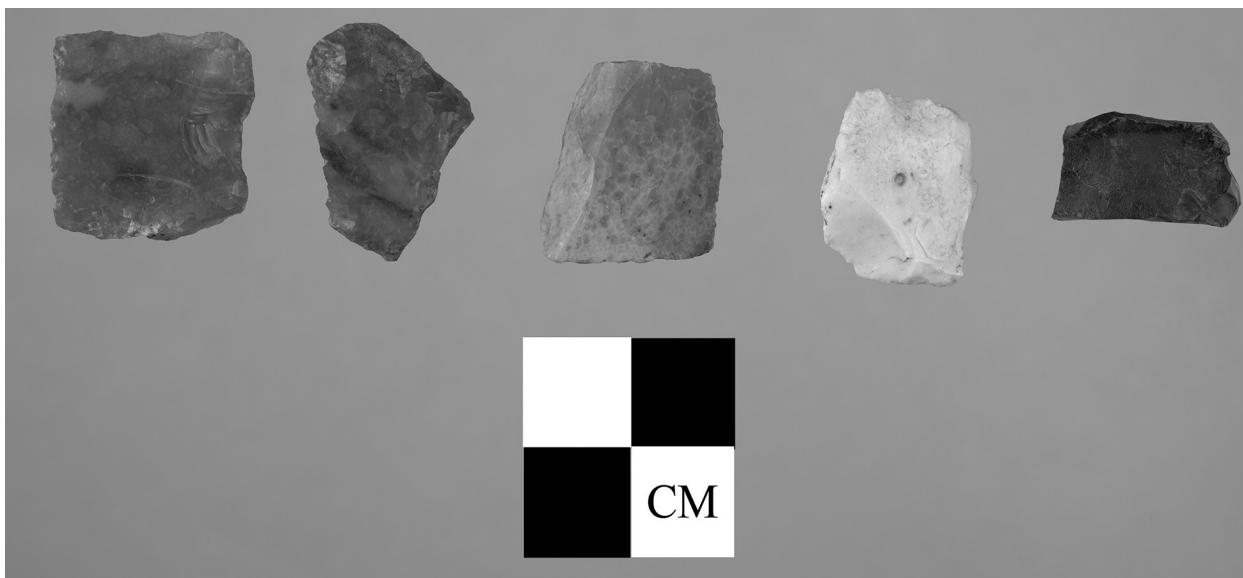


Figure 2. Gunflints made of Alibates agatized dolomite, chalcedony, Flint Hills region chert, and glass. Courtesy of Kansas Memory, Kansas Historical Society.

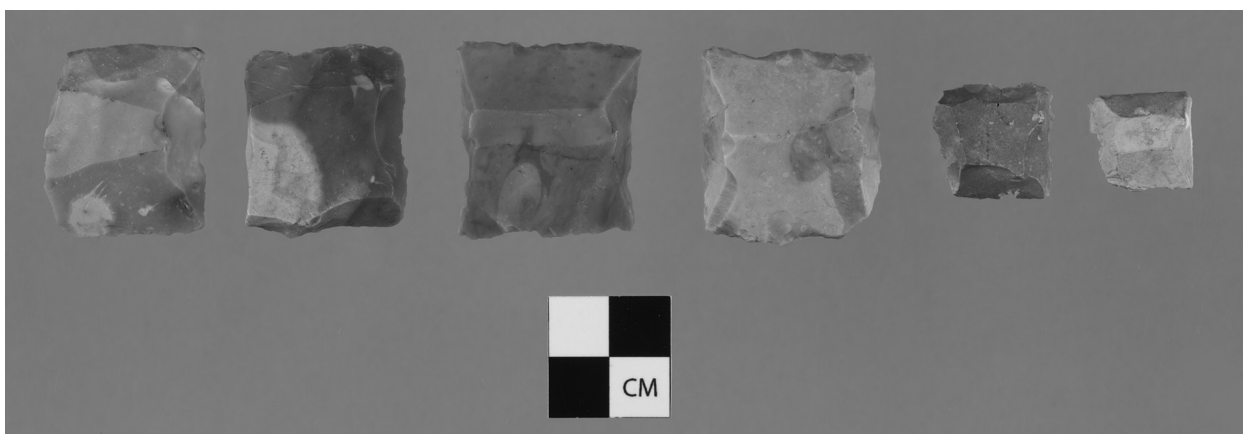


Figure 3. Gunflints from local cherts, recovered from the Canville Trading Post. Courtesy of Kansas Memory, Kansas Historical Society.

and Historic period artifacts, surface collected and donated to the KSHS, including four gunflints.

14EK304 (Archaic–Historic period): The site is a multicomponent site in Elk County along the Elk River. 14EK304 has Archaic, Late Ceramic, and Historic period components. A single gunflint was acquired by a collector and donated to the KSHS.

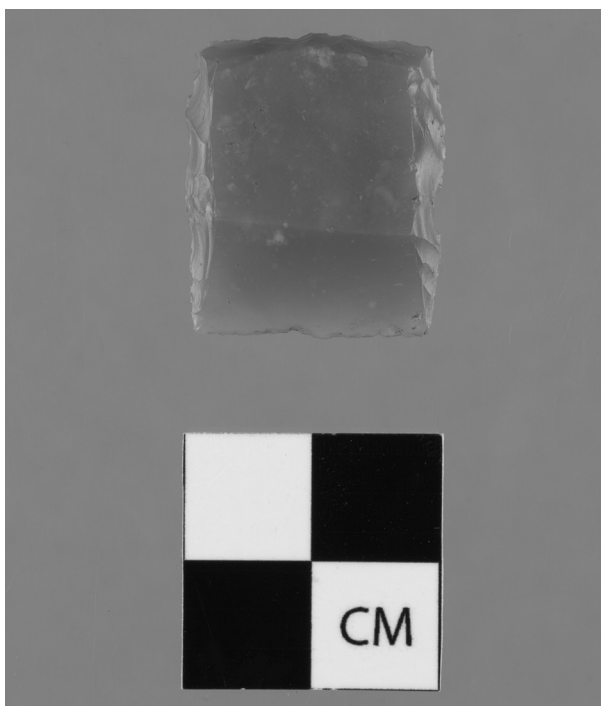


Figure 4. French gunflint from the Kaw Mission. Courtesy of Kansas Memory, Kansas Historical Society.

14GH328 (unknown dates): Little is known about 14GH328 in Graham County along the South Fork of the Solomon River. Recovered from the surface was a single “gunflint,” which instead may be the midsection of a plano-convex tool.

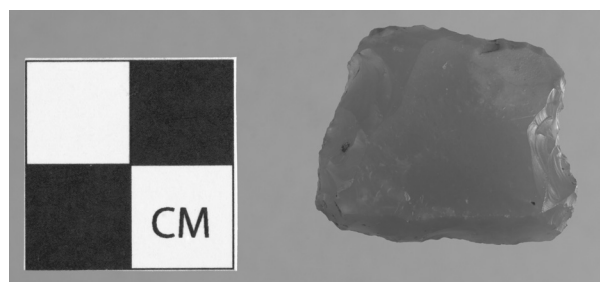


Figure 5. French gunflint from the Adair Cabin. Courtesy of Kansas Memory, Kansas Historical Society.

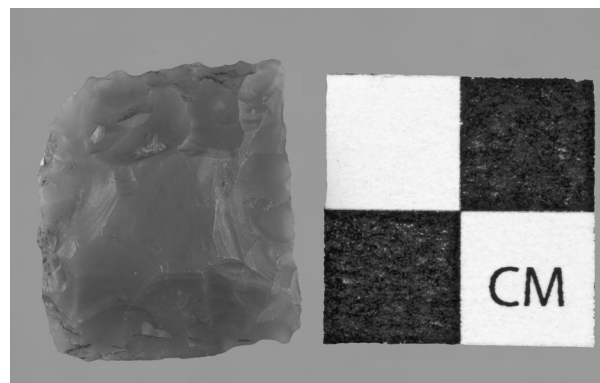


Figure 6. French gunflint from the Across the Creek site. Courtesy of Kansas Memory, Kansas Historical Society.

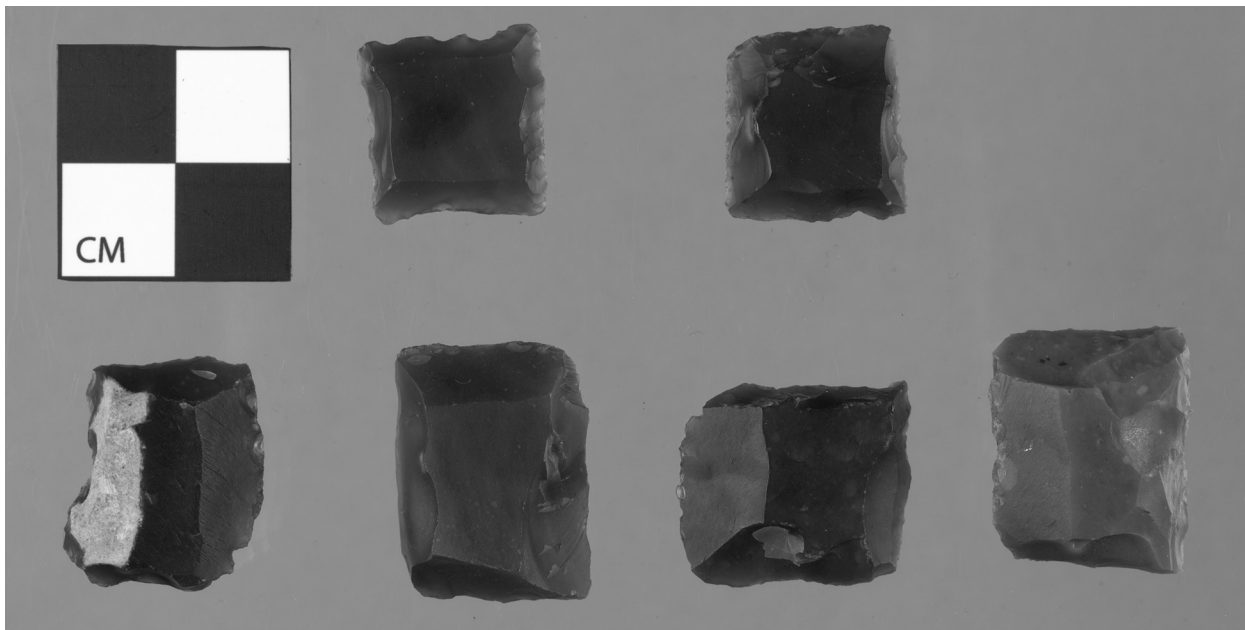


Figure 7. English gunflints from Fool Chief's Village. Courtesy of Kansas Memory, Kansas Historical Society.

14JO55 (late 1820s–1860s): This site is near the Kansa River in Johnson County and has been highly impacted by cultivation. 14JO55 was within the boundaries of the Shawnee Reserve and may have been either a Shawnee farmstead or Chouteau's trading house for the Shawnee. Two gunflints were retrieved from the surface of the site.

14JO406 (1940–Historic period): The Across the Creek site on a terrace near the Blue River in Johnson County has been impacted by cultivation and intermittent flooding. The site has a Middle Ceramic period Steed-Kisker component in addition to a small Historic period component. A single French gunflint from the surface was donated to the KSHS.

14LN305 (Prehistoric–Historic period): 14LN305 on Sugar Creek in Linn County was recorded as a lithic scatter. A single English gunflint was recovered from the surface.

14LO315 (1820–1854): The Indian Camp site is a Logan County burial with associated grave goods. The burial was excavated in 1917 and displayed at a local museum until 1989. The human remains and associated goods were analyzed and considered Historic period Native American but could not be

further identified. Four gunflints were excavated (UBS 1989–44).

14MM322 (1833–1857): The Wea Presbyterian Mission, Osage River Subagency, and Wea and Piankeshaw Baptist Mission, located in Miami County, was excavated during a salvage project in 1997. The foundations of a Mission house, a spring house, another outbuilding, and a well were excavated. The site yielded a single English gunflint.

14MM327 (1854–1912): The Adair Cabin in Miami County was the territorial period home of abolitionists Reverend Samuel and Florella Brown Adair and often was visited by Florella's brother John Brown. A single French gunflint was recovered during the 2014 Kansas Archeology Training Program field school.

14MO368 (1846–present): The Kaw Methodist Mission in Morris County is listed in the National Register of Historic Places. The Mission operated as a school from 1851 to 1854. Prior to that, a portion of the Mormon Battalion (1846–1848) may have camped near the present building. A single French gunflint was found.

14MO414 (1847–1874): The 102 Steel Point site in Morris County had both an Archaic and Historic

period component. The site was one of three large Kansa villages along the Neosho River, occupied during the mid-nineteenth century. Surface survey and testing in 2006 yielded three gunflints, and an additional 53 were donated in 2020. This accounts for a quarter (25.9 percent) of the gunflints in the KSHS collections.

14MO701 (1854–1862): The Arthur Baker house and store were located in Morris County along the Santa Fe Trail. In 1862 the house, store, and all out-buildings were burned to the ground. The artifact collection, excavated by Emporia State University field schools and donated to the KSHS, includes a small pre-1854 lithic assemblage. A single gunflint was recovered.

14MY305 (1800–1900): The Infinity site in Montgomery County was a habitation site, occupied intermittently from the Archaic to the Late Ceramic period with a historic component on the surface. The site produced a single English gunflint.

14NO396 (1844–1872): The Canville Trading Post near the Osage reservation in Neosho County was established by A. B. Canville. The reservation land was ceded to the United States in 1870, and the Osage moved to Oklahoma, followed within a few years by Canville. Seventy-six gunflints, accounting for more than one-third (35.3 percent) of the KSHS gunflint collection, were accumulated from 14NO396 and donated to the KSHS in 1993.

14SH301 (1831–1848): Hard Chief's Village near the Kansas River in Shawnee County was one of three major Kansa villages. Excavations in 1987 revealed 15 possible houses and storage pits and yielded a single English gunflint.

14SH302 (1831–1848): 14SH302 is one of several possible locations of American Chief's Village, one of the three major Kansa villages along the Kansas River in Shawnee County. The site has been collected for decades. A single English gunflint was acquired around the turn of the nineteenth/twentieth century and donated to the KSHS in 1956.

14SH305 (1828–1844): Fool Chief's Village was one of three major Kansa villages along the Kansas

River in Shawnee County. Forty-five gunflints (20.8 percent of the KSHS gunflint collections) were retrieved during excavations spanning 2011 to 2013.

14SH336 (1848–1858): Uniontown, a Potawatomi trading post and historic town site was located along the Oregon-California Trail and the Kansas River in Shawnee County. The site was burned twice, first in 1849 and later in 1859. After that the town was abandoned, but the property continued to function as a farm and rural residence. A single gunflint was recovered.

14TO313 (1000–1850): 14TO313 was a camp/workshop on the Saline River in Trego County. The multicomponent site yielded a single English gunflint from the surface.

FUTURE RESEARCH

Only some of the gunflints in the KSHS holdings were acquired through controlled archeological investigation, yet all are suitable for numerous additional studies and could answer future research questions. The number of gunflints located at, recovered by, or donated to the KSHS will undoubtedly continue to increase, aiding in further research.

REFERENCES

- Gretag Macbeth
1998 *Munsell Soil Color Charts*, revised. GretagMacbeth, New Windsor, New York.
- Kenmotsu, Nancy
1990 Gunflints: A Study. *Historical Archaeology* 24(2): 340–372.
- Kristensen, Todd
2019 Flash in the Pan: The Archaeology of Gunflints in Alberta. Electronic document, Flash in the pan: The archaeology of gunflints in Alberta – RETROactive (albertahistoricplaces.com), accessed November 9, 2021.
- Pfeiffer, Smoke
2015 Gunflints: An Introductory Bibliography. Electronic document, https://www.academia.edu/14806439/Gunflints_An_Introductory_Bibliography_August_2015, accessed November 9, 2021.

APPENDIX

Specimen	Color Munsell	Length (mm)	Width (mm)	Thickness (mm)	Origin	Time Period	Comments
14BT404 2021.B.124	Black 10YR 2/1	18.07	20.63	7.09	English	No date	Dismal River-Historic period
14BT404 2021.B.313	Grayish	22.18	17.36	5.77	Quartzite	No date	Dismal River-Historic period
14BT404 2021.B.781	Grayish	19.82	19.04	4.76	Florence chert	No date	Dismal River-Historic period
14DO324-44	Olive brown 2.5YR	28.85	22.48	8.60	French	1869–1950s	UPRR Depot, Lawrence
14DO324-651-1	Banded gray	28.33	Fragment	7.99	Florence chert	1869–1950s	UPRR Depot, Lawrence
14DP2 2018.D.256	White 10YR 8/1	21.47	18.18	10.53	Local chert	1718–1749	Doniphan site
14EK302 72.14.393	Very dark gray 2.5Y 3/0	18.32	19.14	6.10	English	No date	Early Ceramic-Historic period
14EK302 72.14.394	Black 7.5YR 2/0	26.61	7.75	8.41	English	No date	Early Ceramic-Historic period
14EK302 72.14.395	Very dark gray 2.5Y 3/0	18.33	19.21	6.56	English	No date	Early Ceramic-Historic period
14EK302 72.14.396	Black 2.5Y 2/0	19.35	21.08	5.80	English	No date	Surface find at Early-Middle Ceramic period site
14EK304 1975.103.2207	Black 10YR 2/1	20.78	19.76	7.00	English	No date	Multicomponent Archaic & Historic periods
14GH328-0-1	Strong brown 7.5YR 4/6	27.62	19.69	6.08	Smoky Hill Jasper	No date	Possible plano-convex tool
14JO406 2017-B.381	Dark yellowish brown 10YR 4/4	18.44	20.61	6.96	French	No date	SteedKisker component-Historic period
14JO55-0-16	Light brownish gray 10YR 6/2	17.23	20.59	6.29	English	1820s–1860s	Shawnee Reserve
14JO55-0-17	Very dark gray 7.5YR 3/0	26.64	19.61	6.23	English	1820s–1860s	Shawnee Reserve
14LN305-101	Very dark gray 7.5YR 2/0	18.27	17.08	5.08	English	No date	Prehistoric-Historic period
14LO315	Light olive brown 2.5Y 5/4	26.01	25.12	6.62	French	1820–1854	UBS case
14LO315	Light yellowish brown 2.5Y 6/4	28.22	28.31	7.67	French	1820–1854	UBS case
14LO315	Brown 10YR 5/3	31.57	28.49	10.87	French	1820–1854	UBS case
14LO315	Light brownish gray 10YR 6/2	31.38	26.87	8.71	French	1820–1854	UBS case
14MM322-40-1	Brown 7.5YR 2.5/1	19.95	18.24	7.56	English	1833–1857	Wea Mission
14MM327-633-1	Dark grayish brown 2.5YR	25.19	19.96	6.30	French	1854–1912	Adair Cabin
14MO368-400-1	Blonde 2.5YR 6/4	23.6	20.10	6.24	French	1846	Kaw Mission yard, Mormon Battalion?
14MO414-0-48	Black 2.5Y 2/0	14.88	14.97	5.08	English	1847–1874	Kanza village
14MO414-0-320	Black 2.5YR 2.5/0	21.72	21.92	7.47	English	1847–1874	Kanza village

APPENDIX. (continued)

Specimen	Color Munsell	Length (mm)	Width (mm)	Thickness (mm)	Origin	Time Period	Comments
14MO414-0-321	Dark gray 2.5YR 4/0	16.32	17.29	5.07	English	1847–1874	Kanza village
14MO414 2020.D.1019	Light olive brown 2.5Y 5/4	17.53	Fragment	3.98	French	1847–1874	Kanza village
14MO414 2020.D.1020	Yellowish brown 10YR 5/4	19.49	19.55	5.83	French	1847–1874	Kanza village
14MO414 2020.D.1021	Light olive brown 2.5Y 5/3	17.82	17.76	5.09	French	1847–1874	Kanza village
14MO414 2020.D.1022	Light olive brown 2.5Y 5/3	18.05	18.57	7.48	French	1847–1874	Kanza village
14MO414 2020.D.1023	Light olive brown 2.5Y 5/3	23.04	18.48	8.32	French	1847–1874	Kanza village
14MO414 2020.D.1024	Olive brown 2.5Y 4/3	17.00	17.08	5.63	French	1847–1874	Kanza village
14MO414 2020.D.1025	Light olive brown 2.5Y 5/4	19.18	18.58	7.01	French	1847–1874	Kanza village
14MO414 2020.D.1026	Light olive brown 2.5Y 5/4	22.68	18.83	6.32	French	1847–1874	Kanza village
14MO414 2020.D.1027	Light olive brown 2.5Y 5/4	23.20	22.43	9.92	French	1847–1874	Kanza village
14MO414 2020.D.1028	Olive brown 2.5Y 4/3	28.16	25.92	8.13	French	1847–1874	Kanza village
14MO414 2020.D.1029	Light brownish gray 2.5Y 6/2	18.10	16.29	7.56	French	1847–1874	Kanza village
14MO414 2020.D.1030	Indeterminate	18.29	18.87	5.55	Alibates	1847–1874	Kanza village
14MO414 2020.D.1031	Variegated brown	Fragment	Fragment	Fragment	Chalcedony?	1847–1874	Kanza village
14MO414 2020.D.1032	Variegated gray (heated)	15.38	18.55	5.53	Local chert	1847–1874	Kanza village
14MO414 2020.D.1033	Pinkish white 2.5YR 8/2	16.22	17.28	6.98	Local chert	1847–1874	Kanza village
14MO414 2020.D.1034	Olive	Fragment	17.87	5.76	Glass	1847–1874	Kanza village
14MO414 2020.D.1035	Very dark gray 10YR 3/1	18.34	16.83	5.40	English	1847–1874	Kanza village
14MO414 2020.D.1036	Black 7.5YR 2.5/1	19.70	18.36	5.81	English	1847–1874	Kanza village
14MO414 2020.D.1037	Black 7.5YR 2.5/1	20.31	19.01	8.07	English	1847–1874	Kanza village
14MO414 2020.D.1038	Mottled gray to brown	22.57	24.21	8.44	English	1847–1874	Kanza village
14MO414 2020.D.1039	Banded gray	23.83	24.00	9.12	English	1847–1874	Kanza village
14MO414 2020.D.1040	Black 7.5YR 2.5/1	25.60	19.81	7.91	English	1847–1874	Kanza village
14MO414 2020.D.1041	Black 7.5YR 2.5/1	22.74	22.67	8.72	English	1847–1874	Kanza village
14MO414 2020.D.1042	Black 7.5YR 2.5/1	21.44	22.32	9.23	English	1847–1874	Kanza village
14MO414 2020.D.1043	Black 7.5YR 2.5/1	22.36	19.26	6.64	English	1847–1874	Kanza village
14MO414 2020.D.1044	Black 10YR 2/1	21.36	23.55	7.15	English	1847–1874	Kanza village
14MO414 2020.D.1045	Banded gray	25.25	20.18	7.35	English	1847–1874	Kanza village
14MO414 2020.D.1046	Black 10YR 2/1	19.48	20.66	8.52	English	1847–1874	Kanza village
14MO414 2020.D.1047	Black 10YR 2/1	14.12	16.04	5.92	English	1847–1874	Kanza village
14MO414 2020.D.1048	Black 10YR 2/1	19.34	15.08	6.72	English	1847–1874	Kanza village
14MO414 2020.D.1061	Black 10YR 2/1	26.06	Fragment	5.14	English	1847–1874	Kanza village
14MO414 2020.D.1062	Very dark gray 2.5Y 3/1	19.03	18.57	4.64	English	1847–1874	Kanza village
14MO414 2020.D.1063	Very dark gray 2.5Y 3/1	Fragment	19.63	5.55	English	1847–1874	Kanza village
14MO414 2020.D.1064	Black 2.5Y 2.5/1	Fragment	18.73	7.37	English	1847–1874	Kanza village
14MO414 2020.D.1065	Black 2.5Y 2.5/1	Fragment	Fragment	4.45	English	1847–1874	Kanza village

APPENDIX. (continued)

Specimen	Color Munsell	Length (mm)	Width (mm)	Thickness (mm)	Origin	Time Period	Comments
14MO414 2020.D.1066	Black 2.5Y 2.5/1	18.08	Fragment	5.46	English	1847–1874	Kanza village
14MO414 2020.D.1067	Dark gray 10Y 4/1	19.25	16.04	6.44	English	1847–1874	Kanza village
14MO414 2020.D.1068	Very dark gray 5Y 3/1	19.25	16.04	6.44	English	1847–1874	Kanza village
14MO414 2020.D.1222	Mottled gray	20.37	23.10	6.63	English	1847–1874	Kanza village
14MO414 2020.D.1223	Dark gray 2.5Y	23.57	20.00	6.08	English	1847–1874	Kanza village
14MO414 2020.D.1224	Mottled gray	21.43	19.86	8.37	English	1847–1874	Kanza village
14MO414 2020.D.1225	Mottled gray	19.45	19.88	5.95	English?	1847–1874	Kanza village
14MO414 2020.D.1226	Mottled gray	24.54	22.08	6.80	English?	1847–1874	Kanza village
14MO414 2020.D.1227	Gray 2.5Y 5.1	17.18	19.99	5.46	English?	1847–1874	Kanza village
14MO414 2020.D.1228	Mottled gray	17.84	19.37	6.54	English?	1847–1874	Kanza village
14MO414 2020.D.1229	Light gray 2.5Y 7/1	19.28	18.80	6.01	English?	1847–1874	Kanza village
14MO414 2020.D.1230	Mottled gray	12.64	14.33	7.34	English?	1847–1874	Kanza village
14MO414 2020.D.1231	Mottled gray	18.33	21.15	7.70	English?	1847–1874	Kanza village
14MO414 2020.D.1232	Mottled gray	19.12	17.77	6.22	English?	1847–1874	Kanza village
14MO414 2020.D.1233	Mottled light gray	20.73	19.99	6.97	Local chert?	1847–1874	Kanza village
14MO414 2020.D.1234	Mottled gray	13.94	17.82	6.72	Local chert?	1847–1874	Kanza village
14MO414 2020.D.1235	Mottled light gray	20.44	16.32	7.15	Local chert?	1847–1874	Kanza village
14MO414 2020.D.1236	Mottled gray	16.92	21.72	6.38	Local chert?	1847–1874	Kanza village
14MO414 2020.D.1237	Mottled white to light gray	19.48	18.93	7.39	Local chert?	1847–1874	Kanza village
14MO701-651-1	Variiegated gray	27.67	Fragment	7.90	Florence chert	1854–1862	Baker Store
14MY305	Very dark gray 2.5Y 3/0	20.40	17.64	5.56	English	1800–1900	Infinity site historic component
14NO1320 1994.B.6584	Brown 2.5YR 2.5/1	16.27	16.38	5.37	English	No date	Cache
14NO1320 1994.B.6585	White to gray	19.19	18.83	8.47	Local chert	No date	Cache
14NO396 1994.B.4993	Blonde 2.5Y 6/4	19.97	18.68	5.70	French	1844–1872	Canville Trading Post
14NO396 1994.B.4994	Blonde 2.5Y 6/4	23.11	20.20	8.12	French	1844–1872	Canville Trading Post
14NO396 1994.B.4995	Blonde 2.5Y 6/4	24.34	19.91	5.45	French	1844–1872	Canville Trading Post
14NO396 1994.B.4996	Blonde 2.5Y 6/4	22.80	19.24	6.38	French	1844–1872	Canville Trading Post
14NO396 1994.B.4997	Blonde 2.5Y 5/6	22.55	16.87	5.50	French	1844–1872	Canville Trading Post
14NO396 1994.B.4998	Blonde 2.5Y 5/4	18.89	20.53	6.73	French	1844–1872	Canville Trading Post
14NO396 1994.B.4999	Blonde 2.5Y 5/4	19.91	19.43	5.51	French	1844–1872	Canville Trading Post
14NO396 1994.B.5000	Blonde 2.5Y 6/4	23.50	18.44	6.45	French	1844–1872	Canville Trading Post
14NO396 1994.B.5001	Blonde 2.5Y 5/4	24.80	18.41	4.73	French	1844–1872	Canville Trading Post

APPENDIX. (continued)

Specimen	Color Munsell	Length (mm)	Width (mm)	Thickness (mm)	Origin	Time Period	Comments
14NO396 1994.B.5002	Blonde 2.5Y 6/4	21.62	19.42	7.81	French	1844–1872	Canville Trading Post
14NO396 1994.B.5003	Blonde 2.5Y 6/4	19.14	14.48	6.08	French	1844–1872	Canville Trading Post
14NO396 1994.B.5004	Blonde 2.5Y 6/4	22.00	Fragment	3.21	French	1844–1872	Canville Trading Post
14NO396 1994.B.5006	Dark gray 10YR 4/1	16.95	14.00	4.76	English	1844–1872	Canville Trading Post
14NO396 1994.B.5007	Light gray 2.5YR 5/0	16.46	16.19	5.00	English	1844–1872	Canville Trading Post
14NO396 1994.B.5008	Black 2.5YR 2.5/0	20.88	19.34	8.49	English	1844–1872	Canville Trading Post
14NO396 1994.B.5009	Black 2.5YR 2.5/0	26.88	28.17	8.95	English	1844–1872	Canville Trading Post
14NO396 1994.B.5010	Black 2.5YR 2.5/0	32.62	28.95	9.18	English	1844–1872	Canville Trading Post
14NO396 1994.B.5011	Black 2.5YR 2.5/0	35.30	32.99	11.90	English	1844–1872	Canville Trading Post
14NO396 1994.B.5012	Dark gray 2.5YR 3/0	25.91	26.60	8.60	English	1844–1872	Canville Trading Post
14NO396 1994.B.5013	Black 2.5YR 2.5/0	19.08	18.36	7.20	English	1844–1872	Canville Trading Post
14NO396 1994.B.5014	Dark gray 2.5YR 3/0	20.88	19.34	8.49	English	1844–1872	Canville Trading Post
14NO396 1994.B.5015	Dark gray 2.5YR 4/0	31.95	27.90	10.37	English	1844–1872	Canville Trading Post
14NO396 1994.B.5016	Black 2.5YR 5/0	28.59	29.60	7.91	English	1844–1872	Canville Trading Post
14NO396 1994.B.5017	Dark gray 2.5YR 4/0	18.33	17.60	6.49	English	1844–1872	Canville Trading Post
14NO396 1994.B.5018	Dark gray 2.5YR 4/0	27.56	26.77	11.62	English	1844–1872	Canville Trading Post
14NO396 1994.B.5019	Light gray 2.5YR 6/0	31.96	28.89	9.63	English	1844–1872	Canville Trading Post
14NO396 1994.B.5020	Dark gray 2.5YR 4/0	27.22	29.60	6.80	English	1844–1872	Canville Trading Post
14NO396 1994.B.5021	Dark gray 2.5YR 4/0	21.99	17.78	6.97	English	1844–1872	Canville Trading Post
14NO396 1994.B.5022	Black 2.5YR 2.5/0	17.70	11.46	6.30	English	1844–1872	Canville Trading Post
14NO396 1994.B.5023	Light gray 2.5YR 5/0	25.28	17.16	6.70	English	1844–1872	Canville Trading Post
14NO396 1994.B.5024	Dark gray 2.5YR 4/0	25.91	21.54	8.34	English	1844–1872	Canville Trading Post
14NO396 1994.B.5025	Dark gray 2.5YR 4/0	33.60	27.49	9.50	English	1844–1872	Canville Trading Post
14NO396 1994.B.5026	Dark gray 2.5YR 4/0	20.42	16.40	7.00	English	1844–1872	Canville Trading Post
14NO396 1994.B.5027	Light gray 10YR 7/1	30.66	24.52	8.59	English	1844–1872	Canville Trading Post
14NO396 1994.B.5028	Dark gray 2.5YR 4/0	35.36	32.88	11.60	English	1844–1872	Canville Trading Post
14NO396 1994.B.5029	Brown 10YR 4/2	19.63	16.32	5.20	English	1844–1872	Canville Trading Post
14NO396 1994.B.5030	Dark gray 2.5YR 3/0	21.36	20.52	6.26	English	1844–1872	Canville Trading Post
14NO396 1994.B.5031	Dark gray 2.5YR 4/0	27.84	20.84	7.00	English	1844–1872	Canville Trading Post
14NO396 1994.B.5032	Dark gray 2.5YR 4/0	28.89	25.40	6.99	English	1844–1872	Canville Trading Post
14NO396 1994.B.5033	Black 2.5YR 2.5/0	21.46	13.21	6.40	English	1844–1872	Canville Trading Post
14NO396 1994.B.5034	Black 5YR 2.5/1	24.48	22.85	9.00	English	1844–1872	Canville Trading Post
14NO396 1994.B.5035	Brown 10YR 6/2	15.57	15.69	6.58	English	1844–1872	Canville Trading Post
14NO396 1994.B.5036	Variegated brown	35.52	27.56	10.19	English	1844–1872	Canville Trading Post
14NO396 1994.B.5037	Black 2.5YR 2.5/0	17.45	17.35	5.92	English	1844–1872	Canville Trading Post

APPENDIX. (continued)

Specimen	Color Munsell	Length (mm)	Width (mm)	Thickness (mm)	Origin	Time Period	Comments
14NO396 1994.B.5038	Dark gray 2.5YR 3/0	21.30	17.37	5.60	English	1844–1872	Canville Trading Post
14NO396 1994.B.5039	Dark gray 2.5YR 3/0	16.17	15.82	4.82	English	1844–1872	Canville Trading Post
14NO396 1994.B.5040	Dark gray 2.5YR 3/0	19.32	15.27	7.57	English	1844–1872	Canville Trading Post
14NO396 1994.B.5041	Black 2.5YR 2.5/0	19.04	22.01	10.12	English	1844–1872	Canville Trading Post
14NO396 1994.B.5042	Light gray 2.5YR 6/0	25.78	24.45	7.10	English	1844–1872	Canville Trading Post
14NO396 1994.B.5043	Light gray 10YR 5/1	18.40	20.02	6.64	English	1844–1872	Canville Trading Post
14NO396 1994.B.5044	Light gray 10YR 5/1	15.88	16.40	6.10	English	1844–1872	Canville Trading Post
14NO396 1994.B.5045	Black 2.5YR 2.5/0	22.56	18.04	4.84	English	1844–1872	Canville Trading Post
14NO396 1994.B.5046	Light gray 2.5YE 5/0	16.64	21.99	6.06	English	1844–1872	Canville Trading Post
14NO396 1994.B.5047	Dark gray 2.5YR 4/0	17.65	16.97	10.20	English	1844–1872	Canville Trading Post
14NO396 1994.B.5048	Black 2.5YR 2.5/0	18.61	20.77	6.13	English	1844–1872	Canville Trading Post
14NO396 1994.B.5049	Dark gray 2.5YR 4/0	19.74	23.20	7.07	English	1844–1872	Canville Trading Post
14NO396 1994.B.5050	Black 2.5YR 2.5/0	20.28	27.25	8.18	English	1844–1872	Canville Trading Post
14NO396 1994.B.5051	Blonde 2.5Y 6/4	18.43	14.20	5.76	English	1844–1872	Canville Trading Post
14NO396 1994.B.5052	Light gray 10YR 7/1	30.35	28.68	10.78	English	1844–1872	Canville Trading Post
14NO396 1994.B.5053	Mottled gray	22.42	24.59	8.09	Local chert	1844–1872	Canville Trading Post; Native made
14NO396 1994.B.5868	Black	30.70	28.66	13.43	English	1844–1872	Canville Trading Post
14NO396 1994.B.5869	Blonde	18.72	18.17	6.41	French	1844–1872	Canville Trading Post
14NO396 1994.B.5870	Gray 10YR 5/1 to 3/1	15.42	15.94	8.48	Local chert	1844–1872	Canville Trading Post
14NO396 1994.B.6299	Brown 10YR 4/2	Flake	Flake	Flake	English	1844–1872	Canville Trading Post
14NO396 1994.B.6300	Dark gray 10YR 3/1	16.54	Fragment	8.59	English	1844–1872	Canville Trading Post
14NO396 1994.B.6301	Gray 5YR 4/1	15.36	15.12	6.37	English	1844–1872	Canville Trading Post
14NO396 1994.B.6302	Gray 10YR 6/1	Fragment	16.16	5.60	English?	1844–1872	Canville Trading Post
14NO396 1994.B.6303	Gray 10YR 5/1	Fragment	Fragment	5.57	English	1844–1872	Canville Trading Post
14NO396 1994.B.6304	Brown 10YR 3/2	13.21	15.23	5.02	English	1844–1872	Canville Trading Post
14NO396 1994.B.6305	Brown 10YR 2/1	16.19	16.89	6.24	English	1844–1872	Canville Trading Post
14NO396 1994.B.6306	Dark gray 2.5YR 4/0 (heated)	Fragment	Fragment	Fragment	English	1844–1872	Canville Trading Post
14NO396 1994.B.6307	Dark gray 2.5YR 4/1	18.03	18.42	6.23	English	1844–1872	Canville Trading Post
14NO396 1994.B.6779	Light olive brown 2.5Y 5/3	Fragment	Fragment	6.06	French	1844–1872	Canville Trading Post
14NO396 1994.B.6780	Variegated blonde	Fragment	Fragment	Fragment	French	1844–1872	Canville Trading Post
14NO396 1994.B.6781	Variegated gray	Fragment	Fragment	Fragment	English	1844–1872	Canville Trading Post
14NO396 1994.B.6782	Dark gray 10YR 4/1	Fragment	Fragment	7.55	English	1844–1872	Canville Trading Post
14NO396 1994.B.6783	Dark grayish brown 10YR 4/2	Fragment	Fragment	6.46	English	1844–1872	Canville Trading Post

APPENDIX. (continued)

Specimen	Color Munsell	Length (mm)	Width (mm)	Thickness (mm)	Origin	Time Period	Comments
14NO396 1994.B.6784	Gray 2.5Y 5/1	Fragment	Fragment	6.42	English	1844–1872	Canville Trading Post
4NO396 1994.B.6785	Dark reddish gray 5YR 4/2	Fragment	Fragment	Fragment	English	1844–1872	Canville Trading Post
14SH301-27	Black 5Y 2.5/1	17.05	16.39	7.62	English	1830–1847	Hard Chief's Village
14SH302 1986.M.15	Black 2.5Y 2.5/0	23.01	17.52	5.43	English	1820–1848	American Chief's Village?
14SH305-1010	Black 2.5Y 2/0	21.82	20.74	11.06	English	1830–1844	Fool Chief's Village
14SH305-1038	Dark grayish brown 2.5Y 4/2	23.51	20.50	7.63	French	1830–1844	Fool Chief's Village
14SH305-0-20	Very dark brown 10YR 2/2	14.05	21.39	3.62	English	1830–1844	Fool Chief's Village; spalled
14SH305-0-71	Mottled gray to white	22.72	19.01	6.63	Local chert	1830–1844	Fool Chief's Village
14SH305-1001-3	Very dark gray 7.5YR 3/0	13.90	13.28	6.02	English	1830–1844	Fool Chief's Village
14SH305-1009-1	Light gray 2.5Y 7/0	21.51	17.85	6.16	English	1830–1844	Fool Chief's Village
14SH305-1042-4	Blonde 2.5Y 4/4	Fragment	Fragment	Fragment	French	1830–1844	Fool Chief's Village
14SH305-1042-5	Black 2.5Y 2.5/0	21.85	24.47	8.71	English	1830–1844	Fool Chief's Village
14SH305-1043-1	Black 2.5Y 4/4	16.36	9.89	7.98	English	1830–1844	Fool Chief's Village
14SH305-1043-2	Blonde to gray 2.5Y 5/4	16.45	17.78	5.36	French	1830–1844	Fool Chief's Village
14SH305-1377-3	Light gray 2.5Y 7/0	19.55	17.63	5.72	French	1830–1844	Fool Chief's Village
14SH305-1412-4	Blonde grayish 2.5Y 5/4	17.88	15.74	4.94	English	1830–1844	Fool Chief's Village
14SH305-1428-2	Black 2.5Y 2.5/1	20.80	17.80	6.90	English	1830–1844	Fool Chief's Village
14SH305-260-68	Dark grayish brown 2.5Y 4/2	20.81	17.57	7.05	English	1830–1844	Fool Chief's Village
14SH305-3003-1	Blonde 2.5Y 4/2	15.79	14.68	4.90	French	1830–1844	Fool Chief's Village
14SH305-3009-1	Black 5YR 4/2	21.73	17.94	6.05	English	1830–1844	Fool Chief's Village
14SH305-3011-1	Dark gray 2.5YR 4/0	15.37	16.59	3.80	English	1830–1844	Fool Chief's Village
14SH305-3014-1	Black 10YR 2/1	17.34	21.13	7.72	English	1830–1844	Fool Chief's Village
14SH305-3039-1	Black 7.5YR 2/0	19.27	16.91	7.05	English	1830–1844	Fool Chief's Village
14SH305-3048-1	Mottled gray	18.13	17.86	3.79	Local chert	1830–1844	Fool Chief's Village
14SH305-3066-1	White 5YR 8/1	25.36	21.99	5.38	Local chert	1830–1844	Fool Chief's Village
14SH305-3187-1	Dark gray 10YR 4/1	16.60	16.90	4.97	English	1830–1844	Fool Chief's Village
14SH305-3213-1	Black 2.5YR 2.5/0	14.76	11.60	4.28	English	1830–1844	Fool Chief's Village
14SH305-3252-1	Black 7.5YR 2/0	17.27	18.32	6.06	English	1830–1844	Fool Chief's Village
14SH305-3296-1	Very dark gray 7.5YR 3/0	16.45	19.77	3.63	English	1830–1844	Fool Chief's Village
14SH305-3480-1	Black 7.5YR 2/0	22.04	20.11	7.47	English	1830–1844	Fool Chief's Village
14SH305-3498-1	Blonde 2.5Y 5/4	16.14	17.63	5.29	French	1830–1844	Fool Chief's Village
14SH305-3499-1	Black 2.5Y 2/0	21.84	15.22	7.97	English	1830–1844	Fool Chief's Village
14SH305-3505-1	Mottled gray	20.42	15.72	6.23	Local chert	1830–1844	Fool Chief's Village

APPENDIX. (continued)

Specimen	Color Munsell	Length (mm)	Width (mm)	Thickness (mm)	Origin	Time Period	Comments
14SH305-3532-1	Black 2.5Y 2/0	22.36	16.54	7.10	English	1830-1844	Fool Chief's Village
14SH305-3537-1	Blonde 2.5Y 4/2	17.91	15.28	4.52	French	1830-1844	Fool Chief's Village
14SH305-3559-1	Black 2.5Y 2/0	20.45	18.19	9.10	English	1830-1844	Fool Chief's Village
14SH305-3573-1	Very dark gray 2.5YR 3/0	20.95	21.92	6.52	English	1830-1844	Fool Chief's Village
14SH305-3583-1	Light gray 2.5YR 6/0	24.00	23.35	9.75	Local chert	1830-1844	Fool Chief's Village
14SH305-3595-1	Black 2.5Y 2/0	24.14	17.86	6.29	English	1830-1844	Fool Chief's Village
14SH305-3646-1	Gray 2.5Y 5/0	21.12	19.77	7.24	English	1830-1844	Fool Chief's Village
14SH305-3674-1	Mottled gray	16.64	18.52	3.46	English	1830-1844	Fool Chief's Village
14SH305-3707-1	Blonde 2.5Y 4/2	19.86	19.10	6.59	French	1830-1844	Fool Chief's Village
14SH305-41-1	White 5YR 8/1	18.17	15.48	4.32	Local chert	1830-1844	Fool Chief's Village
14SH305-516-1	Black 2.5Y 2/0	19.88	17.12	6.31	English	1830-1844	Fool Chief's Village
14SH305-551-1	Black 2.5Y 2/0	15.86	19.54	6.07	English	1830-1844	Fool Chief's Village
14SH305-555-1	Mottled very dark grayish brown	23.95	23.35	7.89	English	1830-1844	Fool Chief's Village
14SH305-6053-19	Black 2.5Y 2/0	17.69	15.97	4.73	English	1830-1844	Fool Chief's Village
14SH305-6056-238	Black 10YR 2/1	18.63	17.16	7.72	English	1830-1844	Fool Chief's Village
14SH305-760-1	Black 7.5YR 2/0	19.90	16.85	5.61	English	1830-1844	Fool Chief's Village
14SH336-140	Mottled gray	30.57	8.45	8.43	Local chert	1848-1858	Uniontown
14SH439-7	Very dark gray 7.5YR 2/0	16.29	17.45	6.45	English	1831-1848	American Chief's Village?
14TO3130-16	Very dark gray 7.5YR 3/0	21.86	19.21	7.42	English	No date	Middle Ceramic-Historic period
	Yellow brown 2.5Y 5/4	21.96	19.97	4.45	French	No date	UBS 1989-18
	Yellow brown 2.5Y 4/2	20.63	21.66	6.17	French	No date	UBS 1989-18

FROM GRIPPER SNAPPERS TO ISINGLASS: A SUMMARY OF THE KANSAS HISTORICAL SOCIETY'S 1988 AND 1990 ARCHEOLOGICAL INVESTIGATIONS AT CONSTITUTION HALL (14DO321)

CHRISTINE D. GARST

Kansas Historical Society

WITH A CONTRIBUTION BY TIM RUES

Kansas Historical Society

Construction began on the building that would become known as Constitution Hall in 1856. The site was added to the National Register of Historic Places in 1971 and designated a National Historic Landmark for its role in the drafting of the 1857 Lecompton Constitution prior to Kansas statehood. In 1986 the property was acquired by the state of Kansas, and plans were made to open it as a historic site. Preceding restoration, Kansas Historical Society (KSHS) archeologists and crew undertook an excavation in 1988. In 1990 KSHS archeology staff monitored the lifting of the building and conducted excavations beneath while the structure was elevated for foundation repair. This paper briefly discusses the archeological fieldwork and summarizes the artifact collection of over 75,000 items from clothing fasteners to heating stove fragments and everything in between. The artifacts date from before the Civil War to post World War II.

Constitution Hall (14DO321) has served as the stage for not only some of Kansas' most important territorial political action, but also as the backdrop for daily life in the town of Lecompton, Kansas (Figure 1). The property was acquired by the state of Kansas in 1986 to be operated as Constitution Hall State Historic Site by the KSHS. Plans to stabilize and restore the building were set in motion.

Two years later KSHS archeologists and crew excavated at 14DO321 from June 13 through September 28, 1988. Archeologists returned to the site from October 23 to November 13, 1990, for additional monitoring, excavation, and artifact collection. It was hoped that the investigations might aid in understanding the building's construction and help to interpret activities at the site, especially those occurring from 1856 to 1858. All artifacts recovered during the two field sessions in one building, its outbuildings, and its grounds in one small town from 1856 to the 1980s.

CONSTITUTION HALL STATE HISTORIC SITE IN HISTORIC LECOMPTON, KANSAS

Tim Rues

Constitution Hall State Historic Site is in downtown Lecompton, Kansas, at 319 Elmore Street. It occupies Lot 18 of Block 20 in the original Town of Lecompton, and the grounds comprise three city lots: 16, 17, and 19 of Block 20. The property slopes from west to east, dropping away steeply at the front of the building. Erected in 1856, Constitution Hall may well be one of the oldest private wood frame structures still standing in its original location in the state today.

Constitution Hall was built in mid-to-late 1856. The front two-thirds were completed in mid-1856 and measured 34 by 25 feet; the rear one-third was added in late 1856 or early 1857 and measured 16 by 25. Today the building is 50 by 25 feet.

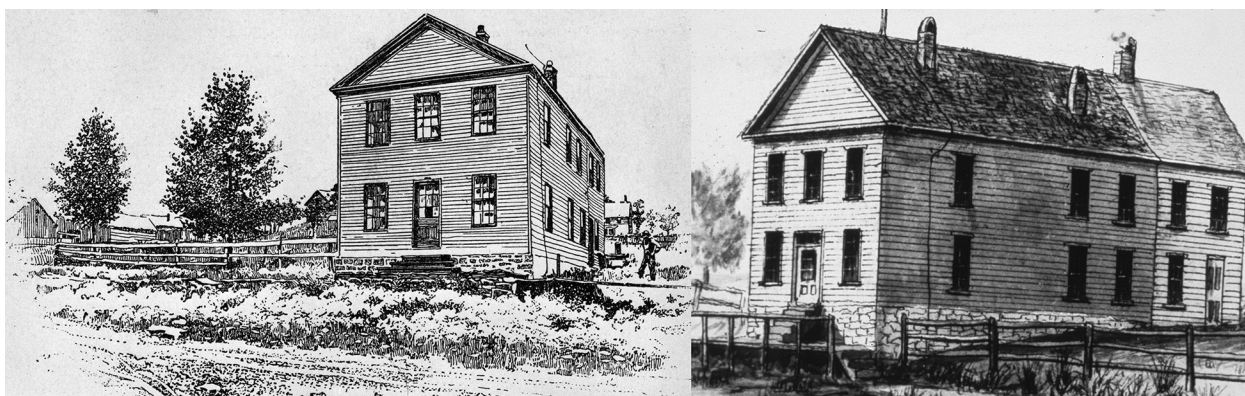


Figure 1. Left: Illustration from 1887 *The Century Illustrated Monthly Magazine* 34:369. Right: Sketch of Constitution Hall by Henry Worrall, drawn in 1869. Courtesy of kansasmemory.org, Kansas Historical Society.

For the most part materials used in construction were locally sourced, including lumber, stone, and brick. Cottonwood lumber was used for floorboards and joists, wall studs, roof sheathing and rafters, wall lathes, and foundation sills. Walnut lumber was used for siding and door frames. Doors, windows, and trim probably were imported from factories in the East.

Constitution Hall is a simple rectangular wood frame edifice with Greek Revival details and a gable roof. It was assembled using a technique known as balloon frame construction, employed to save money, time, and materials. It replaced an older heavy timber frame construction that required skilled craftsmen. Instead of using massive timbers in the walls, light long-milled studs formed a continuous span from the foundation sill to the second-floor plate. The public feared that such a light frame would be blown away by the first gust of wind, therefore, the name balloon frame. The original owner and builder was Samuel J. Jones, a native Virginian, former Westport, Missouri, postmaster, sheriff of Douglas County, Kansas Territory, a Lecompton Town Association officer, an attorney, and a successful Lecompton entrepreneur.

Constitution Hall was the location of some of the most significant events in territorial Kansas economic and political history. The very first federal land office and for a time the only one in Kansas Territory opened in 1857 on the ground floor. Hundreds of anxious land-hungry settlers filed their claims here and secured and ensured legal title and ownership to their new Kansas land. The office remained open until 1860.

Three complete territorial legislative sessions were convened on the second floor of Constitution Hall in January 1857, December 1857, and January 1858. The first session was controlled by the pro-slavery party; however, the final two sessions were dominated by free-state majorities for the first time in Kansas history. Thus, Lecompton, the territorial capital of Kansas, and Constitution Hall changed from being the headquarters of the pro-slavery party to being the scene of free-state activities. Delegates to the famous Lecompton Constitution Convention met upstairs from September to November 1857 to write a state constitution. If the Lecompton Constitution had been approved by the U.S. Congress and Kansas voters, Kansas could have been admitted to the Union as a slave state. This constitution caused much divisive national debate, paralyzed Congress, splintered the National Democratic Party, catapulted Abraham Lincoln onto the national political stage and into the White House, politically divided the Union, and hastened the country toward disunion and civil war. Kansas citizens voted three times on the Lecompton Constitution and ultimately rejected and vanquished it forever in August 1858.

Historically Constitution Hall served the Lecompton community as a center of local social, community, and commercial activities. Its uses were varied and diverse: a land office, private law offices, a territorial legislative hall, a U.S. District and Kansas territorial supreme courtroom, a constitutional and political party convention hall, a hotel, a dry goods store, a boarding house, a student dormitory, the city hall, a schoolhouse, an undertaker's



Figure 2. View of Constitution Hall, taken in 1903, showing IOOF and Undertaker's signs and wooden stairs. Courtesy of kansasmemory.org, Kansas Historical Society.

parlor, a telephone office, a hardware store, a public voting place, and a public assembly hall. Its longest use, beginning in 1894 through 1986, was as a meeting place for the local Odd Fellows, Masonic, Modern Woodmen, Grand Army of the Republic, and Rebekah lodges (Figure 2)

Constitution Hall was designated a National Historic Landmark in 1974, and in 1986 State Senators Winton A. Winter and Frank Gaines purchased the building from the Lecompton Rebekah Lodge 698 and donated it to the state of Kansas. In 1986 it became a Kansas State Historical Society historic site. Preservation and rehabilitation work began in 1990 to save the badly deteriorated structure. In 1995 the work was completed along with new museum exhibits, and Constitution Hall was officially opened to the public with a grand opening celebration on June 24, 1995.

RESEARCH OBJECTIVES

Reynolds (1989:4–5) noted that the archeological excavation at 14DO321 was primarily “... an effort to trace the construction history of the building and to determine whether outbuildings or other evidence were located within the limits of the town lots on which the structure stand.” Reynolds mentioned another goal: recovering artifacts that allow “... us to interpret the territorial period in Kansas, with special attention to the critical years of 1856

to 1858 when Lecompton was the territorial capital.” To his research objectives another question is added: What does the artifact collection have to tell about the activities that occurred in the building and surrounding property during its entire occupational history?

EXCAVATION PROCEDURES

The principal investigator for the 14DO321 excavations was KSHS Assistant State Archeologist John Reynolds (Figure 3). He, along with other KSHS archeological staff, commenced initial testing on June 13 through 23, 1988. KSHS archeologists, crew members, and volunteers started the longer field session on July 25, 1988, and finished on September 28, 1988 (Figure 4). The boundaries of the 1988 excavations were Lecompton city lots 16 through 19 of Block 20.

Work began with laying out three test trenches: A (1 m wide by 12 m long) from the southwest corner of the building eastward; B (.5 m wide by 2 m long) along the north side of the structure; and C (.5 m wide by 2 m long) along the south side of the building, partially covering an existing sidewalk (Figure 5). The southwest corner of the property line was arbitrarily assigned N100 and E100 to serve as the datum for the grid numbering system. In the early days of the 1988 investigations, work also involved removing existing sidewalks and fire



Figure 3. John Reynolds, taking a well-deserved power nap during break time in 1988.

escapes (attached wooden stairs). Additional monitoring and collection occurred in 1990, when the structure was raised off its foundation, and excavations occurred underneath to prepare for foundation replacement (Figure 6).

Written progress reports were completed each day by professionals and volunteers. Information included the unit's identification number and depth, tasks started and/or completed, artifact descriptions, soil type, and occasionally screening practices or a weather report. Plan view maps were drawn for each level, and wall profiles were completed for finished test units and trenches.

The site was mapped using a plane table and open-sight alidade. Distances were measured with tapes using the metric system. Elevations of test units were taken at southwest corner grid stakes. Location of cores within test units were plotted. Some diagnostic artifacts, referred to as features or occasionally as piece plots, were mapped in place. A plan view map of metal detecting in 14 test units was drafted.

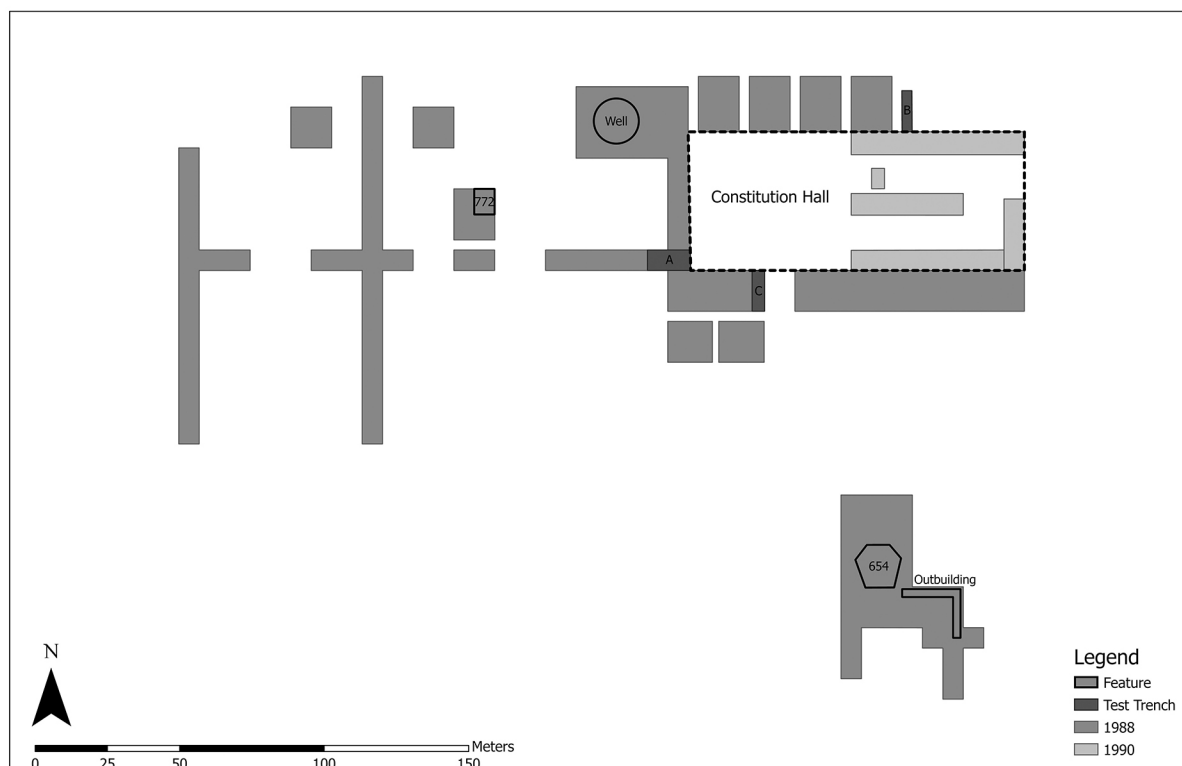


Figure 4. Map of 1988 and 1990 excavations at 14DO321.



Figure 5. Progress shots of some excavations on the south side, northwest corner, and north side of Constitution Hall.

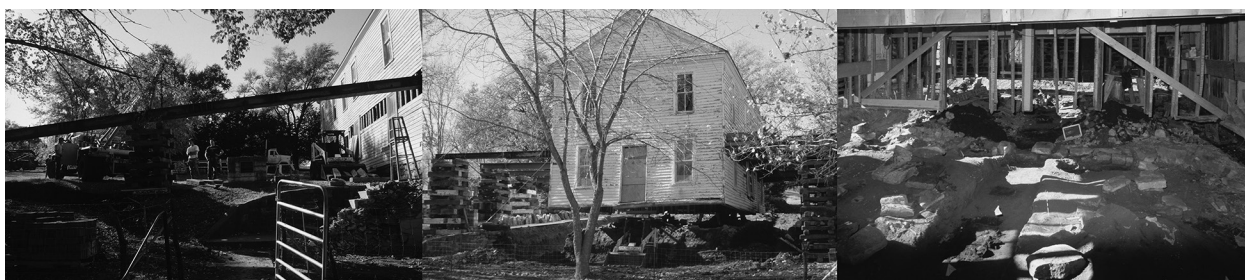


Figure 6. Two views of Constitution Hall being raised with steel I-beams, supported by wood cribbing, and a view of the archeology beneath the building.

Test Units and Trenches

Test units were generally 1 m square, although the records mention one .5-m unit and some 1 by 2-m units. Test units and trenches were marked with wooden stakes, and each was identified by the arbitrarily assigned northing and easting grid coordinates of the southwest stake. Units and trenches were excavated in 10-cm levels, and interior measurements were calculated from the southwest stakes.

The 1988 crew opened 72 test units and 3 test trenches (Figure 4). Excavated sediments were sifted through ¼-inch mesh unless it could not pass through the screen or lack of cultural material deemed sifting to be too time consuming. Progress reports frequently mentioned a lens of yellow clay found around the building at a depth of 20–55 cm. Archeologists thought that this clay might have been brought in to level the ground surface prior to construction.

Twenty test units were cored with an Oakfield probe at the base of their excavations. Cores were extracted from the privy (Feature 654) to 100 cm depth and from a pit (Feature 772) (Figure 7). Other cores were taken in areas of special interest, such as the bottoms of features and the builder's trench,

which appeared as a yellow stain extending east to west across the north side of the structure. Flotation and soil samples were collected from the privy vicinity, from an ash lens in Trench A, and from sweepings from the inside of Constitution Hall (Reynolds 1989). Another sample was obtained beneath the east floor in 1990. To date none of these have been analyzed.

According to Reynolds (1989), the 1988 excavations verified that the builders had dug a trench for the limestone footings around the entire footprint and constructed the structure in two sections: the eastern 35 feet in 1856 and the western 15 feet within six months. Evaluation of the original foundation revealed the builder's trench (Figure 8). For example, test trenches A, B, and C yielded artifacts from the 1850–1900 time period, a possible access for foundation repair, and evidence of construction techniques for the south walkway that consisted of a cinder lens under limestone slabs, which in turn was beneath a 1911 poured cement sidewalk. Also, a large well-finished limestone block, where a post-1900 window replaced an earlier door, may have been a door sill. Another limestone block, encountered on the east end of the south side, might have been used to support exterior stairs.

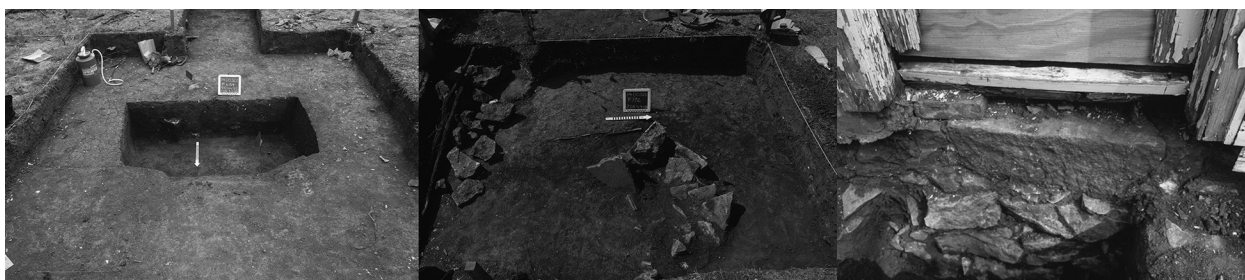


Figure 7. Features 654 (privy) and 772 (pit) and a view of construction methods under a door frame.

Several features were identified at a distance from the immediate environs of Constitution Hall. Reynolds (1989) described a hand-dug, limestone-lined well (Feature 601; Figure 7) .66-.76 m deep near the northwest corner of the building. The well had an interior diameter of 93 cm and an exterior diameter (to the outside of the rock lining) of 1.86 m. To the south slight elevation rises and differences in vegetation suggested a possible foundation (Reynolds 1988). Further investigations exposed the limestone footings of a small structure, erected prior to 1900 (Figure 9). Reynolds (1989) noted that many horse-related items were recovered in this area, suggesting that it may have served a horse or transportation function. Immediately north of the limestone footings, a privy (Feature 654) that was 1.67 m wide by 2.13 m long and 1.22 m deep was discovered (Figure 7). The bottom half appeared to be latrine fill, but the upper half contained clay, ash, and soil. Artifacts of note in the privy include half a pair of wick-trimming scissors, fragments of a wooden slab-handled butcher knife, bone, glass, ceramics, a possible stove pipe, cut nails, and two anomalous modern round wire nails.

Testing west of Constitution Hall revealed that the soil had been re-contoured after 1900. Though the earth was disturbed, the tests uncovered artifacts dating to the mid-1800s (Reynolds 1988). Several excavation units were placed there to better understand the landform. Progress reports discussed a trash complex, a trash deposit, an ash complex, and what may have been a posthole or a pipe.

Prior to work to replace its foundation in 1990, Constitution Hall was raised and suspended, using a system of steel beams inserted beneath the ground floor ceiling. Excavation units and trenches were placed beneath while the structure was suspended above (Figure 6). A 3-m test trench was excavated

west of the east wall to explore a depression. A limestone footing for a brick fireplace was discovered in the western end. Rubble-filled footing trenches were examined along the south and north walls of the western third of the building. At some time in the past, the northern footing had been disturbed by sewer and water pipe installations. The foundation, investigated in the eastern two-thirds, was constructed of faced limestone and compacted clay with some rubble and a few artifacts. Seven pedestal footings comprised of stacked limestone slabs and two pedestal footings consisting of single limestone slabs bisected the space from west to east and north to south. A modern pedestal footing of stacked concrete pieces was in the northwest corner.

ARTIFACT ANALYSIS

During the 1988 and 1990 excavations 75,109 counted artifacts and an additional 14,446.3 g (31.8 pounds) of weighed items were recovered. When possible, the artifacts were cleaned by washing or dry brushing, depending on the constituent materials. The collection was cataloged by KSHS staff and archeology lab volunteers, and individual artifacts or groupings of similar objects from the same proveniences received specimen numbers. This data was entered into a Microsoft Access® database and tabulated by function, type, and subtype. The functional categories were further divided into four groups: building-related, domestic, work, and other. Additional photographs not shown here can be viewed on Kansas Memory at the KSHS website by querying "14DO321."

Building-related Group

Building-related artifacts are associated with the structural or foundational aspects of Constitution



Figure 8. Builder's/ footing trench, exposed in 1990. North arrow is incorrect.



Figure 9. View to south of limestone footings and privy.

Hall and any other buildings, past or present, on the property. Within this group are six functional categories: construction material, window glass, utility, by-product, hardware fastener, and miscellaneous hardware. These combined categories contain 49,403 counted and 5,490.9 g of weighed artifacts.

CONSTRUCTION MATERIAL

Most artifacts assigned to the construction material category ($n = 900$, 46.8 percent) are within the foundation or structural functional type (Appendix). These include bricks, stone, cement, mortar, and wood. Thirteen stones might have been flagstones

that served as part of a walkway. A few mortar fragments are painted gray or green. Roofing materials comprise segments of flashing, gutter clips, tar, tarpaper, a lightning rod, and slate and asphalt shingles. Two slate shingle pieces advertise “B-B/ PAT 2,899,157 PATENTED AUG 11, 1959, M.B. WOLFE OF NORWOOD, PN.” Morton B. Wolfe of Norwood, Pennsylvania, assignor to Berger Brothers, was granted a patent for a gutter hanger clip on this date (Google Patents 2006).

Some idea of how the building's interior was decorated is revealed by remnants of wallpaper, paneling, plaster, and paint (Figure 10). One paint

Figure 10. Interior view of Constitution Hall, showing remnants of wallpaper and paint.



chip is red, a few scraps of plaster are painted green or yellow, the section of wood paneling is white with green swirls, and the wallpaper is a plain ivory color. Linoleum flooring samples are a dark red and a multicolored pattern. The ceramic tiles are colored red, black, green, and cream.

WINDOW GLASS

There are 23,921 clear and aqua window glass fragments (Appendix). Most of the glass ($n = 18,175$, 76 percent) was measured for thickness to provide data toward answering the question, “Is window glass thickness related to time of manufacture?” Schoen (1985) noted a trend for thicker glass from the mid-1800s onward, when improved transportation made cheaper shipping by railways practicable. However, Scharfenberger (2004) pointed out that window glass thickness results from variability within the windowpane and glass surface exfoliation over time and is not related to manufacture date. The measurements are not included in this summary but are available in the KSHS catalog records.

UTILITY

The utility artifacts are sorted into four functional categories: electrical, heating, lighting, and plumbing (Appendix). A strain relief, used to reduce stress or tension in wiring, had molded lettering identifying it as a “HEY CO” product. The company is

now a subsidiary of the Penn Engineering Company of Toms River, New Jersey, which was founded in 1926 and in 2020 still manufactures “... molded wire protection products” (HEYCO 2020). A fuse advertises “CLEARSITE ECONOMY FUSE & MFG. CO. U.S.A.” The dates of operation for this Chicago, Illinois, company could not be located. Nothing beyond manufacturing information could be ascertained for two other utility items: a fuse with “PYREX RADOR USA/15-A” and portions of two porcelain electrical insulators with “E P CO.” Nine glass insulator fragments have embossed letters indicating the Hemingray Glass Company, manufacturers of glass insulators operating from 1870 to 1933 (Figure 11; Lockhart et al. 2016b). The collection contains 10 pieces of Isinglass, a silicate material also called muscovite, that often was used for stove or furnace windows, as it is heat resistant (Geology.com 2020). The mineral is able to withstand high electrical charges as well, making it useful as an insulator in early radios (Langer 2011). Brass fragments that once held a lampshade or globe in place show patent dates of May 15, 1877, and July 29, 1878 (Figure 12), but no further patent details could be found.

BY-PRODUCT

Excavations across the site yielded 5,490.9 g (12.1 pounds) of by-products, such as coal, cinders, and



Figure 11. Glass insulators. Courtesy of kansasmemory.org, Kansas Historical Society.

charcoal (Appendix). The majority of these are cinders (5,091 g [11.2 pounds, 92.7 percent]).

HARDWARE FASTENER

Many hardware fastener artifacts were retrieved from 14DO321 (Appendix). Nails are the largest group ($n = 19,356$, 97.9 percent), but a wide variety of fastener types are represented. Additionally, railroad spikes, discussed under the railroad category, might have been used in Constitution Hall construction.

HARDWARE MISCELLANEOUS

Most objects in the hardware miscellaneous category are strands of common wire ($n = 496$, 64.8 percent) (Appendix). One segment is Kelly Diamond Point right twist barbed wire, which was patented on February 11, 1868 (University of North Texas Libraries 2007). Another barbed wire type is J. F. Glidden's Two Oval, first patented in 1874 (Joseph F. Glidden Homestead and Historical Center 2007). A rabies vaccination tag, issued by the Bradley Animal Hospital in Lawrence, Kansas, in 1972, was collected. A galvanized bucket from the privy feature held hardened plaster, perhaps left to solidify, rendering the container useless.

Domestic Group

The domestic group includes artifacts that traditionally relate to the domestic or household aspects



Figure 12. Brass lamp fragments that once held a globe or shade secure on top of an oil lamp. Courtesy of kansasmemory.org, Kansas Historical Society.

of Constitution Hall and any other buildings, past or present, on the property. Within this group are 10 categories: furniture and appliance, container, table and utilitarian ware, flatware, cookware, organic, clothing, personal, toiletry, and recreation. Combined, these total 24,768 counted artifacts and 8,955.4 g (19.7 pounds) of other materials that were only weighed.

FURNITURE AND APPLIANCE

The furniture and appliance category includes furniture, cleaning appliances, furnishings and structural items, appliances, and window treatments (Appendix). Many artifacts are cook stove parts ($n = 104$, 34.1 percent), such as portions of a damper, ash pan, shelf bracket, door, burners, burner covers, stove pipes, and a decorative silver-colored finial with a knight's helm and crossed arms.

CONTAINER

Containers include bottles, jars, jugs, cans, barrel fragments, tubes, packaging, and closures (Appendix; see Kansas Memory). Most of the containers are bottles ($n = 12,806$, 73.3 percent).

Many bottles are classified according to their original contents: beverage (beer, liquor, wine, and soda pop), chemical (ink and cleaning), toiletry, condiment, extract, and medicinal or pharmaceutical. The only discernible beer brands are Pabst Blue Ribbon and Miller (Stamp 2012; Miller Brewing Co. 2020). Several bottle sherds bear the complete or partial line “FEDERAL LAW FORBIDS SALE OR RE-USE OF THIS BOTTLE,” marking them as sections of liquor bottles (Lindsey 2020c). Another liquor bottle retains its screw-on cap with a 1930 patent number filed for the Safety Seal Company of Chicago, Illinois (Fabrice 1930). Well-known brands of bottled soda pop are Coca-Cola, Squirt, and Dr. Pepper. Less known is the Dodger brand soda pop, a short-lived (1960s) cola manufactured in Dubuque, Iowa (Encyclopedia Dubuque 2021; see Kansas Memory). A miniature Coca-Cola bottle, perhaps a promotional item, was unearthed (Figure 13).

Sandford’s and Carter’s ink bottles were recovered (Figure 14), as were Clorox bleach and Watkins extract bottles. An incomplete aqua rectangular bottle with advertising for “Frank Miller’s Crown Dressing” once contained shoe polish made by Frank Miller and Company of New York, dating from 1875 to 1895 (Glass Bottle Marks 2021). A nearly complete plastic bottle of the Palmolive Company’s Veto Spray Deodorant is in the collection.

Bottles with lettering molded into the glass during the manufacturing process were identified

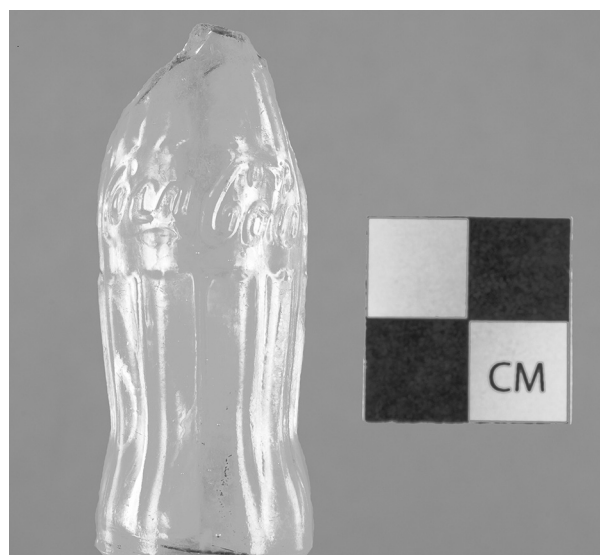


Figure 13. Miniature Coca-Cola bottle. Courtesy of kansasmemory.org, Kansas Historical Society.

as cod liver oil and bitters, a bitter tasting drink thought to promote digestion. Other pharmaceutical or medicinal bottles were recognized by their shape or the type of finish (Figure 15). Some of the earliest bottles have bases bearing a pontil scar, also called a ring pontil, which indicates that the bottles were made using a blow pipe (Figure 16). This type of scar was common from the 1750s through the 1910s, though their frequency began to decline with the advent of bottle-making machines in the 1880s (Lindsey 2020a). Some bottles have applied



Figure 14. Ink bottles. Courtesy of kansasmemory.org, Kansas Historical Society.



Figure 15. Pharmaceutical or medicinal bottle finishes. Courtesy of kansasmemory.org, Kansas Historical Society.



Figure 16. Early bottle bases, showing pontil scars. Courtesy of kansasmemory.org, Kansas Historical Society.

color labels (ACL), where one or more colors were applied to the finished bottles. This process has been used since about 1933 (Lockhart et al. 2019). Occasionally the ACL incorporates a zip code (post 1963) or a copyright symbol (post 1953) that helps date the object more precisely.

Some bottle pieces have the complete or partial word “Duraglas,” advertising a new glass formula by the Owens-Illinois Glass Company from 1940 through 1970 (Lockhart and Hoenig 2015). A clear glass sherd with an unusual decoration of an eye and eyebrow within a keystone shape (Figure 17) was identified to some extent after consultation with the HISTARCH listserv (Garst 2021). The almost flat decorated sherd may represent a flask associated with one of the lodges that met regularly in Constitution Hall from 1857 to 1986.

Several bottle fragments with partial maker’s

marks could not be linked to brands. Recognizable bottle makers are the Hazel-Atlas Glass Company, Owens-Illinois Glass Company, Obear-Nestor Glass Company, Anchor Hocking Company, Illinois Glass Company, and Knox Glass Bottle Company.

Some canning jars are distinguished by their molded lettering (Mason or Ball), while a few have maker’s marks on their bases (Anchor Hocking Company). This category is dominated by the Mason fruit jar, typically characterized by the phrase “Mason’s Patent Nov. 30, 1858” that is part of the jar mold. J. L. Mason patented a jar on that date, but these popular “Mason” jars were made by many different companies, including the Ball Corporation, until about 1915 (Lindsey 2020d). The Ball Corporation began manufacturing canning jars in 1892 (Toulouse 1971). Other jars had contained condiments, toiletries, medicine, or pharmaceu-

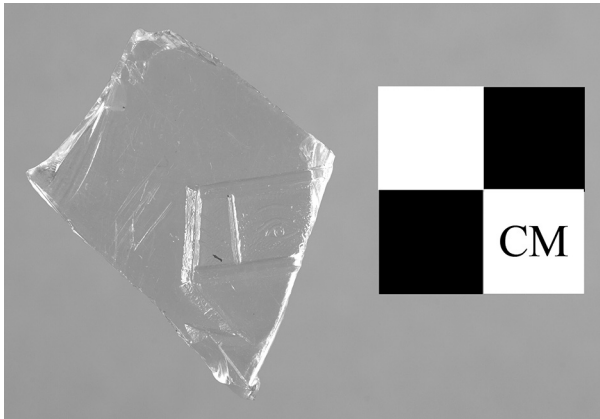


Figure 17. Clear glass sherds, decorated with an eye and eyebrow within a keystone. Courtesy of kansasmemory.org, Kansas Historical Society.

ticals. One plastic condiment jar fragment carries the date of 1978, but no further information was forthcoming. Only a few glass jug sherds are in the collection, one of which represents a jug of Clorox brand cleaner.

The contents of some of the cans were determined to be beverages, meats, tobacco, chemicals, toiletries, or matches. A Folger's coffee can was opened with a key rolling back a metal strip. Cans opened with keys were used until World War II's metal shortages and phased out after the war (Folger Coffee Company 2021). A complete aluminum can of Country Time Lemonade displayed manufacturer, capacity, and nutrition information. It was produced by General Foods from 1975 to 1981, when Kraft Foods began making the lemonade (Country Time Lemonade 2020). A sardine can with the partial labeling "CHATO-ET J/SARDINES

CHELLE/LA ROCHELLE" was possibly a luxury item as "... the sardine *par excellence* is the French sardine" (Smith 1901:1). La Rochelle, a city along the west coast of France, has exported sardines since the nineteenth century and continues to do so today. A complete tube of Solarcaine, touted as a topical pain and itch relief cream, was recovered.

Container closures include pull tabs, can keys, seals, stoppers, corks, caps, canning lids, and canning liners (Figures 18 and 19). Some closures identify the contents, manufacturer, or suggested dates. Nearly half of the container closures are caps ($n = 168$, 49.4 percent), and 84 of these are crown caps, used as closures on beverage bottles since 1891 (Lemelson-MIT Program 2017). An aluminum screw-on cap with a plastic liner advertising 7-UP soda pop postdates 1963, as zip codes are present. Another aluminum cap specifies a quart of "RIKERS;" nothing further could be ascertained about that name (Figure 19, upper right corner).

Aluminum and milk glass canning lid liners are in the collection. Some of liners bear the lettering "BOYD'S GENUINE PORCELAIN - LINED CAP" or "GENUINE BOYD'S CAP FOR MASON JAR," though they rarely are made of porcelain but rather of milk glass. L. R. Boyd first filed for a patent for these canning jar liners in 1869, and the phrasing was used intermittently until 1964 by both the Consolidated Fruit Jar Company and the Hazel-Atlas Glass Company (Lindsey 2020d). Eight complete or fragmentary canning lid liners (Figure 20) advertised the Consolidated Fruit Jar Company that operated from 1878 to 1882 (Lockhart et al. 2016a). As was the case with canning jars, the Consolidated Fruit Jar Company did

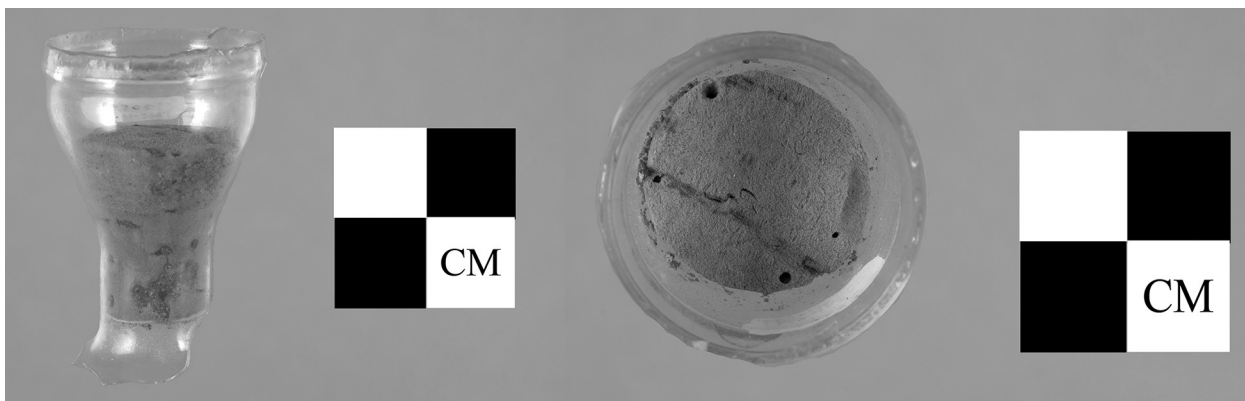


Figure 18. Two views of bottle fragment with a cork. Courtesy of kansasmemory.org, Kansas Historical Society.

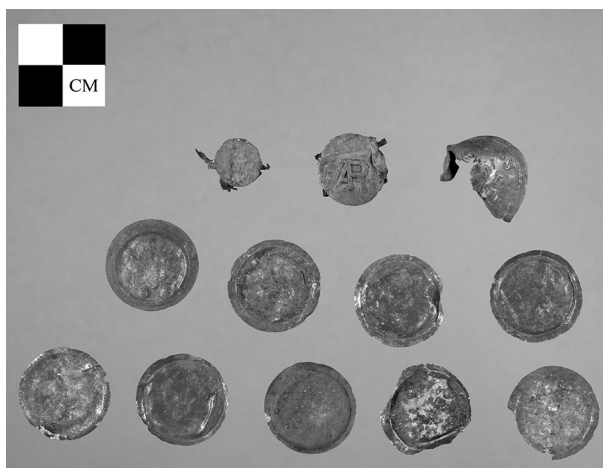


Figure 19. Seals and caps. Courtesy of kansasmemory.org, Kansas Historical Society.

not manufacture the canning lid inserts but purveyed them.

TABLE AND UTILITARIAN WARE

The table and utilitarian ware category represents these functional types: tablesetting, serving, beverage glasses, decorative, and utilitarian (Appendix). It is not always possible to determine whether an artifact should be classified as tablesetting or serving, so a sixth “tablesetting or serving” category was added to manage that information.

The various tablesetting and serving dish sherds are decorated in a wide range of patterns and styles, though the majority are plain whiteware dishes (Figure 21). Decorative techniques include hand painting, the method in which older dishes were decorated, which had a resurgence as a popular pastime around the turn of the nineteenth-twentieth centuries. Mass-produced transfer printing or transferware decoration (1756 to the present) proved a quick and economical replacement for hand-painted wares and accounts for many of the decorated sherds. Flow blue, a distinctive transferware in the collection, has deliberately blurred designs that are viewed as a return to the hand-painted look of earlier decorative styles (Isa 2017).

The collection includes examples of annular or banded ware (Figure 21), a decorative technique with horizontal bands in varying widths and colors, that was mass produced from 1775 through the 1800s and into today (Florida Museum of Natural



Figure 20. Consolidated Fruit Jar Company canning jar liner. Courtesy of kansasmemory.org, Kansas Historical Society.

History 2020). Also present are spongeware, where paint is spattered or daubed on, and Rockingham or Bennington wares, both buff-bodied earthenwares with variegated brown glazes (Figure 21). Glass serving dishes are plain or decorated with cut or pressed motifs. Recognizable crockery glazes are salt, Albany slip, and Bristol, sometimes in combination. For additional illustrations of these decorative techniques, see Kansas Memory.

Maker’s marks on the backs of numerous dishes aid in delineating the “who, where, and when” of these pieces (Table 1). One dates as early as 1852, while some potters are still in business today. Eleven of the maker’s marks indicate ceramics that were imported from the Staffordshire Potteries industrial region of England that is renowned for pottery (Birks 2016a, 2016b). Another example may have originated in the Caledonian Pottery of Rutherglen, Scotland. There are dishes from three American potteries: J. and E. Mayer Potteries, Homer Laughlin China Company, and Glasgow Pottery Company of Trenton, New Jersey, manufacturing pottery from circa 1863 to 1900 (Figures 22–24; Kowalsky and Kowalsky 1999). Many more maker’s marks were too faint or too fragmentary to be deciphered.

FLATWARE

Spoons, knives, forks, and a range of utensils and cutlery are represented (Appendix). One nickel-



Figure 21. Decorated tableware fragments. Courtesy of kansasmemory.org, Kansas Historical Society.

plated teaspoon had the silver maker’s mark of “N_KEL SILVERO.” Nothing further could be learned regarding this teaspoon. A fully tanged butcher knife with a wooden slab-scale handle came from the privy area and was thought by Reynolds (1989) to be one of the oldest artifacts retrieved from 14DO321. Pins inserted through drilled holes in the scales and tang secure the handle.

COOKWARE

The cookware category includes one handle, tin and aluminum pie pans, and cast iron pot fragments, possibly from a single pot (Appendix).

ORGANIC

The food and flora materials were not counted but rather weighed. Combined, they weigh 8,955.4 g (8.9 kilos or about 19 pounds) (Appendix). If a faunal specimen is large, burned, shows butchering marks, or represents an animal typically eaten, it is classified as food fauna. If recognized as coming from a species rarely eaten or deemed too small to identify, it is placed in the other fauna category. To an extent the same guidelines were used to distinguish food flora from other flora. Both parts of this collection would benefit from further examination by an ethnobotanist or a zooarchaeologist.

Table 1. Pottery Maker’s Marks.

Potter	Location	Date Span	Reference
Charles Collinson	Burslem, England	1851–1873	Kowalsky & Kowalsky 1999: 158
J. W. Pankhurst	Handley, England	1852–1882	Kowalsky & Kowalsky 1999:298–299
George Jones & Sons	Stoke-on-Trent, England	1861–1957	Kowalsky & Kowalsky 1999: 249
Glasgow Pottery Co.	Trenton, New Jersey	1863–1900	Kowalsky & Kowalsky 1999:37
T. & R. Boote	Burslem, England	c. 1870–1906	Birks 2016a
Caledonian Pottery	Rutherglen, Scotland	1872–1929	Kowalsky & Kowalsky 1999:137
Thomas Furnival & Sons	Cobridge, England	1875–1890	Kowalsky & Kowalsky 1999:200–201
Homer Laughlin China Company	East Liverpool, Ohio	Post 1877	Kowalsky & Kowalsky 1999:44–45
Francis Joseph Emery	Burslem, England	1878–1893	Kowalsky & Kowalsky 1999:190
Wilkinson & Hulme/			
Richard Alcock	Burslem, England	1881–1885	Kowalsky & Kowalsky 1999:371
J. & E. Mayer Potteries	Beaver Falls, Pennsylvania	1881–1910	Kowalsky & Kowalsky 1999:47–48
Sampson Bridgewood & Son	Longton, England	1885–1891	Kowalsky & Kowalsky 1999: 126–127
J. & G. Meakin	Hanley, England	Post 1890	Kowalsky & Kowalsky 1999:275–276
John Maddock & Sons	Burslem, England	Post 1906	Kowalsky & Kowalsky 1999:262
Thomas Hughes & Son, Ltd.	Burslem, England	1930–1935	Birks 2016b; Kowalsky & Kowalsky 1999:241



Figure 22. Tableware with selected maker's marks. Courtesy of kansasmemory.org, Kansas Historical Society.



Figure 23. Tableware with selected maker's marks. Courtesy of kansasmemory.org, Kansas Historical Society.



Figure 24. Maker's mark of the Glasgow Pottery Company of Trenton, New Jersey. Courtesy of kansasmemory.org, Kansas Historical Society.

Beef bones add up to nearly a third of the fauna ($n = 2,854.1$ g, 32.3 percent), while pork bones and teeth weigh 978.2 g (11.1 percent). Fish and poultry bones also were identified. A single corn cob, walnut hulls, and peach and cherry pits constitute all the food flora. Taken altogether, the fauna and flora may represent occasional dinners held in Constitution Hall or meals provided for guests, lodgers, or students. This does not seem enough residue to account for more than a century of eating at the site, so perhaps food refuse was discarded elsewhere on the property and not exposed during the excavations.

CLOTHING

One of the footwear items was a shoe liner, printed with product information: “SHOES 8–9 MADE IN JAPA” (Appendix). This dates the shoe to

post 1891, when the Tariff Act of 1891 mandated country-of-origin labeling in the United States (Stack Exchange Network 2018). A clothing snap, impressed with the product name “SCOVILLE & GRIPPER SNAPPER,” was made by the Scovill Manufacturing Company of Waterbury, Connecticut, in the twentieth century (Company-Histories.com 2019). The stud side of another snap displays “SAXONY MADE IN USA,” and a stud and socket snap shows “C F Co.” No further information was forthcoming on either of these brands, although today Saxony manufactures a line of men’s clothing. A suspender hook (Figure 25) bears the French phrase “MON.CHOIX,” which roughly translates to “my choosing” or “my choice,” likely a form of advertising or a fashion statement.

It is not unusual to lose a button, snag fabric, or even drop a glove at any location at any time. However, one wonders why 270 brass disks, each with two holes on the side for attachment, were lost or discarded at Constitution Hall (Figure 26). Catalogers struggled to identify these objects. Finally it was decided that they might be decorative elements or functioned as attachments to lodge-related paraphernalia.

Buttons comprise the largest category of clothing function artifacts ($n = 353$, 44.2 percent). Materials are bone, brass, shell, china, hard rubber, plastic, metal, and wood. A variety of types are present: shank, loop, conical, and 2-, 3-, and 4-hole buttons. Numerous decorative styles include floral, diamond shaped, four leaf clover, calico, banded, solid color, and one unique figural button depicting the character Yum-Yum from Gilbert and Sullivan’s 1885 comic opera “The Mikado” (Figure 27). Many of the buttons are types most likely worn by women, and some are so fancy that they must represent dressing for special occasions (see Kansas Memory).

Four hard rubber buttons (Figure 28) are back marked with portions of “GOODYEAR”: two from the Novelty Rubber Company, one from the India Rubber Comb Company, and one that has “GOODYEAR’S PATENT 1851” marked, but no maker’s name. Goodyear held the patent for the button design but never manufactured any buttons. Instead companies like the Novelty Rubber Company (1853–1886) and the India Rubber Comb Company, which used the “Goodyear patent” phrase until 1917, manufactured what are commonly called Goodyear buttons (Vintage Buttons 2016), which first appeared in the 1850s and can still be found today (Marcel 1994).

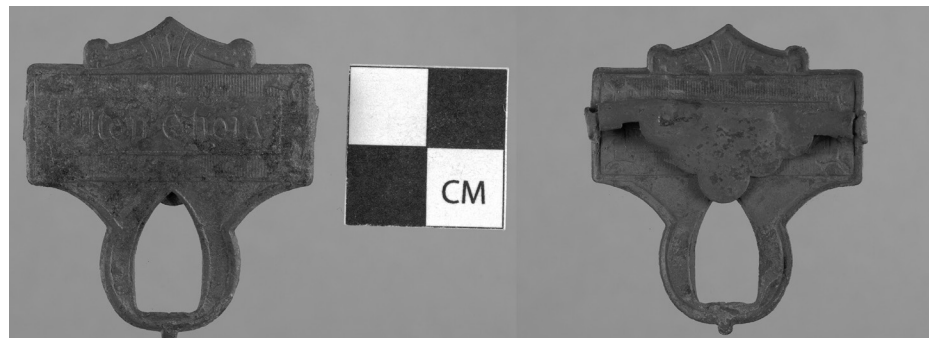
Four military buttons are Sander’s two-piece buttons with omega shanks. One was a General Service button that has a back mark for the Scovill Manufacturing Company of Waterbury, Connecticut, dating from 1855 to 1884 (Luscomb 1967). The other three are Infantry buttons (Figure 29), one of which has a readable back mark of the Waterbury Button Company of Waterbury, Connecticut, dating from 1849 to 1880 (Luscomb 1967).

Another button has “CHICAGO & T. T. & W.” around the edge. While no further information could be uncovered, it is assumed that this is advertising for the manufacturer. Finally, a metal button has “J. PORTER & CO LIVERPOOL” impressed around the edge (Figure 30, upper left). Porter and Company may be the same company mentioned in the American Protective Tariff League’s 1913 publication as J. Porter and Co. of East Liverpool, Ohio, “importers of agate buttons” (American Protective League 1913:93).

PERSONAL

Eight functional categories are represented within personal artifacts (Appendix). Reynolds (1989)

Figure 25. Suspender hook labeled “Mon. Choix.” Courtesy of kansasmemory.org, Kansas Historical Society.



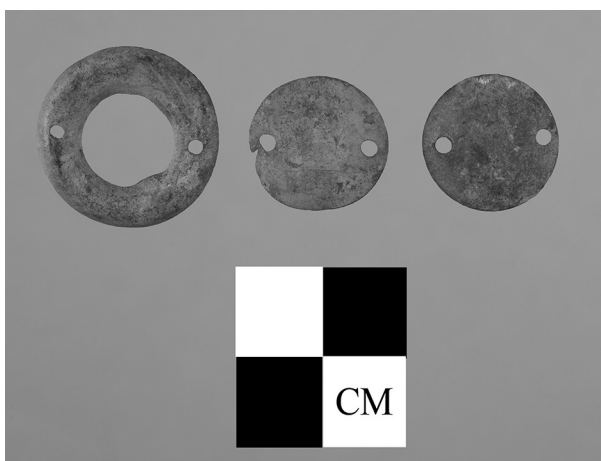


Figure 26. Brass attachment ring and disks. Courtesy of kansasmemory.org, Kansas Historical Society.



Figure 29. Two of the military buttons. Courtesy of kansasmemory.org, Kansas Historical Society.

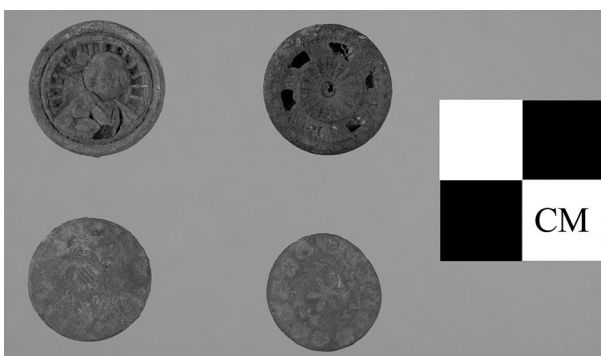


Figure 27. Decorated metal buttons, featuring the Yum-Yum character from "The Mikado" on upper left. Courtesy of kansasmemory.org, Kansas Historical Society.



Figure 30. Metal buttons. Upper left button has the lettering "J PORTER & CO LIVERPOOL." Courtesy of kansasmemory.org, Kansas Historical Society.

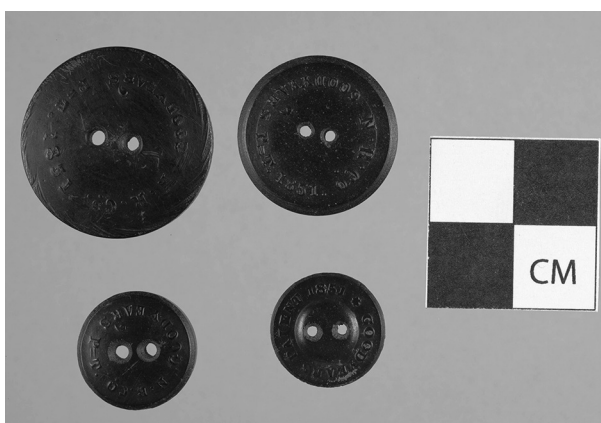


Figure 28. "Goodyear" rubber buttons. Courtesy of kansasmemory.org, Kansas Historical Society.

particularly noted one half of a pair of wick-trimming scissors from the privy area (Figure 31). Wick-trimming scissors were used to trim candle wicks, enabling the candle to produce a cleaner, clearer, and brighter burn. The earliest dated coin is somewhat confusingly referred to as a Three-cent Nickel (Figure 32). On the obverse is an image of left-facing Lady Liberty, surrounded by "UNITED STATES OF AMERICA 1881." On the reverse is the coin's value in Roman numerals "III." Other coins dating before the turn of the century are three Liberty with Headdress pennies, minted in 1887 and 1889, and a Liberty Head dime, minted in 1898. Pennies, nickels, and dimes, minted between 1902



Figure 31. Handle from a pair of wick-trimming scissors, identified by John Reynolds. Courtesy of kansasmemory.org, Kansas Historical Society.

and 1989, and coins on which the mint dates are not discernible also were recovered.

A letter opener advertises “Smith Paper Supply, 737 New Hampshire, Lawrence, Kansas,” which, according to the current occupant’s website, was a paper warehouse that closed in the 1980s or earlier (The Bottleneck 2020). One of the pencils was manufactured by the Eagle Pencil Company of New York, New York, in operation from 1856 to 1969 (Smithsonian Institution 2019).

A necklace setting has “STERLING” engraved on the back, a word long associated with silver but of limited help in dating this ornament. In general, “sterling” was inscribed only on the back of post-1870 jewelry, made in the United States or in England specifically for export (Lang Antiques 2019). A pocket watch plate is in the collection. A small tin of pocket watch parts, stamped “EXCELSIOR WATCH MATERIALS” on the bottom (Figure 33), was manufactured by the New York Standard Watch

Company of Jersey City, New Jersey, in operation from 1885 to 1929 (Renaissance Watch Repair 2018). Images of additional artifacts from the personal category are posted on Kansas Memory.

TOILETRY

Toiletry artifacts were sorted into four functional categories: accessories, cosmetics, grooming aides, and hair care (Appendix). Most are comb fragments. One toothbrush handle is labeled “LE TROCADERO FRANCE” (Figure 34). Trocadéro is a place name of an area in Paris, France, near the Eiffel Tower, making this somewhat of an exotic toothbrush. Other toiletry items can be viewed on Kansas Memory.

RECREATION

The recreation artifacts are further subdivided into art, musical, observation, sports equipment, and toy functions (Appendix). They suggest that leisure time at Constitution Hall may have been spent drawing, playing games or sports, and perhaps getting ready for a fishing trip. The toys range in time from older china doll parts to marbles to plastic soldiers (Figure 35).

Work Group

The work group encompasses 323 artifacts in six functional categories: tool, harness hardware, automotive and farm machinery, knife and ammunition, medical, and railroad.

TOOL

Tools are further classified as boring, cutting, fastening, holding, masonry, measuring, shaping, sharpening, and other (Appendix). A protractor fragment

Figure 32. Earliest dated (readable) coin is this 1881 Three-cent nickel. Courtesy of kansasmemory.org, Kansas Historical Society.





Figure 33. Excelsior watch tin. Courtesy of kansasmemory.org, Kansas Historical Society.

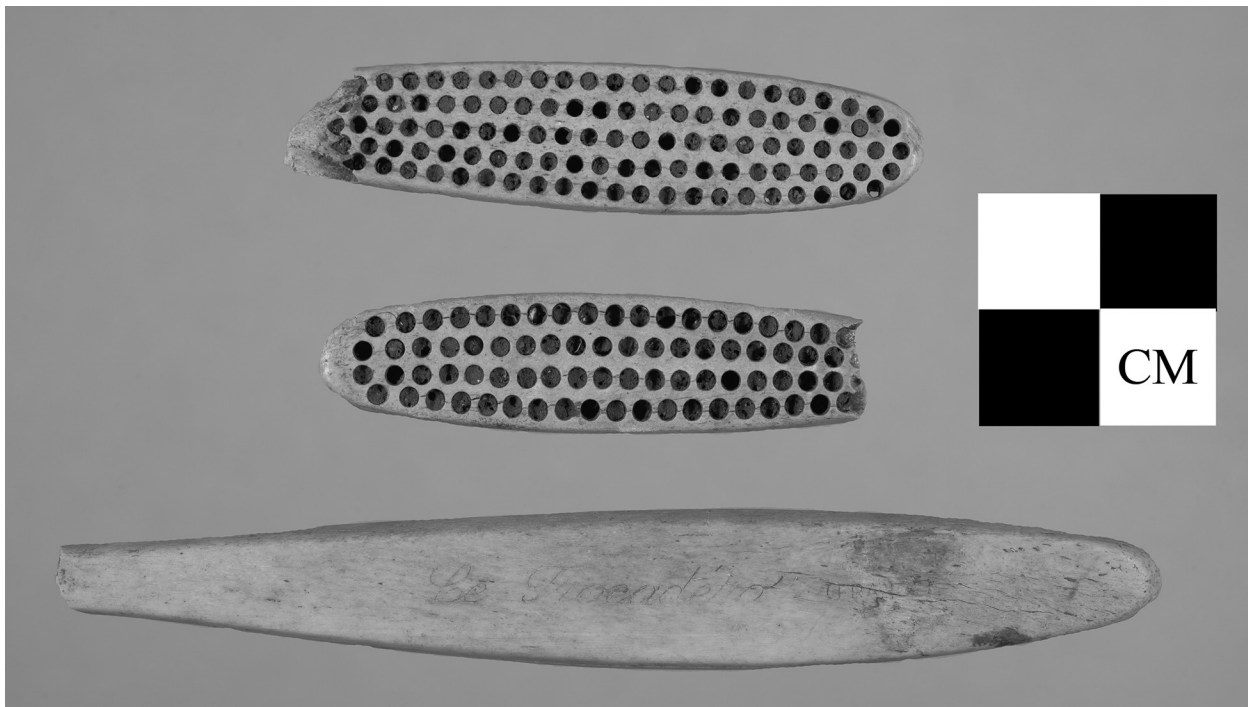


Figure 34. Toothbrush handle, labeled "Le Trocadero (France)," and toothbrush heads. Courtesy of kansasmemory.org, Kansas Historical Society.

has the wording "The Added T." It once may have been a segment of a combination protractor and t-square ruler, used for precision 0 to 180-degree measurements.

HARNESS HARDWARE

Harness, riding tack, and horseshoe artifacts were recovered (Appendix). A spur heel band (Figure 36)

is not complete enough to identify the type of spur from which it came. Unless lost by a recent reenactor, this item likely dates from the mid-nineteenth or early twentieth century.

AUTOMOTIVE AND FARM MACHINERY

Most of the automotive and farm machinery artifacts are farm machinery parts (n = 91, 82.7 per-



cent) (Appendix). One manufacturer's name plate displays "STOVER MFG & ENG. CO FREEPORT ILL." The Stover Manufacturing and Engineering Company was headquartered in Freeport, Illinois, and manufactured a variety of farm machinery from 1862 until 1942 (Barry 2017; Smithsonian Institution 2020). The excavations yielded a "FORD" key and a license plate. Of three identifiable spark plugs, two are labeled "CHAMPION J-13Y." Champion has made spark plugs since 1907 (Champion 2020). The third spark plug, "GENUINE J-M (MEZGER) 500 SOOT-PROOF," was patented in 1916. According to Peterson (2017), Mezger soot-proof spark plugs were the main brand used in early Ford Model T cars.

KNIFE AND AMMUNITION

Seventy-two artifacts have a knife or ammunition function (Appendix). Some of the lead bullets can be viewed on Kansas Memory. One spent and smashed Minié ball weighs in grams close to the mass of a .64-caliber bullet, but its condition prevents definite identification (Figure 37). A single percussion cap (Figure 37), used for powder ignition in muzzle-loading and early breech-loading guns (Eric Skov, personal communication February 11, 2021), was recovered. Percussion caps were invented around 1820, but by the 1850s and 1860s advances in cartridge design had made them obsolete (International Ammunition Association, Inc. 2021). Two brass cartridges had faint undecipherable head stamps, but the head stamps on 19 other cartridges can be read. Companies include the Winchester Repeating Arms Company of New Haven, Connecticut, the Peters Cartridge Company of Cincinnati, Ohio, and the United States Cartridge Company of Lowell, Massachusetts. All these companies began business in the 1860s, and some continue manufac-

turing ammunition today, albeit under different ownership.

MEDICAL

The artifacts classified as having a medical function comprise 31 test tube and vial fragments, an adhesive tape holder, eight band-aids, and the packaging for band-aids (Appendix).

RAILROAD

Complete or fragmentary standard gauge railroad spikes might have been used in building construction at the site rather than for holding track in place (Appendix). All specimens were recovered from the northwest area of the grounds in a shallow trash-filled depression. Associated were a 1910 penny and a 1972 dog tag.

Other Group

The other group consists of those artifacts that do not readily fit into the building-related, domestic,



Figure 36. Spur heel band. Courtesy of kansasmemory.org, Kansas Historical Society.

or work groups: communication, unidentified, and prehistoric. These combined categories contain 615 objects.

COMMUNICATION

The communication category encompasses audio and printed artifacts (Appendix). Those with an audio function are bells, a cassette tape fragment, and two radio-related pieces. Those items with a printed function include three remnants of printed matter too indistinct to be read, a manila envelope clasp, a pamphlet discussing priority mail rates, and six pages from *The Lawrence Daily Journal*, dated August 25, 1910, retrieved from beneath the floor of the building's northwest quadrant. Figure 38 shows a lead seal with "MEAT INSPECTION" and an

advertising token with the lettering "A Sogemeier 5." No further information could be gleaned about either of these. Finally, an advertising or promotional token (Figure 38) boasted "THE SUCCESS MANURE SPREADER," which was manufactured by Kemp and Burpee Manufacturing Company (1881–1911) of Syracuse, New York (Syracuse University Libraries 2017).

UNIDENTIFIED

This category consists of artifacts that cannot be identified, generally due to their fragmented nature. These are made of ceramic, cuprous, ferrous, glass, paper, plastic, and rubber materials (Appendix). One cast iron plate had the lettering "V.10.86. Oct 1." No details could be discovered for the plate.

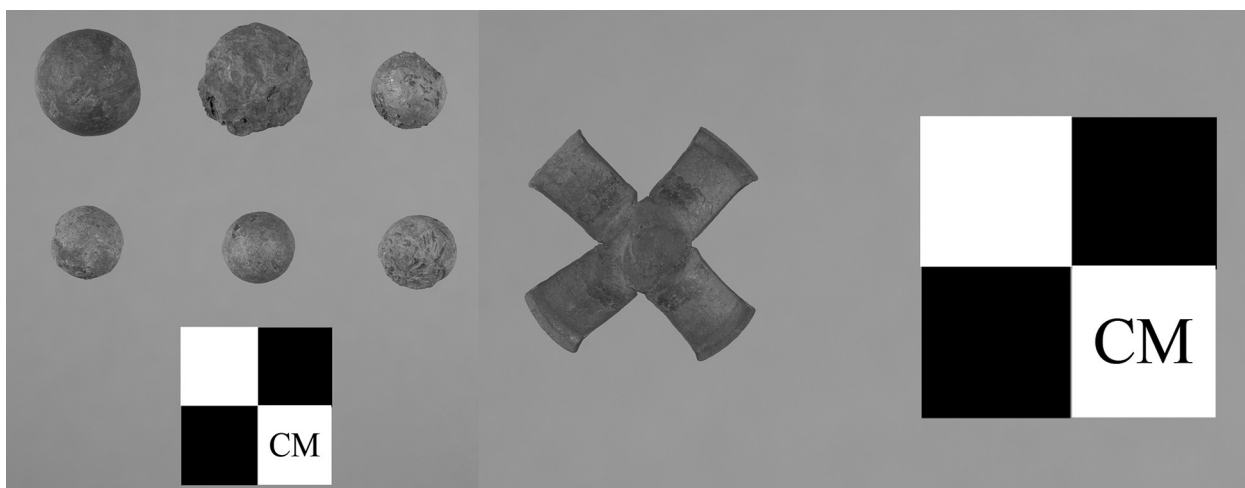


Figure 37. Ammunition and percussion cap. Courtesy of kansasmemory.org, Kansas Historical Society.



Figure 38. Both sides of a token, seal, and advertising piece. Courtesy of kansasmemory.org, Kansas Historical Society.

PREHISTORIC

Sixty-seven artifacts date prior to construction of the hall: chipped stone debitage, two bifaces, a core fragment, and a corner-notched arrow point (Appendix). The arrow point (see Kansas Memory) was recovered from the 30-cm depth zone amid historic trash. Reynolds' comment, "I don't know what it's doing here," offers the final words on this specimen (Progress Report, August 30, 1988). Although not all the lithic material is identifiable, Smoky Hill silicified chalk, Florence chert, and Permian chert were noted. Thermal alteration is present on five pieces.

Temporally Diagnostic Artifacts

Table 2 lists those artifacts from the excavations at 14DO321 that could be assigned a date or date range.

CONCLUSIONS

The primary research objective of tracing the construction history and outbuilding evidence at 14DO321 was met. Observations on how the building was fabricated were instrumental in its later repairs and restoration. Evidence confirmed the building's two-part construction time frame. The placement of a door (no longer present), fireplace

footing underneath the building, support column construction, foundation construction and repair, and modern plumbing additions were examined. Immediately west of Constitution Hall, a stone-lined well was discovered, and construction techniques for the walkway south of the building were ascertained. Farther afield an ambiguous post or pipe was encountered, the function of which remained undefined. A privy was excavated to the south, adjacent to the foundation of an outbuilding that might have had a horse-related function.

Another research objective was recovery of artifacts from the 1856 to 1858 Territorial Capital period. This critical interval is represented by a percussion cap, Minié balls, pontils, Goodyear buttons, infantry buttons, and wick-trimming scissors. Many other artifacts may date to this era but also were available to consumers over a long time span.

The collection sheds light on people and events in the building and on the historic property. The interesting flat glass fragment depicting an eye and the numerous brass rings may be associated with lodge activities. The Hemingray insulators may date to the time that a telephone office was operated there. The dormitory and boarding house use is well demonstrated by objects related to cooking, canning, canned goods, clothing, and toiletries. Special meals were eaten on fancy dishes, and people prepared for special events by putting on their

Table 2. Temporally Diagnostic Artifacts.

Artifact	Date Span	Reference
Percussion cap	1820–1869	International Ammunition Association 2021
Infantry button	1849–1880	Luscomb 1967
Waterbury Button Co.	1849–1944	Luscomb 1967
Scovill button	1850–1986*	Luscomb 1967
Folger can	1850–1963 (except during World War II's metal shortage)	Folger Coffee Company 2021
Novelty Rubber Co.	1853–1886	Vintage Buttons 2016
India Rubber Comb Co.	1853–1917	Vintage Buttons 2016
Eagle Pencil Co.	1856–1969	Smithsonian Institution 2019
Sandford's Ink	1857–1986*	Lindsey 2020b
Mason canning jars	1858–1915	Lindsey 2020d
Carter's Ink	1858–1976	Lindsey 2020b
Stover name plate	1862–1942	Barry 2017; Smithsonian Institution 2020

(continued)

Table 2. (continued)

Artifact	Date Span	Reference
Glasgow Pottery	1863–1900	Kowalsky & Kowalsky 1999
Watkins bottle	1868–1986*	Watkins 2018
Hemingray insulators	1870–1933	Lockhart et al. 2020b
Boyd's canning lid insert	1870–1964	Lockhart et al. 2020a
Illinois Glass bottle maker's mark	1873–1929	Toulouse 1971
Crown Dressing bottle	1875–1895	Glass Bottle Marks 2021
Oil lamp patent date	1878–1986*	artifact
Consolidated Fruit Jar Company canning lid insert	1878–1882*	Lockhart et al. 2016a
Coins	1881–1989	artifacts
Kemp & Burpee Mfg. Co.	1881–1911	Syracuse University Libraries 2017
Excelsior watch	1885–1929	Renaissance Watch Repair 2018
Crown caps	1891–1986*	Lemelson-MIT Program 2017
Made in Japan phrase	1891–1986*	Stack Exchange 2018
"For Mason Jars" with patent date	1892–1904	Toulouse 1971
Ball canning jars	1892–1986*	Toulouse 1971
Pabst "Blue Ribbon" beer	1893–1986*	Stamp 2012
Hazel-Atlas bottle maker's mark	1902–1964	Toulouse 1971
Miller High Life cap	1903–1986*	Miller Brewing Company 2020
Coca-Cola crown cap	1906–1986*	The Coca-Cola Company 2020
<i>Lawrence Daily Journal</i>	1910	artifact
Clorox	1914–1961	Clorox Company 2021
Obear-Nestor bottle maker's mark	1915–1978	Lockhart et al. 2018
Coca-Cola	1915–1986*	Coca-Cola 2020; <i>Grand Forks Herald</i> 2012
Mezger spark plug	1916	artifact
Dr. Pepper "10–2–4"	1920s–1975	Grace 2005
Knox Glass bottle maker's mark	1925–1986*	Lockhart et al. 2008; Toulouse 1971
Owens-Illinois bottle maker's mark	1929–1966	Toulouse 1971
Scoville gripper snapper	1930–1986	Company-Histories.com 2019
7-Up screw-on cap	1936–1986*	Bellis 2020
Bottle cap patent	1930–1986*	Fabrice/U.S. Patent Office 1930
Applied Color Labels (ACL)	1933–1986*	Lockhart et al. 2019
"Federal Law Forbids Sale or Re-Use of this Bottle"	1935–1974	Lindsey 2020c
Anchor Hocking bottle maker's mark	1938–1986*	Toulouse 1971
Duraglas	1940–1970	Lockhart and Hoenig 2015
Solarcaine	1949–1986*	Liquisearch 2021
©	1953–1986*	
Slate shingles	1959–1986*	artifact
Dodger pop	1960–1969	Encyclopedia Dubuque 2021
Labeling with zip codes	1963–1986*	
Country Time Lemonade	1975–1986*	Country Time Lemonade 2020
Plastic condiment jar date	1978–1986*	artifact

* Date of transfer to State property

best jewelry and buttoning the fancy dress buttons on their best outfits.

While luxury items often catch the eye, the sheer quantity of everyday detritus perhaps best exemplifies life at Constitution Hall. A little boy might have crowed with delight when he won a game of marbles, and a small girl cried when she dropped her china doll, breaking it. A woman might have dreamed about the latest Gilbert and Sullivan opera, while she repaired a tear in her dress with needle, thread, and thimble. A man might have tilted his chair back against a wall as he read the latest news from Lawrence and the world beyond.

Constitution Hall State Historic Site holds a prominent place in Kansas territorial period history and national events for its role in the drafting of the 1857 Lecompton Constitution. Even before this initial chapter closed, the building had started to become the hub of the community, sheltering those housed within and providing a backdrop for community and enterprise, for learning and laughter, and for looking forward and looking back.

ACKNOWLEDGMENTS

This paper would not be possible without the hard labor of KSHS archeologists John Reynolds (principal investigator), William Lees, Fred Scott, Bill

Ranney, and Virginia Wulfkuhle. They were joined in the field by crew members and volunteers: Cleta Mulder, Marylie Foust, Michelle Dunlop, Milton Reichart, Daryl Walters, Brenda Goebel, Joe Higgins, Coral McBeth, Don McBeth, Gerry Nudson, Walter Ernst, Laverna Ernst, John Peterson, Ray Harper, Matt Hanshaw, Mike Wildgen, Chris Wright, William Raney, Matt Connolly, Toni Flores, and Holly Hansen.

Processing the artifacts would have been difficult without the arduous work and dedication of archeology lab volunteers Alta Hoffman, Steve Hamilton, Bill Nyquist, Sharon McKinney, Danielle DeMotte, Jim Roberts, Donna Scoggin, Gary Scoggin, Evan Gabriel, Jill Cabrera, Sharon Sage, Maria Regan, Robin Campbell, and Paul Goebel. As most of this summary was written while under a “stay-at-home” order, Preservation Office Supervisor Katrina Ringler made pdfs of important data that I could not access personally. KSHS Outreach Archeologists Nikki Klarmann and Tricia Waggoner photographed artifacts. Constitution Hall Site Administrator Tim Ruis (Figure 39) and Virginia Wulfkuhle provided sounding boards for my ideas and kept me from glaring mistakes. If this paper is comprehensible, it is thanks to Virginia’s skillful editing. As always Dad, this one is for you.



Figure 39. Site Administrator Tim Rues, portraying historical figure Jim Lane for middle school children at Constitution Hall State Historic Site.

REFERENCES CITED

- American Protective Tariff League
1913 Index Section. *American Economist* 53:93.
- Barry, Thomas
2017 Stover Manufacturing & Engine Company, 1927–1939 and n. d. Historical Construction Equipment Association, University of Illinois, Urbana-Champaign. Electronic document Stover Manufacturing & Engine Company, 1927–1939 and n. d. | Historical Construction Equipment Association (hcea.net), accessed April 13, 2020.
- Bellis, Mary
2020 The History of 7UP and Charles Leiper Grigg. ThoughtCo, August 27, 2020. Electronic document www.thoughtco.com/history-of-7up-charles-leiper-grigg-4075324, accessed January 22, 2021.
- Birks, Steve
2016a T & R Boote in *The Local History of Stoke-on-Trent*. Electronic document <http://www.thepotteries.org/allpotters/128.htm>, accessed May 13, 2020.
2016b Thomas Hughes (& son) (Ltd) in *The Local History of Stoke-on-Trent*. Electronic document <http://www.thepotteries.org/mark/h/hughes.html>, accessed April 23, 2020.
- The Bottleneck
2020 About. Electronic document <http://thebottlenecklive.com/about>, accessed April 20, 2020.
- Champion
2020 About Us. Electronic document <https://www.championautoparts.com/about.html>, accessed May 14, 2020.
- Clorox Company
2021 Timeline. Electronic document <https://www.thecloroxcompany.com/who-we-are/our-heritage/timeline/>, accessed January 11, 2021.
- Coca-Cola Company
2020 The History of the Coca-Cola Contour Bottle. Electronic document <https://www.coca-colacompany.com/company/history/the-history-of-the-coca-cola-contour-bottle>, accessed May 18, 2020.
- Company-Histories.com
2019 Scovill Fasteners Inc. Electronic document www.company-histories.com/Scovill-Fasteners-Inc-Company-History.html, accessed January 27, 2021.
- Country Time Lemonade
2020 History. Electronic document Country Time Lemonade | Country Time All The Time (ctlemonade.com), accessed November 30, 2020.
- Encyclopedia Dubuque
2021 Dodger Beverage Company. Electronic document DODGER BEVERAGE COMPANY - Encyclopedia Dubuque, accessed January 13, 2021.
- Fabrice, Edward H.
1930 Receptacle-Sealing Device. U.S. Patent 1,771,034, filed May 19, 1930, and issued July 22, 1930. Electronic document Patent Images (uspto.gov), accessed January 21, 2021.
- Florida Museum of Natural History
2020 Historical Archaeology Type Collection Annular Ware, Banded Type Index. Electronic document <https://www.floridamuseum.ufl.edu/typeceramics/type/annular-ware-banded/>, accessed May 7, 2020.
- Folger Coffee Company
2021 History. Electronic document Our Coffee History | Folgers Coffee, accessed January 4, 2021.
- Garst, Christine
2021 Re: Unusual bottle/jar decoration (Electronic Mailing list message). Retrieved from <https://lists.asu.edu/cgi-bin/wa?A0=histarch>.
- Geology.com
2020 Muscovite. Electronic document <https://geology.com/minerals/muscovite.shtml>, accessed May 6, 2020.
- Glass Bottle Marks
2021 Frank Miller's Crown Dressing, New York, U.S.A. Electronic document <https://glassbottlemarks.com/frank-millers-crown-dressing/>, accessed February 9, 2021.
- Google Patents
2006 Wolfe. Electronic document <https://patents.google.com/patent/US2899157A/en>, accessed April 24, 2020.
- Grace, Roger M.
2005 At 10–2 and 4 O’Clock, It Was Dr. Pepper Time. *Metropolitan News-Enterprise*, Los Angeles, California, 15 December 2005, p. 11. Electronic document At 10–2 and 4 O’Clock, It Was Dr. Pepper Time (met-news.com), accessed March 8, 2021.

- Grand Fork Herald
- 2012 Last 6.5-oz. US coke bottle rolls off Minnesota Line. *Grand Forks Herald*, Grand Forks, North Dakota, 10 October 2012. Electronic document Last 6.5-oz. US Coke bottle rolls off Minnesota line, accessed January 11, 2021.
- HEYCO
- 2020 Corporate Overview. Electronic document <https://www.heyco.com/about.cfm>, accessed May 6, 2020.
- International Ammunition Association, Inc.
- 2021 A Cartridge Collector's Glossary. Electronic document <https://cartridgecollectors.org/?page=glossary>, accessed February 12, 2021.
- Isa, Mari
- 2017 Rhapsody in Flow Blue: The History of a Plate. MSU Campus Archaeology blog. Electronic document <http://campusarch.msu.edu/?p=5014>, accessed May 7, 2020.
- Joseph F. Glidden Homestead and Historical Center
- 2007 Barbed Wire: The Saga. Electronic document <http://www.gliddenhomestead.org/barbedwire.html>, accessed May 6, 2020.
- Kowalsky, Arnold A., and Dorothy E. Kowalsky
- 1999 *Encyclopedia of Marks on American, English, and European Earthenware, Ironstone, and Stoneware (1780–1980)*. Schiffer Publishing, Ltd., Lancaster, Pennsylvania.
- Lang Antiques
- 2019 Hallmarks on Period Jewelry. Electronic document <https://www.langantiques.com/university/hallmarks-on-period-jewelry/>, accessed May 14, 2020.
- Langer, Bill
- 2011 I is for isinglass. Electronic document www.quarrymagazine.com/2011/03/05/i-is-for-isinglass/, accessed January 19, 2021.
- Lemelson-MIT Program
- 2017 William Painter. Electronic document <https://lemelson.mit.edu/resources/william-painter>, accessed May 18, 2020.
- Lindsey, Bill
- 2020a Bottle Bases/Pontil Marks or Scars. In SHA/BLM Historic Glass Bottle Identification & Information Website. Electronic document https://sha.org/bottle/pontil_scars.htm, accessed January 27, 2021.
- 2020b Bottle Typing/Diagnostic Shapes Household Bottle (non-food related). In SHA/BLM Historic Glass Bottle Identification & Information Website. Electronic document <https://sha.org/bottle/household.htm>, accessed May 18, 2020.
- 2020c Bottle Typing/Diagnostic Shapes Liquor/Spirits Bottles. In SHA/BLM Historic Glass Bottle Identification & Information Website. Electronic document <https://sha.org/bottle/liquor.htm>, accessed May 18, 2020.
- 2020d Bottle Typing/Diagnostic Shapes Food Bottles & Canning Jars. In SHA/BLM Historic Glass Bottle Identification & Information Website. Electronic document <https://sha.org/bottle/food.htm#Canning/Fruit%20Jars>, accessed January 21, 2021.
- Liquisearch
- 2021 Solarcaine – History. Electronic document www.liquisearch.com/solarcaine/history, accessed January 4, 2021.
- Lockhart, Bill, Beau Schriever, Bill Lindsey, and Carol Serr
- 2016a Consolidated Fruit Jar Co. Electronic document <https://sha.org/bottle/pdf/ConsolidatedFruitJar.pdf>, accessed May 18, 2020.
- 2016b The Hemingray Glass Firms. Electronic document <https://sha.org/bottle/pdf/Hemingray.pdf>, accessed May 6, 2020.
- Lockhart, Bill, Beau Schriever, Bill Lindsey, Carol Serr, and David Whitten
- 2018 Obear-Nester Glass Co. Electronic document [Obear-Nester.pdf \(sha.org\)](https://sha.org/Obear-Nester.pdf), accessed January 4, 2021.
- Lockhart, Bill, Pete Schulz, Carol Serr, and Bill Lindsey
- 2008 The Knox Glass Bottle Co. *Bottles and Extras, Magazine of The Federation of Historical Bottle Collectors* 19(3):54.
- Lockhart, Bill, Bob Brown, Chris Weide, and Russ Hoenig
- 2019 The Glamorous Applied Color Labels. Electronic document <https://sha.org/bottle/pdf/ACLArticle2019.pdf>, accessed May 18, 2020.
- Lockhart, Bill, and Russ Hoenig
- 2015 The Bewildering Array of Owens-Illinois Glass Co. Logos and Codes. Electronic document https://sha.org/bottle/pdf/OwensIII_BLockhart.pdf, accessed May 18, 2020.
- Luscomb, Sally C.
- 1967 *The Collector's Encyclopedia of Buttons*. Crown Publishers, Inc., New York, New York.

Marcel, Sarah Elizabeth

- 1994 Buttoning Down the Past: A Look at Buttons as Indicators of Chronology and Material Culture. University of Tennessee Honors Thesis Projects. Electronic document https://trace.tennessee.edu/cgi/viewcontent.cgi?referer=https://www.google.com/&httpsredir=1&article=1042&context=utk_chanhonoproj, accessed May 13, 2020.

Miller Brewing Company

- 2020 The Beer. Electronic document <https://millerhighlife.com/>, accessed May 18, 2020.

Peterson, Royce

- 2017 Model T Sparks Plugs: A Primer for the Enthusiast. Electronic document <https://modeltfordfix.com/model-t-spark-plugs-a-primer-for-the-enthusiast/>, accessed February 10, 2021.

Renaissance Watch Repair

- 2018 Brief History: New York Standard Watch Company of Jersey City, New Jersey. Electronic document <http://www.pocketwatchrepair.com/histories/nys.html>, accessed April 20, 2020.

Reynolds, John

- 1988 Proposal for Archeological Investigation, Constitution Hall, Lecompton, Kansas. Manuscript on file, Kansas Historical Society, Topeka.
- 1989 Constitution Hall Was Focus of 1988 Archeological Investigation. *Kansas Preservation* 11(4):4–5.

Scharfenberger, G. P.

- 2004 Recent Evidence for Broad Window Glass in Seventeenth- and Eighteenth-Century America. *Historical Archaeology* 38:59–72. Electronic document <https://doi.org/10.1007/BF03376669>, accessed May 8, 2020.

Schoen, Christopher M.

- 1990 Window Glass on the Plains: An Analysis of Flat Glass Samples from Ten Nineteenth Century Plains Historic Sites. *Central Plains Archaeology* 2(1):57–90.

Smith, Hugh M.

- 1901 The French Sardine Industry. *Bulletin of the United States Fish Commission* 21(1):1–26. Electronic document. BULLETIN OF THE UNITED STATES FISH COMMISSION SEATTLENWF V.21 (noaa.gov), accessed January 21, 2021.

Smithsonian Institution

- 2019 Eagle Pencil Company Model 569 Compass and Divider. Electronic document https://americanhistory.si.edu/collections/search/object/nmah_904328, accessed April 20, 2020.
- 2020 Trade Catalogs from Stover Manufacturing and Engine Company. Electronic document https://americanhistory.si.edu/collections/search/object/SILNMAHTL_23364, accessed April 13, 2020.

Stack Exchange Network

- 2018 When were country of origin labels (e.g. Made in France) introduced? Electronic document trade - When were country of origin labels (e.g. Made in France) introduced? - History Stack Exchange, accessed April 20, 2020.

Stamp, Jimmy

- 2012 Where Did Pabst Win that Blue Ribbon? Electronic document Where Did Pabst Win that Blue Ribbon? | Arts & Culture | Smithsonian Magazine, accessed January 4, 2021.

Syracuse University Libraries

- 2017 Kemp Manure Spreader Patent Infringement Decision. Special Collections Research Center. Electronic document https://library.syr.edu/digital/guides/k/kemp_patent.htm, accessed May 15, 2020.

Toulouse, Julian Harrison

- 1971 *Bottle Makers and Their Marks*. Blackburn Press, Caldwell, New Jersey.

University of North Texas Libraries

- 2007 [Kelly's "Diamond Point" right twist barbed wire.] *The Portal to Texas History*, crediting the Fort Bend Museum. Electronic document <https://texashistory.unt.edu/ark:/67531/metaph73/>, accessed May 6, 2020.

Vintage Buttons

- 2016 Rubber Buttons 2. Electronic document <https://www.vintagebuttons.net/rubber2.html>, accessed February 9, 2021.

Watkins

- 2018 Our History. Electronic document <https://www.watkins1868.com/timeline>, accessed May 18, 2020.

APPENDIX. Artifact Summary by Function and Count or Weight

Function	Artifact	Count or Weight
<i>Construction Material</i>		
Roofing	Slate, asphalt shingles	510
Roofing	Flashing, disc, gutter clip	45
Roofing	Tar paper, tar	2
Roofing	Lightening rod	1
Wall	Plaster	297
Wall	Wallpaper, paneling fragments, paint chips	33
Foundation/structural	Mortar, cement	440
Foundation/structural	Stone	44
Foundation/structural	Wood	30
Foundation/structural	Brick	386
Flooring	Ceramic tile	8
Flooring	Linoleum	97
Window	Putty	29
Total		1,922
<i>Window Glass</i>	Aqua & clear window glass	23,921
Total		23,921
<i>Utility</i>		
Electrical	Zinc carbon batteries	24
Electrical	Battery case	2
Electrical	Box knock outs	2
Electrical	Wiring, clamp, strain relief, electrical tape	15
Electrical	Outlet, switch plates, pull chain	3
Electrical	Fuses	11
Electrical	Porcelain, plastic, & rubber insulators	19
Electrical	Glass insulators (telegraph & electrical)	41
Heating	Cast iron stove fragments	3
Heating	Isinglass	10
Heating	Stove pipe fragments	224
Heating	Tubing, duct tape	32
Lighting	Flashlight bulb, lens housing, incandescent bulbs, Christmas bulbs	575
Lighting	Lamp/lantern air plate, collars, mantles, wick, wick trimmer, bases, fragments	135
Lighting	Lamp/lantern chimneys, globes	1,908
Plumbing	Drain trap plug, faucet screen, toilet float, pump plunger	4
Plumbing	Pipe, fittings	8
Plumbing	Shower curtain fragments, rings	7
Total		3,023
<i>By-Product</i>	Coal, cinders, charcoal	5,490.9 g
<i>Hardware Fastener</i>		
Hardware fastener	Bolts, bolts with nuts or washers	34
Hardware fastener	Nuts	15
Hardware fastener	Rivets	15
Hardware fastener	Tacks	40

APPENDIX. (continued)

Function	Artifact	Count or Weight
Hardware fastener	Grommets	17
Hardware fastener	Box staples, fence staples	48
Hardware fastener	Fasteners, bands, brackets, spacers	31
Hardware fastener	Spikes, pins	16
Hardware fastener	Washers	98
Hardware fastener	Screws	102
Hardware fastener	Wrought nails	10
Hardware fastener	Cut nails	7,973
Hardware fastener	Wire nails, unidentified nails	11,373
Total		19,772
<i>Hardware Miscellaneous</i>		
Animal husbandry	Pet tag	1
Bucket	Bucket, bail	2
Fence	Wire, barbed wire	34
Miscellaneous	Bar stock	15
Miscellaneous	Chain	9
Miscellaneous	Spring	13
Miscellaneous	Strap metal	91
Miscellaneous	Scrap metal	103
Miscellaneous	Wire	496
Trap	Mouse trap	1
Total		765
<i>Furniture & Appliance</i>		
Furniture	Mirror glass, picture wire	19
Furniture	Glass furniture top fragments	19
Furniture	Casters	2
Furniture	Springs, wood, finial, metal fragments	18
Cleaning appliances, other	Mop attachment	2
Cleaning appliances, other	Shelf liner fragments	1
Cleaning appliances, other	Clothes pins, hangers, clothesline	12
Furnishings & structural	Countertop fragment	1
Furnishings & structural	Shelf braces, brackets	3
Furnishings & structural	Clothes & coat hooks	5
Furnishings & structural	Screen door springs	9
Furnishings & structural	Hinges	32
Furnishings & structural	Doorknobs, drawer knobs, pulls	18
Furnishings & structural	Latches, hooks	11
Furnishings & structural	Locks	13
Furnishings & structural	Keys	5
Appliance	Sewing machine pressure foot	1
Appliance	Refrigerator coil	1
Appliance	Cook stove parts	104
Appliance	Clock parts	17
Appliance	Sad iron	2
Window Treatment	Shade brackets & rod ends	10
Total		305

APPENDIX. (continued)

Function	Artifact	Count or Weight
<i>Container</i>		
Bottle	Type unknown bottles	11,560
Bottle	Beer, liquor, wine, pop bottles	878
Bottle	Ink, cleaning, toiletry bottles	80
Bottle	Pepper sauce, oil, flavoring, condiment bottles	144
Bottle	Medicine bottles, pharmaceutical bottles	145
Jar	Type unknown jars	201
Jar	Canning jars	139
Jar	Condiment, toiletry, medicinal, pharmaceutical jars	12
Jug	Cleaning & type unknown jugs	6
Can	Type unknown cans	3,655
Can	Beverage cans, meat cans	78
Can	Toiletry, tobacco, match tin, chemical cans	16
Barrel	Bung	4
Tube	Tubes	4
Packaging	Cellophane, plastic wrap, aluminum foil	90
Packaging	Candy wrappers	88
Packaging	Disposable containers	20
Closure	Pull tabs, can keys, seals, stoppers	49
Closure	Clip off, pry off, flip off, screw on, type unknown caps	168
Closure	Canning lids & liners	123
Total		17,460
<i>Tableware & Utilitarian</i>		
Tablesetting	Dinner, dessert plate sherds	364
Tablesetting	Saucer sherds	25
Tablesetting	Cup sherds	153
Tablesetting	Bowl sherds	18
Tablesetting	Unable to further identify	180
Tablesetting	Disposable dishes, straws	79
Serving	Platter sherds	10
Serving	Serving bowl sherds, bean pot sherds	76
Serving	Mixing bowl sherds	101
Serving	Sugar bowl sherds	50
Serving	Candy, other dish sherds	64
Serving	Pitchers, cruets	19
Serving	Shakers	25
Serving	Unable to further identify	380
Tablesetting or serving	Unable to further identify	2,946
Beverage glass	Tumblers, water glasses, stemware, juice glasses	217
Decorative	Cake candle holder	1
Utilitarian	Crockery	351
Utilitarian	Jugs	5
Utilitarian	Flowerpots	166
Utilitarian	Vases	3
Utilitarian	Ash trays, chamber pots	2
Utilitarian	Unable to further identify	321
Total		5,556

APPENDIX. (continued)

Function	Artifact	Count or Weight
<i>Flatware</i>		
Flatware	Dinner knife blade	2
Flatware	Tablespoon fragments	3
Flatware	Ferrous, silver-plated, & plastic teaspoons	19
Flatware	Forks (1 complete)	9
Flatware	Handles	15
Utensil	Spoon fragments	24
Utensil	Can opener	1
Utensil	Handles	5
Cutlery	Complete butcher knife & knife blade	2
Total		80
<i>Cookware</i>		
Cooking	Handle	1
Cooking	Pie tins	2
Cooking	Cast iron pot fragments	11
Total		14
<i>Fauna, Flora, Other</i>		
Food fauna	Beef, pork, fish, poultry, unidentified	5,647.5 g
Other fauna	Bird, rodent, mussel, gastropod, unidentified	3,169.7 g
Food flora	Corn, nuts, fruit pits	37.0 g
Other flora	Tree bark, plant fragments & seeds	101.1 g
Other	Fossil	.1 g
Total		8,955.4 g
<i>Clothing, Footwear, Fastener</i>		
Material	Fabric, fibers	17
Underwear	Garter buckles, corset buckles	14
Outerwear	Glove fragments	2
Footwear	Heels, heel plate, eyelets, shoe button, leather fragments	82
Clothing accessory	Belt buckles	13
Clothing accessory	Decorative disks	270
Clothing fastener	Snap, rivets, hooks & eyes	34
Clothing fastener	Overall buckles	14
Clothing fastener	Buttons	353
Total		799
<i>Personal</i>		
Money	Coins from 1881 to 1989	28
Eyeglasses	Eyeglasses fragments	23
Other	Credit card, handbag snap, luggage fragments	12
Bead	Beads	12
Jewelry	Jewelry, pocket watch fragments	17
Office supply	Slate board, slate pencils, rubber bands, thumb tacks, tape, paper clips, erasers, letter opener, magnet, chalk, pencils, pens	177
Sewing & scissors	Material, needles, pins, thimbles, scissors	32
Smoking	Matchboxes, cigar mouthpiece, filters, pipe fragments	48
Total		349

APPENDIX. (continued)

Function	Artifact	Count or Weight
<i>Toiletry</i>		
Accessory	Button hook	2
Cosmetics	Compact	1
Grooming aide	Mirror fragments	14
Grooming aide	Toothbrush fragments	3
Hair care	Comb fragments	52
Hair care	Hair band, hair clip, hair pins	6
Total		78
<i>Recreation</i>		
Recreation	Christmas decorations, floral decorations	33
Art	Charcoal pencil	1
Musical instrument	Harmonica plates	2
Observation	Binocular lens	1
Sports equipment	Football, golf ball, fishing sinkers	5
Toy	Model building items, balls, blocks, jax, toy fragments	29
Toy	Card games, board games, toys, bicycle tire gauge cap	2
Toy	Doll fragments	12
Toy	Soldiers, animals, figurines	16
Toy	Marbles	23
Toy	Riding toys	3
Total		127
<i>Tool</i>		
Boring tool	Drill bit, awl	2
Cutting tool	Saw blades	4
Fastening tool	Flat head screwdriver, wrenches	5
Holding tool	Alligator clip, suction cup, pulley guide	4
Measuring tool	Protractor, thermometer tube, weight	4
Masonry tool	Chisels	3
Shaping tool	Steel wool	1
Sharpening tool	File, whetstones	4
Welding tool	Soldering iron	6
Other tool	Handle	1
Total		34
<i>Harness Hardware</i>		
Harness	Rivet, buckles, rings	14
Harness	Straps	12
Harness	Whiffle fragments, single tree fragments	2
Riding tack	Bit	1
Riding tack	Spur heel band	1
Shoe	Heel portion	2
Total		32

APPENDIX. (continued)

Function	Artifact	Count or Weight
<i>Automotive & Farm Machinery</i>		
Automobile	Bearing, license plate fragments, spark plugs, cap, tire chain	9
Farm machinery fragments	Gears, gear stop, lever, brackets, brace, spring, hook, bolt, nut, handle, manufacture's name plate, 91	
General vehicle	Key, nut, brake shoe, spark plug, belts, tire fragments, fragments	10
Total		110
<i>Knives & Ammunition</i>		
Edged weapons	Pocket knives	4
Ammunition	Lead balls	4
Ammunition	Percussion cap, primer	3
Ammunition	Cartridges & bullets: .22 cal., .25 cal., .30 cal., .32 cal., .37 cal., .38 cal., .44 cal., .53 cal., 30.06 M-1 clip, unidentified	58
Ammunition	Shotshell: 10 gauge, unidentified	3
Total		72
<i>Medical</i>		
Medical	Vials, test tubes	31
Medical	Bandages, band aid packaging	11
Total		42
<i>Railroad Items</i>		
Track	Spikes	33
Total		33
<i>Communication Items</i>		
Audio	Radio parts	14
Audio	Bell, cassette	2
Printed	Calendar, advertisement, envelope	5
Printed	Newspaper, pamphlet	2
Printed	Printer's type	8
Printed	Tokens, seals	3
Total		34
<i>Unidentified Items</i>	Assorted materials	514
Total		514
<i>Prehistoric Artifacts</i>		
Chipped stone	Core	1
Chipped stone	Bifaces	2
Chipped stone	Arrow point	1
Chipped stone	Debitage	63
Total		67
Total Artifacts Counted		75,109
Total Artifacts Weighed		14,446.3 g

JACOB V. BROWER AND THE BEGINNINGS OF ARCHEOLOGICAL FIELD SURVEY IN KANSAS

MICHAEL R. PENROD

St. Cloud, Minnesota

Between 1897 and 1903 Jacob V. Brower conducted the first systematic archeological survey of the Kansas River watershed. He was searching for Quivira, the Indigenous site visited by Spanish explorers in 1541. In carrying out his investigation, he surveyed hundreds of sites and accumulated thousands of artifacts. Brower left behind significant documentation of his fieldwork and a substantial collection. The Kansas Historical Society has an inventory of Brower's Kansas sites, as well as artifacts gathered from those sites. While site provenience is known for some of these objects, it is not known for all. This paper examines the possibility of establishing site provenience for the specimens, using Brower's surviving field notes, memoirs, and artifact catalog. In doing so, it also explores Brower's survey activities in Kansas.

Beginning in 1897 and continuing through 1903, Jacob V. Brower conducted the first systematic archeological survey of the Kansas River watershed. As illustrated by the Figure 1 map, Brower's scope of work was extensive. He surveyed hundreds of sites, collected and analyzed thousands of artifacts, and compared his findings among sites and geographic areas throughout the region; based on his examination, he offered characterizations of the areas' early residents.

Brower personally engaged in fieldwork, visiting and surveying sites throughout east-central Kansas. Although he did not have what today would be called an archeology laboratory, he conducted analysis of collected items, evaluating form and function. He integrated those laboratory assessments with his site-based observations to produce conclusions about the places he investigated and the people who made them. He published this information in his memoirs, a multi-volume set of documents describing his endeavors and probably intended for popular consumption.

In carrying out the fieldwork, he collaborated with individual citizens of the Kansas River valley. He specifically mentioned working with L. R. Elliot and W. J. Griffing from Manhattan, Kansas, and J. T. Keegy from Alma, Kansas (J. V. Brower to F. G. Adams, letter, 29 January 1898, manuscript collection, Kansas Historical Society, Topeka;

Brower 1898:4–10, 25–46, 59–70; Brower 1903; Porter 2016). These individuals worked with Brower and on their own in exploring the physical evidence of peoples who previously occupied the landscape, particularly in the areas around modern-day Manhattan and Junction City. Brower's Kansas colleagues were much like today's members of the Kansas Anthropological Association (KAA).

Brower's work in Kansas had a precise focus. He sought the location of Quivira, the Indigenous villages visited by the Coronado expedition into the North American Great Plains in 1541 (Wedel 1990). Brower considered Quivira an aggregation of villages rather than a distinct place (Brower 1898:xi–xiii). Remains of these villages do exist, today recognized as protohistoric sites that are part of the Great Bend aspect. At the time of Spanish contact in the mid-1500s, they were inhabited by the Wichita (Hawley and Blakeslee 2006; Unrau 2001:18–28). In seeking Quivira, Brower was driven by the idea of discovery—certain that it would bring him fame. He (Brower 1903) explained his motives in *Kansas: Monumental Perpetuation of its Earliest History, 1541–1896*, a volume of memoirs summarizing his search for and supposed discovery of Quivira. He marshaled his arguments and evidence to ensure that his claims would be acknowledged. Despite Brower's certainty, modern research suggests that he was off by about 100 miles (Wedel

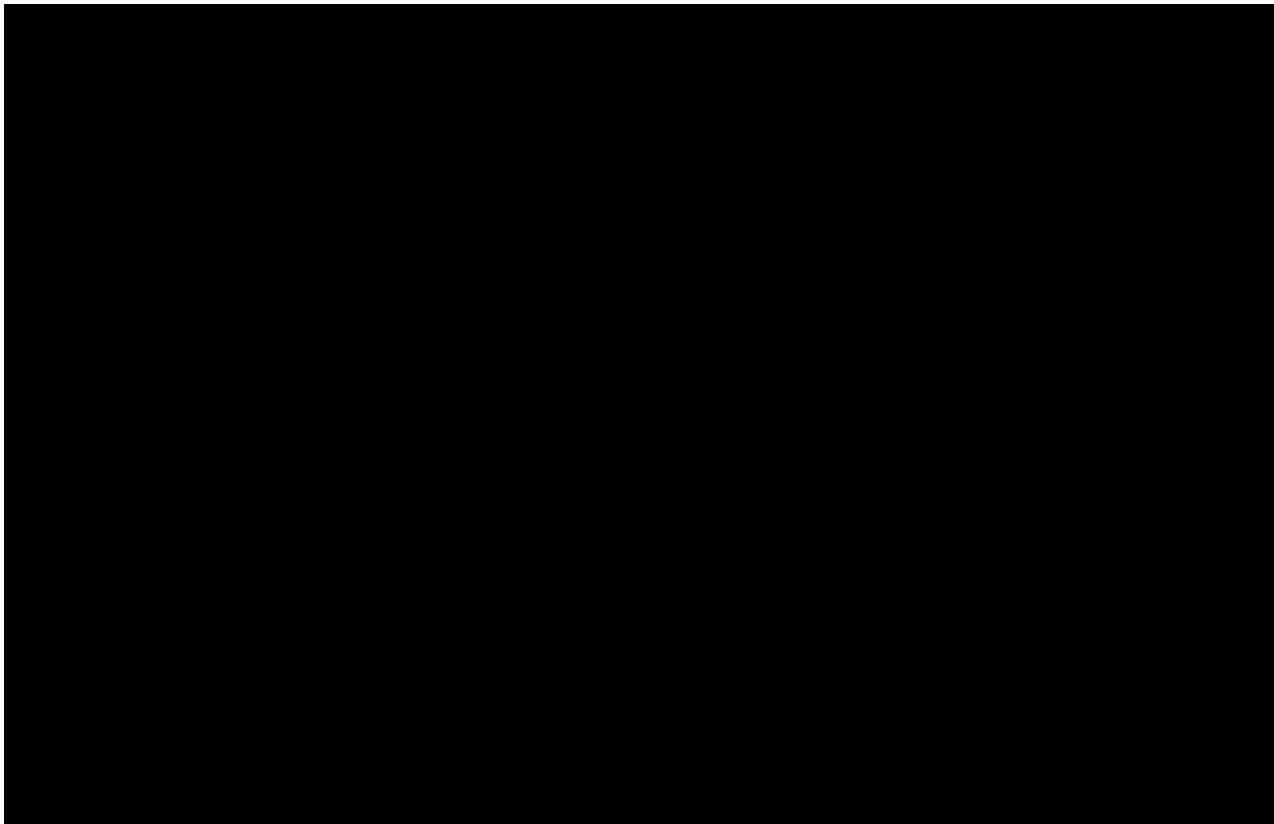


Figure 1. Composite map of Kansas sites surveyed by Brower and his colleagues between 1897 and 1903 (Brower 1903: between 40 and 41).

1990). Brower became obsessed with the search for Quivira, believing it to be one of the last undiscovered places of the North American historical past (Brower 1903).

BROWER COLLECTION

In the process of surveying sites in Kansas and other states across the upper Midwest, Brower acquired an extensive artifact collection, with individual objects numbering in the thousands. This assessment is based primarily on contacts with Minnesota Historical Society (MNHS) and Kansas Historical Society (KSHS) archeologists who manage collections in their respective institutions. Each agency has a large collection of Brower artifacts. Also, this appraisal is supported by documents in the possession of both organizations (*Jacob V. Brower Archaeological Catalog #1* [MSHS 1897–1905?] and *Brower Collection-Catalog* [KSHS 2019]) that appear to be a register of artifacts collected by Brower during his years of fieldwork. MNHS

Project Assistant Nancy Hoffman (personal communication August 2019) believes that specimens are listed in the order accessioned, each having an assigned number. Both MNHS and KSHS archeologists confirmed that Brower items in their respective collections have unique numbers, assigned at some point in the past and not by personnel in their agencies (Nancy Hoffman, personal communication August 2019; Chris Garst personal communication September 2019). These collections will be discussed at length later in this paper.

The existence of the Brower inventory, with a numbering system identifying artifacts and notations about where they were collected and what they were thought to be, indicates that Brower attempted to maintain the provenience of the material in his collection. His stewardship is further reflected in letters that he exchanged with Franklin G. Adams, secretary of the Kansas State Historical Society in the late nineteenth century. In a letter dated October 25, 1897, Brower expressed the importance of assembling all artifacts from the various Coronado sites

in one place because this was important to understanding their historical significance (J. V. Brower to F. G. Adams, letter, 25 October 1897, manuscript collection, Kansas Historical Society, Topeka).

Establishing and preserving artifact provenience is a foundational concept of modern archeology. Typically, the process starts when an artifact is recovered by assigning a field specimen number that links it to the site and to an exact location within the site, including depth if appropriate. Usually an assessment of the object's function is made (Sutton and Arkush 2009:13). This information is recorded in a catalog that stays with the artifacts so that subsequent users know where they came from, when they were collected, and what they are. Knowing the provenience or context of artifacts can help identify cultural shifts, which sometimes were accompanied by changes in tool manufacturing techniques and by adoption or abandonment of a particular kind of implement. Determining artifact function can aid in understanding when and why a site was occupied, what people did there, and when and why a site was abandoned (Sutton and Arkush 2009:19–23).

Additional support for the contention that Brower was a serious researcher rather than a pothunter is his interest in proper treatment of artifacts. In his correspondence with Adams, Brower expressed concern for the state of preservation of Coronado site-related artifacts recovered by himself and other researchers and offered suggestions, based on contemporary artifact conservation technology (J. B. Brower to F. G. Adams, letters, 9 October 1887 and 19 October 1897, manuscript collection, Kansas Historical Society, Topeka).

Much of the Brower collection is in the possession of the MNHS in St. Paul. Apparently it was acquired after Brower's death in 1905 (Nancy Hoffman, personal communication August 2019). Originally part of the MNHS collection, his Kansas artifacts were traded to the KSHS in July 1923 (*Topeka State Journal* [TSJ], 23 July 1923:3.; Nancy Hoffman, personal communication August 2019; Chris Garst, personal communication September 2019). The KSHS also received the paperwork documenting the material obtained from Minnesota, which once was part of the Brower catalog mentioned above (MNHS 1897–1905?). An excerpt from the Kansas segment (Figure 2) enumerates the Kansas artifacts, including specimen numbers and

descriptions, functional identifications, and references to where the items were found. The Kansas inventory comprises 166 pages with 30 or more entries on each page. Several of those pages document collection of artifacts from other states (KSHS 2019). The excerpt in Figure 2 also is illustrative of *Archaeological Catalog #1* (MNHS 1897–1905?).

My interest in exploring Brower's *activities* in Kansas started after meeting KSHS Laboratory Archeologist Chris Garst at the 2019 Kansas Archeology Training Program (KATP) field school, where Chris ran the on-site lab. In June 2019 the KATP undertook excavations at the Tobias site (14RC8) near Lyons, Kansas, which is believed to be one of the Quivira-related villages visited by Coronado. Discovering that I was from Minnesota and had a professional archeological background, Chris struck up several conversations about Brower and Quivira and the Brower materials in the KSHS collections—subjects that I knew little about at the time.

The KSHS has more than 6,000 Brower artifacts in its collection (Mechem 1937:83), and Chris wanted to know more about where in the state these objects originated. She was aware of Brower documents in the KSHS archeology files, the MNHS holdings, and Brower's memoirs, but she had never found time to sort through these sources for clues as to how Brower organized his collection. Did the numbers on the artifacts link them to sites, as would be true with modern practice? If so, it might be possible to establish provenience for at least a portion of the artifacts. Chris wondered if the answer lay in Brower's field notebooks.

When I returned to Minnesota later that summer, I decided to look deeper into Brower's Kansas investigations and specifically whether it was possible to determine the proveniences of artifacts he collected there. I find Brower interesting. Part of the attraction is that much of his fieldwork was done in the area of Kansas where I grew up; thus, I am familiar with many of the places he visited. Furthermore, this project fit well with one of my remaining requirements for a Master's degree in Cultural Resource Management Archaeology at St. Cloud State University. Historical archeologist and my advisor Associate Professor of Anthropology Rob Mann assisted me in arranging to pursue Brower research as Chris' intern at the KSHS.

162
Kansas

Name	Material	Remarks	No.
5021 Knife. Chert.	Tapering taper point at each end.	Mill Cr. Valley Kans	1
5022 "	conce. shaped	"	1
5023 Leaf.	oval but pointed at one end	" ne ?	1
5024 Supplement	Spontless, broad tongue, sides parallel	"	2
5025 Leaf.	oval but tapering to a point at each end	"	1
5026 Scrapers ?	ovate and oblong one end pointed	" pr ne	3
5027 "	oblong.	" "	5
5028 "	hunched	" "	2
5029 "	bituminal	" "	3
5030 "	" and notched at the center	"	1
5031 "	" oblong	" ne	2
5032 " leaf	ovate-oblong.	" pr ne	1
5033 " ?	unfinished	" pr ne	1
5034 "	yellowish gray	" ne	1
5035 OK	ovate-pointed	" ne pr ne	8
5036 "	not typically finished at base	" "	3
5037 "	shape abnormal, about circular	" "	9
5038 "	light gray, unfinished, about circular	" ne pr ne	3
5039 leaf	"	" "	3
5040 "	hunched, one side flat	wt	1

Figure 2. Page from the Brower artifact inventory in the KSHS archeology donation files.

BOWER FAMILY

Jacob Vradenberg Brower (1844–1905) was the quintessential late nineteenth-century antiquarian. A self-educated land surveyor, he saw himself also as a geologist, but he quickly became an accomplished self-taught archeologist. While working as a surveyor in central and northern Minnesota, he encountered the physical remains of previous cultures, and these discoveries sparked his interest in archeology.

Brower's family moved to Minnesota before the Civil War. The family consisted of the parents, Abraham and Mary Brower, and five sons: Richard, James, Abraham, Jr., Jacob, and Walter. In 1860 they settled in Long Prairie, Minnesota, in southern Todd County in north-central Minnesota, just north of the developing town of Sauk Centre.

As the Civil War began, James and Abraham,

Jr. joined respectively the First and Seventh Minnesota volunteer regiments of the United States Army. James survived the war and returned to the farm at Long Prairie. Abraham, Jr. was captured in July 1864 at Tupelo, Mississippi, and died in a Confederate prison camp. Jacob, Richard, and their father served in the Sauk Centre Militia Company in August and September of 1862 as part of the local response to conflict with the Indigenous Dakota people. Later Jacob and Richard also served with the Minnesota Mounted Rangers, state troops raised in 1863 in response to concerns about continued hostilities among the Dakota and the white settlers of western and central Minnesota. They patrolled the Red River Trails in central Minnesota and were part of General Alfred Sully's 1863 campaign into Dakota Territory. Richard died at Fort Abercrombie in Dakota Territory in September 1863 of disease contracted during the campaign. Jacob survived

and eventually entered the U.S. Navy and served as a seaman on a river ironclad in the Mississippi Squadron. He saw fighting with Confederate shore batteries along the river before the war ended. The youngest son, Walter, was about seven when the Civil War started and too young to participate (Osman 2008:162–167).

Jacob engaged in a variety of occupations besides being a soldier and a sailor. Prior to joining the military, he taught school, and in the years immediately following the Civil War, he held elected office in Todd County. In 1879 he was elected to the Minnesota state legislature. His vocational interests coalesced around land surveying, and by the early 1880s he apparently was employed as a full-time surveyor (Osman 2008:167).

In the years immediately following the Civil War, Euro-American immigration into the Minnesota country increased. Defined property surveys facilitated land sales to these new immigrants and thus became increasingly important. Many veterans like Brower took up land surveying, which was a reasonably well-paid and respected vocation.

Because of the high quality of his survey work, the MNHS retained Brower (1895) to identify the source of the Mississippi River. Later he also was involved in verifying the source of the Missouri River. These accomplishments elevated his professional stature and broadened his exposure to the physical evidence of past peoples in Minnesota and the Midwest. As a result of his experiences, he became committed to the emerging idea of protecting existing landscapes for future generations. His efforts culminated in the establishment of Itasca State Park, the crown jewel of the Minnesota State Parks system, and his appointment as its first superintendent (Brower 1904a) (Figure 3).

As he conducted land surveys, Brower took time to map, explore, and record observations about the sites encountered and to collect artifacts (Brower 1898, 1899, 1901, 1903; MNHS 1976b). He compared these sites and drew conclusions about the people he believed had built them. Brower was likely one of the first Euro-Americans to see some of these places.

He shared his observations with others following similar pursuits, including scholars at the Smithsonian Institution. Apparently his intent was to document the existence of people in Minnesota

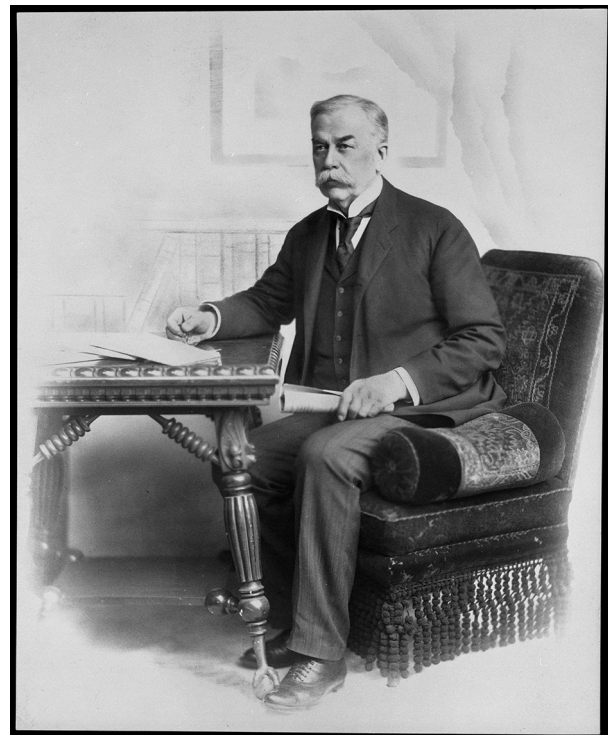


Figure 3. Jacob Vradenberg Brower, about 1904. The photographer is unknown. Used with permission, Minnesota Historical Society, St. Paul.

and across the Midwest prior to the arrival of the late nineteenth-century residents (Brower 1904b:xi). I infer this purpose from the tone of his writings, as I did not find any comments explicitly explaining his interest in past cultures, other than association with the Quivira search.

Brower's fieldwork had a mixed impact on the sites he studied, and some of his conclusions were wide of the mark. Still, he left detailed accounts of what he observed and did while engaged in what is now called archeological survey, stretching across a wide swath of the central section of the country. His written records provide current researchers with insights into what various archeological sites and the region in general looked like before extensive Euro-American encroachment.

PENROD INVESTIGATION

My Brower research began with his multi-volume set of memoirs. These books, expounding on his field experiences, were self-promotional and composed for a popular audience. Because the narra-

tives span multiple years and large geographic areas and are very thorough, Brower must have maintained day-to-day records of his activities while in the field. It seems unlikely that he could have written such highly focused memoirs without careful field notes. The specificity of the memoirs and the fact that he kept an extensive artifact catalog imply a very detail-oriented individual. I decided that Chris Garst was probably right: Brower must have had field notebooks that documented work at the sites mentioned in the memoirs and catalog. The question that she raised with me was: Do those notebooks still exist?

Because of Brower's deep roots in Minnesota, I looked at the MNHS online catalog and quickly found his field notebooks on microfilm in the Minnesota History Center in St. Paul. According to the finding aid, the microfilm copies were prepared in 1976 and assigned the collection reference number M330. The originals are also in the MNHS archives but closed to general use. When I visited the MNHS microfilm room, the librarian and I had some trouble locating the microfilm reels, suggesting that considerable time had elapsed since they had been viewed, if indeed they ever had been accessed. The three reels, cataloged as a set, contain copies of the 25 *New Series Field Notebooks* (MNHS 1976a). Notebooks 1–10 are on the first reel, notebooks 11–18 are on the second reel, and notebooks 19–25 are on the third reel.

I later learned that the KSHS also has the field notebook microfilm under the reference number 44892. KSHS archivists assigned separate numbers to each reel: MF7170, MF7171, and MF7172. In the KSHS collection the notebooks appear on three reels in the same order as in the MNHS collection. In creating finding aids and catalog numbers, the MNHS used the dates that the materials were microfilmed, whereas the KSHS used the dates that the original documents were prepared.

The finding aids identify the states and time periods in months/years covered in the notebooks on each microfilm reel. The notebooks were not paginated, but the entries are in chronological order by date. A researcher looking for information about a certain site must know the state in which the site was located and the year and month that it was surveyed. One can use the finding aid to identify the reel containing the notebook with the information

sought, pull that reel, and scroll through the microfilm to the appropriate notebook and entry date. This search process is the same whether using the microfilm at the MNHS or the KSHS. Scrolling through the notebooks is an engaging activity, as it offers an intimate look at how late nineteenth-century North American archeology was conducted.

The entry on the first page of *Field Notebook #1* indicates that what Brower called his New Series Field Notebooks were started in March 1897 to replace earlier field notes and records lost in a St. Paul house fire in December 1896 (MNHS 1976b). These notebooks cover approximately the last five years of Brower's field career, when he was working primarily as an archeologist. They provide descriptions of sites that Brower and various colleagues surveyed and excavated in Minnesota and other midwestern states, including Kansas.

The entries dealing with Kansas throughout multiple years are concentrated in Notebooks 1, 3, 4, 14, 20, and 23 (KSHS 1897–1905). Brower wrote extensively about sites in Riley, Pottawatomie, Geary, and Wabaunsee counties. While he focused on sites that he considered essential to his Quivira research, he surveyed sites that he believed unrelated to Quivira as well (MNHS 1976b). The extent of his undertakings is displayed in Figure 1, copied from a map in *Kansas: Monumental Perpetuation of its Earliest History, 1541–1896* (Brower 1903). Hundreds of sites are identified, illustrating the wide scope of Brower's investigations between 1897 and 1903.

The initial field entry in *New Series Field Notebook #1* (MNHS 1976b) documents a visit to Manhattan, Kansas, in March 1897, including the Blue Earth Kansa Village site (14PO24) on the eastern edge of the town, at that time the confluence of the Blue and Kansas rivers. It also contains the account of a trip north up the Blue River valley as far as Wymore, Nebraska, surveying sites, several of which subsequently were destroyed in the early 1960s by the construction of Tuttle Creek Reservoir. Additionally, these early entries report what might have been his first visits to the Griffing (14RY31) and Elliott (14GE303) sites near Manhattan (MNHS 1976a). Brower's site descriptions frequently are accompanied by sketch maps. He also recorded recovered artifacts and objects observed but not collected, often adding drawings of them. He recorded site locations, using section,

township, and range notations, and usually named the sites for the landowners.

The Elliott site apparently impressed Brower and convinced him that he had found the general vicinity of Quivira (MNHS 1976b). He viewed Quivira as a region rather than an exact geographic spot, referring to the province of Quivira in his writings (Brower 1898: xi-xiii) and representing it that way graphically (Figure 1).

Brower's interest in Kansas and the Quivira question seems to have originated with a collection of stone artifacts from the Manhattan area, sent to him in 1895 by L. R. Elliott (Brower 1898:xii). These materials most likely came from the McDowell Creek watershed, probably from what became known as the Elliott site, but I could find no reference to definitively support this conclusion. To Brower the specimens suggested a warlike people with a stone tool-based culture. He judged them to be qualitatively different from artifacts that he had collected in other parts of the Mississippi River basin, and he became intrigued with the culture that created them (Brower 1903:107, 1904b:xi). I was unable to find a reference in which he identified what those qualitative differences were.

As Brower explored Riley, Pottawatomie, Wabaunsee, and Geary counties, he perceived differences between archeological sites north and south of the Kansas River. North of the river he saw pottery, kilns, dwellings, and burials, while south of the river he found primarily stone tools but no pottery or dwellings and limited burial remains. Brower concluded that these artifacts and features were the physical evidence of two different cultures, the southern probably older than the northern. He recognized that many of the sites had been occupied repeatedly but did not fully realize the time sequences involved (Brower 1898:5, 1903:104). The technology to accurately date archeological finds would not be developed until the twentieth century (National Park Service 2021). He further deduced that the culture south of the river was warlike, based primarily on the abundance of stone projectile points that he called arrowheads and spears tips and ax heads that he described as war axes (Brower 1898:105–106). He did not clarify what attributes caused him to link these implements to Quivira, but he clearly believed that they marked the location of that province (Brower 1898:xii-xiii).

Brower's conviction that he had discovered Quivira also was based on historical evidence (Brower 1898:xi). Archival records from the Coronado expedition do exist. Walter Prescott Webb (1981) used them in his study of the Great Plains, and Waldo Wedel (1990) cited them in his article on the Quivira search. It does not appear that Brower had direct access to original Spanish documents, but he did have other authors' translations and analyses of such documents. In *Quivira* Brower (1898:71) acknowledged his use of translations by other scholars. Clearly he relied primarily, but not exclusively, on two articles in a publication on the Coronado expedition by George Winship in the *14th Annual Report of the Bureau of Ethnology* (Brower 1898:71–88; Winship 1896): Coronado's Report to the King of Spain and the Castañeda narrative. The Bureau of Ethnology was an agency of the Smithsonian Institution, established in 1879 and charged with anthropological and archeological research on North American Indigenous cultures (Smithsonian Institution 2021). Brower credited these sources in arguing that the expedition route across Kansas traveled farther east from the great bend in the Arkansas River than other researchers assumed at that time (and perhaps also today). He contended that both narratives demonstrated that the explorers followed a guide, rather than relying on a compass heading, as was commonly believed. Brower considered shifts in the earth's magnetic field over the intervening 400 years. He reasoned that following a northeast compass heading in 1541 would have taken the Spaniards close to modern-day Smith Center, Kansas (Brower 1898:xxi-xxii, 91). Relying on material from the narratives and his archeological research, he concluded that a guide took them on a more easterly heading to the vicinity of the junction of the Republican and Smoky Hill rivers.

Several volumes of his memoirs (Brower 1898, 1899, 1901, and 1903) laid out these claims and expounded on his search for evidence supporting his theories about Quivira and other topics. They are a fascinating portrait of an earlier time in North American archeology. The field notebooks (MNHS 1976a) provided more explicit day-to-day commentaries of his activities. At least five things were learned from studying these two sources. One, the memoirs probably were based on the field note-

books. Two, field methods in Brower's time were not nearly as different from current practices as today's archeologists might presume. Brower routinely defined sites using section, township, and range designations. He drew maps of the sites and identified the locations of features, including hearths, kilns, structures, work areas, and the like. Three, he named sites, usually for local landowners. Four, he kept thorough accounts of field activities, including descriptions of recovered artifacts and structures and features that he saw on sites. His notebooks include numerous sketch site maps and highly detailed artifact illustrations. Five, he engaged in comparative analyses of this information and based his conclusions on them.

Neither the notebooks nor memoirs furnished insight into what Brower did with the collected artifacts. The only reference to him or by him about maintaining a research collection was found in the 1897–1898 correspondence with F. G. Adams, and that is not conclusive. However, I believe that the Brower-Adams correspondence supports the idea that between field seasons he examined his collected items and reviewed his field notes in the process of preparing the memoirs and planning subsequent research activities (J. V. Brower to F. G. Adams, letter, 25 October 1897, manuscript collection, Kansas Historical Society, Topeka). To do this the artifacts brought back to St. Paul must have been organized in a system so that he knew where each was recovered and what its function was. There is no other way he could have used the collection as he did. Given the interest in native cultures at the turn of the nineteenth to twentieth centuries, it is hard to fathom that Brower did not curate the artifacts in some fashion and make them available for public display and research. His writings reveal his out-sized ego, and making the collection public would have been consistent with his goal of broad personal recognition for his achievements (Brower 1903). Nevertheless, I could find no mention in any contemporary source that Brower did this.

A review of the archeological catalog disclosed that the individual entries supply locations where artifacts were recovered, with some identifying more specific places than others. Occasionally a single object or group of tools, such as arrowheads, are ascribed to a particular site. Some entries have the comment "exact locality unknown." No dates

are listed. In the Kansas extract of MNHS (1897–1905?), site notations can be as precise as the Elliott site or as general as the Mill Creek valley.

It is important to acknowledge that the MNHS staff believes that *Archaeological Catalog #1* (MNHS 1897–1905?) is a comprehensive record of Brower's collecting career, presuming that the first entry reflects his earliest collecting activities and the last entry represents his final fieldwork. I surmise that the question mark was inserted after the span of dates attributed to the document because they were not sure when it was created.

Initially I disagreed with their assessment. I assumed that the inventory, like the field notebooks, replaced materials lost in the 1896 fire and that the itemized activities started in 1897 and followed to the end of his career, based on the pattern with the field notebooks. However, after further study I began to wonder if Brower actually had created the catalog. Both the notebooks and the inventory were handwritten. The notebooks, which I accepted as Brower's personal output, detailed field activities in the first person, and all entries seemed to be composed in the same hand. To me the handwriting in the catalog appears different from that in the notebooks. This suggested the catalog was created or maintained by someone other than Brower.

In trying to understand the catalog, my attention was drawn to a handful of entries that indicated loaned or missing artifacts. These were the only ones dated, mostly in 1912, seven years after Brower's death. The handwriting resembled that in the rest of the inventory. Initially this led me to conclude that the *Archaeological Catalog #1* (MNHS 1897–1905?) might have been generated a few years after Brower's death, possibly by the MNHS as a register of the Brower collection when the agency took possession of it. As the collection had both scholarly and monetary value, it would have been important to know what was in it and to tag items missing or on loan at the point when the collection changed hands. If this speculation is correct, whoever assembled the catalog had to have access to records showing where each artifact came from and what it was. With Brower dead, there was no other way to access that information. On the other hand, if Brower himself maintained such a written listing, I did not find it.

As I continued to scrutinize the catalog and

Brower's notebooks and memoirs, I finally realized that at least part of the MNHS interpretation probably was correct. The inventory included acquisitions that I judge to predate the December 1896 fire. Had the record been started after the fire, it would contain artifacts from 1897 through 1903, starting with items from the March 1897 travel to Kansas, but it does not. Instead, it begins with artifacts collected in Minnesota. I attempted to match the initial artifact collections with what I suppose to be pre-fire Minnesota fieldwork described in the memoirs and was unsuccessful. While I could not verify when the initial objects were collected, I believe that they predated the 1897 Kansas trip.

Despite being unable to confirm my theory, in the end I was convinced that *Archaeological Catalog #1* (MNHS 1897–1905?) is likely a comprehensive account of Brower's collecting activities, as suggested by the MNHS (Nancy Hoffman, personal communication September 2019). However, I think that it was created and updated by someone other than Brower because I do not think that the handwriting is his (Figure 4). It may have been initiated sometime after his death, based on files maintained by or for Brower, or it may have been a ledger kept for Brower by someone else throughout his collecting career.

I still wanted to know if the catalog might be useful in establishing artifact site provenience. I decided to focus on the Kansas component of the document (KSHS 2019). I had photographs of Brower artifacts at the Fort Osage Missouri State Historic Site in which specimen numbers are visible. These are on display at Fort Osage, identified as having been collected by Jacob V. Brower. The photographs were supplied by James Roberts (personal communication February 2020). These artifacts apparently were part of the collection acquired by the KSHS in July 1923 and later were deaccessioned to Fort Osage (James Roberts, personal communication March 2022). I checked specimen numbers on nine of these artifacts against the *Brower Collection-Catalog* (KSHS 2019). The numbers led to inventory entries for artifacts recovered in Missouri with functional identifications and descriptions consistent with the objects in the Fort Osage photographs. Locations were identified with nothing more specific than "Missouri." Numerous entries for Missouri, Nebraska, and Illinois were

interspersed with ones from Kansas (KSHS 2019). This exercise suggested that comparing the specimen numbers to inventory entries could yield useful information for some of the artifacts.

Taking this a step farther, I identified 12 sites on the Figure 1 map that are in the KSHS Archeological Inventory. A cursory review of *Brower Collection-Catalog* (KSHS 2019) easily located five of these sites in the database. Also, the catalog shows several hundred artifacts collected from these five sites. If at least some of these items are in the KSHS Brower collection, it should be possible to use the specimen numbers to link them to specific sites.

My conclusions about *Archaeology Catalog #1* (1897–1905?) and the associated Kansas extract (KSHS 2019) are as follows. First, the documents taken together probably constitute a comprehensive listing of Brower's collecting activities. Second, the catalog probably was not compiled by Brower personally but was based on records that he developed and maintained or had maintained. Third, the entry numbers are sequential but have no other meaning. Fourth, some of the catalog entries contain comprehensive data that allow determination of artifact provenience and function. Fifth, the question mark in the MNHS citation indicates uncertainty about when it was assembled. Sixth, Kansas' *Brower Collection-Catalog* (KSHS 2019) was originally part of the *Archaeological Catalog #1* (MNHS 1897–1905?). Seventh, using the KSHS document, it will be possible to establish site provenience for some Brower artifacts in the KSHS collection.

SUMMARY

Even though issues remain with establishing provenience for artifacts from some Brower sites, this does not mean that those sites are lost to history. Many sites identified on the Figure 1 map are included in the Kansas GIS archeological site database, and investigations have been conducted at some. Archeologists at Kansas State University (KSU) have pursued an active research agenda involving many of them. Most notable is the late Dr. Patricia O'Brien, who began this process in the early 1970s. On multiple occasions during her KSU tenure, O'Brien revisited several area Brower sites (Lauren Ritterbush, personal communication September 2019). In 2009 Dr. Lauren Ritterbush

B-5-3

St Paul Minn
Oct 5th 1897

Mr Franklin G Adams
Topeka

Dear Sir: I am now at work on a memoir to be addressed to Your Society, relating the circumstances and results of my cooperation with Mr L.R. Elliott of Manhattan in a discovery of the original village sites of Coronado's Quivira in Kansas.

All the illustrations will be made at St Paul.

I desire to borrow from your care of relics all the bird-bone and glass beads excavated from the Mounds near Manhattan, by W.J. Griffing.

As soon as they are engraved I will return them.

As the bird-bone beads are very frail and decayed by age, each bead should be wrapped in soft paper or cotton - separately - to prevent them from breaking or crumbling.

Very Truly Yours
J.V. Brower
PO Box 2360

Figure 4. October 1897 letter from J. V. Brower to F. G. Adams, handwritten by Brower (letter from J. V. Brower to F. G. Adams, letter, 5 October 1897, manuscript collection, Kansas Historical Society, Topeka). This correspondence is an example of Brower's distinctive bold cursive script.

and KSU Department of Sociology, Anthropology, and Social Work graduate students conducted a survey of archeological resources within the community development zone around Manhattan, Kansas. Under contract with the city of Manhattan, their project involved visiting and documenting the condition of many of the Riley County sites depicted in Figure 1 (Ritterbush 2009). Also, KSHS archeologists have actively pursued research at numerous

sites on this map. In the early twenty-first century archeologists are following up on work started by Jacob Brower more than 100 years ago.

So, does this analysis contribute to knowledge of Jacob V. Brower and his impact on Kansas archeology? I believe so. Establishing site provenience for artifacts in the Brower collection at the KSHS facilitates understanding of those sites, the people who made them, and the appearance of the central

Kansas landscape before large scale Euro-American encroachment.

/afori/howfig_print.htm, accessed August 21, 2021.

REFERENCES CITED

Brower, Jacob V.

1895 *Prehistoric Man at the Headwaters of the Mississippi River*. St. Paul, Minnesota.

1898 *Quivira*. St. Paul, Minnesota.

1899 *Harahey*. St. Paul, Minnesota.

1901 *Kathio*. St. Paul, Minnesota.

1903 *Kansas: Monumental Perpetuation of its Earliest History, 1541–1896*. St. Paul, Minnesota.

1904a *Itasca State Park: An Illustrated History*. St Paul, Minnesota.

1904b *Mandan*. St. Paul, Minnesota.

Hawley, Marlin, and Donald Blakeslee

2006 The Great Bend Aspect. In *Kansas Archaeology*, edited by Robert J. Hoard and William E. Banks, pp. 165–179. Kansas State Historical Society, Topeka, in conjunction with University Press of Kansas, Lawrence.

Kansas Historical Society (KSHS)

1897–1905 Jacob V. Brower Field Notebooks. Microfilm reel numbers MF7170–MF7172. Archives, Kansas Historical Society, Topeka.

2019 *Brower Collection-Catalog*. Records on file. Archeology Office, Kansas Historical Society, Topeka.

Mechem, Kirke

1937 Secretary's Report, Year Ending October 20, 1936. *Kansas Historical Quarterly* 4(1):77–96. Electronic document, <https://www.kshs.org/p/annual-meeting-1936/12697>, accessed on March 22, 2022.

Minnesota Historical Society (MNHS)

1897–1905? *Jacob V. Brower Archaeological Catalog #1*. Research Collection. Minnesota Historical Society, St. Paul.

1976a *Jacob V. Brower Field Notebooks, 1897–1905*. Microfilm Collection #M330. Minnesota Historical Society, St. Paul.

1976b *Jacob V. Brower Field Notebook #23*. Microfilm Collection #M330. Minnesota Historical Society, St. Paul.

National Park Service

2021 Archeology Program. Archeology for Interpreters: A Guide to Knowledge of the Resource. 5. How Do Archeologists Figure out How Old Things Are? National Park Service, U.S. Department of the Interior. Electronic document, <https://www.nps.gov/archeology>

Osman, Stephen E.

2009 The Brower Boys in the Civil War. *Minnesota History* 61:162–167.

Porter, Anthony

2016 The Quivira Historical Society of Alma, Wabaunsee County, Kansas 1901–1912. Chapman Center for Rural Studies, Kansas State University. Electronic document, <https://ccrsresearchcollections.omeka.net/items/show/239>, accessed August 21, 2021.

Ritterbush, Lauren

2009 *Manhattan Archaeological Survey, Phases I and II*. Department of Sociology, Anthropology, and Social Work, Kansas State University, Manhattan. Submitted to City of Manhattan, Kansas.

Smithsonian Institution

2021 *Graphic Arts: Bureau of American Ethnology*. National Museum of American History, Smithsonian Institution, Washington, D.C.. Electronic document, <https://www.si.edu/spotlight/ga-bae>, accessed August 25, 2021.

Sutton, Mark Q., and Brooke S. Arkush

2009 *Archaeological Laboratory Methods: An Introduction*. Kendall Hunt Publishing Company, Dubuque, Iowa.

Topeka State Journal (TSJ)

1923 Brower Collection is Back. *Topeka State Journal* 23 July:3. Topeka, Kansas.

Unrau, William E.

2001 *Indians of Kansas: The Euro-American Invasion and Conquest of Indian Kansas*. Kansas State Historical Society, Topeka.

Webb, Walter Prescott

1981 [1931] *The Great Plains*. University of Nebraska Press, Lincoln.

Wedel, Waldo R.

1990 Coronado, Quivira, and Kansas: An Archeologist's View. *Great Plains Quarterly* 10(3):139–151.

Winship, George Parker

1896 The Coronado Expedition 1540–1542. In *Fourteenth Annual Report of the Bureau of Ethnology to the Secretary of the Smithsonian Institution 1892–1893*. J. W. Powell, Part 1:329–637. Government Printing Office, Washington, D.C.

BOOK REVIEWS

People and Culture in Ice Age Americas: New Dimensions in Paleoamerican Archaeology.

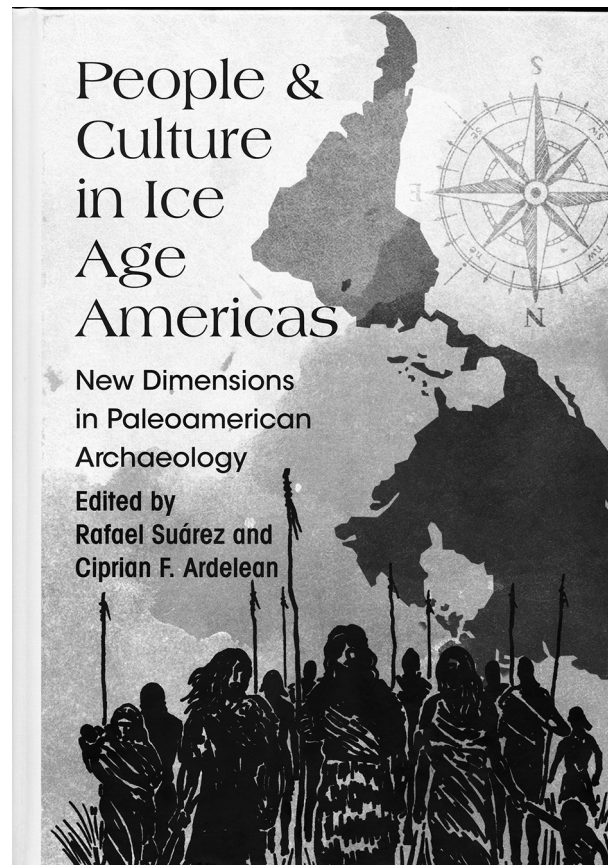
RAFAEL SUÁREZ and CIPRIAN F.

ARDELEAN, editors. University of Utah Press, Salt Lake City, 2019. xvii + 268 pp., 106 figures, 21 tables, contributors, index. \$60.00 (hardback). ISBN: 9781607816454. \$48.00 (eBook). ISBN: 9781607816461. *Reviewed by* Jim D. Feagins, St. Joseph Museum.

People and Culture in Ice Age Americas: New Dimensions in Paleoamerican Archaeology is written for professional archeologists, scholars in a variety of related fields, and avocational archeologists who have a serious interest in Paleoindians. The volume presents an excellent overview of the state of the art/science for Paleoamerican archeology in South, Central, and North America. Disregarding the preface and last two chapters, which focus on DNA research in the Americas and a summarizing discussion about the volume, 7 chapters (totaling 113 pages or 57 percent) of the 11 remaining chapters deal exclusively with Paleoamerican archeological sites south of the United States border.

A short but effective preface, titled “An Upside-Down View,” was written by the editors. It plays on the standard cartographic orientation in which the Northern Hemisphere is pictured at the top of most New World maps. Does this northern perspective also signal a biased view that settlements of the peoples who first populated the southern Americas are less important? More is known about the Late Pleistocene in North America. Not only is archeology better funded there, but financing for studies south of the U.S. border usually are directed toward monumental works of great civilizations rather than evidence of the first inhabitants. In addition, research in the Southern Hemisphere often is reported in Spanish, which many North Americans cannot read. Therefore, it is refreshing to examine a volume with an upside-down map on its cover (see right column) and to learn more about the cutting-edge Paleoamerican archeology going on among southern neighbors. On the other hand, North American sites are the subjects of four chapters, so that region is not slighted.

Chapter 1, “The Cave at the End of the World: Cueva del Medio and the Early Colonization of Southern South America” was written by Fabiana M. Martn, Dominique Todisco, Joel Rodet, Francisco J. Prevosti, Manuel San Román, Flavia Morello, Charles Stern, and Luis A. Borrero. Cueva del Medio is a large exogenous cave, located in mountainous Ultima Esperanza, Chile, not far from that country’s eastern border. It is one of a series of caves and rockshelters that contain Late Pleistocene faunas, as well as evidence of intermittent use by humans. Researchers emphasize the necessity of extremely careful interpretations of the site’s complex stratigraphy and association of humans with ancient fauna. As of this writing, the maximum depth reached is 5 m. Fishtail projectile points are associated with extinct and extant fauna and with hearths. The investigators’ “... criteria for chronological evidence of human presence are radiocarbon dates from bones with cut marks



or charcoal from hearths ...” (p. 3). More than one cultural component is present. The deepest stratum is the oldest with radiocarbon dates that range as far back as $13,670 \pm 50$ RCYBP (16,264–16,737 cal B.P.) and $13,790 \pm 60$ RCYBP (16,413–16,946 cal B.P.). The authors conclude that there is “a strong Late Pleistocene human occupation” at Cueva del Medio.

Nora Viviana Franco and Lucas Vetrivano are the authors of the next chapter, “Lithics and Early Human Occupations at the Southern End of the Deseado Massif (Patagonia, Argentina).” Chapter 2 focuses on the available tool-stone sources in a portion of Argentina’s southern half, where most archeological sites are open air discontinuous occupations. Many of the earliest correspond to the Pleistocene-Holocene transition.

“A Systematic Strategy for Assessing the Early Surface Archaeological Record of Continental Aisén, Central Western Patagonia” was written by César Méndez, Amalia Nuevo Delaunay, Omar Reyes, Antonio Maldonado, and Juan-Luis Garcia. Chapter 3 describes a successful methodology used in searching for early archeological sites in a significant portion of Patagonia in southern Argentina. In the past most research on the oldest occupations in this region has been opportunistic (unanticipated) finds in open-air sites and in caves and rockshelters, as dictated by geology. The authors describe a formal search (a systematic investigation strategy) of open-air sites, targeted primarily for Late Pleistocene-Early Holocene archeological evidence (Figure 3.3).

“Early Human Occupation in the Southeastern Plains of South America,” written by Rafael Suárez, presents a regional view of the earliest human inhabitants from the plains of northern and central Argentina. Sites from Uruguay, Chile, and the southern edge of Brazil are briefly discussed as well. Chapter 4 provides a good introduction to the most diagnostic Paleoamerican artifacts, primarily Fishtail, Pay Paso, and Tigre points. The author dispels the notion that South American Fishtail points represent the earliest inhabitants of the Americas.

“Mobility and Human Dispersion during the Peopling of Northwest South America between the Late Pleistocene and the Early Holocene,” was written by Francisco Javier Aceituno-Bocanegra and Antonio Uriarte. Chapter 5 takes the reader to

the country of Columbia in the northern reaches of the continent. Logically, this area would be an exploration and settlement gateway, either by land or by sea, between the two continents. Despite the region’s importance for understanding the peopling of the New World, little research has been done there on that topic in the last 20 years. Following a summary of a few of the most important oldest sites, the authors used GIS to plot “... optimal paths that represent potential routes that maintain close spatial relationships with archaeological site clusters” (p. 85). These theoretical routes are said to match natural corridors for ease of transit.

“The Clovis-Like and Fishtail Occupations of Southern Mexico and Central America: A Reappraisal” was written by Guillermo Acosta-Ochoa, Patricia Pérez-Martínez, and Ximena Ulloa-Montemayor. Leaving South America and traveling northward as far as southern Mexico, some of the earliest formal point types are the Fishtail and a point that may or may not be considered a Clovis variant; the authors simply refer to it as “Clovis-like.” The points are often small, sometimes with real fluting but often just basal thinning. The attachment portion of these points have concave edges (p.

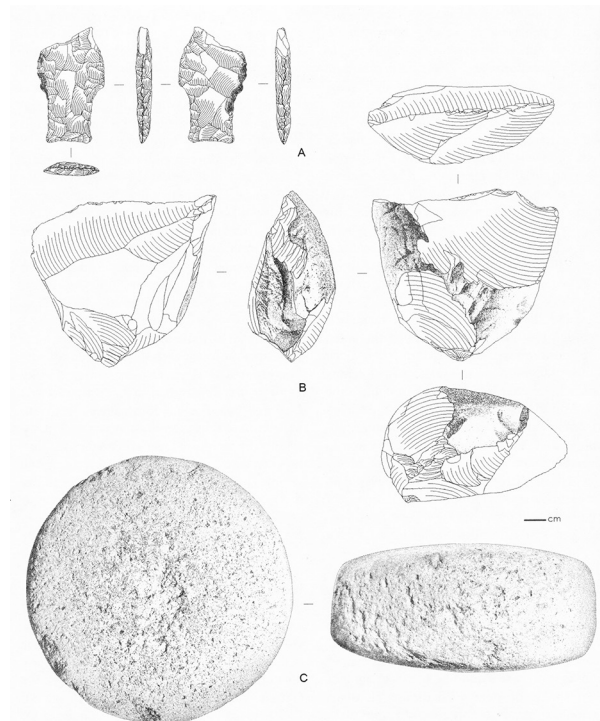


Figure 3.3. Lithic materials from Coichel area: (A) Fishtail projectile point (BN22); (B) core (BN22); (C) discoidal stone (BN75).

95). They have a typical manufacturing sequence, generally shared by both Clovis and Folsom points. However, the authors' primary effort is not on point taxonomy or a synthesis of regional sites; rather they are concerned with subsistence patterns and the human ecology of the earliest groups of people. The Fishtail-point-using groups and the Clovis-like-point-using groups tapped quite a diverse and complex set of subsistence sources—not just megafauna. That also has become more evident on Clovis sites in North America during the last few decades. One of the take-home messages from Chapter 6 is "... the mosaic of archaeological cultures in the New World during the Late Pleistocene is more diverse than currently recognized for Mexico and Central America, just as has been accepted for decades in South America" (p. 102).

The last of the chapters on the archeology south of the U.S. border, titled "Mexican Prehistory and Chiquihuite Cave (Northern Zacatecas): Studying Pleistocene Human Occupation as an Exercise of Skepticism," was written by Ciprian F. Ardelean, Joaquin Arroyo-Cabrales, Jean-Luc Schwenninger, Juan I. Macías-Quintero, Jennifer Watling, and Mónica G. Ponce-González. The Chapter 7 authors have attempted to approach their own and others' research with a healthy dose of skepticism in order to make their investigations more rigorous and acceptable. They are critical of much of the previous Late Pleistocene archeological work conducted in Mexico for its lack of rigor and its easy acceptance by area archeologists in the past. About two-thirds of the chapter is a case study of their scientific approach to examine the relatively recently discovered archeological/paleontological Chiquihuite Cave in northern Zacatecas. Located about 320 km (200 miles) southwest of the Texas border, this multi-component cave is high in the Astillero Mountains. This reviewer heartily approves of the authors' approach and looks forward to reading about additional research at this site. Furthermore, it would be interesting to read a critique of the chapter by someone more knowledgeable about Late Pleistocene Mexico.

Chapter 8, "Stone Tool Technology at the Gault Site: Exploring Technology, Patterns, and the Early Human Occupation of North America" was authored by Thomas J. Williams, Nancy Velchoff, Michael B. Collins, and Bruce A. Bradley. The Gault site has

been extensively written about in recent decades and undoubtedly will be a rich source of information for years to come, as more research continues on one of the more important sites in North America. The site is located near reliable springs along the headwaters of Buttermilk Creek in central Texas along the east face of the Edwards Plateau, which is a large source of high-quality chert. With many vertically stratified archeological components, the site is most notable for its Clovis occupation and for the cultural occupation that lies at a yet deeper level. Archeologists throughout the Americas have begun to realize that the most ancient occupations from Alaska to Argentina are far more complex than first thought, and because Clovis evidence is not found in significant portions of the Americas, a less Clovis-centric debate is needed (p. 134). Hitherto the deepest occupation at Gault often was referred to as simply "older-than-Clovis." More recently it has been assigned the name "Gault Assemblage" in recognition that, while older, it may or may not be ancestral to Clovis. One of the questions asked is, "How diverse was the archaeological record before ca. 13,000 cal BP?" (p. 134). The authors compare the site's Clovis and Gault assemblages. The latter lithic assemblage contains biface technology, Gault blade technology, and Gault flake-tool technology, based on a preliminary analysis. They present good descriptive comparisons of the lithic technologies with fine illustrations. They state that the findings are tentative for technology because the sample is relatively small, but there is some suggestion that the Gault assemblage is ancestral to Clovis. They state, "The remarkable similarities of the blade technologies of the Gault Assemblage and Clovis suggest some form of continuation or common technological ancestor. It is possible that only the Clovis biface technologies were introduced into the region" (p. 145). How well this stands up to the test of future research remains to be seen. Chapter 8 also contains a good discussion of Clovis dating on the plains and also the dating of the Western Stemmed Tradition. The authors have produced a well-written chapter, one which is an especially useful addition to the study of Late Pleistocene archeology in the Americas.

Ashley K. Lemke and John M. O'Shea are the authors of Chapter 9, "The End of an Era? Early Holocene Paleoindian Caribou Hunting in a Great

Lakes Glacial Refugium.” This chapter focuses on archeological evidences on submerged landscapes in the Great Lakes (Figure 9.1). The authors consider the evidences of various now-submerged archeological features, originally designed to manage the hunting of ancient caribou herds. With the slow retreat of glacial ice masses, water levels in the Lake Huron Basin oscillated over time. Sometime between 9,900 and 7,500 RCYBP (p.157), the water level was more than 100 m lower than at present and was traversed by a long geological ridge, called the Alpena-Amberley Ridge (AAR). The high points along this ridge are now 12–45 m below the surface. The rocky geological landform apparently became part of a caribou migration route. This conclusion was obtained using various sonar techniques to interpret 73 stone features located on the AAR, such as stone lines, cairns, cluster blinds, rectangles, rings, an upright stone, V-blinds, and a couple of complex constructions. Most appear to be associated with the mass hunting of caribou. The authors describe the preservation of these features, as well as that of organic materials, in the deep cold waters as excellent. Their research is innovative.

Despite its title, “Late Pleistocene Occupation(s) in North America,” Chapter 10 is primarily a selective overview of before-Clovis sites solely within

the United States and its adjacent continental shelf. Authors J. M. Adovasio and David R. Pedler briefly discuss a sampling of sites and localities that contain evidence of pre-Clovis occupations. Their list includes Meadowcroft Rockshelter (Pennsylvania), Cactus Hill (Virginia), Chesrow complex (southeast Wisconsin), Page-Ladson and other Florida localities, Delmarva Peninsula (Maryland), Continental Shelf (Florida), Buttermilk Creek complex (Gault and Debra L. Friedkin loci, Texas), and Paisley Five Mile Point Caves (Oregon). Most of these sites/areas are quite well known, and many have been extensively published elsewhere.

Michael J. Shott’s Chapter 11 is titled “Midwestern Paleoindians, Stone Tools, and Proboscidean Extinctions.” The author summarizes and updates information on a problem that has long been debated: the causes of proboscidean extinctions. He discusses possible natural causes and the role that human hunters might have played in their demise, if any. The focus is on mastodons in the Midwest, with only slight mention of mammoths, considering the evidences for and against overkill. A few fresh ideas are presented, but generally very little new information is offered. However, the chapter is well researched and of interest. Shott stated, “Midwestern Paleoindians may have been

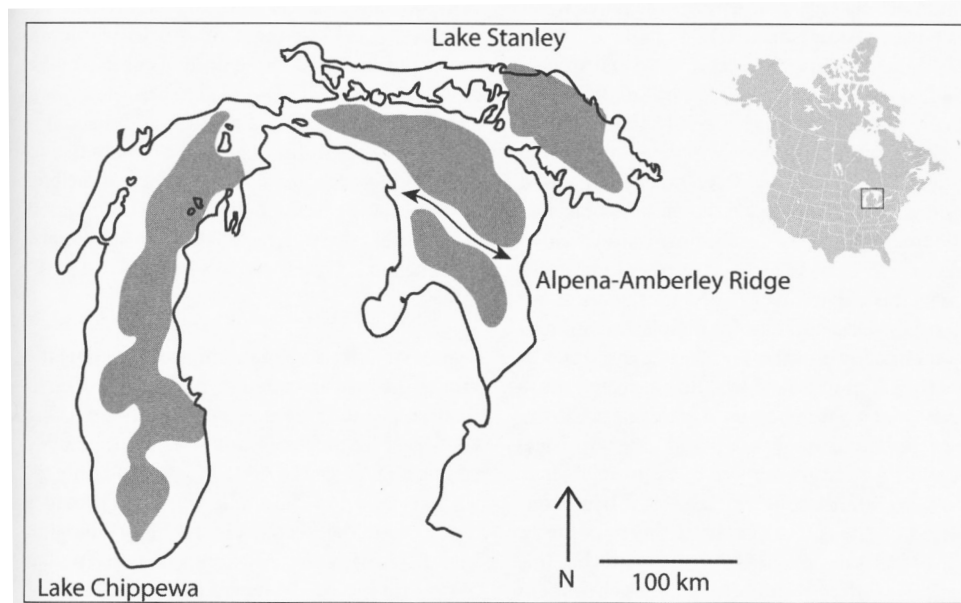


Figure 9.1. The Lake Stanley and Lake Chippewa lowstands and the Alpena-Amberley Ridge (AAR). Grey areas indicate ancient water levels, white areas are dry land, solid lines indicate the modern outlines of the state of Michigan, and Lakes Michigan (to the west) and Huron (to the east). Line with two arrows indicates the Alpena-Amberley Ridge.

a contributing cause of proboscidean demise, but after decades of vigorous search and advocacy the evidence remains equivocal” (p. 205).

Chapter 12, “Where Tides of Genes Perpetual Ebb and Flow: What DNA Evidence Tells Us about the Peopling of the Americas,” was written by Theodore G. Schurr. For many centuries much speculation and debate has persisted concerning from whence and when the first peoples arrived in the “New World.” Recent Ancient DNA (aDNA) studies have shown a considerable genetic diversity among early populations. The chapter covers a series of research questions, generally addressing the complexities of DNA research and competing hypotheses, most of which are far beyond this reviewer’s background. Schurr presents much data in the form of numerous figures, tables, and graphs. However, even a generalist reader should read the chapter summary on pages 235–236.

In the final Chapter 13, “Comments and Discussion,” Tom D. Dillehay has produced a thoughtful ending for the volume. He illustrates the complexities of studying Paleoamericans and the diversity of the earliest occupations across the Americas. While in some minds the last nail may not yet be driven in the coffin of “Clovis First,” the pine box seems near completion. Dillehay states, “Given the demise of this model over the past two decades, our understanding is now a more open and healthier scientific enterprise, with scholars from multiple fields asking new questions and probing new areas of interdisciplinary research” (p. 244). Rather than critiquing the volume chapter by chapter, as this reviewer has done, Dillehay discusses some of the overriding themes: sampling biases, defining terms, projectile points, habitats, and thematic gaps. These topics encompass method, theory, and perspective, plus they serve as another way to compare the chapters and tie the volume together.

In more recent decades an ever growing range of sites in the Americas claim to be “the same age or older than Clovis.” Evidence of Clovis occupation has not been found in many parts of the New World; thus, except as a time marker, “Clovis” may not be a good reference point. For now the term “Before Clovis” is still useful and may remain so, especially in much of North America. How will the complex array of peoples who first inhabited the Americas be identified and explained in the future? Which were passing through and which were the actual first settlers of different regions? It is important for archeologists on the two continents to share new and tweak existing ideas. This volume certainly is not the first to reflect the paradigm shift that is well underway, if not almost complete. At the very least it presents a much expanded and useful outlook. As the writers of Chapter 6 state, “... while the Clovis culture is not necessarily the oldest in the New World it is the first ‘clearly distinguishable’ technology in the archaeological record ...” (p. 93). Much careful work remains to be done, as knowledge about initial peopling of the Americas is still in its infancy.

This reviewer greatly appreciated the enhanced (five-page) Contributors section. As many of the volumes’ 38 authors are from Latin America, information was needed for readers unfamiliar with their backgrounds.

While every chapter in *People and Culture in Ice Age Americas: New Dimensions in Paleoamerican Archaeology* may not be for everyone, the volume has much to offer if taken as a whole. Even though some regions in the Americas are not discussed, the volume’s title is descriptive of its contents. This reviewer is glad to have spent the time delving into its many dimensions and recommends the book.

Household Economy at Wall Ridge: A Fourteenth-Century Central Plains Farmstead in the Missouri Valley. STEPHEN C. LENSINK, JOSEPH A. TIFFANY, and SHIRLEY J. SCHERMER (editors). University of Utah Press, Salt Lake City, 2020. xv + 251 pp., 100 figures, 72 tables, 9 appendices (online), acknowledgments, references, list of contributors, and index. \$70.00 (cloth), \$56.00 (e-book). ISBN 978-1-60781-773-4 (cloth) or ISBN 978-1-60781-774-1 (e-book). *Reviewed by* C. Tod Bevitt, Buried Past Consulting, LLC.

Wall Ridge (13ML176) was discovered in 1983 during archeological survey, carried out by the Office of the State Archaeologist (OSA), University of Iowa in advance of a planned road construction project. The OSA also conducted initial testing in the spring of 1984. Despite impacts to portions of the site by past road project borrow activity and actions of looters, it was concluded that the location contained significant remains of a Glenwood phase habitation. The original transportation project ultimately fell outside of the review and compliance processes that would have sought to mitigate or otherwise protect and preserve the site. Because the work was not federally funded, other funding sources were secured to allow a limited budget for salvage excavations to be carried out with the gracious permission of the property owners and assistance from the Office of the County Engineer, Mitchell County, Iowa.

Dozens of volunteers assisted with excavations in the late spring and early summer of 1984, and more performed laboratory processing of collected artifacts and samples. Formal analysis and reporting were supported as part of the modest funding. Over the years numerous conference posters and papers, publications in journals, and later collaborative efforts continued to disseminate the results of the Wall Ridge investigations. Now, over three decades after the excavations at Wall Ridge closed, *Household Economy at Wall Ridge: A Fourteenth Century Central Plains Farmstead in the Missouri Valley* exemplifies the years of contributions by those dedicated researchers toward producing a comprehensive report of that work. Editors Stephen C. Lensink, Joseph A. Tiffany, and Shirley J. Schermer are also key contributors to many chapters, and the volume includes contributions from Toby A.

Morrow and Michael A. Perry (Chapter 7-Lithics), William Green (Chapter 10-Botanical Remains), and James A. Theler (Chapter 11-Zoological Remains). In addition, Perry contributed to Chapter 13-Lodge Housekeeping, while Theler co-authored Chapter 9-Bone and Shell Tools.

A salvage excavation carried out on a tight timeline with a limited budget would not often be viewed as favorable conditions for producing exceptional outcomes, but Wall Ridge itself is unlike many sites and so were the results of the investigation. The effort began with the simple desire to record all the features and acquire representative materials before the site ultimately was destroyed. The site was gridded and tied to existing survey points in the area. A combination of mechanical trenching, hand excavation, and finally mechanical stripping was employed to complete the tasks of identification and recovery. Besides hand collection of artifacts during excavation, retrieval efforts relied on fine screening of matrix along with systematic sampling processed by water screening and flotation—methods that were quite progressive for the time and more comparable to standard practices for data recovery today. The resulting data set allowed consideration of a host of research questions that simply could not have been asked or answered well from past work in the locality.

The first three chapters, encompassing the introduction, site setting, and project overview and methods, are vital to a thorough understanding of the problem and approach. They place Wall Ridge in proper context, not only in relation to the nearby Glenwood locality, but also its position within the Nebraska variant, spanning the Missouri River area of eastern Nebraska and western Iowa, and the Central Plains tradition, extending over an even wider geographical range during the Plains Village period.

Chapter 4 summarizes the results of the excavation. Stratigraphy of overburden deposits and lodge fill are discussed, as well as the lodge architectural features and related features, such as the hearth and eight storage/refuse pits found arranged around the interior of the house basin.

Chapter 5 addresses radiocarbon dating at Wall Ridge. A strong rationale for a very tight period of occupation at the turn of the fourteenth century was based on AMS dating of cultigens from good contexts. Notes of caution regarding dating of

carbonized materials that could result in skewed dates include the need for critical reexamination of dates obtained from the Wisconsin Radiocarbon Laboratory, consideration of the freshwater reservoir effect that can incorporate fossil carbon into cooking residues on ceramics, and dating of nutshells that might be long preserved under dry conditions. Examples of issues with dates in all these circumstances were enlightened by statistical comparison with the cultigen dates from the site. Both chapters handle their respective topics well with useful, well-conceived figures and tables supplementing the discussion.

Central chapters present analyses of various aspects of the collection. Chapter 6 deals with ceramic artifacts and opens with a review of Nebraska variant ceramics in general and Glenwood phase pottery specifically, encompassing the history and geography of ceramics in the area, some of the problems with past analyses and typology, and basic descriptions of the pottery types with which Wall Ridge is compared. Artwork of ceramic attributes and decorative motifs help the reader visualize traits mentioned in the text, as do numerous color figures of sherds, accompanied by tables highlighting the research results.

Chapter 7 describes the lithic artifacts. The study includes basic raw material identification, examination of common key attributes of chipped and ground stone tools, and classification of debitage. Favorable comparisons are made with previously studied Glenwood phase collections along with speculation on the types of activities represented by the assemblage as a whole. Figures showing the distribution of identified raw material sources, full color images of artifacts alongside drawings of the same objects, and accompanying tables and bar graphs enhance the written content.

Chapter 8 consists of a brief discussion of the small collection of ceramic and stone pipes and pipe fragments. The section is entirely descriptive and relates the modest sample to what is known about pipes in other Glenwood phase, Nebraska variant sites in the area. An illustration of the measurement landmarks used in the analysis and high-quality color images again provide useful information for following the narrative.

Chapter 9 documents bone and shell tools, classifying specimens functionally and identifying

the source species and elements when possible. In addition to a wide variety of functional tool classes, the analysis includes decorative pieces: pendants from a canine tooth and mussel shell, bird bone and marine shell beads, and a unique fish effigy pendant or possible lure made from mussel shell (an artifact outstanding enough to be selected for the book cover). The chapter continues the established reliance on color imagery and handy summary tables to complement the text.

Chapters 10 and 11 are reserved for the botanical and zoological components of the collection. Both chapters provide historical perspective on regional studies of plant and animal remains before defining the particular methods used to analyze the Wall Ridge materials. Rightfully, both authors point out a key problem with past interpretations, as well as an impediment to comparing and contrasting current assemblages: the lack of fine-scale data recovery techniques, skewing retrieval of small items. Despite this obstacle, the authors accomplish much in evaluating the respective assemblages, outlining new information, and comparing the findings with what is known about other Glenwood botanical and zoological collections.

The volume concludes with three chapters of interpretation and discussion. Chapter 12 reconstructs the life history of the lodge, beginning with the architectural characteristics of the house. Insights are offered into the duration of occupation, based on ceramic discard, food energy represented by botanical and zoological remains, and number of storage pits. This deliberation furnishes an interesting assessment, especially considering the reported radiocarbon dates, and demonstrates the potential utility of such calculations in estimating the effective lifespan of the site. Chapter 13 examines five aspects of lodge life, including spatial arrangement of the interior, artifact distribution through refits, post-occupation deposition, ceramic vessel function, and diet composition. The resulting discussion relates the recovered collection to the people whose lives are imperfectly depicted by the assemblage. Chapter 14 provides a final overview and is by itself worthy of a careful reading, covering topics of paleoecology, seasonality, economic and subsistence activities, site abandonment, size and composition of the resident group, and cultural interactions.

The volume is enhanced by inclusion of 151 pages of appendices in digital format at <https://collections.lib.utah.edu/ark:/87278/s69h1bv6>. These additional tables and records support much of the research conveyed throughout the report, including excavation data for the various proveniences, ceramics, lithics, bone and shell tools, botanical and zoological data; supporting information for lodge life and lodge housekeeping discussions; and a report of lipid residue analysis by Mary E. Malainey and Timothy Figol. The lengthy digital file can be navigated via a sidebar menu and also can be downloaded for future reference.

Household Economy at Wall Ridge: A Fourteenth Century Central Plains Farmstead in the Missouri Valley is dedicated to Donna C. Roper. This work stands as 1) a testament to what can be done when there is too little time and money but many willing volunteers, 2) a worthy contribution to the field of archeology that furthers understanding of Central Plains tradition lifeways, and 3) a fitting tribute to a former colleague with a strong interest in seeing Plains archeology done well.

Fort St. Joseph Revealed: The Historical Archaeology of a Fur Trading Post. MICHAEL S. NASSANEY, editor. University Press of Florida, Gainesville, 2019. xii + 292 pp., 56 figures, 10 tables, preface, references cited, contributors, and index. \$ 90.00 (cloth). ISBN 978-0-8130-5642-5 (cloth). \$26.95 (paper). ISBN 978-0-8130-6849-7 (paper). *Reviewed by* Jim D. Feagins, St. Joseph Museum.

Once again historical archeologist Michael Nassaney has produced a useful volume relating to the fur trade (book cover). (See a 2015 review of his *The Archaeology of the North American Fur Trade* in *The Kansas Anthropologist* 36:104–105.) He has published many articles on historical archeology and on various aspects of the decades-long research at Fort St. Joseph for which he was the principal investigator. Nassaney is the author or co-author of 8 of this volume's 10 chapters. Other authors are Rory J. Becker, Kelley Berliner, José Antóino Brandao, Cathrine Davis, Erica A. D'Elia, Brock A. Giordano, Erika K. Hartley, Joseph Hearn, Allison M. Hoock, Mark Hoock, Terrance J. Martin, Eric Teixeira Mendes, and Sue Reichert.

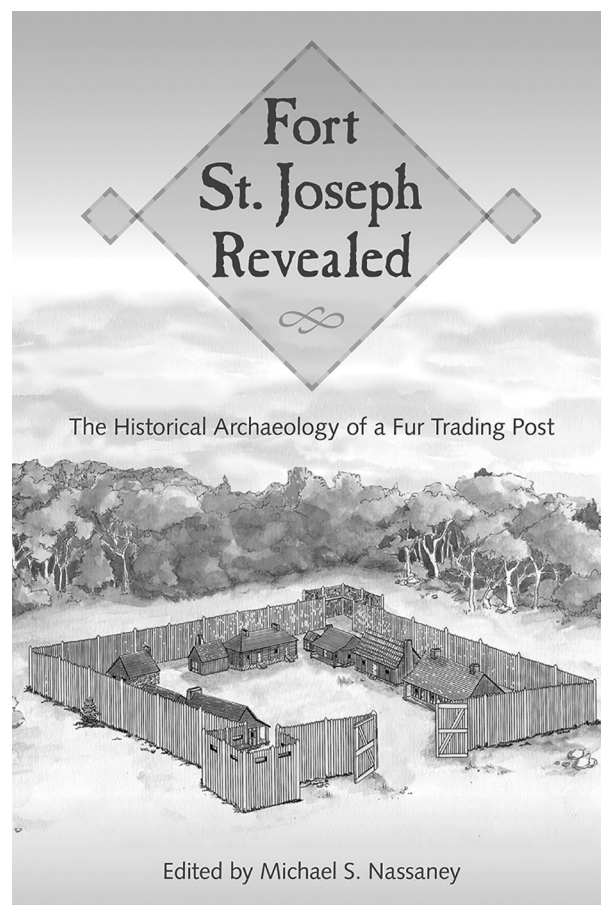
Established in the mid-1680s, Fort St. Joseph became one of the most important French trading posts in the western Great Lakes region. It began as a mission among their Miami and Potawatomi allies in the *pays d'en haut* (the Upper Country) of New France. For nearly a century it served as a fort, settlement, and trading post for the French and later for the English until it was abandoned in 1781.

The history of Fort St. Joseph is marked by a close alliance between Native American peoples and their French allies. Exchanging goods, services, and marriage partners were among the strategies that both groups used to meet their daily needs and ensure their survival (Nassaney 2019). The French were dependent on Native American Peoples for resources, information, and technological goods such as canoes and moccasins, much as the Native Americans depended on the French for cloth, iron implements, and other imports (p.13).

This principal commercial and military center was located in the St. Joseph River valley in southwestern Michigan. Soon after it was built, the

Iroquois tried to destroy it because it was located among their enemies. A permanent settlement, soon established around the fort, was inhabited by families, mainly composed of French husbands, Native wives, and their children. These blended *Métis* families shared the values and customs of both backgrounds. Most men were employed in the fur trade at the fort; often the women prepared skins for the trade, but they worked at or near their homes.

One chapter is titled "The Use of Animals for Fur, Food, and Raw Material at Fort St. Joseph." Zooarchaeologists identified to varying degrees of certainty (species, genus, family, subfamily, order, etc.) the following numbers of taxa: 24 of mammals, including rodents, lagomorphs (rabbits, for example), carnivores, and ungulates, ranging in size from tree squirrel to bison; 25 of birds, including waterfowl, miscellaneous swimming and wading birds, galliformes (chicken-like), 2 raptors, and



Cover of *Fort St. Joseph Revealed*. Reprinted with permission of the University Press of Florida.

many passenger pigeons; 6 of reptiles, all turtles; 2 of amphibians; 9 of fishes; and 3 of bivalves.

The diversity of faunal remains recovered at the fort and settlement indicated that animals were harvested well beyond what was used for furs and meat. Researchers were surprised "... that domesticated species such as cattle, swine, and chickens contributed so little to the residents' diet" (p. 76). The assemblage affirms that the site was occupied year round. Modified bone/antler specimens were incised round (button-shaped) gaming pieces, a white-tailed deer phalanx "cup" from a cup-and-pin game, a carved rasp, a bone comb, and fragments of carved bone adornments.

Another chapter describes the architectural remains at Fort St. Joseph. As expected, excavations encountered remnants of some French-style structures. These buildings were constructed according to the residents' needs and culture. Historical records contained no maps, descriptions, or drawings of the fort and small settlement. However, the years of investigations are beginning to present a significant, though still partial, "blueprint" of them.

Davis' excellent chapter describes lead seals. Various types of lead seals are key artifacts to recognize, as they inform archeologists about trade cloth origins. Most are French with a lesser number from England, which would be expected as France traditionally was the major exporter of cloth. During the time that the fort was occupied, only one town in the Netherlands was noted for textile exports, so lead seals from there are rare. Also, lead seals are more likely found on very early historic sites and, therefore, are not as common in the Central Plains as they are back east.

Three main categories of lead seal attachments are well described and illustrated (Figure 5.2). Drawings depict various seal imprints. The seals are relatively small in size (1–3 cm in diameter) and often are hard to spot in the soil. In addition, they sometimes were recycled to seat gunflints in the hammer vice of a flintlock, to patch damaged metal kettles, or melted to mold bullets, etc. In any form they are relatively rare in Kansas.

Although not all lead seals were attached to cloth bales, the majority were. Historical records clearly show that trade cloth, by value and by volume, was by far the most important commodity that fur traders had to offer. Even though textiles do not pre-

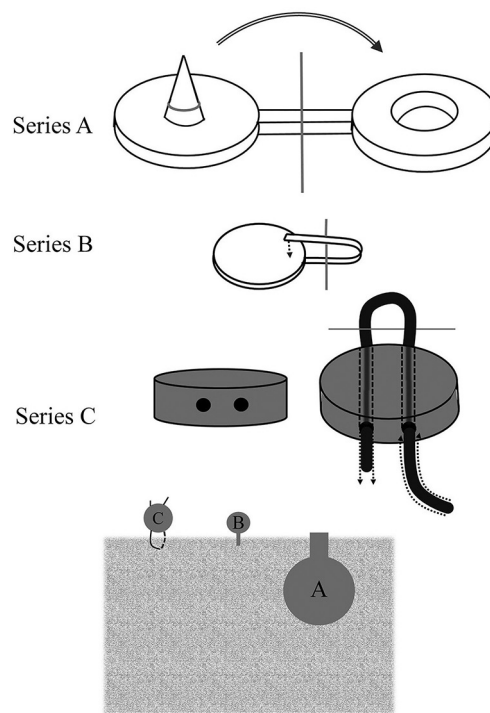


Figure 5.2. Attachment styles for lead seals. Drawing by Cathrine Davis. Reprinted with permission of the University Press of Florida.

serve well in the majority of archeological sites, the seals generally do. The markings on them often encode information about textile variety, quality of cloth, manufacturing method, city of origin, and sometimes the port from which it was exported. Lead seals were difficult to remove by design and served as anti-pilfering devices along the route. Indigenous villages were at the westernmost fringe of the European trade. Many Native Americans were avid consumers of textiles, often modified into traditional styles of clothing, and they were astute traders.

When practical or timesaving [and] European objects were available for a reasonable price, Native Americans adopted them. If they were too expensive, of low quality, or not easily accessible, Native Americans simply reverted to or continued to use traditional objects or technologies . . . Likewise, the French adopted Native American clothing elements such as moccasins on *mitasses* (woolen or hide thigh-high leggings) because they were practical for navigating rugged and wooded North American landscapes, the same reason that birch bark canoes

became the preferred mode of transportation for delivering cloth to consumers (p. 105).

In “Crafting Culture at Fort St. Joseph: An Analysis of Tinkling Cone Production,” Giordano and Nassaney provide an excellent analysis.

An underlying premise in the study of material culture is that artifacts express the practices of the individuals who commissioned, fabricated, purchased or used them, and by extension the cultural values and beliefs of the larger society in which these individuals operated . . . (p.134).

Tinkling cones, also called tinklers, bangles, danglers, or jingles, are an excellent example of such artifacts. They are relatively small decorative metal cones. When fastened close enough to bump into each other during movement, they make musical sounds. They frequently were attached to clothing and leather or cloth containers, such as bags, pouches, and purses. Tinkling cones often were cut from copper trade kettles and then rolled into small cones (Figure 6.1). Much later in time (post-Fort St. Joseph), they commonly were made from discarded tinned cans (Feagins 2021:6–7), as well as copper, nickel silver, and other white metal sources. The authors adequately describe various manufacturing techniques, tinkling cone typology, and metric attributes. They define three styles of manufacture: conical, extended base, and extended seam. They present a labeled illustration of tinkling cone anatomy that should aid other researchers when describing similar artifacts. Apparently tinkling cones were made by indigenous peoples and perhaps by enterprising local traders on occasion. Further supporting this conclusion, tinkling cones were not listed in trade ledgers.

The analysis of a large assemblage of tinkling cones collected . . . from the vicinity of Fort St. Joseph suggests considerable variation in metric attributes, techniques of production, and final form, implying a lack of the standardization one would expect if production was specialized and conducted by a limited number of skilled producers (p. 151).

Discussed in some detail is the processing of hides and their exchange at and near the fort, as well as

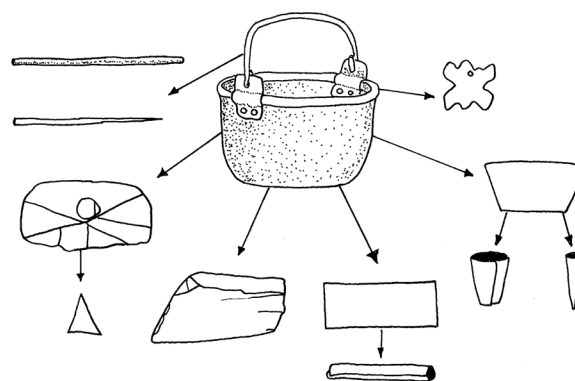


Figure 6.1. Items made from recycled kettles. In the seventeenth and eighteenth centuries kettles were recycled into a range of useful goods that included a) awls, b) projectile points, c) knives, d) beads, (e, f) tinkling cones, and (g) pendants. Adapted from Bradley 1987a, Figure 13. Redrawn by Michael S. Nassaney. Reprinted with permission of the University Press of Florida.

hide processing at other sites in the region. Of special note is the use of smudge pits in the preparation of hides. These small pits are filled with combustible materials to create smoky fires. Use of smudge pits is not exclusive to Native Americans; occasionally they have been found in Euro-American settlements in the eastern portion of the continent.

“Public Archaeology at Fort St. Joseph: Past, Present, and Future” thoughtfully presents Fort St. Joseph’s award-winning public archeology program. Authors describe the abundant opportunities offered by public outreach, seeking support and input from local residents and certainly including the Indigenous community. While there were a few negative aspects, by far most were very positive and well worth the effort. Others hoping to establish such a worthwhile program would be advised to consult this how-to chapter.

The final chapter is primarily a commentary on and partial summary of the volume. *Fort St. Joseph Revealed: The Historical Archaeology of a Fur Trading Post* accomplishes what the title suggests. Combining the historical record with discoveries made during the archeological investigations clearly demonstrates that each field can make significant contributions to the others and thereby greatly enrich understanding of the historic past. The volume is a thoughtful synthesis of an important French outpost, and some chapters contain

artifact details and classification systems that will be useful to archeologists working on similar sites. While many details of various aspects of this Fort St. Joseph research collaboration were not discussed, much can be gleaned from reading the book. It can be obtained directly from the University Press of Florida (<http://upress.ufl.edu>) or from other online vendors.

REFERENCES CITED

Feagins, Jim D.

- 2021 A Nineteenth-Century Native American Burial from the Kansas High Plains: The McKinney Site (14SD301). *The Kansas Anthropologist* 42:1–34.

Nassaney, Michael S.

- 2019 Social Identity and Materiality at French Fort St. Joseph (20BE23), Niles, Michigan. In *Disrupted Identities: Colonialism, Personhood, and Frontier Forts*, edited by Mark Tveskov and Chelsea Rose. *Historical Archaeology* 53(1):56–72.

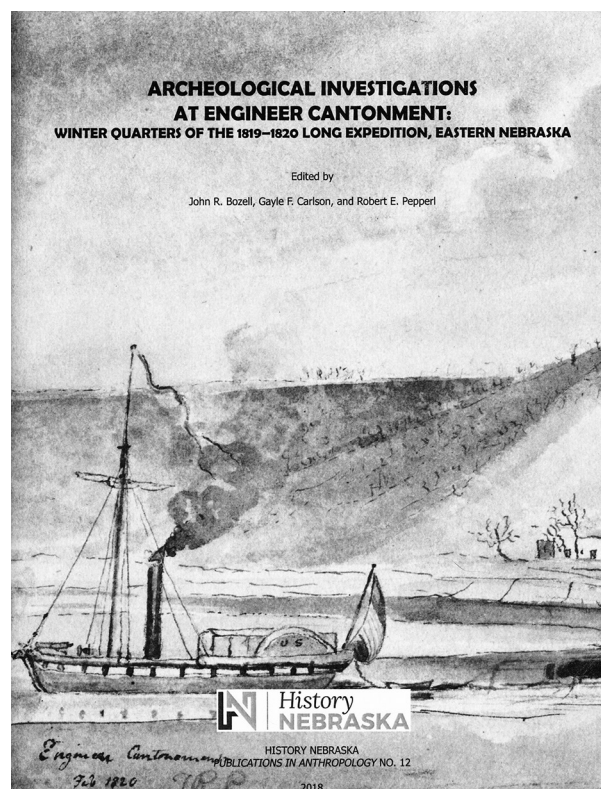
Archeological Investigations at Engineer Cantonment: Winter Quarters of the 1819–1820 Long Expedition, Eastern Nebraska. JOHN R. BOZELL, GAYLE F. CARLSON, and ROBERT E. PEPPERL (editors). History Nebraska, Publications in Anthropology No. 12; University of Nebraska Press, Lincoln, 2018. 394 + xiii pp., 97 figs., 65 plates, 81 tables, contributors, 5 appendices, and references cited. \$29.95 (paper). ISBN: 978-0-933307-41-4. *Reviewed by* Jim D. Feagins, St. Joseph Museum.

The Stephen Long Scientific Expedition is of tremendous importance in the geophysical exploration of the great American west. These scientists and soldiers spent almost nine months at Engineer Cantonment along the Missouri River in what is now eastern Nebraska before completing their journey to the west and south across the Plains (see book cover in right column). Their early nineteenth-century fall-to-spring stay at the cantonment is the keystone for understanding much of what this scientific, cartographic, military, and diplomatic/ethnographic mission accomplished. All that history records about the mission is greatly enhanced by the site's archeological record, discovered less than two decades ago. Much additional information undoubtedly awaits discovery with further innovative archeological/scientific approaches.

In addition to the excellent work done by the editors, many authors contributed to the research and writing of *Archeological Investigations at Engineer Cantonment: Winter Quarters of the 1819–1820 Long Expedition, Eastern Nebraska*: William T. Billeck, John R. Bozell, Gayle F. Carlson, Jeremy S. Dillon, Carl R. Falk, Hugh H. Genoways, Amy Koch, Thomas E. Labedz, Mary E. Malainey, Curtis Nepstad-Thornberry, Catherine A. Nickel, Robert K. Nickel, Robert E. Pepperl, Michael A. Pfeiffer, Paul R. Picha, Brett C. Ratcliffe, and Karen A. Steinauer. The volume is appropriately dedicated to the late Gayle Carlson (1935–2015), a well-known Nebraska archeologist with many decades of archeological experience. This reviewer never had the opportunity to work in the field with Gayle but knew him from frequent visits at conferences, his writings, and occasional correspondence by e-mail or by note with a mailed report. While working on

the Engineer Cantonment site in 2013, he reportedly stated that he could “... die in peace, now that Engineer Cantonment had been found” (inside front cover). Clearly, Gayle would have been pleased that this research is now available to other scholars and the public.

The introduction (Chapter 1) to the volume provides a better understanding of 1) the project's overview, 2) how the Engineer Cantonment's location was discovered, 3) the site's significance, 4) research topics that were examined, and 5) how the content is organized. Chapter 2 presents an extremely useful background on previous scientific explorations in the trans-Mississippian west and a summary of the Long expedition's history and scientific importance. Also included are short biographies of the key participants, including Major Stephen Harriman Long (leader), Major Thomas Biddle, Jr. (recorder, historian, and ethnographer), Lieutenant James Duncan Graham (topographical engineer), Cadet William Henry Swift (topographical engineer), Dr. William Baldwin (botanist and surgeon), Thomas Say (zoologist), Augustus Edward Jessup (geologist), Titian Ramsay Peale II (assistant naturalist and scientific illustrator), Samuel Seymour



(topographic artist/painter), Captain John R. Bell (journalist), Dr. Edwin James (replaced Baldwin as surgeon and botanist and replaced Jessup as geologist), Major Benjamin O'Fallon (Indian agent), John Dougherty (assistant Indian agent and interpreter), and a number of others for military escort, hunting, and other support. The short background stimulated this reviewer to search his personal library to read more about Major Long (Nichols and Halley 1995).

The team members traveled by the steamboat *Western Engineer* from Pittsburgh, Pennsylvania, down the Ohio River and up the Mississippi and Missouri rivers with a side trip to and from the lower Kansas River. Essentially they spent the summer of 1819 in transit from Pittsburgh to what would eventually become eastern Nebraska, where they established Engineer Cantonment. During travel and at several stops along the route, they collected scientific specimens and data. For example, during their six-day (August 20–25) stay at the Kansa Blue Earth Village (archeological site 14PO24), Say identified new insect species and recorded ethnographic information, and others made village scene sketches. Accurate mapping of their route and their future itinerary were also priorities.

Chapter 3 focuses on the Engineer Cantonment site (25WH106) and the archeological field and laboratory methods used to investigate it. Three general components were encountered: a late nineteenth to mid-twentieth century farmstead, Engineer Cantonment, and pre-contact Native American deposits. Grid layouts and abundant feature descriptions comprise most of the chapter.

“Arming the Expedition” is the first of five chapters, altogether totaling 102 pages, that describe the artifacts recovered from 25WH106, including excellent characterizations of the gun parts and the ammunition. (Perhaps this chapter was written before Sivilich’s fine book on *Musket Ball and Small Shot Identification: A Guide* [2016] was available. For a review see *The Kansas Anthropologist* 37:117–118.) The author, Karen Steinauer, conducted an innovative hypothesis-testing study of the ratio of shot to ball sizes, comparing those from Engineer Cantonment and those from Fort Atkinson. As stated, “... one would expect a scientific party to have higher utilization of shot and less of musket balls since they would be more regularly killing small game for scientific collections”

(p. 82). Although there is some margin of error, the results clearly confirm the prediction.

Considerable attention is given to the many gunflints (Plate 4.3.1). Researchers should find the illustrations and descriptions quite useful, especially when coupled with Appendix C (pp. 325–337), depicting additional gunflints and other related gun parts from nearby Fort Atkinson (1820–1827). The metrics of the various sizes of French and English gunflints are matched with various sizes of weapons. Gunflint anatomy is adequately defined, although there is some selective variance from the terminology used by other researchers. As one might expect, some gunflints had a secondary use as fire flints for strike-a-lights. The chapter and

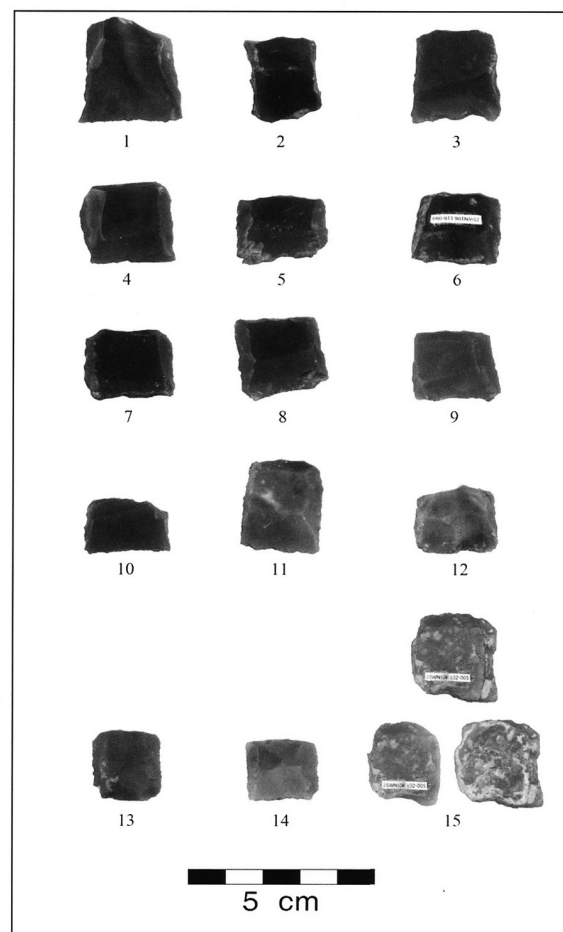


Plate 4.3.1. English gunflints (1-14) and one of the two measurable French gunflints (15) recovered from Engineer Cantonment. Musket/fowler (1); musket/rifle (2, 15); rifle (3-8); rifle/pistol (9-12); and pistol (13-14). Item 15 shows both the dorsal and ventral components (lower two images) of this refit specimen (upper image).

appendix are excellent sources of information on military and nonmilitary firearms commonly used during this time period.

A total of 399 smoking pipe specimens was retrieved from Engineer Cantonment: two were made of red pipestone, and the remainder were manufactured from fired white ball clay (Plate 5.1.1). Although all were thought to be from the cantonment period, nine months seems to be a rather short period to produce that high number of pipe artifacts. Of course, some fragments likely would be from the same broken pipes; however, it seems that many expedition members must have had serious smoking habits and/or were quite careless with their pipes. This collection is compared with the smoking pipes from Fort Atkinson.

Military and civilian buttons and buckles and a variety of other personal items are described. The latter includes two pocket (folding) knives, four finger rings, a badly worn silver Spanish $\frac{1}{2}$ Real coin, two molded glass jewelry settings, six straight pins, and a brass object that is speculatively called a "cross-like ornament." While that portrayal might be appropriate, the object is unlike any variations of the standard Christian cross that this reviewer has observed.

Pottery dinnerware, glass ware, metal flatware, cutlery, and miscellaneous dining-related materials are enumerated. One item not usually preserved is a light blue paper fragment that was part of a cone sugar wrapping. These artifacts offer a hint of what daily life must have been at Engineer Cantonment.

Chapters 6 and 7 are concerned with "Maintaining Field Gear and Equipment" and "Building Materials." This includes the sampling of coal, coke, and clinkers, related to blacksmith use, as well as a variety of abrading stones or whetstones for wearing down, smoothing, shaping, or sharpening tools. Miscellaneous items and scraps of lead were recovered, along with sheet iron and other iron scraps and tools, such as a mule shoe, plumb bob, and cast-iron crucible. Brass strips, chain links, and tacks were found.

In addition to building features, a variety of building materials are listed. This includes metal hardware, such as nails, door bolt keepers, spike-like objects, and pins or wall pegs. Also window glass, limestone and mortar, other stone, fire-cracked rock, burned earth, and ash were associated with various building locations. Later in Chapter

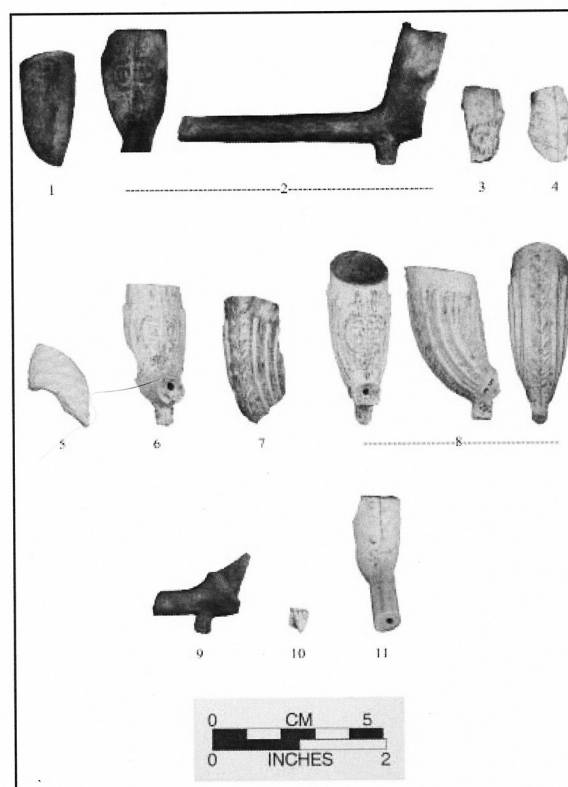


Plate 5.1.1. Smoking pipes. 1, Type 1, Plain Bowl, 036-018, right front; 2, Type 2, "TD" in Oval, 035-018, rear and right side views; 3, Type 2, "TD" in Oval, 101-043, rear or back of bowl; 4, Type 3, Horizontal Diamond Bowl, 036-022; 5, Type 3, Horizontal Diamond Bowl, 043-074; 6, Type 4, Floral "TD" in Circle with Cockles, 040-001; 7, Type 4, Floral "TD" in Circle with Cockles, 080-101; 8, Type 4, Floral "TD" in Circle with Cockles, 124-062, rear, left, and front views; 9, Type 5, Plain Peg-Style Spur, 042-009; 10, Type 6, Dotted Rim, 060-041; and 11, Type 7, Spiked-Frond Mold Seam, 072-070, rear.

10 the architecture and activity areas are discussed. This information, along with future additional research, likely will play a key role in development and public interpretation of the site, which is on the National Register of Historic Places and owned by the Nebraska State Historical Society Foundation.

Chapter 8 summarizes pre-contact and post-contact Native American materials. The prehistoric materials included only three possible flake tool fragments, one core, and 45 pieces of flaking debris. Two worked red pipestone fragments were collected; one is from a pipe bowl, and the other is a small fragment probably also from a pipe. They are thought to be of Indigenous origin, although their time of manufacture is not known. The historic trade items include 18 varieties of glass and shell beads, two iron arrow points, a complete brass

hawk bell (Flushloop variety), and two ceramic gaming pieces. The latter pieces are said to be from a game commonly played by women from various Plains tribes.

One of the expedition's primary scientific goals was identification of new plant and animal species, as well as observation of the area's natural history. Most of this was done while the participants were in winter quarters at Engineer Cantonment. While there, they described hundreds of species, 56 of which were new to science. Only four of those discoveries were plants. Baldwin, the botanist, became ill and had to return to the East before reaching the cantonment. His replacement was not able to join the group until just two weeks before they set out for their hurried westward exploration. The modern archeological investigations, conducted more than 180 years later, also focused on the flora and fauna recovered at the site. The historical and archeological records and modern data on many species of plants, snails, mollusks, mammals, fish, amphibians, reptiles, and birds were analyzed and compared. From biologists to the general public, those interested in natural history should find Chapters 9 and 11 noteworthy. Of special interest to this reviewer are reproductions of the original art. Peale and Seymour produced paintings and drawings of various animals encountered while at winter quarters. These were made available through the courtesy of the American Philosophical Society.

At least 300 species of mammals, birds, reptiles, amphibians, fish, insects, snails, and plants were documented in this area. This vital survey has been overlooked both by biologists and historians, but it should rank among the most significant accomplishments of the expedition (p. 277).

Unfortunately, the remainder of the trek was conducted during an extremely dry summer, making it quite difficult for the men to obtain food from the land, water for humans and horses, and grass for forage. They had to travel quickly through this large dry region for their own survival, allowing little time for scientific research during the western part of the journey. The originally planned trip to Yellowstone was scrapped. That summer's weather led Major Long to declare the Great Plains "the Great American Desert." At the time the undertaking's failure to accomplish its western-

most exploratory goals vastly overshadowed the exceptional scientific accomplishments at Engineer Cantonment. Those successes did not reach the public's attention until years later. This publication of historic and more recent research at and near Engineer Cantonment helps to correct some overall misconceptions.

Chapter 12 summarizes a diverse volume, written by many authors and based on the cooperative research of archeologists, biologists, geologists, and historians. While it is not easy to produce such a broad multidisciplinary volume, the editors have achieved the task most successfully. This reviewer would have arranged a few chapters in a different sequence, but in the long view the order probably makes little difference in readers' understanding of the diverse contents. That variety makes *Archeological Investigations at Engineer Cantonment* stand out from other historical archeology books.

This hefty volume contains five appendices, two of which inventory the materials recovered from the cantonment and the plants and animals in the vicinity. The other three detail selected types of artifacts from nearby Fort Atkinson: smoking pipes, trade beads, gunflints and other firearm-related material. Individually each appendix enhances the information in the text, as well as provides an extremely useful source for material culture researchers and the interested public.

Archeological Investigations at Engineer Cantonment: Winter Quarters of the 1819-1820 Long Expedition, Eastern Nebraska illustrates how the historic and archeological records can greatly enhance one another. It also demonstrates how various fields of scientific research can combine to form a volume whose sum is greater than its individual parts. This reviewer is glad to have this interesting reference in his library. It may be obtained from the University of Nebraska Press (presswebmail@unl.edu) or History Nebraska (david.bristow@nebraska.gov), both located in Lincoln.

REFERENCES CITED

- Nichols, Roger L., and Patrick L. Halley.
1995 *Stephen Long and American Frontier Exploration*.
University of Oklahoma Press, Norman.
- Sivilich, Daniel M.
2016 *Musket Ball and Small Shot Identification: A Guide*.
University of Oklahoma Press, Norman.

ABOUT THE AUTHORS

Jennifer Banks

Jennifer Banks is a Master's candidate at Wichita State University. She earned her B.S. in anthropology at the University of Iowa. Banks' research interests include microfossil analysis, food studies, bison hunting techniques, and experimental archeology. Currently she is working on analyzing bison hunting toolkits from early Great Bend aspect campsites in southern Kansas.

C. Tod Bevitt

Tod Bevitt is a lifelong Kansan and longtime professional archeologist, having received a B.A. degree in anthropology from the University of Kansas and M.A. in anthropology from Wichita State University. He was introduced to archeology as a teenager, attending his first KATP field school in 1987 at Topeka. Tod and wife Wendi currently co-edit the *KAA Newsletter* and work together at Buried Past Consulting, LLC, a cultural resource consulting company that they established in 2015.

Crystal A. Dozier

Crystal Dozier, Ph.D., is an Assistant Professor in the Department of Anthropology at Wichita State University. She is director of the Archaeology of Food Laboratory, where she and her students utilize residue analysis, zooarcheology, experimental archeology, and ancient microfossil analysis to better understand the diets and decisions of past peoples. Dozier also serves as the City Archaeologist for Wichita, Kansas.

Jim D. Feagins

Jim Feagins is a retired private archeological consultant who still serves as part of the adjunct archeological staff for the St. Joseph Museum. He received an A.A. degree from Graceland University in Iowa, a B.S. degree from Pittsburg State University, and a M.N.S. degree from the University of Oklahoma. After 30 years as a science instructor for Consolidated School District No. 4, Grandview, Missouri, he retired in 1995. Active in promoting archeological education, he is president emeritus of the Missouri Archaeological Society. He also served as president of the Kansas City Archaeological Society and as a vice-president of the Missouri Association of Professional Archaeologists and the Kansas Anthropological Association. He is a life member of the KAA.

Christine D. Garst

Christine Garst has a Master's degree in anthropology from the University of Kansas. She is an archeologist with the Kansas Historical Society where she supervises the Archeology Lab and its volunteers. Her interest in rural historical archeology stems from growing up on a farm in north-central Kansas, and other research pursuits including gunflints, petroglyphs, and the analysis and reporting of orphan artifact collections.

Robert J. Hoard

Robert Hoard has been the State Archeologist of Kansas since 2000. He is interested in the identification of traded items from archeological sites to determine exchange routes through time. He also studies the technical attributes of prehistoric pottery, especially the earliest pottery in the High Plains. Much of his fieldwork has been in the North American prairies and plains, but he also worked in Florida at the Little Salt Spring site in Pohnpei, Micronesia at the World Heritage-listed site of Nan Madol. When not involved in archeological work, he builds dry-laid native limestone fences in the Flint Hills and identifies and preserves wild plants and their habitats.

Brad Logan

Brad Logan is Research Associate Professor Emeritus of anthropology at Kansas State University. He received his M.A. at the University of Nevada, Reno (1977) and his Ph.D. at the University of Kansas (1985). His field and research experience over a period of 45 years occurred in Kansas, Nebraska, Missouri, Colorado, Nevada, Wyoming, southern France, and lower Austria. Prior to his position at KSU he was senior curator at the University of Kansas, Museum of Anthropology and director of its Office of Archaeological Research. He is a native Kansan and a life member of the KAA.

Anthony Miles

Anthony Miles is an archeology student at Wichita State University and assistant cultural resources specialist at Burns and McDonnell. His interest in archeology began when he found his first artifact, a broken Dickson point, in October 1998. He has been studying and collecting with permission from the same site ever since. The site was officially documented in 2012, which furthered his interest in archeology. In February 2017 he took up flintknapping with the intent of being able to better understand the artifacts that he finds and the field in which he works. Anthony's primary interests in archeology are the Archaic period and lithic technology. His goal for his senior thesis is to study the site from which he collects to attain more insight into its history, lithic procurement, and the day-to-day life of the people who occupied it for approximately 10,000 years.

Michael R. Penrod

Michael Penrod grew up in Manhattan, Kansas. He is a retired university administrator and part-time faculty member in American history. He has B.A. (1974) and M.A. (1981) degrees in American military history and a Ph.D. (1985) in higher education studies from Kansas State University. Late in life Michael completed an M.S. in cultural resource management archaeology at Saint Cloud State University. He participated in field work, studying Civil War period sites in central Minnesota.

Timothy K. Perttula

Timothy K. Perttula has an M.A. (1977) and Ph.D. (1989) in anthropology from the University of Washington. He has engaged in all aspects of archeological research and management since the mid-1970s, including consulting on HPF and NAGPRA grants with the Caddo Nation of Oklahoma. Much of his research through Archeological & Environmental Consultants, where he is manager, and other entities and agencies has been on archeological sites in Texas, particularly Caddo sites and ceramics, but he has worked on projects in Oklahoma, Kansas, Nebraska, Arkansas, Louisiana, Minnesota, Wisconsin, Michigan, and Washington. Additionally, he was a Section 106 project reviewer and planner for the Advisory Council on Historic Preservation and the Texas Historical Commission between 1989 and 1996.

Tim Rues

Tim has been the site administrator of Constitution Hall in Lecompton, Kansas, since it opened to the public as a state historic site in 1995. Previously he was site curator for 10 years at the First Territorial Capitol State Historic Site at Ft. Riley. He came to Ft. Riley from Hays, where he was the assistant director of Ft. Hays State Historic Site for two years. Tim is a lifelong Kansan, born and raised in McCracken in Rush County. He is a graduate of Kansas State University with a Bachelor's degree in American history.

ADDENDUM TO 2021 KANSAS ANTHROPOLOGICAL ASSOCIATION MEMBERS

ARNOLD
BAKER
BELTZ
BELTZ
CARLSON
COLLE
CRAWFORD-CLINE
ECK &
 JACQUELINE BERGER
FOSHA
GOOD
HORD
HUTSON
LEE
NANCE
NIOCE
POWELL
RILEY
RUDKIN
RUIZ
SAGE
SIELERT
THOMPSON

WILLIAM
KYLE
SHANNON
SHELBY
JACK
BRITT
CHELSEY
CHRISTOPHER

MICHAEL
BETH
CHRIS
RUTH
KIP
ZACH
BECKY & MARVIN
GINA
ZELLA
THOMAS & JANN
ANGELO
SHARON
SUE & DAVID
ZOE



2022 KANSAS ANTHROPOLOGICAL ASSOCIATION MEMBERS (AS OF MAY 2022)

*AARON	DEBI			
ANDERSON	STEVEN			
*ARENDR	NANCY			
ARNOLD	WILLIAM F			
ATCHISON PUBLIC LIB				
BAKER	KYLE			
*BARBER	REBECCA			
BAUER	EMMETT & PATRICIA			
BAY	ROY			
BELTZ	SHANNON			
BELTZ	SHELBY			
*BETH	MARLENE			
*BEVITT	C TOD			
*BITIKOFER	SHAUN			
*BLASING	BOB			
BOGNER	PAUL F			
BRIGGS	GLENN			
BRIGGS	NEIL			
*BRUBAKER	MARYLIE			
*BRUNSELL	JANE R			
*CALHOUN	DEBORA			
CALHOUN	MYRON & NANCY			
CATLETT	TOM			
*CHAPMAN	DEAN E			
CHENEY	NADINE			
COLLE	BRITT & LINDA			
COLLIE-AKERS	ANDREW & VICKI			
COLSON	JANNA			
*CONRAD	MARY			
COOK	EVA C LORD			
CUSHENBERY-ANDREWS	SARA & SOFIA			
*DALE	FRANK			
DANIELS	JESSICA			
DAVIS	LELAND			
DEBOLD	PAT			
DEINES	WILLIAM E			
DYE	NORMAN & NANCY			
EDENS	JACK			
ELLISON	KATE			
*FEAGINS	JIM D			
*FINCH &	STEVEN			
MARILYN S MILLER				
FINKE	JERRY & MARILYN			
FLOYD	MORRIS			
GARST	CHRISTINE			
GELDHOF	GORDON			
GOERING	MARK & SHEILA			
GOOD	ELIZABETH			
GUTIERREZ	JENNIFER & GIANNA			
HAAS	JAMES			
HAND	DAVID J			
HANNA	CASSIE & STEPHEN			
HARRIS &	ELIZABETH			
JOHN M VINCENT				
HARVARD UNIVERSITY	TOZZER LIB SERIALS & ACQS			
HEATH &	TARYN			
C HEATH COVEY				
HINTZ	PAULINE			
HIXON	ROBIN			
HOARD	ROBERT			
HOFFMAN	BARBARA E			
*HOFMAN	JACK			
HORD	CHRIS			
HOWELL	JEAN & BILL			
*HUENERGARDE	JIM			
JOHNSON	PAUL & ROBIN			

JOHNSON CO LIB	ACQUISITIONS
*KANSAS HIST SOC	PERIODICALS
KANSAS STATE UNIV	HALE LIB ACQUISITIONS DEPT
KAUL-HURST	LUCY
KECK	DICK & CYNTHIA
KENNEDY	CRYSTAL
KING	MARSHA
KLARMANN	NICOLE
KLEIER	JODI
*KRAUS	KURT
KREISSLER	ALICE
KURTZ	CHRIS
LANE	ELISE M
LATHAM	MARK
LEE	KIP H
LICKTEIG	ALICE & JAKE
LINTZ	CHRISTOPHER
*LOGAN &	BRAD
LAUREN RITTERBUSH	
LUNDEEN	GAIL
MALLOUF	ROBERT J
MCCHESNEY	KAROL
MCKINNEY	SHARON L
MCLEAN &	JANICE
ROBERT CONARD	
*MISSOURI ARCH SOC	MISSOURI STATE UNIV
MOORE	CAROL
MOREHOUSE	JEAN
MULDER	CLEVE
MURRAY	KENT & GLENNA
MYERS	CARL
NADEN	MELANIE
NANCE	ZACHARY
NIOCE	MARVIN & BECKY
OBENIETA	ABIGAIL
OLIVA	BONITA
OLSON	BILL & BETH
PETERSON	ANDREW W
PETZ	AL
PITTSBURG STATE UNIV	AXE LIB
POWELL &	GINA
TIM MEADE	
RACK	KIM, JAKE & MASON
REED	MARGIE
REXROAD	VIRGINIA
RILEY	ZELLA
ROBERTS	JAMES
ROECKERS	HENRY J
*ROHR	ROBERT
ROMANS	ANNA
ROWLINSON	DANIEL & JIMMETTE
*ROWLISON	DON
*ROYCE	CLARE H
RUDKIN	JANN & TOM
RUIZ &	ANGELO
MICHELE BERENDSEN	
RYAN	SHANNON
SAGE	SHARON
*SALLEE	KENT
SCALET	DEBRA
SHERIDAN	ALAN
SHIVELY	BARON
SICHTER	JAMES
SMITH	RYAN
*SMITH	SUZANNE
SPELLMAN	BECKY
ST HIST SOC OF WI	LIB ACQS SEC
*STEIN	MARTIN
STIPPICH	JULIE A
STITES	DEAN & VALORIE
*STRICKLER	BRENDA



STROM

STUBBS

*SUDBURY

*SULLIVAN

SWANEK

THOMPSON

*THURMOND

TREMBLAY

TSUKAMOTO &
STUART MCGREGOR

TUCKER

UNIV OF KANSAS

UNIV OF OKLAHOMA

VEHIK

VESEL

WALKER

WALLEN &
CARSTEN HOLM

WALLEN

WALLEN

WARD

WATT

WEBSTER

WEDEL

*WEST

WESTON

WILDGEN

WILLIAMS

WING

*WULFKUHLE

YARMER

*YOUNG

BYRON

MICHAEL

BRYON

MELONIE

ED

ZOE

J PETER

LELAND

KATHLEEN

VITA

WATSON LIB RETRIEVAL

BIZZELL MEM LIB SERIALS

DR SUSAN

GEORGE A

DANNY

ANNE

MIRIAM

ROSE MARIE & MIKE

ROGER

MARLEE

JULIA

DALE L

JOHN

TIM

MIKE

BARRY & HEDY

EUGENE

VIRGINIA A

ROBERT E

A L

* denotes life membership



INFORMATION FOR AUTHORS

Manuscripts are actively solicited for *The Kansas Anthropologist*. Articles should have a relationship to Kansas anthropology (archeology, ethnography, ethnohistory, cultural/social anthropology, physical anthropology, etc.). All manuscripts must be the original, unpublished work of the authors. Responses to previously published articles and book reviews are invited also.

The varied readership of the journal should be kept in mind when preparing papers. Jargon should be avoided. Third-person narrative is strongly preferred unless the piece is a personal reminiscence in which first-person voice is acceptable. Contractions should be avoided. The style authority is *American Antiquity* (see <https://www.saa.org/publications/american-antiquity>).

Manuscripts should be prepared using as little internal formatting as possible. Tables and figures should not be embedded in the text, but each submitted as a separate file. Illustrations are encouraged, and their preparation is the responsibility of the author. Digital photography with original resolution less than 300 dpi is not optimal for print publications. High resolution digital images are preferred, but 35-mm black and white or color prints or slides are accepted. All illustrations should be designed to fit within 6 x 8.5-inch margins, including caption. If protected by copyright, securing written permission for use is the responsibility of the author. Manuscripts may be submitted on CD/DVD or portable storage device (flash or jump drive), as e-mail attachments, or by Dropbox, OneDrive, or other cloud storage sites. If computer technology is not available, a hard copy may be submitted.

The editor will review manuscripts and judge whether articles are appropriate and what revisions may be necessary for publication. Outside reviewers may be used. Authors will receive a proof of the formatted article for review before printing.

A digital copy of the article and up to five reprints will be provided free of charge to the author of each major article. Book reviewers will receive a digital copy of the review and up to two reprints. Abstracts are posted on the KAA web site at www.katp.org.

As publisher, the KAA will hold all rights, title, and interest in copyright for the full legal term of copyright. This copyright will pertain to the copy-edited, formatted, and laid-out published version of the report and to any illustrations and maps that the KAA may pay to have drafted. The content and all other illustrations and photographs remain the author's intellectual property. Following publication, the author may write other articles or give talks based on the research, citing *The Kansas Anthropologist* article. The author may post a final accepted copy of the manuscript, but not the edited and formatted version of the report, in an institutional repository ("green" open access), provided the full bibliographic entry for the report is posted with it.

Publication of *The Kansas Anthropologist* is financed in part with Federal funds from the National Park Service, a division of the United States Department of the Interior, and administered by the Kansas Historical Society. The contents and opinions, however, do not necessarily reflect the view or policies of the U.S. Department of the Interior or the Kansas Historical Society. U.S. Department of the Interior regulations strictly prohibit unlawful discrimination in departmental federally assisted programs on the basis of race, color, national origin, age, or handicap. Any person who believes that he or she has been discriminated against in any program, activity, or facility operated by a recipient of federal assistance should write to Director, Equal Opportunity Program, U.S. Department of the Interior, National Park Service, 1849 G Street, Northwest, Washington, D.C. 20240.