American Petrographic Services, Inc.

REPORT OF ARCHAEOPETROGRAPHY INVESTIGATION

PROJECT:
BAT CREEK STONE
INVESTIGATION

REPORTED TO:
EASTERN BAND OF CHEROKEE
498 TSALI BLVD
CHEROKEE, NC 27719

ATTN: DON ROSE

APS JOB NO: 10-06557

DATE: JULY 14, 2010

Introduction

This report presents the results of a microscopic examination of the physical and geological features of an archaeological artifact called the Bat Creek Stone that American Petrographic Services Inc. performed at the McClung Museum on the campus of the University of Tennessee in Knoxville on May 28, and June 29, 2010. The scope of our work was limited to:

1. Performing petrographic observations using reflected light microscopy and micro-photo documentation on the artifact.

2. Performing scanning electron microscopy (SEM) analysis.

3. Conducting a document review of the Smithsonian Institute field reports written by John W. Emmert, who discovered the artifact on February 14, 1889.

American Petrographic Services Inc. transported its microscopic equipment to the museum where staff members, Registrar Bob Pennington, and Museum Director, Jefferson Chapman, graciously provided access to their facilities and the artifact. Present during the examination were Dr. Barbara Duncan, Education Director at the Museum of the Cherokee Indian, Sharon Littlejohn, Eastern Band of Cherokee Indian, and Leslie Kalen, Eastern Band of Cherokee Indian.

On June 29, 2010, American Petrographic Services Inc, returned to the Science and Engineering Research Facility at the University of Tennessee to complete the examination of the artifact using the Scanning Electron Microscopy equipment on campus.

Background Information

The Bat Creek Stone was discovered by Mr. John W. Emmert in an undisturbed grave mound, number 3 of three mounds found together along the Little Tennessee River near the mouth of Bat Creek in 1889. Emmert was working on behalf of the Smithsonian Institute's Bureau of Ethnology's Mound Survey Project and reported to his immediate supervisor, Cyrus Thomas, who originally identified the inscription as Paleo-Cherokee. In 1964, the inscription was noticed by Chicago patent attorney, Henriette Mertz, to have been published up-side down by the Smithsonian Institute and believed the characters to be Phoenician. [1]

In 1971, the inscription was found to be a Roman era Paleo-Hebrew Judean by Dr. Cyrus Gordon (1908-2001), who was an American scholar of Near Eastern cultures and ancient languages.

John Emmert's Notes and Correspondence

The following is the correspondence relevant to this investigation between John W. Emmert and Cyrus Thomas between February 15th and March 21, 1889. Much speculation has been made by previous investigators of earlier correspondence between the two relevant to Emmert's struggles with alcohol and the possibility of his forging the inscription to curry favor from his supervisor Cyrus Thomas.

Since there is no direct evidence that we have discovered to support such speculation which casts doubt on the veracity of the discovery, we dismiss such speculation. Mr. Emmert's field work and documentation appears to be more than competent by the standards of his time and should stand on their own merit.

> February 15th, 1889
>
> Emmert to Cyrus Thomas
>
> Dear Sir,
>
> I am truly glad to inform you that I have struck two very interesting mounds I have taken nine skeletons from one and seventeen from the other. In the one with nine in it found a large pair of copper Bracelets and a polished stone with letters or characters cut on it unlike anything I have ever seen before. They were found at the very bottom of the mound. Some parties wanted to send a copy of the stone to Knoxville for translation but I objected until I heard from you.
>
> February 23rd, 1889
>
> Emmert to Cyrus Thomas

[1] Mertz, 1964, Page 130.

Dear Sir,

I wrote you several days ago telling you of my success in the Tipton mounds in which I found the Bracelets, Buckles, Buckskins, the engraved Stone +. Since that time I have worked the big mound that I mentioned in my first letter and found it to contain nothing of interest but a large circular hearth of burnt earth, coals and ashes...

There is considerable excitement here about the stone with letters on it that come out of the Tipton mound…

February 25th, 1889

Emmert to Cyrus Thomas

Dear Sir,

Yours received today. I am very sorry to hear of your illness, it is impossible to get a photograph of the stone here, I send you a copy of it as near as I can draw it. I will take good care of everything I get as you direct. I discovered another mound near hear that I did not know of, so I have four yet to open near this place. I think it a good idea to look into every thing near here that we might find something else like the Stone, or that might have some connection with it…

Very truly,

John W. Emmert

I will not write to McChessney as you directed my check sent here; will you please inform me what the inscription on the stone is?

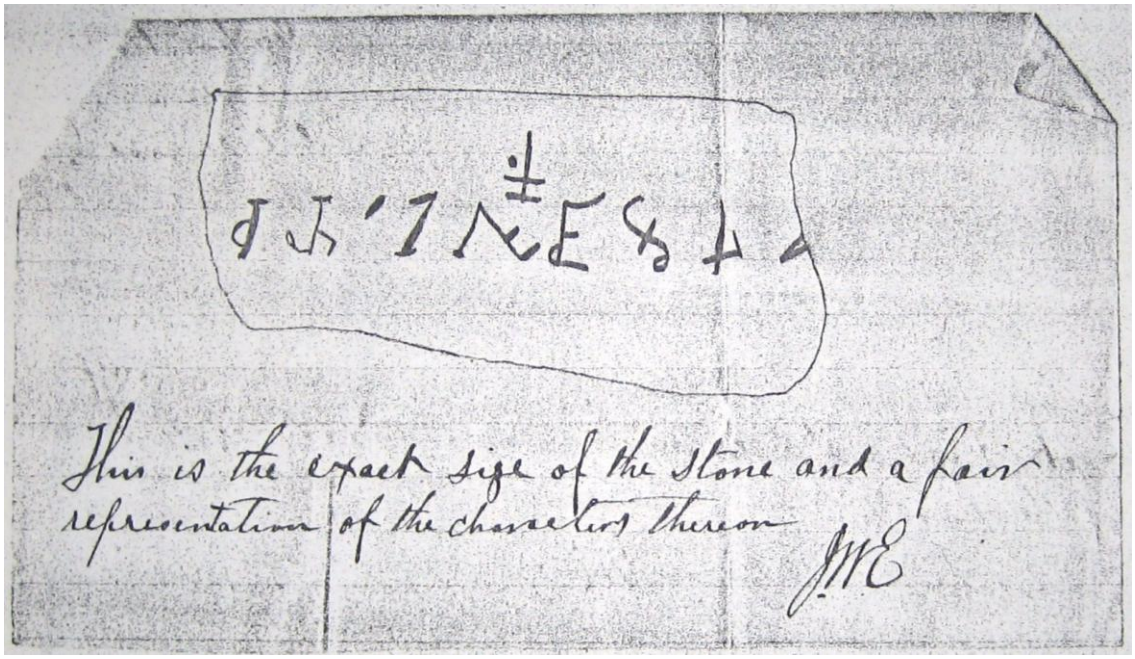


Figure 1: This drawing of the Bat Creek inscription was made by John W. Emmert shortly after its discovery in mid-February of 1889. "This is the exact size of the Stone and a fair representation of the characters thereon JME." (Courtesy of the McClung at the University of Tennessee).

March 7th, 1889

Emmert to Cyrus Thomas

Dear Sir,

(Page 2 of 11) Two miles below or northwest of Morganton, on the west side of the Little Tennessee River, Bat Creek empties in the river. Above and below the creek is some beautiful bottom land running back from the river at some places ½ mile and terminating in high steep hills. Along the borders of the river and creek there are still growing massive clusters of cane showing that these bottoms was once covered with a dense cane brake.

Just in the angle of the creek and river is a large mound (see no. 1 on map) and on the other side of the creek on the upland or second bottom are two other mounds marked 2 and 3 on map. These two stand about 100 feet apart from center to center. The first bottom runs back from the river to a rise or bank almost perpendicular about 20 to 30 feet high then the level land running back to the high hills is called second bottom. On this second bottom is the two mounds, 2 and 3.

(Pages 6 and 7) Mound no. 3, Tipton Group, stands about 100 feet from no. 2 and was 28 feet in diameter and about 5 feet high. I found some large sassafras trees standing on the mound and Mr. Tipton told me that he had chopped other trees off of it forty years ago and that the mound had been a cluster of trees and grape vines as far back as the oldest settler could recollect. There was an old rotten stump yet in the center of this mound the roots of which ran down in the mound

almost or quite to where the skeletons were found. That any one could have ever worked this mound without leaving some evidence of it I think it impossible.

I worked this mound by cutting a pit 8 feet square right down from the top to the bottom taking out the old rotten roots all the way. I found the entire mound to be of hard red clay all the way from top to bottom without any change of color whatever. Not any seams in the earth which would have been if the ground had ever been disturbed.

I cut my pit down square and short to the very bottom of the mound where I found 9 skeletons lying on the natural surface surrounded by dark colored earth. Skeleton no. 1 was lying at full length with head to the south. Lying close by the side of no. 1 was another skeleton no. 2 with head to the north and feet almost touching the head of no. 1.

On the same level with no. 1 and two were found 7 other skeletons all lying side by side with their heads to the north and all of them very much decomposed as were nos. 1 and 2. These 7 skeletons were lying almost touching each other, the skulls being in line with each other a little singular that all were lying with the heads to north, but no. 1 whose head was to the south. I found no relics of any kind with any of skeletons except no. 1, immediately under the skull and jaw bones of skeleton no. 1 I found two copper bracelets, an engraved stone, a small drilled fossil stone, a copper bead, a bone instrument, and some small pieces of polished wood. The ground about the skeletons was wet and muddy. The pieces of wood w[ere] soft and colored green with copper rust off the bracelets. I could squeeze the green water out of them by pressing between my fingers. The copper bracelet appeared to have been rolled up in something that crumbled off them on taking them out. They were apparently as large as my finger before the outside crumbled off. The engraved stone was lying just under the back part of the skull. I punched it on the rough side with my steel rod in probing before I came to the skeletons. The other side of the stone is exactly as it was taken from the skeleton at the bottom of the mound about five feet deep.

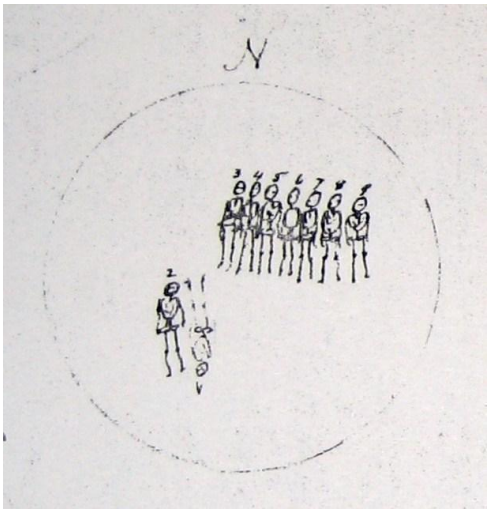
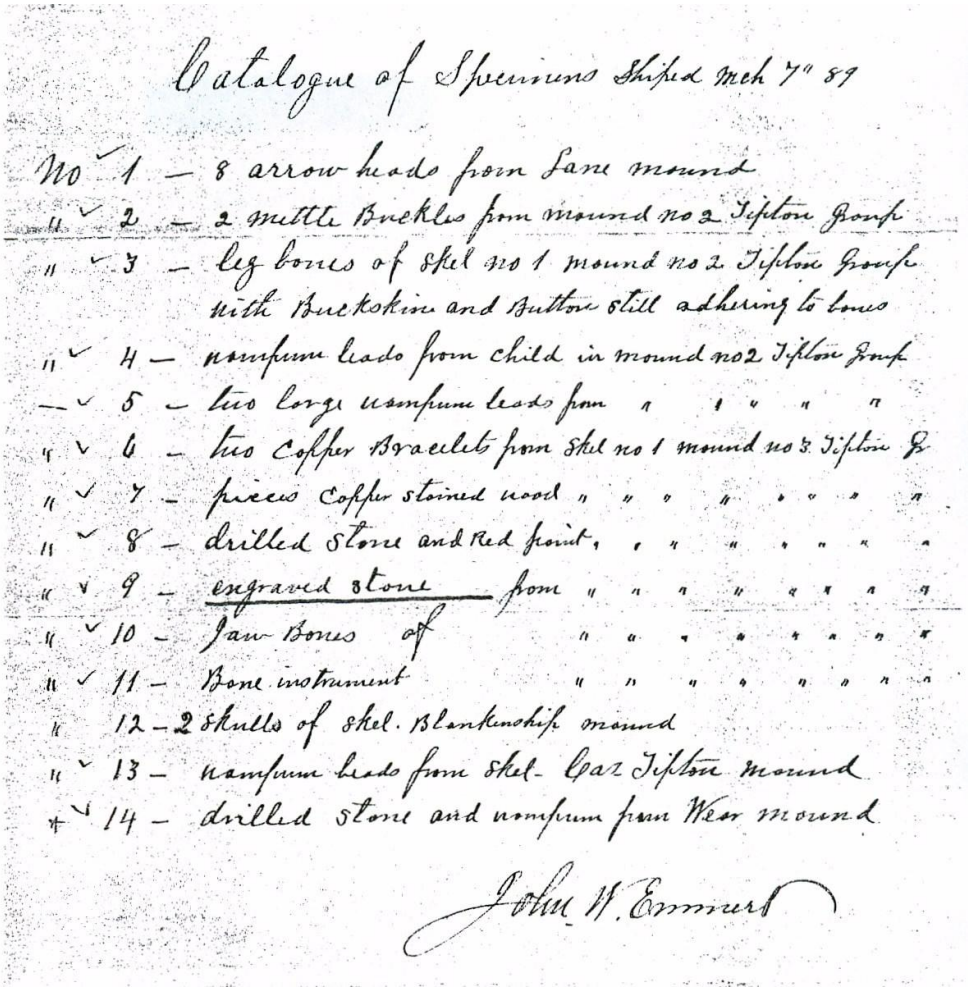


Figure 2: John Emmert wrote the following comments for this drawing: "Diagram mound no. 3, Tipton Group, showing the position of the skeletons."



Catalogue of Specimens Shipped March 7th 89

No 1 – 8 arrow heads from Jane mound
" 2 – 2 mettle Buckles from mound no 2 Tipton Group
" 3 – leg bones of Skel no 1 mound no 2 Tipton Group with Buckskin and Button still adhering to bones
" 4 – wampum beads from child in mound no 2 Tipton Group
– 5 – two large wampum beads from " " " " "
" 6 – two Copper Bracelets from Skel no 1 mound no 3 Tipton G
" 7 – pieces Copper stained wood " " " " " " "
" 8 – drilled Stone and Red paint " " " " " " "
" 9 – engraved stone from " " " " " " " "
" 10 – Jaw Bones of " " " " " " " "
" 11 – Bone instrument " " " " " " " "
" 12 – 2 Skulls of Skel. Blankenship mound
" 13 – wampum beads from Skel- Carr Tipton mound
" 14 – drilled Stone and wampum from West mound

John W. Emmert

Figure 3: The above list is a catalogue of specimens that includes the artifacts collected from Mound Number 3 that were shipped to Cyrus Thomas on March 7, 1889:

No. 6 – Two copper bracelets from skeleton no. 1, Mound no. 3, Tipton Group
No. 7 – Pieces of copper stained wood from skeleton no. 1, Mound no. 3, Tipton Group
No. 8 – Drilled stone and red paint from skeleton no. 1, Mound no. 3, Tipton Group
No. 9 – Engraved stone from skeleton no. 1, Mound no. 3, Tipton Group
No. 10 – Jaw bones from skeleton no. 1, Mound no. 3, Tipton Group
No. 11 – Bone instrument from skeleton no. 1, Mound no. 3, Tipton Group

Discussion

It is appropriate to provide comments on the arguments forwarded by Mainfort and Kwas (1991, 2004) in their response to McCulloch (1988). Typical of many other mainstream archaeologists' arguments about other controversial artifacts they cite speculation, and opinion, in place of factual evidence to prove the artifact fraudulent. Here are just a few examples of their arguments:

1. The authors begin by labeling those who take seriously the idea of pre-Columbian contact with the Old World as "Cult archaeologists." This term promotes a negative connotation to the subject matter at the outset. At the same time this strategy of name-calling undermines their objectivity and credibility.

2. They also undermine their own argument by attempting to associate the Bat Creek inscription with other allegedly fraudulent artifacts such as the Kensington Rune Stone. [2] This author has extensive experience investigating this artifact which has now been found to be a genuine medieval artifact.

3. The crux of their argument was to accuse John Emmert of faking the inscription to curry favor with his supervisor, Cyrus Thomas. What is also disturbing and unethical, in this case, is that Emmert's credibility was never questioned until the 1970s when it was first realized the inscription was in fact Paleo-Hebrew.

More recent arguments by archaeologists Mainfort and Kwas, who initially argued the inscription was not Hebrew, conceded in 2004 the inscription was Hebrew, but insisted that Freemasons made the inscription. Another recently proposed theory is that the mound was intruded by the Cherokee in the Eighteenth Century.[3]

Original Sample Dimensions

4 ½" (115 mm) x 2" (50 mm) x 3/8" (10 mm) thick

Microscopic Examination

The artifact was examined on May 28, 2010, using an Olympus SZX12 Zoom microscope with a Spot digital camera system that was transported to the McClung Museum on the University of Tennessee campus. The artifact was again examined on University of Tennessee campus using a scanning electron microscope on June 29, 2010.

The following photographs with commentary were taken by Wolter during the examinations on May 28, and June 29, 2010.

[2] Mainfort and Kwas, 1991, Page 1.
[3] Dr. Brett Riggs, an archaeologist at UNC Chapel Hill who has done work for the Eastern Band, reported in email communication by Dr. Barbara Duncan on July 5, 2010.

Figure 4: The inscribed side of the Bat Creek Stone with nearly all of the dark brown-colored, approximately 1-2 mm thick iron-oxide-rich weathering rind intact. Areas along the top edge and in the lower right corner have spalled off exposing the light brown-colored, unweathered iron-cemented clayey siltstone.

Figure 5: The number designation for each carved character as defined in this report. In the upper left area there are two, roughly parallel, approximately 1 cm long vertical lines (characters 11 & 12) that were scratched into the stone sometime between 1894 (Cyrus Thomas) and 1970 (Cyrus Gordon).

Figure 6: The back side of the Bat Creek Stone has the original Smithsonian (Institute) identification names and numbers. Virtually all but a few remnants along the top and bottom edges, and the small arrowhead-shaped portion on the lower right side, of the approximately 1-2 mm thick iron oxide-rich weathering rind has peeled off exposing the light brown-colored, unweathered iron-cemented clayey siltstone. The scratch made by Emmert with the metal prod at the time of the excavation is on the far right.

Figure 7: An approximately 27 mm long scratch (yellow box) is present on the far middle-right end of the back side of the stone. The long thinning scratch has relatively sharp and jagged edges and appears to be consistent with contact with a sharp prod as reported by John Emmert at the time of discovery.

Figures 8 & 9: A closer view of the top portion of the scratched groove (character # 11) inside the yellow box shows iron-rich orange-colored clay that was produced when the instrument crushed the exterior weathering rind. The crack pattern in the clay-filled groove indicates the probe made the scratch in the direction of bottom to top (Right, 50X).

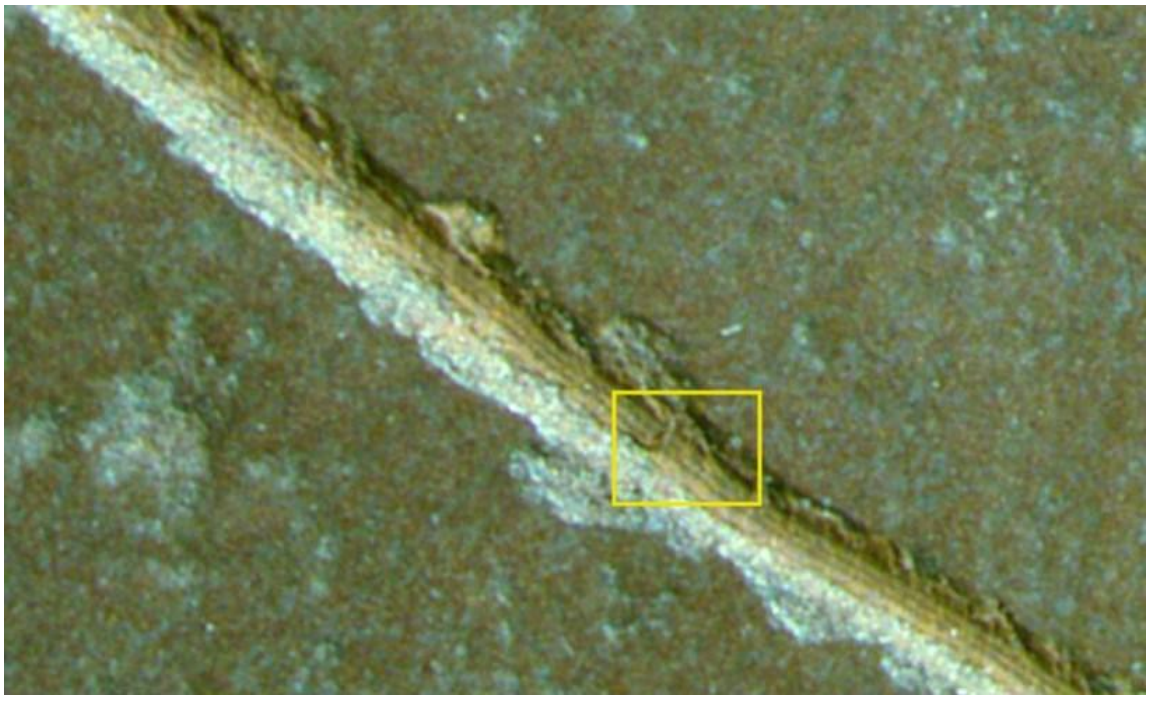


Figure 10: The yellow box indicates the area observed in the scanning electron (SEM) images below taken in character 12 (20X).

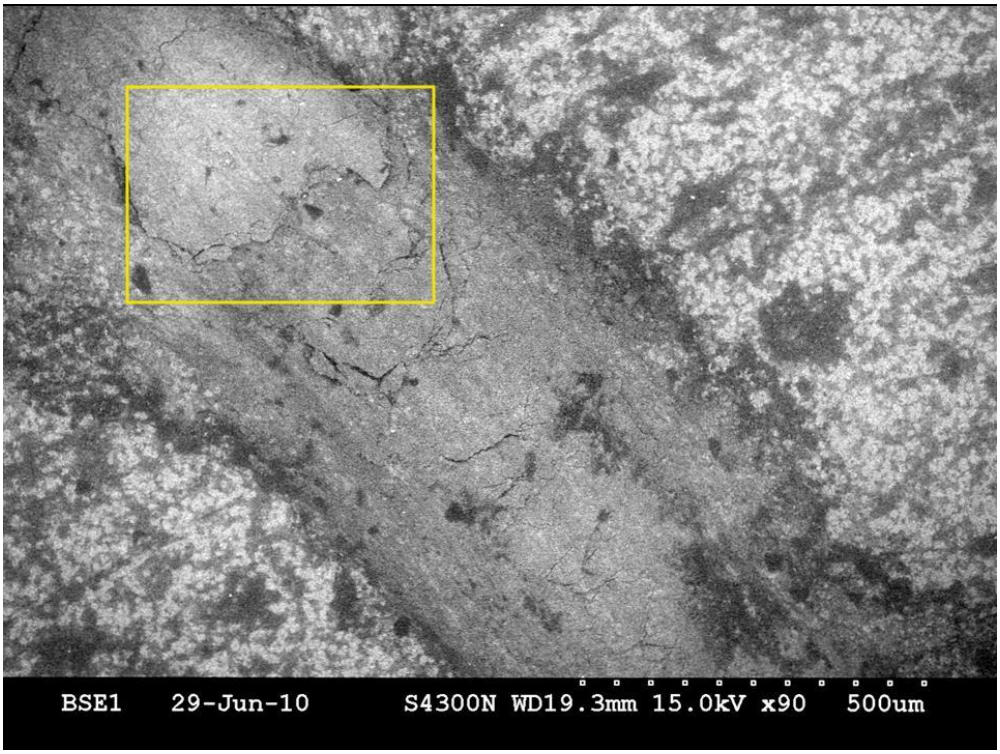


Figure 11: The yellow box indicates the area of the cracked clay produced by the probe that made the scratch in the image below. The bright white areas on either side of the scratched groove indicate the presence of iron in the iron-oxide-rich weathering rind (90X).

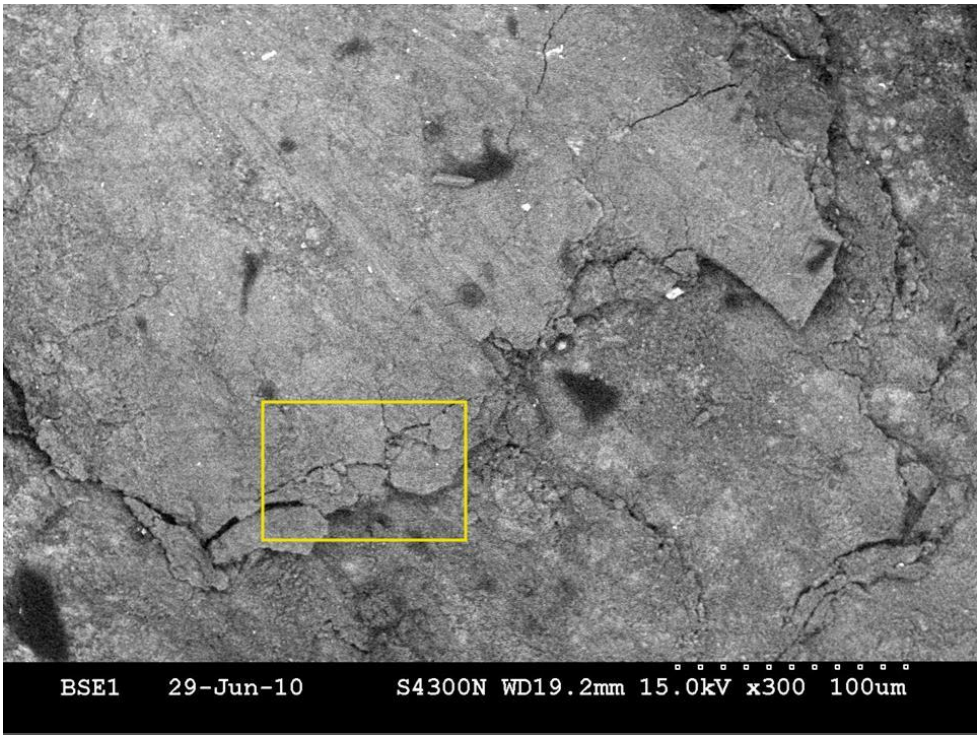


Figure 12: The yellow box indicates the area of the cracked clay edge produced by the probe that made the scratch in the image below (300X).

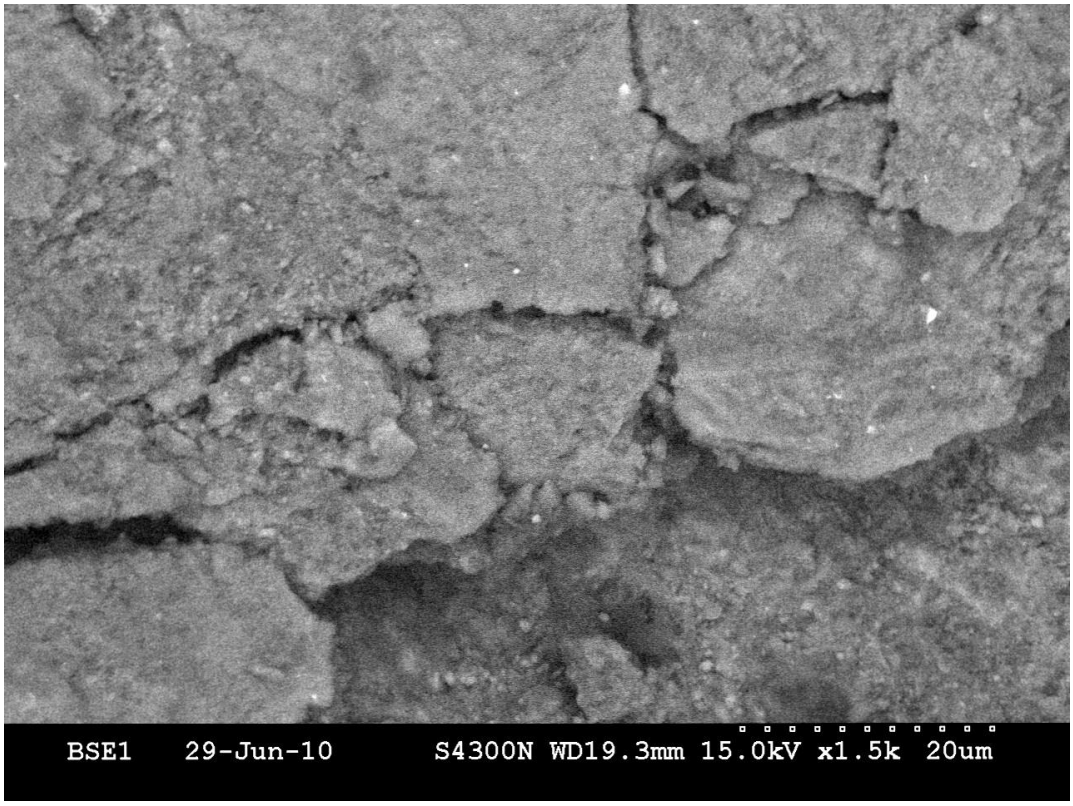


Figure 13: This image is a closer view of the broken edge of the cracked silty-clay within the scratched groove of character 12 (1500X). The brittle nature of the deposits within the groove are consistent with comprised of greater than 50% clay minerals with the remaining silica material comprised of quartz (SiO2).

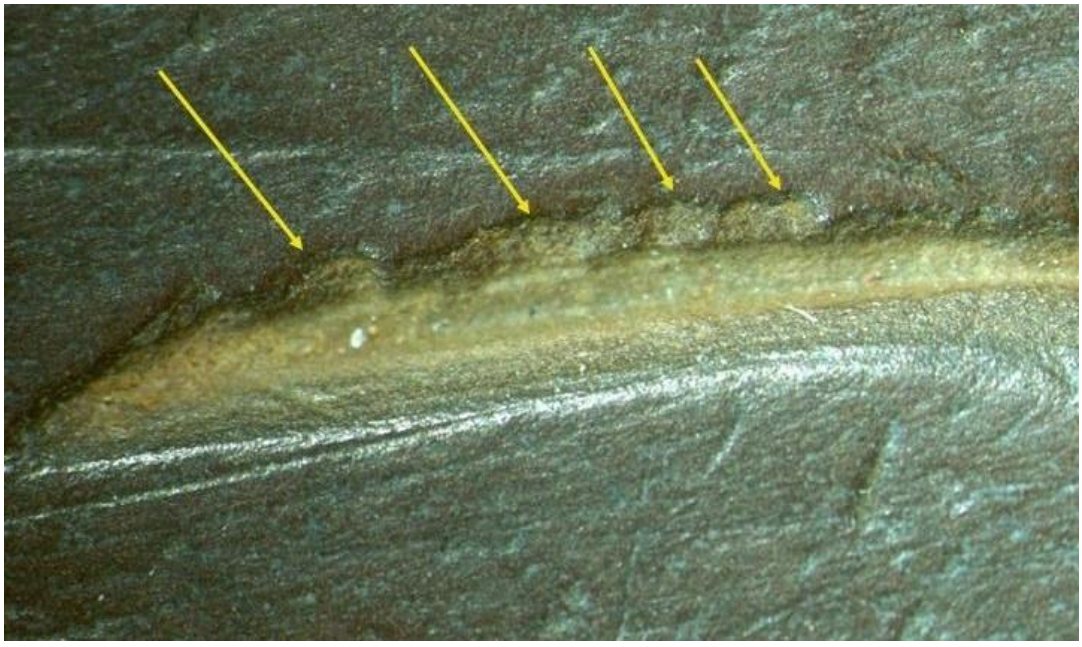


Figure 14: The yellow arrows indicate jagged flakes that were made when the carved line in character #4 was made. The edges of the grooves were then rounded by subsequent polishing (30X).

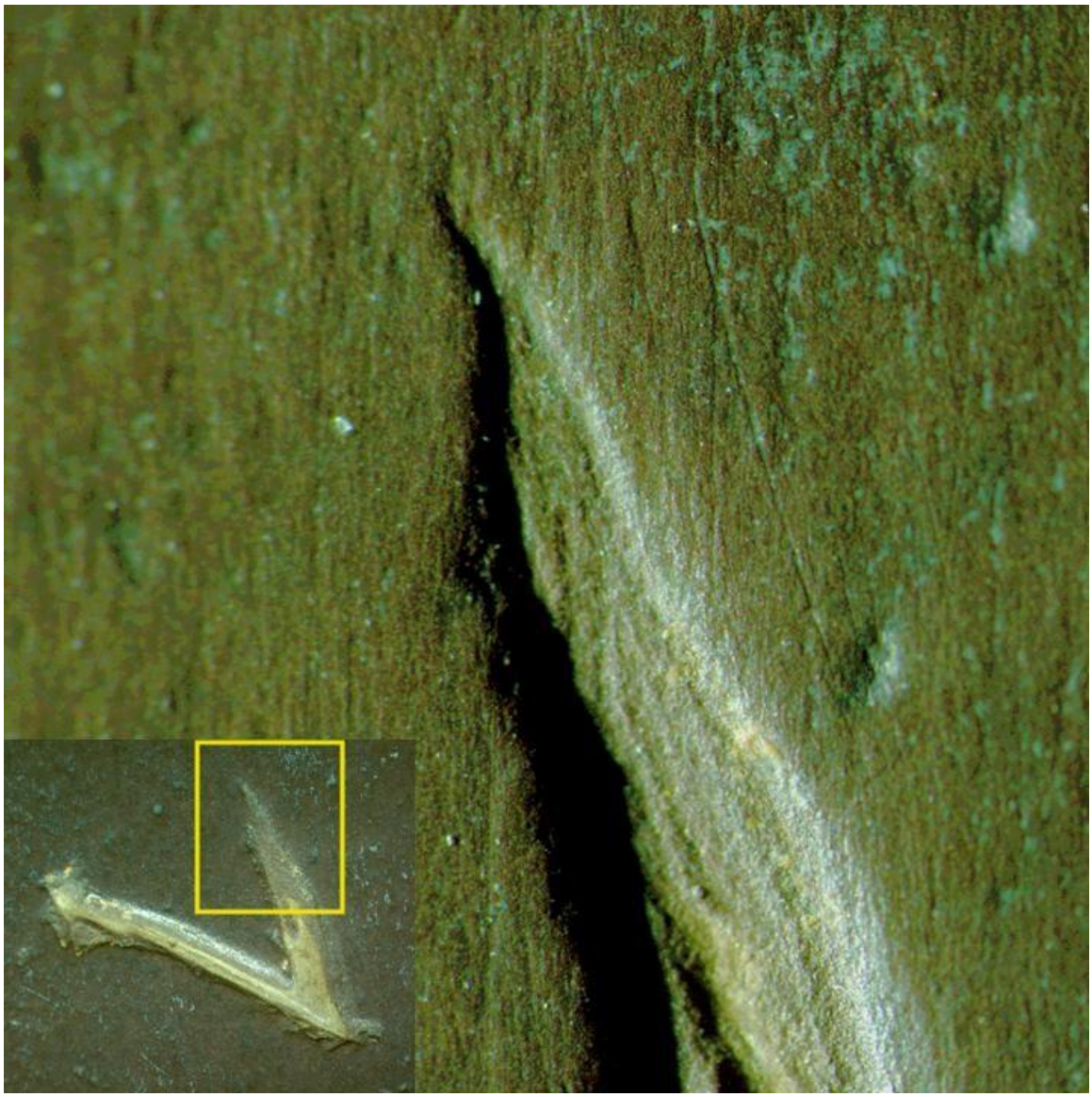


Figure 15 & 16: The edges of the carved lines in character #6 were rounded and smooth after polishing. The tiny, roughly vertical scratches in this image were made by polishing the surface of the stone after the inscription was carved (40X).

Figures 17 & 18: All nine of the carved characters present when the stone was discovered, extend all or partially through the 1-2 mm thick dark-brown-colored weathering rind and into the tan-colored, non-weathered silty-clay matrix. The smaller scratches running roughly parallel to the longest groove of the character changes direction as if made by a large grain of sand during polishing (Left). The bottom of the groove in character #3 is smooth, clean and free of any of orange-colored iron-rich clay that was present when the characters were originally carved (Right, 30X) The yellow box at left indicates the area within the carved groove that is smooth and clean in the image below .

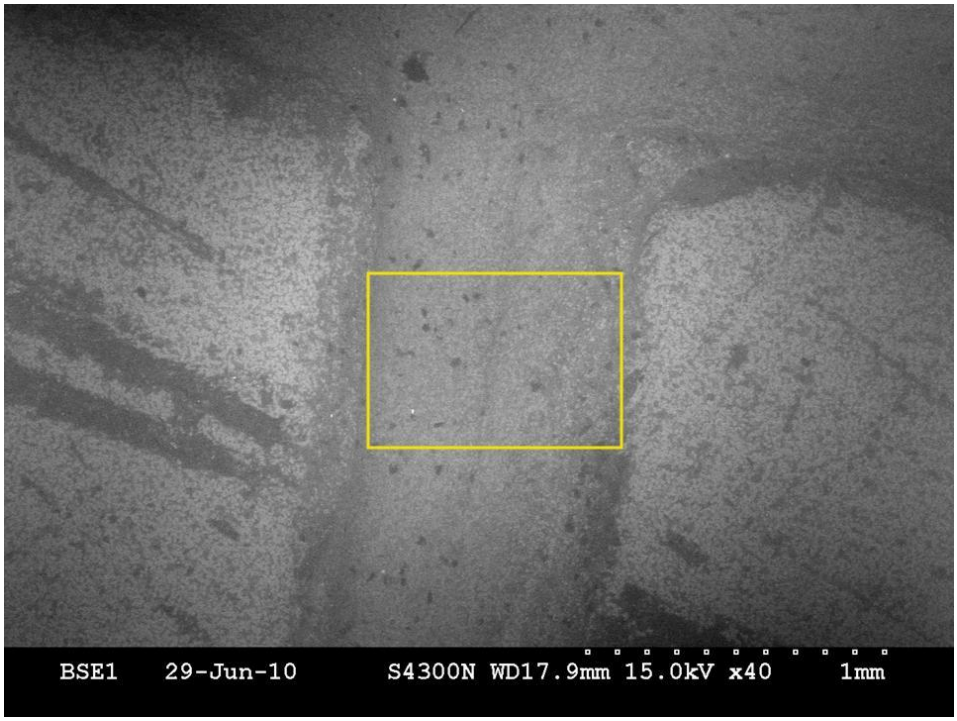


Figure 19: This scanning electron microscopic image was taken near the middle of character #3 where the right short line crosses the long sub-vertical line. The yellow box indicates the area within the groove that is clean and devoid any iron-rich clay that has completely weathered away pictured below (40X).

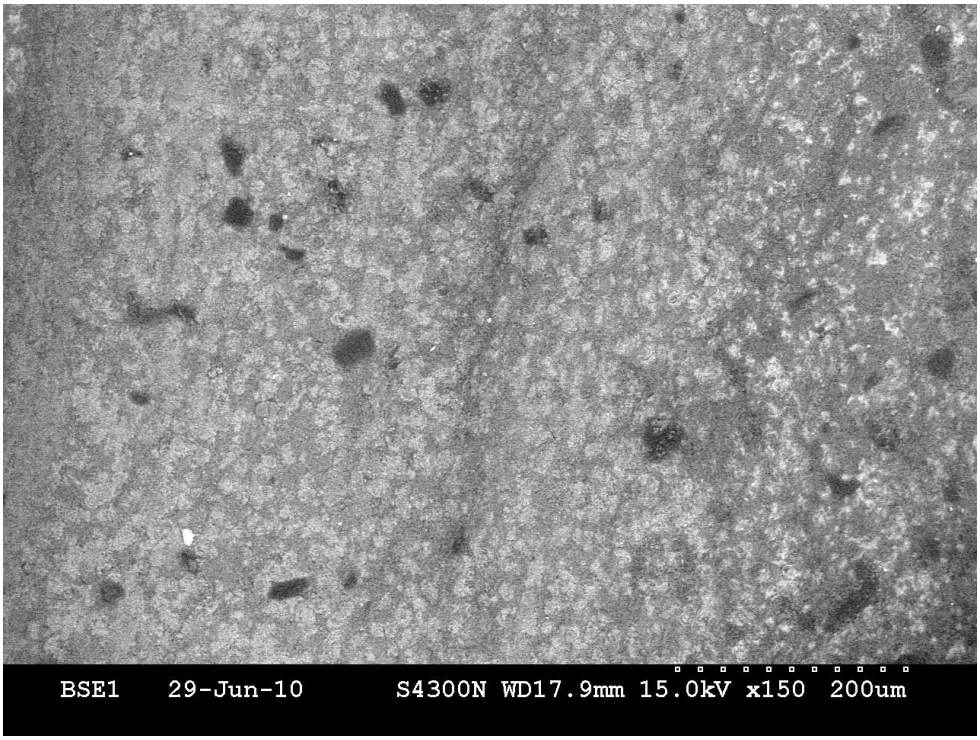


Figure 20: This image is a closer view of the area at the bottom of the groove area in character #3 that is void any iron-rich clay that was made at the time the inscription was carved (150X).

Microscopy Results and Findings of Fact

The following points are factual observations made upon completion of the geological microscopic examination of the Bat Creek Stone artifact and a detailed review of the historical letters of John W. Emmert:

1. The Bat Creek inscription was carved into what appears to be a dark brown to light tan-colored iron-oxide-rich clayey siltstone concretion.

2. The relatively shallow (2-3 mm average depth) and rounded shape of the grooves, suggests the characters were carved with a tool that had a somewhat rounded tip.

3. The iron-oxide-rich clayey siltstone concretion has a dark brown weathering rind that is approximately 1-2 mm thick.

4. Nearly the entire dark brown, weathered rind layer has peeled off the back side of the artifact revealing the light brown-colored, clayey siltstone interior.

5. The entire surface of the inscription of the stone was lightly polished which rounded the edges of the carved grooves of the inscribed characters. This is consistent with the following comment in John Emmert's letter to Cyrus Thomas in his February 15, 1889 letter, "In the one with nine in it found a large pair of copper Bracelets and a polished stone with letters or characters cut on it unlike anything I have ever seen before."

6. The two, roughly parallel scratches (characters 11 & 12) that were made sometime after 1891 and before January, 1971, have sharp and jagged edges.

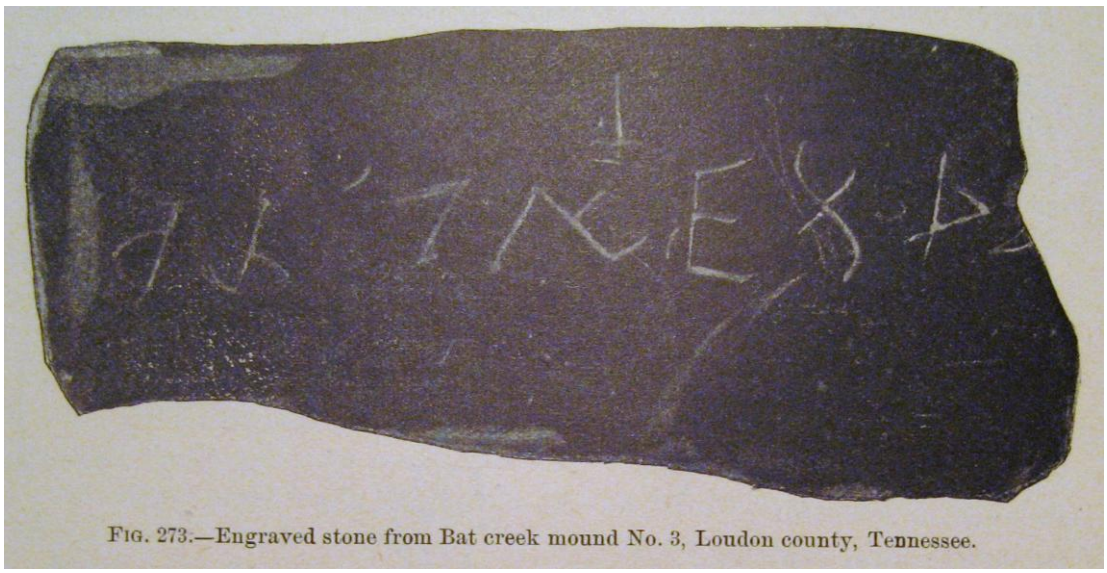


FIG. 273.—Engraved stone from Bat creek mound No. 3, Loudon county, Tennessee.

Figure 21: The first known photograph of the inscribed stone appeared in the 1890-1891 Annual Report of the Bureau of Ethnology on page 392. The inscription is shown up-side down for Hebrew, and the two vertical scratches (characters 11 & 12) are not present in the lower right hand corner.

7. The two, roughly parallel scratches have an orange-colored silty-clay at the bottom of the grooves produced by a tool that cut through and crushed the iron-oxide-rich rind.

8. In his February 25, 1889 letter to Cyrus Thomas, John Emmert included a sketch of the inscribed stone that *did not* include the two, roughly parallel scratches on the inscription side.

9. The two, roughly parallel scratches are *not present* in the 1891 photograph, and *are present* on the stone in 1971.[4]

10. In his March 7, 1889 letter to Cyrus Thomas, John Emmert wrote, "That any one could have ever worked this mound without leaving some evidence of it I think it impossible."

11. In his March 7, 1889 letter to Cyrus Thomas, John Emmert also wrote, "The engraved stone was lying just under the back of the skull. I punched it on the rough side with my steel rod in probing before I came to the skeletons. The other side of the stone is exactly as it was taken from the skeleton at the bottom of the mound about five feet deep."

Interpretations

1. The scratch on the back side of the stone has sharp and jagged edges that are consistent with an unweathered and unpolished, freshly made surface defect.

2. The presence of the fresh scratch made with a metal prod at the time of discovery on the back side of the artifact indicates the stone was placed "immediately under the skull and jaw bones of skeleton no. 1…" at the time of burial with the inscription side down. [5]

3. The two, roughly parallel, non-weathered and unpolished scratches on the inscribed side of the stone were made some time between 1891 and 1971, apparently while in the custody of the Smithsonian Institution.

4. Since the profile of the grooves of the original inscription are rounded as opposed to the grooves of the two scratches which are "V"-shaped, this would be consistent with the scratches being made with a sharper, more pointed tool.

5. Based on a visual review of the images and the physical properties of the material it is estimated that the deposits within the groove carved into the dark brown, iron-oxide-rich weathered rind layer are comprised of greater than 50% clay minerals with the remaining silt-sized material comprised of quartz (SiO2).

[4] Argosy, January 1971, pg 25.
[5] Emmert to Thomas, March 7, 1889.

6. Since we did not observe any of the orange-colored silty-clay in the grooves of the inscription, and the overall surface of the stone and the edges of the grooves were polished at the time of discovery, the inscription had to have been made prior to the excavation of the mound by John Emmert.[6]

7. Based upon the results of our investigation the following sequence of events occurred:

    a. The at least nine character inscription was carved into the dark brown iron-rich siltstone concretion on the side with the weathered rind intact.

    b. The entire inscription side was polished, smoothing out the dark brown surface and rounding the sharp edges of the grooves of the carved characters.

    c. The inscribed stone was placed behind the skull of the deceased (identified as skeleton No. 1 in Mound No. 3) at the time of burial with the inscription side down.

    d. The back side of the inscribed stone was hit and scratched by the metal prod used by John Emmert at the time of excavation of the mound.

    e. The two vertical scratches on the inscribed side of the Stone were made after 1891 and before January, 1971.

Conclusions

Based on the review of the historical correspondence and the reflected light and scanning electron microscopic examinations of the artifact on May 28, 2010, the following conclusions are appropriate:

1. **Our geological findings are consistent with the Smithsonian Institute's field report written by John W. Emmert.**

2. **The complete lack of the orange-colored silty-clay residue in any of the characters of the inscription is consistent with many hundreds of years of weathering in a wet earth mound comprised of soil and "hard red clay."** [7]

3. **The inscribed stone and all the other artifacts and remains found in the mound with it, can be no younger than when the bodies of the deceased were buried inside the mound.**

[6] Emmert to Thomas, February 15, 1889.
[7] Emmert to Thomas, March 7, 1889.

Recommendations

We recommend the other artifacts found in association with the Bat Creek inscription be examined by the appropriate professionals and various testing performed. Although some testing has reportedly already been conducted on some of the artifacts in the past, a complete new round of testing using the latest technology is appropriate. The following is a list of the minimum tests that should be performed:

1. Elemental content of the copper bracelets.
2. Carbon-14 dating of the wooden artifacts and human remains (jaw bones).
3. Mitochondrial DNA of the human remains.
4. Microscopic examination of the drilled stone.
5. Elemental mapping of the artifact to determine its specific mineralogical composition.
6. Conduct a geological field review of the area where the mounds were excavated to find the possible source rock the inscription was carved into.
7. Perform invasive petrographic analysis testing, such as thin section review of similar rock types encountered in the field.

Report Prepared By:
American Petrographic Services, Inc.

Scott F. Wolter, P.G.
President
MN License No. 30024

Richard Stehly, P.E., FACI
MN License No. 12856

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