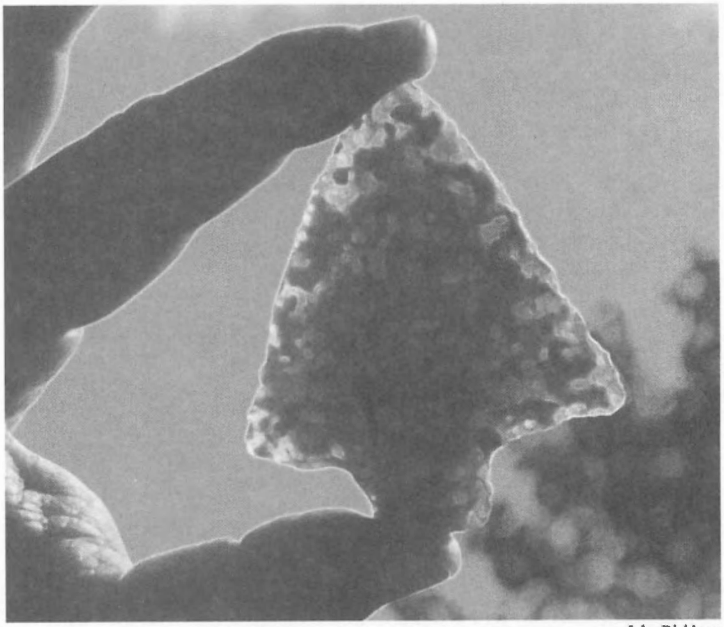
Journal of Alabama Archaeology

Volume 54 • Numbers 1 and 2 • 2008



John Richburg

Editor: Eugene Futato, efutato@bama.ua.edu
Editor-Elect: Ashley A. Dumas, jaa@alabamaarchaeology.org
Assistant Editor: Stuart McGregor, smcgregor@gsa.state.al.us
Layout and design services were donated by Big Canoe Press (*www.BigCanoePress.com*)

The Journal of Alabama Archaeology (ISSN 0449-2153) is published biannually by the Alabama Archaeological Society, 13075 Moundville Archaeological Park, Moundville, Alabama, 35474. The journal is a benefit of membership in the society.

For information about joining the Alabama Archaeological Society and a list of current membership options and dues, visit the *Dues & Donations* page of the AAS web site at *www.alabamaarchaeology.org.*

Authors can find the AAS style guide and information about submitting manuscripts on the *AAS Publications* page of the AAS web site at *www.alabamaarchaeology.org.*

Back issues are available. A list of back issues and order information can be found on the *AAS Publications* page of the AAS web site at *www.alabamaarchaeology.org.*

***On the cover:* Lanceolate projectile points from Montevallo phase sites arranged to show clinal gradation between the three extremes in haft form. From "The Middle Woodland Montevallo Phase in North-Central Alabama" by Steven M. Meredith, pg. 45.**

OBSIDIAN ARTIFACTS FROM MOUNDVILLE

Scott W. Hammerstedt, Michael D. Glascock, and Craig E. Skinner

Introduction

Excavations at Moundville in the 1930s and 1940s were directed by Dr. Walter B. Jones and were reported to have produced several obsidian artifacts from widely separated areas. Since the presence of these artifacts potentially can important information on the nature and scale of prehistoric exchange in the Southeast and beyond, archival research and chemical sourcing techniques were carried out to determine the authenticity and geological sources for these artifacts.

Archival Research

Three artifacts were identified as obsidian. Two eventually were reported by Christopher Peebles (1979:222,1094); one was from the Oliver Rhodes site and the other came from northeast of Mound E (see also Marcoux 2000:68-69). The third was found in Mound W fill (Johnson 2005) (Figure 1). None were from burials.

To assess the provenience of these objects, Hammerstedt travelled to Moundville in 2004 and 2006 to inspect the original field notes and the artifacts. It was apparent that the Rhodes site piece (RHO23) was a fragment of bottle glass and not obsidian (Figure 2). No further work was done on this artifact.

The second object, a large black and red projectile point (NE164; Figure 3b) was reported from northeast of Mound E (Figure 1) on December 4, 1931. It was described in the field notes as a "Beautifully made, polished obsidian spear head- 4 ½"." No other description was given.

Further investigation into the provenience casts doubt on the authenticity of this object. First, the notation about the point is in a different handwriting than the rest of the notes. There is also no mention of it in the Alabama Museum of Natural History (AMNH) annual report tabulation of excavated artifacts from NNE, although all stone objects seem to have been lumped into a "Miscellaneous" category (Jones 1932:7). Nor does Jones, a geologist, mention it in his transcribed field notes. Jones presumably would have recognized the piece as important and exotic given his training.

The most damning evidence comes from a later cataloguing of the Moundville material by Chapman in the 1940s. In both the handwritten and typed list, the NNE point is clearly labeled as "purchased" and "bought Dec. 3, 1931" (1941.05.F353, Sheet 22). Based on this evidence, it seems that the point was obtained from a visitor to the site rather than excavated. Jones, as well as his predecessor E. A. Smith (who purchased the famous Rattlesnake Disk), was known to buy artifacts so this would not be unusual behavior (Vernon J. Knight, Jr., personal communication 2004). It is unclear how and why the object found its way into the official catalog but it was not made or used by the native inhabitants of Moundville.

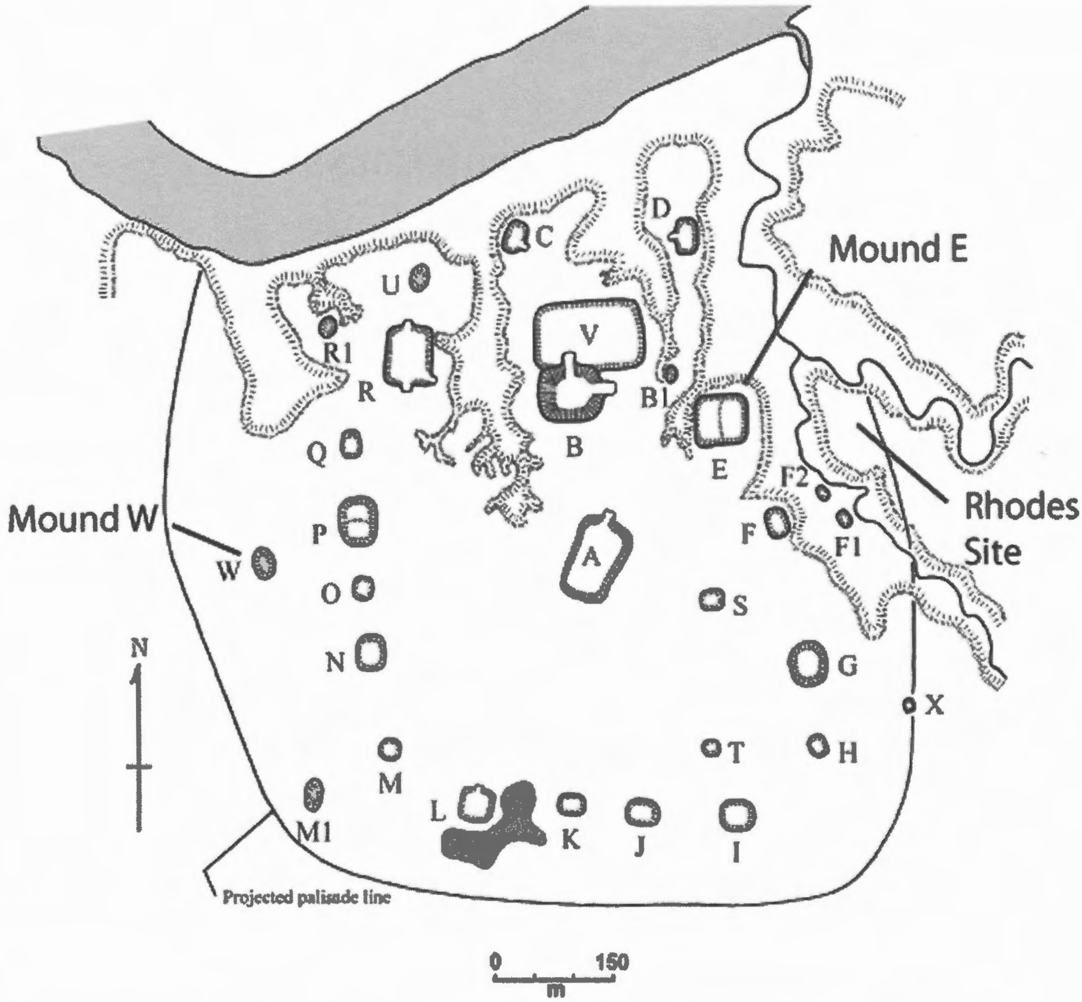


Figure 1. Locations of obsidian artifacts from Moundville. Adapted from Knight and Steponaitis (1998).

The third artifact, a small obsidian projectile point (Wa75; Figure 3a) was reported from Mound W (Figure 1). Excavations at Mound W occurred from February 16, 1940 to March 29, 1940. While no daily field notes exist for these excavations, there is a tabulated list of artifacts with proveniences. The artifact was recorded as a "birdpoint" and appears to be from mound fill rather than a specific feature as it has a valid square number (55L1) and depth (10" below surface). This point appears to be authentic.

Chemical Sourcing

In May 2004, the NNE point apparently purchased by Jones was sent to William Lanford (SUNY-Albany) for obsidian hydration and X-Ray Florescence (XRF) analysis to determine if it was a modern reproduction or an actual artifact, and to identify the geographic source of the raw material. Obsidian hydration confirmed that the object is not a modern forgery and is at least several hundred years old. The XRF analysis indicated that it originated in what is now the western United States, but an exact source could not be determined (Lanford 2004).

To confirm this identification of the NNE source and to determine the source of the Mound W point, both artifacts were sent to the University of Missouri Research Reactor (MURR) for instrumental neutron activation analysis (INAA). Small portions weighing less than 100 mg were removed from each sample to perform INAA using standard analytical procedures described in print (Cobean et al. 1991). A total of 27 elements were measured in each sample and reported in parts per million. In order to determine the most probable sources for each artifact, the concentration data were transformed to log-base 10 and a Euclidean distance search was made against all source samples in the MURR obsidian database.

The best matches for NE164 were source samples from the Grasshopper Group source located in northern California (Figure 4), confirming the tentative western United States identification made by Lanford. As seen in the bivariate plots shown in Figures 6 and 7, the point matches the chemical signature of this obsidian source. All known archaeological examples of obsidian artifacts sourced to Grasshopper Group are found within 100 to 150 km of the area. Since this part of northern California has been a popular vacation area for many years, it would have been easy for someone to acquire this artifact and bring it to Alabama. Clearly, given this geochemical evidence and the information in the paperwork, someone obtained this artifact elsewhere and brought it to Moundville in the late 1920s or early 1930s.

The best INAA matches for Wa75 were samples from San Bartolome Milpas Altas, a relatively obscure source in the highlands of Guatemala (Figure 4). Bivariate plots showing the artifact projected against this source are shown in Figures 5 and 6. Although there is an apparent match shown in Figure 6, the fit is not as good as we would like in Figure 5. Therefore, although this source is the best match available, this artifact could very well come from a far dif-

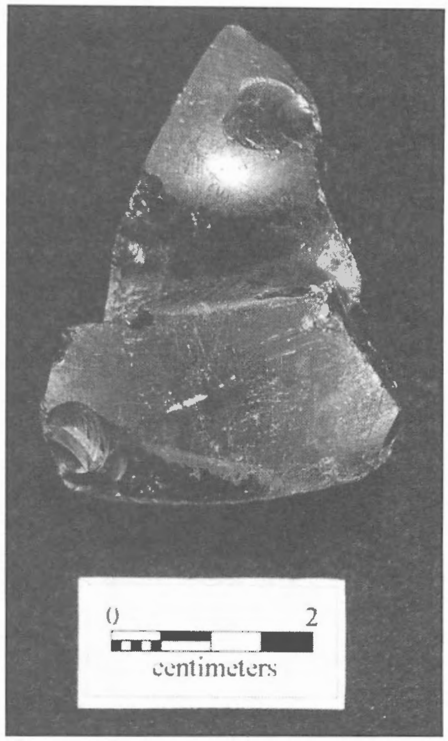


Figure 2. Bottle glass (RHO23) from the Rhodes Site. Photo courtesy University of Alabama Museums.

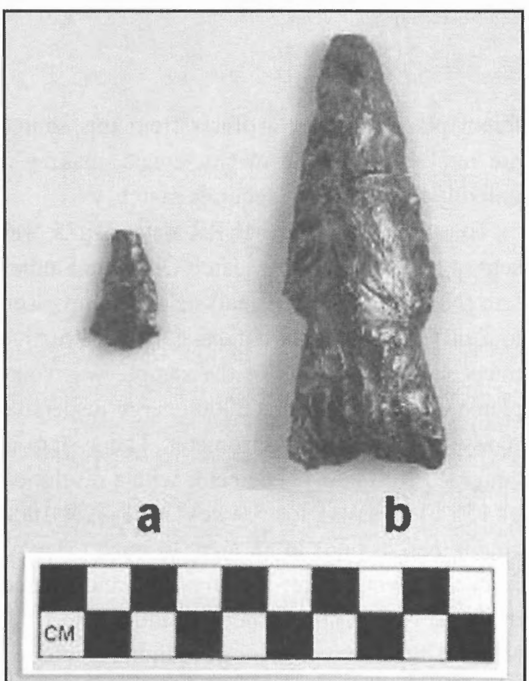


Figure 3. Obsidian points from Mound W (Wa75) (a) and northeast of Mound E (NE164) (b).

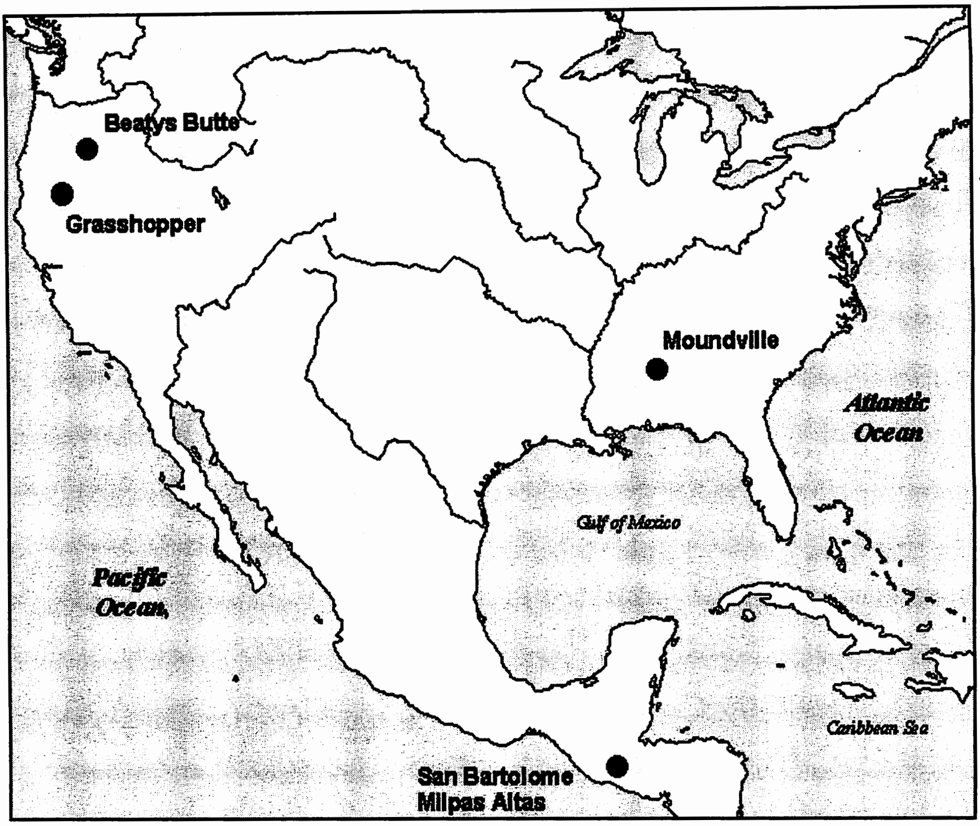


Figure 4. Locations of Moundville and obsidian sources mentioned in text. Base map created using ESRI ArcMap 9.2.

ferent place. Further, artifacts from this source are rarely found even in Guatemala, making it unlikely that this is an accurate match.

To supplement the MURR data, Wa75 was sent to the Northwest Research Obsidian Studies Lab (NROSL) for XRF analysis and comparison to a different obsidian database. Nondestructive trace element analysis of the sample was completed using a Spectrace 5000 energy dispersive X-ray fluorescence spectrometer. The system is equipped with a Si(Li) detector with a resolution of 155 eV FHWM for 5.9 keV X-rays (at 1000 counts per second) in an area 30 mm2. Signals from the spectrometer are amplified and filtered by a time variant pulse processor and sent to a 100 MHZ Wilkinson type analog-to-digital converter. The X-ray tube employed is a Bremsstrahlung type, with a rhodium target, and 5 mil Be window. The tube is driven by a 50 kV 1 mA high voltage power supply, providing a voltage range of 4 to 50 kV. For the elements zinc, rubidium, strontium, yttrium, zirconium, niobium, and lead (Zn, Rb, Sr, Y, Zr, Nb, and Pb) that are reported in Table 1, we analyzed the collection with a collimator installed and used a 45 kV tube voltage setting and 0.60 mA tube current setting. For additional details about the analytical methods used in the analysis of the artifact, see NROSL (2008).

The best match according to the XRF data is the Beatys Butte source in southern Oregon (Figure 4). Beatys Butte was a prehistorically significant obsidian source but the geographic range of geochemically-characterized artifacts from it is well known and is not extraordinarily widespread. It is rarely seen at sites farther south than northern Nevada and it has previously only been found at Oregon and Nevada sites. Further, the overall compositional pattern of the artifact was

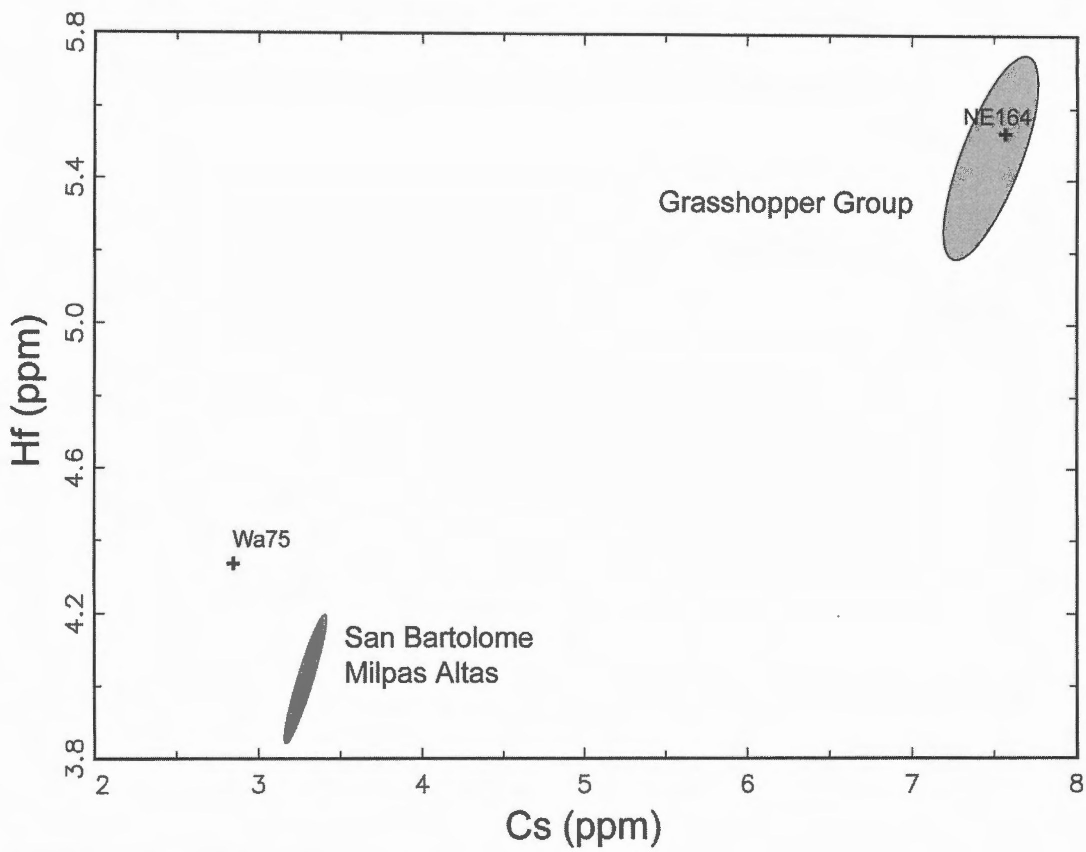


Figure 5. Bivariate plot of cesium versus hafnium.

an "off-center" hit on the Beatys Butte source in material in the NROSL reference collection. The strontium and zirconium content was low and the iron-manganese and iron-titanium ratios were not precise matches (Table 1).

Based on the imperfect match with the reference collections, the disagreement between the XRF and INAA data, and the great distance involved, we cannot securely identify a source for the Mound W point at this time.

Discussion

Only one other obsidian artifact from Mississippian contexts has been identified to date. This piece, a scraper from Spiro, was traced to the well-known Pachuca source in Mexico (Barker et al.. 2002). While Pachuca obsidian was widely traded throughout Mesoamerica, San Bartolome Milpas Altas is a relatively anonymous source in the highlands of Guatemala and artifacts from both it and Beatys Butte are geographically restricted. Given the obscurity of the sources and the incomplete matches with the reference databases, it is unlikely that the Wa75 point originated at either of these sources.

It is possible that this point comes from somewhere in the western United States, albeit from an as yet determined place. Prehistoric connections to western obsidian sources are clearly evident during the Middle Woodland, as seen by the presence of Yellowstone obsidian in Ohio (Griffin et al. 1969; Hatch et al. 1990) and Oregon obsidian in parts of Tennessee (Mark Norton, personal

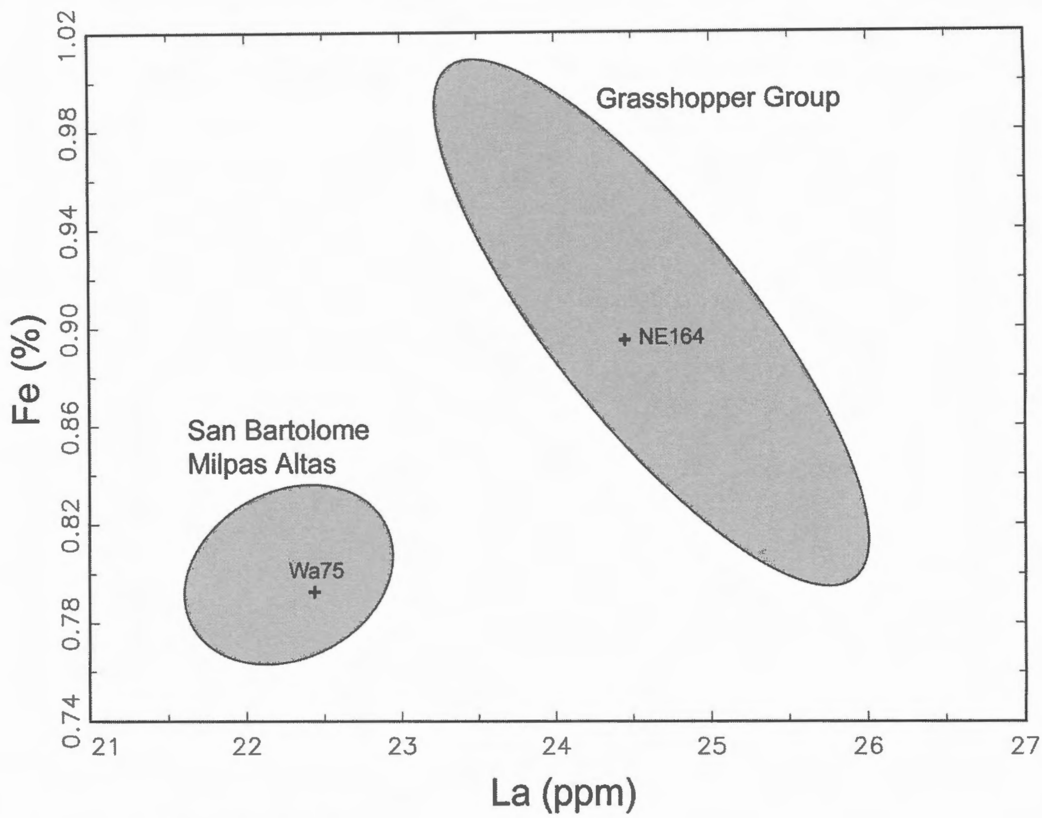


Figure 6. Bivariate plot of lanthanum versus iron.

communication 2005). Obsidian artifacts of uncertain age from sources in Utah, California, Idaho, and Nevada have been found in New England and the Mid-Atlantic (Boulanger et al. 2007; Dillian et al. 2007). While comparable exchange of obsidian is not known for the Mississippian period, other items, such as marine shell, were moving over great distances.

Archaeologists often debate the nature and scale of prehistoric exchange networks. There is no doubt that some items, such as the artifacts discussed here, moved over great distances, likely through down-the-line exchange. If this type of contact was occurring, the objects from Spiro and Moundville were found in an expected place: large, important sites. Clearly, obsidian artifacts would have been viewed as special items by those who possessed them. The fact that both items are utilitarian in nature, and relatively unremarkable (e.g., not elaborately made like earlier Hopewell obsidian artifacts), suggests that a form of down-the-line movement involving multiple intermediates is more likely than direct contact, although we need much more data to confirm or reject this idea. The presence of these artifacts does suggest, however, that perhaps archaeologists should re-examine their ideas about the distances involved in prehistoric exchange networks.

Table 1. XRF Results for the Mound W Point (Wa75; ppm = parts per million). Fe2O3 reported as weight percent oxide.

Element	Abundances
Ti	1190 +/- 90 ppm
Mn	478 +/- 28 ppm
Fe2O3	0.86 +/- 0.11 ppm
Fe:Mn	15.7 ppm
Fe:Ti	25.1 ppm
Rb	131 +/- 4 ppm
Sr	153 +/- 9 ppm
Y	15 +/- 3 ppm
Zr	151 +/- 10 ppm
Nb	11 +/- 2 ppm
Ba	859 +/- 32 ppm

Conclusions

This research demonstrates several things. First, when dealing with older excavations, it is imperative that we return to the original notes and any other available paperwork to confirm the authenticity of artifacts and their provenience. The fact that two of the three items reported here were not "real" artifacts illustrates this point. Second, it shows the value of submitting artifacts and geological samples to research laboratories for trace element analysis. By expanding the reference databases available to these labs, we are more likely to be able to confidently assign artifacts to a specific source. The Mound W point comes from a source that has not yet been identified, but it is possible that we may yet determine its place of origin as more samples become available. Third, it demonstrates that some prehistoric exchange networks, albeit through intermediaries, may extend further than previously thought.

Acknowledgements. We thank Eugene Futato and Mary Bade for allowing us to perform these analyses and facilitating access to the Moundville collections. Vernon J. Knight, Jr. provided details and suggestions regarding the original paperwork and the person-alities involved. William Lanford performed the initial XRF and obsidian hydration analyses at no cost, Steven Shackley compared our results against his own database, and Amanda Regnier commented on an early draft of this article.

References Cited

Barker, Alex W., Craig E. Skinner, M. Steven Shackley, Michael D. Glascock, and J. Daniel Rogers
2002 Mesoamerican Origin for an Obsidian Scraper from the Precolumbian Southeastern United States. *American Antiquity* 67(1):103-108.

Boulanger, Matthew T., Thomas R. Jamison, Craig E. Skinner, and Michael D. Glascock
2007 Analysis of an Obsidian Biface Reportedly Found in the Connecticut River Valley of Vermont. *Archaeology of Eastern North America* 35:81-92.

Cobean, Robert H., James R. Vogt, Michael D. Glascock, and Terrance L. Stocker
1991 High-Precision Trace-Element Characterization of Major Mesoamerican Obsidian Sources and Further Analyses of Artifacts from San Lorenzo

Tenochtitlan, Mexico. *Latin American Antiquity* 2(1)69-91.

Dillian, Carolyn D., Charles A. Bello, and M. Steven Shackley
2007 Crossing the Delaware: Documenting Super-Long Distance Obsidian Exchange in the Mid-Atlantic. *Archaeology of Eastern North America* 35:81-104.

Griffin, James B., A. A. Gordus, and G. A. Wright
1969 Identification of the Sources of Hopewellian Obsidian in the Middle West. *American Antiquity* 34(1):1-14.

Hatch, Hames W., Joseph W. Michaels, Christopher M. Stevenson, Barry E. Scheetz, and Richard A. Geidel
1990 Hopewell Obsidian Studies: Behavioral Implications of Recent Sourcing and Dating Research. *American Antiquity* 55(3)461-479.

Johnson, Pamela A.
2005 *The Occupational History of Mound "W" at Moundville, Alabama.* M.A. Thesis, Department of Anthropology, University of Alabama, Tuscaloosa.

Jones, Walter B.
1932 *Fifth Annual Report to the Board of Regents of the Alabama Museum of Natural History.* Alabama Museum of Natural History, University of Alabama, University.

Knight, Vernon J., Jr., and Vincas P. Steponaitis
1998 *A New History of Moundville. In Archaeology of the Moundville Chiefdom,* edited by Vernon J., Knight, Jr. and Vincas P. Steponaitis, pp. 1-25. Smithsonian Institution Press, Washington.

Lanford, William
2004 Analysis Report of Obsidian Arrowhead. Manuscript on file at the Oklahoma Archeological Survey, University of Oklahoma, Norman.

Marcoux, Jon B.
2000 *Display Goods Production in the Moundville Chiefdom: A Mississippian Dilemma.* M.A. Thesis, Department of Anthropology, University of Alabama, Tuscaloosa.

Northwest Research Obsidian Studies Laboratory (NROSL)
2008 Northwest Research Obsidian Studies Laboratory. Electronic document, http://www.obsidianlab.com/, accessed March 17, 2008.

Peebles, Christopher S.
1979 *Excavations at Moundville, 1905-1951.* The University of Michigan Press, Ann Arbor.