



Ivy Knoll (1MT9) Archaeology: A Glimpse into the Trade Networks of the Archaic – Woodland Transition



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INTRODUCTION

Located along the Tallapoosa River in Montgomery County, Alabama, site 1MT9 (Fig. 1) was excavated from 1974 to 1976 by David W. Chase. Analysis of artifacts recovered from the site reveal a continuous occupancy from the Late Archaic to Early Woodland Transitional period (2500BC – 1 AD).

A significant element of the Ivy Knoll site is a concentration of ten burial features. Excavated from one of these burials was a string of sixteen copper beads (Fig. 2 & 3). Current research interests are focused on determining the source location of the copper using X-Ray Fluorescence Spectrometry.

As copper maintains the unique trace element composition of its parent geologic deposit, determining source location of artifacts is possible. Source location has the potential to provide valuable information regarding the site's position in a regional trade network.

MATERIALS & METHODS

The copper beads were analyzed by X-Ray Fluorescence Spectrometry using a handheld Bruker III pXRF. Analyses were conducted in the GIS Lab of Auburn University at Montgomery.

In analysis, an individual bead was centered over the detector (Fig. 4). Two 300-second reads were taken for both sides of the same bead. Two beads were analyzed in total.

XRF uses X-ray radiation to excite elements in the material. The elements ionize and release fluorescence. The fluorescence and intensity are measured, presented as a series of peaks that represent the trace element composition of the material (Fig. 5).



Fig. 2: Copper Beads, suspension intact



Fig. 1: Site Location (USGS Soil Maps ca. 1960)

RESULTS

The pXRF analysis for the bead analysis is shown in Figure 5.

The photon value peaks indicate that the beads are largely copper with trace impurities. The small peak between Zn and Ga is ⁶⁸Zn (Shackley, M. Steven 2011 An Introduction to X-Ray Fluorescence (XRF) Analysis in Archaeology. X-Ray Fluorescence Spectrometry (XRF) in Geoarchaeology pp. 7-44.) that does not indicate the presence of these elements.

Fig. 5: Elemental composition of copper beads, XRF results

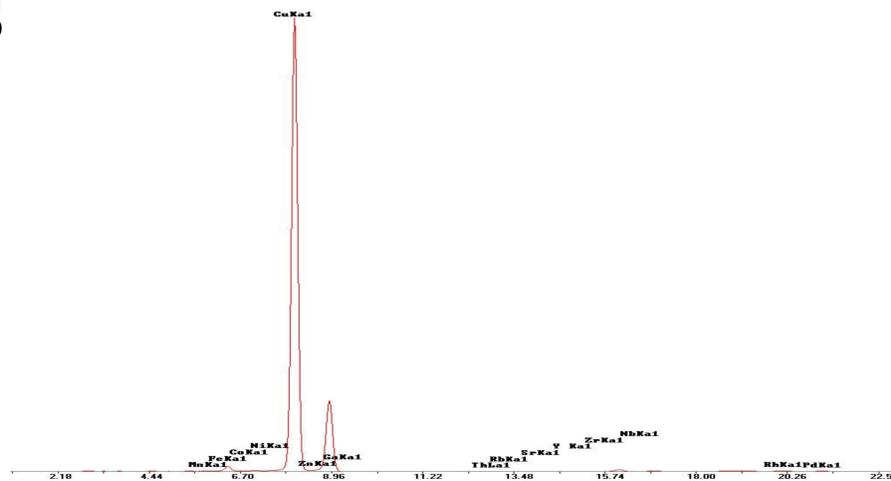


Fig. 3: Copper Beads in situ, Burial 1 (ca. 1974)



Fig. 4: Beads centered over sensor, pXRF machine

DISCUSSION

This supports the hypothesis that the beads are a native artifact from the Woodland Period, suggesting the beads as the earliest known copper artifact in Alabama

Detailed ppm results will provide a more detailed trace element signature, which has the potential to source the copper to its parent geological deposit [3,4]. As there are no natural copper deposits in Alabama, the beads were imported to the area.

It is hypothesized that the copper is sourced from a deposit in the Appalachian Mountains. Sourcing from this region would lend support for Ivy Knoll's participation in an Alabama River exchange system. If further XRF analyses suggest otherwise, this may imply a role in larger interaction spheres [1,2].

While analysis involved testing two different beads multiple times, the peak distribution results were consistent. This validates the reliability of XRF, a very valuable technique due to its non-destructive character [3]

FUTURE RESEARCH

- Detailed analysis of the XRF results will provide a trace element signature for the beads. The signature can provide insight into source location.
- Accelerator Mass Spectrometry (AMS) of the suspension holding the beads can provide an exact date for the artifact. This could conclusively place the beads in a prehistoric context.

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REFERENCES

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