



Current Evidence Does Not Support a Hopewell Age, Provenience, or Affiliation for the Figurine Allegedly from Hopeton Earthworks or the Hopewell Mound Group

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ABSTRACT

Everhart and Biehl's research, discussed within, questions our conclusions regarding a ceramic figurine allegedly from Hopeton Earthworks. They conclude that the figurine is culturally Hopewell and that its provenience is the Hopewell Mound Group. Here, we demonstrate that there is no verified provenience for the figurine and no evidence for validly inferring a Hopewell affiliation. Instead, the preponderance of evidence is consistent with the hypothesis that the figurine is non-Hopewell in origin.

KEYWORDS

figurine; portable art;
ceramic; provenience; XRD;
XRF

We thank Everhart and Biehl (2020) for their comment regarding our previous work pertaining to a small ceramic figurine (Bebber et al. 2018). Yet, while Everhart and Biehl (2020) provide a few extra links in the figurine's chain of custody, that chain is still a floating one, unshackled to any concrete Hopewell link at Hopeton, the Hopewell Mound Group, or any other Hopewell site. Moreover, contrary to what they state, and as we detail below, the preponderance of evidence does not support a Hopewell age, provenience, or affiliation for the figurine. As a result of Everhart and Biehl's (2020) archival work and our new analyses, our case is now stronger than it was in our original article (Bebber et al. 2018).

On Archival Sources

We appreciate the extra documentation provided by Everhart and Biehl (2020). None of it explains exactly how or why the figurine ended up in the Kent State University collections with its accompanying descriptions. However, that is now irrelevant given that the figurine appears to have originally entered the Ohio History Connection (OHC) collections in or before 1925, as evidenced by a 1925

Boston Evening Transcript (Boston Evening Transcript [BET], 16 September 1925:4) newspaper article in which the figurine is depicted with artifacts from Ohio's pre-historic mounds (Everhart and Biehl 2020:5). As Everhart and Biehl (2020) note, the photograph of the figurine used in the *BET* (16 September 1925:4) article is still in the OHC collection. Given these two early sources depicting the figurine—the newspaper article and the OHC photograph—Prufer's assertions about the figurine's provenience or cultural affiliation in letters to Griffin, Seeman, or anyone else are now irrelevant. The details surrounding these two early sources, however, are not irrelevant.

Everhart and Biehl (2020:5) provide an image of the *BET* (16 September 1925:4) article that contains the picture of the *ceramic* figurine in question. Yet, they do not mention that the figurine caption in the *BET* (16 September 1925:4) states, "Torso of Human Figure Carved from Stone" (emphasis added). An error this egregious is only consistent with the scenario that the unknown OHC staff member who sent the pictures to the *BET* (16 September 1925:4) did not handle the artifacts directly but rather simply pulled pictures from the collections. Not familiar with the figurine, the unknown OHC staff member, or the article's reporter, interpreted it as having been carved from stone. We lay this mistake on either the unknown OHC staff member or the article's reporter because we do not believe that Mills or Shetrone would have incorrectly identified the ceramic figurine as having been carved from stone had they themselves excavated, described, and analyzed it. The only conclusion that can be drawn, therefore, is that neither Mills nor Shetrone excavated, described, or analyzed the figurine. It directly follows that the figurine's inclusion in the *BET* (16 September 1925:4) article is not evidence of site provenience or Hopewell affiliation. Indeed, if the figurine were Hopewell and OHC staff members or archaeologists knew it to be Hopewell, Everhart and Biehl (2020) provide no explanation for why it would have been newsworthy in 1925 but not mentioned in Shetrone's field notes or final report (Shetrone 1926).

Moving on from the *BET* (16 September 1925:4) article to the OHC photograph, Everhart and Biehl (2020:6) state that "the photo within the collection of the OHC that displays the object alone is labeled on its back and indicates the object was from a Hopewell Mound in Ross County." However, they again do not mention that there are *two* pieces of information on the back of this photo. First, an official stamp—in red ink—states, "967 Department of Archaeology The Ohio State Museum." Second, *handwritten* black ink states, "Hopewell Mound Ross Co., O." Beyond the strange and unexplained fact that no actual Hopewell site is indicated on the back of the photo, it is impossible to tell *who* added the handwritten label and *when* the handwritten label was added—which potentially could have occurred as late as the 1960s. Clearly, whoever wrote the label did not know the site provenience of the figurine.

In sum, neither the early archival sources nor the figurine's early presence in the OHC collections is evidence of provenience or Hopewell affiliation.

On the Chronometric Assessment via Thermoluminescence

Everhart and Biehl (2020) attempt to disregard or sow doubt about the thermoluminescence (TL) date directly acquired from the figurine, which was 4590 ± 270 BP (Bebber et al. 2018), thus over 2,000 years older than the Hopewell period. Considering possible confounding factors, we showed that all potential figurine dates were still over 1,000 years older than the Hopewell period. Given that there is no verified provenience for the figurine, that Everhart and Biehl's (2020:2, 11) "chain of custody" does not in fact "provide a more probable Hopewell affiliation," and that the stylistic comparison is ambiguous (see next section), there is no valid reason to reject the date. Indeed, we note that our use of TL dating is consistent with Madsen (1997:96), who wrote in *Ohio Hopewell Community Organization* that use of absolute dating methods, and specifically thermoluminescence, is "indispensable." The caveats we provided to our chronometric analysis are the same as those that any valid scientific study should provide and are potential explanations for why the current analysis could be wrong *in light of new or future evidence that directly questions it*. In absence of such evidence, however, caveats provided in a scientific analysis are not pretexts for other researchers to disregard evidence that does not suit their preferred interpretations.

On Stylistic Comparisons

Everhart and Biehl (2020:11) state that their "view of the comparative analysis [between the figurine and Hopewell figurines] is that it demonstrates broad similarities between this figurine and others, showing no inconsistent or unique features." They are entitled to that view. But what we concluded in our stylistic analysis was that "[b]y no means can we state the figurine is 'Hopewell' via visual description and comparison alone" (Bebber et al. 2018:123). Our conclusion is further warranted given the presence in Mesoamerican cultures of ceramic figurines nearly identical to the one in question (Figure 1). In other words, features that Everhart and Biehl (2020) use to conclude the figurine is Hopewell are features that are also found on figurines from non-Hopewell cultures (Figure 2), including red paint, "undetailed 'hands/fingers,' and lack of noticeable clothing" (Everhart and Biehl 2020:9).

Given the possible TL date range of 5140–3990 BP (Bebber et al. 2018:16; see also previous section), it is plausible that the figurine in question has Mesoamerican origins. Indeed, as exemplified in Figures 1 and 2, well over a thousand similar figurines have been studied from the Olmec sites of Canton Corralito and San Lorenzo (Cheetham 2006, 2009). The figurine in question also has measurements (Table 1) that fall well within the range of those from Canton Corralito (Cheetham 2006, 2009). Given the apparent similarities in production style and nature of the breaks, we reiterate our original conclusion: "By no means can we state the figurine is 'Hopewell' via visual description and comparison alone" (Bebber et al. 2018:123).



Figure 1. *Left:* Ceramic figurine from Canton Corralito in a standing cross-armed position (Cheetham 2006). *Right:* Figurine in question, allegedly from a Hopewell Mound. Note the similarity in construction, gesture, and surface paint. Both have red paint extant in the arm creases.



Figure 2. Examples of Olmec figurines from Canton Corralito and San Lorenzo (Cheetham 2006). Note the similarity in overall style and construction of the legs, as well as the nature of the breaks at the neck and joints. *Overlay color images* (Everhart and Biehl 2020:Figure 5). Everhart and Biehl (2020:10) argue that terminations such as these, which show no anatomical detail, are found on Hopewell figurines from the McGraw site. However, the three examples given can just as easily fit the style of distal appendages found on Olmec figures.

Table 1. Average Torso Measurements from Standing Figurines Found at Canton Corralito Compared to the Torso Measurements of the Figurine in Question.

	Canton Corralito	Figurine in Question
Torso Height (avg)	37 mm	37 mm
Torso Width (avg)	24 mm	25 mm

On Geochemical Origins

As promised (Bebber et al. 2018:128) and requested (Everhart and Biehl 2020:11), we used X-ray diffraction (XRD) and energy dispersive X-ray fluorescence (EDXRF) to compare the mineralogical and elemental composition of the figurine to a clay sample procured from Ross County’s Scioto River valley (Bebber 2017) as well as to two pot sherds from the Late Woodland Cash site, also located in Ross County’s Scioto River valley (Tables 2 and 3; Figure 3; see also Supplemental Mineralogical Methods Graphs Data and Supplemental XRD and EDXRF Data available at <https://www.midwestarchaeology.org/mcja/supplemental-materials>).

Mineralogical Composition: XRD Methods and Results

Mineral composition of a milled subsample for each pottery sample was determined by powder X-ray diffraction using a MiniFlex 6G Benchtop X-Ray

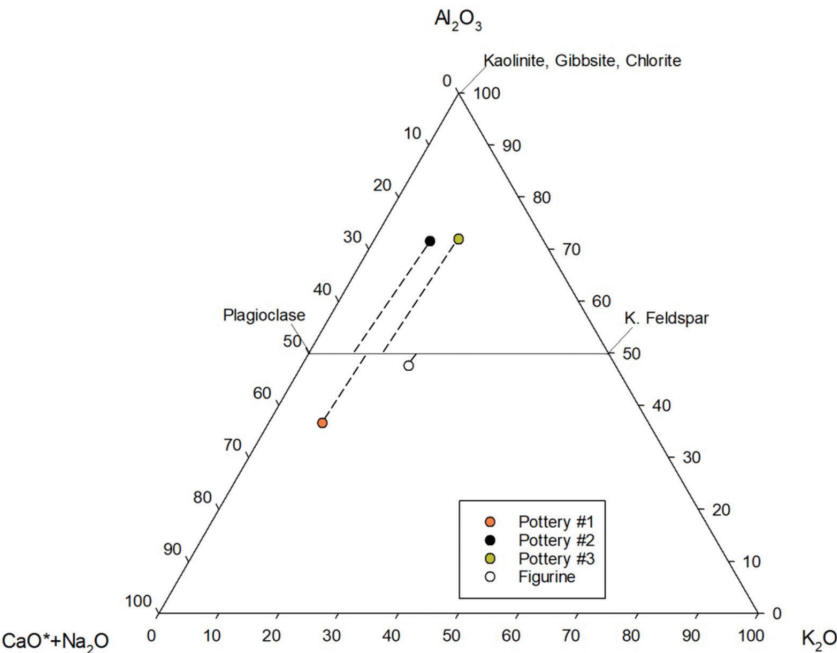


Figure 3. Characterization of the source of the figurine and pottery using A-CN-K relations (adopted from Fedo et al. 1995). The dashed line denotes how far off the felsic line the sources are from their original sources.

Table 2. Mineralogical Components of Figurine and Pottery Samples, Suggesting Different Regions of Manufacture.

Ceramic Samples	Quartz %	Microcline %	Kaolinite %	Illite %	Orthoclase %	Labradorite %	Calcite %	Muscovite %	Anorthite %	Albite %	Riebeckite %
1	35.0	15.0	4.3	13	3.8	6.0	6.3	14.4	1.8	1.1	0.0
2	26.0	1.2	0.09	4.4	0.0	0.4	0.0	37.0	11.5	17.7	0.0
3	47.0	1.4	0.07	0.6	2.5	16.4	0.2	10.3	5.9	14.8	0.0
Figurine Sample*	Quartz %	Microcline %	Kaolinite %	Illite %	Orthoclase %	Labradorite %	Calcite %	Muscovite %	Anorthite %	Albite %	Riebeckite %
1	5.5	7.0	4.6	1.6	7.1	34.6	0.0	1.6	14.1	0.0	4.5

*Denotes a different form of measurement and calculation for the figurine. Due to the importance of the sample, we could not manipulate it to obtain LOI values or utilize the fusion method to analyze the figurine.

Table 3. Major Element Composition of Pottery Samples.

Sample ID	Na ₂ O (wt.%)	MgO (wt.%)	Al ₂ O ₃ (wt.%)	SiO ₂ (wt.%)	P ₂ O ₅ (wt.%)	K ₂ O (wt.%)	CaO (wt.%)	TiO ₂ (wt.%)	MnO (wt.%)	Fe ₂ O ₃ (wt.%)	LOI. (wt.%)	Total
Pottery 1	0.461	5.318	12.348	53.407	—	2.922	9.932	0.684	0.058	5.89	7.51	98.53
Pottery 2	1.022	0.528	15.658	64.844	1.225	2.415	1.466	0.654	0.014	4.092	7.75	99.668
Pottery 3	1.987	0.693	15.374	61.691	1.051	2.353	2.021	0.593	0.023	3.77	10.17	99.726
Figurine* (adjusted)	0.677	0.904	12.632	61.964	0.524	4.410	5.047	1.125	0.122	9.444	—	96.848
SBC-1	—	2.221	22.768	49.099	0.251	3.845	0.516	0.882	0.04	9.632	10.06	99.314

*Denotes a different form of measurement and calculation for the figurine. Due to the importance of the sample, we could not manipulate it to obtain LOI values or utilize the fusion method to analyze the figurine.

Note: These values are reflective of the proportion distribution of the raw data of a bulk measurement on the EDXRD and values normalized of the total raw major elemental concentration of 96.848 (wt. %). See supplemental data for the raw elemental values and oxides.

Diffractionmeter (Rigaku) with a D/teX Ultra2 detector operated with a Cu X-ray tube ($\lambda = 1.5406 \text{ \AA}$) at 40 kV and 15 mA. Counts were collected from 3° to 90° with a step size of 0.02° and a speed of 2.0° per minute. Phase identification and quantitative analysis of minerals were performed using Rigaku's PDXL software, utilizing the whole pattern powder fitting (WPPF) method, connected to the ICDD PDF-2 mineral database. To fit the peaks, the split pseudo-Voigt function and the B-spline background model were used. The fitting quality of the experimental data was confirmed by using the goodness of fit term (S), which should be close to 1 for a good fit, and the reliability factor Rwp (weighted difference between measured and calculated profile values), which should be close to or less than 10%.

The major mineralogical components (Table 2) of the figurine are primarily plagioclase and k-feldspar bearing minerals, which account for 83.8%. The figurine has more kaolinite (4.6%) than illite (1.6%). This mineralogical composition is much different from those of the three pottery samples from Ross County, Ohio, where the dominant minerals are quartz, clay-associated minerals, and muscovite. In contrast to the figurine, in the pottery samples illite is the predominate clay mineral (see Table 2), with lower kaolinite content and substantially smaller ratios of plagioclase and k-feldspar bearing minerals. Indeed, clay mineralogy found at other Hopewell sites, such as at the Mann site (Ruby and Shriner 2005:564) and in the Hocking River valley (Patton 2007:18), is also in contrast to that of the figurine. These studies show that throughout the Ohio Valley the predominant clay mineral is illite, and this is reflected in the archaeological materials from these drainages.

Major Elemental Composition: Methods and Results

Pottery samples were powdered using a marble mortar and pestle and SPEX Ball Mill. Loss on ignition (LOI) was performed on powdered pottery samples to remove any volatiles. Ash powdered pottery samples were mixed with lithium tetraborate flux and fused together to create a glass bead using a LeoNeo Flux Fusion system. Glass beads were measured on the Malvern Panalytical Epsilon 3XLE, an energy dispersive X-ray fluorescence (EDXRF) spectrometer. We measured USGS standard Brush Creek Shale (SBC-1) to monitor EDXRF accuracy and precision. SBC-1 was within 5% error of certified USGS values except for Na_2O : This value was not measured.

The major elemental composition of pottery samples suggests clay content. Adopting the Fedo et alia (1995) strategy in understanding the parent source of siliciclastic material, we implemented this technique to understand the source of the pottery and the figurine. The chemical composition of these artifacts derived from siliciclastic material; this material can be plotted as molar proportions within Al_2O_3 , CaO^* (CaO associated with silicates) + Na_2O , and K_2O (A-CN-K) compositional space, where CaO^* represents Ca in silicate-bearing minerals only (Fedo et al. 1995). This makes the A-CN-K system useful in evaluating fresh rock compositions and their weathering trends due to the dominance of plagioclase-feldspar

rich and K-feldspar rich rocks on the continental crust (Nesbitt and Young 1984, 1989). This includes weathering by-products like clay minerals, which were used to make pottery and prehistoric figurines.

Utilizing the A-CN-K system, we observe differences in parental sources between the pottery samples and the figurine. The pottery derives more from a plagioclase source, whereas the figurine source has more K-feldspar. This supports our theory that the figurine is not from the same source as the pottery.

Conclusion

Contrary to what Everhart and Biehl (2020:12–13) purport, the current preponderance of evidence is not consistent with a Hopewell age, provenience, or affiliation for the figurine in question. The sum of our findings are as follows:

1. The additional archival documentation described by Everhart and Biehl (2020) does not provide any evidence for the figurine's provenience or Hopewell affiliation.
2. The figurine dates to approximately two millennia older than the Hopewell culture. (In the unlikely event that an in situ photograph or early field record emerges supporting a *specific* Hopewell site provenience, the figurine's early date would be consistent with Everhart and Biehl's [2020:11] suggestion that it was an "heirloom" acquired, saved, and passed on from another time and/or place.)
3. Stylistic comparisons of the figurine with Hopewell and non-Hopewell figurines remain ambiguous but are consistent with Mesoamerican artifacts.
4. Compositional analysis shows the figurine's clay is different from samples of clay from Ross County, Ohio, and other areas of the Midwest where Hopewell figurines have been found. Future comparisons to Mesoamerican samples would be welcome.

Not only does the current preponderance of evidence fail to support a Hopewell origin for the figurine in question but also there is no evidence that it is even from North America. Yet, we acknowledge that future research may not support this interpretation (Eren et al. 2021). It is important for archaeologists to not only generate data to support their interpretations but also to think carefully about the link between data and conclusions. In the future, we will be happy to work with Everhart, Biehl, or anyone else on these issues.

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Supplementary Materials

The following supplementary materials for this article can be found at <https://www.midwestarchaeology.org/mcja/supplemental-materials>:

Supplemental Mineralogical Methods Graphs Data
Supplemental XRD and EDXRF Data

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