

USE AND CONTINUITY ON THE PLATEAU: RECENT ARCHAEOLOGICAL INVESTIGATIONS AT SERPENT MOUND STATE MEMORIAL, OHIO

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Abstract

Recent archaeological investigations, building on previous work, establish more clearly that the Serpent Mound plateau has been a focus of intensive, repeated activity both in prehistory and more recently. In the 1880s, Frederic Ward Putnam conducted the first archaeological investigation of the Great Serpent Mound and the surrounding plateau. Subsequent analyses established that the Adena constructed a conical mound on the plateau to the south of the Serpent effigy. An Adena, and later, a Fort Ancient settlement were established nearby. In 2011, ASC Group, Inc. (ASC) conducted archaeological investigations in the areas around the conical mound prior to the installation of utilities at the Serpent Mound State Memorial. The utility work was planned to support the increased tourism expected due to the pending World Heritage nomination of the site. The excavations shed light on activities in the conical mound area by both the Early Woodland Adena and Late Prehistoric Fort Ancient peoples. Adena activities involved lithic reduction and tool use, while a buried A horizon appears to relate to a burned area Putnam investigated north of the Adena mound. However, a radiocarbon analysis returned a Fort Ancient period date, suggesting the re-use of the area around the conical mound.

Introduction

In 2011, archaeologists from ASC Group, Inc. conducted an archaeological investigation at Serpent Mound State Memorial in Adams County, Ohio (Figures 1–4). The Ohio Historical Society (now the Ohio History Connection) requested this work be done prior to new utility line installations at the park, which were planned to improve the restrooms and electrical infrastructure (Pickard et al. 2011).

The Great Serpent Mound is the largest effigy mound in North America (Lepper 2009), but little was known of the archaeology of the surrounding plateau until recently (Milner 2004:79; Thompson et al. 2013:1) (Figures 2 and 3). The Great Serpent

Mound was first investigated and later preserved by the efforts of Frederic Ward Putnam, who put trenches in the Serpent effigy and completely excavated a conical mound nearby. He also discovered and investigated an Adena and a Fort Ancient settlement nearby (Putnam 1890). ASC's excavations focused on areas on three sides of the conical mound, but away from the mound itself (Figure 3)¹.

The main goal of this article is to present the results of the ASC field investigation, further documenting what activities took place in different parts of the Serpent Mound plateau. It compares the findings of the present work with previous investigations of the area. The comparison includes the ASC investigation

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Figure 1. Location of Serpent Mound State Memorial.

(Schwarz and Lamp 2011), a 1988–1994 Ohio Historical Society (OHS) salvage excavation (Thompson et al. 2013), and a recent reanalysis of Putnam’s lithic artifacts (Purtill 2013). Finally, I offer new data and new interpretations.

The investigations described here are doubly significant because of the recent events involving Serpent Mound. Currently, several of Ohio’s major earthworks sites have been proposed for nomination as World Heritage sites, including Serpent Mound, which is on the U.S. tentative list. These nominations focus on the accomplishments and legacy of Ohio’s prehistoric moundbuilders. The nominations are a testament to their achievements. The creation of Serpent Mound, which is a geoglyph or effigy figure built on the landscape, is particularly significant because its form references Native American iconography of serpents, figures of mythological importance (Gill and Sullivan 1992:72, 127; Lepper et al. 2018:14–15; Parker 1923:16–17; Willoughby 1919:160–162). The serpent also is aligned astronomically to mark the passage of the seasons (Fletcher and Cameron 1987; Romain 2000, 2015). As such,

Serpent Mound invokes spiritual power within Native American culture and represents an acme of effigy mound construction in the Eastern Woodlands (UNESCO 2013).

The utility installations and restroom upgrades at Serpent Mound State Memorial support increased archaeological tourism expected as a result of the World Heritage inscription. The archaeological findings are significant because they demonstrate that archaeologists continue to unearth new, interesting, and important information at a long protected archaeological park. The new information reported here augments our understanding and provides a new perspective to our view of the history and activities at this important site, showing the value and legacy of Serpent Mound.

Background

Serpent Mound is located at the end of a plateau overlooking the confluence of Ohio Brush Creek and Baker Fork in Adams County, southern Ohio. The sheer, cliff-like walls below Serpent Mound extend down to the valley floor. This impressive rock formation looks vaguely like an upraised serpent, perhaps providing the initial inspiration for its construction (Fletcher et al. 1996; Holmes 1886).

Little is known about Serpent Mound in the Early Historical period. When Ephraim Squier and Edwin Davis visited and mapped the earthworks in the 1840s, they thought they were going to visit defensive earthworks (Squier and Davis 1848:96). The earthworks were forested, but Squier and Davis realized that they were viewing a serpent effigy, not an earthen fort. The map that they made (Squier and Davis 1848:XXXV) was the first map of the serpent effigy and the conical mound (Figure 2). They thought that perhaps the oval mound at the head of the serpent depicted a serpent swallowing an egg, or possibly a globe. Squier and Davis tied their interpretations to Greek, Egyptian, or Assyrian imagery, thus suggesting an Old World origin for the earthworks (Lepper 2009).

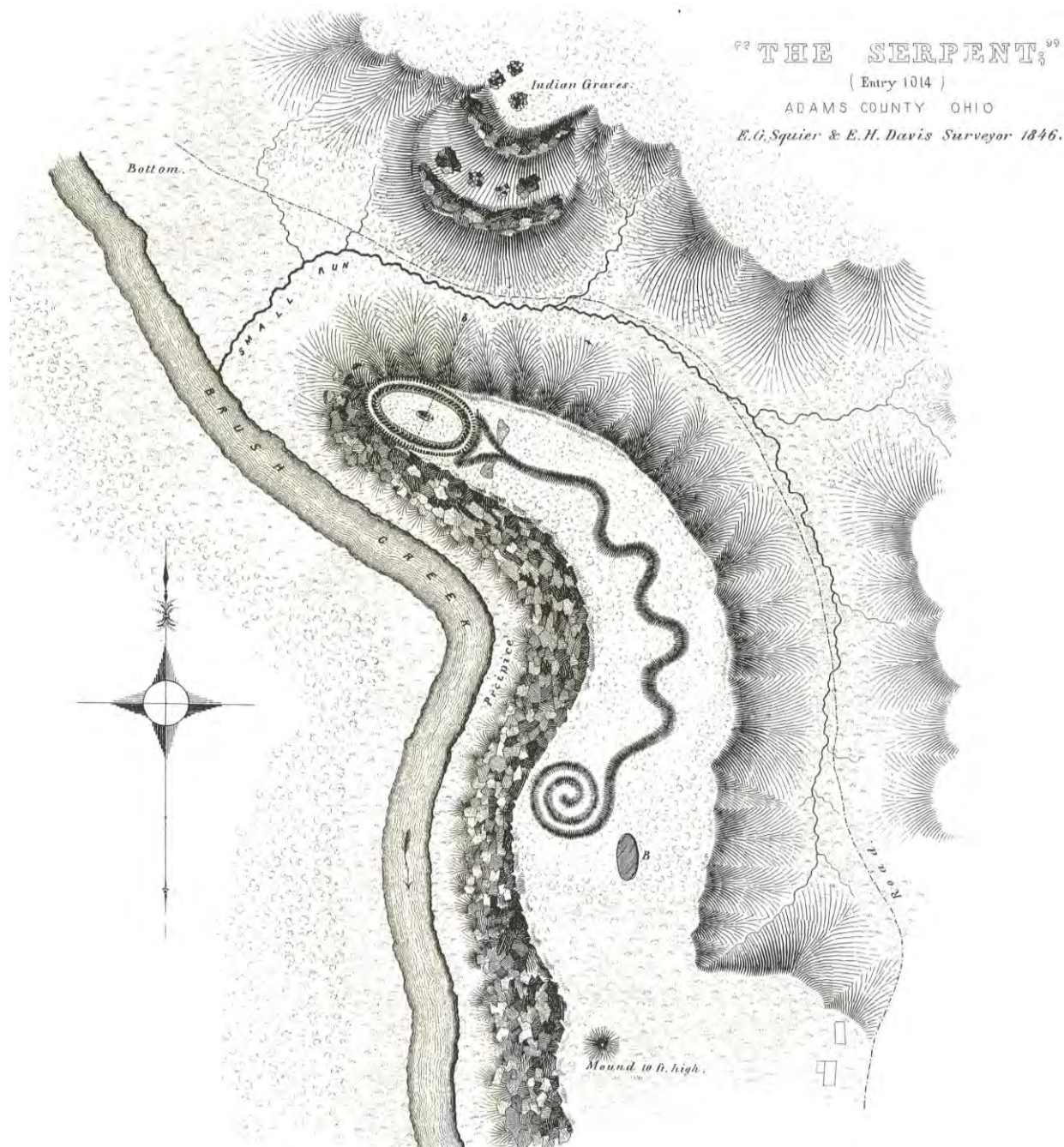


Figure 2. Squier and Davis's (1848) map of Serpent Mound.

In 1858, a tornado swept through Adams County and stripped the earthworks of most of its trees, leaving only a few saplings. After this, the landowner, a farmer, utilized much of the ground on the Serpent Mound plateau, including Serpent

Mound itself, for grazing and even, for a few years, cultivation (Putnam 1890:872).

Serpent Mound is at least 396 m in length and is currently 1.2 m to 1.5 m in height along the body but tapers to 0.3 m near the tail (Lepper 2009). The

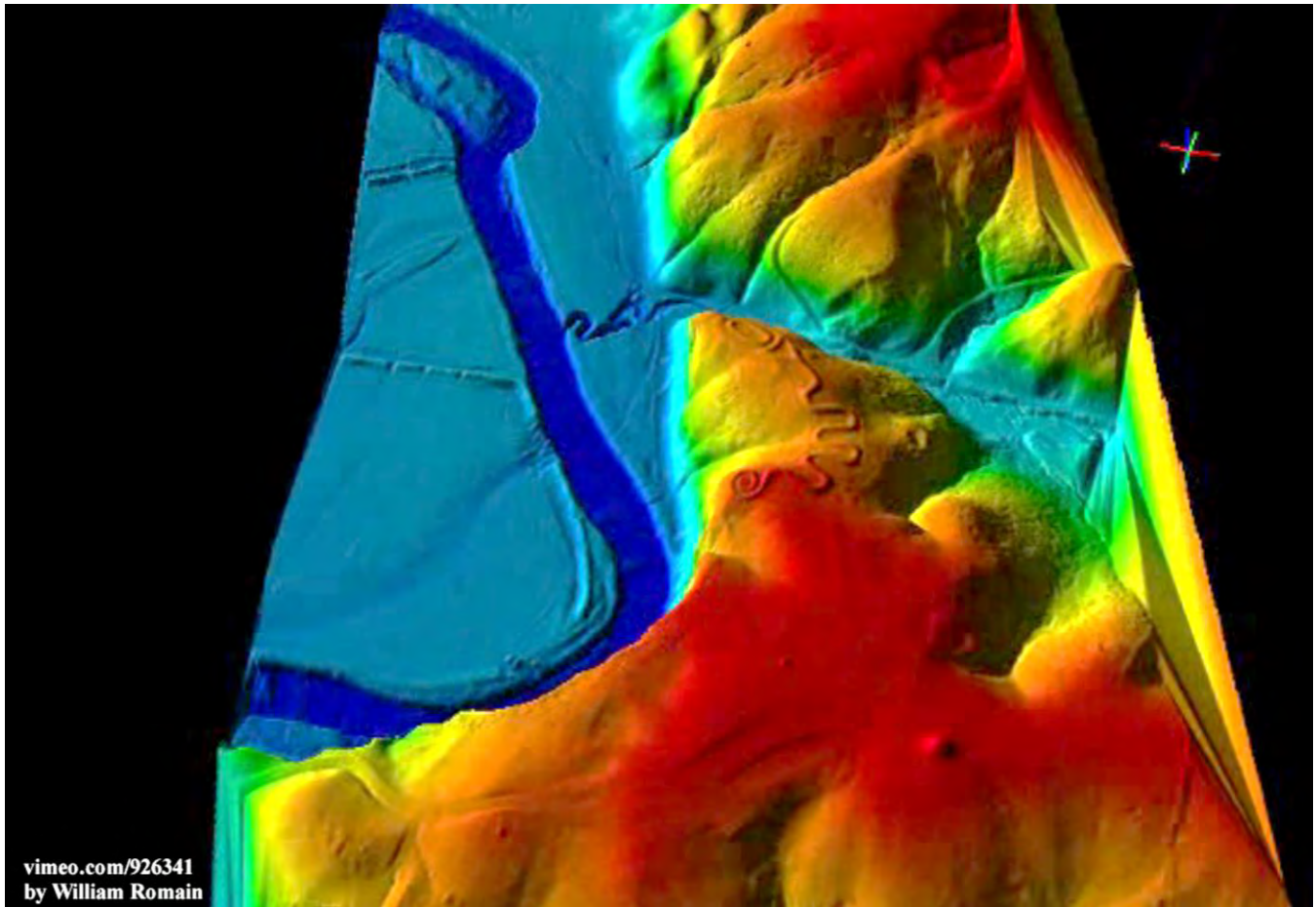


Figure 3. LiDAR map showing Serpent Mound, the surrounding plateau, and conical mound (foreground). Elevations exaggerated to show Serpent Mound. Adapted from Romain (2012). (Courtesy of William Romain)

embankment width varies from 6 m to 7 m (Fletcher et al. 1996).

Many drawings have been made of Serpent Mound over the years. They show its morphology and iconography, which Fletcher et al. (1996), Lepper (n.d.a), Lepper et al. (2018), Lepper, Frothing, and Pickard (2019), and Romain et al. (2017) review in depth. The drawings are important because their depictions vary in detail. Jarrod Burks (Ohio Valley Archaeology, Inc.) and colleagues conducted a geophysical survey of the earthwork (Herrmann et al. 2014). The geophysical survey results indicate a slightly different morphology of the serpent than is commonly drawn. In particular, an additional

undulation nearest the head of the serpent appears to have existed in the past, but it was either removed prehistorically, or not included in Putnam's nineteenth century restoration. Also, some older drawings show small projections extending from the base of the head of the Serpent, but Burks' geophysical survey could not verify these details.

Frederic Ward Putnam is credited with the early rescue and preservation of this archaeological monument. He was one of the founders of Harvard University's Peabody Museum and traveled extensively in pursuit of his archaeological interests. The lack of tree cover and the extent of vandalism were apparent when



Figure 4. Aerial photograph of Serpent Mound. (Courtesy of the Newark Earthworks Center and Timothy E. Black)

Putnam visited Serpent Mound in the 1880s. Once he noticed that Serpent Mound was eroding, he took action and began raising funds for its preservation. His and others' efforts were successful, and in one of the first editions of the *Ohio Archaeological and Historical Quarterly* he announced its purchase and permanent preservation (Putnam 1887).

In the late 1880s, Putnam cleared the Serpent Mound of vegetation and restored it (Figures 5–7). He and his work crew lived in a camp near Serpent Mound for a time (Anonymous 1889; Romain 2016). He conducted limited excavations within the effigy's embankment but could not develop a sense of the age of the mound. Putnam also completely excavated the conical mound (Figure 8), disinterring burials and artifacts from within

and below it. Further, he explored the nearby Adena and Fort Ancient village site. Most importantly for this study, during his investigation he identified and excavated a prehistoric burned area, which extended northward from the mound. Putnam (1890:880) described it as a “burnt area extending perhaps one hundred feet north of the mound...” (Figure 7, see Area 25, the “burnt space”). On Putnam's (1890) map, the burned area is shown crossing a small road and extending to the north (Figure 7). The extent of his excavations in this area is unclear. Putnam recovered many small pottery sherds, stone chips, pieces of burned bone, broken stone implements, and a dozen “perfect ones” (stone implements) from this burned area. Also, shells of “freshwater clams” were encountered (Putnam 1890:880). These



Figure 5. Serpent Mound after clearing of vegetation by Frederic Ward Putnam in 1887. (Museum Collection. Courtesy of the Peabody Museum of Archaeology and Ethnology, Harvard University, PM 2004.29.2226)

details are important because ASC identified a buried A horizon north of the conical mound that I believe is a remnant of Putnam's burned area.

Putnam set about establishing Serpent Mound as a park open to local residents and tourists interested in the earthwork and mounds. Thus, Serpent Mound Park, as Putnam called it, became the first archaeological park in the United States. It was administered initially by the Peabody Museum, but such a long-distance relationship became difficult to maintain and it was transferred to the Ohio Archaeological and Historical Society in 1900 (Randall 1907). It was renamed "Serpent Mound State Memorial" and now is generally referred to simply as Serpent Mound. The Ohio

History Connection has maintained the site since 1900 and the Arc of Appalachia, a non-profit group, now administers it.

Putnam's achievement in creating the park and investigating the earthwork stands out. His excavations and summary article also are remarkable in two ways. First, the relative scientific rigor he brought to the task led him to a new, empirically valid understanding of the site. Also, he was able to extend his knowledge of the meaning of the site by application of the comparative method. Importantly, Putnam's work put his contemporaries on a path toward understanding more clearly the implication that ancient Native Americans built the earthwork, but



Figure 6. Serpent Mound coiled tail in 1887. (Museum Collection. Courtesy of the Peabody Museum of Archaeology and Ethnology, Harvard University, PM 2004.29.2272)

only after Putnam made a broad comparative study of the subject.

Putnam's (1890:876-877) interest in serpent iconography led directly to his archaeological investigation at the earthwork and his excavation of the village site, mounds, and burials. He also observed the flattening of the back of skulls (i.e., brachycephaly) from burials excavated at the site. With a few ad hoc comparisons of serpent iconography and cranial deformation practices worldwide, he concluded that the culture of the builders of Serpent Mound originated in the Old World, most likely Asia, but Europe was discussed as well (Putnam 1890:876-877, 888). Later, in a more detailed study of symbolism, Putnam and Willoughby (1896:302), concluded that serpent iconography in the Ohio Valley was closely related to Mexico, Central America, and the Southwest, which indicated to them native origins, not Old World influences. They saw serpent imagery as more tied to native cultures of

these distant regions rather than historic Eastern native tribes. Today, archaeologists see symbolic connections between Serpent Mound and Mississippian culture iconography (Lepper et al. 2018, 2019; Lepper n.d.a; Romain et al. 2017) or the earlier Woodland period iconography (Romain 2015; Romain et al. 2017).

As site visitation during the twentieth century continued and grew, an observation tower was added in the early twentieth century (Fletcher et al. 1996) and various other improvements were made. During the 1930s, the Civilian Conservation Corps (CCC) constructed the restrooms and caretaker's house at Serpent Mound State Memorial (Pickard et al. 2011). Additionally, the CCC workers constructed a concrete bunkhouse on the edge of the property, where they lived. The foundation of this bunkhouse remains on the property. There was also an early spring house; only the foundation remains and the spring has dried up. The

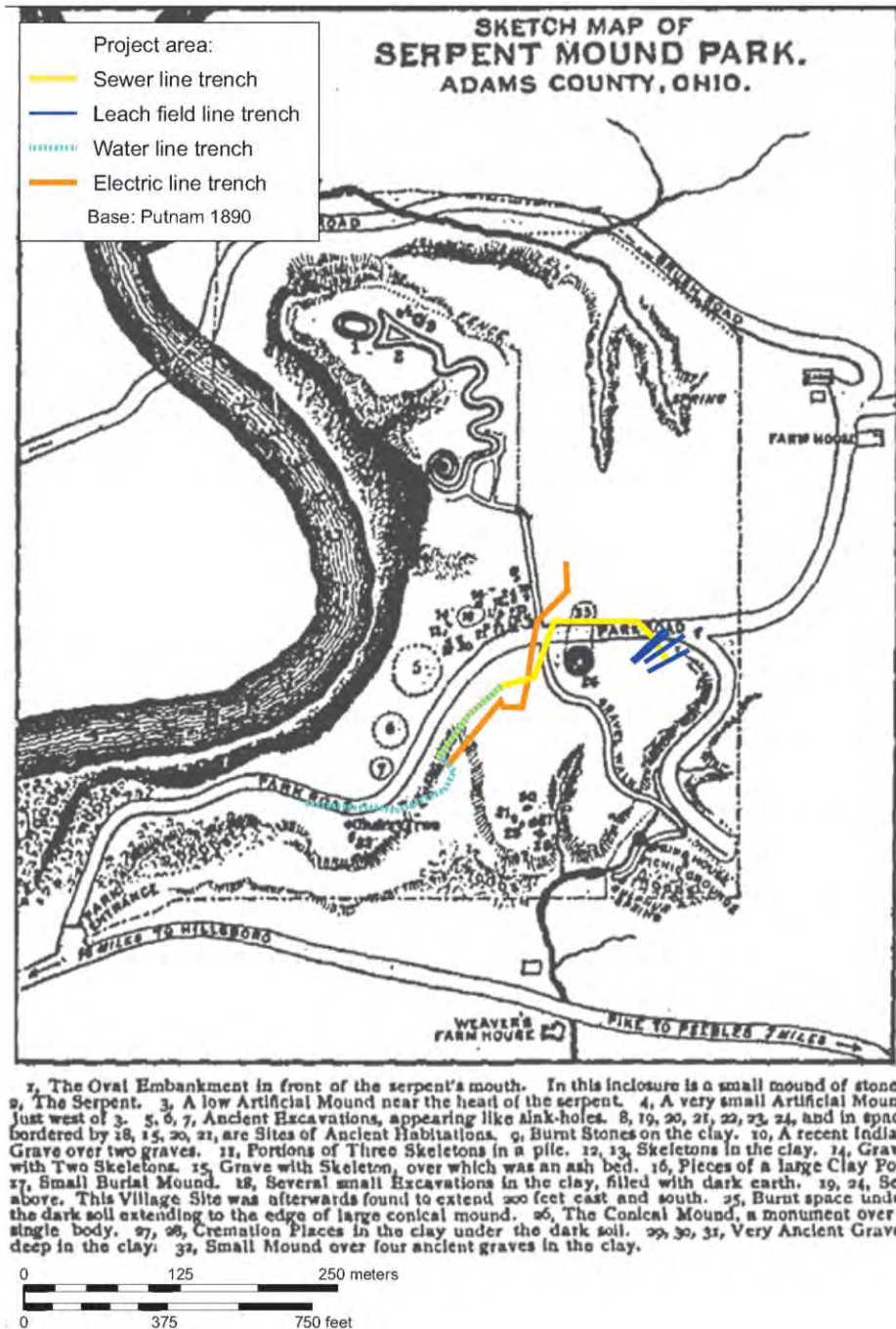


Figure 7. Putnam’s (1890) map of Serpent Mound and surrounding archaeological features with infrastructure installed in 2011 overlaid. Note 26, the conical mound, and 25, the burnt space he identified extending north from the edge of the conical mound (Schwarz and Lamp 2011).

restrooms and caretaker’s house have rustic CCC-style exteriors and are considered to be historic resources due to their design and association with the Great Depression-era relief agency.

At the time of Putnam’s investigation, Ohio’s prehistoric chronology was not known well enough to establish the occupational history and he did not recognize any diagnostic artifacts



Figure 8. Conical Mound at Serpent Mound State Memorial.

during his excavation of Serpent Mound itself². Subsequent analyses by Greenman (1934) and Griffin (1943), among others, established the presence of the Adena occupation (800 BC-200 BC) in the village and the mounds and serpent were thought to be related primarily to this occupation. However, iconographic analysis and the first radiocarbon dates from the earthwork led archaeologists Fletcher et al. (1996) to propose that early Fort Ancient peoples built the Serpent Mound at ca. AD 1000, thereby upending previous notions of its origins. This was the state of knowledge at the time of the ASC field investigations.

Adding to the debate over origins, a research group recently published new radiocarbon dates from Serpent Mound. The research group was led by William Romain (Ohio State University, Newark) and Edward Herrmann (Indiana Geological Survey). They obtained Early Woodland period radiocarbon dates from samples derived from a number of cores through Serpent Mound itself (Herrmann et al. 2014; Romain et al. 2013, 2017). The investigation, which included geophysical survey, coring, and trenching, resulted in a modified timeline for the Serpent's construction, one that incorporated the dates of Fletcher et al. (1996) but pushed back the initial construction. In response, Fletcher (2014) and

Lepper (2013) noted that the radiocarbon dates obtained by Herrmann et al. (2014) were from soil cores rather than broader excavations where provenience could be better controlled. Several other important issues were raised as well. For example, Lepper (2013, n.d.a) and Lepper et al. (2018, 2019) discussed the iconography of the Woodland versus Fort Ancient periods and, hence, the likelihood that the serpent effigy belongs to the Fort Ancient period rather than the Adena period. The debate has continued with new radiocarbon dates, arguments, and counterarguments (Lepper n.d.a, 2018; Lepper et al. 2018, 2019; Romain et al. 2017; Romain and Herrmann 2018).

In this article I do not take a position in this debate and have no data that bear directly on this issue. But I note that resolution of the dating issue is vital to our understanding of the history and importance of effigy construction in the Eastern Woodlands. There is considerable uncertainty and need for research about what activities took place nearby and how particular parts of the site were utilized during various time periods (Fletcher 2014; Weintraub and Schwarz 2013).

Additionally, Wilson (2016:5) writes that recently he discovered a map made by Putnam (1889), which is in the Peabody Museum at Harvard University. The map shows a circular formation of "Fort Holes" (presumably post molds) located south of the serpent effigy. Wilson (2016:5) believes that this mapped formation of features is the remains of a "woodhenge," a circle of wooden posts. In the Eastern Woodlands, woodhenges are thought to be related to calendrical observations, as the placement of the posts marked the solstices and equinoxes.

Recently, Jarrod Burks conducted a geophysical survey of nearly all of the Serpent Mound State Memorial (Burks 2017). Excavations of anomalies identified during the geophysical survey may be able to confirm or deny the existence of the woodhenge, though no indications of a circular feature akin to a woodhenge were detected. If the hypothesized woodhenge is confirmed, it would raise the possibility of a third ritual focus at the site. That

is, another ritual focus could exist in addition to the serpent effigy and conical mound. This would also place Serpent Mound State Memorial in a category with other complex ceremonial sites in the Eastern Woodlands with a woodhenge (Bill Romain, personal communication to Kevin Schwarz, 2016), like Cahokia (Pauketat 2012), Fort Ancient (Burks 2006; Riordan 2015), and Stubbs (Cowan 2005)³. An alternative explanation is that the “Fort Holes” identified on the Serpent Mound map by Wilson (2016:5) are, in fact, remnants of a Fort Ancient palisade (Brad Lepper, personal communication to Kevin Schwarz, 2016; Burks 2017).

Despite the several investigations reviewed above and the great interest that Serpent Mound holds for the archaeological community and the public, there has been little reporting of basic archaeological information about the habitation areas on the plateau and across the historical site landscape, at least not since the investigation of Putnam (1890). ASC’s investigation provides an opportunity to begin to correct this situation. Below is the summary of the excavations. ASC identified evidence of activity areas and temporally diagnostic deposits in the circum-mound area⁴. There are deposits made by both Adena and Fort Ancient peoples. There were also surprising amounts of historic artifacts and information that relate to Putnam’s era at Serpent Mound, tourists over the years, and the Depression of the 1930s when the CCC worked at Serpent Mound State Memorial.

Summary of Excavations

ASC developed the investigation methods as the result of a research design written by Pickard et al. (2011) for the project. A total of 87 test units were excavated at various sizes (50 cm x 50 cm, 50 cm x 100 cm, 50 cm x 200 cm, 100 cm x 200 cm) along the utility trenches (Figure 9). Later, ASC cleared away the surface layer of the soil with a backhoe in order to search for features in these areas. Feature investigation techniques were used when features or possible features were

found. Also, flotation and botanical samples were collected. Annette Ericksen of Hocking College/ASC analyzed the samples. Radiocarbon analyses were submitted to the University of Georgia, Center for Applied Isotope Studies. During construction of the utility lines, an ASC archaeologist monitored the construction work and documented artifacts when they were found.

It is important to note that the OHS previously had commissioned a geophysical survey covering the potential impact area for the utility line project. Jarrod Burks (2008) used a magnetometer and an electrical resistance meter across the work site. He identified a number of geophysical anomalies that he thought were likely to be prehistoric features, mostly north of the conical mound. The OHS then carefully rerouted the utilities to avoid these anomalies. In this way, a proactive approach was taken to avoid, to the extent possible, disturbing any significant archaeological remains. My expectation going into the fieldwork was that it was unlikely that these investigations would locate cultural features larger than 50 cm in diameter since no such anomalies were detected by Burks’ (2008) magnetometer and electrical resistance surveys. In contrast, smaller cultural features, such as post molds or small pits or basins, easily could have gone undetected, meaning that small features were a distinct possibility.

Burks’ (2008) work is also important for understanding the present investigation because he identified two anomalies (Anomalies 38 and 39) that are north of the conical mound and are possibly related to Putnam’s excavations, although the interpretation leaves it open to the possibility that Anomaly 38 is not a feature.

The test units ASC excavated along the routes of the utility lines were spaced at 5-meter intervals. In total, 81 test units were excavated utilizing natural stratigraphic levels and screening through ¼ in. mesh. Forty-three test units were positive for artifacts with between 1 and 25 artifacts found in each. Separate concentrations of prehistoric artifacts were west and northeast of the conical mound, while little was found directly to the east where four transects of test units were

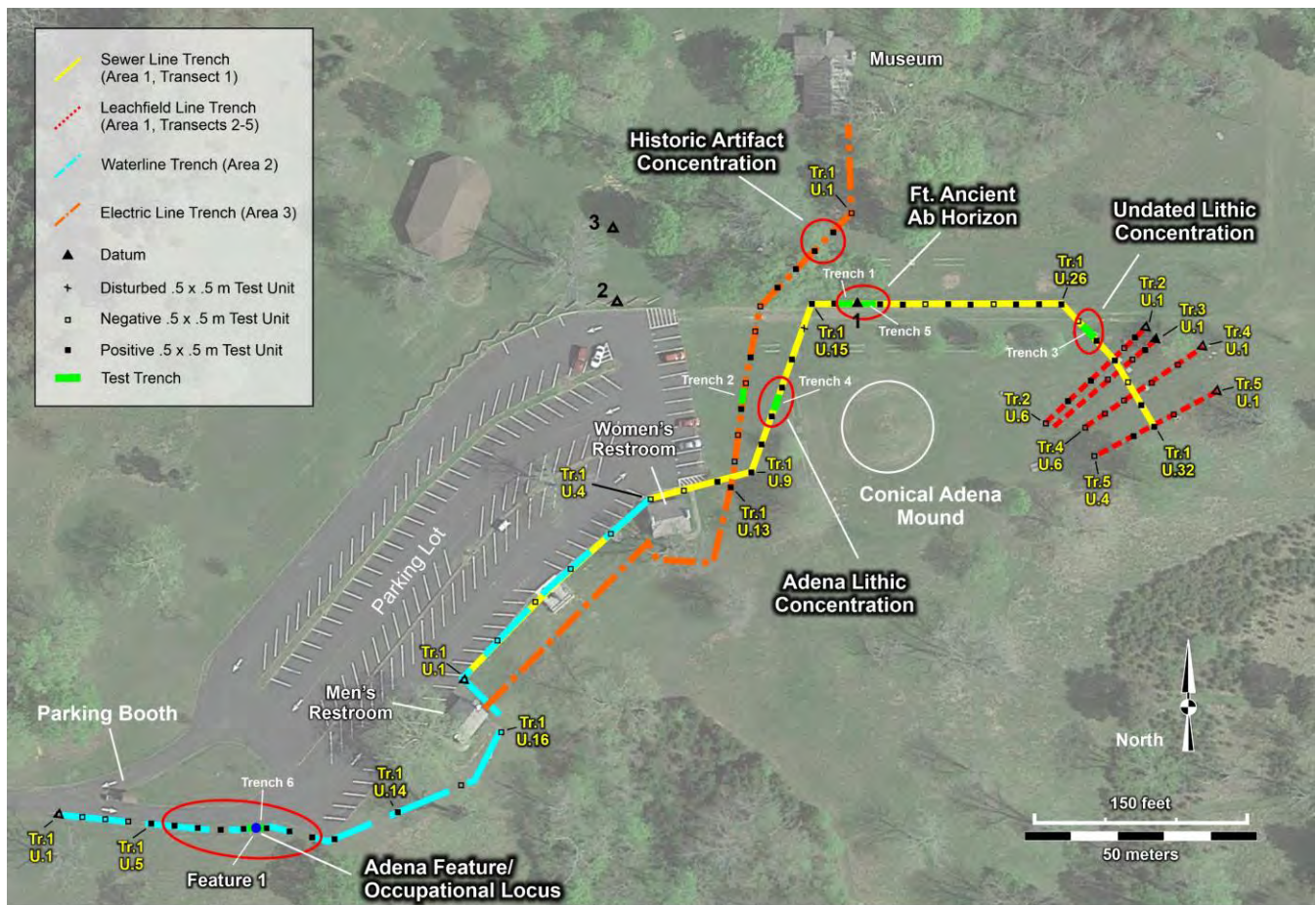


Figure 9. Aerial photograph showing the ASC excavations along planned utility trenches, the Adena feature and occupational locus, Fort Ancient buried A (Ab) horizon, and artifact concentrations (adapted from Weintraub and Schwarz 2013).

placed (Figure 9). More stone tools were found west of the mound, and debitage concentrations were both west and northeast of the conical mound. Additionally, a transect of test units along the proposed water line ran between a parking lot and the restrooms. Testing along this transect yielded a surprising amount of prehistoric artifacts and a prehistoric feature, on a slight rise. The water line was routed just 1.5 m south of the parking lot entrance where visitors park. The identification of an intact feature and artifacts is a remarkable instance of preservation so close to the pavement in an area where earthmoving is known to have taken place. Historic artifacts were found scattered in different locales, but the greatest concentration of finds was along the electrical line

that now runs to the museum and gift shop, southeast of Serpent Mound.

ASC excavated six screened test trenches to further document various areas where stratigraphic anomalies or artifact concentrations were identified during the testing. Test Trench 1 followed up on a stratigraphic anomaly north of the conical mound. Three stacked A horizons, including buried ground surfaces, were identified in this locale (Figure 9). The first A horizon corresponded to a paving episode as chunks of asphalt were found (a road was built in this part of the park in the 1960s or 1970s). Below was what appeared to be a late nineteenth-early twentieth century ground surface, which is highly mottled and compacted. This horizon also contained



Figure 10. Test Trench 1, showing the Fort Ancient period buried A horizon, 28 cm below surface.

prehistoric artifacts. ASC uncovered a third A horizon, an ashy light yellowish brown silt loam horizon, at about 28 centimeters below surface (cmbs) (Figures 10 and 11). This test trench was in the same area that Putnam (1890:880) encountered the burned area north of the conical mound. The buried A horizon contained a few debitage, a prehistoric sherd, and very limited charcoal flecking. The sherd was grit-tempered and cordmarked. It was assigned to the Fort Ancient period due to its relative thinness (6.89 mm) and location in the buried A horizon, which was radiocarbon dated (see below).

Test Trench 2 was in the electrical line corridor west of the conical mound. Recovery of prehistoric artifacts from this test unit was less ($n=16$) than in the nearby Test Trench 4 ($n=52$). Cinders or slag represent materials from a modern or historic road, but the soil texture and profile

were not otherwise indicative of a disturbed context.

Test Trench 3 was placed east-northeast of the conical mound to follow up on a dense concentration of debitage and a few fire-cracked rock (FCR) in a test unit. A substantial concentration of debitage ($n=101$) was recovered from the trench, particularly from 10–30 cmbs in the A horizon. Additionally, 22 artifacts (17 debitage, 1 FCR, and 1 stone tool fragment) were in the adjoining test unit. Four FCR and three prehistoric ceramic sherds were found in Test Trench 3, which was sterile below 40 cmbs. The sherds are grit-tempered and cordmarked and their relative thinness suggests they are Fort Ancient sherds. The finds seem to indicate that late-stage lithic reduction was going on at this location in the Fort Ancient period. The primary raw material was Bisher chert.

Test Trench 4 was placed to follow up on the find of an Early Woodland period Cresap Stemmed projectile point from a test unit west of the conical mound (Figure 12). A concentration of lithics was recovered primarily from 10–30 cmbs. The concentration consisted of debitage ($n=46$) and FCR ($n=6$). A broken drill and an endscraper found nearby suggested the use, or at least the disposal, of tools in this part of the site. It is likely that Early Woodland period subsistence activities took place at this locale.

Test Trench 5 was placed directly within the cleared trench north of the conical mound in the buried A horizon. Only three lithics were found in the excavation, which was sterile below 52 cmbs. But Test Trench 5 did prove that the buried A horizon bears cultural deposits across a width of at least 7 m, the distance between Test Trench 1 and Test Trench 5 (Figure 11). Clearing of this section of trench and excavation of the test trench also resulted in the identification of hickory charcoal (*Carya* sp.), which was carbon dated, as described below.

Feature 1 was discovered in the water line trench near the toll booth and parking lot. The location was a slight rise near where Putnam (1890) located and investigated some small

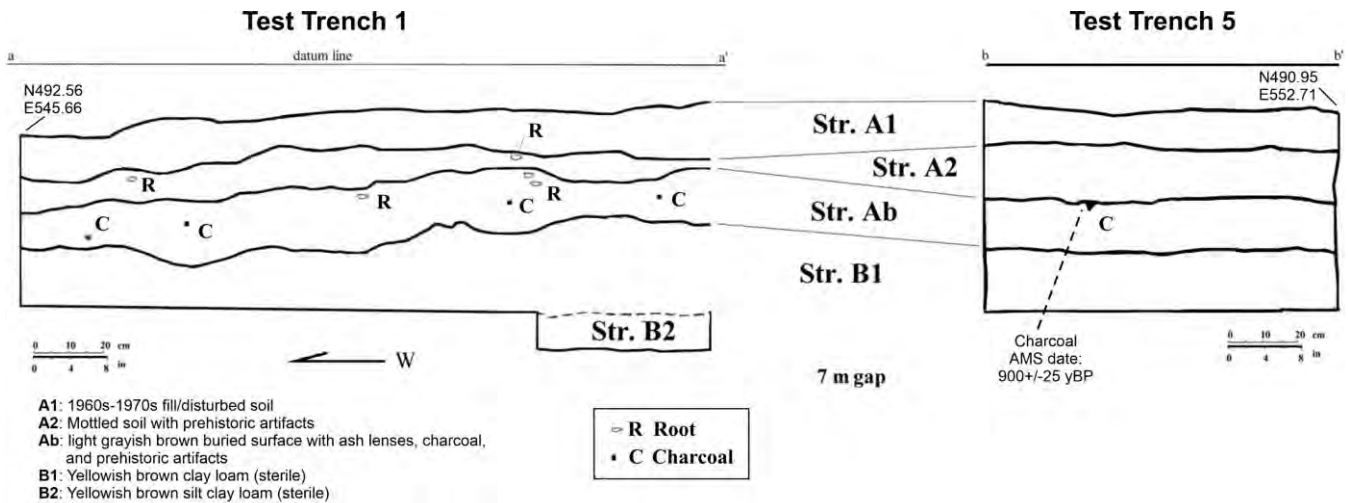


Figure 11. Stratigraphy of ASC Test Trench 1 and Test Trench 5, showing the Fort Ancient period buried A horizon.

mounds. In the water line trench at the interface of the A and B horizons, a soil stain was encountered. Fire-reddened soil, small pieces of burned/decaying sandstone, two chunks of carbonized material, charcoal flecks, and a flake were exposed on the surface of the feature. Excavation revealed a steep-sided yet shallow basin with debitage (n=8) and FCR (n=2) (Figure 13). Radiocarbon analysis of wood charcoal from

the basin yielded an Early Woodland date. The feature is a small fire pit.

Test Trench 6 was laid out to further document Feature 1 to the north of the water line trench wall. Though a substantial amount of debitage (n=93) was recovered from the excavation, the feature boundary could not be identified clearly in the test trench. The evidence indicates though that the slight rise was an Early Woodland occupational



Figure 12. Test Trench 4.



Figure 13. Feature 1 profile excavation.

locus considering the finds at Feature 1, Test Trench 6, and adjacent test units.

Analysis Stratigraphic Summary

The investigation revealed that Serpent Mound State Memorial retains areas of intact cultural stratigraphy. Most of the artifacts found during the investigation were recovered from one or two A horizons. Generally, the A1 horizon consists of a mature A horizon, and, in places, soil additions had been contributed historically or relatively recently. The A2 horizon, in some cases, appears to be a transition zone with a lot of tree roots. In other cases, particularly north of the access road, the A2 horizon was heavily mottled and disturbed. At test units near the parking lot, it was not uncommon to find one or two man-made land horizons. These soil layers are either fill that

was brought in or are so thoroughly mixed and disturbed that they stand out in terms of color, texture, and inclusions from the surrounding native soils. Below the A horizon(s), B horizons have been found and only in one very limited case (Test Trench 6) did the B horizon prove to contain artifacts. Generally, the B horizons are sterile.

The cultural stratigraphy of the site is evident from the recovered artifacts (Table 1). Of the 195 prehistoric artifacts recovered from the test pits, 87.8 percent (n=171) are from the A or A1 horizon, while 9.7 percent were recovered from the A2 horizon (n=19). Only 2.5 percent (n=5) of the prehistoric artifacts were found in humanly constructed land horizons. Among the historic artifacts (n=47), nearly all are from test units excavated along the electrical line corridor. All historic artifacts were in the uppermost layer of natural soil, the A/A1 horizon. These findings, in particular the absence of historic artifacts in the A2 horizon, demonstrate that stratification is present at the site. Excavations in test trenches and backhoe trenches generally support this stratigraphic description. A few artifacts were found in the buried A horizon (Ab) below the A2 horizon north of the access road and a few artifacts were found in the B horizon (Test Trench 6).

Putnam (1890) indicated stratification of earlier prehistoric finds, from what is now termed the Early Woodland period, below the upper village materials. The earlier finds were in the reddish clay soil, below the darker overlying soils, where he found more recent Late Prehistoric finds

Table 1. Artifacts recovered from ASC test units by stratum.

| Stratum | Prehistoric Artifacts | Historic Artifacts |
|---------|-----------------------|--------------------|
| ML1 | 4 | 0 |
| ML2 | 1 | 0 |
| A/A1 | 171 | 51 |
| A2 | 19 | 0 |
| B | 0 | 0 |

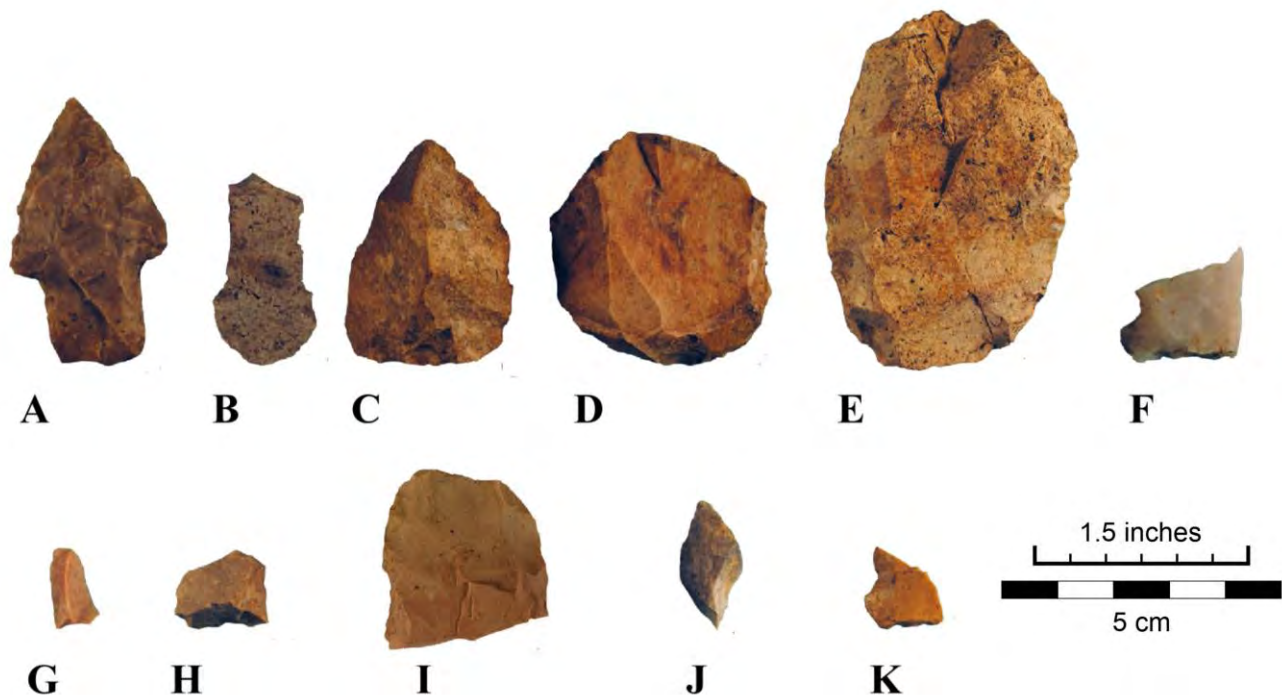


Figure 14. Selected stone tools from the ASC investigation: (A) Cresap Stemmed projectile point; (B) base fragment of drill; (C) biface; (D) endscraper; (E) biface; (F) fragment of a notched, hafted tool; (G and H) biface fragments; (I) endscraper fragment; (J and K) biface fragments.

(what are now known to be Fort Ancient period materials). He restricted his stratigraphic observations to the village site and it may be that superposition of village components has produced the stratification he observed, but it is not evident at most other places on the property (but see below for more evidence of stratification from the OHS excavations).

On more level terrain, the historic period alteration of the landscape appears to have been largely additive. The park has been developed and maintained in grass, so sediments have mostly been added (e.g., fill brought in for landscaping or road construction and maintenance) leading to the formation of deep soils found at the site. And, as a result, the underlying natural strata are in many cases intact. Where ASC found less disturbed soil contexts, gradual A/B transitions were noted, with an A2 transition horizon, as would be expected for natural forest soils. No evidence of a plow zone

was noted, and historically the area was cultivated at most a few times in the mid-nineteenth century (Fletcher et al. 1996). With the exception of a few cases, limited historic period alterations of the property and recent disturbances have not appreciably disturbed artifacts. Feature 1, the buried A horizon, and the prehistoric artifacts they contain are in situ and undisturbed.

Prehistoric Lithics and Ceramics

The debitage assemblage (n=472) is dominated by local Bisher chert, 95.6 percent (n=451); 2.5 percent is unidentified chert (n=12); 1.1 percent is Vanport chert (n=5); 0.4 percent is Upper Mercer (n=2); 0.2 percent is Wyandotte (n=1); and 0.2 percent is quartz (n=1). Of the eleven chipped stone tools, nine are made from Bisher chert (81.8%), one is Vanport chert (9.1%), and one is an unidentified chert (9.1%).



Figure 15. Groundstone tools from the ASC investigation: (A) fragment of bi-pitted stone found while shovel testing the electrical line; (B) hammerstone found in trench spoil along leach field line.

Bisher chert, a Silurian chert type, is found in Adams County (Stout and Schoenlaub 1945:16–19). Most of the raw materials of these artifacts appeared to be cobble chert, which would have been available in local streams including the Ohio Brush Creek near Serpent Mound (Stout and Schoenlaub 1945:16–19). A Bisher checked cobble was recovered⁵. It was also noted that some cortical dorsal surfaces of flakes are water rounded, and the cortex is often thick and differentially weathered depending upon the thickness of the piece. The relatively high percentage of chert debitage with cortex (25.9%) suggests that these cobble cherts were the predominant chipped stone raw material. Small cobbles were being reduced, which resulted in primary reduction flakes having a lot of cortex and many secondary flakes having small amounts of cortex.

A single Early Woodland period diagnostic Cresap Stemmed projectile point was found, as well as a drill, and bifacial tools (Figure 14). Most of the bifacial tools found are fragmented. Two

ground stone tools were recovered: a fragment of a bi-pitted stone, found while shovel testing the electrical line, and a hammerstone, which was located along the leach field line (Figure 15).

The ceramic analysis built on the previous investigation of Brose (reported in Fletcher et al. 1996) and Griffin (1943). Brose identified early Fort Ancient Baum Focus ceramics in the serpent effigy, while Griffin (1943) identified both Adena Thick ceramics and Fort Ancient Baum Focus materials in his analysis of the village assemblage that Putnam (1890) excavated. ASC recovered six prehistoric ceramic sherds (e.g., Figure 16), including smoothed (or plain) and cordmarked sherds. All of the ceramics are grit-tempered body sherds. The tempering varies between 2 mm and 5 mm in size. Interestingly the cordmarked sherds, which were typically thinner than smoothed or plain sherds, tended to be found at relatively shallow depths (mean depth of 32 cmbs), while the smoothed or plain sherds, typically thicker, were more deeply buried (mean of 50.5 cmbs). As described below, this pattern fits the observations of previous archaeologists regarding site stratification and temporally sensitive ceramic characteristics.

Paleoethnobotanical and Radiocarbon Analysis

The paleoethnobotanical analysis presented here builds upon the earlier study of Fletcher et al. (1996). In that study, Wymer produced a detailed paleoethnobotanical study based on 20 flotation samples taken during trench investigations of the Serpent Effigy. Wymer identified wood charcoal from 18 different tree taxa, including white oak group, ash, maple, and elm-hackberry. The notes and sketches left by Putnam also provide a picture of the tree community around Serpent Mound (Wilson 2016). Serpent Mound plateau appears to have been an oak forest adapted to drier conditions, while areas near intermittent streams and a spring on the property were wetter. Also, Putnam's maps of the Serpent Mound park (Wilson 2016) show it to have supported black

Table 2. Botanical samples recovered during the ASC investigation.

| ASC sample I.D. | Provenience | Contents | Taxon | Weight (g) |
|-----------------|--|-----------------------------------|------------------|------------|
| 69 | Water line trench, Area 2, Transect 1, Feature 1, W 1/2, 32–42 cmbs | 3 pieces wood charcoal (hardwood) | Unknown | 0.25 |
| 92 | Sewer line trench, Area 1, Transect 1, Test Trench 5, Level 1, 42–45 cmbs (Ab horizon) | 2 pieces wood charcoal (hickory) | <i>Carya</i> sp. | 0.61 |
| 93 | Sewer line trench, Area 1, Transect 1, Test Trench 5, Level 1, 42–45 cmbs (Ab horizon) | 14 pieces wood charcoal (hickory) | <i>Carya</i> sp. | 2.11 |

walnut (*Juglans nigra*), a species adapted to wetter conditions and rich soils. The surrounding Brush Creek Valley was characterized by moist soil conditions (Fletcher et al. 1996:130). ASC's data, analyzed by Annette Ericksen, consist of three additional samples (Table 2), two of which were identified as hickory wood (*Carya* sp.) and the other was unidentified. The two charcoal samples were collected from the buried A horizon in the sewer line trench while the unidentified sample was from Feature 1.

Two radiocarbon assays from these samples provide important temporal information (Table 3). The wood charcoal from Feature 1 has a calibrated two-sigma date range of 506 B.C.–376 B.C., within the middle to late Early Woodland Adena period. The other radiocarbon assay was from a hickory wood charcoal chunk in the buried A horizon north of the conical mound (at Test Trench 5). It has a calibrated date range of A.D.

1041–A.D. 1211, or the early Late Prehistoric Fort Ancient period. The radiocarbon age determination for this sample is 900±25 B.P., which is very similar to the 920±70 B.P. radiocarbon age determinations received by Fletcher et al. (1996) for two radiocarbon samples from within Serpent Mound itself.

Historic Archaeology

Forty-nine historic artifacts were encountered during the 2011 ASC excavations at Serpent Mound State Memorial. These include 22 stoneware crockery sherds, 15 sherds of colorless vessel glass, three sherds of light blue glass, two whole beverage bottles, two other metal artifacts (described below), one horseshoe, one ceramic pipe bowl fragment, one whiteware sherd, one piece of flat glass, and one glass marble. All of the stoneware sherds are Bristol glazed and/or Albany

Table 3. Radiocarbon dates from the ASC investigation.

| Lab I.D. | ASC Sample I.D. | Material | Method | Context | $\delta^{13}\text{C}$ | C-14 age | Cal 2-sigma date range* |
|------------|-----------------|--------------------------------|--------|---------------------------|-----------------------|----------|--|
| UGAMS-9539 | 69 | unidentified hardwood charcoal | AMS | Feature 1, 32–42 cmbs | -25.7 | 2340±25 | 506 B.C.–439 B.C. (7.6 %) or 420–376 B.C. (87.8 %) |
| UGAMS-9540 | 93 | hickory wood charcoal | AMS | Test Trench 5, 42–45 cmbs | -26.3 | 900±25 | A.D. 1041–A.D. 1109 (43.7%) and A.D. 1116–1211 (51.7%) |

AMS = accelerator mass spectrometer; * Calibrated with Oxcal 4.1.7 (Ramsey 2011).

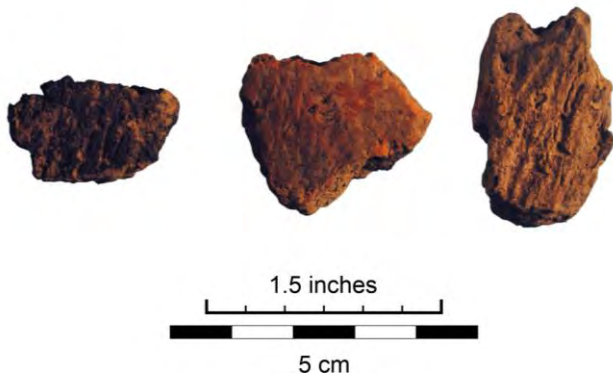


Figure 16. Selected prehistoric ceramic sherds recovered during the ASC investigation.

slipped. Albany slipping was a treatment popular from the mid-nineteenth century to the first quarter of the twentieth century. Bristol glaze became popular around 1890 (Stelle 2006). Most of the stoneware crockery sherds were found in two contiguous test units along the electrical line

corridor near the museum and during subsequent backhoe trenching and construction monitoring of the same area. The pipe bowl was found near the museum, slightly further north than the stoneware.

The finds of stoneware crockery sherds (Figure 17A) and the ceramic pipe bowl (Figure 17B) are significant. These artifacts were where it is believed Putnam and his team had their camp during their excavation and restoration work in the late 1880s (Anonymous 1889; Romain 2016). The crockery and possibly the pipe bowl, which was darkened on the interior and still smelled of tobacco, may relate to the Putnam encampment. The Bristol glazed stoneware is contemporary with the Putnam encampment. Photographs of the camp (Romain 2016) show it to have been a relatively simple affair with several tents (Figure 18). Based on period photographs, the camp was located on the west edge of the site along the bluff overlooking Ohio Brush Creek (Burks 2017;

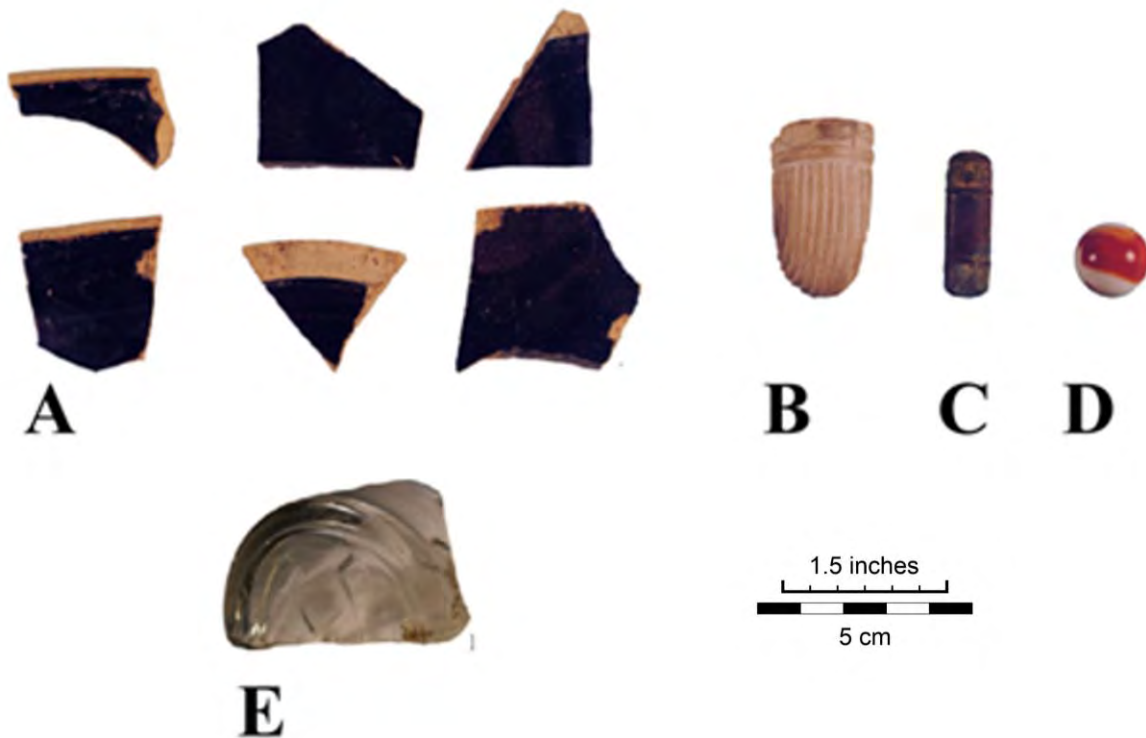


Figure 17. Selected historic artifacts recovered from Serpent Mound state memorial: (A) stoneware crockery sherds; (B) ceramic pipe bowl; (C) copper capsule; (D) marble; (E) colorless glass jelly jar base with embossed star within horseshoe motif.



Figure 18. Frederic Ward Putnam in camp at Serpent Mound. (Museum Collection. Courtesy of the Peabody Museum of Archaeology and Ethnology, Harvard University, PM 2004.1.149.1)

Romain 2016). This camp area is just west of the current museum. It is expected that the camp's refuse disposal would have been ad hoc. Thus, the historic finds in this area are not surprising and are probably trash associated with the camp⁶.

A few other quotidian artifacts were found: a small copper capsule (Figure 17C), a marble (Figure 17D), a jelly jar base (Figure 17E), and bottles. The copper capsule was recovered via shovel testing of the sewer line east of the conical mound. It is closed and has not been opened. It may have been a container for sewing needles or an apothecary for pills or other medicines. Also, a glass marble⁷ was found in Test Trench 3. A young visitor may have lost it.

Only a few of the artifacts reference the Great Depression Era and surrounding decades. These include a soda bottle from 1948 and a glass vessel base sherd. The vessel sherd is a portion of a jelly glass or tumbler. It was found during monitoring,

in the trench spoil east of the museum. It is colorless and has a distinctive swirl incising pattern. The base is embossed with a partial star within a horseshoe motif. This motif was prevalent between ca. 1900–1930 and several Ohio and Indiana companies made these glasses and tumblers, including Ball Brothers Glass Company, Hazel Atlas Glass Company, and the Fostoria Glass Company. It could not be determined which company made it. Jelly glasses were used for jellies or other sweet, fruit-based desserts that were common in the early twentieth century and tumblers could have been used for fruit juices, sodas, or alcoholic drinks.

According to one of the former caretakers at Serpent Mound State Memorial, Andy Davenport, there were a lot of parties at Serpent Mound in the mid-twentieth century, when he was a child. He and other locals attended them on Sundays. There were also frequent picnics and Governor Michael

DiSalle spoke at the Serpent Mound State Memorial in the late 1950s or early 1960s (Schwarz and Lamp 2011). The jelly jar was probably broken and discarded during such an event.

Comparisons

The recent re-analysis of artifacts from Putnam's excavations (Purtill 2013) and a report of the salvage excavations undertaken by the OHS for a waterline project (Thompson et al. 2013) provide important data for comparison and synthesis. The waterline project investigated portions of the Adena and Fort Ancient village⁸ while Putnam's work was more wide ranging. Here I compare temporal data and artifact densities and types across the site.

The 110 temporally identifiable projectile points recovered from the site (Purtill 2013;

Schwarz and Lamp 2011; Thompson et al. 2013) provide valuable information that indicates the degree of continuity of occupation and peaks of occupational intensity. Most of these projectile points were recovered from the plateau during excavation of residential and funerary contexts (e.g., the conical mound and other smaller mounds that Putnam investigated). Figure 19 illustrates that small numbers of Early Archaic period points (n=9) and more Late Archaic period points (n=15) were recovered, primarily by Putnam's excavations. By far, Late Prehistoric period (Fort Ancient) points (n=44) are the most numerous, followed by Early Woodland period points (n=27). Additionally, points (n=10) that Purtill (2013) identified as transitional Late Archaic-Early Woodland also were in Putnam's collections. Fewer Early Archaic-Middle Archaic (n=1), Middle Archaic (n=2), Middle Woodland (n=1), and Late Woodland (n=1) points have been

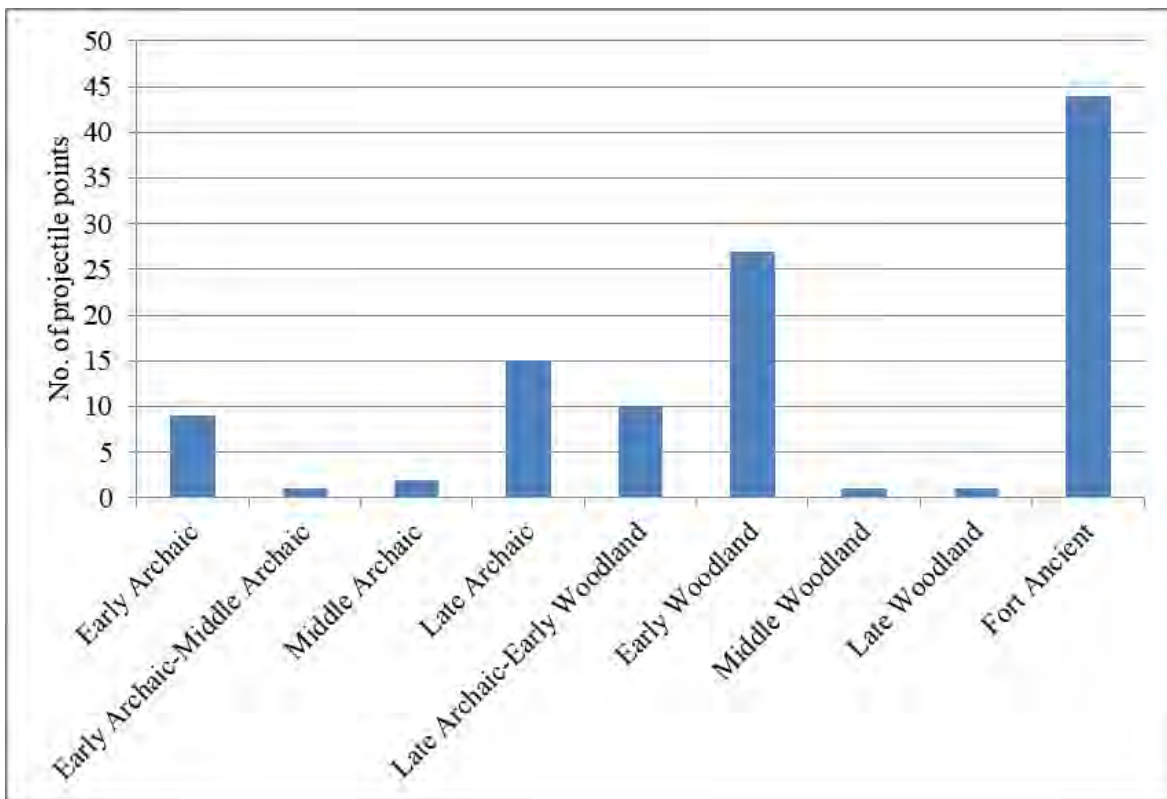


Figure 19. Projectile points recovered from Serpent Mound State Memorial by time period (based on data from Purtill 2013; Schwarz and Lamp 2012; and Thompson et al. 2013).

Table 4. Description of prehistoric ceramics from Serpent Mound State Memorial.

| Sample | Description | Mean Depth of Recovery (cmbs) | Mean Thickness (mm) | Identification |
|---------------|---|-------------------------------|---------------------|-------------------------|
| ASC 2011 | Plain or smoothed surface sherds, grit tempered | 50.5 | 8.32 | Adena Plain or Smoothed |
| ASC 2011 | Cordmarked sherds, grit tempered | 32.5 | 7.12 | Baum Cordmarked |
| OHS 1988-1994 | Plain or smoothed surface sherds, grit tempered | 14.4* | N.D. | Adena Plain or Smoothed |
| OHS 1988-1994 | Cordmarked sherds, grit or shell tempered | 13.7* | N.D. | Baum Cordmarked |

*-Based upon a sample tabulated from N43 E0-N49 E0, an area in the village with maximum stratigraphic superposition.

recovered.

It is worth noting that no Paleoindian projectile points have been collected from the Serpent Mound plateau or from the Serpent effigy itself⁹. The projectile point data do support traditionally identified temporal foci for activity on the plateau in the Early Woodland and Fort Ancient periods (Griffin 1943) (Figures 20 and 21). The point data could be interpreted to indicate the somewhat more intensive use of the plateau area during the Fort Ancient period, based on the higher numbers of projectile points. Perhaps it means that overall, the Fort Ancient village was more intensely occupied than the Adena settlement (Griffin 1943). However, it is also possible that these seeming patterns relate to poorly understood tool use and disposal practices, which could result in their differential presence and recovery on the plateau. The Late Archaic and transitional use of the plateau is most surprising and interesting. Perhaps the point data are indicative of a gradual intensification of use of the plateau landscape in the millennia before the construction of the Adena burial mound at the site. More research is needed on this topic.

Also noteworthy is the dearth of much projectile point evidence of Middle Woodland or

Late Woodland occupation or use of the plateau. Purtill (2013) only records one Late Woodland projectile point, of the Jack's Reef variety. Nine intrusive burials (which may be Late Woodland in age) were excavated from the upper layers of the conical mound, but the Jack's Reef projectile point was apparently not part of their grave goods.

Most artifacts relate to daily living activities, such as ceramic vessel sherds and projectile points (Figures 20 and 21). Burial and other interred offerings include leaf blades from the Adena conical mound (Figure 20D), an Adena sandstone plummet (Figure 20E), and a Fort Ancient period incised sandstone spool (Figure 21F).

Ceramics from the OHS village and ASC circum-mound excavations are similar, as Table 4 documents. Thinner cordmarked wares, identifiable as Baum Cordmarked ceramics (Griffin 1943), tended to be stratigraphically higher in soil profiles than the thicker smoothed or plain ceramics identifiable as Adena Smoothed or Plain.

Differing artifact densities were obtained in the village excavations versus the circum-mound and edge of plateau locations that ASC investigated (Table 5). In the village, artifact counts from 52 positive excavation units (mostly

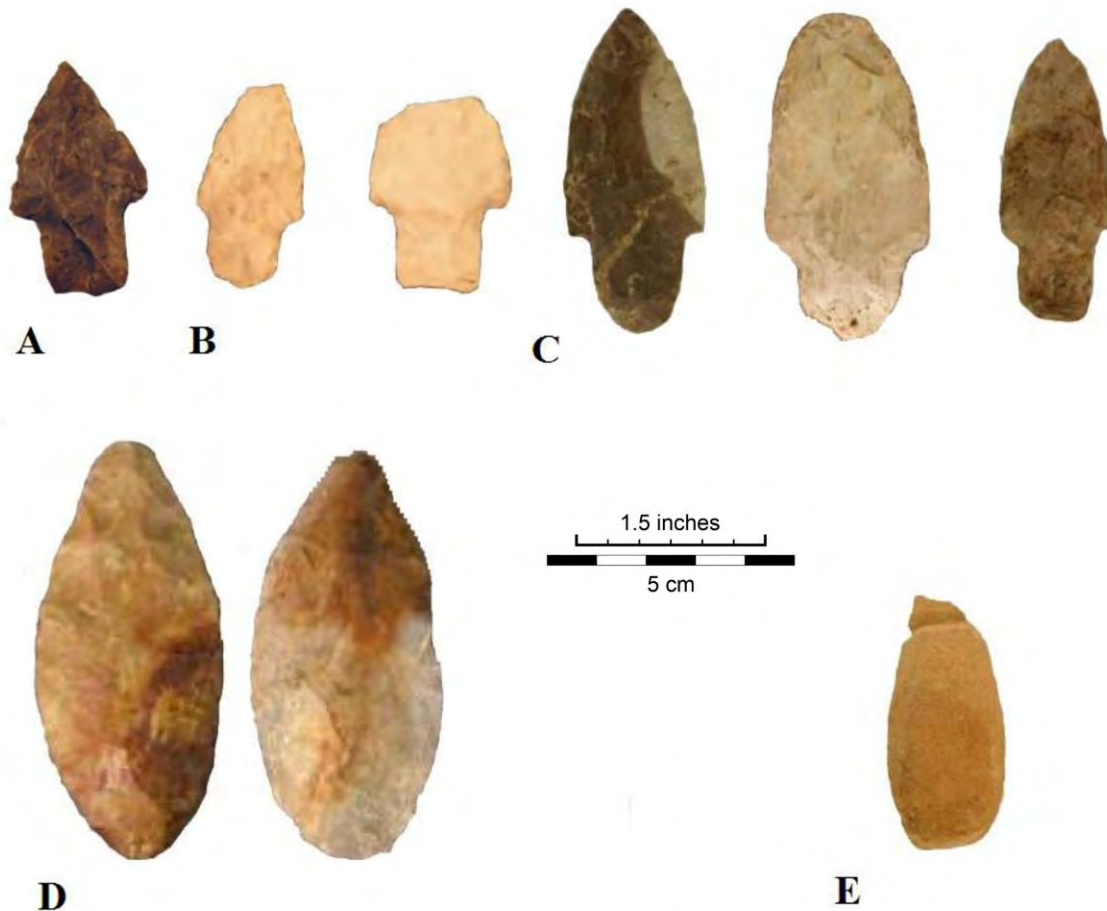


Figure 20. Selected Adena artifacts recovered from Serpent Mound State Memorial: (A) Cresap Stemmed projectile point (ASC 2011); (B) Early Woodland projectile points recovered by 1988-1994 OHS project (Thompson et al. 2013); (C) Stemmed points recovered by Putnam (1890); (D) Leaf blades from cache within the conical mound (Putnam 1890); (E) Sandstone plummet recovered by Putnam (1890). Artifacts from Putnam’s investigation are curated at the Peabody Museum.

1 m x 1 m test units) provide a mean artifact density of 520.5 prehistoric artifacts per square meter and a standard deviation of 344.1 artifacts (Thompson et al. 2013). For the areas outside of the village core, 49 positive ASC excavation units provide a density of 23.8 prehistoric artifacts per square meter, with a standard deviation of 29.8. The ASC distribution of densities has a “long tail,”¹⁰ signifying that a few high-density units, relatively speaking for the outside-of-the-village distribution, were encountered, but most units’ densities were relatively low.

In the case of the ASC investigations, lithic concentrations of primarily Bisher chert and a few

tools were encountered in three places and account for the high artifact densities (Figure 22), up to 144 artifacts per square meter. In the case of the OHS investigations, the density measures were generally high, and the mean exceeded the standard deviation. This pattern confirms the extremely dense and consistent accumulations of artifacts in the village area. The pattern corroborates Putnam’s account of his excavations and indicates a lower tendency for variability at the village site. Variation, which does exist (from 2 to 1,172 artifacts per square meter), is probably accounted for by differential activity and disposal patterning within the lived space of the settlement,

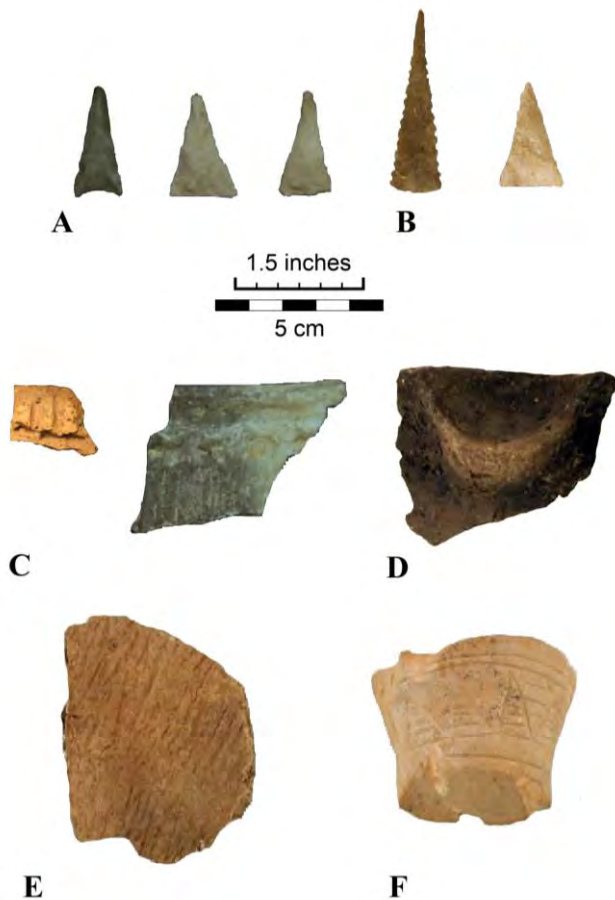


Figure 21. Selected Fort Ancient period artifacts recovered from Serpent Mound State Memorial: (A) Madison triangular projectile points recovered from the 1988-1994 Ohio Historical Society investigation (Thompson et al. 2013); (B) Madison triangular projectile points recovered by Putnam (1890); (C) Fort Ancient rim sherd recovered by the Ohio Historical Society investigation (Thompson et al. 2013); (D and E) Fort Ancient sherd with lug and cordmarked sherd recovered by Putnam (1890); (F) sandstone spool with zig-zag incised designs recovered by Putnam (1890). Artifacts from Putnam's investigation curated at the Peabody Museum.

as well as effects from post-depositional processes, such as the construction of the pavillion.

Interestingly, artifact densities at a few locations near the mound are similar in magnitude to that of the village (i.e., >100 artifacts per square meter). These locations are Test Trenches 3 and 4, and the Adena occupational locus at the south end

of the water line, including Test Trench 6 (Figure 9). As discussed below, I conclude that the circum-mound area tested by ASC had more evidence of activities than expected.

Close study of the OHS excavation report (Thompson et al. 2013) indicates that earlier deposits (e.g., Early Woodland Adena deposits) underlay a Fort Ancient midden in the central portion of the excavated village (where the cross formation of test units meets near the Pavilion in Figure 22). In some cases, such as at Test Units N0, E48 and N0, E49 (these coordinates relate the OHS excavation grid; they are not indicated in Figure 22), Fort Ancient features (e.g., Feature 5) intruded upon earlier deposits, which are identifiable by the recovery of stemmed projectile points (Figure 23). A sample of triangular projectile points (n=18), mostly from Test Units N0, E43 to N0, E49, has a mean depth of recovery of 16.1 cmbs, while a sample of stemmed projectile points and other Adena tools (n = 6), has a mean depth of recovery of 22.7 cmbs¹¹. Typically, the triangular projectile points were found in the darker A horizon and upper subsoil while the Adena tools were found deeper in the clayey subsoil, although there is some variation. This superposition of components is most evident in Test Units N0, E46 to N0, E49 (Figure 24). The OHS data demonstrate the correctness of Putnam's (1890) original interpretation of an upper darker village layer overlying a lower layer with artifacts in the reddish clay soil.

The trend in depth of recovery of ceramics from different components is more pronounced in ASC's excavation results (Table 4), suggesting some inchoate superposition of components. But notwithstanding this observation, I have not been able to identify an ASC excavation unit with clear evidence of prehistoric stratigraphic superposition. Nonetheless, both lithics and ceramics in the OHS excavation samples suggest that there is stratigraphic superposition in the central portion of the village (Putnam 1890).

Regarding the historic artifact analysis, ASC recovered some nineteenth century artifacts (stoneware crockery sherds, the pipe bowl, a

Table 5. Artifact densities from ASC and OHS investigations.

| Investigation | No. of Positive Units in Sample | Mean Prehis-toric Artifact Density* | Standard Devia-tion | Range |
|-----------------|---------------------------------|-------------------------------------|---------------------|--------|
| OHS (1988-1994) | 52 | 520.5 | 344.1 | 2-1172 |
| ASC (2011) | 49 | 23.8 | 29.8 | 1-144 |

*per sq. m (data from Schwarz and Lamp 2011; Thompson et al. 2013)

copper capsule, and a horseshoe). The stoneware crockery and pipe bowl were found near the modern museum. ASC also recovered a few items that relate to the mid-twentieth century (particularly from the 1930s–1940s) when a lot of activities were going on at the Serpent Mound

State Memorial. In comparison, the OHS investigation of the village site (near the pavilion) recovered mostly relatively modern items, like bottle glass (Thompson et al. 2013) and twentieth century coins¹². They are, presumably, losses from tourists’ visits.

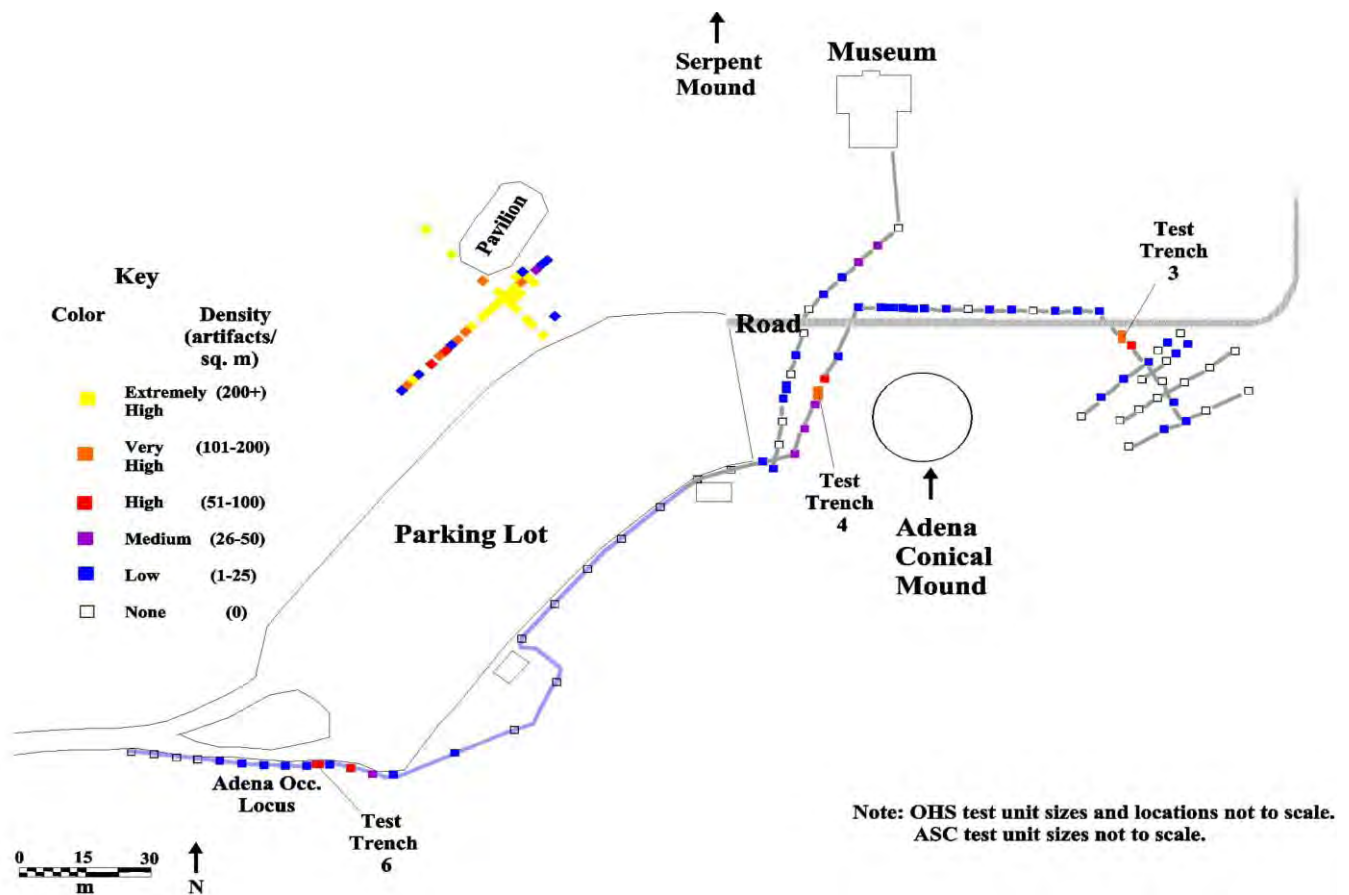


Figure 22. Map comparing density of prehistoric artifact finds made during the OHS (1988–1994) and ASC (2011) investigations at Serpent Mound State Memorial.

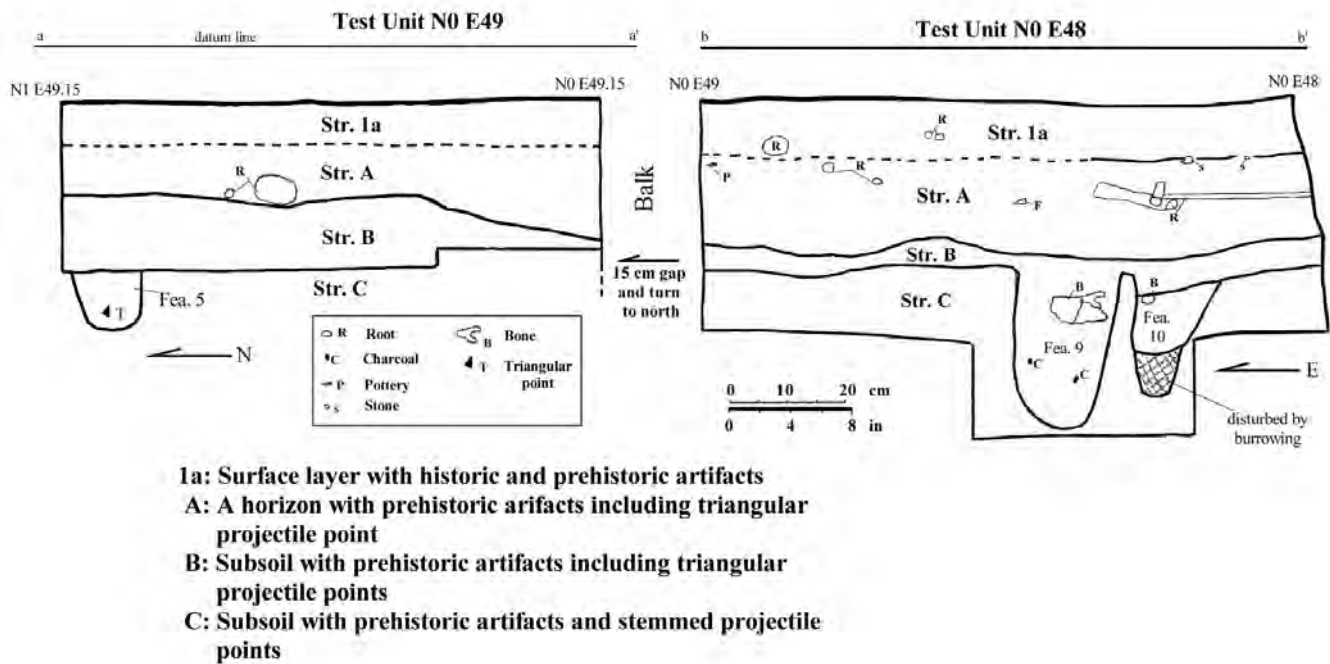


Figure 23. East wall profile of OHS Test Unit N0, E48 and a south-north transect across OHS Test Unit N0, E49 at E49.15 showing intrusive Fort Ancient feature excavated into the earlier Stratum C.

Discussion and Conclusion

Evidence collected by Putnam's (1890) investigation, the OHS's 1988–1994 investigation (Thompson et al. 2013), and ASC's work (Schwarz and Lamp 2011), indicates that there were various occupations or uses of the relatively flat areas on the Serpent Mound plateau. Nearly all of the plateau was lived space where there were small prehistoric occupational loci, activity areas, zones of refuse disposal, and, of course, the previously known Fort Ancient village site. In addition to the well-known conical Adena mound, several smaller mounds existed on the plateau, some of which Putnam (1890) or later investigators excavated and are no longer visible on the landscape. Archaeologists need to consider seriously what the close physical relationship of living areas with the Serpent Mound and the burial mounds tell us about perceptions of the built and sacred environment among the Adena and Fort Ancient peoples on the plateau and what Serpent Mound meant (and means) for people visiting

during the period of construction and thereafter.

For example, in the circum-mound area ASC identified two lithic concentrations, one, northeast of the conical mound, could not be precisely dated. The other lithic concentration is west of the conical mound. It appears, based on the presence of a Cresap Stemmed projectile point, to date to the early Early Woodland period (1000 BC-500 BC). A few other scattered finds, such as a hammerstone and fragment of a bi-pitted stone, indicate relatively prosaic activities were taking place around the conical mound. Also, ASC dated a thermal feature to the Early Woodland period (506 BC-376 BC). This feature and associated debitage and tools in nearby excavation units indicate that this area was an occupational locus. This area is on a slight rise that is the northeasternmost of several slight rises, including some that were determined to be mounds (Putnam 1890). This is important information because it shows the extent and kinds of deposits spread around the plateau, even in seemingly marginal areas on the modern historical site landscape.

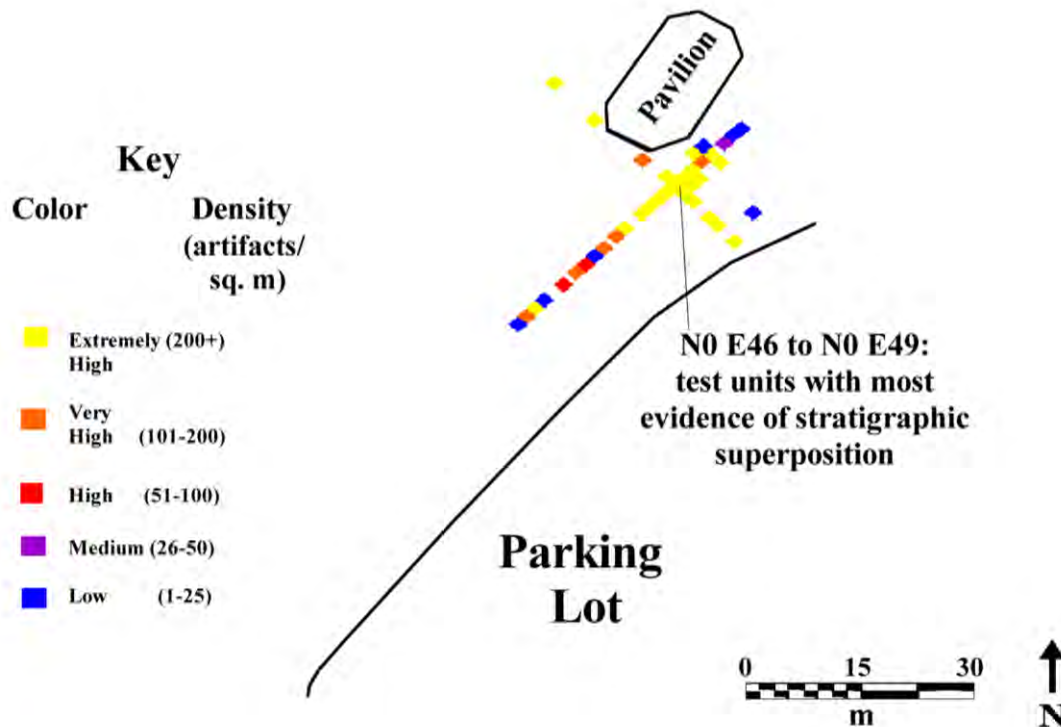


Figure 24. Detailed view of OHS village excavation units with artifact density. Test Units N0, E46 to N0, E49 exhibit the most evidence of stratigraphic superposition of the Early Woodland and Fort Ancient components.

The differing artifact densities examined between the circum-mound area and the village indicate the variety of archaeological contexts present at the site. Archaeologists have just begun to understand the domestic and ritual activities that took place on the Serpent Mound plateau, and the evidence for varying artifact density presented here provides a step towards advancing our knowledge of this topic.

One of the principal findings is that the area north of the conical mound, an Adena construction, continued to be used in the Fort Ancient period. I believe that the ashy buried A horizon is a remnant of the “burnt space” that Putnam (1890:874) excavated. It is noteworthy that the location, size, and shape of the burned space mapped by Putnam roughly match two geophysical anomalies (Anomalies 38 and 39) identified by Burks (2008), although the anomalies do not extend north of the access road, probably because of road-related disturbance in

the surface layer. The road-related strata may have prevented the geophysical instruments from detecting the buried A horizon and associated features. A more recent magnetic susceptibility survey of Serpent Mound State Memorial indicates that the area north of the conical mound has high susceptibility, which corroborates the presence of midden in this area (Burks 2017:83, Figure 43).

Dating of the buried A horizon, via a fragment of wood charcoal, provided an early Late Prehistoric Fort Ancient date. The radiocarbon age determination is 900 ± 25 B.P. The date is very similar to radiocarbon age determinations made by Fletcher et al. (1996) of 920 ± 70 B.P. from charcoal samples within Serpent Mound itself. These facts suggest some activities (at least the deposition of the carbon) in the area north of the mound took place in a similar time frame as activities at Serpent Mound.

The archaeological evidence indicates

continued use of the space around the Adena conical mound well after its construction. Because ritual deposits, including an ash bed, a possible charnel structure, and burial, were under the mound (Putnam 1890:880), it is likely that the adjacent burned area north of the mound and related artifact deposits were ritual in nature, as well. Putnam's (1890:880) relatively prosaic, though vague, descriptions of artifacts found north of the mound, however, do not clearly indicate a ritual function. The limited artifacts found by ASC north of the mound included small amounts of debitage, ceramics, and FCR. These artifacts alone do not provide evidence of ritual activity. Clearly more research is needed on this deposit but the re-use of the circum-mound area across such a long span of time is intriguing, particularly since intrusive burials also were found in the upper portions of the conical mound. The dearth of evidence of the use of the circum-mound area and the plateau as a whole in other time periods like the Middle Woodland period is also puzzling¹³.

Archaeologists have sometimes characterized areas around mounds and earthworks as vacant terrain where few activities took place (Clay 1986; Prufer 1965, 1975). However, current investigations identified circum-mound areas as zones of multiple activities including Early Woodland chert knapping, tool use, and/or disposal of lithic debris. This patterning is consistent with more recent archaeologists' interpretations of activities in areas around Middle Woodland mound and earthwork sites (Dancey and Pacheco 1997; Lepper and Yerkes 1997). Previous investigations have not fully addressed the nature of circum-mound activities for the Early Woodland period or later re-use, but instead have focused on evidence of charnel structures, or other mortuary preparation features that were created at locations which were later buried under mounds (Clay 1986; Pacheco and Burks 2008; cf. Purtilt et al. 2014; Seeman 1986)¹⁴. The evidence suggests the kind of spatial propinquity of ritual and domestic activity deposits known for the Middle Woodland period, actually occurred in this setting previously. Thus, this investigation helps extend

our knowledge of the use of space around burial mounds.

This study provides no direct evidence relating to the debate about the period of construction of the Serpent Mound itself (Fletcher et al. 1996; Fletcher 2014; Hermann et al. 2014; Lepper 2013; Romain et al. 2017). It is important to mention though that particulate charcoal, recovered from the earthwork, might not relate specifically to its construction. Various agents, such as lightning burning trees or tree roots, or earlier unrelated Early Woodland thermal activities, such as the creation of hearth features, could account for the charcoal. Dispersion of the charcoal in the soil could have occurred due to earthworms (Brad Lepper, personal communication to Kevin Schwarz 2016), freeze-thaw cycles in the earth, or other natural processes or human-made disturbances¹⁵. The presence of dispersed charcoal in the Serpent, thus, may not be able to be related clearly to the construction of this earthwork. Certainly, an attempt has been made to provide more convincing proof for the claim that the particulate charcoal present in cores collected at the base of Serpent Mound are related to the period immediately prior to its construction (Romain et al. 2017). But doubts linger without a better demonstration of provenience control, which would be afforded by broader excavations. It remains to be seen if an account of Serpent Mound's construction can be created that places it definitively in the Early Woodland period.

Notwithstanding the controversy on the chronology of Serpent Mound itself, the temporal information from the entire plateau confirms that the most consistent occupations and uses of the landform are during the Early Woodland Adena period and then later during the Late Prehistoric Fort Ancient period. The analysis of projectile points, primarily from Putnam (1890) and Thompson et al. (2013), identified secondary temporal foci of the Late Archaic period and Late Archaic-Early Woodland transition period (Purtill 2013). More research certainly is needed on these other temporal foci. In particular, understanding better the Late Archaic and transitional

antecedents on the plateau would help us to understand the use of the landform (i.e., the origins of ceremonial usage) in the subsequent Early Woodland period, when so much activity took place.

The data generated by the ASC investigation and reviewed in this article provide perspective on the complexity of the archaeological deposits present at this significant historic property. The presence of Adena, Fort Ancient, and historic period deposits on the plateau means that it will take a lot of careful attention to context and stratigraphy, and analysis to determine with certainty the period of construction or use of any of the Serpent Mound plateau's features, including the Serpent effigy itself (Fletcher 2014; Lepper 2013). The apparent Late Prehistoric re-use of the area north of the Early Woodland conical mound indicates the degree to which re-use and other secondary transform effects of subsequent occupations have had upon earlier deposits and need to be factored into our reconstructions of past events.

It is becoming increasingly evident that certain sites in the Eastern Woodland period have long-term histories as sacred places (Pauketat 2012; William Romain, personal communication to Kevin Schwarz, 2016). Sites such as Fort Ancient and Cahokia are providing tremendous insights into continuities of belief and sacrality with historic period Native American societies. This evidence emerging from Serpent Mound suggests that, in addition to being a habitation site of some complexity, most if not all of the Serpent Mound plateau was a sacred place during the Woodland and Fort Ancient periods. Archaeologists would do well to develop, through careful and thoughtful investigations, a better understanding of Serpent Mound and its immediate surroundings as a sacred place.

In conclusion, the Serpent Mound State Memorial, the first archaeological park in the United States, has preserved many archaeological deposits on the plateau surrounding the effigy. The good state of preservation of the site is important because, although the broad outlines of the use of

the plateau have been known for some time, ASC's investigation, as well as the 1988–1994 OHS investigation, shed additional light on the Adena and Fort Ancient period uses of the site. ASC's investigation, the first archaeological project to document the historic period usage of the plateau, appears to have encountered artifacts related to Putnam's camp (Romain 2016), and certainly evidence is present of later activities by tourists and others as the archaeological park was developed and visited during the twentieth century. It is important to realize this evidence is also a manifestation of the fascination that Serpent Mound has had since its construction. The continued work there, including recent attempts to date the Serpent effigy's construction, are testaments to the high level of interest surrounding this significant and enigmatic geoglyph. The pending World Heritage nomination, if approved, would be a fitting honor for Serpent Mound, and its rich legacy, which we are only just beginning to understand.

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Endnotes

1. William Romain (2012) of the Ohio Earthworks Center at Ohio State University at Newark, created a virtual reality fly-through video of the Serpent Mound area. Figure 3 is a portion of the video which includes Serpent Mound and the conical mound and also shows the surrounding plateau.

2. Romain et al. (2017) state that Putnam actually did recover an Early Woodland Adena projectile point from the sod layer within Serpent Mound, although it was not recognized as diagnostic to this period, or identified as such in subsequent analyses. It is curated in the Peabody Museum's collections and labeled as having come from Serpent Mound itself.

3. The Stubbs Cluster in the Little Miami Valley is another Ohio Hopewell site that has a woodhenge (Cowan 2005).

4. Circum-mound is defined as the area around the circumference of the conical mound.

5. A checked cobble is a natural chert cobble, where one or a few flakes have been removed, presumably to assess the quality of the chert for knapping.

6. The subject of the location of Putnam's camp is of great interest in the reconstruction of historic activities on the Serpent Mound. The analysis of historic photographs of the camp (Romain 2016) and geophysical survey results (Burks 2017) suggests that the camp was along the bluff, north of the sinkholes and south of

Serpent Mound. It has to be considered though the camp residence (a series of tents) is but one part of the occupation, which lasted for a few months in 1887. It would make sense that debris would be disposed of away from the habitations (the tents), in that people dispose of trash away from where they reside. Finding crockery or the pipe bowl a little way away is not surprising. Of course, it cannot be proven definitively that the stoneware and pipe bowl relate to the Putnam encampment, but it was the most intensive late nineteenth century occupation of the plateau so the inference makes sense. The electrical line was routed to the museum. A transect of test units surveyed this area and these artifacts were found as result of these excavations and clearance of the trench along the electrical line route. Part of this transect is lower terrain and is sloped. It could be that this slope was a convenient place to throw trash for the Putnam team, which had established residence on the flatter ground along the bluff. I argue the trash is part of the "camp," or is at least a camp-related deposit.

7. The most probable identification of the marble, which is machine-made, is an oxblood corkscrew from the Akro Agate Company, Akron, Ohio. This company was actively producing marbles from 1910–1951 (Block 2017).

8. In using the term village, particularly for the Adena occupation, I am referencing Putnam's (1890) description of the type of settlement he believed he had located. It is realized that there is some skepticism about whether the settlement on the Serpent Mound plateau truly would qualify as a village in a cross-cultural anthropological sense, as relates to a comparative taxonomy of settled life. Certainly, the use of the term was taken up by other archaeologists (Fletcher et al. 1996; Griffin 1943), but doubts have arisen about what kind of settlement existed south of the Serpent Mound in the Early Woodland and Fort Ancient periods. It is not my purpose in this article to attempt to investigate or critique the construct, but rather to provide a description of ASC's excavations of the site and to make some comparisons with the findings of other archaeological investigations of the Serpent Mound plateau. Certainly though, regarding the Fort Ancient component, the 1988–1994 OHS water line investigations identified a very dense settlement (Thompson et al. 2013), which would be consistent with a Fort Ancient village, as traditionally defined. Additionally, a

contemporaneous description relates that as many as 20 domestic structures, referred to as “wigwams”, were identified and excavated by Putnam during his investigations, though Putnam (1890) gives this structural evidence short shrift, preferring to focus on burial investigations (Anonymous 1889, cited in Fletcher et al. 1996:134). Less is known about the Adena occupation and there is no evidence that the Adena in Southern Ohio lived in settlements sizeable enough to be called villages. It is hoped that this article, and the considerable growth of research on Serpent Mound generally, will stimulate further investigation into these settlements. Particularly, future work should focus on disentangling evidence of the Adena and Fort Ancient habitation components and should put them in a comparative settlement perspective.

9. The lack of any Paleoindian projectile points or even Late Pleistocene radiocarbon dates is important because recently Graham Hancock (2019) claims that Serpent Mound, or least an early version of it, was in existence as early as 13,000 years ago, which would be during the Paleoindian period. This idea is not founded upon empirical evidence and scholars and archaeologists give no credence to Hancock’s (2019) ideas about Serpent Mound and early American settlement (Colavito 2019; Feagans 2019).

10. This long tail distribution is identified because the standard deviation exceeds the mean (Brown and Tukey 1946:1).

11. In addition to stemmed Adena projectile points, an Adena leaf-shaped blade was recovered.

12. Twelve coins (dimes, nickels, and pennies) had readable dates ranging from 1918–1971.

13. Recent investigations by Romain’s research group and by Lepper and his collaborators, as well as ASC, have yielded more Early Woodland and Fort Ancient dates, confirming two major occupations making up the chronology of the site, a fact known since the time of Griffin (1943). On the one hand, the temporal gap and relative absence of evidence of Middle Woodland occupation of the plateau is surprising, in that it implies lack of use of the plateau and its monuments for a long period of time. But, on the other hand, the gap confirms previous information and, it should be said, that Hopewell habitation-use areas are not particularly

common in Ohio, so the lack of this occupation in this place should not be seen as problematic.

14. In a sophisticated critique of prior studies, Purtill et al. (2014) note that circular paired-post structures, which are often considered to be primarily Early Woodland mortuary structures found below mounds, in fact occur in a wider variety of contexts. These include “open air” paired-post structures, which are not associated with mounds (Purtill et al. 2014:67). Additionally, there is a good deal of complexity in contexts and relationships of features and artifacts, even in paired-post structures which underlay mounds. These data falsify the notion that paired-post structures were just used as mortuary preparation structures, or at least provide a greater variety of functions for which they could have been used by the Adena. Other ritual and even domestic functions have been suggested for these structures. For the conical mound, Putnam (1890:880) described a prepared clay floor, a single primary burial, and two formations of four small pits nearby, among other finds. He writes that these small pit features were not posts, discounting the idea that these features could relate to a sub-mound structure. There is not enough detail presented in Putnam’s (1890) description of the conical mound and the sub-mound feature assemblage to compare against this broader Early Woodland data described by Purtill et al. (2014). Thus, it is not currently possible to assess the conical mound against these recent interpretations, nor against earlier interpretations of sub-mound structural remains (Clay 1986; Seaman 1986). The mortuary and other cultural practices enacted at the conical mound are in need of further reconstruction from Putnam’s notes and from the artifacts present in the Peabody Museum and then a comparison needs to be made with regional examples.

15. For example, Putnam’s restoration work on the Serpent earthwork created disturbance and redeposited soils so that the modern construction is a composite of the original and reconstructed earthworks. Some have suggested that this could be the source of charcoal dating to the Fort Ancient period (Romain et al. 2017).

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