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## Vol. 1 Ch. 2 At the Heart of Fort Ancient

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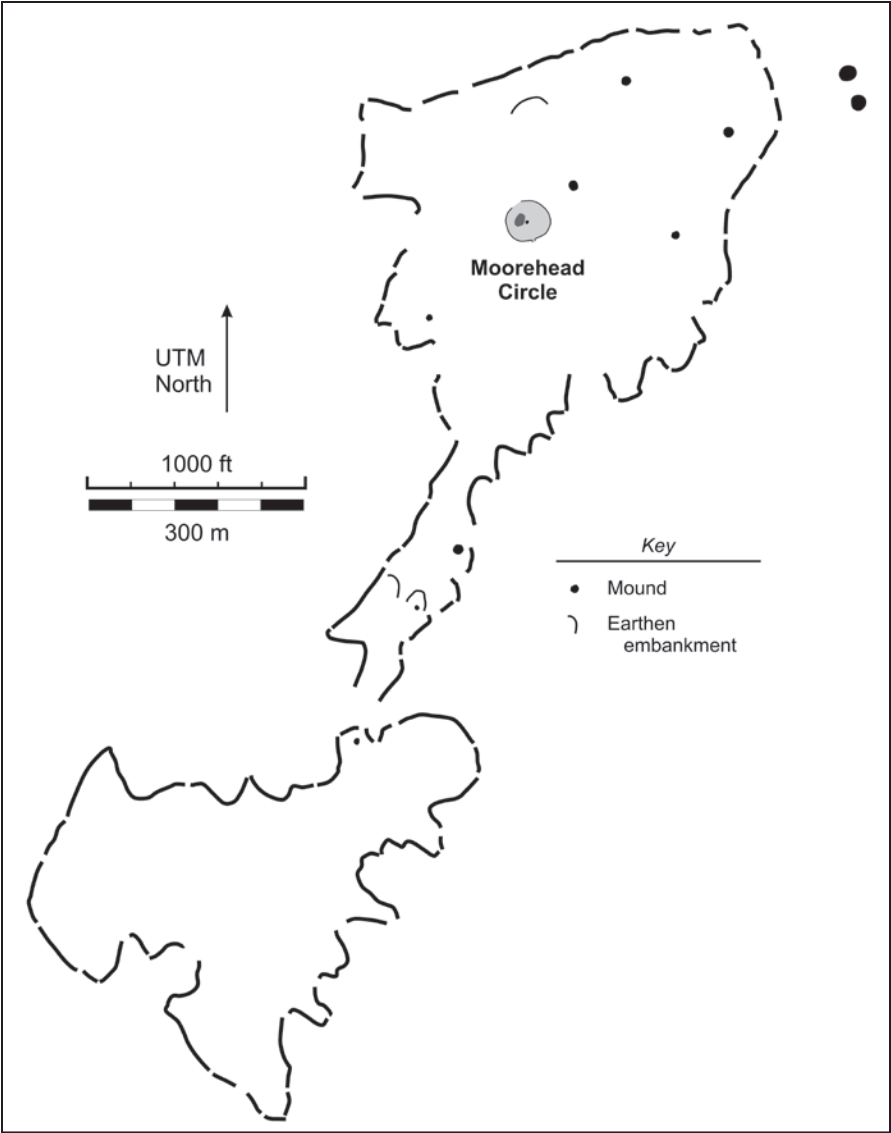
## Chapter 2

# At the Heart of Fort Ancient

Robert V. Riordan

**T**he Fort Ancient earthwork, one of the most elaborate building projects ever undertaken by the people of the Hopewell culture, occupies a peninsular landform in northern Warren County in southwest Ohio (Figure 1). Classed as a hilltop enclosure, its roughly 5.8 km of embankments, comprised of earth and stone, are connected to the adjacent uplands only at its northeast corner. Steep slopes descend from its walls down more than 80 m to the Little Miami River, which has cut a gorge to its west. Fort Ancient's prominence among Ohio earthworks has been recognized and publicized since the first years of the nineteenth century, and following several years of archaeological study by Warren K. Moorehead (1890), the state of Ohio purchased its acreage between 1890 and 1908 (Otto 2004).

Erosion has been a destructive problem at many hilltop sites, and Fort Ancient has not been immune to it. In the early years of the twenty-first century, the staff of the Ohio Historical Society (OHS) applied for and received a grant from the federal "Save America's Treasures" program to combat erosion at six specific locations along Fort Ancient's embankments. Heavy trucks were to be used to transport many tons of large rocks on internal service roads to points adjacent to the eroded areas, where other equipment would then deposit the rock. Prior to that, in order that no major archaeological features would be inadvertently destroyed by this activity, part of the grant money was used to fund remote sensing surveys



**Figure 1.** The Fort Ancient earthwork, depicting the location of the Moorehead Circle. (From GPS survey January 2007 by Jarrod Burks and William Romain. Zone 16 north, datum = NAD 1927 [conus]; map by Jarrod Burks.)

of each of the areas that separated the targeted embankments from the roadways. The survey work, which included magnetometry and electrical resistivity, was conducted by Jarrod Burks of Ohio Valley Archaeology, Inc. In the North Fort portion of the earthwork, however, one location was different from the rest. There, the deteriorating embankment, which overlooks the Little Miami River, was more than 150 m from a road, and rocks would have to be trucked across the open field to it. During the survey of that access route, Burks immediately recognized that the magnetometry data suggested that a collection of anomalies across a large area might all be part of a singular entity. He was given permission to enlarge his survey area beyond just the 20 x 20 m blocks he normally employed in data collection, and his resultant find is the subject of this essay.

What Burks had detected was a collection of features that described a well-defined circular space about 60 m in diameter. At its center was a 4 m diameter feature that contained a highly magnetic soil. Other anomalies pointed to the internal presence of pits and/or post pits. In December, 2005 the OHS Curator of Archaeology, Martha Otto, contacted me to ask if I might consider investigating this complex with my summer field school. Having just completed the long-term investigation of a small hilltop enclosure in Greene County, about 35 miles from Fort Ancient, I was quick to accept the opportunity. Archaeological work began in the following summer of 2006. It quickly became clear that the complex needed an identity other than the awkward “the big circular feature in the North Fort of Fort Ancient,” and by that July I decided to call it the “Moorehead Circle,” honoring the contributions made by Warren Moorehead toward the preservation and early interpretation of the Fort Ancient earthwork. The archaeology of the Moorehead Circle has consumed eleven field seasons, from 2006 through 2016. The remotely sensed circular form has by this work been shown to have been due to the presence of postholes, in which wooden posts had been erected around its perimeter. It is an extraordinarily complex edifice, and while it still retains many secrets, its investigation has achieved at least a partial understanding of it.

### **HOPEWELLIAN CIRCLES**

Many hundreds of geometrically shaped earthen forms were constructed by people of the Hopewell culture across the landscape of southern Ohio during the roughly four centuries of their sway. Prominent among them were circular embankments, usually with one or more openings. A few occur as large, stand-alone figures, such as the Ross Township No. 1 earthwork near Hamilton, Ohio, enclosing 26 acres, the Shriver Circle in Chillicothe, enclosing 28 acres, the eight acre Bournev-

ille Circle, and the Great Circle (Fairgrounds Circle) at Newark. Smaller circular works, occurring alone as well as in the vicinity of larger enclosures, are more ubiquitous. Complete circles, as well as arcs, or partial circles, were major components of most of the large, composite geometric earthworks that were constructed on broad alluvial terraces in south central Ohio. Famous examples of these include the Seip, Frankfort, Liberty, Hopeton, High Bank, and Works East earthworks of Ross County, the Octagon Earthwork at Newark, and more isolated examples like Circleville and Seal. Many of the large, composite works were also embellished by the presence of relatively smaller circles that were located in the immediate vicinity of the large enclosure. As an example, the “smaller” circles recorded by Squier and Davis (1848) at High Bank include three with diameters of about 91 m (300 ft) and another of 76 m (250 ft). When viewed as small elements on a large canvas, the potential importance of circles like these tend to get overlooked; they are generally viewed as contributing elements to the greater whole, a complex that in this case was dominated by the large circle and octagon. Each one of these smaller circles, however, individually constituted a major enclosure, whose creation required a significant investment of time and labor. The examination of circular works like the Moorehead Circle may help to bring to the fore their contributory potential to the understanding of what happened at complex, large earthworks.

Despite the frequency of circular Middle Woodland works on the landscape, there have been very few archaeological excavations of them. The four examples that follow are included because each one, like the Moorehead Circle, demonstrates an association of postholes with a circular Hopewellian construction.

The Great Post Circle is a part of the Stubbs Earthwork complex near Morrow, Ohio. It is of particular interest here because it is located just a few miles south of Fort Ancient. The circle, which lay just outside the earthwork, was originally marked by a low embankment, and was included on the map that Whittlesey made of the complex (1851). Excavation in 1999 by Frank Cowan, Bob Genheimer, Ted Sunderhaus, and volunteers revealed that the Great Post Circle was approximately 75 meters in diameter, had a single ring of 171 large (30–50 cm) postholes around its perimeter (Rippl 2009), and that it lacked obvious major interior features. Radiocarbon dates from three postholes date it to the late-second century AD (Cowan and Sunderhaus 2002). Because of the proximity of Stubbs to Fort Ancient, it would seem to be beyond doubt that members of the same Hopewellian population contributed to the construction and were involved in the use of both earthworks and their post circles.

Farther afield, in Adams County, one of two circular embankments located below the Fort Hill hilltop enclosure was partially excavated by crews from Ohio State University under the direction of Raymond Baby and William Sassaman in 1952 and 1953. Known as the William Reynolds enclosure, it had two concentric rings of postholes under a low 54 m diameter embankment, and it contained some interior features. A physical model located in the museum at Fort Hill interprets this as having been a circular communal house, much like those employed by the Yanomamo in South America (Baby 1954, Lynott 2014). This interpretation was apparently worked out during the original fieldwork (Sassaman 1953), but it lacks an artifact assemblage that would point to its use as a place of habitation. It seems more likely that a woodhenge type of structure was constructed that was subsequently replaced with a low earthen embankment.

The large circle at High Bank, near Chillicothe, which encloses some 20 acres and is connected to the octagon, was investigated by Orrin Shane in the 1970s and by N'omi Greber in the 1990s. A narrow trench, in which posts had been set about a meter deep, was discovered to have preceded the building of the earthwork. The posts in it had been removed before the circular embankment was built (Greber 1998, Greber and Shane 2009). Shane and Greber only examined a small portion of the circle, so it is not known whether an earlier post ring may have preceded the entire course of the circular embankment. Radiocarbon dates on four of the burned posts average around AD 90 (1860+/-80 BP, uncalibrated; Greber 1998).

In 2014, Bret Ruby began to excavate the Great Circle within the Hopewell earthwork near Chillicothe. Squier and Davis (1848) mapped this feature as a low embankment. Since then it was completely plowed down, but it was relocated by gradiometer surveys initiated by Jennifer Pedersen Weinberger and completed by Jarrod Burks. In limited work to date, Ruby has found perimeter postholes over a meter deep associated with an exterior ditch. In the two that have been sectioned, both showed that the posts in them had been removed (Ruby, this volume, Chapter 4). The diameter of the inside edge of the circular ditch is 114 m, while the diameter of the post circle is a few meters smaller. Based on the posthole spacing he observed in the magnetometry data on the circle's east side, Burks estimates that the total number of posts may have been around 108. The estimate is tentative because not every posthole shows up in the magnetic gradient data, and some were lost to the construction of the modern road that runs through the earthwork. William Romain has recently shown that "the summer solstice [sunset] alignment is orthogonal to the diagonal of the ¼ HMU [Hopewell Measurement Unit, 1054 feet] square; and further, the diagonal of the square and its solstice orthogonal establish the locations for at least two of the gate-

ways into the circle” (Romain 2016). The scale of Hopewell’s Great Circle dwarfs both the Moorehead Circle and the Great Post Circle at Stubbs, quite possibly reflecting its presence in what was surely one of the central places in the Ohio Hopewell world.

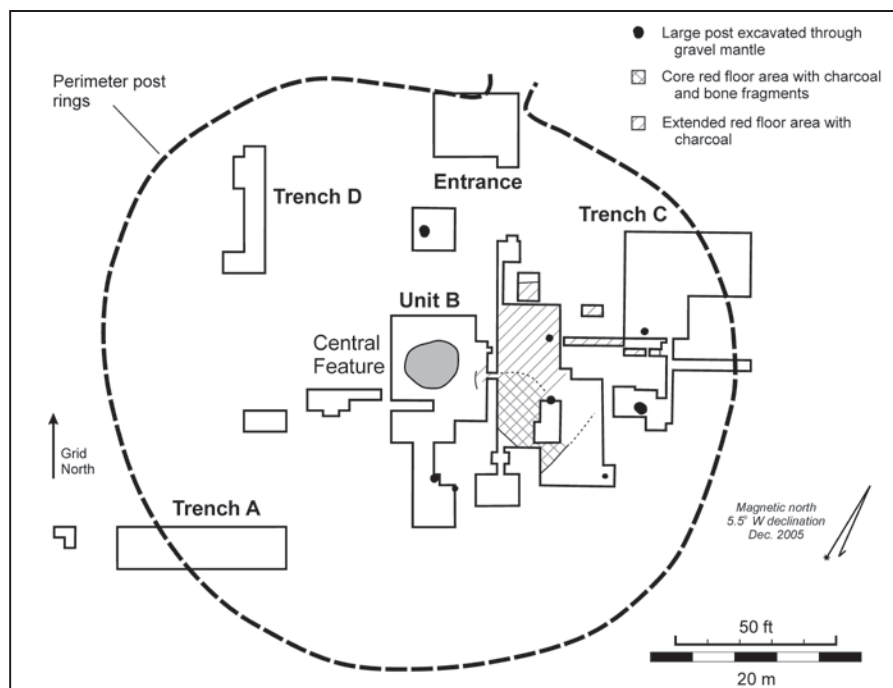
Whether there are rings of postholes below other Hopewell circular embankments is an open question, but this small sample does suggest that there could be many more. Some, like the Moorehead Circle, may never have been detected and mapped, and may lie undiscovered inside earthwork enclosures, or, like at Stubbs, just outside them. Spielmann, for instance, has suggested that a number of post pits at Seip that were excavated during the investigation of the several interior structures there may be from a previously unrecognized circular ring of posts (Spielmann and Burks 2011).

The limited archaeology that has been conducted at circular enclosures has, for the most part, been descriptive in nature, aimed at revealing a sample of their constituent features, with functional interpretations still to come. The Hopewell Great Circle is the exception, but Romain’s insight there was not based upon any fieldwork beyond the remote sensing surveys.

The long program of archaeological investigation conducted at the Moorehead Circle has yielded a degree of understanding that more limited work at other circular sites has to date been unable to provide. In fairness to them, however, the work at Fort Ancient was not constrained by the imminent loss of the resource, and most importantly, the Moorehead Circle may possess an interior suite of features that so far does not seem to have been replicated at other such sites (there are, however, a number of probable features, interpreted by Ruby as earth ovens, at the center of Hopewell’s Great Circle). Moorehead could therefore be uncommonly complex, and it could be that, by discovering some aspects of its meaning, we still may not have found the key to understanding other circular Hopewellian constructions. It is also the only example so far known to have been situated inside a hilltop enclosure, and that may be a meaningful distinction in itself. Its apparent duration of use, spanning perhaps eight to twelve human generations, from the first into the fourth centuries AD, may also be unmatched at other, and even otherwise potentially comparable, sites, nor may the changes that occurred there during its period of use have been reproduced elsewhere.

#### **THE MOOREHEAD CIRCLE**

The first sighting of the Moorehead Circle was in the data that Burks collected with his gradiometer in 2005, which displayed a circular form nearly 60 meters in diameter. Burks initially thought that he might have found a ditch and plowed-down



**Figure 2.** The Moorehead Circle, with excavation units of 2006–2016; the location of the perimeter post rings is approximate.

embankment, and that was the first thing that we attempted to ground-truth when excavations began in June 2006. To date, there have been four excavations on the perimeter of the Moorehead Circle: one trench that intersected its northeast side, two on its west/southwest side, and one on the south side (Figure 2).<sup>1</sup> The latter was situated to examine what appeared to have been a formal entranceway, where parallel arms (ditches or posts in trenches) projected a short distance outward from the ring of post features; later, after a full ground-penetrating radar (GPR) survey was conducted in 2010, it was found that the location was highly reflective to the radar, expectably due to the presence of a buried stone surfacing, or pavement. Together, these four excavations examine only a small fraction of the entire perimeter, but it is expected that what has been seen in them is probably representative of the unexamined portion.

On the northeast side, a 4 x 16 m trench (Trench A) exposed portions of two concentric rings of postholes, and a somewhat jumbled group of additional postholes that may have been part of an exterior third ring. Of these, the middle ring had by far the most substantial features, with five postholes that ran diagonally





**Figure 3.** Perimeter posthole, feature 1, Trench A. Excavation of this posthole was incomplete in this photo. Rocks were used to refill the posthole (left), and the insertion ramp (at right). (Photo by Linda Pansing)

across the width of the trench, each one accompanied by an insertion ramp. After the posts had been set in their holes, buttressed by chinking stones rammed in alongside them to reduce lateral motion, the insertion ramps were refilled with soil and an average 100 kg of rocks (Figure 3). In almost every instance at the Circle the rock of choice was limestone, which had to have been obtained from the Little Miami River or its vicinity. This means that obtaining each rock would have necessitated a trip of perhaps 0.5–1 km down the 80+ vertical meters to the river, and then a hike back up to the earthwork while burdened with a load of stone.

On the west side of the Circle, in a much larger excavated area (Trench C, 96 m<sup>2</sup>), three concentric rings of postholes were found, with the most substantial one being the middle ring. Only one insertion trench was observed on that side, where postholes were instead set into individually dug holes, or, in a couple of instances, multiple posts were placed in larger post pits. The middle ring was begun by digging a shallow trench, followed by the excavation of closely set individual postholes into the bottom of it. The postholes extended an average of 49 cm below the base of the trench, which likely represents the average reach of an extended human arm.

In virtually all cases, the posts that were set in these perimeter postholes were subsequently removed by the Hopewell. Most of the postholes were then refilled

with fairly clean soil, sometimes mixed with some gravel, scattered charcoal fragments, and tipped-in chinking stones or loose rock, but only occasionally with one or more artifacts. A small minority of postholes were intentionally refilled with as much rock as possible, so that a column of stones was formed from a posthole's base to its top. This deconstruction of timber elements has been seen at numerous Hopewell sites, notably including the structures at Seip, the fence at High Bank, the posts of the Great Post Circle at Stubbs, and posts from the Great Circle at Hopewell.

When radiocarbon dates are used to assess the time when posts were erected in sites like these, unless actual fragments of the post were left behind, which did occur at High Bank, they are based on charcoal that was included in the refill soil. Since that charcoal would have been derived from the site environment at the time the posts were removed, depending on where it came from, it could be older than (even much older) or else roughly contemporaneous with the period of use of the post, and so using a date obtained from such charcoal in order to estimate when the post was in use becomes something of a crap shoot. If the site in question was used only for a short time, several decades or so, then any refill charcoal is likely to be close to the age of the post; in the case of southern Ohio earthworks, however, many of which were probably in some form of use for a century or more, such dating becomes more problematic.

And then there is always the outside chance that charcoal was introduced into a feature by a burrowing animal, and that this fact went unnoticed during the excavation of the feature. Radiocarbon dates based on such material could be older, younger, or equal in age to the context it purports to date.

That being said, there are five radiocarbon dates that were run on wood charcoal from Moorehead Circle perimeter postholes, including one date that is anomalously more recent than the others (Table 1). The calibrated intercepts of the four acceptable dates range from 10 BC to AD 130. Taken together, they likely indicate that the appearance of the early Moorehead Circle was characterized by a wood-henge-like arrangement of standing wooden posts. Whether the three post rings that were detected in the ground were contemporaneous, or whether one ring was replaced by another, has not been sorted out. Post spacing was not uniform. Those on the east side, set using insertion trenches, were almost a meter apart from each other, although there was no strict uniformity. On the west side, the posts were set closer together, and the visual effect would have been of something more like a fence. With postholes averaging over a half-meter deep, including a few cases more than a meter deep, it is likely that the posts themselves projected about two to three meters above the ground.



**Figure 4.** The entrance, with its superimposed pavements (view to grid south). Moistened (dark) stones are from the upper pavement. Many upper stones at the center were removed to permit exposure of the lower pavement.

**Table 1. Calibrated Perimeter Posthole AMS Radiocarbon Dates.\***

Lab No.	Feat	Locus	13C/ 12C ratio	Conv RC age(BP)2	sigma range 1	sigma range	Int
Beta-225388	21	Tr.A	-25.9 0/00	1950+/- 40	40BC- AD130	AD10- 80	AD60
Beta-225389	1 (PH)	Tr.A	-22.5 0/00	1600+/- 40	AD390- 550	AD410- 540	AD430
Beta-225391	1 (ramp)	Tr.A	-29.9 0/00	1870+/- 40	AD60- 240	AD80- 210	AD130
Beta-251617	56	Tr.C	-24.7 0/00	2010+/- 40	100BC- AD70	50BC- AD30	10BC
Beta-251622	125	Tr.C	-23.6 0/00	1910+/-40	AD10- 210	AD60- 130	AD80

\*All dates are based on the 5568-year half life. Calibration using the INTCAL04 database.



**Figure 5.** The red mound central feature (feature 22).

The archaeology also indicates that a formal entranceway was part of this early construction. As previously noted, the magnetometry data showed parallel everted arms (ditches?) on the south side of the Circle, and the GPR survey there indicated a sizable radar-reflective area. Excavations subsequently revealed a pavement of limestone rocks that was intercepted by possibly three rings of postholes (Figure 4). Unexpectedly, a second pavement was found several centimeters underneath the first. Gaps had been left in some areas of both pavements to allow for the placement of perimeter posts. The fact that posts and pavements appear to have been interdigitated is seen as evidence that the entrance was an integral early aspect of the Circle, and that the pavements functioned as durable surfaces upon which people were intended to enter into a very special space.

At the approximate center of the Circle, Burks had recorded the presence of a strongly magnetic soil. Excavation there (in our Unit B) revealed a low mound four meters in diameter, composed of a vibrantly reddish (and probably baked) soil (Figure 5). It was internally free of biological materials except for trace amounts of charcoal, and the excavated portion was devoid of any artifacts. Prior to the installation of this central feature (Feature 22), a smaller pit 1.4 m long by 70 cm wide (Feature 183) had been dug in the same location; only the deepest 18 cm of it was found intact below the bottom of the red soil of Feature 22, which had trun-





**Figure 6.** Part of the pottery deposit in feature 42, the apron of soil that surrounded the central feature.

cated the upper part of it. In what remained of Feature 183 there was a small, scattered amount of ash. What this pit had originally contained can only be surmised, but I note that its size is consistent with that required for a burial.

The central red mound was surrounded by a meter-wide apron of soil (Feature 42). Primarily on its northwest side, the soil covered a deposit of several layers of broken pottery that were intermingled with ash and charcoal (Figure 6). While the contents of this feature appear to have been deposited in a single episode, it is the source of two radiocarbon dates, whose intercepts of the calibration curve are AD 120 and 230. Four small pits and several postholes lay directly adjacent to the red mound. We have dates from two of the pits, with intercepts of AD 60 and 130, and another date from one of the postholes, with an intercept of AD 120.

The carbon dates from the perimeter postholes and central feature complex do not illuminate a smooth narrative trajectory, but they do seem to indicate that early construction probably occurred late in the first and into the second century AD. To further complicate matters, to the west (or, grid east) of the central red mound is an even more complex assemblage of features and stratigraphy that indicates development across at least several decades. In order to describe this area in what is hopefully a fairly coherent way, I will outline what I believe to have been the Hopewellian

timeline of construction. To do so, we must go back in time to a point before the rings of posts, the paved entrance, and the central red mound were present.

Several meters to the west of the central red mound, on what appears to be a buried A soil horizon located about 60 centimeters below the present ground surface, postholes have been found that may have been part of a structure. From the depth of the postholes, the hypothesized structure appears to have been quite substantial, and possibly roofed. Several of these are on the west side, directly north of the central red mound, while others are six to seven meters to the west. The area in-between these post clusters was either not excavated or was not taken down to the level of the buried A horizon surface where additional examples might be found, for reasons explained below. Some areas were partially disturbed by later construction. Two especially large and deep postholes, Features 530 and 618, may have been associated with this hypothesized structure, but they are about 10 m apart from each other, and their function is not known. What we do know is that all of these early posts were removed before subsequent construction occurred.

Following their removal, the surface level of the northwest quadrant of the Moorehead Circle was increased in height by the addition of up to about a half meter of fresh soil. The original ground surface, the buried A horizon soil seen in multiple excavation profiles, has been traced all the way out to the extreme west edge of the Moorehead Circle, into which a trench was dug in 2015. There, the carefully placed layers of soil used to build up the surface could be clearly seen. The trench served to demonstrate that the perimeter postholes were dug into it only after the surface had been elevated. Seemingly, the builders desired that all the perimeter posts would be set on a consistently level surface, which necessitated the buildup.

One radiocarbon date was run on a chunk of wood charcoal found in association with the buried A horizon soil, and not in a posthole. While I am keenly aware that any single date cannot be assumed to accurately identify the time after which the surface buildup began, this one is consistent with other dated contexts. It intercepts with the calibration curve at 20 BC, 10 BC, and AD 1. This date is also the only proxy time marker for the early set of postholes, those associated with the hypothesized open post enclosure or roofed building that stood near the center of what later became the Moorehead Circle. That structure, whatever its makeup, may have coexisted with the presence of the small pit (Feature 183) found under the central red mound. It currently appears that these central developments were present before the Moorehead Circle became a circular space ringed with posts, and before the construction of its formal entranceway. Since the true nature of



**Figure 7.** The core area of the red floor during its excavation in 2015.

these earliest developments is unknown, it is impossible to say whether or not the post rings and the later centrally located features evolved from them, or whether the later uses of the Moorehead Circle represent an abrupt change of focus. With the one radiocarbon date cited above and the dates on the post rings and central red mound with its pottery to guide us, it looks like the first structure inside what became the Circle was probably built in the first century AD.

With the elevation of at least part of the surface of the Circle's northwest quadrant, the rings of posts (or, at least, the first ring of posts) were in all likelihood quickly constructed, and the new interior complex began to take shape. Archaeological work conducted between 2006 and 2009 was partially devoted to revealing the central red mound and its associated features. After the GPR survey was conducted in 2010, the focus shifted to the area immediately to its west. It was there that the most interesting find of all was made in 2015.

It is not known exactly how far into the interior of what became the Circle the soil buildup went, but it seems likely that it included much of the area where the central red mound (Feature 22) was formed. What seems to have happened, soon after the new soil had been placed, was that a new excavation was undertaken into that very same soil across part of it. A shallow basin measuring at least 14x18m was dug, cutting through the A horizon on its eastern side where the soil of Feature 22 was heaped. To the west of that, the bottom of the basin left the A horizon surface





**Figure 8.** Burned bone fragments amid embedded charcoal in the red floor core area.

intact. A buff-colored soil two to four centimeters thick was deposited at its base, and directly on top of that what I have termed the “red floor” was formed.

The “red floor” describes a stratum between four and seven centimeters thick that has a distinctly reddish color, especially when freshly exposed (Figure 7). Then, its Munsell color was often perceived to be in the 2.5YR7/3 (light reddish brown) to 5YR5/8 (yellowish red) range. It is devoid of any gravel, and is very finely textured everywhere. It varies texturally across space, described in some areas as sandy clay loam, and in others as sandy clay, silty clay loam, and clay loam. In its core area, flecks of charcoal are visible everywhere in it, along with traces of ash, occasional bits of mica, and small bits of heavily burned bone (Figure 8). The red floor extends well beyond that core, however, to both the south and west; why it did not extend to the north is unknown. The “extended” area of the red floor, that is, the portion beyond the core area, is similar to the core in that it has soil of the same dark reddish color and the frequent occurrence of scattered charcoal bits, but it lacks any detected fragments of burned bone. In the core area there are also some places where there are some larger pieces of wood charcoal, some measuring as large as 2 x 5 cm. The impression it gives is that wood might have been heaped above the floor, set alight, and that some larger burned fragments settled on the



floor and became embedded in it. The north edge of the basin that contains the red floor was preserved. Its vertically sloping side appears to have been baked red and hard, presumably by the fires that blazed inside it. Because it is expected that those fires were large and intense, it is unlikely that there could have been a roof over the basin, nor does it appear that it was surrounded by a post enclosure.

The big question, of course, is what was going on here. The presence of the burned bone would seem to be the key factor, and it suggests at least two possible interpretations. First, that this was a large communal kitchen, where meat was cooked in support of feasting. Second, that it was a crematory facility, albeit on a scale not seen at other Hopewell sites. Since the pieces of burned bone were too small to preserve morphology that would make a species identification possible, it was hoped that DNA could be extracted from them and that it would reveal their origin. With the aid of a Patricia Essenpreis Grant from the Ohio Archaeological Council in 2015, several small pieces of the burned bone were submitted to Dr. Deborah Bolnick's lab at the University of Texas at Austin for DNA testing.

Unfortunately, the results indicated that the samples had been contaminated during collection and could not provide a definitive answer to the question posed. However, no deer DNA was detected, which would probably be the expectable game meat that a communal kitchen might process for a Hopewell feast. This view is also supported by the lack of any stray large pieces of identifiable bone and the absence of any partially burned bones, both of which would likely be present in a cooking facility. The greatest likelihood is that the basin contained a facility that was used to cremate human remains. If it was indeed a crematory, it would presumably have been a regional facility, serving a population in what is now southwest Ohio and perhaps in adjacent portions of southeastern Indiana. Logic suggests that bodies of the deceased would not have been transported to Fort Ancient in the flesh, but that instead curated collections of defleshed bones were transported from around the region to Fort Ancient, and cremated there in the context of a predictable, ritually informed schedule. The bits of burned bones that were archaeologically recovered from the red floor were probably pieces that were overlooked when the remains were collected by the Hopewell. Questions about whose remains would have been qualified for final processing at Fort Ancient, and where their cremated remains may ultimately have gone afterwards cannot at this point be answered. The known Middle Woodland cemeteries at Fort Ancient occurred on artificial terraces below the embankments of the South Fort, where inhumations were placed under layers of stones.

The radiocarbon chronology from the basin is also at this point a bit murky. A sample of wood charcoal from the red floor had a calibrated two-sigma range between AD 85 and 240, with an intercept of AD 135 (Beta-436044), which agrees well with most of the dates from the central red mound. A date on charcoal from the bottom of the basin a few meters away, however, had calibration curve intercepts between AD 260 and 320. Stratigraphy leads us to expect that the dates from both areas, red mound and red floor, should be in general agreement, which the initial red floor date supports. In 2016, a short east-west trench was dug that connected the red floor to the central red mound. It served to visually demonstrate that the surface elevations of the two features had been nearly the same. Numerous additional samples of charcoal were collected from the red floor, and in the near future several more will be processed, hopefully solidifying the estimate of the time when it was in use.

A tentative view of the red floor's use is that pyres of wood were regularly erected on it, that ancestral bones were deposited within them, probably in containers such as deerskin bags, and that fires then consumed most of the wood and reduced the bones to cremains. Use of the area in that manner for a protracted time, probably measured in decades, is what is responsible for the thickness of the floor, the ubiquitous presence of wood charcoal bits in it, and its general lack of artifacts. Beyond the core area, where the burned bone fragments were found, a deep reddish-colored floor also embedded with bits of charcoal extends to the south and west. The absence of bone across the larger expanse of red floor is somewhat surprising. If all crematory activity was confined to the core area, the one to three centimeter thick red floor outside it is hard to explain. Charcoal might have been spread by burning embers across many square meters beyond the core processing area, but it may be worth noting that the prevailing winds on the site are from the west to east.

Because of the perceived uniqueness of the red floor, a decision was made to impact it as little as possible during our investigations. This meant that many postholes that originated from levels above it were not sectioned below the level of this floor. A soil auger was used to determine the depths of postholes that originated above it and extended below it, as well as the depth of the postholes that originated at the level of the red floor. The surface of the red floor was shovel-skimmed and then troweled, with generally one to two centimeters being removed in the process. This means that, in both its core area and extended area, generally from two to five centimeters of the red floor remains intact. The major downside of this decision is that the old surface below the bottom of the basin, which contains the red floor, has been left unexamined, and that any postholes from the hypothesized structure

that may have preceded the establishment of the Moorehead Circle that might be present remain undetected across this space.

After whatever period of time the red floor was in use, it was subsequently covered by multiple thin layers containing high proportions of sand, along with gravel and clay. Profiles reveal that several surfaces existed, upon which pockets of charcoal indicate that some burning continued to occur, although on a reduced scale. This activity did not necessarily involve either bodies or bones, since very few pieces of burned or unburned bone were recovered from any of the strata that lay above the red floor. What was probably a crematory may have been changed into something else, although precisely what that might have been is not evident. Two radiocarbon dates from these strata that overlay the red floor indicate use in the late third or early fourth century AD. If this is accurate, it would point toward a very lengthy, and perhaps an improbably long, period of use of this area at the heart of the Circle.

After the basin was eventually filled with a total of about 25 cm of mostly sandy strata, the resultant surface was impacted by the excavation of a new series of post-holes. These have not, unfortunately, provided us with a comprehensible structural floor plan.

It was at this point that another set of features made its appearance. In the southern part of the Moorehead Circle, between the central red mound and the stone-paved entranceway, a series of linear trenches were dug across the Circle by the Hopewell. They all originate from the stratum at the top of the basin or its equivalent beyond the basin to the south. As seen in the GPR data, those closest to the perimeter post rings are approximately concentric with them, while those toward the center of the Circle run in straighter lines. Most originate in the center/southeast quadrant of the Circle and extend to the northwest, in the direction of lower ground that runs off into the great ravine to the north of the Circle, which serves to channel runoff down to the Little Miami River. There are also a few short trenches that are in the southeast quadrant of the Circle and extend to the northeast, where the ground also gradually falls away. The first trench to be detected cut across the southern edge of the central red mound (Feature 22), and others were subsequently exposed that ran parallel to it. Trenches occur only to the south of the central feature, and several of them were cut through the red floor. The trenches measure between about a half meter to a meter wide at their surfaces and vary in width along their courses. Taken all together, there are several hundred meters of these trenches. Generally, they are about a half meter to almost a meter deep. They were filled with a mix of gravelly sand, sometimes with clay, and sometimes having charcoal near their bases (Figure 9). Some had postholes dug into them, probably



**Figure 9.** Prehistoric trench feature 550. Note the gravel cap above it.

on purpose, while in some other instances postholes occasionally intruded into them and appear to have been placed with no awareness of the trenches' existence. Infrequently, an earlier posthole was truncated by a trench, and is detected on the base of a trench. Naturally, the trenches were cut through and destroyed whatever lay in their path, including sections of the southern red floor.

The reason why the Hopewell dug approximately fifteen such trenches (an estimate based on a reading of the GPR data) was a mystery during the first several years of the excavation program. The obvious answer was that they were intended to serve as drainage ditches, but there did not seem to be any need for this at the site. An answer, however, began to emerge when the Wright State University calendar changed in 2013 from the quarter system to a semester format. Field school excavations then began in the month of May, and excavation units that had been covered over with landscape tarp at the end of one season, so that work in them could resume in the next, were found to be partially filled with water at the start of work in May of the subsequent year. The water was primarily ground water, not rainwater, making evident the extremely high water table at Fort Ancient in the springtime. It does now seem likely that the trenches owed their existence to a Hopewell attempt at a solution to a water problem that existed for them in the spring, although apparently not

one that they had felt the need to address while the red floor was in operation. Since the trenches were dug late in the history of the site, that seems to suggest that the red floor and its overlying sandy strata were used when the site was dry, which would have been in the summer, just like the first years of archaeological excavation at the Moorehead Circle. If the trenches solved the problem of wet conditions underfoot, then that may mark a shift in use of the Circle to a different season, and perhaps to fulfill different functions. In any case, the presence of the trenches, each one only a meter or so from those to either side, seems like overkill, something on the order of taking a sledgehammer to pound in a nail. The sand and gravel that fill the trenches cause them to act as French drains, using gravity to move ground water off of the Circle and toward the ravine to its north. Every bit of this fill material had to be obtained from source areas located well below the embankments of the earthwork. Like the stones that were used with the posts, its presence represents thousands upon thousands of trips made by people to secure the necessary materials.

The period of time during which the surface, into which the late postholes and trenches were dug, was in use was probably short; there was little soil development, and artifacts are rare. The end of its time of use, however, is very clearly marked. The posts were removed, the postholes were refilled, and then a 10–20 cm thick layer of gravel was deposited over the entire central complex, out almost to the perimeter post rings on the west, and south to the old entranceway. This effectively sealed off the vital areas of the Moorehead Circle, and I have previously interpreted this deposition as having been part of a rite by which the Hopewell terminated their relationship with the Circle (Riordan 2015). If so, it was certainly a protracted and labor-intensive way of saying goodbye to what the Circle had represented to those who used it over many human generations.

This may not, however, have marked the final abandonment of the space. There are a few postholes that may have penetrated the gravel cap. They are large; at their surface they measure a meter or more in diameter, but that includes the spread of stones that were set around them. The diameters of the posts they held appear to have been between about 30 and 40+ cm, and their depths range from around 1.0 m to about 1.6 m. Stones were used quite lavishly to support these posts, and in one known instance completely surrounded it from its bottom to its top (Figure 10). Most of these late postholes occur in the area of the central complex, with a few to the west of the core area of the red floor. One large post pit was found in 2016 that was located nearer to the former entrance to the Circle; it had held two smaller posts, and upon their removal, the upper part of the pit was refilled with a plug of yellowish subsoil.





**Figure 10.** Posthole feature 385, one of the late, large postholes. It is situated on the (grid) NE edge of the red floor core area.

There are a couple of ways to interpret this group. One is that they were among the most substantial of the late group of posts, those that were removed and then capped by the final layer of gravel. In this view, the uppermost stones used to surround these big posts were aboveground and visible, and the gravel cap was placed

around them rather than over them. If so, this must have been because the posts they held were left standing for a time after the gravel was deposited. The alternative scenario is that they were installed after the gravel cap, and therefore represent a very late episode of Hopewell construction at the site.

Ultimately, these posts, like all those that preceded them, were also removed. The post in Feature 385 was removed with particular care, somehow without disturbing its surrounding stones (Figure 10); we know that it was removed because a couple of rocks were found half a meter deep in the center of the posthole when it was quarter-sectioned, something that would not have been possible if the post had decayed in place. Several others of this group of large posts were less carefully extracted, since the stones at the top of them were scattered across a meter or more of space.

The locations of these (possibly) latest postholes do not seem to form the footprint of either a structure or an enclosure, although four of them could mark a rectangular space with sides of six to nine meters (Figure 2). Like many of the other late posts, those whose postholes were capped by the layer of gravel, the posts of this last group were also placed without regard for what had gone before them. Several of them were placed directly in the way of trenches, which would have destroyed the viability of the latter to serve as French drains.

## SUMMARY

The appearance of the Moorehead Circle in its early and later days may have been quite different. As reconstructed here, a structure was first present about which we know nothing more than that its postholes point toward the possible existence of a substantial enclosure or building. After its removal, the erection of a ring, or rings, of wooden posts around the perimeter on a modified landform may have signified a new way of defining a sacred space, which seemingly marked the advent of a new use for it. This kind of circular enclosure is one that is now recognized as having been present at several other Hopewell earthworks.

Ritual activity likely involved the admission of persons via a formal entrance-way into a space that was ringed by wooden posts. There they encountered a central red mound, around which portions of ceramic vessels were deposited, and a crematory facility that was sufficiently large for multiple remains to be processed at the same time.

Why the use of the red floor ended is not known, but the large basin in which it lay did continue in some sort of use, and for what may have been an extended period of time. The importance of this location even after the basin was filled is underlined by the subsequent construction of some kind of structure on top of it.

By the time this second central structure was in use, it is quite possible that the wooden post rings were no longer standing, and that the relevant space around it was thus no longer viewed as circular in shape. The reputation of the place, however, seems to have long persisted. Details of it were well enough remembered for the entrance pavement to have been included in the application of the final cover of gravel. It is possible that there was a short-lived return to the location that was marked by the erection of a group of deeply set posts, but if so, these were also removed soon after their erection.

If anything can be generalized from this to other Hopewellian circular spaces, including post circles and circular embankments, it is that they were more than simple architectural features arrayed on the landscape. They were places where a populace was concentrated to engage in critical ritual performances and activities, and which may, in similar settings, have been similar in their form across wide areas of southern Ohio. Some of this probably involved at least portions of the mortuary programs that were conducted at many, if not all, earthworks. At Fort Ancient, and possibly at other hilltop enclosures as well, the existence of the Moorehead Circle's red floor points to the possibility that previously unrecognized mortuary activities were being enacted, something that may only have been properly done in a prescribed circular setting.

The archaeological study of the Moorehead Circle has served to inform our understanding of the persistence of its use and its alterations of form, even if much of what may have occurred there lurks tantalizingly just out of view. It seems fair to say, however, that the Moorehead Circle, in all of its guises, stood at the conceptual heart of what drew so many people to Fort Ancient, the most important earthen enclosure in southwest Ohio, across so many generations.

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## NOTES

1. References to cardinal directions in this article are geographical (east is east, etc.), unless grid coordinates are specifically invoked. The site grid, originally set up in 2005 by Burks when the remote sensing survey was performed, employed a “grid north” that was conveniently established as 157 degrees south of magnetic north. The excavation program since 2006 has used that grid setup, with the result that site grid north points nearly to the geographic south.

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