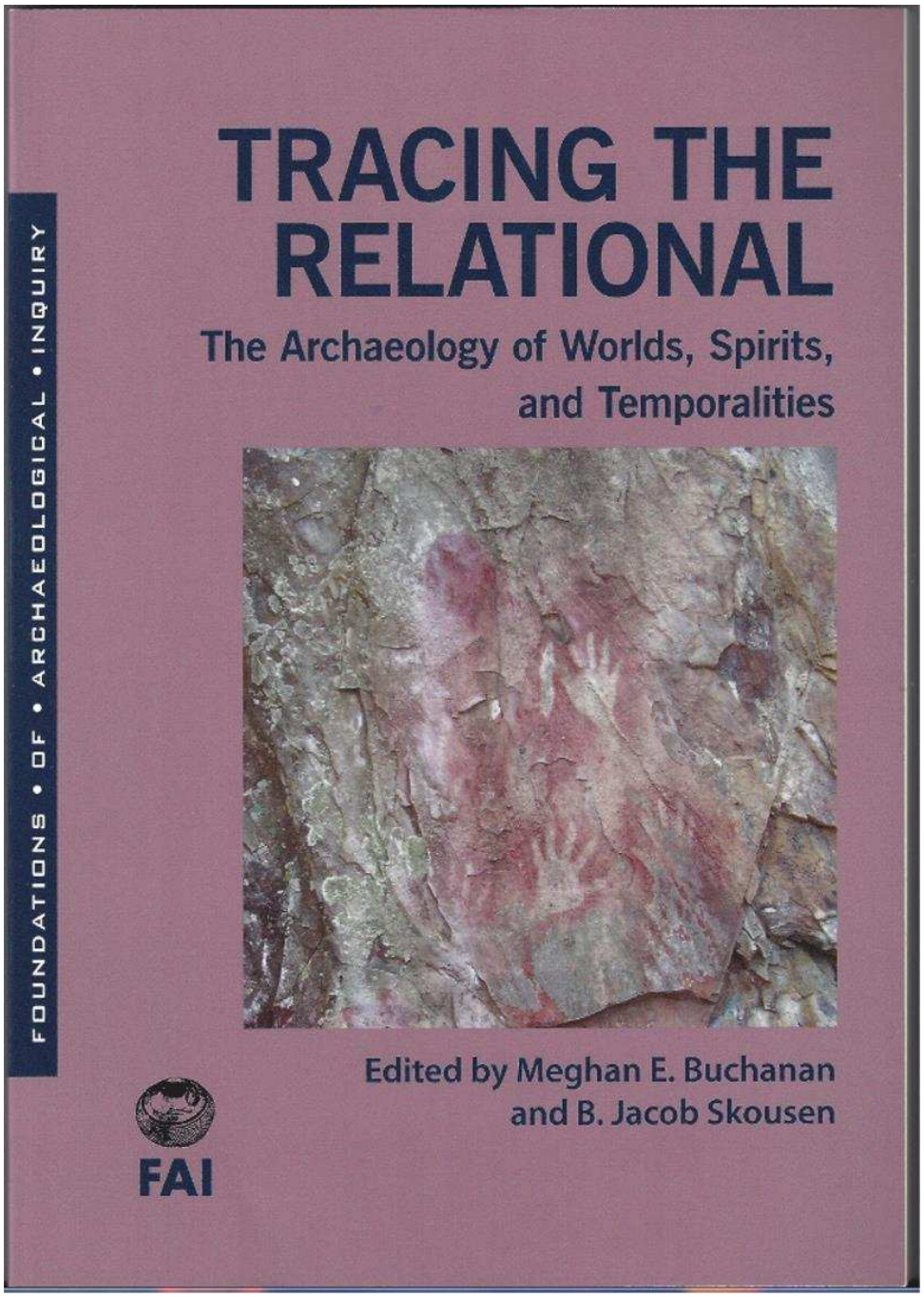

Romain, William F.
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4

Adena-Hopewell Earthworks and the Milky Way Path of Souls

William F. Romain

In this chapter I consider Adena-Hopewell earthworks from a relational perspective. For decades, archaeologists have focused a great deal of attention on individual sites. But what if it was found that the full significance of certain sites unfolded in their relationships to other earthworks and even other dimensions? What if it was found that certain sites were entangled with each other and nonmaterial realms in such a way as to give rise to emergent properties that contribute to the deep meaning of these places and made such places special to their builders? Would that change how we think about Adena-Hopewell? Would that change the questions we ask?

In what follows, I propose that the Newark Earthworks, Great Hopewell Road, Sugarloaf Mountain, Serpent Mound, and others were part of a dynamic relational web. These sites span a distance of about 89 miles (143 km) across south-central Ohio. But the relational web I am referring to consisted of more than just a handful of prehistoric sites. It included nonhuman agents such as the sun and moon, Milky Way, and star constellations, as well as souls of the dead, living people, spirit entities, and special places in the Otherworld. Moreover, this relational field was not static, but rather, to quote Skousen and Buchanan (Chapter 1, this volume), was "encountered, experienced, and constructed through practices, performances, movements, and relationships of all kinds."[1] In this, the deep significance of any one site was contingent on others as well as celestial and nonhuman agents.

I suggest that the Newark Earthworks were a portal to the Otherworld that allowed for interdimensional movement of the soul during certain solar, lunar, and stellar configurations; that the Great Hopewell Road was the terrestrial equivalent of or a metaphor for the Milky Way Path of Souls, providing a directional component for soul travel to the Realm of the Dead; that Sugarloaf Mountain in Chillicothe was an axis mundi connecting cosmic realms; that multiple sites in the Chillicothe area were entangled with Sugarloaf Mountain, thus expanding the relational web temporally and spatially; and that Serpent Mound was a cognate for the Great Lowerworld Serpent, which guarded the Realm of the Dead. Each site was more than a cosmic symbol. Rather, each site "did" something in the sense of enabling, facilitating, guiding, constraining, or otherwise affecting the movements and experiences of people, living and dead. Each site was part of a "trans-dimensional relational matrix" (after Baires et al. 2013:212) wherein living people, souls of the dead, celestial bodies, and other agents moved in trajectories that intersected and entangled with one another, unfolded, and opened into new realms.

The idea that things are entangled, interconnected, and interdependent is not new. Written Buddhist teachings dating back to at least 200 BC explain: "Three cut reeds can stand only by leaning on one another. If you take one away, the other two will fall." The original sutra explaining the concept of *pratītya-samutpāda* (or dependent co-origination) is a bit more involved (Bodi

2000:607–609, Book of Causation, Sheaves of Reeds 67[7]); but one gets the idea.

Similar, and cutting against the grain of reductive and deterministic thinking, are recent efforts to understand the world in relational ways as expressed by ideas of nonlocality in quantum physics, emergent properties in complexity theory, neural networks in cognitive science, and holism in deep ecology. In anthropology and archaeology, a number of scholars have developed relational approaches, including networks (Latour 2005), material entanglement (Hodder 2006, 2012), meshworks (Ingold 2007, 2011), complex objects (Zedeño 2008, 2013), assemblages (Harris 2014; Fowler 2013 and others), and bundles (Pauketat 2013a, 2013b). There are subtle differences among these metaphors, but the underlying concepts are similar—things are entangled at the deepest ontological levels, and relational fields are in a continuous state of flux, resulting in new configurations.

In support of what I am proposing, I draw on astronomical data, LiDAR imagery,[2] computer planetarium simulations, aerial photographs, and archaeological and ethnohistoric data. Before proceeding further, however, I place things in context with a brief introduction to Adena and Hopewell and a consideration of individual sites. Then I demonstrate how together these bits and pieces made up a relational field that was greater than the sum of its parts.

Adena-Hopewell Earthworks

Our focus is with the Adena and Hopewell of south and central Ohio. There are taxonomic issues concerning the terms *Adena* and *Hopewell* (Applegate and Mainfort 2005; Brown 1992; Otto and Redmond 2008; Swartz 1971). For purposes of this discussion, however, and to maintain continuity with other literature, *Adena* and *Hopewell* are used as heuristic terms of convenience.

Adena flourished from about 500 BC to AD 100. It encompassed southern Ohio and parts of Kentucky, West Virginia, Indiana, and Pennsylvania, as well as occasional outposts farther east. Hopewell flourished from about 100 BC to AD 400. Hopewellian "cultures" are found across the Eastern Woodlands (Crab Orchard, Havana, Marksville, etc.), but classic Hopewell is situated in south and central Ohio.

There are recognizable differences between Adena and Hopewell. At the same time, however, there is considerable temporal and spatial overlap between the two, and it appears that Adena and Hopewell shared certain core beliefs and practices (Romain 2009), even if sometimes expressed in different ways.

The most visible and dramatic expressions of Adena and Hopewell are their monumental earthworks (Squier and Davis 1848; Thomas 1894). Adena mounds, which are conical in shape, range from barely noticeable rises on the landscape to enormous structures reaching roughly 70 feet (21 m) in height and more than 200 feet (60 m) across. Some mounds include burials, others do not. Where burials are found in Adena mounds it is often the case that more than one individual is interred. "Sacred circles" are another kind of Adena earthwork. These structures range from more than 200 feet (60 m) in diameter to much smaller. Most are simple earthen circles with an interior ditch and single opening through the perimeter wall. Some have a burial mound in the center of the circle. Often Adena circle earthworks are found in groups.

In many ways, Hopewell appears to be an elaboration of Adena, but there are differences. Hopewell earthworks are generally larger and more complicated than Adena. Hopewell submound mortuary structures are different from Adena, and Hopewell artifacts have a greater variety and complexity. The most concentrated and greatest number of Hopewell earthworks were located near the present-day city of Chillicothe, Ohio. The most intricate and complex group was at Newark, Ohio. Other major earthwork centers were situated at the present-day cities of Marietta, Portsmouth, and Cincinnati.

Hopewell earthworks include several kinds of mounds, such as conical, truncated pyramid, and loaf-shaped. Many mounds have one or more burials within. Another kind of earthwork built by the Hopewell were hilltop enclosures. This designation is something of a misnomer. Most are better described as flat promontories enclosed by perimeter walls.

Lastly, the Hopewell built geometrically shaped enclosures. Made of walls 5–10 feet (1.5–3 m) or more in height and 20–30 feet (6–9 m) wide at their base, Hopewell geometric earthworks

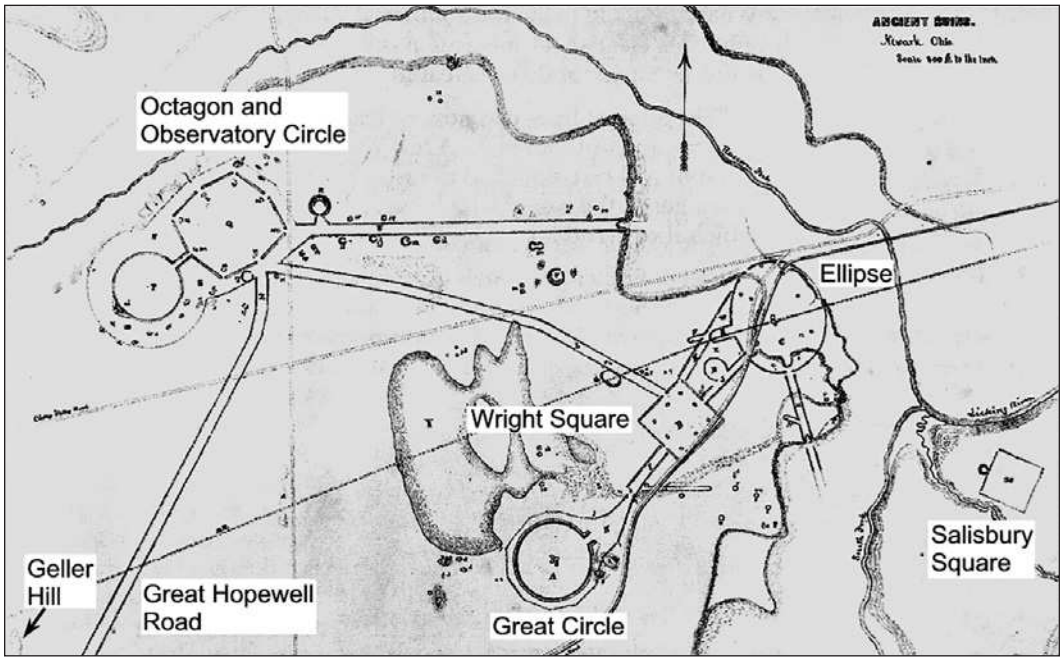

FIGURE 4.1. Annotated Salisbury 1862 map of the Newark Earthworks (image courtesy of the American Antiquarian Society).

typically enclose 15 to 50 acres (6–20 ha), with a couple that are even larger. Hopewell geometric earthworks come in different shapes, the most common of which are circles and squares. Some squares, such as the Liberty Earthworks, have relatively sharp right-angle corners, whereas others, such as Mound City, have rounded corners and ballooned-out sides, making their shape more ambiguous. Geometric earthworks can be single shapes, as at Mound City, or more complex designs that include a circle and square or a circle and octagon, as at Hopeton and High Bank, respectively.

Very large oval or ellipse-shaped earthworks occur at Newark and Turner. Also found in Hopewell are rectangles, irregular polygons, and a few shapes we have no technical name for. Several major earthworks are composed of three or more geometric shapes. Hopewell geometric earthworks incorporate specific design principles, including alignments to the sun and moon, the use of selected geometric shapes, and special units of length (e.g., DeBoer 2010; Eddy 1978; Hively and Horn 1982, 1984, 2010; Romain 1991, 1996, 2000, 2009).

As we see below, mensuration is significant. For now, suffice it to say that every Hopewell earthwork I have assessed incorporates a unit of length I refer to as the Hopewell measurement unit (HMU), or an iteration thereof. This length is equal to about 1,054 feet (321.26 m). The length was first noted by Cyrus Thomas (1894:464) for the diameter of the Newark Observatory Circle. It was further applied to the earthworks around a century later (Hively and Horn 1982, 1984; Romain 1991, 1996, 2000; Romain and Burks 2008a). In addition to this length, greater and lesser multiples of the HMU were sometimes used.

The Newark Earthworks Complex

The Newark Earthworks Complex is located about 32 miles (51.5 km) northeast of Columbus, Ohio. It covers more than 4 square miles (1000 ha^2) of a broad river valley at the confluence of Raccoon Creek and the North and South Forks of the Licking River. Most of the Newark complex has been obliterated by urban development, but from old maps, remaining earthwork remnants, and other clues, it is possible to gain a sense of what was. An early map of the Newark earthworks made by James and Charles Salisbury is shown in Figure 4.1. Although it is not an earthwork, we begin

with Geller Hill, an important feature central to the design of the complex.

Geller Hill

Geller Hill is located about 1 mile (1,610 m) southwest of the Observatory Circle and Octagon earthwork (Figures 4.1 and 4.2). The feature is a glacial kame, about 35 feet (10.7 m) in height, 1,150 feet (350.5 m) in length, and 700 feet (213.4 m) in width at its base. In Hopewell times, Geller Hill would have been the most prominent feature on the flat plain where the earthworks are built. There are several knolls on the top of Geller Hill that in Hopewell times could have provided excellent vantage points of the earthworks and celestial events.[3]

As plotted from one of these vantage points (i.e., VP1 at the north end of Geller Hill), an isosceles triangle can be drawn between VP1, the center of the Octagon, and the center of the Great Circle (Figure 4.2b). This triangle has two sides each equal to 7 HMU (or 7,378 ± 10 feet) in length. The northwest leg of the triangle extends along an azimuth that is parallel to the Great Hopewell Road—the significance of which will become evident later.

From VP2 on Geller Hill (Figure 4.2a), on the night of the moon's maximum north rise, an observer would have seen the moon rise in the northeast, balanced between the Octagon and Great Circle. Further, this sightline would have intersected a sizeable lake or bog (ca. 150 acres [60 ha.], per Atwater 1820:Plate II) that appears to have been part of the original complex before it was drained in the 1800s. Together, observers at VP2, along with the lake-bog, moon, and earthworks, would have been entangled in a geometric relationship that unfolded in its full relational significance at celestially determined times. In this, trajectories of space, time, and human perceptions intersected and opened into new relational webs, as discussed below.

The Ellipse

The Ellipse earthwork (Figure 4.1) is part of the Newark complex. The earthwork has been mostly destroyed by urban development, and accounts differ as to how many mounds were originally located in the enclosure. David Wyrick's (1866) map made in 1860 shows seventeen mounds. We do not know how many people were buried in these mounds, as few records were made when the mounds were cleared away during the 1800s. An early report (Squier and Davis 1848:72) records that fourteen skeletons and large quantities of mica were found in one of the Ellipse mounds. Additional information comes from James and Charles Salisbury (1862:12–13), who reported that a mound situated in the northeast section of the Ellipse contained mica and "numerous skeletons." They further reported that an area in the southwest part of the Ellipse contained "many skeletons in a good state of preservation," and within the conjoined mounds at the center of the Ellipse was found a "tier of skeletons" accompanied by mica and copper objects. Given the large number of burial mounds and burials within the Ellipse, it is reasonable to presume that this enclosure was used as a burial ground.

As mentioned, many Hopewell earthworks use the HMU (or 1,054-foot) length in their design. The Newark Observatory Circle, for example, is 1 HMU in diameter (Thomas 1894:464), and the Octagon is designed around a square that is 1,054 feet, or 1 HMU ~~feet~~ on each side (Hively and Horn 1982:S8). Where this becomes interesting is in the observation that if instead of drawing an octagon around a 1-HMU square, we draw an ellipse, the resulting figure will have the same shape and size as the Newark Ellipse as represented by the Salisbury map (Figure 4.3a–b).[4] Further, if we take the ellipse and square design just drawn and rotate it so its orientation is the same as that represented by the Salisbury map, one of the diagonal axes of the square will point to the summer solstice sunset while the other will point to the ground trajectory of the Milky Way on the night of the summer solstice, just after sunset (Figure 4.3b). Thus the Newark Ellipse burial ground is oriented and connected to celestial phenomena. Given its celestial orientation and significant numbers of burial mounds and burials, it may be that the Newark Ellipse was something of a staging area for the deceased before they began their journey to the Otherworld.

The observation that the Newark Ellipse is oriented to the summer solstice sunset and Milky Way and that the earthwork may also be implicated in the movement of souls from one realm to another might be dismissed as overly speculative

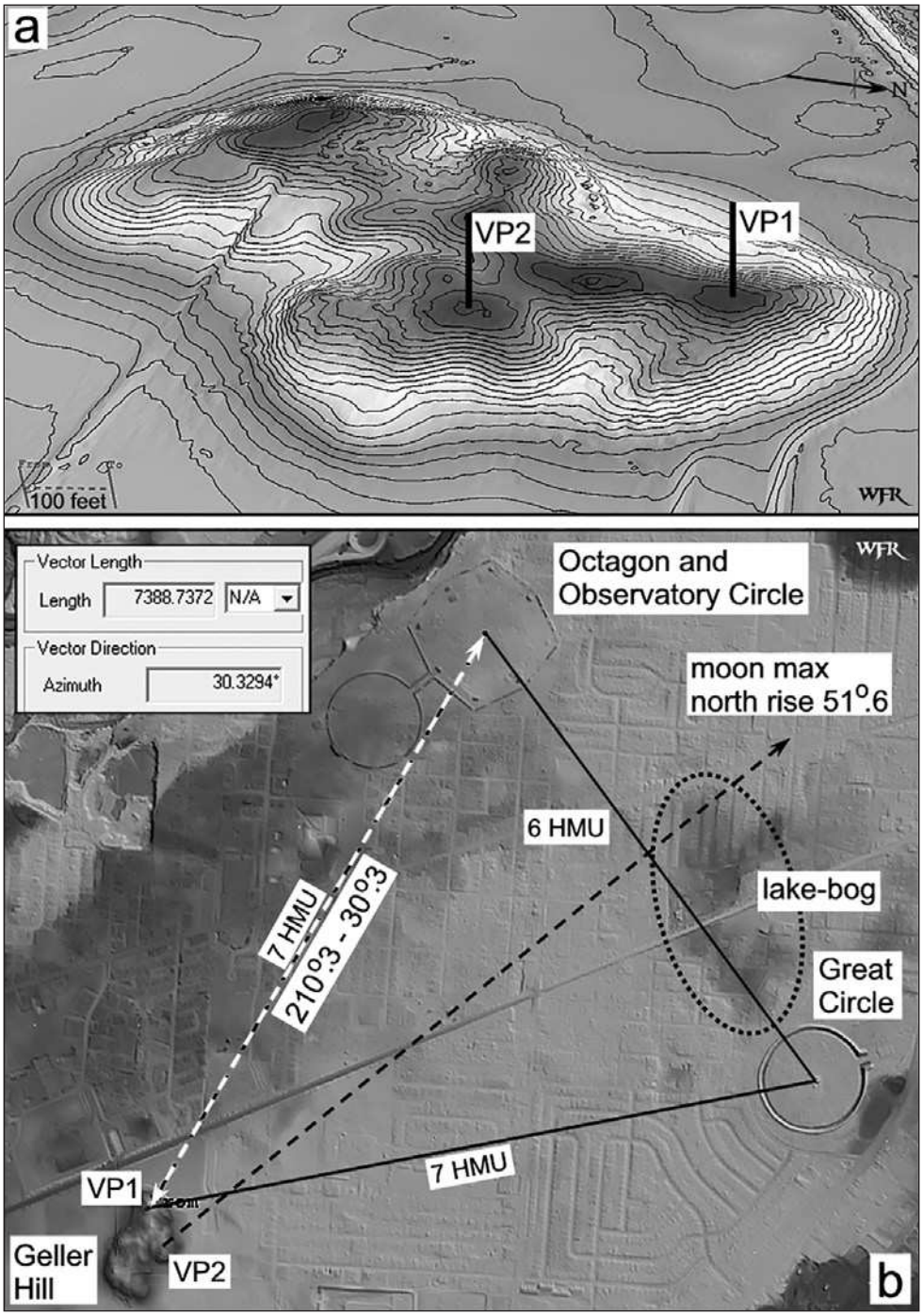

FIGURE 4.2. (*a*) LiDAR image showing locations for VP1 and VP2; (*b*) LiDAR image showing isosceles triangle between VP1, Great Circle, and Octagon. Lake-bog shown by dotted line, as indicated by lower LiDAR elevation represented by dark gray area.

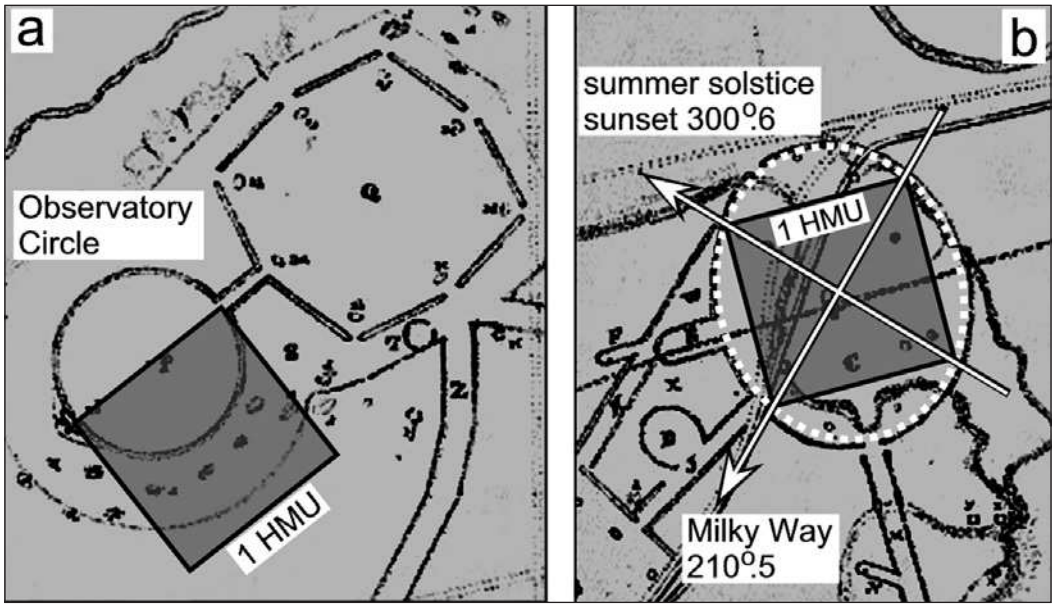

FIGURE 4.3. (*a*) Detail of the Salisbury 1862 map. The Salisburys (1862:23) give the diameter of the Observatory Circle as 1,060 feet. This is to within 4 feet of the Hopewell Measurement Unit (HMU) of 1,054 feet. Using the diameter of the Observatory Circle as a guide, we can draw a square with sides equal to that length. (*b*) Detail of Salisbury map. When an ellipse is drawn around a square that is 1,060 feet on each side (or ca. 1 HMU square), the result matches the shape and size of the Newark Ellipse, as shown. Further, the diagonal axes of the resulting ellipse are oriented to the celestial events shown (Salisbury map image courtesy of the American Antiquarian Society).

except for similar findings at other Hopewell burial grounds. The Turner Earthworks near Cincinnati, for example, feature a large Ellipse earthwork roughly 1,500 feet (457 m) by 1,000 feet (305 m), within which were found dozens of graves and more than a dozen burial mounds (Willoughby 1922). Analyses of aerial photos showing an extant section of the Turner Ellipse finds that the major axis of that earthwork was oriented along the Milky Way trajectory and its minor axis was oriented to the summer solstice sunset (Romain 2015a).

At Mound City, which is about 55 miles southwest of Newark, we find an earthwork best described as a square with rounded corners and ballooned-out sides (perhaps on its way to becoming an ellipse). Ground survey and photographic evidence (Romain 2000:127, 2009:92) show that the southeast-to-northwest diagonal axis across Mound City points to the summer solstice sunset. In addition, the northeast-to-southwest diagonal axis is aligned to the Milky Way trajectory. Like the Newark Ellipse, Mound City uses the 1 HMU in its design. More to the point, Mound City is sometimes referred to as a "city of the dead" in recognition of the large number burial mounds (~ 22) that have been identified within its perimeter walls (Brown 2012).

Octagon and Observatory Circle

By any standard, the Newark Octagon and Observatory Circle earthwork (Figure 4.4a) is an impressive monument. When observed in the 1890s by Thomas (1894:464), the southern part of the Octagon was mostly in original forest. Other sections had been plowed, but in no place were the walls less than 2.5 feet (76 cm) in height. The walls of the Observatory Circle averaged 1–5 feet (1.2–1.5 m) high. In the late 1800s the embankment walls of both features were built up by the Ohio National Guard in order to restore the earthwork to its height as recorded by Squier and Davis (1848).

No known burials are associated with the Octagon and Observatory Circle. Mounds are

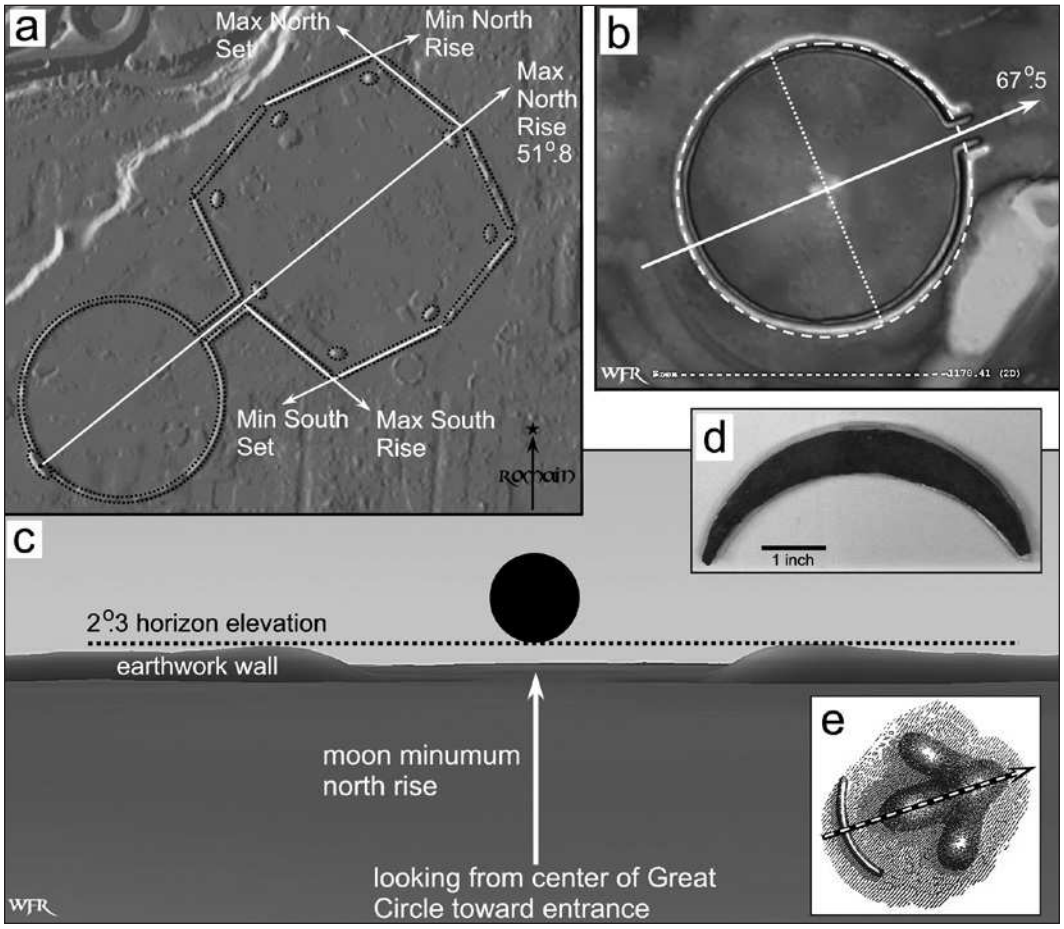

FIGURE 4.4. (*a*) LiDAR image of Newark Observatory Circle and Octagon showing core lunar alignments (after Hively and Horn 2013:Figure 2). (*b*) LiDAR image of Newark Great Circle showing south design circle (dotted line) and lunar alignment. (*c*) LiDAR image showing view from center of the Great Circle (wall heights as rendered by LiDAR program). (*d*) Crescent-shaped copper object found in Eagle Mound. (*e*) Squier and Davis's (1848:Figure 12) illustration of the crescent-shaped and Eagle mounds at center of Great Circle. Arrow added to show lunar alignment.

located at the vertices of the Octagon. However, coring into two of the mounds at multiple locations failed to reveal any evidence for burials, special soils, or man-made features within (Romain 2005).

The Octagon incorporates multiple lunar alignments in its design. Figure 4.4a shows several of the core alignments.[5] The most dramatic of these—the alignment of the earthwork's major axis to the moon's maximum north rise—was discovered by astronomer John Eddy (1978:149). The others were found by Ray Hively and Robert Horn (1982).

The Great Circle

Figure 4.4b shows the Newark Great Circle. This earthwork is about 1,178 feet (395 m) in diameter with a deep interior ditch. When surveyed in the late 1800s, the perimeter walls ranged from 5 to 14 feet (1.5–4.3 m) in height (Thomas 1894:461). Some minor, mostly cosmetic restoration work has been done to the earthwork. Located in the center of the Great Circle is a mound that some people believe looks like a bird—hence the name "Eagle Mound."

Eagle Mound was dug into in the late 1800s by Isaac Smucker. Smucker (1881:266) reported

finding an "altar" (likely a crematory basin) at the center of the mound containing "ashes, charcoal, and calcined bones." A more thorough excavation was made in 1928 by Emerson Greenman. Greenman found that the mound covered a series of postholes outlining what seems to have been a temple structure at its base. Situated in the center of the floor of this structure was a clay basin of the type typically used for cremations. Greenman (1928) did not report finding anything in the basin. However, he did note finding bits of mica, lithic debitage, projectile points, charred matting, a crescent-shaped object made of copper, and bone fragments on the floor. It is not known if the bone fragments reported by Smucker and Greenman are human, and unfortunately their present whereabouts is unknown. Given the occurrence of confirmed human remains associated with similar clay basins in other mounds (e.g., Mound City—see Squier and Davis 1848), however, it seems possible that the bone was human.

The major axis of the Great Circle is aligned to the moon's minimum north rise (using the center of the south design circle as the point of origin for the sightline). This alignment takes into account the height of the earthwork's walls on either side of the entrance (Figure 4.4c).[6] Based on nineteenth-century records of pre-restoration wall heights, the artificial horizon created by these walls likely reflects what was seen in ancient times to within tenths of a degree. Further, as Figure 4.4e shows, the longitudinal axis of the Eagle Mound and the underlying temple structure are both oriented to the moon's minimum north rise.

In addition to the lunar alignment of the Great Circle, Eagle Mound, and temple structure, two other findings support a lunar association for this earthwork. As mentioned, a copper crescent was found on the floor of the Eagle Mound temple. The object is about 5.5 inches (14 cm) in length (Figure 4.4d). While it is impossible to know with certainty, it may be that the object is a crescent moon symbol.

It is also the case that a low, crescent-shaped embankment or mound was originally situated to the immediate southwest of the Eagle Mound (Figure 4.4e). The longitudinal axis of the Eagle Mound bisects the crescent mound. And again, the crescent shape suggests a lunar association.

Great Circle: Observatory Mound Alignment

The core lunar alignments for the Octagon and Observatory Circle and Great Circle have been noted. There is an additional alignment between earthworks, however, that is relevant. That alignment extends between the inside entrance to the Great Circle and a feature known as the Observatory Mound. The Observatory Mound is located on the major axis of the Observatory Circle, at its southwest terminus (Figure 4.5a–d). As Figure 4.5a shows, the sightline between the Great Circle entrance and Observatory Mound is aligned to the summer solstice sunset to within three-tenths of one degree.[7]

The Observatory Mound is basically a platform mound built into the perimeter embankment of the Observatory Circle. The mound is about 10 feet (3 m) in height—which is several feet higher than walls of the Observatory Circle and about 3 feet (0.9 m) higher than the gateway mounds at the inside entrances of the Octagon. With reference to its pre-restoration height, Squier and Davis (1848:69) note that the mound was "eight feet higher than the general line of the embankment." According to Squier and Davis (1848:69), explorations into the mound found only "an abundance of rough stones." Since the Observatory Mound is situated on the major axis of the Octagon and Observatory Circle earthwork, a good view of the enclosure is offered from its summit. The height of the mound, however, may have served an additional purpose. LiDAR line-of-sight analysis (Figure 4.5d) shows that the height of the Observatory Mound allows it to be seen from the inside entranceway of the Great Circle, over the intervening perimeter wall of the Great Circle. Further analysis shows that the summer solstice sunset would have been visible over the Observatory Mound as viewed from the inside entrance of the Great Circle (Figure 4.5a.)[8]

The Great Hopewell Road

Another important feature of the Newark Complex is the Great Hopewell Road (Lepper 1995, 2006; Romain and Burks 2008b). Most of the road has been obliterated by plowing and urban development, although a small section survives today in a woodlot just north of the Newark-Heath airport. The Great Hopewell Road consists of

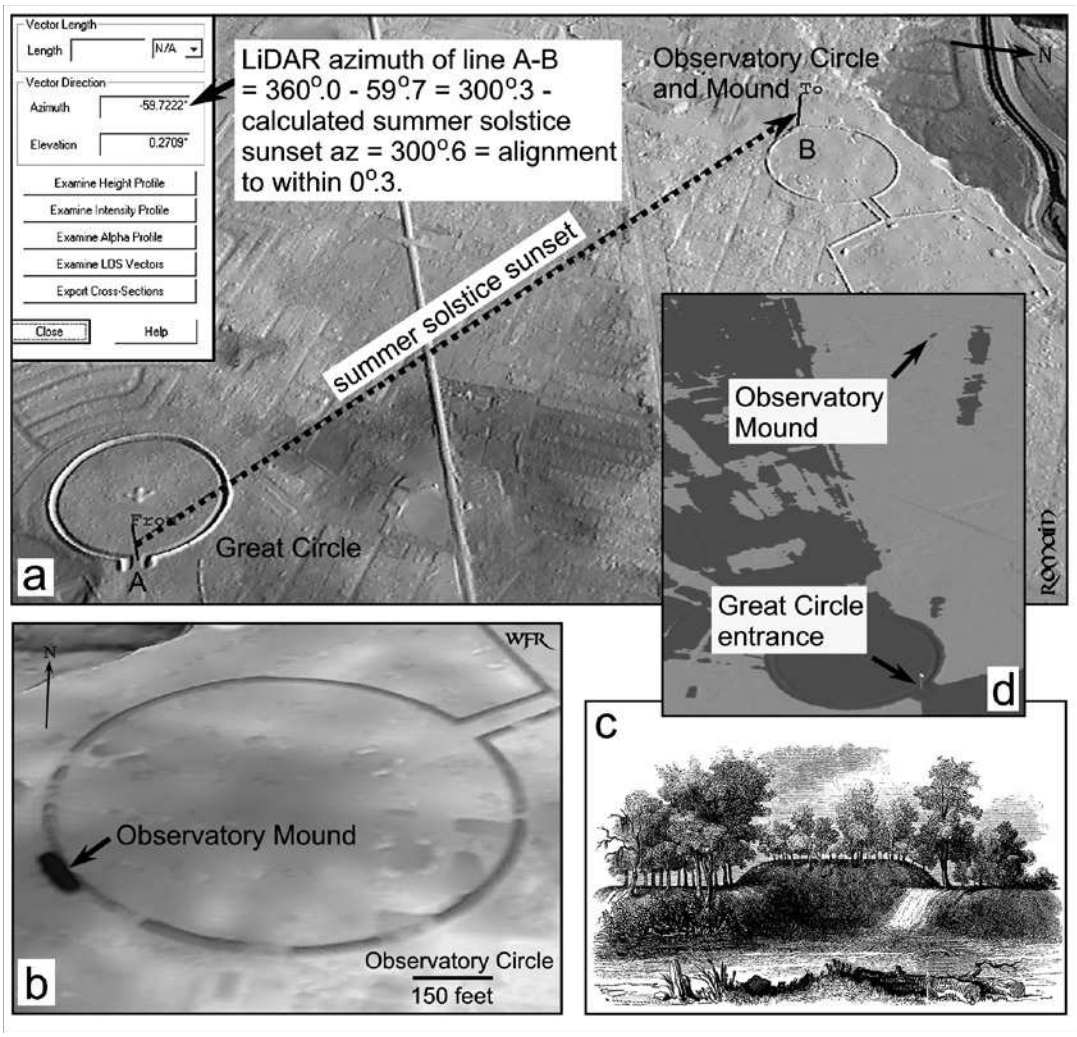

FIGURE 4.5. (*a*) LiDAR view of the Great Circle–Observatory Mound solstice alignment. (*b*) LiDAR image showing the Observatory Mound and Circle. (*c*) Squier and Davis's (1848:Figure 16) sketch of the Observatory Mound. (*d*) LiDAR line-of-sight analysis. Dark areas are visible from the inside entrance of the Great Circle.

two parallel embankments, each about 1.5–2 feet (50–60 cm) in height and 19–30 feet (6–9 m) in width, separated from each other by about 150 feet (50 m) (center to center). The embankments originally extended from near the Octagon to at least as far as Ramp Creek, about 2.5 miles (4,023 m) distant (Figure 4.6a–c). The Great Hopewell Road is not a road in the modern sense. LiDAR cross-section shows that it is concave in shape with parallel walls on either side of the concavity (Romain and Burks 2008b). Similar parallel-walled causeways are found at the Portsmouth, Marietta, High Bank, Hopeton, and Fort Ancient sites. In every instance that can be assessed by LiDAR or ground-truthed data, the parallel wall features at these sites extend along solstice azimuths (Romain 2000, 2004, 2015a).

In 1820 Caleb Atwater (1820:17) suggested that the parallel walls might connect to an earthwork on the Hocking River, roughly 30 miles (48 km) distant. More recently, Bradley T. Lepper (1995, 1998) suggested that the Great Hopewell Road may have connected to Chillicothe. The Salisbury brothers (1862) claimed to have traced the road for a total distance of 6 miles (9.6 km). And in 1931 aviator Warren Weiant Jr. reported seeing

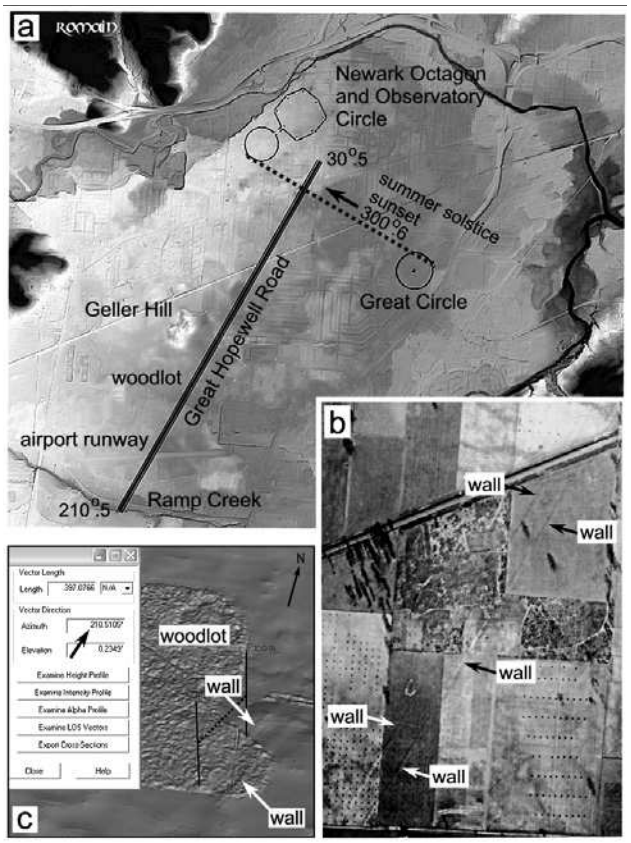

FIGURE 4.6. (*a*) LiDAR image showing trajectory of the Great Hopewell Road. (*b*) Dache Reeves aerial photo from 1934 showing section of Great Hopewell Road north of Ramp Creek. (*c*) LiDAR analysis of extant section of Great Hopewell Road in woodlot north of Newark-Heath airport showing that the road extends along an azimuth of 210.5 degrees.

what he thought was a road extending from Newark toward Millersport (Lepper 1998:129).

The idea is intriguing. However, no ground-truthed excavations, LiDAR, or geophysical data have found evidence for the road south of Ramp Creek, which is about 2.5 miles from the Octagon.[9] The Squier and Davis (1848:Plate XXV) map includes the notation "Parallels 2 1/2 miles long," which is the distance from the Octagon to Ramp Creek. This suggests that Squier and Davis did not survey the area south of Ramp Creek, or if they did, they found no evidence for the road. In contrast, and as already shown, old aerial photographs reveal long sections of the road north of Ramp Creek (even after plowing) (Figure 4.6b), a small section of the road is still visible on the ground and in LiDAR data north of Ramp Creek, and sections of the road can be seen as soil discolorations in Google Earth imagery.

That said, a physical connection between Newark and Chillicothe is not necessary to what follows. LiDAR analysis of the extant section of the Great Hopewell Road in the woodlot north of the Newark-Heath airport shows that the road extends along a trajectory of 210.5 degrees (Figure 4.6c). Several lines of evidence suggest that this trajectory was intentional. First, the trajectory of the road is parallel to a line that extends from VP1 on Geller Hill to the center of the Octagon earthwork (Figure 4.7d). As demonstrated earlier, VP1 appears to have been an important design point given its location at the apex of an

isosceles triangle that connects two of the complexes' most important earthworks through their centers. Moreover, what this parallel-line relationship does is bring the road into a geometric relationship with the Octagon and Geller Hill.

Second, the trajectory of the road is orthogonal to the earlier-discussed summer solstice sunset sightline between the Great Circle and Observatory Mound to within one-tenth of one degree. The solstice azimuth between the earthworks is 300.6 degrees, while the trajectory of the road is 210.5 degrees (Figure 4.7d). The likelihood that the road would be oriented 90 degrees perpendicular to a solstice sightline that links two major earthworks due to chance is remote. More likely is that by making the trajectory of the road perpendicular to the solstice sightline, the designers of the road intentionally brought it into a right-angle relationship with the solstice sunset and earthworks.

The geometric relationship between the Great Hopewell Road and the solstice sightline is interesting. But there is a related alignment that may be just as significant—and that is to the Milky Way. In ancient times, before light pollution caused by modern cities, the Milky Way was one of the most prominent features of the night sky. We know that the Milky Way comprises billions of stars. But to the naked-eye observer it looks more like a hazy band of white light arcing across the sky. The Milky Way is about 30 degrees in width.

The trajectory of the Milky Way changes during the course of the year. As astronomer Edwin Krupp (1996:411) explains, "It connects one side of the horizon with another by vaulting over the earth…the angle it makes with the ground depends on where you are located and how the spinning Earth has lifted the Milky Way into the sky." During summer months the Milky Way extends in an arc from northeast to southwest (Figure 4.7a). During the winter it arcs in the opposite direction, from northwest to southeast.

The Milky Way is brightest during the summer months. Moreover, during Hopewell times, on the night of the summer solstice sunset the trajectory of the Milky Way extended in the same direction as the Great Hopewell Road. As Figure 4.7a–d shows, on the night of the summer solstice, at nightfall, the Milky Way would have been seen rising in the northeast at an azimuth of about 30 degrees,[10] arcing across the sky, and plunging to the southwest at an azimuth of about 210 degrees. If the beginning and end azimuths for the solstice Milky Way are connected by a straight line on the ground, then the ground trajectory for the Milky Way is found to extend along the same trajectory as the Great Hopewell Road—that is, from 30 degrees east of north, through Newark, to an azimuth of 210 degrees (Figure 4.7a).

From the foregoing what seems suggested is a spatial-temporal countdown of sorts that could have worked in the following way: relevant years were determined by alignments of either the Octagon or Great Circle with the moon. A significant year occurred about every nine and one-half years when either the Octagon or Great Circle came into alignment with the moon's maximum north or minimum north limit, respectively. The date of the summer solstice narrowed the target time down to the month and day within the designated lunar year. Nightfall on the date of the summer solstice sunset was the final tick of the clock—at which time the Great Hopewell Road–Milky Way alignment occurred. In those moments the trajectories of sun, moon, stars, and earthworks converged to create a special geometric and astronomic relationship in ritual space. As I discuss below, it may be during this liminal time that souls of the dead (perhaps escorted by living people) began their movement from the Ellipse burial ground (and perhaps other locations) toward the Milky Way–Great Hopewell Road entrance and Realm of the Dead. Perhaps it was believed that as the moon rose from the northeast horizon at these special times, that celestial entity transported or otherwise assisted the soul in making the transitional leap from This World to the Otherworld Milky Way Path.

Presumably, the movements of souls (and living people, if present) were further guided by the parallel-walled causeways between earthworks, maybe in a manner similar to that shown in Figure 4.8. Like the Great Hopewell Road, several of these causeways and causeway sections were apparently oriented along celestial azimuths. Aerial photos from the 1930s, for example, show that a then-visible section of causeway 1 near the Octagon (Figure 4.8) was oriented to within one degree of a due east-west line, or basically in the direction of the equinox rise and set. U.S.

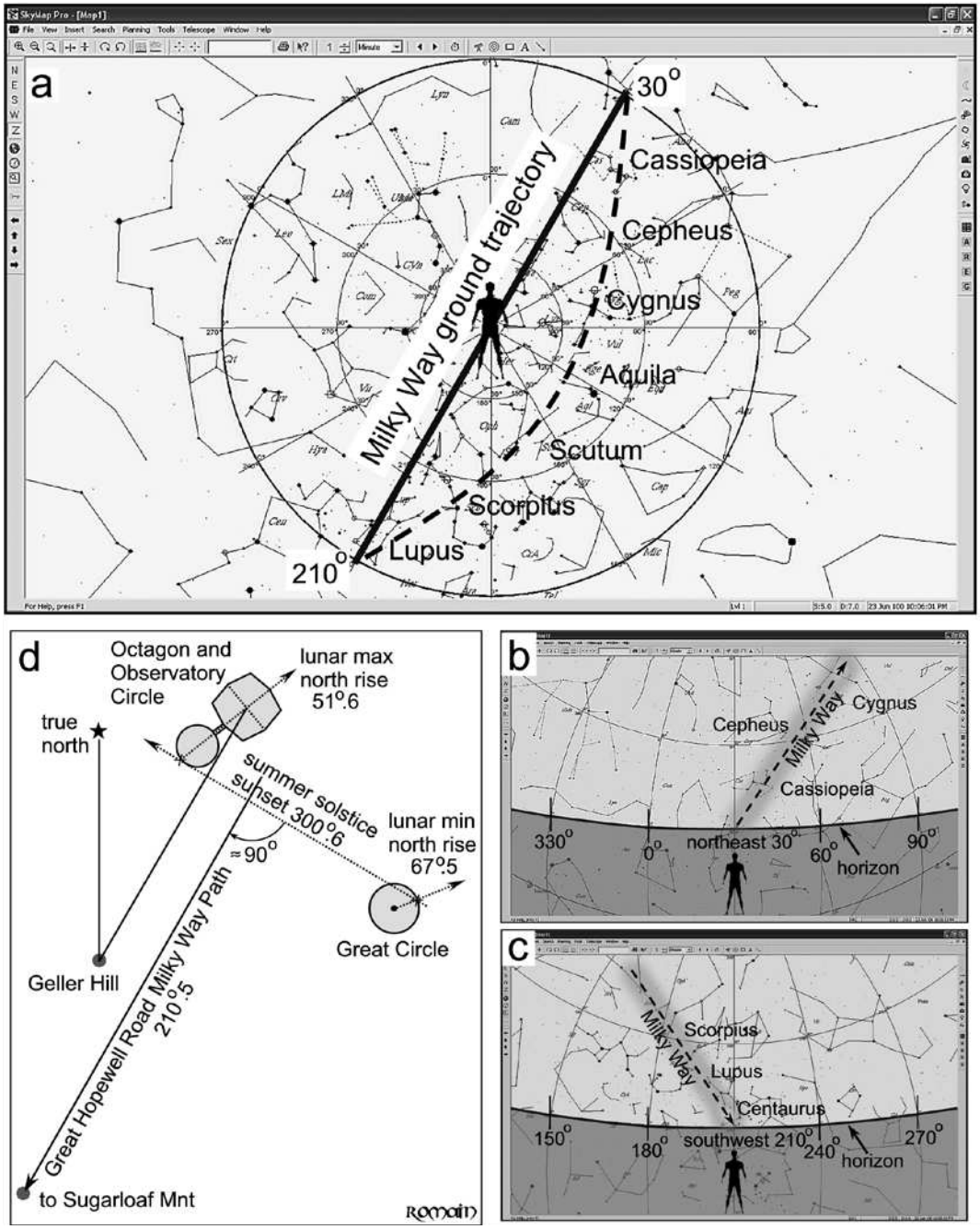

FIGURE 4.7. (*a*) Annotated sky map showing ground trajectory of the Milky Way at nightfall, AD 100, on the date of the summer solstice. (*b*) Central Ohio observer looking northeast at nightfall on the date of the summer solstice, any year between 100 BC and AD 200. (*c*) Same as 4.7b with observer looking southwest (sky maps by SkyMap Pro, annotation added). (*d*) Schematic plan showing relationships between Newark Earthworks and Milky Way trajectory.

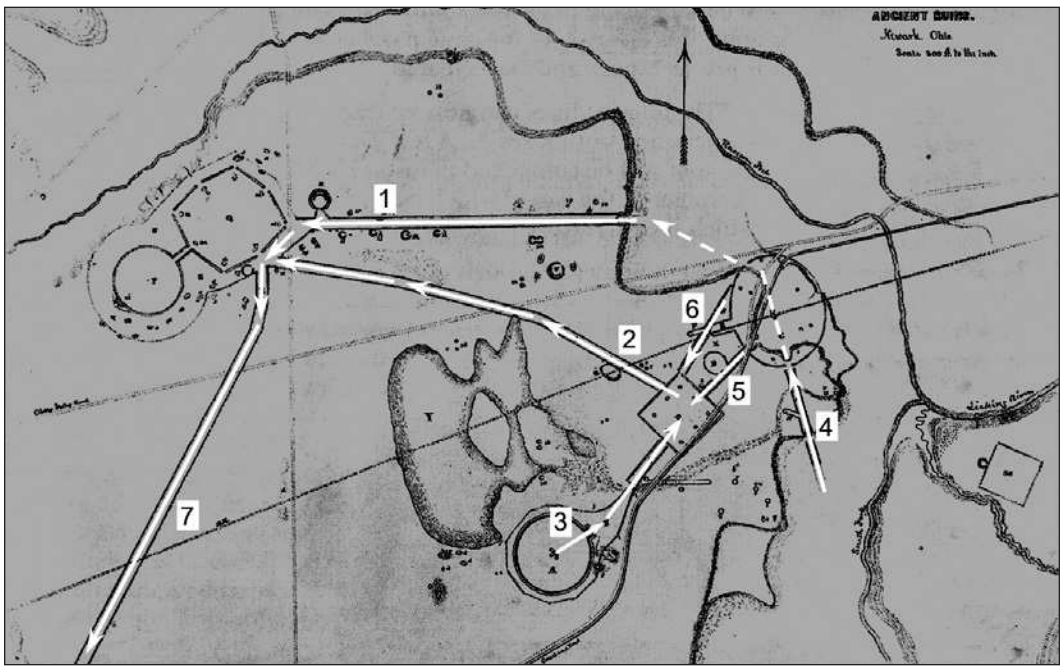

FIGURE 4.8. Hypothetical spirit paths associated with the Newark Earthworks. Salisbury map of 1862 (courtesy of the American Antiquarian Society, annotation added).

Geological Survey map analysis suggests that as it exited the Wright Square, causeway 2 was oriented to the moon's north minimum set before it curved around the former lake-bog, continuing to the area of the Great Hopewell Road's point of beginning. Earlier it was shown how the major axis of the Great Circle—which is oriented to the moon's minimum north rise—leads into a walled walkway. In Figure 4.8 this vector is identified as causeway 3. Causeway 4 is aligned along the same azimuth as the major axis of the Ellipse, which brings it into a geometric relationship with the solstice and Milky Way–oriented design square around which the Ellipse was built. The causeway 5 entrance begins at an opening in the Ellipse situated at the intersection of the Ellipse perimeter wall and the Milky Way axis of the Ellipse design square (Figure 4.3b). Lastly, if the Salisbury map is approximately correct, then causeway 6 extends to within a couple of degrees of the Great Hopewell Road (i.e., causeway 7) and the Milky Way trajectory.

If the celestial-aligned causeways of the Newark Earthworks guided souls and/or people to the entrance of the Great Hopewell Road, the next question is, exactly where does the Great Hopewell Road lead? As Figures 4.1 and 4.8 show, the road initially extends south. At a distance of several hundred feet from the Octagon, however, the road turns southwest and for the rest of its length is perfectly straight.[11] I believe there is good reason for this. When the trajectory of the Great Hopewell Road is plotted, it is found to intersect Sugarloaf Mountain in Chillicothe—52 miles (84 km) distant (Figure 4.9a–d).[12]

The likelihood that the intersection of the Great Hopewell Road trajectory with Sugarloaf Mountain is due to chance is slim. Had the azimuth for the road been even slightly different, it would not intersect Sugarloaf. Similarly, if the straight line section of the road originated at any other point east or west of where it actually begins, then again the road's trajectory would miss Sugarloaf. If the 210.5-degree trajectory (controlled by the perpendicular relationship to the solstice sightline) and the intersection of the road with Sugarloaf Mountain were conditions that had to be met, then the road had to begin where we find it. For reasons I explain below, the Great Hopewell Road and Sugarloaf Mountain were intentionally linked in the ritual space of the Hopewell, if not physically on the ground.

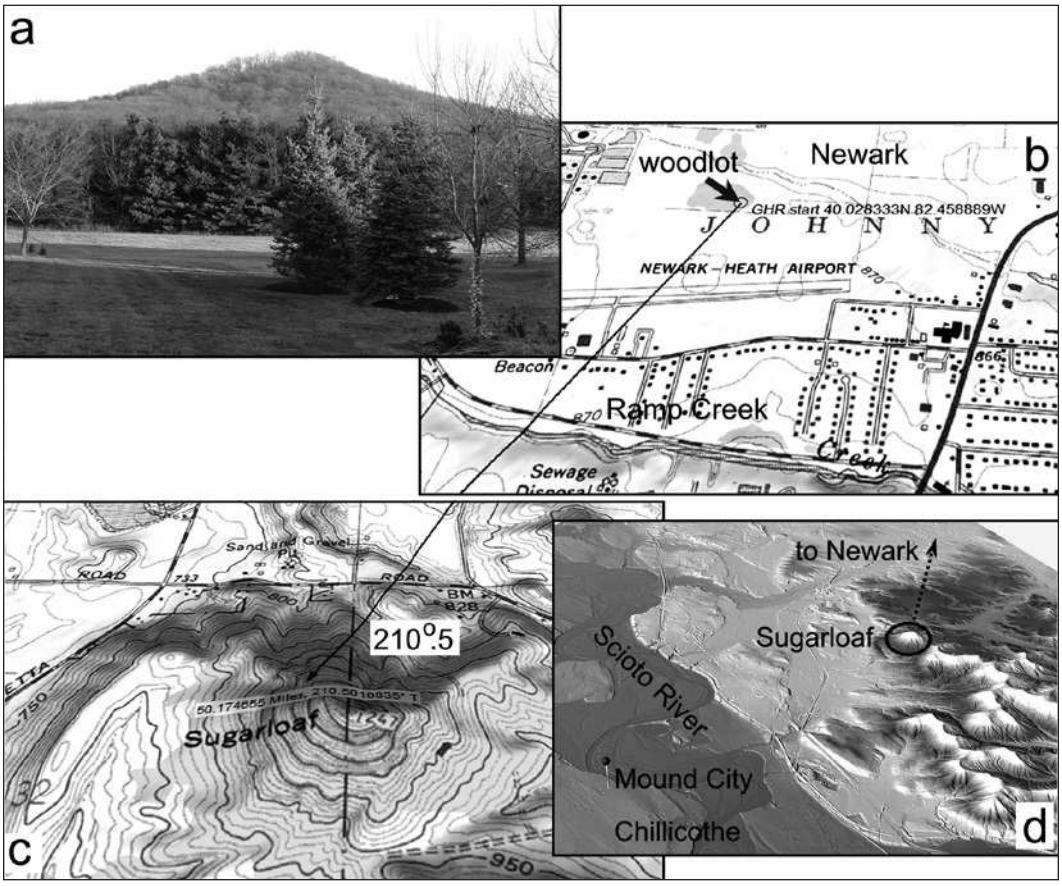

FIGURE 4.9. (*a*) View of Sugarloaf Mountain. (*b*) Starting point for plotting the trajectory of the Great Hopewell Road. (*c*) End point for plotting the Great Hopewell Road (maps by MyTopo). (*d*) LiDAR image showing the location of Sugarloaf Mountain relative to the Scioto River Valley.

Sugarloaf Mountain

Sugarloaf Mountain is situated immediately northeast of the modern-day city of Chillicothe. Sugarloaf is a moderately high mountain compared with others in Ohio. But it is not a matter of height that makes the mountain special. What makes Sugarloaf special is that it is an outlier, meaning it is somewhat separated from others in the group that flank the eastern horizon of Chillicothe. It is in fact the most northern mountain of the group composed of Bald Hill, Sand Hill, Bunker Hill, Mount Ives, and Mount Logan. Because it is an outlier, however, its conical shape is quite distinct and the mountain stands out against the distant horizon. Approached from any of several directions, Sugarloaf is a sure sign that the traveler has arrived in the Hopewell heartland.

Of considerable interest is the relationship between Sugarloaf Mountain and several surrounding Adena and Hopewell sites. At least five major sites in the immediate vicinity are situated so that a significant solar or lunar event will appear over Sugarloaf Mountain when viewed from each respective site (Figure 4.10).[13] Viewed from the Stitt Mound (likely Adena in cultural affiliation), the winter solstice sunrise will appear over Sugarloaf Mountain. Viewed from Mound City, the moon's minimum north rise will appear over Sugarloaf. Viewed from the southeast gateway or from the south small circle of the Hopeton earthwork, the summer solstice sun will rise over Sugarloaf. The summer solstice sun will also rise over Sugarloaf when viewed from the Shriver Circle. And viewed from the namesake Adena Mound, the moon's maximum north rise will appear over Sugarloaf. With the exception of Hopeton, what

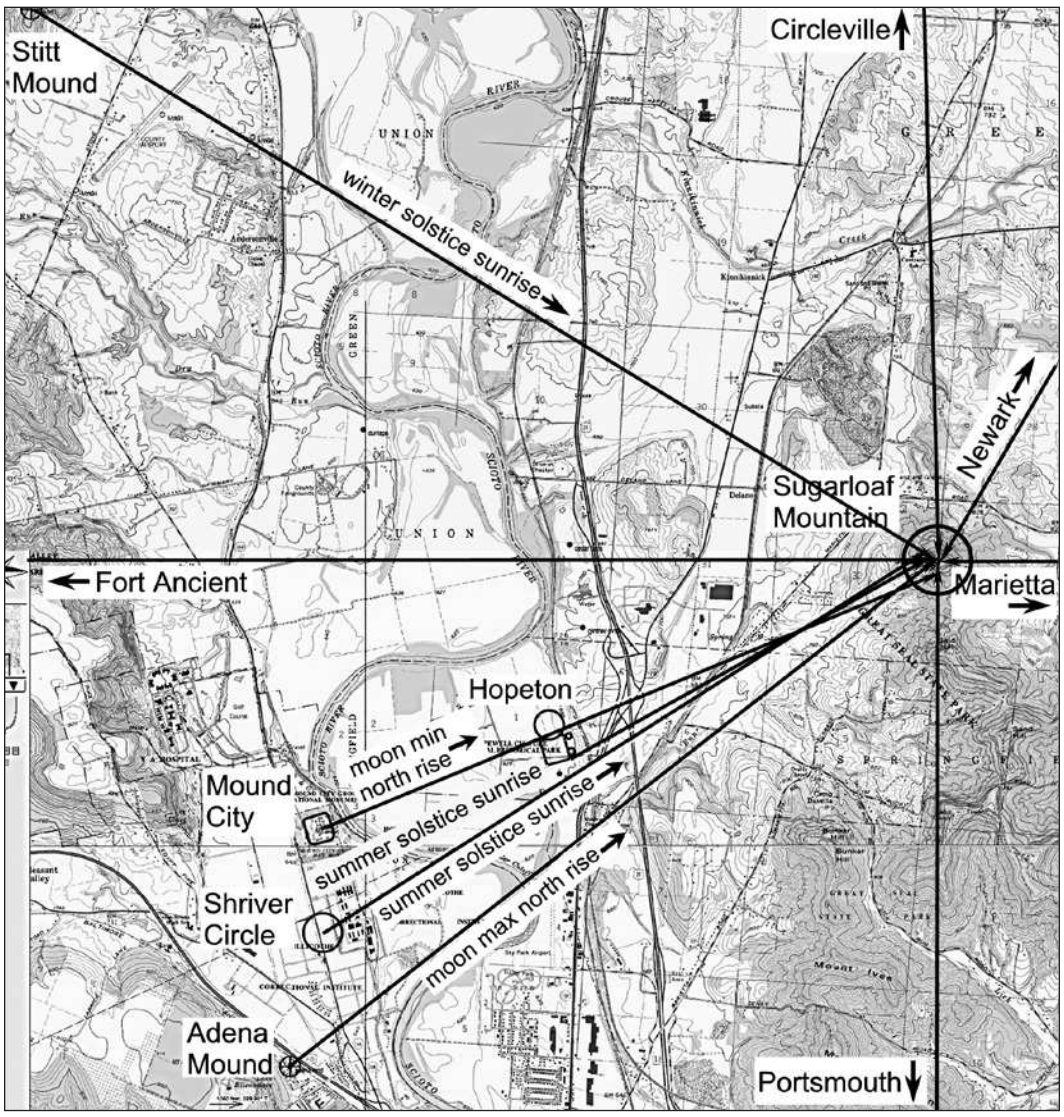

FIGURE 4.10. Several important Chillicothe-area mounds and earthworks as well as major outlier sites are astronomically linked to Sugarloaf Mountain. The map shows celestial events that would have been visible over Sugarloaf Mountain.

Stitt Mound, Mound City, Shriver, and the Adena Mound have in common is that all contained one or more burials. That said, there are several sites in the immediate area that do not demonstrate an obvious celestial link to Sugarloaf Mountain (e.g., Dunlap). The point, however, is that several major sites are linked.

Beyond the Chillicothe area, in addition to the Newark-Sugarloaf connection already discussed, there are other alignments worth noting. For example, a line drawn due west from the summit of Sugarloaf Mountain intersects the Hopewell culture hilltop enclosure known as Fort Ancient at a distance of 62 miles (100 km). The 270-degree azimuth intersects the southern end of the earthwork.

Looking in the other direction, a line drawn due east from Sugarloaf Mountain comes to within 1.5 degrees, or about 10,600 feet (3,231 m), of the Conus mound at the Marietta Earthworks Complex, at a distance of 79 miles (127 km). Looking north from Sugarloaf, a true north line comes

to within 1.25 degrees, or 1,520 feet (463 m), of the Circleville earthworks, about 14 miles (22.5 km) distant.

A line drawn due south from Sugarloaf precisely intersects the Biggs mound at a distance of 46 miles (74 km). Situated on the south side of the Ohio River, the Biggs mound was part of the Portsmouth Earthworks Complex and consists of a conical burial mound (resembling Sugarloaf in its shape) surrounded by a ditch and low embankment.

It is interesting that if we add Newark, then these sites generally establish the geographic boundaries of the core south-central Ohio Hopewell territory. That said, I am not suggesting that Circleville, Portsmouth, Fort Ancient, and Marietta were situated where they are in order to form a deliberate relationship to Sugarloaf. Undoubtedly, there were other factors that influenced and constrained the locations of these sites. Still, given the long-distance conceptual link between Newark and Sugarloaf, the possibility needs to be considered that the Adena-Hopewell may have at least recognized the cardinal relationships of these sites to Sugarloaf. If that was the case, then it is reasonable to think that Sugarloaf Mountain was considered the axis mundi for the Ohio Hopewell world. In this view, Sugarloaf Mountain was a place where horizontally extended cardinal, solstice, and lunar directions intersected a vertically oriented landscape feature—a prominent mountain at a geographic location that was central to the Adena-Hopewell world.[14] That is the essence of an axis mundi. As explained by Yi-Fu Tuan (1977:149):

> Human groups nearly everywhere tend to regard their own homeland as the center of the world.… In diverse parts of the world this sense of centrality is made explicit by a geometrical conception of space oriented to the cardinal directions. Home is at the center of an astronomically determined spatial system. A vertical axis, linking heaven to the underworld, passes through it.

The axis mundi concept is integral to many worldviews and can be expressed in different ways (e.g., Eliade 1971 [1954]:12–17). Common axis mundi symbols are trees, poles, columns of smoke, temples, and, significant to the discussion here, mountains. Among the mountains identified as an axis mundi by diverse peoples are Mount Fuji in Japan, Mount Kun-Lun in China, Mount Zion in Jerusalem, Mount Kailash for Hindus, and Mount Calvary for Christians.

From a religious perspective what makes the axis mundi important is not only that it links opposite cosmological realms; it also serves as a vector for ecstatic shamanic journeys to the upper and lower worlds and as a means for souls of the dead to transition to the Otherworld (see also Skousen, this volume).

The Milky Way Path of Souls

From the evidence at hand it appears that at least in part the Newark Earthworks Complex was a place for rituals associated with movement of the dead from This World to the Otherworld. We can speculate that certain of the Hopewell dead were prepared for burial or cremated in special crematory basins situated in the temple structure or spirit house found within the Eagle Mound. It may be relevant to note that in a sense, cremation references a "redistribution of personal substance into the cosmos" (Fowler 2004:74). When timed to solar, lunar, or stellar events, the integration of the deceased into the cosmos becomes a temporally referenced, memorable, and realm-entangling event. During such liminal times, processions might have carried either the prepared bodies or ashes of the dead to staging, holding, or final interment places within the Ellipse. We do not yet understand why some persons were cremated while others were interred as extended burials, especially within the Ellipse. But in either case, it may have been believed that once the corporeal substance of the body was suitably dealt with, the free soul of the deceased would continue to the Land of the Dead.

Many Native American traditions explain that a person has more than one soul (Hultkrantz 1953; also see Lankford 2007c). At the risk of oversimplifying the matter, a person was said to have a physical body that decays after death, a shadow soul that lingers with the body after death and is basically a grave ghost, and a free soul that continues on in a journey to the Realm of the Dead. The Great Hopewell Road may have been the directional corridor that guided the free soul in its

journey. In essence, the Great Hopewell Road and Milky Way Path were equivalent expressions of the pathway to the Realm of the Dead.

Along similar lines, Lepper (1998:132) early on proposed that the Great Hopewell Road was the "functional equivalent of a Mayan *sacbe*"—meaning a sacred road. He further noted that in the Mayan language the term *sacbe* not only means "white road" but also is a "Mayan term for the Milky Way" (Lepper 1998:132; also see Keller 2009). Lepper did not pursue the Great Hopewell Road–Milky Way connection further, but I believe he was on the right track.

Part of the road existed in This World, where processions helped guide the deceased person's free soul along the Milky Way trajectory. Beyond where the road physically dissolved into the landscape, the Great Hopewell Road was a spirit path aimed with precision at Sugarloaf Mountain—perhaps the final terrestrial landmark for the soul in This World. One can imagine that having been guided by the trajectory of the Great Hopewell Road to Sugarloaf Mountain, the soul ascended the axis mundi that was Sugarloaf Mountain, connecting This World to the Otherworld. In this the Great Hopewell Road was a "cosmological corridor" (sensu Marshall 1997) that connected the ceremonial earthworks at Newark to the topographic and cosmological axis mundi of the Hopewell world.

By now the reader is perhaps thinking that all this sounds like a just-so story. Maybe that is the case, or maybe not. Certainly there is overwhelming evidence from other pre-Columbian periods and sites to suggest that monumental architecture was often linked to celestial events and religious rituals (e.g., Davis 2012; Malville 2008; Pauketat 2013a; Rolingson 2012; Romain 2012a, 2012b, 2014; Romain and Davis 2013; Sherrod and Rolingson 1987; Skousen, this volume; Sofaer 2008; Van Dyke 2007). Even more to the point, compelling cases have been made for seeing various prehistoric roads and causeways as corridors linking This World to the Otherworld (e.g., Baires 2014; Baires et al. 2013; Marshall 1997; Parker Pearson et al. 2006).

Specific support for identification of the celestial Milky Way as a "Path of Souls" is provided by ethnologist George Lankford (also see Hall 1997: 162). As Lankford (2007a:175) explains:

> The mortuary belief complex in question manifests variation in ethnographic details from one tribal group to another, as might be expected, but there is a unifying metaphor which argues for a common core of belief across the Eastern Woodlands and Plains, and probably far beyond that area. That unifying notion is an understanding of the Milky Way as the path on which the souls of the deceased must walk.

Lankford (2007a:179–180) further notes:

> That identification is virtually universal in the early ethnographic literature of North America. It is recorded from the Ojibwa, Fox, Sauk, Menomini, Miami, Delaware, Shawnee, Powhatan, Cheyenne, Huron, Iroquois, Oglala, Osage, Omaha, Quapaw, Saponi, Caddo, Pawnee, Chickasaw, and Creek, and the designation extends at least as far south as the Andes (Sullivan 1996:58–75), as far north as Siberia (Eliade 1974:188, 248–251, 295, 466), and as far west as California (see Krupp 1996).

To the list of tribes provided by Lankford we can add the Apache (Curtis 1907:134), Paiute (Mooney 1976 [1896]:290), Shoshone (Curtis 1926:82), and Seneca (Wallace 1972:245).

As for the ascension of the soul, we know the dangers of drawing ethnographic analogies between cultures separated by thousands of years and thousands of miles, and in what follows I am not suggesting a direct connection. Rather, the following serves to inform us of the possibilities. Specifically, astronomer Edwin Krupp (1996:416) makes the interesting observation that among the Ajumawi Indians of northeast California, "the dead travel to the summit of Mount Shasta and from there, ascend to the Milky Way." Krupp's (1996:417) account is worth quoting in full:

> In the northeastern part of California, Floyd Buckskin, a member of the Pit River Indians Tribal Council, has reported Ajumawi band beliefs about the journey to the land of the dead. Departing from the body at death, the shadow, or soul, migrates southwest. It leaves the Fall River Valley and at the Pit River, it turns west and continues to the Pacific Ocean.… Arriving at the coast, the shadow heads north and

soars to the summit of Mount Shasta. From the mountain top, the shadow transfers to the Milky Way. The Ajumawi call the Milky Way "the pathway of spirits." When the Milky Way arcs over Mount Shasta, the shadow is able to travel east and join Hewisi the Creator at sunrise. This itinerary has a seasonal aspect, for the Milky Way climbs out of the northeast before dawn at summer solstice. The Ajumawi say the Milky Way is aligned at this time with the trail followed on the Earth by the dead and aligned with the Sun as well. Because these celestial and terrestrial routes are all so congruent, it is easier for those who die at this time of year to travel to the Creator.

Serpent Mound and the Realm of the Dead

Thus far, we have traced the movement of the soul through the labyrinth passageways of the Newark Earthworks, along the trajectory of the Great Hopewell Road, and upward along the Sugarloaf Mountain axis mundi to the Milky Way Path. But there was more. Most Eastern Woodlands traditions explain that the final destination for the soul was the Realm of the Dead. Accounts differ as to the details of this otherworldly place. Some accounts say the Realm of the Dead is like a "mirror world," where things are the reverse of This World: when it is daytime in This World, it is nighttime in the Realm of the Dead, seasons are reversed, and so on (e.g., Smith 1995:46; also see Hall 1997:133). Generally, though, the Realm of the Dead is a place where souls continue on in an existence similar to their corporeal life (e.g., Landes 1968:196–197; Smith 1995:46).

The location for the Realm of the Dead varies but is usually said to be in the south, southwest, or west (Lankford 2007a:176; 2007b:207, 240); and as already discussed, it is the Milky Way Path of Souls that leads to the Realm of the Dead. Given the widespread occurrence of these beliefs across the Eastern Woodlands, it seems possible that their conceptual origins extend back at least to Adena-Hopewell times (Lankford 2007b:224; Reilly 2004:126).

Where things become intriguing is Lankford's (2007b:213–214) finding from "Ojibwa, Menomini, Miami, Potawatomi, Sauk, Fox, Shawnee, and other Algonkian sources… [that] at the southern foot of the [Milky Way] Path the free-soul encounters the guardian/owner of the realm of the dead souls, sometimes identified as a serpent." Elsewhere Lankford (2007a:178) explains: "The goal of the journey is the Realm of the Dead, which lies at the southern end of the [Milky Way] Path. It is protected by the Great Serpent with the red jewel in its forehead… Scorpio."

The Great Serpent is known throughout the Eastern Woodlands as the master of the Lowerworld (Lankford 2007c; Penny 1985; Reilly 2004, 2011). The Great Serpent is the main antagonist of Upperworld entities such as the Thunderbirds. Although the Great Serpent reigns over the Lowerworld, the creature has celestial attributes as well; in some stories it is visible as a meteor or can be seen during summer months flying across the night sky, from one watery entrance to the Lowerworld to another (Hewitt 1891:384). Moreover, as Lankford suggests, the constellation Scorpius may be a cognate for the Great Serpent.

Back on the ground in Ohio, the iconic Serpent Mound effigy in Adams County (Figure 4.11a) is located precisely where one would expect to find the Lowerworld Serpent: at the end of the Milky Way Path. Serpent Mound is the best-known effigy mound in North America.[15] The effigy is situated on a promontory overlooking Brush Creek; its total length is about 1,370 feet (420 m). The body of the Serpent has seven convolutions and ends in a spiral coil. The head of the Serpent resembles a snake poised to bite or swallow an ellipse-shaped figure (the oval embankment), perhaps intended as a circle sun symbol turned at an angle, similar to the way the Serpent's head is turned to show its profile (Figure 4.12a).

Charles Willoughby (1919) was the first to suggest that the Serpent Mound effigy represents the Great Serpent of Native American mythology. In 1988 I documented a number of physical resemblances between Serpent Mound and ethnographic descriptions of the Great Serpent (Romain 1988). More recently, Lankford (2007c) likewise concluded that Serpent Mound represents the Great Serpent of Native American legend. Perhaps Lankford's most valuable contribution to the discussion, however, has been to connect the Great Serpent of Eastern Woodlands mythology and the Serpent Mound effigy with the constellation Scorpius. Specifically, Lankford

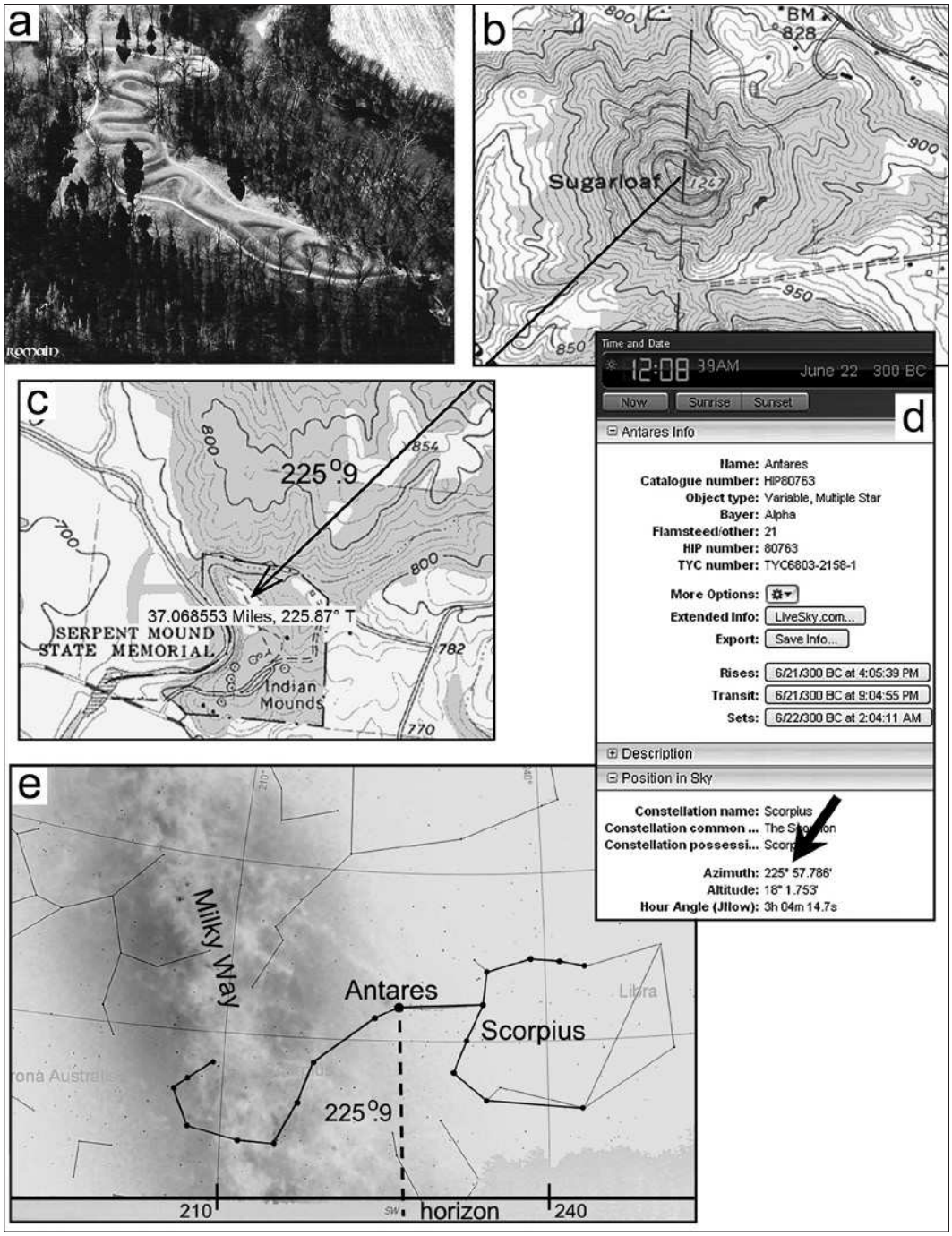

FIGURE 4.11. (*a*) Aerial view of Serpent Mound. (*b*) Starting point for plotting the azimuth between Sugarloaf Mountain and Serpent Mound. (*c*) End point for plotting the azimuth between Sugarloaf Mountain and Serpent Mound (maps provided by MyTopo). (*d*) Starry Night computer data for Antares at midnight on summer solstice, 300 BC. (*e*) Sky map showing Antares and Scorpius at midnight on night of summer solstice, 300 BC (map by Starry Night, annotation added).

(2007c:133) posits: "If the identification of the earthwork is the Great Serpent under discussion, then the oval shape [i.e., the oval embankment] would be readily seen as the red crystal/eye/Antares, and the peculiar globular forms at the base of the head are likely remnants of some feather locative." Further, according to Lankford (2007c:132), "the identification of Scorpio and Antares as the Serpent and his red eye points to a significant ethnoastronomical belief complex which cut across tribal and linguistic lines."

I believe Lankford is correct in his identification of Serpent Mound with Scorpius.[16] I differ from Lankford in how the Serpent may be represented by Scorpius, however. I believe that Antares is better situated to be the heart of the Serpent and that the Serpent's open mouth is found in the Scorpius configuration in the manner suggested by Figure 4.11e. In my interpretation, the Great Serpent in its Scorpius guise is forever in pursuit of the sun. Notably, this comports well with the on-the-ground, visual representation of the serpent attempting to swallow the rotated sun disk, and with the finding that the oval embankment is aligned to the summer solstice sunset through its major axis, thereby directly connecting the oval to the sun (see Figure 4.12b; also see Hardman and Hardman 1987; Fletcher and Cameron 1988; Romain 1992, 2000). Moreover, several stories from the Eastern Woodlands tell of a celestial serpent that tries to bite or swallow the sun (e.g., Hewitt 1891; Mooney 1900). Perhaps best known is the Cherokee story of the monstrous Uktena serpent who attacks the sun (Mooney 1900:252–254, 297–298). In any event, the fundamental idea is the same—that is, Scorpius is the celestial manifestation of the Great Serpent of Eastern Woodlands mythology and is represented on the ground by the Serpent Mound effigy.

To this I would add the following. As viewed from Sugarloaf Mountain on the night of the summer solstice, Scorpius and its bright star Antares are situated at the end of the Milky Way Path, on an azimuth of 225.9 degrees (Figure 4.11b–e).[17] Likewise, as plotted from Sugarloaf Mountain, the Serpent Mound effigy is located on the same 225.9-degree azimuth, at a distance of 37 miles (59.5 km). Given this, it may be that the location for the Serpent Mound was selected based on its azimuthal relationships to Sugarloaf Mountain, the Milky Way, and Scorpius (in addition to its location in the midst of several sinkhole fields—presumably Lowerworld entrances).

Supporting the interpretation for Serpent Mound as a cognate for Scorpius and the Lowerworld Great Serpent is the observation that Scorpius is a summer constellation that appears to rise in the southern sky and then rotate clockwise both during the course of a single night and over the course of the summer months (as viewed at the same time of night at one-month intervals—see Figure 4.12d–g). With regard to the monthly position of Scorpius, as shown by Figure 4.12c–g, the bisectors of each Serpent Mound body convolution reference or correspond to the monthly position of Scorpius when each of the convolution bisectors moves into a horizontal position relative to the observer's horizon. Notable too is that the annual path of the sun (referred to as the ecliptic) passes through the Scorpius serpent's jaws. Hence the appearance of the summer sun at sunset, being pursued by the Great Serpent as the serpent entity becomes visible in the darkening sky.

In summary, it may be that some earthworks in the Adena-Hopewell world were used to facilitate the transition of souls from This World to the Otherworld. The Newark Earthworks served at least in part as a focal point for mortuary ceremonies involving cremation and burial. From this we can speculate the following. Very likely the mortuary ceremonies at Newark—such as occurred within the spirit house in the center of the Great Circle—included measures for dealing with the dual or even multiple souls that a person might have. Perhaps the shadow soul was ritually contained within its designated burial ground while the free soul was helped in its transition to the Otherworld by the moon as that celestial entity rose from the northeast horizon. Having made the transition to the Otherworld, the soul was then guided by spirit barriers and passageways to the beginning of the Great Hopewell Road. For its journey through the Newark Earthworks, the soul may have been accompanied by processional movements of living people: relatives, mourners, psychopomps, and others. It appears that ceremonies were timed to coincide with temporal and spatial intersections involving lunar standstill and solstice events. Maybe it was believed that during such times This World and the Otherworld were

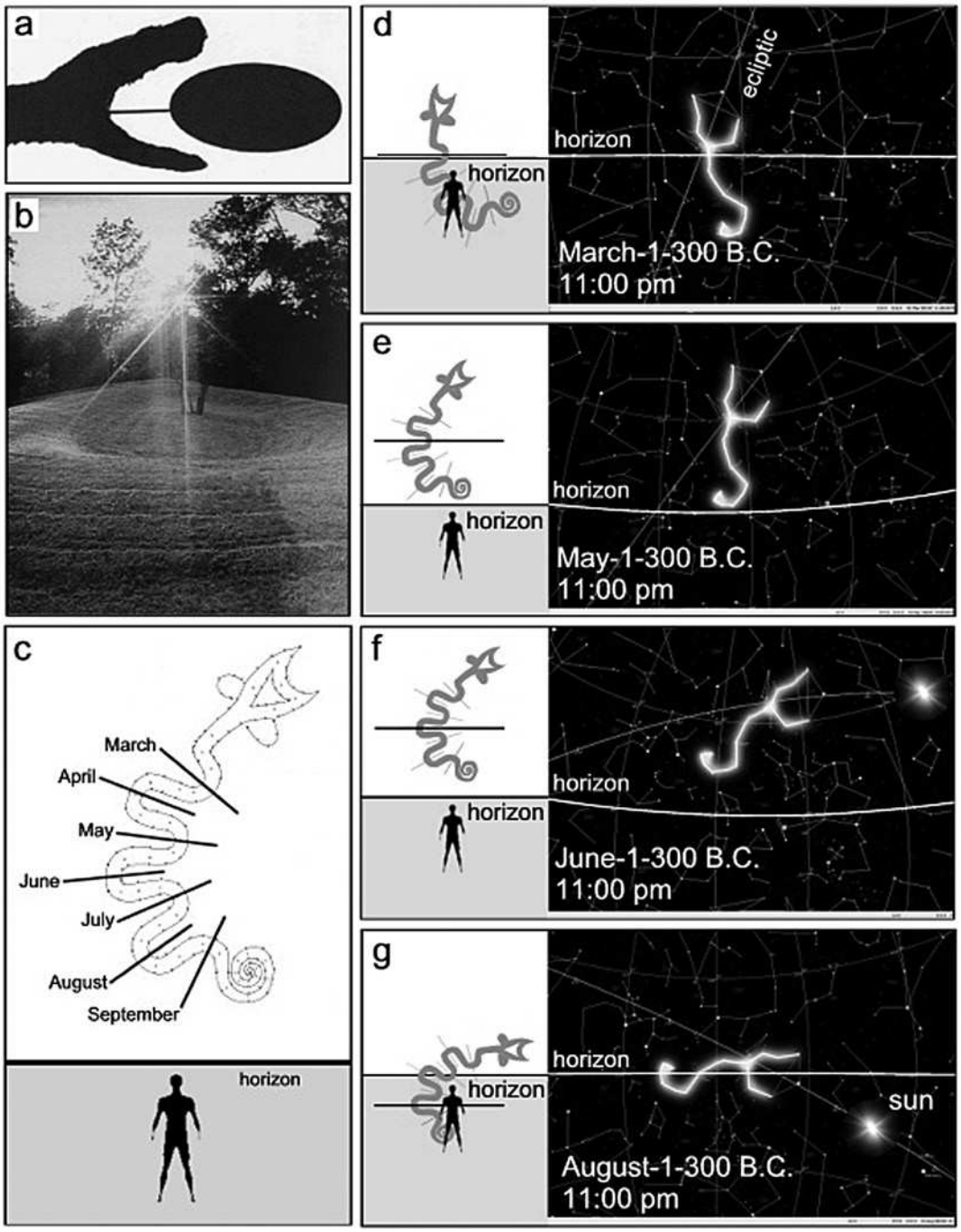

FIGURE 4.12. (*a*) Serpent Mound resembles the side view of a serpent attempting to bite a circle disk that has been rotated in a similar fashion as the serpent's head, thus generating the appearance of an oval. (*b*) Summer solstice sunset along the major axis of the Serpent Mound oval embankment, June 21, 1990. (*c*) The Serpent has been lifted off the flat earth surface and placed in the sky as Scorpius. Each line that bisects a body convolution represents one month of rotation of the Scorpius Serpent. The rising of Scorpius begins in March as the head of the Serpent rises from the Lowerworld. The Serpent continues its movement in an upward and clockwise manner until the end of the summer, when it descends back into the Lowerworld, below the horizon. (*d–g*) Views showing how each Serpent Mound convolution references an incremental clockwise turn of the Serpent during the course of the summer at monthly intervals. In each figure the bisector line for each body convolution is parallel to the horizon. Each month a different bisector line moves into the horizontal position and thereby shows the relative position of Scorpius in the sky. Not all summer months shown due to space limitations (maps by SkyMap Pro, annotation added).

at their closest or that the boundaries between realms were blurred, thereby allowing the soul to cross. In any case, once the soul reached its entry point to the Great Hopewell Road, movement along the trajectory of the road provided the soul with the requisite direction for its journey.

Continuing the soul journey, we can imagine that, following the Great Hopewell Road–Milky Way trajectory, the soul (or perhaps multiple souls released in a related group) traveled until reaching Sugarloaf Mountain, the axis mundi and center of the Hopewell world. Following the vertical track of the mountain, the free soul ascended to the Milky Way Path. There the soul may have been joined by others from nearby Chillicothe burial mounds also linked to Sugarloaf along celestial azimuths. Traveling southwest along the Milky Way Path, with the bright red star Antares as its guide, the soul eventually encountered the Great Serpent, guardian of the Realm of the Dead. If the soul was successful in its encounter with the Great Serpent, it joined the ancestors in the Realm of the Dead.

Conclusion

Of course there are possible iterations and scenarios other than what I proposed above. For example, over the course of more than one thousand years and especially in the Southeast, the story likely evolved to include concepts involving the Orion constellation, ogee symbol, and hand-in-eye motif (Lankford 2007a). The important point is that, considered as separate entities, the Newark Earthworks, Great Hopewell Road, Sugarloaf Mountain, Chillicothe sites, and Serpent Mound provide a limited view of what may have been happening in the Adena-Hopewell world. Considered together as part of something bigger, these sites offer a different set of meanings. The sites emerge as part of a relational web that gathered and engaged people (both living and dead), special places in This World and the Otherworld, cosmic forces and entities, landscape features, and celestial events in a dynamic meshwork that evolved in its manifestations over generations.

In this relational web the boundaries between realms were permeable and mutable, and human perceptions, emotions, and memories entangled multiple spaces and dimensions—which is to say, Adena-Hopewell earthworks facilitated movement between worlds and provided a center place for temporally linked rituals that intertwined human sensory experience with the dimension of spirit. This relational web linked sites across a distance of nearly one hundred miles. In this, the Newark–Sugarloaf–Serpent Mound relational web may have been one of the largest religious complexes known to the prehistoric world.

Indeed, it may be that the Milky Way Path as written across the landscape of Ohio was known to people throughout the Eastern Woodlands, and that the Newark–Sugarloaf–Serpent Mound corridor served as a regional ceremonial center intended to provide access to the Realm of the Dead for selected special persons such as powerful chiefs, medicine men, clan leaders, and shamans. In this, Newark and certain of the central Ohio earthworks may have been pilgrimage destinations (also see Lepper 2006). Such a scenario is supported by the many occurrences of large quantities of exotic materials found in central Ohio burial contexts that were brought into the area from far-flung regions (e.g., Indiana hornstone, obsidian from Yellowstone, mica from the Appalachians, copper from the upper Great Lakes, conch shell from the Atlantic or Gulf coasts).

In any event, for the people who were part of it, the relational web I have sought to rematerialize engaged and unfolded into a powerful narrative. This narrative was woven from moonbeams and starlight, landscape features and life events, all on a framework of geometric shapes and symbols that were the earthworks. This narrative, I believe, provided people with answers to life's most perplexing questions: What happens when we die? Where do we go? The Newark–Sugarloaf–Serpent Mound relational web gave an answer to those questions. It was an answer visible in the heavens above and traced across the land for all to see. Generations of people built the earthworks, used them for various purposes, lived, and died. As souls, they ascended to the Milky Way Path, journeyed to the Realm of the Dead, and joined the ancestors. It was all perfectly clear and needed no further proof beyond that which the people could see, feel, and experience. The relational web that the Adena-Hopewell built and were enmeshed in provided a context that was familiar, reassuring, and hopeful. Neither the individual nor the community was destined to perish.

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My thinking about relational webs and the Adena-Hopewell Milky Way Path has been influenced by the work of Tom Emerson, Robert Hall, George Lankford, Tim Pauketat, and Kent Reilly III. I am solely responsible for any shortcomings in this chapter.

Notes

1. Given the temporal range of the Adena and Hopewell earthworks involved in the relational web described, it is clearly not the case that the entire web, or even each site, was built contemporaneously pursuant to a grand master plan. Hundreds of years passed as the web morphed and expanded and eventually came into the form we see today. Most likely, different parts were added in a piecemeal fashion as special places became evident, the narrative became more detailed, or new earthworks and symbols needed to be added. However, as long as the additional constructions incorporated basic shared design principles, and the core narrative was maintained by successive mound builders, the relational web would have continued to work throughout the Adena-Hopewell florescence.
2. LiDAR is an acronym for Light Detection and Ranging. The technology uses reflected near-infrared laser beams aimed at the earth from an aircraft to develop high-resolution images of the ground (Romain and Burks 2008a, 2008b, 2008c). Because of the high density of coordinate point data typically collected and because LiDAR beams have the ability to penetrate some vegetation, accurate representations of the surface topography can be made.
3. The Salisbury (1862) map shows these knolls as mounds. The knolls resemble mounds in shape and size. However, Geoprobe coring by Monaghan, Herrmann, and Romain (Romain 2013) into four of the knolls at multiple locations failed to find any evidence that these features are man-made.
4. There are other maps that show the Ellipse earthwork, such as those by Atwater (1820), Squier and Davis (1848), and Wyrick (1866). The represented shape for the Ellipse differs somewhat between maps. Each map has its unique strengths and weaknesses; for distance, shape, and direction, I consider the Salisbury (1862) map to be the most accurate.

   A sense of the accuracy of the Salisbury map can be gained from the following comparison to modern, ground-truthed data: Salisbury diameter for the Observatory Circle is accurate to within 6 feet; Salisbury azimuth for the main axis of the Octagon–Observatory Circle is accurate to within one-half degree; azimuth between Observatory Circle and Great Circle is accurate to within 4 degrees; azimuth of railroad shown by the Salisburys is accurate to within 1.5 degrees; distance between Observatory Circle and Great Circle is accurate to within 100 feet; Salisbury azimuth for the Great Hopewell Road is accurate to within 2 degrees.
5. Lunar azimuths calculated by Romain for AD 100, zero-degree horizon elevations corrected for parallax, refraction, and lower limb tangency. Zero-degree horizon after Hively and Horn (2010), who propose that for this earthwork, lunar azimuths were established by observations made from surrounding hilltops. The difference between azimuths computed using local horizon elevations viewed from the earthwork and zero-degree elevations from hilltops is on average less than one degree—but in the direction favoring the zero-degree hypothesis.
6. The lunar alignment posited here differs from that suggested by Hively and Horn (1982:S15), who used the axis of the entranceway walls leading to the Circle for calculation purposes.

   The Newark Great Circle appears to have been laid out on the ground using two slightly overlapping circles, each about 1,178 feet in diameter (perhaps reflective of two different construction episodes). In Figure 4.4b the southern design circle is shown and is used for calculation purposes.

Newark Great Circle moon minimum north rise azimuth calculated for AD 100, with horizon elevation based on an entrance wall height = 15 feet, horizontal distance 589 feet, 0.35-degree refraction correction, 0.25-degree lower limb correction, 0.95-degree parallax correction, which yields a corrected horizon elevation of 2.3 degrees.

7. Newark Great Circle–Observatory Mound summer solstice sunset azimuth calculated for AD 100; map-measured distant horizon elevation corrected for refraction, lower limb tangency, and estimated foresight tree level of 80 feet = corrected horizon elevation = 0.98 degrees.
8. Several design lines between earthworks at Newark involve geometric relationships and multiples of the HMU in such a way that relationships between earthworks are clearly and intentionally established—even though the beginning and end points for many of these lines are not intervisible. The validity of the solstice sightline between the Great Circle and Observatory Mound does not require intervisibility.
9. A considerable number of Eastern Woodlands stories explain that to reach the Realm of the Dead the soul must travel along the Milky Way Path. Before reaching this realm, however, the soul must cross a river. Some souls are able to successfully cross the river, but others fail and are lost (Lankford 2007a:182–183). Coincident with this feature of the soul journey story, it is interesting to note that Ramp Creek cuts across the trajectory of the Great Hopewell Road about 2.5 miles south of the Octagon. Beyond this location, physical traces of the road vanish. It is as though once the soul reached the other side of Ramp Creek, the soul entered a slightly different dimension, a dimension where physical manifestation of the road was no longer needed for directional guidance.
10. In AD 100 the summer solstice sunset occurred on June 23. Nightfall occurred at about 10:05 PM local standard time. Nightfall begins after sunset and after twilight when no visible light is provided by the sun. This occurs when the sun reaches an elevation of about 18 degrees below the horizon.
11. Great Hopewell Road starting point coordinates: Ohio State Plane (NAD83): N 738729 / E 1980066.
12. The observation that the trajectory of the Great Hopewell Road intersects Sugarloaf Mountain was noted in an Internet posting in 1998 by Joseph M. Knapp. To my knowledge, Mr. Knapp's finding has not been reported in the professional literature. I happened on the Knapp (1998) article after independently reaching the same conclusion. Mr. Knapp used USGS maps and aerial photos to determine the azimuth for the road. As indicated, my findings are based on LiDAR data. Our azimuth values are nearly the same.
13. Alignments calculated for AD 100 (although observation dates ± 300 years will not result in azimuth differences discernible to the naked eye). Stitt Mound winter solstice sunrise = 121.8 degrees, map measured horizon elevation corrected for refraction and lower limb tangency = 0.5 degrees, map measured azimuth = 121.5 degrees, and therefore alignment is to within 0.3 degrees; Mound City moon minimum north rise—see Hively and Horn 2010:145; Shriver summer solstice sunrise = 59.7 degrees, corrected *h* (where *h* refers to horizon elevation) = 1.1 degrees, map measured azimuth = 59.02 degrees, and therefore alignment is to within 0.7 degrees; Hopeton summer solstice sunrise = 61.1 degrees, corrected *h* = 2.6 degrees, alignment is to within 0.2 degrees; Adena Mound moon maximum north rise = 52.25 degrees, corrected *h* = 0.8 degrees, map measured azimuth = 52.12 degrees, alignment is to within 0.2 degrees.
14. Review of the Ohio Archaeological Inventory database reveals no reported prehistoric sites documented on Sugarloaf Mountain. At first this seems peculiar for what is purportedly a central component of the relational web proposed; but in an Adena-Hopewell world, where things were part of a larger web of relationships, there was no real need for humans to mark or designate the mountain as special. As an entity possessing agency in its own right—meaning the capacity, consciously or not, to "alter the trajectory of some other being, phenomenon, or entity" (Pauketat 2013a:29; also see Skousen 2012)—the mountain was already obviously special simply by virtue of its presence.
15. Recent radiocarbon dates (Herrmann et al. 2014; Romain 2014; Romain et al. 2013) suggest that Serpent Mound was built during the Early Woodland period. Five radiocarbon samples extracted by Geoprobe coring from five different locations along the spine of the Serpent at the base of the effigy yielded an OxCal median date of 321 BC, with a 2-sigma range of 381–44 BC. Two additional samples yielded dates about two hundred years earlier. These findings differ from claims made by Fletcher et al. (1996), who, using two radiocarbon dates from an area of the Serpent subject to erosion, assert that the effigy was built by Fort Ancient people. The most parsimonious explanation for the combined data is that Serpent Mound was built by people of the Adena culture and later repaired or renewed by people of the Fort Ancient culture. (For further details, see Herrmann et al.

2014; Romain 2014.) Physical evidence shows that the area to the immediate south of Serpent Mound was occupied by Archaic, Adena, and Fort Ancient peoples.

16. Scorpius is a "Western" constellation in the sense that it was recognized as a scorpion by the Babylonians and Greeks. The constellation was known as a serpent, however, by some Native Americans, including the Skidi Pawnee (Chamberlain 1982:82; Fletcher 1903:15, also see Lankford 2007b:131–132).
17. Azimuths for Scorpius and Antares plotted for midnight ± 10 minutes, June 22, 300 BC, eastern standard time (no daylight saving time correction applied).

    Although star declinations change over time, the stars that make up the constellations are, for all practical purposes, fixed relative to each other. Thus Scorpius in 300 BC looked the same as it does today. So, too, in cal AD 1070 (the date that Fletcher et al. [1996:133] posit for Serpent Mound construction) Scorpius and Antares would appear in the southwest sky at the same azimuths as they did in 300 BC, but roughly one hour later, at about 1:00 AM rather than midnight. Given this, the Great Serpent in the guise of Scorpius and Serpent Mound could have been recognized from Historic times back through Fort Ancient and into the Adena period in the same position relative to the Milky Way.

    Midnight is the conceptual opposite of noon, and hence it is a symbolically meaningful time. In this regard, recall the earlier discussion that the Realm of the Dead is the reverse of This World.

    Antares is the brightest star in Scorpius. It is bright red and is the only red star in the summer sky.

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