

Chapter 2

Environmental Setting, Natural Symbols, and Subsistence

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The social and ceremonial lives of Scioto Hopewell peoples were richly interconnected with the natural, experiential, and culturally interpreted, symbolic qualities of the land in which they made their home. The Scioto-Paint Creek area was both a medium for the creative expression of Hopewellian beliefs and practices, and a setting that presented a limited range of experiences and various ecological restrictions, which encouraged Hopewellian thought, activities, and society to develop in certain broad directions. Places of extraordinary character in the Scioto and Paint Creek valleys were selected by Hopewell people as the locations of their ceremonial centers. Animal species of the area served as templates for leadership roles, clan identities, and clan organization, and as means for obtaining personal power and journeying to an afterlife. Natural qualities of the valleys also helped to mold the densities and spatial distributions Hopewellian people there, affecting the sizes and complexity of their societies and rituals.

The social and ceremonial organization of Scioto Hopewell peoples was also broadly constrained by their means of subsistence. Gathering, hunting, fishing, and swidden horticulture necessitated that Scioto Hopewellian residential communities be small, dispersed

over the landscape, and move every few years to a decade or so, if people were to closely map onto sources of food. Over the course of a year, logistical moves, and seasonal residential moves in at least certain parts of the Scioto drainage, were required of some or all members of households to harvest staple foods. The spatial dispersion and isolation of households from one another that resulted from these conditions required households to gather together periodically for enculturation, to work out marriage arrangements, for rites of passage, for their spiritual well being, and possibly to exchange foods to buffer against temporal variations in local food availability, i.e., for personal, societal, cultural, and biological health and reproduction. Social and spiritual ceremonies at mound centers and within earthen enclosures were the cultural vehicles that ensured the needed gatherings and interactions among households.

This chapter overviews the environment and subsistence of Scioto Hopewell people as a context for understanding their social and ritual organization and culture history. The chapter begins with an experiential view of the natural environment in the Scioto and Paint Creek area, with sensitivity to how Hopewellian people might have perceived it through concepts of

their own world view. Next, the physiographic, pedological, floral, and faunal elements of the natural environment and the swidden horticultural plots that Hopewell people cleared in it are described in modern Western terms. These features of the natural and constructed environment are then explored for the symbolic meanings that Scioto Hopewell people probably attributed to them, given what is known about Scioto Hopewellian cosmology. The ecology of the Scioto-Paint Creek area is discussed next. The topics addressed include a correlation between locales of high environmental diversity and the spatial distribution of Hopewell people and their ceremonial centers, the stable regional density of people in the Scioto drainage during the Early and Middle Woodland periods, the aggregation of people into the bottomlands and middle terraces of the Scioto-Paint Creek area from its upland settings and from other portions of the Scioto drainage during the Middle Woodland period, and the nevertheless mild degree of spatial packing of social groups in the area.

The second half of the chapter documents the subsistence base of Scioto Hopewell people. Wild animal and plant foods, with emphasis on deer and other mammals, nuts, and mollusks, are found to have comprised the bulk of the caloric diet of Scioto Hopewell people. These food resources were the long-time mainstays of Woodland peoples in the Midwest-Riverine area. Cultivated Eastern Agricultural Complex starchy and oily seeds provided supplementary sustenance constituting only about a quarter of the diet. This reconstruction of the balance of food resources used by Scioto Hopewell people is supported by seven diverse lines of paleoethnobotanical, zooarchaeological, artifactual, artistic, and gender-based evidence. Diachronic paleoethnobotanical data from the upper Ohio valley basin are discussed next. They indicate that horticulture was intensified to its significant but supplementary level quickly in the last half century B.C. and first decades A.D., and remained approximately stable in its contribution to subsistence for about eight centuries thereafter. The chapter ends with evidence that Scioto Hopewell people grew their crops by means of swidden horticulture

with periodically shifted garden plots, and that households varied significantly among one another in the balance of species of crops that they cultivated.

In line with the intent of this book to thickly describe local Scioto Hopewell people for their own particular lifeways in their own cultural, historical, and natural settings, this chapter focuses on environmental and subsistence data specifically from the Scioto drainage and close regions. Broader and generalized Midwestern and Eastern United States environmental conditions and subsistence patterns and their change over time serve as a general backdrop for reconstructing the local scene described here, but local data are given precedence in this task. Introductions to the broader Midwestern and Eastern Woodlands picture, for readers not familiar with it, are presented elsewhere (e.g., Asch and Asch 1985; Delcourt and Delcourt 1987, 2004; Ford 1974, 1978; Styles 1981; Styles et al. 1983; Phillips and Brown 1983; Smith 1992, 1995).

NATURAL AND EXPERIENTIAL SETTING

Paddling a dugout canoe southward on the Scioto river or Paint Creek, from their upper reaches toward the great concentration of Hopewellian earthworks at the confluence of these streams (Figures 1.3 and 1.4), one can only be awestruck by the changing landscape. From the gently rolling hills of the Till Plain, where sunlight can abound, the mountains of the Allegheny Plateau suddenly emerge and rise to their heights (Figure 2.1A–D), creating a world of interfingering light and shadows, which can reversibly transform into each other – a theme that also preoccupied much of Hopewellian thought, art, and culture of the area (Carr and Case 2005b:199–202; Greber 1996: 162–165, 168–169, figure 9.9; Greber and Ruhl 1989:276; Turff and Carr 2005:670–672). The canoeist leaves behind the thinner oak-hickory or oak-sugar maple forests of the Plains, with their openings of scrub and prairie, and enters a

(A)



(B)



Figure 2.1. Landscape change. (A) Flat to gently rolling Till Plain north of the Scioto-Paint Creek area, 5 miles west of Frankfort, Ohio, near the North Fork of Paint Creek. (B, C) Mountains of the Allegheny Plateau emerge from

(C)



(D)



Figure 2.1. (continued) the Till Plain, 10 miles and 8 miles north of Chillicothe, Ohio, respectively, near the Scioto river. (D) Dissected Allegheny Plateau, nine miles east of the Scioto valley at Waverly, Ohio. See credits.

denser and darker world of bottomland forests, surrounded by bluffs and mountains with yet deeper stands. Here the trees are giants in comparison to those on the Plains (Figures 2.2 and 2.3).¹ As one's canoe approaches the Plateau, its outstretching arms slowly engulf one and come to tower above, giving the canoeist the feeling of entering a cavern and accentuating the downward flow of the Scioto. It is an unnatural decent, where the stream falls rather than rises as one proceeds into the climbing mountain terrain. This is a sacred place of change, where above and below meet and interpenetrate, and where distinct landscapes in different directions interface, recalling the vertically and horizontally positioned and interacting realms of the Scioto Hopewellian cosmos—

a structure likewise emphasized by Scioto Hopewell peoples in their thought, art, and burial practices (see below, Figures 2.8 and 2.9).

Among all historic Native Americans, certain places in nature were believed to be full with energy and power (Gill 1982:97) – for example, “where the Creator’s heart beats more strongly” (Swan 1988:152). Waterfalls, springs, deep pools, caves, canyons, mountain passes, outcrops of fascinating minerals and pigments, and refuges of medicinal plants are common examples of natural settings that historic Eastern Woodlands Native Americans thought to have especial power (Hudson 1976:130–131, 145; Bacon 1993). The landscape around the



Figure 2.2. A wet prairie within the oak-hickory forests of the Till Plain province in Ohio. See credits.



Figure 2.3. Tall and dense hardwoods of the Allegheny Plateau province in Ohio; primarily poplars. See credits.

confluence of the Scioto river and Paint Creek has this quality.

The lower 40 kilometers of Paint Creek valley, and adjacent portions of the Scioto valley for about 30 kilometers north and south of the confluence, is a place of great physiographic, geological, and biological diversity and powerful features. Around the confluence of Paint Creek and the Scioto river meet three physiographic provinces: the glaciated Till Plains section of the Central Lowland physiographic province, and the glaciated and unglaciated regions of the Allegheny Plateaus section of the Appalachian Plateaus (Figure 2.4A). The Till Plains are flat to gently rolling ground moraine, whereas the unglaciated regions of the Allegheny Plateaus have a rugged profile and deep, steep-sided valleys. The angularity of the glaciated regions of the Allegheny Plateaus is somewhat more subdued (Figure 2.4B). These geomorphological variations in the Scioto-Paint Creek area are attributable to it having been a southern terminus of both the Illinoian and Wisconsinan glaciations.

In the Allegheny Plateaus section, the Scioto and main Paint Creek valleys are distinctive from their tributary streams. The Scioto valley and Paint Creek valley are broad: 3–5 kilometers wide, and 1.5–2 miles wide, respectively, in the area of Chillicothe (Figure 2.5A, B). The Scioto and Paint Creek are greatly underfit streams, with valleys that were scoured out by much larger preglacial and glacial rivers. The Scioto river occupies the preglacial Teays valley immediately around Chillicothe, and farther south it flows through wide, Deep Stage, Illinoian, and Wisconsinan valleys in its course to the Ohio river (Hansen 1987; Quinn 1974; ver Steeg 1946). In contrast, streams tributary to the Scioto and Paint Creek are commonly V-shaped, with little to no flood plain (Figure 2.5C; Brockman 2006; Fenneman 1938).

Both the Scioto and Paint Creek valleys have a complex morphology, with up to seven terraces of Illinoian and Wisconsinan age (Kempton and Goldthwait [1959] in Maslowski and Seeman [1992]). Their

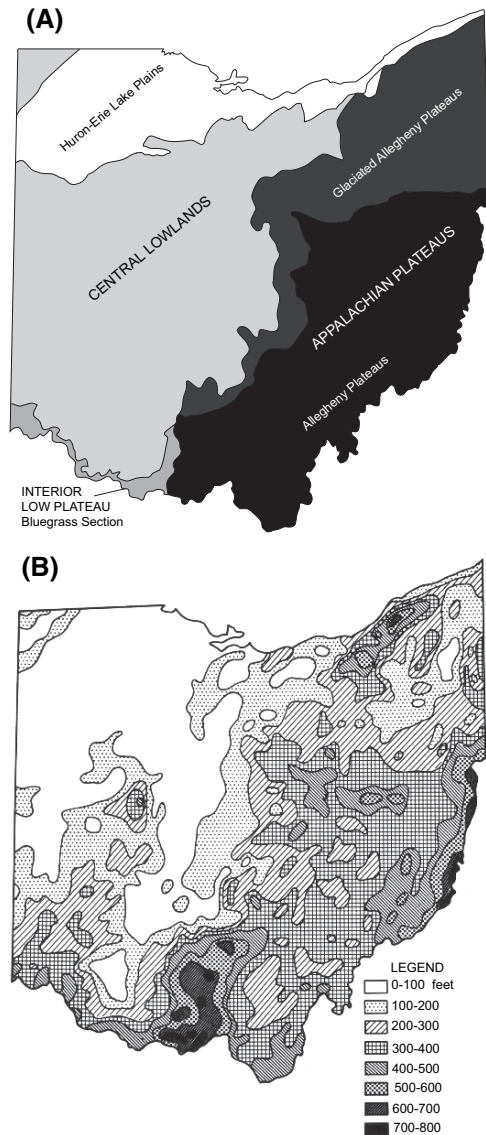


Figure 2.4. (A) Till plains, glaciated Allegheny Plateaus, and unglaciated Allegheny Plateaus of Ohio. (B) Relative topographic relief in Ohio. Note the region of maximal relief around the lower Scioto valley. See credits.

pedology is diverse, with six distinct soil series, and an additional two series characterize the surrounding uplands. This geomorphological and pedological variation, in turn, has fostered the development of diverse biological communities in the area (Maslowski and Seeman 1992). It likely had the greatest diversity of

(A)



(B)



Figure 2.5. Comparison of the widths of the flood plains of the Scioto, main Paint Creek, and North Fork of Paint Creek valleys in the Chillicothe area. (A) The wide Scioto valley flood plain, looking bluff-to-bluff, one mile south of the Liberty earthwork. (B) The somewhat less wide, main Paint Creek valley flood plain,

(C)



Figure 2.5. (continued) looking bluff-to-bluff, 2 miles east of the Seip earthwork. (C) The narrow North Fork of Paint Creek, one half mile west of the Hopewell earthwork, and between the Hopewell and Old Town (Frankfort) earthworks. See credits.

microenvironments in areas of comparable size in the entire mid-Ohio valley (Gordon 1969; Crowl 1937; Quinn 1974 cited in Maslowski and Seeman 1992:11). The rivers and their open banks offered a variety of fish, especially buffalo, channel cat, redhorse, and drum; fresh-water mussels; turtles of the soft-shelled, box, snapping, and less common varieties; and fair-sized flocks of migrating ducks and geese (Parmalee 1965; Stansbery 1965; Bellrose 1976:20–23; Ruby et al. 2005:128, Table 4.1). In the Scioto valley near the mouth of Paint Creek valley (Figure 2.6), the shores of these two streams were lined with cottonwood, willow, and sycamore. Mixed hardwood forests of beech, white oak, sugar maple, red maple, elm, black walnut, ash, and/or yellow buckeye, with occasional small prairie openings, filled out the swampy flood plains. The higher and better drained Wisconsinan terraces supported mesophytic forests dominated by white oak and sugar maple, with small prairie openings. This community offered

acorns, maple syrup, and edge-adapted animals such as deer and turkey as key food resources. Yet higher, Illinoisan terraces and slopes of the Allegheny Plateau were characterized by mixed mesophytic forests, including beech, sugar maple, tulip poplar, white basswood, chestnut, yellow buckeye, white oak, red oak, and small prairie openings. The uplands beyond the valley rim bore mixed mesophytic, mixed oak-hickory, and mixed oak-sugar maple forests. Hickory nuts, acorns, maple syrup, and deer would have been the primary foods of interest here. Paint Creek valley had different and less diverse vegetation. Cottonwood, willow, and sycamore grew at the stream's edge. The floodplain was dominated by beech trees with some maple and surrounded by mixed mesophytic forests. In their more western and northern reaches in Ross county, Paint Creek and its North Fork flowed through mixed oak and elm-ash swamp forests (Figure 2.7; Gordon 1966, 1969:37–44, 50, 70; Ohio Department of Natural Resources 2005; Maslowski and Seeman 1992:11). On

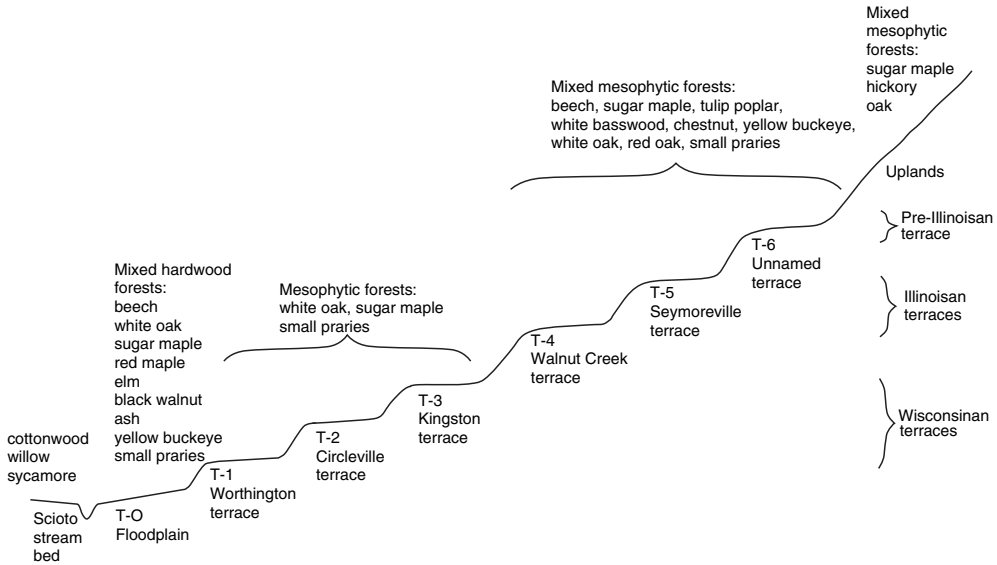


Figure 2.6. Relation of natural vegetation to physiography in the Scioto valley near the confluence of Paint Creek. Flood plain and terrace widths are not drawn to scale. See credits.

a grander geographic scale, the Scioto-Paint Creek area was the boundary between oak-hickory forests that dominated the Till Plains and chestnut, chestnut-oak, and poplar forests that dominated the landscape to the south (Fenneman 1938:669–670).

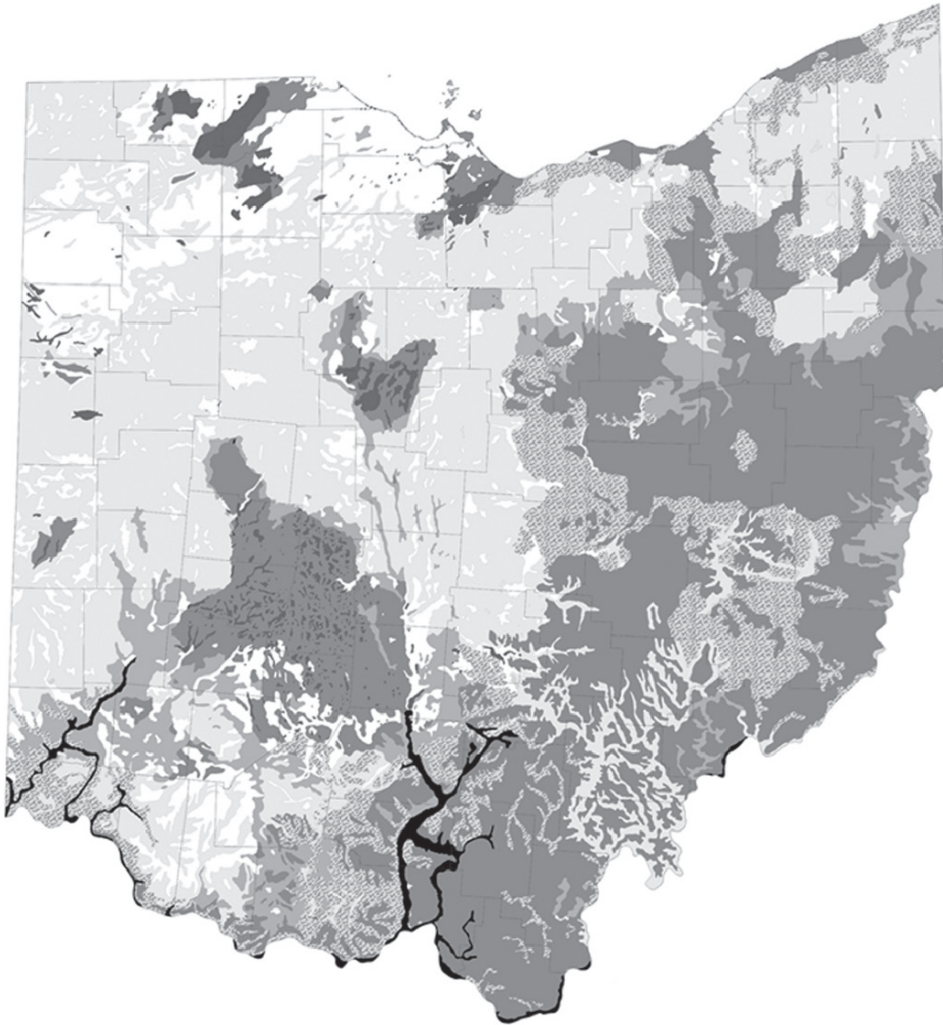
Swidden plots for growing Eastern Agricultural Complex crops (goosefoot, erect knotweed, sumpweed, sunflower, maygrass), with their associated forest-edge berries and nuts (raspberry, elderberry, hazelnut, honey locust) and deer and turkey, added to the natural floral and faunal diversity of the Scioto-Paint Creek area. Plots were probably cleared in the mesophytic forests of the valley terraces, piecing together archaeological and paleoethnobotanical evidence from the neighboring Licking drainage (Pacheco 1993:101–102, 110; Wymer 1997:157, 159; see also Romain 2000:167–188). The friable and fertile Fox loam soils of the Wisconsinan T-2 (Circleville) terrace would have been one setting well suited to swidden farming. Bottomland soils, which were annually renewed with nutrients by flood-brought alluvium, were another good setting for farming (Pacheco et al. 2005; Prufer et al. 1965). Historically, these soils grew outstanding corn crops, bringing the nickname, “Egypt”, to the

area, in reference to the fertility of the Nile valley (Gordon 1969:72 citing Marshall [1966]).

The Scioto-Paint Creek area is also advantaged in its climate, which complemented its rich soils in making it agriculturally fruitful. Its growing season of 195 frost-free days is a full 20–30 days longer than immediately surrounding locations (Gordon 1969:80, Figure 22).

The power of the Scioto-Paint Creek area was demonstrated by the massive trees and dense forests that the fertile soils of its bottomlands and terraces, and its longer growing season, supported. Of the sizes of trees in the area during the early 1800s, it has been said: “It seems that the lower Scioto valley in that earlier day was a celebrated ‘big tree’ region.” “The giant Scioto sycamore was... a forked hollow tree measuring 21 feet in diameter at its base and 42 feet in circumference at the height of five feet.... In June 1808, a party of 15 persons mounted on horseback advanced into the cavity...” “Another, near the town of Waverly, was used as a blacksmith shop, large enough, it was said, ‘that a man could stand in the center of the hollow, balance a 10 foot pole, and describe a circle without striking the side.’ National champion among living trees of the species is a giant sycamore measuring a little

(A) **NATURAL VEGETATION OF OHIO**
AT THE TIME OF THE EARLIEST LAND SURVEYS



Legend

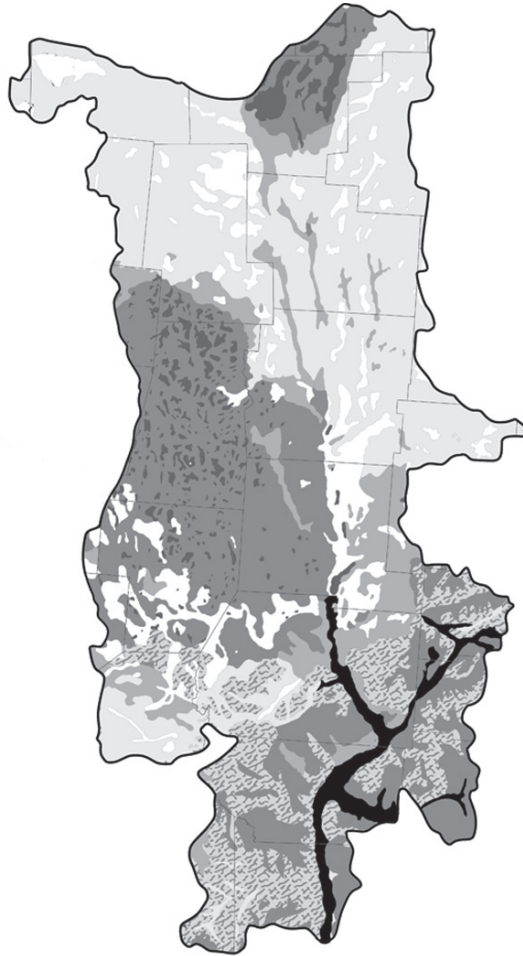
Original Vegetation

Type/Association

Elm-Ash Swamp Forest	Mixed Oak Forest
Beech Forest	Prairie Grassland
Mixed Mesophytic Forest	Bottomland Hardwood Forest
Oak-Sugar Maple Forest	

Figure 2.7. (A) Kinds of forests in Ohio. (B) Kinds of forests in the lower and central Scioto drainage. See credits.

(B)



Legend

Original Vegetation

Type/Association

	Elm-Ash Swamp Forest		Mixed Oak Forest
	Beech Forest		Prairie Grassland
	Mixed Mesophytic Forest		Bottomland Hardwood Forest
	Oak-Sugar Maple Forest		

Figure 2.7. (continued)

short of 23 feet in circumference, standing 80 feet high, and with a spread of 102 feet, growing on river bottom land in Pickaway County” (Gordon 1969:72 citing Marshall [1966]). The massive forests of the Scioto-Paint Creek area stood in contrast to thinner and shorter forests in more northerly sections of the Scioto and Paint Creek valleys in the Till Plains (see Note 1).

The structure and the diverse and rich content of the natural environment of the Scioto-Paint Creek area provided both a ripe symbolic setting and a rich material-ecological context in which Hopewellian practices and beliefs were fostered, oriented, and flourished. Society, ritual, religion, and nature were closely interconnected here. This can be seen from both local and regional perspectives, which are presented in the following two sections.

SYMBOLIC SETTING

Taking a local and symbolic viewpoint first, one finds that Scioto Hopewellian peoples created from their natural surroundings a ceremonial landscape that expressed their cosmos and role in it. Scioto Hopewellian peoples appear, from artistic and mortuary remains, to have believed in a multidimensional and relational cosmos, with many realms whose beings commonly interacted. Sentient beings, who almost certainly were attributed personhood like that of humans (Hallowell 1960; Morrison 2000, 2002), resided in and traversed between several Above air realms, several Below earth-water realms, and places in the four Cardinal Directions and/or the Equinox Directions and its perpendiculars, in the four Semi-Cardinal Directions, in the four Solstice Directions, and in the four Moon maximum north and south Rise and Set Points. Different combinations of these realms and the meanings and beings that were associated with them were emphasized in different ceremonies, artworks, graves, and ritual deposits, but the balanced recognition of many if not all of them in any given act was also essential, as it was in Woodland and Plains Native American ritual historically and is today (e.g., Paper 1987:301, 303;

J. E. Brown 1971:31–43; Mails 1991:48–60, 104–106). Focal to these different realms was the Center – a locus of relationship, interaction, mixing, conjoining, merging, transformation, complementarity, cooperation, conflict, and expression of differences among beings and elements from different realms. Historically in the Eastern Woodlands, as in many traditional settings around the world, each person, each house, each pipe, each ceremonial ground, and each village stood at the Center (DeBoer 1997:229–232; Eliade 1964:262, 264–265; Greber 1979b:28; 1983; Knight 1989:280; Mails 1991:104–106; Paper 1987:300–301; Pearson and Richards 1994:12; Swanton 1931:10–11). At a yet broader scale, Turtle Island – the earth-disk and top surface of the Below realms – also was the Center, surrounded by the expansive primal waters told of in Woodland earth-diver lore (e.g., Barnouw 1977:68; Henricksen 1903: 181–182; Owen 1904:37; Trowbridge 1939: 60–64).²

Scioto Hopewell peoples expressed in their art, architecture, burial practices, and other rituals the balance of their relationship to beings associated with different realms in sets of 2, 4, 6, 7, and 8 minimally. Above and Below comprised a set. The four Cardinal or four Semi-Cardinal Directions or four Moon Rise and Set points were other sets. Above, Below, and the Four Directions, with and without the Center, were yet two other sets. The eight-fold combinations of the Cardinal and Semi-Cardinal Directions, or the Cardinal and Solstice Directions, or the Cardinal and Moon Rise and Set Directions filled out Scioto Hopewell people’s modes of relating to realms of the cosmos and their beings. Three-fold organization and strongly emphasized verticality and hierarchy, which are deeply entrenched in Western thought and lifeways (Lakoff and Johnson 1980: 14–21), and which are popularly attributed nowadays to the cosmologies of historic and prehistoric Woodland peoples in the form a vertically structured, three-world universe (Dye 1989:322; 325, 333, 350; Hudson 1976:122; Lankford 2004:208; 2007:15; Penney 1985:180; Reilly 2004:127, figure 2; Townsend 2004:21) designed by Hudson (1976), were foreign to the cultural fabric and lifeways of Scioto Hopewell peoples.³

The multiple layers, directions, and center of the cosmos of Ohio Hopewell peoples are well evidenced in their representations of it in their architecture and art. The Pricer mound in the Seip earthwork was constructed as a three-dimensional model of the cosmos (Figure 2.8), including strata and features that represented multiple Below realms; the Center,

Turtle Island, and the waters surrounding it and below it; multiple Above realms; a stony sky vault; the four Cardinal Directions of Turtle Island; and the place of humans in the cosmos.⁴ Two human parietal rattles from the Central Altar of Mound 3 in the Turner earthwork (Figure 2.9A,B) were carved with a side view of the cosmos showing Turtle Island and the waters

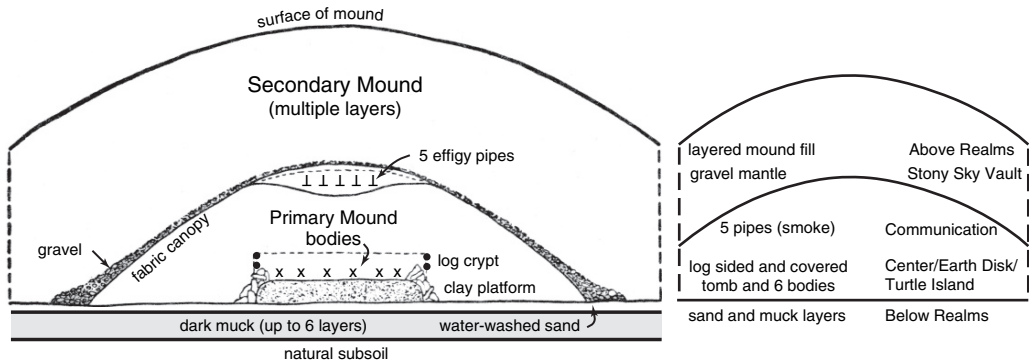


Figure 2.8. The Pricer mound of the Seip earthworks and the Great Multiple Burial within it (Shetrone and Greenman 1931:369–377) were constructed as a three-dimensional, hemispherical or spherical, symbolic model of the Scioto Hopewell cosmos, much like sweat lodges were later in the historic Woodlands and Plains (J. E. Brown 1971; Mails 1991:104–105; see also Paper 1987:301) and houses and ceremonial grounds in North America (Mails 1978:97–103, 129; Mindeloff 1898:421–422; Nabokov and Easton 1989:110–111, 138–140, 325–326). The mound was comprised of multiple layers that represented multiple Above realms, a Center, and multiple Below realms. The human skeletons and cremations of the Great Multiple Burial were natural symbols of the Center. The two pairs of males and females, in their twenties, and two infants perhaps constituted two families and represented family life in this life at the Center, on the earth-disk. The individuals were laid out on a raised, four-foot high platform that was almost square and was oriented north-south with its sides to the cardinal directions and corners to the semicardinal directions (depicted in Figures 1.8B, *right*, 4.17B). The platform possibly symbolized Turtle Island (also depicted in Figures 2.9A, E, and 2.10E, G), rising above the primal waters and floating on it. Historically among Woodland Indians, the square and its implied directions were one symbol used to depict the Earth realm (Mann 2003:197–200; Swanton 1928:477; 1946:772). Below the platform was the charnel house floor comprised of a thin layer of water-washed sand, and below that a thick layer of dark muck-clay, in turn comprised in places of up to six layers separated by vegetable matter (Shetrone and Greenman 1931:363–365). The water-washed sand layer likely represented the primal waters and the muck clay the primal muck underneath, which in widespread historic Woodland earth-diver myths was brought to the surface by a creature and grew to create Turtle Island (Hall 1979:259–261; 1997:17–23). The layers of muck topped with vegetation may have represented multiple Below realms similar to this one and found in the lore of some historic Woodland Indian tribes (Chaudhuri and Chaudhuri 2001:15; Mooney 1900a:240; Swanton 1928:480; Swanton 1946:773). A few feet above the skeletons was placed a cache of effigy smoking pipes. The pipe, rising smoke from a pipe, or a ceremonial fire was widely associated with the Above realms and/or its beings and with communication with them via rising smoke by historic Woodland and Plains Indians (e.g., J. E. Brown 1971:5, 7, 8; Mails 1978:101; Morgan 1954:190–197). For the Oglala Sioux holy man, Black Elk, the pipe, itself, represented more generally the axis mundi joining sky and earth, but its smoke or offering was sent in all six directions to all relatives (J. E. Brown 1971:5, 7; Paper 1987:301). The arcs that comprised the primary mound and multiple secondary mound layers above the burials, and the thick gravel layer over the primary mound (Greber 1979a:41; Shetrone and Greenman 1931:357–360, figures 3, 4, 6) may have represented multiple, stacked Above realms and the stone sky vault, respectively, like those in historic Woodland Indian beliefs (see Note 4). The significance of the gravel retaining wall that extended only half way up the exterior of the secondary mound is unclear relative to historic Woodland knowledge. The whole burial assemblage suggests a ritual drama, given its many rare qualities: the large number of individuals and combination of individuals of specific ages and sexes buried together, the very high raised platform, and the pipes placed above the burials.

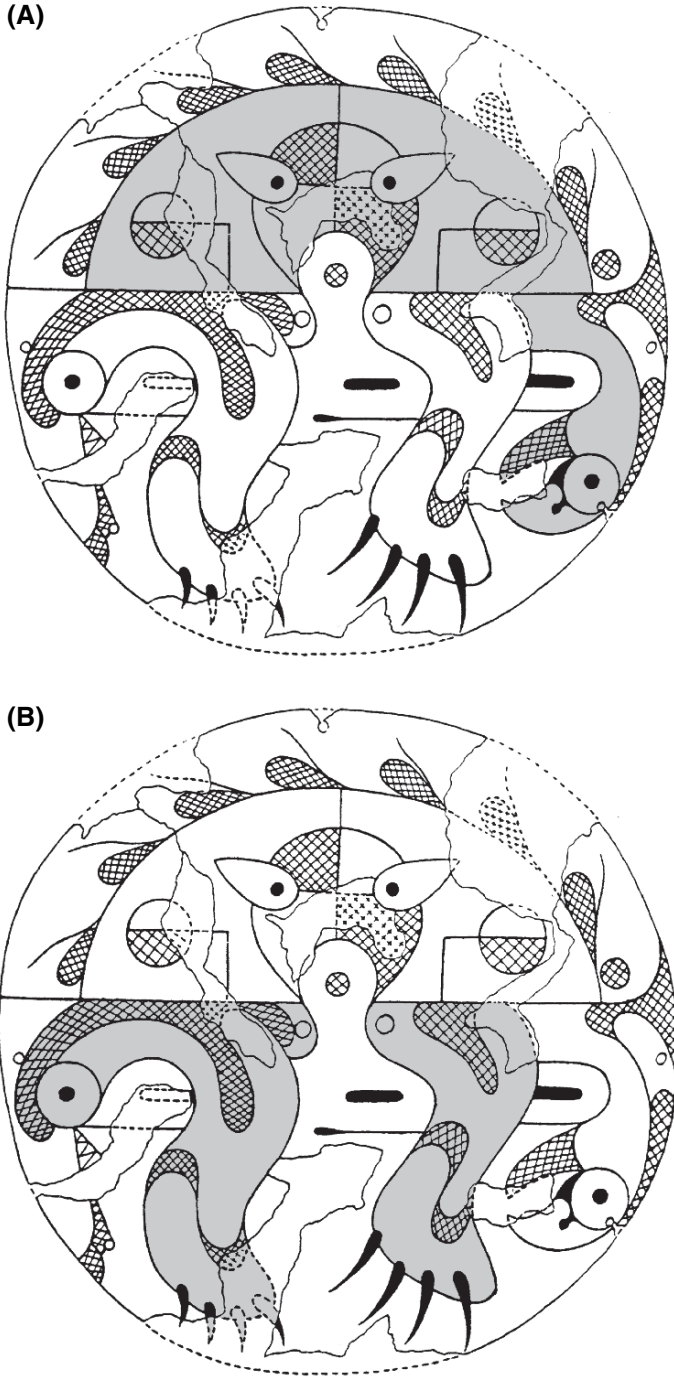


Figure 2.9. Artifacts depicting the Ohio Hopewell cosmos, from the side, from above, and in three dimensions. (A, B) One of a pair of carved human parietal (skull bone) rattles. From the Turner earthwork, Mound 3, Central Altar. Each parietal depicts, from the side, the layered cosmos of Ohio Hopewellian peoples. (A) Central to the composition, shaded in grey, is an emydid – a pond turtle – with its characteristically round head and its

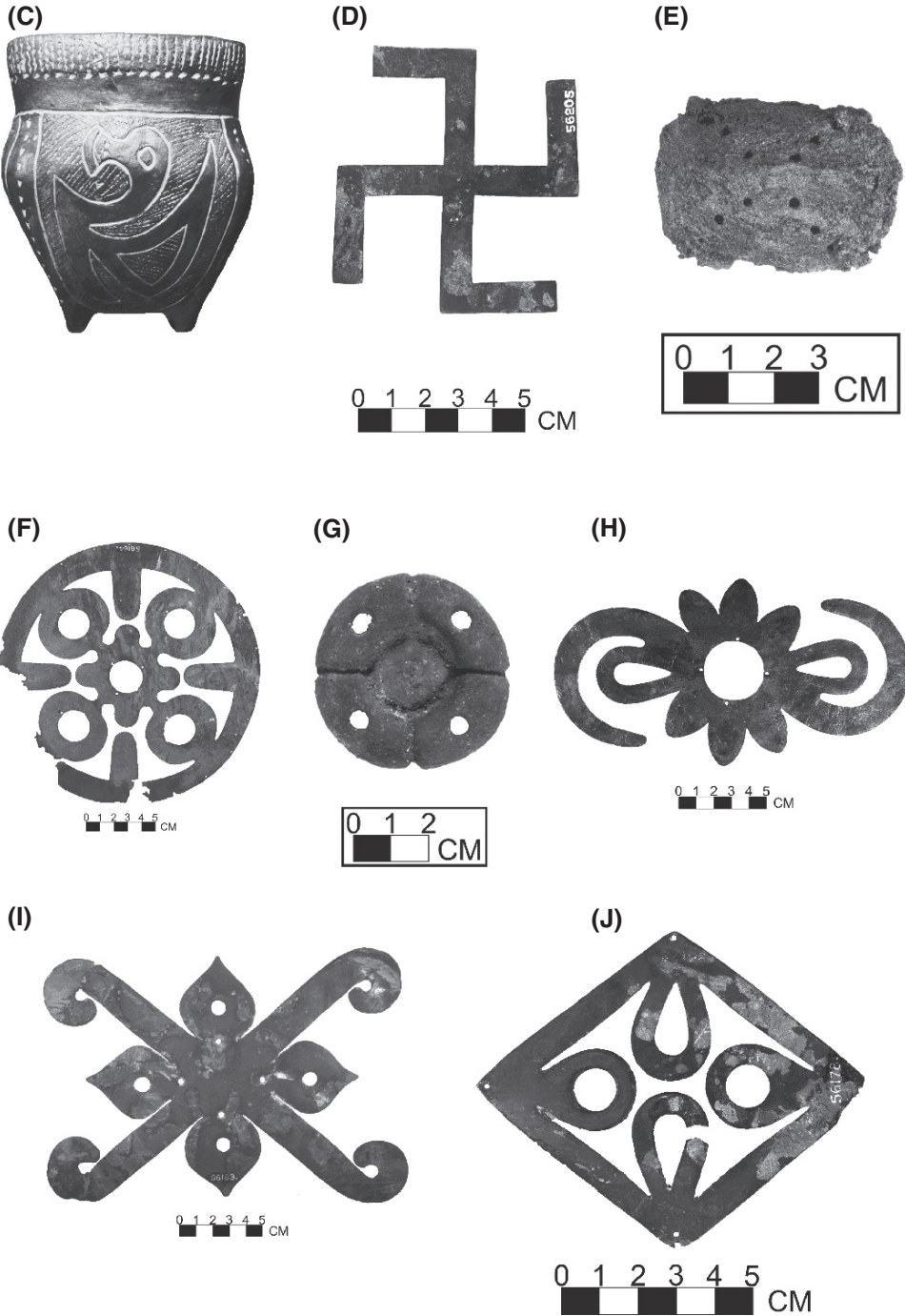


Figure 2.9. (continued) sharp beak below the water line. The cylinder-like tail and cloaca (*dot*), which extend beyond the back of the carapace, mark it as a male emydid. Above the carapace of the turtle is an arch with seven feather-like motifs. This zone probably represents the Above realms, which may have numbered seven, as in the case of the historic Cherokee cosmos (Mooney 1900a:240). The feathers may double as horn-shaped growths (mid-dorsal carina) on the crest of the carapace of a map turtle (*Graptemys*), one genera of emydid, also possibly depicted in Figure 2.10G. (B) Below the water line are

surrounding it, the sky and perhaps its seven layers, and a Below realm perhaps inhabited by an Underground or Underwater Panther like that of historic Woodlands and Plains Native American lore (Hammel 1998; Howard 1960; Skinner 1923:47–48; see also Fitzgerald et al. 1998; Fox 2004; Sampson 1988). The multiple, stacked realms of the cosmos of Scioto Hopewell peoples were also vividly expressed by them in many artistic representations of the creatures and beings who tended to reside in one realm or another and were associated with them (Figure 2.10). The four Cardinal or Semicardinal Directions (Figure 2.9C–E), the eight Cardinal and Semicardinal Directions with the Center (Figure 2.9F–H), and the eight Cardinal and Moon maximum north and south Rise and Set points (Figure 2.9I,J) were depicted in the form of large copper cutout symbols worn on the clothes of ceremonial leaders and a pair of earspools recovered from a deposit on the floor of Mound 25 of the Hopewell earthwork, as well as a ceramic vessel and eighteen copper effigy turtle rattles from the Mound City site. The Seal earthwork was

oriented to the Cardinal Directions and other earthworks to the Summer Solstice Set and Winter Solstice Rise, the Summer Solstice Rise and Winter Solstice Set, or Equinox Sunrise and Sunset (Romain 2005).

The vertical morphology of the Scioto and Paint Creek valleys, and the positions on the terraces where Scioto Hopewell peoples built their earthen ceremonial grounds, reiterated the peoples' multi-level cosmos and their place in it. Conical-shaped hillocks at valley edges referenced the Above realms, or the vertical axis mundi that led to them. Streams referenced the Below realms, or entrances to them. These are symbolic associations that were deeply embedded in Woodland Native American thought, and in world views across cultures generally (Bacon 1993; Eliade 1964:266–269, 492; Hudson 1976:130, 132, 145; but see nuances in McLachlan 1999:45, 49, 55). In between the upland prominences and valley-bottom streams, the multiple terraces of the valleys reinforced the image of a cosmos with many levels. Within this vertically structured landscape, Scioto Hopewell



Figure 2.9. two legs, shaded in grey. If viewed as the turtle's legs, the front foot has claws about twice as long as those of the hind foot, which is characteristic of a male emydid. The legs are, however, more robust than those of a turtle and give the general impression, with the long claws on their feet, of a carnivorous mammal. One possibility is a feline, which might reference the Underground or Underwater Panther of historic Woodlands and Plains Native American lore (Fitzgerald et al. 1998; Fox 2004; Hamell 1986/1987:79; 1987:76;1998; Howard 1960; Perino 1971; Sampson 1988; Skinner 1921:263; 1923). The entirety of each parietal was a circle, a primary symbol of the cosmos of historic Woodland Native Americans and viewed from above (J. E. Brown 1971; Mails 1978:99; Mann 2003:206–208; Neihardt 1979; Paper 1987:300–303). The depicting of the cosmos on a human parietal suggests the central role of humans in literally supporting and maintaining the cosmos and its order, and keeping it balanced through world renewal ceremonies and other rites (Table 4.11). (C) Pottery vessel depicting the four Cardinal or Semi-cardinal Directions of the Scioto Hopewell cosmos in three dimensions, by means of its subsquare orifice and four side panels, each swastika engraved with a spoonbill duck. From Burial 2, Mound 2, Mound City earthwork. (D) Copper cutout of a swastika, depicting the four Cardinal or Semi-cardinal Directions of the cosmos, plus its spin, but without its Center. From the Hopewell earthwork, Mound 25, Copper Deposit of symbols. (E) Copper effigy turtle carapace rattle, one of eighteen sewn on a leather belt, each with twelve holes and depicting Turtle Island and the four Semicardinal Directions. From the Mound City earthwork, Mound 7, Burial 12. (F, G) Copper cutout and copper earspool, each depicting the circular cosmos, its eight Cardinal and Semi-cardinal Directions, and its Center. From the Hopewell earthwork, Mound 25, Copper Deposit of symbols. (H) Copper cutout depicting the circular cosmos, its eight Cardinal and Semi-cardinal Directions, its Center, and the spin of the cosmos by raptors, which are symbolized by two raptor claws and claw bulbs. From the Turner earthwork, Central Altar, Mound 3. (I, J) Copper cutouts, each depicting the four Cardinal Directions and four Moon maximum north and south Rise and Set Points of the cosmos, but without its Center. The swing angle of 76°:92 between moon maximum north and south rise and set points is rendered very closely (within one degree) by the acute angle between the long arms of copper cutout "I" and by the acute angle between the sides of copper cutout "J". Cutout "J" also may depict in its interior four raptor claw bulbs. From the Hopewell earthwork, Mound 25, Copper Deposit of symbols. See credits.

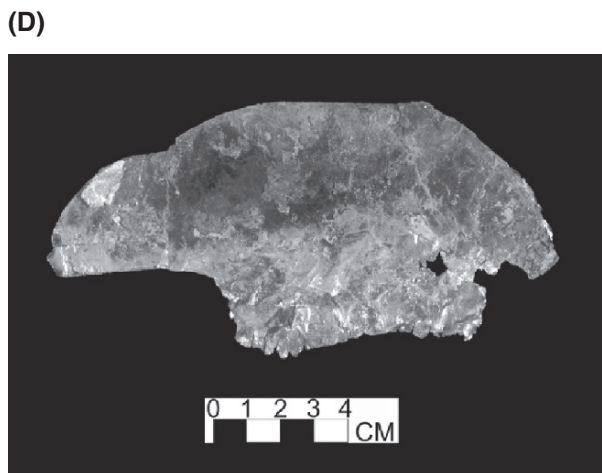
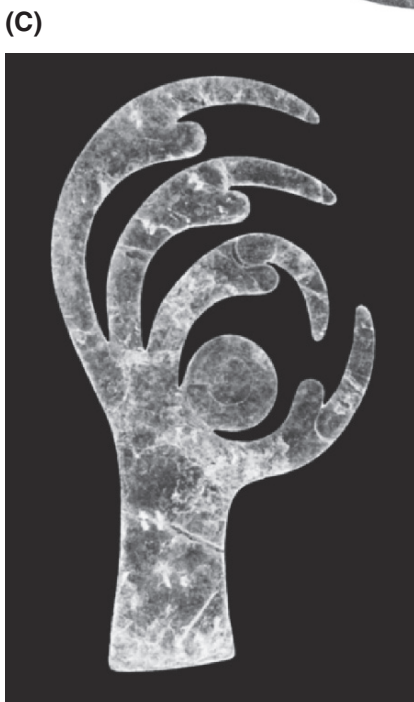
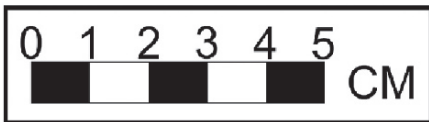
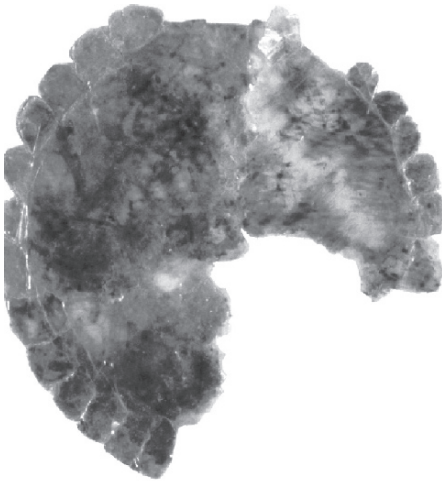


Figure 2.10. (continued)

(E)



(F)



(G)



Figure 2.10. (continued)

(H)



(I)

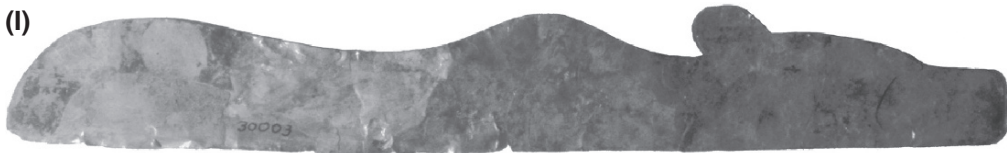


Figure 2.10. Beings and creatures that tended to reside in and be associated with the Above and Below realms of the cosmos and its Center, as envisioned by Ohio Hopewell peoples, are well represented in their art. (A) Copper cutout of probably a raven or crow. (B) Copper cutout of a raptor, probably peregrine falcon, associated with the Above realms. From the Mound City earthwork, Mound 7, Burial 9. (C) Mica cutout of a raptor's talons. From the Hopewell earthwork, Mound 25, Burial 47B. Equivalent to a human body and head, with two arms over head and bending to the right; compare to Moorehead (1922:Plate 63). (D) Mica cutout of an eagle's head, with mica-altered dark circular eye and mica-altered ruffled neck feathers. Possibly a mica mirror decommissioned into this animal form. From the Hopewell earthwork. (E) Smoking pipe carved from pipestone with an effigy box turtle on its bowl and representing the Center of the cosmos, Turtle Island. From the Tremper mound, Great Cache. (F) Mica cutout of a turtle carapace. From the Edwin Harness mound. (G) Casual copper cutout of a turtle, one of a set of eight, this one with four dimples on its back. See Figure 2.9A,B for species identification. From the Mound City earthwork, Mound 13, Deposit 5. (H) Copper cutout effigy of probably a sucker fish of a kind. One of a set of four from the Copper Deposit, Mound 25, the Hopewell earthwork. Suckers are native to the Scioto river and were among the most frequent fish remains recovered from the Middle woodland McGraw site, Ohio. Some sucker species dwell and feed at the bottom of rivers (benthic fish) and might have been among the most of bottom-dwelling of animals in the Hopewell cosmos. (I) Mica effigy of a bear in water, applied with red hematite and white ground quartz paints. One of a set of five from the Turner earthwork, Mound 3, Central Altar. (J, K) Stone carving of a composite being associated with the Below realms, combining the body and horns of an ungulate, legs of apparently an aquatic

(J)

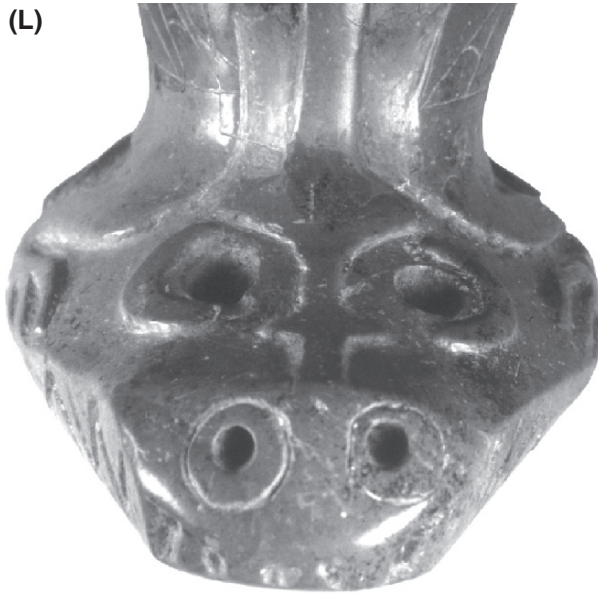


(K)



Figure 2.10. (continued) mammal, and tail of a rattlesnake. These characteristics and the six-sided geometric on the creature's head, which may represent a quartz crystal, would suggest a creature analogous to the Uktenas of the historic Cherokee (Hudson 1976:131–132) – a not unlikely interpretation, give the greater Southeastern flavor of the archaeological record at the Turner earthwork than those at Scioto valley earthworks. From the Turner earthwork, Mound 4, Altar 1. (L, M) Smoking pipe carved from stone in the form of a composite being with snake-shaped head, teeth of an unknown animal (perhaps caiman), bird wings on the pipe bowl, and tail of a snake (not shown) on the body and block end of the pipe. From the Esch Mound Group, Mound 1. See credits.

(L)



(M)



Figure 2.10. (continued)

peoples almost always built their geometric earthen ceremonial grounds on a broad middle terrace – a cosmic ground where humans lived and performed ceremonies to ensure their balanced and productive relationships with one

another and other creatures and spirits at the Center, as well as with powerful spirit beings of the Above and Below realms and in the multiple horizontal Directions of the earth-disk. Of 12 Hopewellian enclosures in the Scioto-Point

Creek area that were surveyed by Romain, ten are located mainly on Fox series soils (Romain 2000:0–25), which associate with the middling Wisconsinan T-2, Circleville terrace (Maslowski and Seaman 1992:11).

Earthen enclosures in the area are positioned and have formal designs that concretely express the relationships of Scioto Hopewell peoples in the cosmic Center to the Below realms. Most of the earthworks in the Scioto-Paint Creek area were built close to the waters of the Scioto or Paint Creek. Of 14 earthworks in the area that were surveyed by Romain (2000:18), 13 have an average distance from these streams of only 1,115 feet, or about 0.2 miles.⁵ The site of Mound City, one of the earliest of the Hopewellian geometric earthworks built in the area and one that helped to set that tradition, is immediately adjacent to the Scioto River. Its sister and partially contemporary site across the river, Hopeton, has a set of parallel walls that lead from it to the terrace edge, to go down to the river. Three other ceremonial sites – Works East, Cedar Banks, and Seal – have earthen enclosures with square or circular elements that are incomplete, with their open side situated on the terrace edge leading directly down to the flood plain. The open sides of Works East and Cedar Banks lie directly above the Scioto river, which runs close to the terrace edges in both locations. The site of Portsmouth, at the confluence of the Scioto river with the Ohio, has long parallel embankments that join two of its circular elements on opposite sides of the Ohio. The embankments traverse the terraces on which the circular earthworks stand, run over the terrace edges, and down onto the flood plain all the way to, or very close to, the Ohio river. Outside of the immediate Scioto-Paint Creek area, the Marietta earthwork has a graded way that runs from the works down a terrace edge onto the flood plain and near to the banks of the Muskingum river. A burial mound group lies immediately across the river from the graded way. All of these spatial arrangements and features suggest a fundamental symbolic relationship between the earthworks, which Scioto Hopewell people built at the Center of their cosmos, and rivers, which historically in the Woodlands were considered to be one kind of entrance to the Below realms

(Bacon 1993; Hudson 1976:130, 132, 145). The instances of open sides, graded ways, and parallel embankments suggest the movement of people between ceremonial centers and the rivers adjacent to them in the course of rituals. Rites of “mingling with water” or “blending into water” (Kilpatrick and Kilpatrick 1964:1388, 1390; see also Mooney 1900b:3), which anthropologists have assumingly labeled rites of “purification” (Churchill 2000; see also Hudson 2000:494, 497–498) and which were done by historic Eastern Woodlands Native Americans in the course of any of a broad range of ceremonies for various purposes (Hudson 1976:324–325), including but not exclusive to world renewal (busk-like) ceremonies (e.g., Hudson 1976:367, 374; Mooney 1900b:2; Swanton 1928:553, 564, 582, 600–601, 603, 606), are implied by the Scioto Hopewell earthwork arrangements and features (Chapter 15, Functions of Ceremonies, and Table 4.11).⁶ Thus, Scioto Hopewellian peoples created from their natural environment a suite of ceremonial landscapes that symbolized their cosmos and constituted a medium for enacting relationships between the Center of their cosmos, including themselves, and Below realms.⁷

These symbolized and enacted relations between the Center and Below realms were balanced with attention to relations between the Center and the Above realms. Scioto Hopewell people built their earthen enclosure ceremonial grounds of the middle terraces so as to orient precisely where celestial bodies of the Above realms met the earth-disk: the sun and moon rise and set points listed previously, all within less than 1.8 degrees error (Romain 2004:104, 111). Undoubtedly, these celestial events were monitored as benchmarks for calibrating an annual calendar of the rituals (Greber 1996) and perhaps the myths that Scioto Hopewellian people observed, and for anticipating times to gather at the earthworks for ceremonies. In addition, it has been pointed out that most earthworks were built where their geometric layouts and ceremonial events might be viewed and appreciated from nearby higher terraces or hills (Seaman 2004: 67–68), closer to the Above realms.⁸

The central terrace position of Scioto Hopewell earthworks within their natural environment and the Scioto Hopewellian cosmos also directly expressed the fundamental concern of Scioto peoples for their horizontal spiritual and social relations at and radiating from the Center. Relationships with fellow community members, people in neighboring communities, animals, ghosts, and spirits all were important and were expressed materially – in the shape, location, features, and internal organization of their burial mounds, in their mortuary rituals, and in their art. These horizontal relationships and archaeological evidence of them are described in detail in Chapters 3 and 4 on community and social organization and on ritual, and in Chapter 5 on world view.

The locations that Scioto Hopewell people selected to build their ceremonial grounds also had unique qualities that pertained to specific rituals of their lives and that concerned power. The Seip earthwork, for example, is located immediately northwest of and across the valley from Copperas mountain, an anomalous 350-foot-high cliff of black shale (Figure 2.11A–F; Bingham et al. 1980; Carlson 1991:20–21). The cliff emerges dramatically, directly from the waters of Paint Creek, to its height which, along with its dark-colored yet shiny surface, would have associated it with both the Above and Below realms, their powerful beings, and transformation between the two realms. And powerful the cliff is: it weeps water, which precipitates abundant white florescences of alum (Figure 2.11G; Seeman

(A)



Figure 2.11. Copperas Mountain's shale cliff in Paint Creek valley, adjacent to the Seip earthwork. (A, B) The shale cliff. (C) The cliff emerges from the waters of Paint Creek. (D) The cliff has a dualistic dark-light quality, being dark in color but shiny from its wetness. (E) The cliff's thin shale layers have the look of mica books, and could have been thought of as a dark, natural complement to light mica. (F) The shale deposits contain large limestone concretions that range from 1 to 8 feet in diameter and that sometimes have a skin of fine crystalline or radiating pyrite. (G) The cliff weeps water, which precipitates abundant white florescences of alum. Six inch ballpoint pen for scale. See credits.

(B)



Figure 2.11. (continued)

(C)



(D)

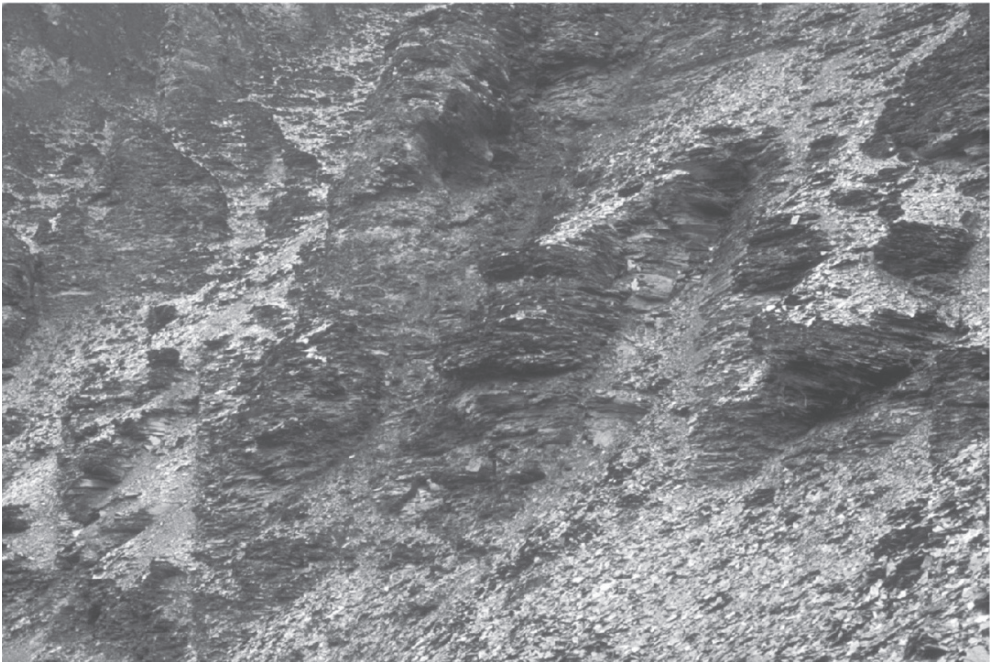
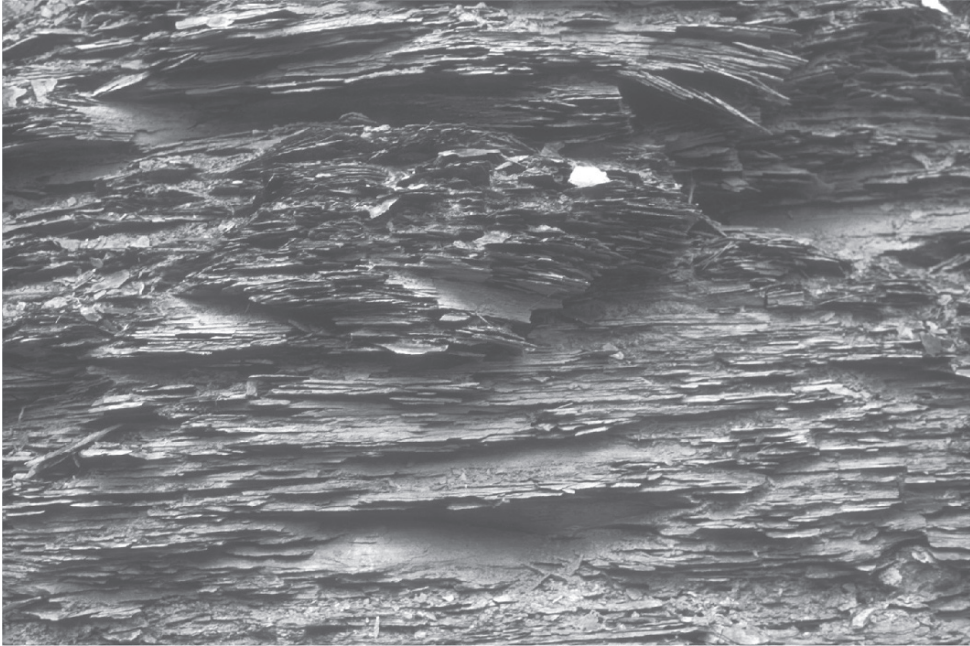


Figure 2.11. (continued)

(E)



(F)



Figure 2.11. (continued)

(G)



Figure 2.11. (continued)

and Branch 2006:114), an astringent useful for clotting blood and seeping tissues, as in healing ceremonies. The cliff is also a traditional nesting place for vultures (Seeman and Branch 2006:114), which probably played an important defleshing role in some mortuary ceremonies of the Scioto Hopewell and their Adena ancestors (Otto 1975:33; Webb and Baby 1957:100–101). The cliff's likely associations with healing and death may have been reasons for the use of its shale to form the tombs of certain individuals buried under the Pricer mound with the Seip earthwork.⁹ Copperas mountain has several other special qualities that fit well with the cosmology of Scioto Hopewellian peoples, and to which they would likely have been attuned.¹⁰ Seip is also very close to outcrops of red ocher (Romain 2000:29; see also Zeisberger 1910:170), which would have been useful in making paints for decorating ritual paraphernalia and the human body. The site is three miles downstream on Paint Creek from falls – features that

historic Eastern Woodlands Native Americans considered to have purifying, healing, and other helpful qualities, but also to sometimes be the homes of harmful spiritual creatures (Bacon 1993:260–263). Tremper mound was located strategically across the Scioto valley from Feurt Hill and its quarries of pipestone (Mills 1916:265), which was used to manufacture some of the smoking pipes deposited in the mound (Emerson et al. 2002). Most of the pipes are sculpted with animal effigies and are analogous to pipes smoked historically in the Eastern Woodlands in order to produce trance states and commune with one's personal power-animal helper, whose effigy image faced the smoker (see below; von Gernet and Timmins 1987). The Hopewell site is located immediately adjacent to a series of springs that logically could have been used in “mingling with water”, renewal, and healing ceremonies. The McKittrick earthwork is less than a half mile from brine springs used historically to make salt (the Old Scioto Salt Lick [Romain 2000:30]).

Beyond its nutritional value, salt was used by Scioto Hopewell artists to patinate ceremonial copper breastplates, celts, and headplates with pictures of animal impersonators, other fully human leaders in ceremonial garb, and a diversity of animals (Carr 2000c,d, 2005e; Carr and Lydecker 1998; Carr et al. 2002).¹¹

Like the geomorphological and geological features of the Scioto-Paint Creek area, its biological communities provided media through which Hopewell people constructed their rituals and social life and expressed their beliefs. The diverse species of animals in the area served as models for leadership roles, templates for clan organization, means for achieving personal power, and sometimes vehicles for passing to an afterlife. The central place of animals in each of these matters was based on a fundamental Scioto Hopewellian belief that is well represented in the art and burial practices of Scioto Hopewell peoples: the ability of humans to transform into animals and vice versa (Chapter 4, Figure 4.8A–L; Carr and Case 2005b). Scioto Hopewell peoples also may have had other beliefs about animals that were widespread among historic Native Americans of the Eastern Woodlands, although direct evidence of these beliefs is wanting: the attribution of personhood and souls to animals (Hallowell 1960:23–40), their existence in societies parallel to and similar in organization and complexity to those of humans (Hudson 1976:157–159, 161–165; Lankford 1987), and their behaving like humans in grieving, taking pity, and participating in reciprocal exchanges (Hallowell 1960:47; Morrison 2000, 2002).

The power of some Scioto Hopewell societal leaders derived in part from their abilities to transform into animals. This is evidenced in their ceremonial costumery: copper effigy deer and elk antler and deer ear headdresses, a copper effigy bear headdress, a copper headplate in the shape of a feather, another with a cat paw cutout, and a human mandible with a deer tooth replacement for a human tooth, as well as representational art of bird, bear, and cat impersonators and a deer-rabbit, deer-hummingbird, or deer-snake impersonator (Figure 4.8A–L ; Carr and Case

2005b:198, table 5.2). The Mound City pipe of a flying being with a bird's body and a human head, and the Wray figurine of a man in the midst of transforming into a bear, from the Newark earthworks, depict classic shaman-leaders in the act of harnessing the powers of animals to make soul flights (Figures 4.6A,B; Carr and Case 2005b:192–193, figures 5.2A,B).

Similarly, Scioto Hopewell clans were distinguished by their animal eponyms and/or totems common to the geographic region: bear, canine, feline, raptor, raccoon, elk, beaver, nonraptorial bird, fox, and perhaps several others (Chapter 4, Clan Organization; Thomas et al. 2005:359, table 8.7). Leaders with various social responsibilities were often recruited from clans having eponym or totemic animals with characteristics natural to those tasks. For example, diviners who used mica mirrors, cones, hemispheres, and/or boatstones in their work, presumably to see into the past, future, a person's soul, and/or other dark and unknown domains, were recruited in high frequency from the Raccoon clan (Thomas et al. 2005:368–370). Raccoons have a sharp ability to see through the night.

Personal, spiritual power was commonly obtained by Scioto Hopewell people – at least early in the Middle Woodland period – with the help of guardian-tutelary spirits of the species of animals found in the area. A person likely communicated and merged with his or her power animal spirit by going into a trance facilitated by smoking and perhaps supplemented by other methods of induction. This practice can be inferred from the numerous, individually owned (Carr, Goldstein, et al. 2005:485) smoking pipes that Scioto Hopewell people sculpted with the images of animals that faced and thus interacted with the smoker, much like the method used in historic times in the Eastern Woodlands (von Gernet and Timmins 1987). The species of animal guardian-tutelary spirits evoked by Scioto Hopewell people were very diverse, like those in their natural environment. Twenty-nine categories at the species level or above are recorded for the sculpted pipes from the Mound City and Tremper sites (Otto 1984; 1992:5). The animals reside on river shorelines, in prairie

patches, and in several different kinds of forests. The animals have characteristics that logically associate each with one of the realms of the Scioto Hopewell cosmos or as a “transformer” that could mitigate between two or more realms. Over 137 animal effigy smoking pipes and 199 plain ones are known from the two sites, suggesting a widespread ritual of power animal communion.¹²

Passing to an afterlife was facilitated for at least some Scioto Hopewell individuals by birds of the region and their spirits. Vultures possibly were employed to deflesh some corpses prior to cremation or bundling for burial, but this does not seem to have been common at least at the sites of Mound City, Liberty, Seip, and Ater, to judge from experimental work by Baby (1954). Dismemberment followed by selection of some body parts and their cremation and burial, with other parts given over to nature, is one of several mortuary techniques more likely used at these sites (Carr 2005c:471).¹³ At the same time, copper breastplates from Seip, Hopewell, and other sites commonly were patinated with vultures or vulture impersonators (Carr 2000c, d, 2005e; Carr and Lydecker 1998; Carr et al. 2002), which have analogs in the “bone pickers”, “buzzard men”, and “turkey-buzzard men” of the Choctaw and Chitimacha Indians of the Southeastern Woodlands (Swanton 1946:726, 729). Birds also may have been thought to help the soul of a deceased Hopewell person make its way to an afterlife. At the North Benton site in northeastern Ohio, two burials were placed tellingly below the wings of a huge stone raptor in flight, oriented to the east (Figure 2.12A,B) – occasionally a location of an afterlife of historic Woodlands Native Americans (e.g., Brain et al. 1996:592; Callender 1978a:639; Feest and Feest 1978:777; Swanton 1946:725, 729; see also Feest 1986:31). At the Hopewell site, a copper effigy of a head of a bird was placed under the head of one person (Moorehead 1922:110) or in place of the person’s head.¹⁴ Crossculturally, the head is commonly taken to be the place of residence of a soul, and/or where a soul exits the body, producing illness or death, enters the body at birth, and/or is reintroduced into the body during a curing (e.g, Furst 1995:180;

Guiteras-Holmes 1961:298; Harner 1980:93, 107–108; Hultkrantz 1953:87, 176–178, 215–216, 222–224, 251; Ingerman 1991:71, 74–75; Lati and Hopkins 1985: 49; Nash 1970:131; Rose 1922; Swanton 1946:729).¹⁵ A mortuary practice that may have been conceptually related to these is the occasional burial arrangement of the disarticulated skeletons of Scioto Hopewell people in the form of a bird’s head, and of the leg and arm bones of articulated skeletons in the form of spread wings and tail feathers of a bird in flight (e.g., Chapter 15, Figure 15.3 A,B; Shetrone 1926:34, figure 9).

Over time, as social and ritual relations in the Scioto-Point Creek area became more complex, people drew further upon the varied animal life of the area to symbolize, structure, and express those relations. Animal symbolism grew more coincident with the diversity of animal species there. Classic shaman or shaman-like leaders of earlier Adena peoples in the broader Ohio and Kentucky region impersonated a limited range of animals: raptorial birds, nonraptorial birds, cougar/puma, and wolf. Scioto Hopewellian animal impersonators spanned these species and more: additionally bear, deer, elk, and composite creatures (Carr and Case 2005b:193–196, 198, table 5.2; Webb and Baby 1957:61–71). Animal masks, animal effigy headdresses, and art work depicting animal impersonators evidence this broadening of animal symbolism. Moreover, over time, clans into which Scioto Hopewell peoples classified themselves, and their eponyms or totems, may have increased in number. The early Scioto Hopewell charnel house below the Tremper mound contained clan-symbolic ornamental animal parts of only bear, wolf/coyote, puma, and bobcat (Thew n.d.). Later charnel houses contained clan-symbolic ornamental animal parts of these species and additional ones, including raccoon, elk, beaver, nonraptorial bird, and fox (Chapter 4, Clan Organization, Table 4.7).

Plants of the many species found in the Scioto-Point Creek area, unlike animals, do not appear to have been directly central to the thought, social life, and rituals of Hopewellian peoples

there. Plants were almost never depicted in Scioto Hopewell representational art. The only two unequivocal examples are of mushrooms that could have been used to produce a trance state in which a person might communicate with an animal spirit, deceased person, and/or other spirit beings (see below, How Important Was Farming, Table 2.3; Figure 4.1GG, HH).

Indirectly, however, the darkness of the dense and tall forests of the Scioto-Point Creek area (see above, Figure 2.3, and Note 1), augmented by the largely grey-skied days there, and in contrast to the light-filled swidden plots and ceremonial centers that had been cleared of their trees, provided a milieu that was very influential on the development of thought and culture

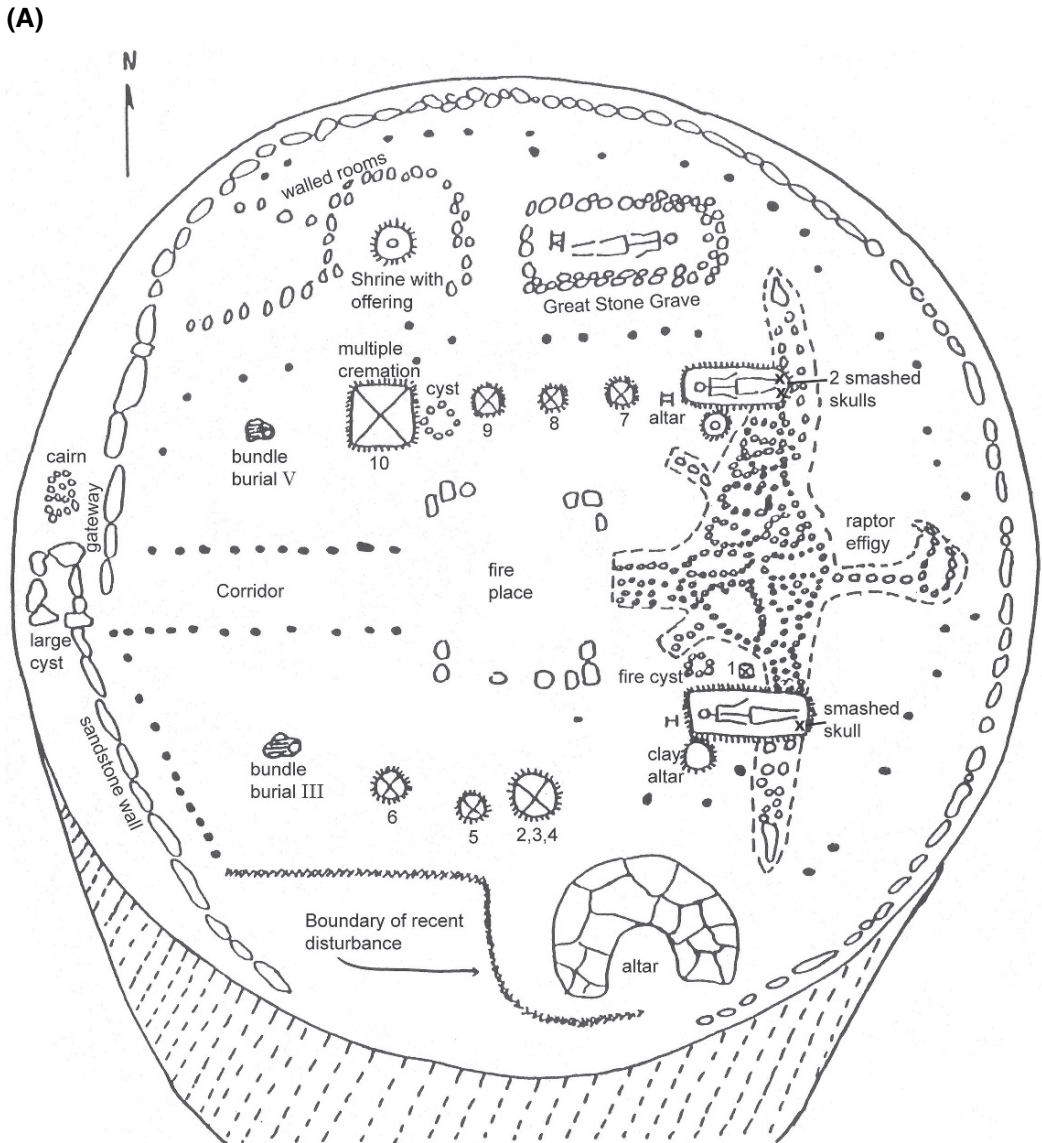


Figure 2.12. (A) Layout of the stone effigy raptor and burials under the North Benton mound in northeastern Ohio. (B) Photograph of the stone raptor effigy. See credits.

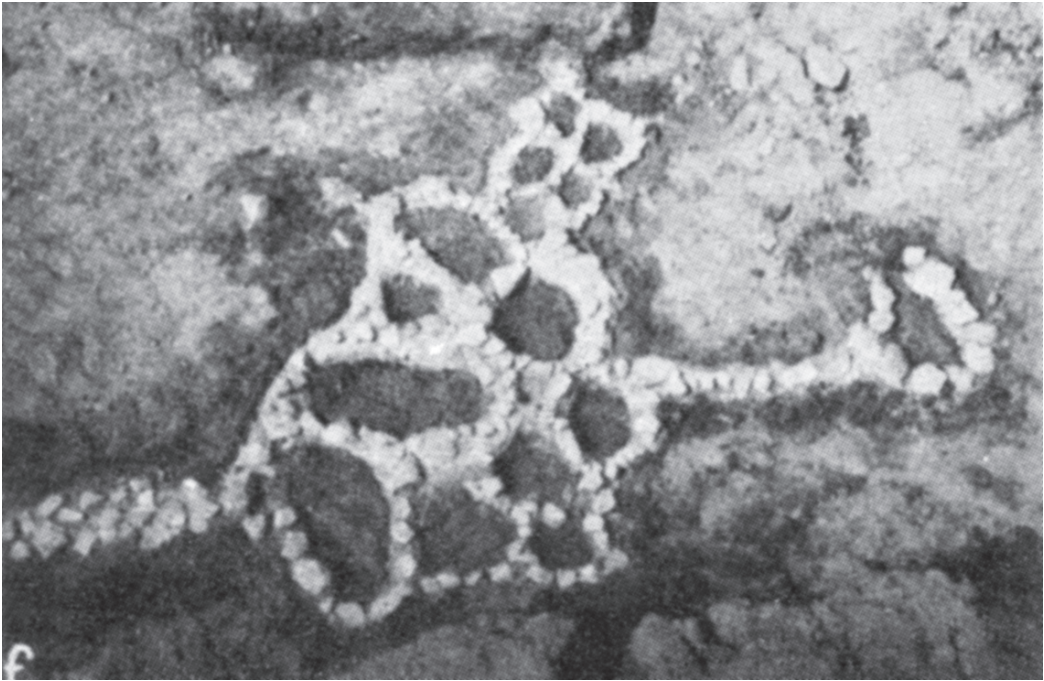
(B)

Figure 2.12. (continued)

of Scioto Hopewell peoples. Their ritual art, as an expression of their beliefs, is infused with their obsession over the contrast, interplay, and balance of darkness and light (Carr and Case 2005b:199–202; Greber and Ruhl 1989:78–84, 275–283; Turff and Carr 2005:670–672) – an accentuation of a general pattern found among Native North Americans (DeBoer 2005:70, 85). The raw materials from which the majority of Scioto Hopewell ceremonial paraphernalia and elite items were made can change from light and shiny to dark and dull, or simultaneously display both light/shiny and dark/dull qualities. Copper, silver, meteoric iron, mica, steatite, chlorite, clay for pottery, human bone, obsidian, shell, and pearls each have this magical personality (Carr and Case 2005b:199–201, table 5.3). Additionally, the “positive-negative play” of visually shifting foreground and background that characterizes Hopewell art on bone, ceramics, and copper is occasionally

expressed in terms of dark and light in the Scioto tradition (Chapter 4, Figure 4.5H–J), and more frequently in ceramics of the Havana and Marksville traditions (Chapter 4, Figure 4.5E–G).

Summary

The natural environment in the Scioto-Paint Creek area, in both its structure and diverse content, was a creative medium that helped Scioto Hopewell people to both form and ritually express their beliefs and social life. The flood plain, terraces, and uplands of the Scioto drainage defined a space that was synonymous with the vertical layering and horizontal expanse of the multidimensional cosmos of Hopewellian knowledge. In that space, Hopewell people constructed a ritual landscape of earthen ceremonial grounds and causeways that manifested the place of

Hopewell people at the Center of their cosmos, their relations to earthy-watery Below realms and airy Above realms and many places in horizontal directions, their status in calendrical time, and their access to locations with much power and the raw materials for specific rituals. Animals of the area provided models for shaman-like leaders who derived their power and roles by transforming into animals, templates for defining the identity, roles, and organization of clans; means for achieving personal power; and sometimes vehicles for passing to an afterlife. The dark forests and light, open swidden plots and ceremonial centers encouraged and guided Hopewellian thought, ritual, and art in exploring the meaning of darkness, light, and their relationship. What we distinguish and call nature, society, ritual, and religion were intimately integrated in Scioto Hopewellian life.

ECOLOGICAL SETTING

A broader, regional ecological viewpoint, like the local symbolic one just presented, also reveals how the diverse content of the natural environment in the Scioto-Paint Creek area fostered Hopewellian lifeways. A well-known correlation at the scale of the Scioto drainage is that between the area of concentration of Scioto Hopewellian earthen enclosure ceremonial centers and the area of maximal environmental diversity in Ohio. Both occur in the vicinity of the Scioto-Paint Creek confluence (Webb and Snow 1974:132–133, Map 1; Seeman and Branch 2006), where the rolling Till Plain of the Wisconsinan glaciation gives way southward to the rugged, earlier-glaciated Appalachian Plateaus and then to the yet more angular, unglaciated portions of them (see above, Figure 2.5A,B). Few Hopewellian earthen enclosures in the Scioto and Paint Creek valleys occur outside of this ecotone, beyond about 22 miles distance from the Scioto-Paint Creek confluence, in either the open Till Plain or the unglaciated Appalachian Plateaus.¹⁶

This correlation is repeated across Ohio: concentrations of Hopewellian earthen

enclosures are found along major streams in the vicinity of where they cross the terminus of the Wisconsinan glaciation and flow into preWisconsinan glaciated landscapes and/or unglaciated Appalachian Plateaus. Primary examples are the massive Newark site and the mound and earthwork centers in its neighborhood, in the Licking drainage (Pacheco 1996:24, figure 2.2); the grand Fort Ancient earthwork (Otto 2004:3) and the enclosures south of it in preWisconsinan glaciated country cut by the Little Miami valley (Riordon 2004a:226, figure 16.1); and the concentration of enclosures along the Great Miami valley in Butler County, where the Wisconsinan Till Plain transitions to a preWisconsinan glaciated landscape (Riordon 2004a:226, figure 16.1). Again, exceptions to these patterns of earthen enclosure locations within these drainages are few.¹⁷

The correlation between locations of Hopewellian earthen enclosures and natural settings of ecological diversity in the Scioto drainage, and across southern Ohio in general, can be understood to a degree in an ecological framework that involves population as an intervening variable. After all, the earthworks were places of gatherings of sometimes large numbers of people, in the hundreds (Carr, Goldstein, et al. 2005). In this view, the greater biomass and biological diversity in the ecotone settings mentioned above, like ecotones generally, offered more potential food resources to Hopewell people and their ancestors. People would have been attracted to the resources in these ecotones compared to the surrounding Till Plain and dissected uplands, fostering greater population sizes and densities in the ecotones. In addition, the greater residential sedentism that was possible in the ecotones than in surrounding lands could have encouraged greater birth rates, population sizes, and population densities in the ecotones. In turn, these demographic changes would have encouraged increases in social complexity – new means to integrate and regulate people – including the organization of people in building earthen enclosures and in performing ceremonies within

them. The complexity and flamboyance of the Scioto Hopewell material record might be explained in part in this rough ecological-demographic manner, as it has been by several authors (e.g., Ford 1974:394, 402; see also Braun 1986:121; Caldwell 1958; Fagan 1995:415–416 for variants on this argument), although important qualifications are needed to bring it in line with archaeological data (see below, and Chapter 5).

An essential component of the ecological diversity in the Scioto and Paint Creek valleys near their confluence was their flood plains. They are broad and also very fertile (Romain 2000:15). Where Paint Creek and Salt Creek flow into the Scioto, the Scioto valley has extensive alluvial fans and bottom lands (Prufer 1967:274). These settings provided the conditions in which Eastern Agricultural Complex seed foods grew naturally (Smith 1995:194; Struever 1965:102–103) and could be enhanced for their harvest through cultivation and eventually through swidden techniques (Wymer 1996, 1997; see Wymer 1992:74, figure 9.9 for increasing sizes of sumpweed and sunflower seeds through time; see also Smith 1992:205–209, 269–271, 287–288; 1995:186–191). Indeed, current evidence from Early and Middle Woodland archaeological records in the mid Ohio valley suggest that increases in the production and consumption of Eastern Agricultural Complex seed foods were substantial at the initiation of the Middle Woodland period (Wymer 1992, 1996:40–41, 2003; see below, Subsistence) and were likely an important factor related to increases in social complexity in the Scioto drainage. However, it was the richness of the natural environmental ecotone in the Scioto-Paint Creek area specifically that was the more important foundation for Hopewellian development there. The Scioto valley is wide and fertile from several miles north of Chillicothe to its confluence with the Ohio river, yet Hopewellian earthen enclosures cluster in the Scioto-Paint Creek area around Chillicothe and are rare in the stretch of the river 5 miles south of Chillicothe to the Ohio river, where ecological diversity is considerably less (see Note 14).

The same conclusion about the more fundamental role of natural environmental diversity than farming and good farmland, *per se*, to Hopewellian development holds for other regions of the Eastern Woodlands, as well. In Illinois, Hopewellian ceramic styles, mortuary practices, and interaction goods are restricted in their distribution to broad river valleys with rich microenvironmental diversity, and are missing from narrower valleys (Struever 1965:98–99, 103–104).¹⁸ Hopewellian ceremonialism was also found in regions of the Woodlands where people relied primarily or fully on the intensive harvest collecting of wild plants or mixed hunting-gathering, and had little or no commitment to farming: south-central Ontario, western New York, southern Michigan, Wisconsin, Louisiana, and northwest Georgia. Hopewellian development was not tied to farming, *per se* (Seeman 2004:59).

Regional population density in the Scioto-Paint Creek area, its trajectory over the Early and Middle Woodland, and its effect on the development of Adena and then Hopewellian social and ritual complexity, as posed in the above ecological framework, are difficult to assess. Estimates of absolute population density in the Scioto-Paint Creek area during the Middle Woodland are not feasible currently, for a number of reasons.¹⁹ However, relative estimates for the Early and Middle Woodland are approachable. In a thorough literature and public records inventory of mounds in the Scioto drainage, Seeman and Branch (2006:116, 118) identified equal numbers of Adena and Hopewellian mounds ($n = 111, 112$ respectively). Adena and Hopewell mounds also were also found to be similar in their range and distribution of sizes – heights and diameters (Seeman and Branch 2006:figure 6.2), with implications for the construction labor expended and the numbers of people involved. However, Adena mounds were dispersed from one another and spread widely over the Scioto drainage basin, both north and south of the Scioto-Paint Creek confluence and ecotone, whereas Hopewell mounds clustered strongly in the vicinity of the confluence and ecotone. Also, Adena mounds were constructed in both the

main valleys of the Scioto river and Paint Creek and up small tributary streams, whereas Hopewell mounds were built in concentration on the terrace systems of the main valleys. Taken at face value, these statistics and spatial patterns suggest no significant change in the numbers of people in the Scioto drainage at large from the Early Woodland to Middle Woodland period, but an aggregation of people into the Scioto-Paint Creek area, and specifically into the main valley trenches themselves, creating higher population densities there during the Middle Woodland. People probably aggregated into main valleys for habitation in general, but it is possible that they gathered there simply on occasion for rituals at earthworks, with their having inhabited lands spread more widely up and down the Scioto drainage and across it. Either form of interaction among greater numbers of individuals in the Scioto-Paint Creek area during the Middle Woodland period could have encouraged the development of social and ritual complexity there.

The magnitude of aggregation of people from along the Scioto drainage into the Scioto-Paint Creek area for habitation and/or participation in rituals at earthworks is unknown. The 223 mounds that Seaman could identify as Adena or Hopewell in the Scioto drainage are only a small portion of the total number of mounds there ($n = 952$ in Mills' [1914] *Archaeological Atlas of Ohio*), making uncertain the exact balance of Adena and Hopewell mounds throughout the drainage and in the Scioto-Paint Creek area specifically. However, an estimate of the maximum amount of aggregation can be gotten from Mills' (1914:XI, 21, 25, 65, 66, 71A, 73) maps and tables of all reported mounds and enclosures in the Scioto drainage (Figure 2.13; see below, Table 7.7 and Appendix 7.3). Almost all of these earthworks can be reasonably attributed to the Early and Middle Woodland periods; no mounds are known to have been constructed in the Scioto drainage before, and few were afterward. The maps and tables show that the number of Early and Middle Woodland mounds within the Till Plains of Pickaway, Franklin, and Delaware counties, north of the Appalachian Plateau-Till

Plain ecotone in Ross county, and the number in Ross county, are nearly identical, at 366 and 370. This distribution translates into a potential for the number of people who interacted in Ross county to have doubled from the Early to Middle Woodland period through aggregation there for settlement and/or for participation in rituals. Adding in contributions of people to the Scioto-Paint Creek area from south of Ross county, where 91 mounds are reported from Pike and Scioto counties (Mills 1914:XI, 66, 73), reinforces this estimate of a doubling of interacting people in Ross county. A substantial increase over time in the numbers of people who participated in rituals in the earthworks in the Scioto-Paint Creek area is also implied by the steady and large increase in the areas of the earthworks over time (Chapter 4, Changes over Time in the Sizes and Social Compositions of Gatherings).

The tentative conclusion that regional population densities in the Scioto drainage at large did not increase significantly over the course of the Early through Middle Woodland, however shaky, does align with current evidence for a lack of increased population packing there and in neighboring areas. Geographic analysis of the areal sizes and spacings of local symbolic communities in the Scioto-Paint Creek area during the last century of the Middle Woodland period indicates that they were liberally separated from one another (Chapter 3, Sustainable Communities). In addition, in the neighboring Licking valley, where paleoethnobotanical data are available, Hopewellian peoples were selective in their use of plant foods, emphasizing those that were locally available and easily collected. Different specific kinds and amounts of plant foods were used at different sites (see below, Opportunism). This pattern is the reverse of what one would expect with significant population packing. With packing, some alternative food resources and/or alternative patches of a resource come to fall within the lands used by other local groups, local temporal variation in the productivity of resources and resource patches can no longer be ameliorated as well by using alternative resources and patches, and instead,

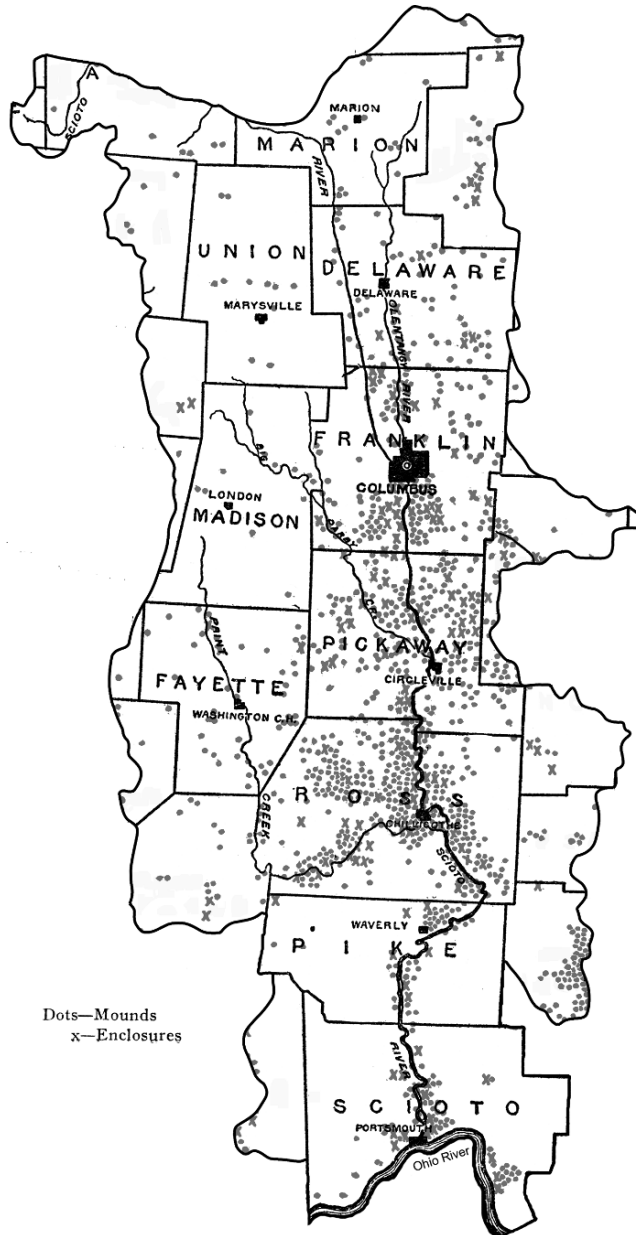


Figure 2.13. A section of Mills' (1914:XI) map of all reported earthen mounds and enclosures in Ohio, focusing on the Scioto drainage only. Almost all of the earthworks were probably built during the Early and Middle Woodland periods.

the diversity of food resources used must be broadened and will come to include less easily collected or processed foods. It was not until the Early Late Woodland period in the Scioto valley, when high densities of people came

to lived in nucleated villages, that intensive use of a broader spectrum of foods, including less easily exploited ones, is evidenced and population packing might be implied (Wymer 1992:65, 73, figure 9.7; 1996: 42; Wymer and

Abrams 2003).²⁰ Finally, little packing of local symbolic communities in the Scioto drainage is suggested by the paucity of evidence for ancestor worship there (Chapter 4, The Question of Priest-Chiefs). Ancestor worship correlates crossculturally with territoriality and packing in societies of middle range complexity.

In all, then, the archaeological evidence from the Scioto-Paint Creek area and the broader Scioto drainage suggests that the increases in sociopolitical and ritual complexity and material flamboyance observed in the Scioto-Paint Creek area during the Middle Woodland period cannot be explained simply by a local ecological model that evokes the area's environmental richness, consequent sedentism and population increases there, and subsequent increases in cultural complexity. Population aggregation from the broader Scioto drainage into the Scioto-Paint Creek area for ceremony and probably settlement, and from secondary valley and main valley edge locations in the area to the terraces of the Scioto and Paint Creek valleys, also were significant causal factors. Further, the long, earlier history of ritualism in the Scioto-Paint Creek area, founded in Adena expressions in the Early Woodland period, and in yet older, Glacial Kame ceremonialism to the immediate northwest of the area, was key to the florescence of Hopewellian sociopolitics and ritual in the Scioto-Paint Creek area (Chapter 5). Finally, other social, religious, and/or other factors internal to the local culture, people, and their history may also have been critical to development there.²¹

The conclusion that a solely local-scale, ecological-demographic model is inadequate for explaining Hopewellian sociopolitical and ritual complexity in the Scioto-Paint Creek is reinforced by taking a comparative, interregional-scale perspective (Table 2.1). The lower Illinois valley, the lower Wabash-Ohio valley area in the vicinity of the Mann and Mount Vernon sites, and the Scioto-Paint Creek area were each regions of marked Hopewellian sociopolitical and ritual development during the Middle Woodland. These three areas vary in their natural food productivity, climatic potential for agriculture, their potential for

population growth as a product of natural and agricultural food productivity, their circumscription of food resources, and the ease of local transportation and communication within them (Ruby et al. 2005:127–132) – all of which are factors that can encourage or discourage the development sociopolitical complexity. From these parameters, it is possible to qualitatively rank the three areas for their potential for sociopolitical development, assuming the logic of the above, local-scale, ecological-demographic model: specifically, natural and agricultural food productivity translate into sedentism with concomitant population increases, and these factors, along with circumscription of natural resources and at least some ease of transportation and social interaction, encourage social tensions and, thus, the development of sociopolitical and ritual cooperation and complexity to overcome such tensions. In this perspective, the region that has the optimum environmental potential for producing sociopolitical complexity is the lower Illinois valley. The lower Wabash-Ohio region and the Scioto-Paint Creek area follow in that order (see Note 20 for the specific reasons behind this ordering).²² In contrast, Hopewellian material and ritual flamboyance, and sociopolitical complexity, were greatest in the Scioto-Paint Creek area by a strong measure, lesser in the lower Wabash-Ohio region, and least in the lower Illinois valley.²³ Thus, a local-scale, ecological-demographic model of sociopolitical and ritual development in the Scioto-Paint creek area is insufficient in and of itself to explain that development.

Summary

The geological and biologically diverse and biologically productive natural environment of the Scioto-Paint Creek area, in comparison to that of the Till Plain north of it and the dissected Appalachian Plateaus south of it, certainly fostered higher population densities and more complex sociopolitical and ritual organization there, from the Early through Middle Woodland periods. However, this simple, local ecological-demographic model

Table 2.1. Comparison of the Natural Environments of the Central Scioto, Lower Illinois, and Lower Wabash-Ohio Valleys for Their Potential to Encourage Demographically-Driven Socio-Political Development

Study Region	Spatial Scale	Natural Food Productivity	Agricultural Potential Relative to Climate	Total Population Potential	Circumscription of Food Resources	Connectedness, Ease of Transportation and Communication	Environmentally Encouraged Potential for Socio-political Development
Scioto valley	3	3	2	3	2	3	3
Lower Illinois valley	2	2	2	2	1	2	1
Lower Wabash-Ohio valley	1	1	1	1	3	1	2

¹ Rank order of 1 = biggest/most, 3 = smallest/least.

of increases in the complexity of sociopolitical and ritual organization in the Scioto-Paint Creek area during this time span is incomplete and must be qualified in three ways. Cultural developments in the area appear to have been a response more so to the aggregation of people there from the larger Scioto drainage than to increases in population densities throughout the drainage. Regional population levels do not appear to have changed much over the duration. Equally contributory to sociopolitical and ritual development in the Scioto-Paint Creek area was the redistribution of people from upland locations, small tributary stream settings, and the edges of the Scioto and Paint Creek valley trenches into the valley terraces and bottoms, themselves. Finally, Hopewellian sociopolitical and ritual complexity in the Scioto-Paint Creek area was much greater than one would expect from the moderate productivity and the structure of its natural environment, and its modest potential for population growth, compared to the lower Illinois valley and lower Wabash-Ohio region.

In light of these extensions of and qualifications to the local ecological-demographic model, the marked florescence of Hopewellian sociopolitical organization, ritual and material culture in the Scioto-Paint Creek area is better understood as the result of sociocultural and ideational processes embedded in a long-term historical development from the Early through Middle Woodland in a supportive natural environment than it is in strictly ecological terms.²⁴ This conclusion is given much additional support in Chapters 3 and 4, which describe in detail the social, political, and ritual lives of Scioto Hopewell people, and in Chapter 5, which revisits the question of how Scioto Hopewellian cultural life emerged.

SUBSISTENCE

Hopewellian peoples in the Scioto-Paint Creek area subsisted on a mixed diet of grown cultivars, collected wild plants, and hunted

and fished animals. Wild foods appear, from current data, to have been the mainstay of the Scioto Hopewellian diet, although crops were a substantial complement to wild foods and increased dramatically in their dietary importance over the course of the Middle Woodland period. Cultivated plants include starchy seeds of the Eastern Agricultural Complex (maygrass, goosefoot, knotweed, little barley), oily seeds of the EAC (sunflower, sumpweed), and squash. Of these cultivars, those with morphological changes indicating domestication and that have been identified specifically in Scioto Hopewell sites include some samples of goosefoot (*Chenopodium berlandieri* var. *jonesianum*), marked by their truncate margin and thin seed coat, and maygrass and sumpweed, which occur outside of their natural distributions (Wymer 1987:59–63). All of the cultivated seedy plants appear to have been grown in cleared forest plots on valley bottoms and terraces of the Scioto and Paint Creek valleys. Plot productivity seems to have been sustained through a shifting-plot, swidden system. The compact flowers and seed masses on the terminal inflorescences of the EAC plant foods make them easy to harvest when grown in dense stands in gardens.

Animal Foods

Animals that were hunted and fished are known directly from their remains in the midden deposit of the McGraw site on the Scioto flood plain (Parmalee 1965:115–118; Prufer et al. 1965:136; Stansbery 1965:119–124). This one, rich midden provides a good sample of the kinds of animals that were eaten, but probably a limited view of the balance of the species. Mammals, especially white-tailed deer, and mollusks appear to have dominated the animal diet. Fish, turtles, and fowl, which were taken in approximately equal proportions, each constituted less than half the mammalian contribution.²⁵ Turkey, ducks, and geese were the birds that were most commonly eaten.

These animal foods would have been taken from microenvironments that were spread over several miles of a valley-upland profile, from the rivers themselves and river edges (mollusks,

fish, turtle, ducks, geese), to Wisconsinan and Illinoian terraces (deer, turkey, other mammals), to uplands and their dissecting, narrow tributary valleys beyond main valley rims (deer, other mammals) (see above, Figure 2.7). Logistical trips of a day to much longer duration away from valley-based residences would have been necessary to harvest these resources. Hunting deer that congregated in sheltered small valleys and hollows in the uplands during winter would have required long-duration logistical trips of some members of valley-based households. Whether seasonal base camps away from valley-based residences were established for all members or portions of a household during winter or other seasons can only be conjectured, currently (Chapter 3, Residential Communities). Symbolically, Hopewell peoples of the Scioto-Paint Creek area relied upon species with characteristics and/or locations of capture that were associated with the Above and Below realms. A fair balance of attention was given to animal foods and products from both sets of realms, opening the possibility that Hopewell people were concerned with balancing the things they associated with these places in their diet, technology, and other aspects of their daily lives, as were some historic Woodland Native Americans (Hudson 1976:165, 302, see also 317–319).

Plant Foods

Plant foods known through paleoethnobotanical studies of remains from five Middle Woodland sites in the neighboring Licking drainage (Wymer 1987, 1988, 1992, 1996) include wild and encouraged nuts, cultivated and wild seeds, fruits and berries. Tubers and roots, which normally do not preserve archaeologically, can probably be added to the list based on their frequent occurrence at the Middle Woodland Jennison Guard site, at the mouth of the Great Miami river in southwestern Ohio (Kozarak 1987, 1997; Wymer 1996:43). Hickory was ubiquitously the most common kind of nut used in the Licking drainage sites, ranging between 50 and 95% of the nut assemblages, while acorns, hazelnuts, black walnuts, and rare butternuts comprised most of the remainder of the assemblages and varied in importance from site to site (Figure 2.14; Wymer 1996:39–40, figure 3.3; 1987:142–143, 1988). Seedy food resources were predominated by EAC starchy seeds, on the order of 65 to 90% of seed assemblages within sites (Figure 2.15; Wymer 1996:figure 3.4). Fruits and berries were next most important, comprising about 10–20% of seed assemblages. Most of the recovered specimens were honey locust, with minor amounts of hackberry, grape, sumac,

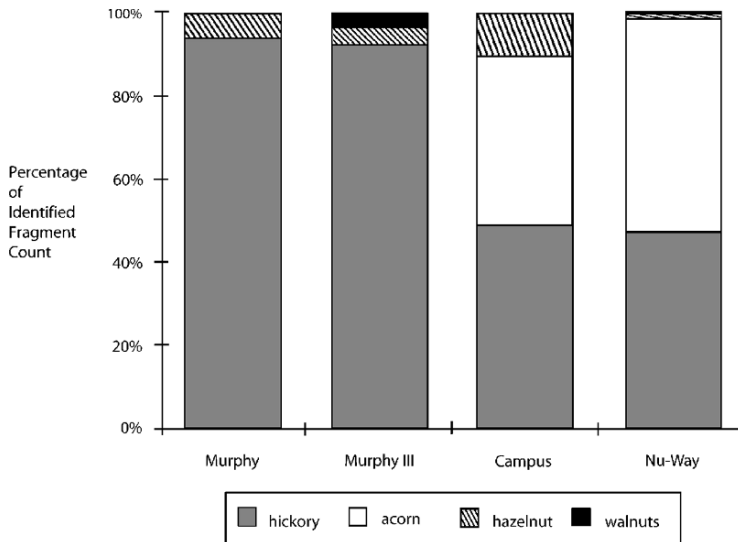


Figure 2.14. Consistency and diversity in the species of nuts used at four Hopewellian habitation sites in the Licking valley, Ohio. See credits.

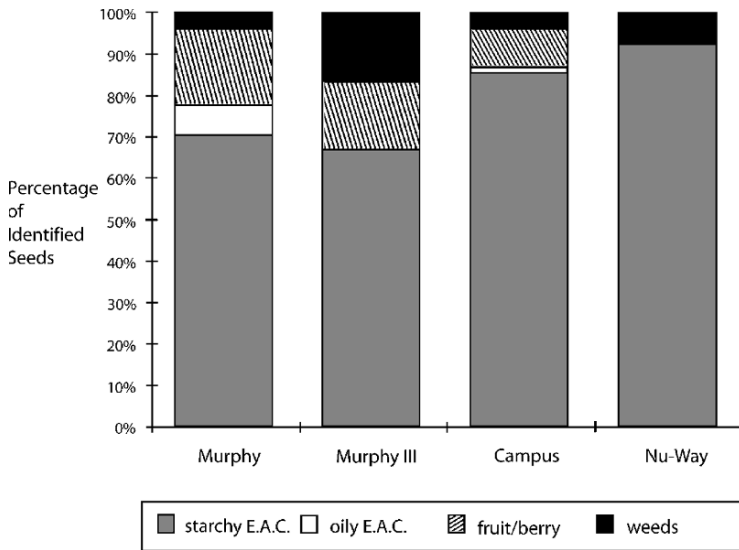


Figure 2.15. Consistency and diversity in the categories of seeds used at four Hopewellian habitation sites in the Licking valley, Ohio. See credits.

strawberry, pokeberry, and elderberry (Wymer 1996:41). Ruderal, wild weedy seeds, including bedstraw, panic grass, and several others, may sometimes have been significant foods, constituting about 3 to 15% of seed assemblages (Wymer 1996:41). Oily EAC seeds, unlike the previous forms, were not found at all five of the excavated sites, and made up a low, 1

to 6.5% of seed assemblages where present. Most of the oily EAC specimens recovered have been sumpweed, with only occasional sunflower seeds (Wymer 1997:157). Within the starchy EAC food category, maygrass was consistently important among sites, averaging about 38% of the starchy EAC seed assemblage and ranging between 17% and 75% (Figure 2.16; Wymer

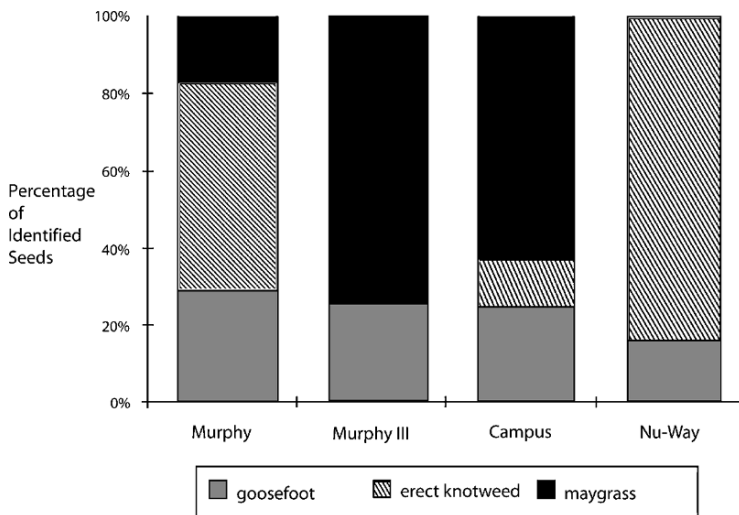


Figure 2.16. Consistency and diversity in the genera of Eastern Agricultural Complex seeds used at four Hopewellian habitation sites in the Licking valley, Ohio. See credits.

1996:figure 3.5). Erect knotweed was equally important on average, at approximately 38% of the starchy EAC seed assemblage, but more variable among sites, with ranges between 0% and 84% of the assemblages. Both foods were more important than goosefoot, which averaged only 24% of the starchy EAC seed assemblage, but was fairly consistent in its contribution to diet, ranging between 16% and 29%. The high and consistent level of use of maygrass probably relates to its spring harvest time, when most other plant foods in the Scioto-Paint Creek area have not reached fruition.

As was the case for animal foods, the plant foods used by Scioto Hopewell peoples were derived from diverse settings spread over several miles of a valley-upland profile. Hickory nuts were available in the uplands beyond valley rims. Acorns and black walnuts were taken from Illinoisan and Wisconsinan terraces. EAC seedy plants appear from all evidence to have been grown in swidden plots cleared in terrace and flood plain forests (Wymer 1996, 1997). At the edges of garden plots or in abandoned plots, where light was more available than in the mature terrace and flood plain forests, hazelnut, honey locust, sumac, elderberry, and raspberry would have grown naturally and were probably encouraged and tended for their fruits (Wymer 1996:47; 1997:159). Effectively harvesting their produce would have required close attention to them, to stave off animal competitors. The plant foods that Scioto Hopewell peoples gathered imply that they took logistical trips of a day to much longer away from their valley residences. Harvesting hickory nuts in the uplands could have involved the construction of fall season base camps in the uplands by some or all members of a household, away from valley-bottom and terrace residences (Chapter 3, Residential Communities). Upland settings have scarcely been explored in the Scioto-Paint Creek area, leaving this possibility open for study. Symbolically, Hopewell peoples in the area harvested and gathered plants primarily from locations associated with the earth-disk surface of the Below realms – terraces, and rises within flood plains – and secondarily from uplands transitional to the Above realms. Some tubers

probably were dug along river edges transitional to the Below realms. Balancing plant foods and products from Above and Below realms in their diet, technology, and other activities in life, like balancing animal foods and products, may have been essential to the substance and rhythm of the lives of Scioto Hopewell peoples.

How Important Was Farming?

The level of contribution that cultivars made to the diet of Scioto Hopewell peoples is a central question. It bears on the major issues of the degree to which Scioto Hopewell peoples were annually sedentary, predispositions for territoriality and competition, subsistence risk and intercommunity exchange, kinship structure, and world view orientation, to name a few. Currently, it appears that crops were a *substantial* component of the diet of Scioto Hopewell peoples, but *supplementary* to hunted and collected, wild foods. DeeAnne Wymer (personal communication, 2005) currently would estimate that cultivars comprised approximately 30–50% of the annual diet of Scioto Hopewell peoples.²⁶ I would place the estimate somewhat lower, at approximately 25%, given the paleoethnobotanical and broader subsistence record for the area and a number of other considerations, which I discuss immediately below (see also Brown 2005:114; Smith 2006:501–502).²⁷ This lower estimate is more in line with other assessments of annual plant consumption in the general midwest-riverine area during the Late Archaic and Woodland periods, prior to the shift to intensive maize agriculture there.²⁸

The significant role of cultivars in the diets of Scioto Hopewell people is evidenced in the ubiquity and density of EAC seeds across features within sites in the neighboring Licking valley. Both measures are high—comparable to the ubiquity and density of both wood charcoal and nuts across features (Table 2.2). These measures indicate the consistent and plentiful use of seeds at the sites. EAC seed ubiquity and density within Licking valley sites are also respectively more consistent and much higher than these measures within Middle Woodland

Table 2.2. Ubiquity and Density of Seeds, Nut Shells, and Charcoal in Middle Woodland Sites in the Licking Valley (Ohio), the Lower Illinois Valley, and the American Bottom (Illinois)

	All Seeds	EAC Seeds ²	Nuts	Charcoal
Licking valley, Ohio¹				
<i>Ubiquity</i>	82% of samples		84% of samples	100% of samples
<i>Density</i>	22 counts/liter	17.4 counts/liter	10.4 counts/liter	25 counts/liter
Lower Illinois valley, Illinois³				
<i>Ubiquity</i>	69% of samples		98% of samples	100% of samples
<i>Density</i>	1.29 counts/liter			
American Bottom, Illinois⁴				
<i>Ubiquity</i>	70% of samples		65% of samples	97% of samples
<i>Density</i>	0.67 counts/liter		3.0 counts/liter	3.5 counts/liter

¹Data are for the Murphy I and Campus sites (Wymer 1987:135, 136, tables 10, 11). The samples number 44, come from 21 features, and total 160 liters.

²Datum is calculated knowing that EAC seeds comprise 78.9% of all seeds recovered from samples from the Murphy I and Campus sites (Wymer 1987:178, table 31).

³Data are for the Smiling Dan, Massey, and Archie sites (Wymer 1987:222, table 37). The samples come from 203 features and 348 midden samples and total 13,536 liters.

⁴Data are for the Mund and Truck #7 sites (Wymer 1987:221, table 36). The samples come from 48 features and total 1,354.5 liters.

sites in the lower Illinois drainage and the American Bottom (Table 2.2).

At the same time, Scioto Hopewell people's dependence on EAC seed plants appears to have been supplemental to wild foods, which comprised the bulk their diet. This qualification is suggested by seven kinds of qualitative data. First, the Scioto Hopewell subsistence system can be placed in culture historical context, on a scale from emphasis on wild foods to emphasis on domesticated cultivars, by comparison to the subsistence of the Mississippian societies of Moundville and Cahokia. These societies were much larger, had much greater regional population densities, and had much denser localized concentrations of people than Scioto Hopewell societies, and thus would have been more encouraged in their reliance on domesticates. The greater productivity of Late Woodland maize than EAC plants also would have made horticulture more attractive to Mississippian peoples than Scioto Hopewell peoples. Nevertheless, the contribution of maize to the caloric diet of early Mississippian people at Moundville (A.D. 1050–1250) is estimated at only 40%, and at similar to somewhat lower proportions for early Mississippian people at Cahokia (A.D. 1000–1050), as indicated by human bone chemistry studies (Schoeninger et al. 2000; Schoeninger and Schurr 1998; Yerkes

2005:244, 250). Less than 40% dietary reliance of cultivars would thus be expectable for Scioto Hopewell societies, which would make wild foods their mainstay.²⁹

Consistent with this scaling of Scioto Hopewell people's dependence on cultivated plants, the historic Central Algonkian tribes of Illinois, Indiana, Ohio, and Wisconsin, including the Prairie Potawatami, Sauk, Fox, Menomini, Mascouten, Kickapoo, Shawnee, Miami, and Illinois, all relied most heavily on hunting and gathering for their subsistence. Agriculture played a secondary role (Miller 1955; Trigger 1978)

Second, at the McGraw and Brown's Bottom sites in the Scioto valley, the remains of nut, mollusk, and deer foods were each plentiful in archaeological deposits, with more minor representation of fish, bird, and small mammal remains (Pacheco 2005; Parmalee 1965:115–118; Prufer et al. 1965:136; Stansbery 1965:119–124; P. Pacheco, D. Wymer, and J. Burks, personal communication 2005).³⁰ If nuts, mollusks, and deer were of primary importance to the diet of Scioto Hopewell people, as they seem to have been from these two sites and as they were across much of the midwestern and midsouthern United States as a strong supra-regional pattern from about 5000 B.C. onward (e.g., Brown 1983:7; Brown and Vierra 1983:188–189; Emerson and McElrath

1983:237–238; Ford 1974:393, 395; Fortier 1983:258; Jeffries and Lynch 1983; Styles 1981; Styles et al. 1983:286, 290; Webb 1946, 1950a,b; Webb and Haag 1939, 1940, 1947; Winters 1969), then EAC seed plants proportionally must have constituted a minority of the Scioto Hopewell diet. Ubiquity and density counts for nuts compared to seeds in the Licking valley data (Table 2.2) do suggest that nuts were an important component of the Scioto Hopewell food spectrum, although probably somewhat less important than EAC cultivars.

Third, Scioto Hopewell settlements lack hoes for making agricultural production efficient. They are not found earlier in the area or in southern Ohio generally, and first appear in Ohio in Late Woodland villages, especially in the southwestern part of the state (Seeman and Dancey 2000:589).³¹ By the Late Prehistoric period, a diversity of kinds of hoes, made of mussel shell, the shoulder blades of deer and elk, elk antler, and stone were used by Fort Ancient peoples of Ohio (Carskadden and Morton 1977:49, 53, 91; Griffin 1943:table 14; Hooton and Willoughby 1920:60–61, 66–67, plates 13–15; Marwitt et al. 1984:68; Mills 1904:164, figure 38, 1906:89, 1917:422, figure 74; Prufer 1975:284, 306; Prufer and Shane 1970:121; Otto 1980:65). The implication is that Scioto Hopewell peoples must have broken and cultivated ground with wooden digging sticks, which would have been less effective than the tools used by later peoples and would have encouraged their major attention on other, more easily gotten food sources.

Fourth, and related, slab and basin-shaped milling stones (metates) for processing seeds in quantity are also missing from Scioto Hopewell settlements. They, too, are not found earlier in the area or in southern Ohio generally, and first appear in Late Woodland villages broadly over southern Ohio (Seeman and Dancey 2000:589).³² Their common use in southern Ohio continued through the Fort Ancient Period (Converse 1973:45; Hooton and Willoughby 1920:57, plate 10; Mills 1904:158; 1906:76, figure 10; 1917:355, 357, figure 27; Prufer and Shane 1970:121; Seeman 1985:58, 61).

The lack of milling stones in the Scioto area cannot be attributed to Scioto Hopewell peoples having eaten their seed foods primarily uncooked and chewed instead of ground and cooked. Dental anthropological and ceramic technological studies suggest, instead, that seed foods were normally cooked.³³ These conditions imply that seedy foods were probably ground in less efficient ways, in preparation for boiling or baking, than by stone slab milling, and thus are less likely to have constituted the major portion of the diet of Scioto Hopewell people.³⁴

Fifth, storage pits are rare in domestic sites in the Scioto valley and the neighboring Licking valley, with only one firm example and two less certain cases currently known.³⁵ This situation is consistent with the inference that production of EAC starchy seed crops in these valleys was limited, and did not regularly result in plentiful surpluses that were store for extended periods of time. However, the possibility of alternative means for storage must be considered, as suggested by the textile bag of domesticated goosefoot found in Ash Cave, Ohio, and another found in the Marble Bluff shelter in the Arkansas Ozarks (Smith 1985, 1995:187–188).

Sixth, the content of the representational art of Scioto Hopewell peoples is inconsistent with the idea that they depended heavily on cultivating plants. Almost all of their representational art depicts animals rather than plants (Carr 1998, 2000a, b; Seeman 2004:64–65). The corpus includes many hundreds of images of animals of diverse species, sculpted on smoking pipes, ceramic vessels, and bone and antler batons; cut out of mica and copper; painted on mica, copper, and textiles; patinated on copper breastplates, celts, and headplates; and built out of earthen and stone architecture. In contrast, I know of only two definite representations of plants – both of mushrooms associated with shaman-like trancing rather than foods (Table 2.3). A few other possible representations of seed pods, flowers, and sprouts have been suggested (Table 2.3; Figure 2.17A,B); however, other interpretations have also been made of these art works. Many of the just-mentioned items with animal imagery

Table 2.3. Ohio Hopewell Artworks Depicting Plants

	Site and Provenience	Reference
Definite Examples		
Copper wand effigy of an <i>Amanita</i> mushroom	Mound City, Burial 9, Mound 7	Mills (1922:489–491, 547–548, figures 31, 32, 71)
Stone effigy of a mushroom	Fort Ancient, Middle Woodland component	Carr and Case (2005a:29, figure 1.5B)
Possible Examples		
Copper effigy of head of <i>Amanita</i> mushroom?	Hopewell, Mound 17, Ceremonial Offering 1	Shetrone (1926a: 44, 46, 186, figure 115), Zurel (2002)
Copper geometric effigy of seed pod in cross section?	Hopewell, Mound 25, Copper Deposit	Moorehead (1922:109–110, plate 65 #3) Zurel (2002)
Copper geometric effigy of seed pod in cross section?	Hopewell, Mound 25, Copper Deposit	Moorehead (1922:109–110, plate 65 # 1) Zurel (2002)
Copper geometric effigy of a flower?	Hopewell, Mound 25, Copper Deposit	Moorehead (1922:109–110, plate 65 # 2)
Copper geometric effigy flowers?	Turner, Mound 23, Central Altar	Willoughby and Hooton (1922:46–48, plate 11c)
Copper effigy emerging sprouts (rather than snake tongues)?	Hopewell, Mound 25, Burial 4	Shetrone (1926a:63, 187, figure 116), Zurel (personal communication 2002). See Figure 2.17B.
Copper effigy emerging sprouts? (rather than snake tongues)?	Turner, Mound 3, Central Altar	Willoughby and Hooton (1922:46–48, plate 11a) Zurel (personal communication 2002)
Mica effigy of a pistil, flower, or seed (partial)	Edwin Harness Mound	Mills (1907:173, figure 56)
Mica effigy of a pistil, flower, or seed (partial)	Edwin Harness Mound	Collections of the Ohio Historical Society Columbus, OH (catalog no. 7/-). See Figure 2.17A.

were markers of leadership or other socially important roles, suggesting the core value that Hopewellian peoples gave to wild game compared to native domesticates. This value system is not what one would expect for peoples whose livelihoods rested on their success in farming, and suggests the strong degree to which hunting and gathering remained woven in the fabric of Scioto Hopewellian life.

Seventh, the supplementary role that EAC seed plants played in the diet of Scioto Hopewell peoples is reflected in the social roles and relative sociopolitical status of Scioto Hopewell women and men. Across cultures, the access that women compared to men have to sociopolitical positions of importance (or that any segment of society has to important positions) depends considerably on the degree to which they dominate the perceived, essential means of production (Murdock 1949b; Sered 1994; Steward 1955). If EAC seed plants had been the majority component of Scioto

Hopewell diet and perceived as core to Scioto Hopewell life, and if farming tasks beyond clearing of land were done primarily by women, then one would expect Scioto Hopewell women to have filled many important sociopolitical roles in their societies. Instead, most important sociopolitical and ritual positions were held primarily or exclusively by men (Chapter 4, Gender, Gender Relations, and Kinship Structure). The highest sociopolitical position of community-wide leader, which was marked by copper headplates, was held exclusively by males. Several specialized kinds of shaman-like leadership roles were filled exclusively or largely by males, and clan leaders were almost always male. A ceremonial sodality symbolized by bear canines, and perhaps another that employed smoking pipes, had exclusively male members. Two other sodalities, marked by breastplates and earspools, had male members two to four times more frequently than female members. There were

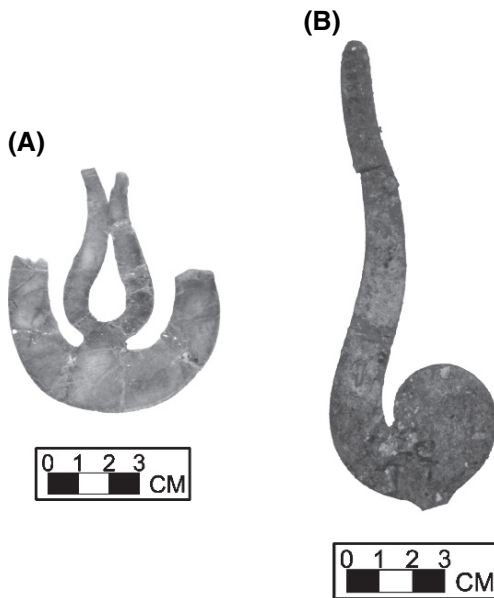


Figure 2.17. Possible Scioto Hopewell artistic representations of plants. (A) Mica cutout that might represent a flower or a flower's pistil in cross-section. From the Liberty earthwork, Edwin Harness mound, internal provenience unknown. (B) Copper cutout that might depict a growing seedling, or a fern or other plant unfolding (inverted orientation), or one half of a bifurcate snake's tongue (compare with Shetrone 1936:figure 77, lower row, center; and Greber and Ruhl 1989:243, 246, figure 6.61). From the Turner earthwork, Mound 3, Central Altar. See credits.

no important sociopolitical or ritual roles that women filled exclusively, and only one or two kinds, which involved blown instruments, that were filled primarily by women. Only three kinds of positions were held by women as often as men: community-wide leaders marked by copper celts, public ceremonial leaders who used conch shell dippers, and diviners who used mica mirrors. In short, the subordinate position of women in the sociopolitical and ritual arenas of Scioto Hopewell societies suggests that growing of EAC crops, and women's contributions to that work, were not perceived by Scioto Hopewell peoples as core to their subsistence and way of life. One is left with the conclusion that EAC foods were supplemental to wild one.

The reduced status of women compared to men in Scioto Hopewell societies and the conclusion reached from it, that horticulture was

not the primary means of subsistence of those societies, reckons with ethnohistorical patterns in the Eastern Woodlands. Historically there, northern tribes that relied fully or considerably on hunting and gathering defined kin relations patrilineally, whereas southern tribes that relied more heavily on agriculture did so matrilineally (Hudson 1976; Trigger 1978).

All told, many lines of evidence, ranging from paleoethnobotanical and paleozoological to tools, features, art, and gender relations suggest that EAC foods made a substantial contribution to the diet of Scioto Hopewell peoples, but one supplementary to hunted and collected wild foods.

Subsistence Change over Time

To the best that can be told from paleoethnobotanical evidence in Ohio and the broader midwestern United States, Scioto Hopewell peoples increased their use of EAC seed foods dramatically over the course of the Middle Woodland period. Both the quantity in which seeds were used and diversity in the kinds of seeds used were expanded. These large changes in the balance of Scioto Hopewell diet appear to have begun around 50 B.C., and seem to have occurred within a fairly short time window at the beginning of the Middle Woodland period, with more gradual change thereafter over the remainder of the Middle Woodland. In contrast, the morphological changes in some kinds of EAC seed foods that made them more productive and culminated in their being classified as "domesticated" began much earlier and extended over a much longer period of time, on the order of millennia. Significant morphological changes that distinguish them as domesticated occurred between about 2000 and 1000 B.C. (Smith 1992:205–206).³⁶

Contrasts between Early Woodland and Middle Woodland paleoethnobotanical samples in the upper Ohio valley basin show that over this time span, the use of all kinds of seeds (EAC foods, fruits, berries, weeds) increased about 34 times, and the use of specifically EAC seeds increased about 69 times (Table 2.4). During the Early Woodland period,

Table 2.4. Changes in the Use of All Seeds and Eastern Agricultural Complex Seeds Over the Early Woodland and Middle Woodland Periods in the Upper Ohio River Basin¹

Time Period	All Seeds / Liter	EAC % of All Seeds	EAC Seeds / Liter
Early Woodland ²	0.5	36%	.18
Middle Woodland ³	17.	73%	12.41
<i>Rate of Increase over Time, Early to Middle Woodland</i>	<i>34 X</i>	<i>2 X</i>	<i>68.9 X</i>
Early Late Woodland ⁴	13.	70%	9.1

¹Data are from Wymer (1992:71–72, figures 9.4, 9.6).

²For the sites of Graham, east-central Kentucky; Boudinot, southeastern Ohio; and Niebert–Early Woodland component, northwest West Virginia.

³For the sites of Campus, Licking valley, Ohio; Murphy, Licking valley, Ohio; and Dow Cook, east-central Kentucky.

⁴For the sites of Waterplant, Scioto valley, Ohio; Scioto Trails/Zencor, Scioto valley, Ohio; and Childers, northwest West Virginia.

upper Ohio valley peoples focused primarily on maygrass and goosefoot, and made little or no use of other EAC seedy foods. The EAC diet of upper Ohio valley peoples during the Middle Woodland was more diverse, and included maygrass, goosefoot, and knotweed, as well as augmented percentages of sunflower and cucurbit (figure 2.18; Wymer 1992: figure 9.7).

The probable timing and pace of these changes can be estimated with some confidence

from small but consistently patterned paleoethnobotanical samples from the upper Ohio valley basin. Throughout a range of early to late Early Woodland sites there, between about 600 B.C. and 100 B.C., the use of seeds of all kinds and those specifically of the EAC remained consistently very minor. A large jump in the use of seeds is documented to have occurred between about 40 B.C. and A.D. 10 at the Middle Woodland Nuway and Campus sites, and seed use remained high thereafter, through

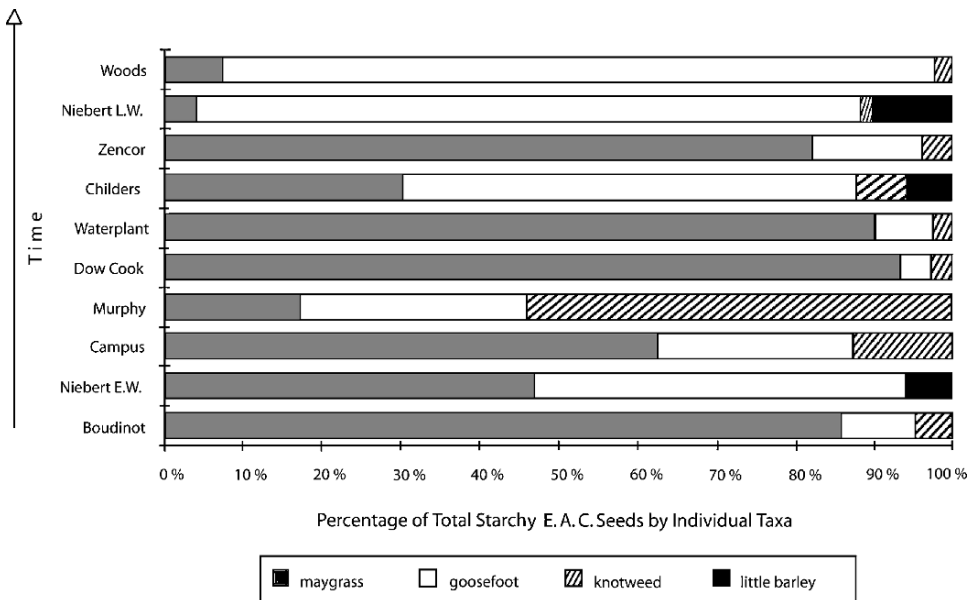


Figure 2.18. Consistency and diversity in the genera of Eastern Agricultural Complex seeds used at ten Early Woodland through Late Woodland habitation sites in the upper Ohio valley drainage. See credits.

Table 2.5. Changes in the Use of All Seeds and Eastern Agricultural Complex Seeds over the Early Woodland through Early Late Woodland Periods in the Upper Ohio River Basin

Site ¹	Occupation Dates ²	All Seeds / Liter ³	EAC % of All Seeds	EAC Seeds / Liter
<i>Early in Time</i>				
Graham (Early Woodland)	801 B.C.	0.0	0%	0.0
Boudinot 4 (Early Woodland) ⁴				
early features	922 B.C. average	0.01	0%	0.0
later features	362 B.C. average	0.18	88%	0.15
latest feature	101 B.C. average	0.65	61%	0.39
Niebert (Early Woodland)	274 B.C., 22 B.C.	0.33	31%	0.10
	averages for two modes			
	— Rapid increase in use of all seeds and EAC seeds beginning around 50 B.C. —			
Nuway (Middle Woodland)	40 B.C.	9.0	92%	8.3
Campus (Middle Woodland)	A.D. 12	30.0	81%	24.3
Murphy (Middle Woodland)	40 B.C., A.D. 285	22.0	70%	15.4
	averages for two modes			
Waterplant (Early Late Woodland)	A.D. 655 average	15.0	78%	11.7
Scioto Trails / Zencor	A.D. 658, 878	15.0	80%	12.0
(Early Late Woodland)	averages for two modes			
<i>Late in Time</i>				

¹ Graham is located in east-central Kentucky; Boudinot in southeastern Ohio; Niebert in northwest West Virginia; Nuway, Campus, and Murphy in the Licking valley, Ohio; and Waterplant and Scioto Trails in the Scioto valley, Ohio.

² Based on calibrated radiocarbon dates in Wymer and Abrams (2003), Clay and Niquette (1989), Dancy and Pacheco (1997a: table 1.3), Maslowski et al. (1995), and Carr and Haas (1996).

³ Most of the paleoethnobotanical data are from Wymer (1992:71–72, figures 9.4, 9.6). Information on Boudinot 4 comes from Wymer and Abrams (2003). Information from Niebert comes from Clay and Niquette (1989).

⁴ Early features are numbers 16 and 14. Later features are numbers 11, 8, and 5a. The latest feature is number 5b.

the Middle Woodland and early Late Woodland periods, between approximately A.D. 10 and A.D. 800 (Table 2.5, Figure 2.19). Wymer (Wymer and Abrams 2003:189) would place the establishment of horticulture as a prominent aspect of the economies of peoples in the upper Ohio valley basin slightly later – by approximately A.D.100 – with continuity thereafter.

This pattern and its approximate timing are corroborated by a larger, though less geographically relevant suite of paleoethnobotanical samples drawn from the broader midwestern and midsouthern United States. Compositing samples from west-central Illinois, the American Bottom, central Tennessee, and eastern Tennessee (Figure 2.20; Smith 1992:206, figure 9.3a) suggests that the dramatic increase in use of EAC seed foods in these areas began about 100 B.C. and was rapid.

The sudden increase in the use of EAC seed foods in the Scioto-Paint Creek area somewhat after the beginning of the Middle Woodland period, if this pattern holds, has

important implications for understanding the beginnings of Hopewellian style lifeways there (Chapter 5).

Swidden Farming

Hopewell peoples farmed the bottoms and terraces of the Scioto and Paint Creek valleys by swidden methods. These methods involved opening garden plots in the valley forests and relocating garden plots over time in order to take advantage of new, fertile, and less weed-prone soils.

A number of kinds of evidence support this reconstruction. First, simply the use of EAC cultigens by Scioto and Licking Hopewell peoples suggests that they cleared forest land for garden plots. EAC plants could not have grown in the dim light of the valley forests native to the Scioto and Paint Creek (Wymer 1996:47).

Second, wild, forest-edge plant species representing different stages of forest regrowth were collected and eaten by Scioto Hopewell

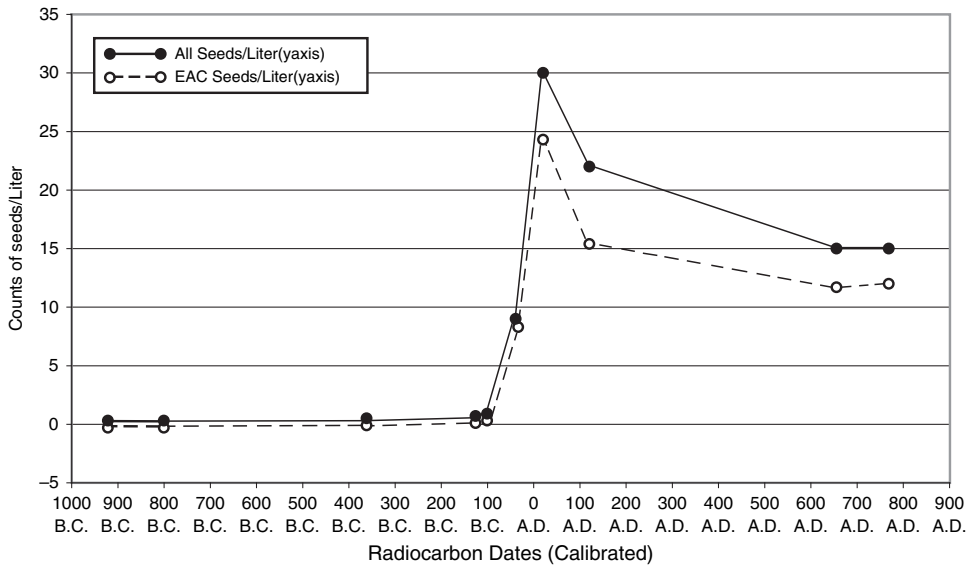


Figure 2.19. The use of seed foods, and Eastern Agricultural Complex seeds in particular, increased abruptly in the upper Ohio valley drainage between about 40 B.C. and A.D. 10.

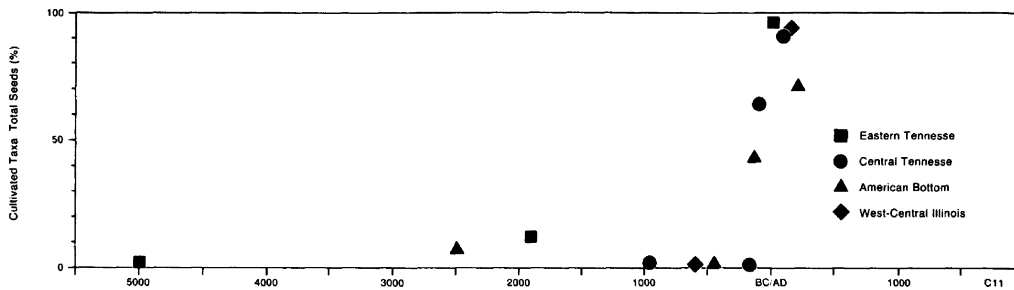


Figure 2.20. The use of seed foods broadly in the midwestern and midsouthern Eastern Woodlands (west-central Illinois, the American Bottom, central Tennessee, and eastern Tennessee) increased dramatically about 100 B.C. See credits.

peoples. This practice suggests that garden plots were made, abandoned, and used for their natural products after abandonment, as were other natural patches of wild foods near their residences. The forest-edge plants that were used include raspberry, elderberry, sumac, hazelnut, and honey locust (Wymer 1996:47; 1997:159). That these forest-edge products represent regrowth at the edges of extant and old garden plots rather than the edges of a settlement, itself, is evidenced by the occurrence of several different suites of species from different stages of regrowth, rather than only species from new growth. Different garden plots at different stages of regrowth around

a settlement were all used simultaneously. In addition, the forest-edge foods found in Scioto and Licking Hopewell habitation sites are not nearly so common in earlier, Early Woodland habitation sites (D. Wymer, personal communication 2005). The increased occurrence of forest-edge foods over time in southern Ohio and neighboring areas correlates with the increased use of EAC plant foods there, implying that the two kinds of foods were interconnected in their growth and use, i.e., the growth of forest edge species in abandoned EAC garden plots.

Third, a rotating system of garden plots is implied by the short lengths of occupation of

Scioto and Licking Hopewell habitation sites and a pattern of their repeated reoccupation. It appears that a household would move its residence to a new location when mature forest land for garden plots became an inconvenient distance away. Short lengths of occupation, on the order of a few years to a generation, have been estimated by total assemblage mass (Prufer et al. 1965), ceramic assemblage size (Carr and Haas 1996:29), ethnohistoric analogs (Rainey 2003), a study of plant use and succession in abandoned Hopewellian swidden plots in the area (Rainey 2003), and by comparison to much denser, Illinois Hopewell habitation assemblages (Chapter 3, Long-term Cycles of Residential Mobility and Lengths of Occupation of Sites). Cycles of reoccupation of a same location are estimated at 175–300 years, based on the radiocarbon chronologies of individual sites (Chapter 3, Long-term Cycles of Residential Mobility and the Lengths of Occupation of Sites; Table 3.3).

All of these diverse lines of evidence would be hard to explain succinctly by other than the practice of swidden farming by Scioto and Licking Hopewell peoples.

Opportunism

The reconstruction offered here of subsistence in the Scioto-Paint Creek area and its surroundings is a generalization. Households in the area seem to have varied significantly in the particular food resources that they emphasized, depending on very localized conditions in the foods most easily obtained. This kind of variation can be seen in paleoethnobotanical data from the Licking valley. There, the Murphy I, Murphy III, Campus, and Nu-Way sites vary considerably in the percentages of maygrass and goosefoot per starchy EAC seeds recovered from them, on a count basis (see above, Figure 2.16; Wymer 1996:41, figure 3.5), the percentages of fruit and berry seeds compared to starchy, oily, and weedy seeds retrieved, on a count basis (see above, Figure 2.15; Wymer 1996:40, figure 3.4), the overall density of nuts recovered, on a weight basis (Wymer 1987:135, table 10; 1996:39,

figure 3.1), and the percentages of particular species of nuts excavated, on a count basis (see above, Figure 2.14; Wymer 1996:40, figure 3.3).

Larger scale differences in subsistence practices probably occurred between the Scioto-Paint Creek area, which was environmentally very diverse and productive, and portions of the Scioto valley to the north and south, which were more homogeneous and less productive (see above, Ecological Setting). These differences in subsistence were fundamental enough to apparently have produced organizational differences in residential settlement and mobility between the Scioto-Paint Creek area and its northern and southern counterparts. Habitation sites with strong evidence for multi-season residential stability, like some known in the Scioto-Paint Creek area, appear to be lacking in the northern and southern portions of the Scioto valley. There, seasonal base camps are found, instead, implying the movement of residences over the course of the year (Chapter 3, Residential Communities).

Summary

By all empirical accounts, Hopewell peoples of the Scioto-Paint Creek area were mixed forager-farmers. They relied substantially and relatively equally on collected nuts, especially hickory, hunted deer and other mammals, gathered mollusks, and cultivated Eastern Agricultural Complex starchy and oily seeds. Fish, turtles, and fowl that were taken, as well as pods, fruits, and berries that were encouraged and harvested at the edges of their gardens, and probably roots and tubers that were dug, filled out their diets. These products were gotten from diverse parts of the people's cosmos – in their river and riverbank portals to the Below realms, on their valley bottom and terrace surface of the earth-disk – the top surface of the Below realms – and in their valley edge and upland transition to the Above realms. Swidden farming of the naturally largely forested valley bottoms and terraces required Scioto Hopewell peoples to move their gardens periodically, probably every several or more years, and to shift their small, valley-based

residences every few years to a decade or two. Obtaining other foods involved short, one-day logistical trips, longer-duration logistical trips, and perhaps the building of seasonal base camps away from their valley-based residences.

Hopewell peoples of the Scioto-Paint Creek area developed their particular system of subsistence and settlement, with its significant integration of swidden gardening and its valley-bottom focal residences, relatively quickly, over perhaps three or four generations in the last half century or so B.C. and the first decades A.D. As will be seen in Chapter 5, this subsistence-settlement shift appears to have been precipitated by changes in religious belief and practices that made late Early Woodland peoples decide to move their ceremonial centers and rituals from valley edge locations transitional to the Above realms to valley terrace settings on the earth-disk surface of the Below realms. Thereafter, subsistence and settlement in the Scioto-Paint Creek area remained essentially the same throughout the Middle Woodland period, until nucleated village life was relatively quickly adopted in the central Scioto valley, in the sixth century A.D. (Carr and Haas 1996), or perhaps somewhat earlier (P. Pacheco, personal communication 2007). Subsistence practices changed in only minor ways through the ninth century A.D., over which time the spectrum of eaten plant foods was broadened across all major plant categories (nuts, seeds, fruits, berries, weedy genera) and greater reliance was placed upon nuts (Wymer 1987, 1992:65).

CONCLUSION

Part of the process of richly describing a people, in order to come to know them in their terms, is contextualizing their deeds and ideas within their own local environmental setting. This setting includes not only physical and biological places and aspects of the environment, but also the symbolic meaning of them to the people in light of their world view and beliefs. The setting also includes spiritual places and aspects of the environment that are recognized by the people but that may have no physical correlate that you

or I can perceive. In addition, because culture and environment hold a recursive relationship to each other, the environmental setting also comes to include cultivated and built places and characteristics, such as Hopewell peoples' garden plots in use, abandoned garden plots, and earthworks. Finally, human demographic features of a landscape, as a part of its ecology and as a transitional category between nature and culture, also contribute to the character of a local setting. All of these components of a people's environment form the context in which individual and social perceptions, decisions, and actions take place.

This chapter has described the natural, symbolic, cultivated, and demographic environmental setting in which Scioto Hopewell people created their lives and culture. A number of key aspects of the Scioto-Paint Creek environment have been revealed. First are the area's physiographic, floral, and faunal diversity and productivity, its broad and nutrient-rich flood plains, and its longer growing season compared to surrounding locales. These characteristics of the area are largely attributable to it encompassing ecotones between the glaciated Till Plain, the glaciated Allegheny Plateaus, and the unglaciated Allegheny Plateaus, and to the Scioto river following the course of the preglacial Teays valley near Chillicothe. The natural diversity and richness of the area were essential to the increases in numbers of people there during the Early Woodland period and the development of Adena social and ceremonial complexity, which stood at the foundation of Scioto Hopewellian cultural innovations. Later, during the Middle Woodland period, the rich and large flood plains supported the aggregation of people there from surrounding valley-edge and upland locations, and the moving of people into the area from neighboring parts of the Scioto drainage. The intensification of horticulture in the Scioto-Paint Creek area at the beginning of the Middle Woodland period was secondary to the area's natural, wild biotic productivity in allowing population aggregation and local population increases there at that time.

Second, the Eastern Agricultural Complex foods that Scioto Hopewell people cultivated

were supplemental in their diet to the wild foods they harvested. Deer and other mammals, nuts, and mollusks constituted the core of the diet of Hopewell people in the Scioto-Paint Creek area, as they were generally for peoples across the Midwest-Riverine area during the Woodland period. Seven diverse lines of paleoethnobotanical, zooarchaeological, artifactual, artistic, and gender-based evidence support this conclusion.

Third, intensification of horticulture and increased reliance on Eastern Agricultural Complex seed foods occurred abruptly at the very beginning of the Middle Woodland period rather than gradually over the course of the Early and Middle Woodland in the Scioto-Paint Creek area. Current paleoethnobotanical data suggest that the develop occurred over perhaps three or four generations, between about 40 B.C. and A.D. 10. Subsistence change appears to have been coeval with the development of Scioto Hopewellian social and ritual organization rather than prior to it, and probably was not a direct, primary cause of it. This point is elaborated and its implications are explored in Chapter 5. There, it is shown that the florescence of Scioto Hopewellian sociopolitical organization, rituals, and material culture is better understood as a response to conceptual developments in world view and belief that began in the late Early Woodland period and quickly crystalized at the beginning of the Middle Woodland period.

Fourth, total population in the greater Scioto-Paint Creek area does not seem to have changed much from the Early Woodland to the Middle Woodland period. Instead, this time span saw primarily the relocation of people, from valley-edge and upland settings to valley terraces and bottomlands in the vicinity of the confluence of Paint Creek with the Scioto river, and from some parts of the Scioto valley north and south of the confluence area to it.

Fifth, subsistence data summarized here, and geographic analysis of the areal sizes and spacings of local symbolic communities, as presented in Chapter 3, indicate that despite the aggregation of people into the valleys and bottomlands of the Scioto-Paint Creek area during the Middle Woodland

period, social groups were not closely packed together spatially and social packing was not a causal factor in subsistence and social change. Communities were liberally separated from one another, and the plant foods utilized were those most easily collected and grown rather than a broad spectrum of easy to hard-to-procure ones. Considering this point and the previous means that earlier ecological explanations of Hopewell that pose the linear causal chain of sedentism, regional population growth and packing, agricultural intensification, local subsistence risk, and the development of social complexity (Ford 1974; see also Braun 1977, 1986; Dancey 1992; Fagan 1995; Tainter 1977; and some aspects of Caldwell 1958) are not supported empirically for the Scioto-Paint Creek area during the Early Woodland to Middle Woodland time span. Also, while increases in the numbers of people who resided in the Scioto-Paint Creek area provided the medium for social and ritual complexity, they were not the impetus for its development. Scioto Hopewell cultural complexity was not a response to population pressure and to social competition that was specifically demographic in its basis. These conclusions and evidence for them will be considered in greater detail in Chapter 5.

Finally, the natural environment of the Scioto-Paint Creek area was, for Hopewell people there, a creative medium that suggested cultural possibilities, provided means for expressing them, and guided the development of culture within certain broad limits. The valley edges with their conical-shaped hillocks, the flat terraces and bottomlands of the valleys, and the rivers were a very natural expression of the age-old, Eastern Woodlands, layered cosmos (Lankford 1975) with one or more Above realms, one or more Below realms, and a Center from which many horizontal directions were also recognized. The physiographic relief of the area made for a landscape of light and shadows, which was played out in the fascination of Hopewell people there for contrasts between light and dark, and shiny and dull (Carr and Case 2005b; Greber and Ruhl 1989; Turff and Carr 2005). The rugged relief of the area, as well

as the massive trees and dense forests that its fertile bottomland and terrace soils supported, evoked a sense of awe and imbued the area with a greater feeling of power than the flat to rolling Till Plain to the north. These characteristics certainly contributed to the concern that Hopewellian peoples in the Scioto-Paint Creek area had for the appropriate balancing of powers and their raw material, artifactual, and architectural manifestations, and the cautious decommissioning of these in ceremonial deposits and under specific kinds of soils, minerals, sands, and gravels. The awe-inspiring features and power of the Scioto-Paint Creek area also must have contributed to its attraction to outsiders as Scioto Hopewellian rituals and earthen architecture became more elaborated. The area was a natural and cultural theater for pilgrims, for individuals and social groups searching for esoteric knowledge and power, and perhaps for those needing to be healed (Carr 2005d:585–586, 589–591, 609, table 16.2; see also Ruby and Shriner 2005). Extraordinary geographic features in the Scioto-Paint Creek area, such as alum-weeping Copperas mountain directly across the valley from the Seip earthwork, the outcrops of red ochre near Seip, the falls on Paint Creek three miles above Seip, the springs near the Hopewell earthwork, and the pipestone outcrops across the valley from the Tremper site, were perceived as places of power, and drew Hopewell people to build their earthworks near these locations. Animal species of the area, each with their own unique roles in nature, habits, and personalities, provided models for leadership roles, clans, and clan interrelations, and served as vehicles for obtaining personal power, traveling to other realms of the cosmos, and passing onto an afterlife. The flamboyant and powerful nature of Scioto Hopewellian culture, ritual practices, art, and architecture, which excited antiquarians who first explored the Scioto Hopewell archaeological record and is yet felt today by archaeologists and laypersons alike, owes much to the expressiveness of the natural environmental setting in which Scioto Hopewell people created their world.

NOTES

1. The upper reaches of Paint Creek, in Madison county and northern Fayette county, flow through the Wisconsin Till Plain with mixed oak forests comprised of white oak, black oak, bur oak, post oak, and shagbark hickory interdispersed with prairie. The oaks are stunted (Gordon 1969:40, 55, 62). Through the remainder of Fayette county, Paint Creek flows through the Till Plain with denser elm-ash swamp forests (Gordon 1969:44–47). Upon entering the Allegheny Plateau, it flows within yet denser beech forests and mixed mesophytic forests comprised of beech, sugar maple, tulip poplar, white basswood, chestnut, yellow buckeye, white oak, red oak, and/or small prairie openings (Gordon 1969:50). Near its confluence with the Scioto river, Paint Creek flows within dense bottomland mixed hardwood forests of beech, white oak, sugar maple, red maple, elm, black walnut, ash, and/or yellow buckeye, with occasional small prairie openings (Gordon 1969:70; Ohio Department of Natural Resources 2005; Maslowski and Seeman 1992:11). See Figures 2.2 and 2.3 in the text.

The upper reaches of the Scioto river, in Marion county, likewise flow through the Till Plain with mixed oak forests comprised of white oak, black oak, bur oak, post oak, and shagbark hickory interdispersed with prairie. Again, the oaks are stunted (Gordon 1969:40, 55, 62). Through Delaware and northern Franklin counties, in the Till Plain, the Scioto flows through denser oak-sugar maple forests and beech forests. In southern Franklin, Pickaway, and northern Ross counties, in the Till Plain, the river flows through elm-ash swamp forests surrounded by sugar maple and mixed oak forests. As it approaches the Allegheny Plateau, in Ross county, the Scioto river begins to flow through dense bottomland mixed hardwood forests of beech, white oak, sugar maple, red maple, elm, black walnut, ash, and/or yellow buckeye, with occasional small prairie openings. These are surrounded by oak-hickory, mixed mesophytic, and mixed oak-sugar maple forests (Gordon 1969:37–44, 50, 70; Ohio Department of Natural Resources 2005; Maslowski and Seeman 1992:11). See Figures 2.2 and 2.3 in the text.

The denser and darker experiential quality of the forests in the Allegheny Plateau, in contrast to the somewhat more open forests of the Till Plain, is well captured by the phrase, “dark and bloody ground.” This was the historic description of the general Kentucky area given by a young Cherokee Chief, Dragging Canoe, to Daniel Boone – “dark” referring to the depths of the forests there and “bloody” to it having been a hunting ground for many surrounding tribes and/or where many fierce battles occurred between northern and southern Woodland tribes along the Warrior’s Path through the area (Web 2006).

2. The both earthy and watery nature of the Below realms is described well by Chaudhuri and Chaudhuri

(2001:15) for the Creek. See also Bailey (1995:31, 33, Figure 3.1)

3. Sensitivity to the fabric of historic Woodland cultures generally and Scioto Hopewell art, architecture, and rituals in particular requires us to leave behind the tripartite and vertically-emphasized cosmos of three stacked worlds or sets of worlds that are posited in recent ethnohistoric and archaeological literatures for the Woodlands (see citations in text). Tripartite and strongly vertical organization discord with the two and/or four-part cultural fabric of most historic Woodland and related Plains peoples: the organization and symbolism of their ceremonies, myths, sacred formulae, songs, and art (e.g., Bailey 1995; Chaudhuri and Chaudhuri 2001:26–27; Lankford 1992; Mann 2003:176–180, 212–215; Mooney 1891a,1900a, esp. p. 431), their social and socio-political organization into horizontally complementary, two-part moieties, dual divisions, leadership roles, and other reciprocal social categories (Bailey 1995; Callender 1994; Chaudhuri and Chaudhuri 2001:28–55, 73–80; Fenton 1978:310–311; Fletcher and La Flesche 1911:134–141; Radin 1923; Swanton 1946:663–665; Thomas et al. 2005:table 8.2; Tooker 1971), and their independence and dislike for subordination and command that characterizes the personalities and ways of Woodland peoples (Holizinger 1961; Miller 1955). Likewise, tripartite symbolism is rare in Scioto Hopewell art and architecture, with the exception of symbols of one particular alliance among three communities (Chapter 4, Ritual Gatherings and Alliances; Carr 2005a), and Scioto Hopewell social interactions had a strong horizontal dimension created by roughly equal and role-complementary clans, sodalities, and leaders (Chapter 4). Thus, it appears inappropriate, in terms of Scioto Hopewell world view, to speak of a cosmos comprised of Upper, Middle, and Lower Worlds, emphasizing a tripartite and vertical structure.

It may also be inappropriate to speak of a Scioto Hopewell “Middle World” or “This World” (e.g., Dye 1989:322, 325, 333, 350; Hudson 1976:122–123; Lankford 2004:208; Reilly 2004:127) as a cosmic layer and an absolute position in space viewed by a hypothetical, outside observer rather than to use the term “Center” as a locus that is relative to the experimenter or place of ceremony and that varies in absolute geographic location with the locus of the experimenter. For example, in pan-Indian pipe ceremonies of Woodland and Plains peoples, “the pipe is always at the center of the cosmos” and the center varies in location as the pipe is passed around the circle (Paper 1987:300). Contrast the center-focused viewpoints of Paper (1987:299–301, 303) for Plains and Woodland pan-Indian cosmology and J. E. Brown (1971:31–43) and Mails (1991:104–106) for Oglala and Teton Sioux to the planar viewpoints reported by Mooney (1891b:85, 1900a:239–240) for the Cherokee, Swanton (1928:480) for the Creek, Swanton (1931:200–201) for the Choctaw, and Bailey (1995:31, 33) for the Osage.

One Scioto Hopewell example that is relevant to this issue is the Pricer mound within the Seip earthwork. There, within the charnel house, deceased individuals or small groups of deceased individuals were each placed, in almost all cases, on a clay platform of their own, above the water-washed sand floor of the building. The platforms each possibly represent Turtle Island, and the sand floor the primal waters around and below it (Figure 2.8). The individuals were not all placed together on a single clay platform. In other words, each person or small group of persons was conceived of as having been located at the Center of the cosmos, Turtle Island (their burial platform), at the time of their having been ceremonially laid out, and the Center varied in its absolute geographic location over time as different persons were laid to rest on different burial platforms. No single Middle World or earth plane/disk as an absolute place viewable from an outside vantage, in the form of a single clay platform for all deceased persons, was built within the charnel house.

A multi-centered cosmos analogous to that suggested by the layout of the Seip-Pricer charnel house floor is recorded for the historic Chippewa. They envisioned the earth as “lots of islands on the surface of the big ocean”, the islands being thought of as floating pieces of muskeg (peat) (Reagan 1922:335–336). (However, Chippewa cosmology is yet more complex, with both the “earth plate” and “sky plate” having their respective, distinct centers [Reagan 1922:336, 338, 339, 356, 357].) A multi-centered cosmos is also implied by historic Plains and Woodland Earth Diver myths and their enactments in the Cheyenne and Arapaho Sun Dances. In the Cheyenne Earth Diver myth, the earth-diving mudhen gave the mud it brought up from below the waters to a man. He put the mud in “little piles . . . on the water at different places near him, and these became land which spread out and grew until, as far as could be seen, all was solid land” (Grinnell 1972, 2:337–338 cited in Hall 1997:19), i.e., he created a multi-centered land. In the Cheyenne Sun Dance, five sods are cut and placed around the buffalo skull altar, separated from one another and reminiscent of the different piles of mud placed on the water by the man (Hall 1997:20–21, figure 3.1). (The five sods might also represent mud brought up on each of the five toes of the mudhen, and be analogous to the five toes of the muskrat earth diver in many Algonkian origin myths, according to Hall [1997:22]; however, in the Cheyenne case, at least, the mud was brought up by the mudhen on his beak). In the Arapaho Sun Dance, two round pieces of sod were cut from a swampy location and placed, separated from one another, on opposite sides of the buffalo skull altar (Hall 1997:19). I am greatly indebted to Rex Weeks for our many conversations in which he raised the basic concern and which led to these insights.

See Churchill (2000) for additional criticisms of specifically Hudson’s (1976) model of the cosmology

of southeastern Woodland Native Americans, which has been foundational to other, more recent models of Woodland cosmology generally (e.g., Dye 1989:322; Lankford 2004, 2007; Penney 1985; Reilly 2004; Townsend 2004).

4. The numbers of Below and Above realms that Scioto Hopewell peoples represented in the Pricer mound is unclear from its construction and historic Woodland Native American analogs. Refer to Figure 2.8. The vegetation-topped layers of muck below the water-washed sand floor of the mound varied in total number from place to place, with up to six layers noted in one area. The vegetation-muck layers varied in total thickness under the sand floor from six inches to a foot in general, and occasionally were up to two feet or more in depth (Shetrone 1926a:363–364). Multiple layers comprised the primary and secondary mounds that represented Above realms. The primary mound was apparently built as one layer of light brown clay (Shetrone 1926a:359). No stratification of the gravel cap over the primary mound was reported (Shetrone 1926a:356). The secondary mound was built up of a minimum of four layers of soil of differing darkness and texture, according to a stratigraphic profile drawn by Shetrone (1926a:357, Figure 3) and at least six layers, to judge from the combined evidence of this profile and colluvial deposits mapped at the base of the mound (Shetrone 1926a:354–361, Strata 1 to 5 and a).

Historically in the Eastern Woodlands and Plains, Native American cosmologies posited varying numbers of Above realms and Below realms, and differed in whether they focused on the Above or Below or both. A simple Sky-Earth division was posited by the Iroquois (Mann 2003:177–180), Ondataouaout (Thwaites' [1896–1901] *Jesuit Relations* 33:227), Choctaw (Swanton 1931:200–201, 1946:777), Chickasaw (Swanton 1946:776), Caddo (Rogers and Sabo 2004:625; Swanton 1942:211–212), Oglala Sioux (J. E. Brown 1971:6, footnote 7), and Osage (Bailey 1995:31). More elaborate, vertically symmetrical cosmologies were held by the Ojibwa, Chippewa, and Mandan, who each told of four realms Above and four Below (Alexander 1916:23, 105, 275; Barnouw 1977:41; but see Reagan 1922:336). Several tribes had cosmologies with both Above and Below realms, but asymmetrically posited more Above realms. The Cherokee knew of seven Above realms (variably below or above the sky vault; compare Mooney [1900a:240] and Hudson [1976:122] to McLachlan 1999:43) and one Below realm (McLachlan 1999:43; Mooney 1900a:240; Swanton 1946:767) or perhaps no Below realm (McLachlan 1999:40–60). The Winnebago held there were three Above realms and one Below or earth realm (Radin 1923:316, 354, 355). The Omaha divided the Sky of the Sky-Earth division into seven realms (Fletcher and La Flesche 1911:196, 589). The Potawatomi told of twelve Above realms and three Below (ShupSheWana 2007:75). Likewise, the Delaware knew 12 Above realms and many fewer

Below (Feest 1986:6; Speck 1931:61). In contrast are tribes with cosmologies that asymmetrically emphasized the Below realms. The Creek held there were multiple Below realms and one Above (Chaudhuri and Chaudhuri 2001:15; Swanton 1928:478, 480; 1946:773). The Saulteaux “emphasized only the lower world immediately below this one, although they asserted there are other worlds farther down as well as one or two above ‘the central plane’ on which they live” (Hallowell 1977:145–146).

5. The Liberty Earthwork is an outlier, situated more than 5000 feet from Walnut Creek and yet further from the Scioto river.
6. Byers (2004) and Romain (2000), writing about Ohio Hopewell peoples, and Buikstra and Charles (1999:215), discussing Illinois Hopewell peoples, have focused too narrowly on world renewal ceremonies, alone, as involving water “purification” rites. See Chapter 15, Functions of Ceremonies, and Table 4.11.
7. Earthen enclosures in the Scioto-Paint Creek area also have a strong tendency to have been built close to a river confluence, within less than a mile (Romain 2004:101–102). This pattern could be used to argue that Scioto Hopewell people chose to construct their earthworks near natural places of power (confluences) associated with the Below realms. However, the average distance is much greater than that between the earthworks and their adjacent streams. The correlation might also indicate simply locations that were easily accessible to Hopewellian peoples by river travel, or areas along rivers where terrace-flood plain remnants were wide and afforded adequate space for building earthworks, or areas of wide flood plains that provided abundant and fertile ground for wild and grown foods.
8. Fire cairns – large fires that were built on top of piles of rock – have been found on prominent, elevated positions around some larger earthworks. Squire and Davis (1848:183) offered that they might be lookouts or signal stations. Christopher Turner (2000:10) made a systematic survey of the horizon surfaces around the Hopeton earthwork and found fire cairns to correspond to sight lines defined by the gateways of the site. The locations of such cairns do not likely coincide with areas where people might have gathered in numbers to observe from above the earthworks and the ceremonies within them, but do indicate a linkage between earthworks and the use of their surrounding high ground, and the feasibility of Seeman's (2004:67–68) idea for other highland settings for observation closer to the earthworks. Observation of the earthworks and their ceremonies from above by shamanic, out-of-the body journeying would have been more effective (e.g., Mails 1991:107–109; Neihardt 1979:224–229).
9. “Large slabs of shale from Copperas mountain, nearby, were set up around the platform, inside the log [tomb] structure” of Burial 39 under the Pricer mound in the Seip earthwork, according to Shetrone (1927 field notes, August 1, p. 10). Shale (of unspecified origin)

was also placed above the cremation in Burial 8, surrounding and above the cremation in Burial 10, and so as to form a box-like cist above, below, and around Burial 96 – all under the Pricer mound (Shetrone 1926 field notes, July 26, p. 4; Shetrone and Greenman 1931:474–475). Red shale was placed on the charnel house floor around Grave 1 and an adjacent grave, and on the eastern and southern sides of Burial 70 (Shetrone 1928 field notes, July 12, 13, p. 99). Sandstone or other, unspecified kinds of stones were used to form parts of the tombs of Burials 69, 82, and 97 (Shetrone and Greenman 1931:472–473, 476, 479). It is significant that the one tomb identified to have been formed of shale from Copperas mountain was also distinguished by five copper celts, two ear spoons, and a breastplate. The remaining burials had no artifacts, excepting Burial 97, which had a shark's tooth, a small copper celt, two prismatic blades, and a half dozen pearls.

Shale (of unspecified origin) was also used to form two effigies—one of a lizard, insect pupa, or composite animal, and one of a human head (Shetrone and Greenman 1931:427, 457, Figure 47).

10. The black shale of Copperas mountain sparkles in the light from the water that perpetually runs from it, balancing its dark color with its light surface. Balancing and transforming dark and light were fundamental concerns in Scioto Hopewell cosmology (Carr 1998, 2000a, b; Carr and Case 2005b:199–201). In this regard, the shale of Copperas mountain was like obsidian, which is dark yet shines, and the shale cliff of Copperas mountain is similar in quality as well as form to Obsidian Cliff, Wyoming. However, no shale ceremonial artifacts complementary to the obsidian ceremonial bifaces found in some Scioto Hopewell ceremonial centers are known.

The shale of Copperas mountain also is predominantly black in color, but has red, yellow, white and green patinas. These are the five colors that are most common in Scioto Hopewell art, and that historically indicated the Four Directions of the cosmos and its center for numerous Woodland Indian tribes. Thus, Copperas mountain has qualities that express the Scioto Hopewellian and historic Woodland Indian concern for balancing various constituents of the cosmos (Carr 1998, 2000a, b; DeBoer 2005; Hudson 1976:132; Mails 1991:60, 104–106; Mooney 1891a:342, 388–391).

Small crystals of pyrite, larger crystals of colorless calcite, colorless quartz crystals up to 5/8 inch in length, plates of colorless barite that often exceed 4 inches in length, and large limestone concretions that typically range from 1 to 8 feet in diameter and that may have a skin of fine crystalline or radiating pyrite are found in Copperas mountain (Carlson 1991:20–21).

Quartz crystals were commonly used by Scioto Hopewell peoples, both in raw form and knapped into projectile points. Both forms were used by historic Woodlands and eastern Plains Native Americans to divine for various purposes and to send and extract

power intrusions (Table 11.3, Appendix 11.8). The small quartz crystals from Copperas mountain could have been used in their natural state by Scioto Hopewell peoples, but are too small to have been made into the knapped quartz projectile points found in some Scioto Hopewell sites.

Pyrite shaped into hemispheres that were probably used for divination were deposited at the Hopewell site (Shetrone 1926a:190–191), which is not far from Copperas mountain, but in a different branch of Paint Creek valley. However, most if not all pyrite crystals in Copperas mountain are too small to have been made into these artifacts. In addition, no pyrite is reported from Seip (Shetrone and Greenman 1931:455–458, 509), which is directly adjacent to the mountain.

Crystals of colorless calcite, plates of colorless barite, and large limestone concretions like those found in Copperas mountain are not reported from Scioto Hopewell sites.

11. The Serpent Mound in Adams County, Ohio, in the Brush Creek drainage, is located on the western flank of a circular cryptoexplosion geological structure that is four miles in diameter, includes more than 7 cubic miles of disturbed rock, and has an uplifted center more than 1000 feet above its normal position (Hansen 1994). The selection of this massive geological feature as the location for construction of the Serpent mound may relate to the feature's effect on local "energy fields" to which shaman-like practitioners can be sensitive and/or to its culturally-significant shape. The structure has a circular shape and profile like an Adena sacred circle with outer embankment, inner ditch, and central mound. (This is also the typical shape of a meteorite crater – one of the possible causes of the feature.) Whether the Serpent mound was built by Adena people (Greenman 1934; Webb and Snow 1945), Hopewell people (Converse 1979:3; Romain 2000:234), or Fort Ancient people (Fletcher et al. 1966; Lepper 1998; Lepper cited in Hansen 1994:2; Lepper and Frolking 2003) is debated.
12. Animal effigy smoking pipes: Mound City, $n = 57+$ (Otto 1992:5); Tremper, $n = 80$ (Otto 1992:2). Plain smoking pipes: Mound City, $n = 143+$ (Otto 1992:5); Tremper, $n = 56$ (Otto 1992:2).
13. An experimental study by Baby (1954) indicates that most of a sample of 128 cremations from the sites of Seip, Ater, Mound City, and Liberty were the product of dismemberment and burning of bodies in the flesh rather than the burning of dry bones that had been defleshed and dismembered. At the same time, more than a third of the cremations were composed of fragments of only skulls and long bones, and ribs were absent from most of the cremations, possibly indicating the selection of some body parts for cremation and burial and the disposing of others in nature.
14. The bird head effigy was found in Hopewell Mound 25. Moorehead's (1922:110) published site report notes it as having occurred under the head of Burials 265, while other documentation places it with Burial 266,

- in the location where the head of this headless person would have existed. The effigy encompassed only the head of the bird, and would have resembled the head of the full bird shown by Moorehead (1922) in Plate LXIX.
15. Possibly depicted within the bird effigy, but not easily seen, are the small heads of several humans, some dressed in ceremonial headgear (Carr, personal observation).
 16. The exceptions to this pattern are: the Circleville Works, 18 miles north of Chillicothe, the Wright-Holder Works, 54 miles north of Chillicothe; the Seal Works, 23 miles south of Chillicothe; the Tremper earthwork, 35 miles south of Chillicothe, the Portsmouth earthworks, at the confluence of the Scioto and Ohio rivers, and a few small works reported on Mills' (1914) *Archaeological Atlas of Ohio*, but not verified.
 17. Earthen enclosures in the Little Miami valley that are exceptions are the Bell Works, Bull Works, and Pollock Works (Riordon 2004:226–227) in the Wisconsinan Till Plain, about 25 miles north of the terminus of the Wisconsinan glaciation. Earthen enclosures in the Great Miami valley that are exceptions are the Alexandersville Works, Miami River Earthwork, and Glander Works in the Wisconsinan Till Plain, more than 35 miles north of the terminus of the Wisconsinan glaciation.
 18. Struever argued that these settings provided favorable conditions for the natural growth of dense stands of Eastern Agricultural Complex seed foods and their collecting, domestication, and agricultural production. The areas' natural ecological diversity is equally important to consider.
 19. A first reason why demographic parameters and trends in the Scioto drainage are hard to estimate is that a broad, regional-scale survey that statistically samples various microenvironments within the drainage has yet to be done. Prufer's (1967) opportunistic survey is the only broad-scale one available for the drainage, and it covered only a 25 river-mile stretch of the valley, from Chillicothe south to Waiverly. Systematic surveys in the neighboring Licking drainage (Pacheco 1996) provide a more even picture of Hopewellian domestic settlement there, but a lack of chronological indicators of the ages of habitation sites presents the problem of assessing the contemporaneity of habitations and their density during any one slice of time. Second, the area of landscape use over which population density should be assessed is unclear. Third, detailed surveys of burial mounds (Mills 1914; Seeman and Branch 2006) in the Scioto drainage are insufficient for estimating absolute population densities currently because the numbers of persons buried in most Early and Middle Woodland mounds is unknown, and is hard to figure given a weak relationship between mound size and burial population, in both time periods. Fourth, in the Middle Woodland period, only select individuals were given mound burial, and the proportion of the population not given mound burial remains unknown (Carr 2005a:278–280; Prufer 1964a:74).
 20. It is unclear even for the Early Late Woodland situation in the Scioto valley that the paleoethnobotanical indicators of population packing found there indicate increases in *regional* population densities. The diverse food resources used may indicate, instead, only very local conditions and pressures on food resources associated with nucleated village life. Known, Early Late Woodland nucleated villages in the Scioto drainage are few in number.

An increase has been documented, however, in the diversity of plant foods used from the Early Woodland Period to the Middle Woodland Period in the upper Ohio valley generally (see Figure 2.18, Wymer 1992:figure 9.7; D. Wymer, personal communication 2005). If this pattern held at the local scale of the Scioto drainage, it could suggest some increases in population density and packing there over the time range.
 21. The significance of local cultural-historical factors to the development of Hopewellian lifeways is also seen across the Eastern Woodlands in the notable absence of Hopewellian traditions in lands that were nonetheless ecologically rich: portions of the middle Mississippi valley, the American Bottom (largely absent), portions of the Missouri valley, and much of the Tennessee valley, for example (Griffin 1967:181). Whether Hopewellian lifeways came to flourish in an area depended on the receptivity of local people to Hopewellian beliefs and practices.
 22. Specifically, the lower Illinois valley is rich (although not the richest) in natural food resources that would have encouraged sedentism and population growth. Yet the resources are strongly circumscribed, which could have promoted social competition, tensions, and concomitant organizational complexity. Moderate connectivity would have ensured the interactions of local populations and the expression of their competition, but also would have been a vehicle for cooperation and developing socio-political-ritual complexity at a supralocal scale. The lower Wabash-Ohio confluence is the richest of the three areas in natural foods and has the greatest potential for population growth. However, food resources are not circumscribed much and would not have encouraged food-based competition. In addition, the low circumscription of natural foods within the area, the ease of transportation within it, and its large size all would have facilitated the budding-off of local social groups as local populations rose, as a strategy for obviating social competition. Increases in sociopolitical complexity would not have been so necessary there. The Scioto valley offers the lowest density of natural food resources and potential for population growth. Its food resources are not strongly circumscribed and so promoting of competition that would encourage sociopolitical and ritual complexity. Especially significant is the lack in the Scioto valley of backwater lakes and sloughs, which the lower Illinois valley and lower

- Wabash-Ohio have and which provide abundant fish and mollusk harvests (Ruby et al. 2005:129). Also, duck and geese migrations are much smaller in the Scioto valley than in the lower Illinois valley and lower Wabash-Ohio (Ruby et al. 2005:128, Table 4.1).
23. Lower Wabash-Ohio region includes the large earthwork at the Mann site, which consists of six enclosures, two large loaf-shaped mounds like those at Hopewell, Seip, and Liberty in the Scioto valley, two rectangular mounds, six conical mounds, and a very long, linear earthwork. Two of the mounds in the earthwork, along with the nearby Mount Vernon mound, rank among the five largest Middle Woodland mounds in the midwestern United States. (The other two are Hopewell Mound 25 and Seip-Pricer, in the Scioto drainage.) The Mount Vernon mound had an extraordinarily rich mortuary record, approaching that of the Hopewell site in the Scioto valley (Seeman 1995). In contrast, the lower Illinois valley has only one or two earthen enclosures – Golden Eagle, comprised of an oval embankment and 2 to 6 small mounds within it, and Ogdan-Fettie, perhaps comprised of a subrectangular or pentagonal ditch along with its 37 mounds (Chapter 5, Note 10) – and has no mounds that rival those in the lower Wabash-Ohio region or the Scioto-Paint Creek region in size or richness in ceremonial artifacts. See also Struever (1964) for a comparison of the Ohio and Illinois Hopewellian material records.
 24. See also Wymer (1987:260–262) for a complementary conclusion from paleoethnobotanical data. “The implication is that the Interaction Sphere, and the accompanying ceremonial rituals, was not a cultural system that emerged or functioned as an adaptation to human populations beset with unpredictable or uneven subsistence resources. Humans in this region [central Ohio] have always faced this problem both prior to and after the appearance of the Hopewell” (Wymer 1987:261).
 25. The most numerous mammal remains identified to genera at the McGraw site included white-tail deer and cottontail rabbit, followed by lesser numbers of grey squirrel, raccoon, chipmunk, muskrat, beaver, and woodchuck, and single occurrences of 15 other genera. Diverse genera of fish were recovered from McGraw, including redbone, buffalo, drum, suckers, catfish, gars, walleye, and a single bass. Five different kinds of turtle were recovered. Turkey, ducks, and geese were the most common birds found at McGraw, complemented by 8 other avian genera.
 26. Previously, Wymer suggested “that [Eastern Agricultural Complex] agricultural products had been a major (if not the primary) component of [Ohio] Hopewellian diet” (Wymer 1997:158; parentheses in original). Again, “I would suggest that the cultigens from those gardens were a major, *if not the* major, proportion of their diet” (Wymer 1996:42; emphasis in original). Also, speaking for the upper Ohio valley generally, “This [Early Woodland] pattern is in clear contrast to the paleoethnobotanical record beginning around A.D. 100 and continuing to the Contact period, in which cultigens seem to have played a prominent, if not central, role in the populations’ diets” (Wymer and Abrams 2003).
 27. J. Brown (2005:114) would agree with this lower estimate for northern Hopewellian societies generally: “While cultivation of weedy annuals provided a dependable plant resource base to supplement fishing and foraging, the economic base did not depend on cereal grain farming.”
Smith (2006:501–502) places Hopewell societies that fall between 35° and 40° latitude, including Ohio Hopewell societies, within his crosscultural category of “low-level food production” societies, which gain less than 30–50% of their annual caloric budget from domesticates. He says that Hopewell societies within these latitudes “fall comfortably” within this caloric range. This view, however, leaves a wide range of possibilities, and Smith (2006:502), himself, says “Unfortunately, it is still difficult to establish with any degree of confidence the relative range of dietary contribution of crop plants to Hopewell groups and their exact role within the larger context of continuing reliance on wild plant and animal species.”
 28. Yarnell (1969, 1974a:122) estimated that cultivated plant foods comprised about 42% of the diet of explorers of Salts Cave, Kentucky, while making their visits inside the cave, between 2,250 and 2,700 B.C. during the Late Archaic period. However, the specialized use of Salts Cave comprised only one component of the land use and settlement system of these people. Abundant rock shelters in the area and dating to this time range show little evidence of the use of cultivated plants (Gremillon 1990; Gremillon and Sobolik 1996:536; Wagner 1978; Watson 1985); likewise open sites (Yarnell 1974b:112) and the vestibule of Salts Cave compared to its interior and paleofeces from its interior (Yarnell 1974a,b). This suggests that *annual* dietary contributions of cultivated foods considering all components of the Late Archaic system of land use and settlement in the Salts Cave area was considerably less than the 42% estimate (Gremillon and Sobolik 1996:537).
 29. Later in the Mississippian period, at the site of Moundville, Alabama, between A.D. 1250 and A.D. 1500 (Moundville II and III phases), and at the Late Prehistoric period Fort Ancient sites of Turpin and Incinerator, Ohio, the contribution of maize to peoples’ diets was greater: about 65% in each case, based on bone isotopic analyses (Broida 1984; Conrad 1985; Schoeninger et al. 2000; Schoeninger and Schurr 1988; Yerkes 2005:244, 250).
 30. Prufer (1964b:98) concluded from the faunal and floral analyses of the McGraw site—the largest Hopewellian zooarchaeological and paleoethnobotanical assemblage from the Scioto valley excavated and analyzed to date – that “a substantial part of their food came from hunting, fishing, and collecting. Analysis of the animal bones shows that the commonest source of meat was the

white-tailed deer . . . River produce was of equal or perhaps greater importance . . .”

31. Hoes are unknown from the Scioto Hopewell sites of McGraw, Brown’s Bottom, Ilif Riddle I and II, Madeira Brown, Haven, Clarence Ford, Marsh Run, Gilead, Starr’s Knoll, and Wade. (For references to these sites, see Chapter 1, Note 1.) Hoes are also unknown from the Murphy I site and the Murphy site complex in the neighboring Licking valley (Dancey 1991; Pacheco 1993, 1996, 1997).

Mussel shells with holes for mounting on a pole were found at the McGraw site. However, most are too small to have served as agricultural hoes, and experimental specimens made from mussels taken from the Scioto river usually “broke almost immediately upon even gentle use” (Prufer et al. 1965:93). Winters (1969:65–66) inferred that similar specimens found in the Late Archaic Riverton culture sites in southwestern Indiana might have been used for hearth rakes, given their association with hearths, their lack of soil polish, and the fact that the walls of pits show that they were dug with digging sticks.

Unhafted hoes made of slabs of limestone, sandstone, and shale and showing soil polish have been recovered in fair number from several Kentucky Adena sites (Webb and Snow 1974:23, 88; see also Webb 1946:273). Their use in digging pits and in excavating soil for mounds is likely, but their handheld nature would not have made them effective for breaking and cultivating the ground of garden plots. Similar implements are unknown from Ohio Early and Middle Woodland sites. No unhafted or hafted hoes were found in the Early Woodland Boudinot #4 habitation in the Hocking valley (Abrams 1989, personal communication 2006).

In the Illinois valley, chert bifacially chipped hoes with soil polish, and hoe chips with polish, are common in Middle Woodland settlements (Carr 1982:261–262; Montet-White 1968:84; Sonnefeld 1962:63; Witthoft 1967:387). The practice of making chert hoes was a strong tradition that continued there and in the American Bottom during the early Late Woodland (Wray and MacNeish 1961:61, figure 16) and into Late Bluff times (Harn 1971: 33; Maxwell 1959:28, 30; Munson 1971:11–13; Munson and Anderson 1973:34, 43). Chert hoes and hoe chips are unknown from Ohio Middle Woodland sites.

32. No slab or basin-shaped milling stones (metates) were found at the Scioto Hopewell sites of McGraw, Brown’s Bottom, Ilif Riddle I and II, Madeira Brown, Haven, Clarence Ford, Gilead, Starr’s Knoll, and Wade. One mano was recovered from the Marsh Run site. However, it was found on the surface and might be attributable to the Late Archaic or Terminal Late Archaic/Early Woodland components at the site. (For references to these sites, see Chapter 1, Note 1.) Slab and basin-shaped milling stones are also unknown from the Murphy I site and the Murphy site complex in the neighboring Licking valley (Dancey 1991; Pacheco

1993, 1996, 1997). No slab or basin-shaped milling stones were recovered from the Boudinot #4 habitation in the Hocking valley (Abrams 1989, personal communication 2006). In contrast, slab-shaped milling stones are known from Illinois Hopewell settlements (Carr 1982:252–258). In Illinois, slab-shaped milling stones date as far back as 6300 B.C. in the Middle Archaic at the Koster site and continue there throughout the Middle Archaic horizons until 2900 B.C., but are absent from the Late Archaic Titterington Phase occupation (Brown and Vierra 1983:183–185; Cook 1976).

33. In Ohio, the tooth crown wear rates of Woodland through Late Prehistoric peoples were markedly less than those of earlier Late Archaic peoples. This decline in tooth crown wear correlates with the introduction, there, of pottery for cooking foods (Sciulli 1997). The correlation suggests that Ohio Woodland people normally cooked their seed and other tough foods, in contrast to earlier Late Archaic peoples, who probably ate their seed and other tough foods uncooked and directly by chewing. Paleofeces from Early Woodland contexts in Salts Cave, Kentucky, indicate that, there at least, Eastern Agricultural Complex seeds and other seed foods were eaten uncooked and by chewing (Steward 1974; Yarnell 1974).

Analyses of Woodland ceramics from Ohio (Carr and Haas 1996; Cotkin et al. 1999) show that Middle Woodland cooking vessels commonly have on their interiors carbonized residues that can be attributed to cooked foods rather than smudging. Boiled, starchy foods, such as starchy seeds, are good candidates for the kinds of foods that produced the residues. This pattern supports the above dental evidence that Ohio Middle Woodland peoples normally cooked their starchy seed foods rather than ate them uncooked by chewing. (For similar ceramic evidence from the Illinois Hopewell record, see Braun [1983].)

34. It appears that Middle Woodland peoples of the Scioto drainage, and Early Woodland peoples there and in Kentucky, did not commonly use ground stone artifacts generally to process the nuts and seeds they ate, unlike peoples in some other regions of the Great Lakes-Riverine area at these and earlier times. Pitted nutting stones/mortars are unknown from almost all Scioto and Kentucky Early Woodland and Middle Woodland sites (Otto 1980; Webb and Snow 1974:90). One pitted nuttingstone or anvil was recovered from the fill of the Middle Woodland Armitage mound in the Hocking valley, Ohio, and another from the Early or Middle Woodland components of the Taber Well site in the vicinity (Elliot Abrams, personal communication 2006). No pitted nuttingstones were found at the Boudinot #4 site in the Hocking drainage (Elliot Abrams, personal communication 2006). Pitted nuttingstones did not become widespread over southern Ohio until the Late Woodland and continued in use thereafter (Seeman and Dancey 2000:589; see also Carskadden and Morton 1977:90; Hooton and Willoughby 1920:56–57, plate 10; Marwitt et al.

1984:70; Mills 1917:353, figure 23; Prufer and Shane 1970:120–121; Seeman 1980). Pestles are rare in Scioto and Kentucky Early Woodland sites (Webb and Snow 1974:24, 90). One possible, informal pestle for crushing and/or grinding seeds held possibly in a small bowl was found at the Early Woodland Boudinot #4 habitation site in the Hocking valley, Ohio (Abrams 1989:22, figure 7d, personal communication 2006). Pestles are unknown from Scioto Middle Woodland sites. They do occur in Early Late Woodland through Fort Ancient sites across southern Ohio (Hooton and Willoughby 1920:57, plate 10; Mills 1904:158; 1906:75; 1917:358, Figure 28; Oehler 1973:17). At the same time, paleoethnobotanical remains evidence the plentiful use of nuts and/or seeds in these areas and during these times. Materials and technologies other than pounding and/or grinding with ground stone nutting stones, pestles, and slab and basin-shaped milling stones must have been used. The possibility that these implements were used and stored only at logistical sites, which have not been located, is remote but cannot be rejected at this time, for lack of adequate regional survey data. The inability to stylistically date nutting and milling artifacts to time period is also a problem. Three pitted stones were recovered from the Madeira-Brown site in the Scioto valley flood plain (Bush et al. 1989, 1992), two pitted stones and one mano grinding stone from the Marsh Run site in an upland setting (Aument 1992, Aument et al. 1991), and at least two pitted stones from the Clarence Ford site in an upland setting (Aument 1992). Each of these sites includes a Middle Woodland seasonal camp, but components of other time periods prevent the attribution of the ground stone finds to the Middle Woodland occupation.

During the terminal Archaic, just north and west of the Scioto drainage, in northwest Ohio, northeast Indiana, and southern Michigan, ground stone nutting stones, pestles, and slab and basin-shaped milling stones are unknown from Glacial Kame burials in several dozen sites, save at the Zimmerman site (Converse 1979; Cunningham 1948:40). The absence cannot be attributed to the mortuary nature of these archaeological records, because other utilitarian subsistence items (e.g., projectile points, atl-atl weights, harpoons, copper ceremonial renditions of utilitarian celts and awls) were in fact commonly included with Glacial Kame burials.

In contrast to the above terminal Archaic, Early Woodland, and Middle Woodland archaeo-

logical records in the Scioto drainage and neighboring areas, farther southwest, in Green River Late Archaic sites (Webb 1946:231–232, 274–276; 1950a:295, 299; 1950b:381, 386; Webb and Haag 1939:20, 60; 1940:93, 96, 103–104; 1947:21, 29, 36, 41), pestles and nutting stones are very numerous (many hundreds). In Illinois, at the Koster site, pestles are known in Middle Archaic horizons from 6200 B.C. to 5800 B.C., and manos are known throughout the Middle Archaic and Late Archaic horizons, from 6200 B.C. to 950 B.C. (Brown and Vierra 1983:183–186; Cook 1976). Winters (1959:9, 10, 13) typified the Illinois Archaic period by pebble grinding stones, pestles, grinding slabs, and nutting stones. Manos, but not pestles or nuttingstones, are frequent at Late Archaic Riverton culture sites in the Wabash valley, Indiana (Winters 1969:61–64). Fowler (1959:19) characterized the Illinois Early Woodland by pestles and mortars.

35. A large and deep cylindrical pit, which extended 90 centimeters below plowzone, was found in the interior of a substantial house at the Brown's Bottom #1 site in the Scioto-Paint creek area. The pit was encircled by a line of posts that probably supported a screen. The pit functioned most likely for storage (Pacheco et al. 2005; P. Pacheco, D. A. Wymer, and J. Burks, personal communication 2005). A large, 90 centimeter in diameter and 65 centimeter deep, cylindrical, flat-bottomed pit was excavated at the Murphy III site in the Licking drainage. It most likely was used for storage (Pacheco 1996:27). A similar, large, 75 centimeter in diameter, but shallow, 24 centimeter deep, cylindrical pit that possibly was capped with limestone slabs was excavated at the Murphy I site in the Licking drainage. It may have been a storage pit (Dancey 1991:43).

The paucity of storage pits in the Scioto and Licking drainages during the Middle Woodland Period is mirrored by their complete absence in southern Ohio during the Early Woodland (Seeman 1992a:26).

36. Increase in the achene size of marshelder (*Iva annua*) is documented by about 2000 B.C. Reduction in the seed coat thickness of goosefoot (*Chenopodium berlandieri*) is noted by about 1500 B.C. Increase in the achene size of sunflower (*Helianthus annuus*) occurred by about 1000 B.C. Increases in the thickness of the rind and morphology of seeds of squash (*Cucurbita pepo*) are known by about 1000 to 500 B.C. (Smith 1992: 205–206).

The Scioto Hopewell *and Their Neighbors*

Bioarchaeological Documentation and Cultural Understanding

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Cover Design Acknowledgment: Digital painting, “On the Way”, by Christopher Carr, based on portraits of three ceremonial leaders rendered on three copper celts by anonymous Ohio Hopewell artists, compositions of processions of persons rendered on copper breastplates by anonymous Ohio Hopewell artists, and an early photograph of a virgin hardwood forest in the Allegheny Plateau province of Ohio. The three celts bearing the portraits of leaders, from left to right, are: Carr no. C023 Side A, from the Hopewell earthwork, possibly Mound 25, Skeletons 260–261, curated at the Ohio Historical Society, cat. no. 283/351B; Carr no. C301 Side A, from the Edwards Mound Group, 33HA7, curated at the Harvard Peabody Museum, cat. no. 84-6-10/32346; and Carr no. C011 Side A, from the Seip earthwork, curated at the Ohio Historical Society, cat. no. 957/-. Example depictions of processions of ceremonial leaders are found on breastplates Carr B061 Side B, from the Liberty earthwork, curated at the Ohio Historical Society, cat. nos. 7/1.007 and 13716; and Carr B025 Side A, from the Hopewell earthwork, Mound 25, Burial 6, curated at the Ohio Historical Society, cat. no. 283/83C. The portraits and processions were revealed by color and near-infrared digital photography, hybrid color-near-infrared image display, and image contrast enhancement. The full forest photograph is published by Gordon (1969:Frontispiece). Top and bottom border designs are, respectively, a snake-skin design incised on the top of a pottery vessel and a rocker-stamped bird feather design placed on the body of the same vessel, from the Hopewell earthwork, Mound 25, Altar 1 (Moorehead 1922:171, Figure 70). Cover layout by Christopher Carr and Deann Gates.

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Data Base of Intrasite Layouts

Christopher Carr and Rebekah A. Zinser

Regional Geographic Data Base

Christopher Carr and Rebekah A. Zinser

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Christopher Carr, Rex Weeks, and Mark Bahti

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