Chapter **4**

Community Organizations in the Scioto, Mann, and Havana Hopewellian Regions

A Comparative Perspective

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This chapter has three purposes. First, it reviews previous and current models of Hopewellian community organization in the Midwestern United States, to stand as context for other chapters in the book. Community organizations modeled implicitly by Prufer (1964a, 1965) for Ohio and Struever (1968a, 1968b) for Illinois in the framework of subsistence-settlement studies, as well as explicitly by Bruce Smith (1992) for the northern and midsouthern Eastern Woodlands in general, are considered. Second, this chapter reports, summarizes, and cites many new archaeological data, against which previous and current models of Midwestern Hopewellian community organization are evaluated. Three geographic regions are considered: the lower Illinois valley, which was a homeland of the Mound House phase of the Havana Hopewellian tradition (Farnsworth and Asch 1986); the lower Wabash–Ohio River confluence area, where the Hopewellian Mann phase developed (Ruby 1997a); and the Scioto–Paint Creek confluence area, which was the center of the Ohio Hopewell phase of the Scioto tradition (Prufer 1965) and the place of the most elaborate Hopewellian expression in the Eastern Woodlands (Figure 4.1). Third, this chapter aims at an empirical, controlled comparison of Hopewellian community organizations across the three regions. A comparative perspective holds the promise of highlighting variability in the organization of Hopewellian communities and resolving the monolithic, homogenized characterization of Hopewellian community organization presented by Smith and others into its variant forms. At the same time, a comparative perspective may draw attention to underlying ecological, social, and historical factors that might account for similarities and differences in community organization across regions.

The chapter begins with a broad, theoretical consideration of the nature of communities as a framework for interpretation. Three kinds of communities are distinguished: residential communities defined by coresidence and regular, face-to-face interaction; sustainable

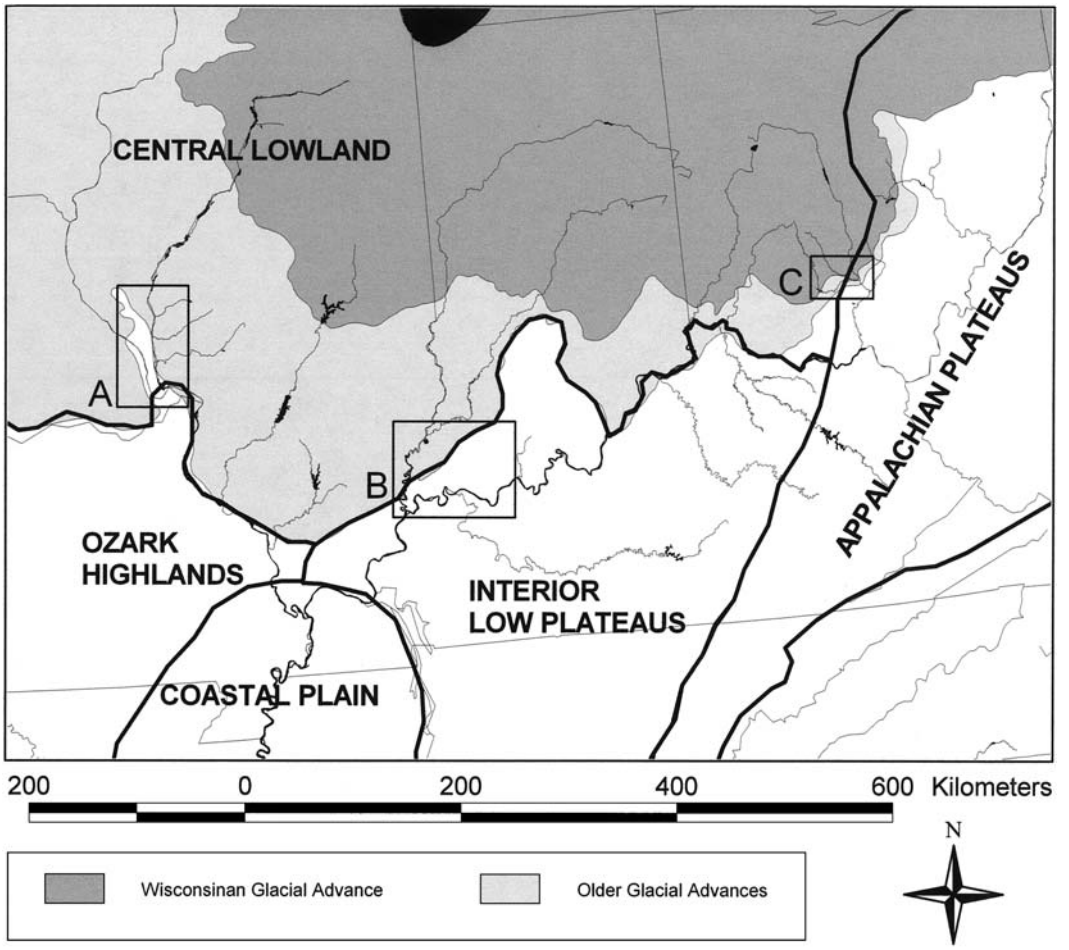

Figure 4.1. Three Midwestern study areas of Hopewellian expression: (A) the lower Illinois valley, where Havana–tradition Hopewell developed; (B) the lower Wabash–Ohio River confluence area, where the Hopewellian Mann phase developed; and (C) the Scioto–Paint Creek confluence area. Five physiographic provinces in the vicinity of these areas are shown.

communities of the size necessary to meet the long-term demographic requirements of a population; and symbolic communities that may be more fluid in membership and less territorially bounded, and that are formed for various social, political, and/or economic ends.

A brief discussion of the roles of mounds and earthworks in community formation, organization, and maintenance is also provided. We point out that mounds and earthworks can play very different roles in relation to different kinds of communities, such as defining and displaying corporate identity, defining territorial rights, and/or symbolizing participation in a continuously negotiated network of social units. Different mounds and earthworks can be variously interpreted as cemeteries, as earth shrines or shrines to the ancestors, or as stages for ritual and political action (Buikstra and Charles 1999). Thus, some Hopewellian mound and earthwork centers hosted a much richer array of activities than simply mortuary ritual. We also note that mounds and earthworks may vary in their spatial relationships to communities. They may occur at the centers or edges of communities, or in less definable positions where community boundaries are fluid, overlapping, and/or continuously negotiated.

The chapter proceeds to summarize Bruce Smith's (1992) monolithic model of Hopewellian community organization in the Eastern Woodlands. Smith (1992), like Prufer (1964a) earlier for Ohio, envisioned the Hopewellian community to have been a group of dispersed households that associated with a single mounded cemetery or earthwork complex and that supported themselves through farming. We then point out the need, today, to explore regional variations in community organization and their natural environmental determinants. The chapter goes on to detail environmental variability across the three regions, including their natural plant and animal productivity, climate-based agricultural potential, spatial circumscription of food availability, and ease of transportation. The lower Wabash–Ohio area and the lower Illinois valley are found to have been privileged relative to the Scioto–Paint Creek area in food availability, potential for sedentism, potential for population growth, and/or opportunity for regional social intercourse. In addition, the lower Illinois valley is observed to exhibit the greatest circumscription of food resources and potential for social competition and subsequent development of territoriality and social complexity. These conditions are found to have been essential in determining variations among the three regions in the organization of their local symbolic and sustainable communities. In addition, the specifics of the environmental variations among the three regions suggest that these factors, alone, cannot account for the unusual elaboration of social complexity in the Scioto–Paint Creek area.

Hopewell community organization in each of the three regions is explored next. Key excavated sites and survey areas are described, with an emphasis on summarizing new information from the lower Ohio–Wabash and Scioto regions that has emerged through a resurgence of field research in these areas. Equivalent studies in the lower Illinois valley are well published and are presented more briefly. The evidence indicates that none of the three areas had nucleated villages during the Middle Woodland and, instead, supported small residential units of one to a few households, in agreement with this basic element of the Hopewellian community models posed by Bruce Smith for the Woodlands and Prufer, and later Dancey and Pacheco, for the Scioto–Paint Creek area. However, the image that these models construct, of the dispersed households of a community of one unspecified kind focused on a single ceremonial center, is not supported empirically. Specifically, in each region are found ceremonial centers of diversified functions rather than centers of one kind. Some centers served primarily for holding mortuary ceremonies; others as the locations of predominantly or exclusively other kinds of ceremonies. Some mounds and mound groups were built and used by relatively small, local social groups, while others hosted gatherings of social groups drawn from farther afield, forging symbolic or sustainable communities. Local symbolic communities used multiple kinds of centers within their own territories, and some centers were used by multiple local symbolic communities. Ceremonial precincts used by singular local symbolic communities were sometimes segregated from and sometimes combined with ceremonial precincts used by multiple local symbolic communities that constituted a broad, sustainable community. Individuals in each region likely visited a range of these ceremonial centers for different purposes, each event a potential context for the construction of group identities and affiliations of varied membership, duration, and spatial extent.

We conclude that greater circumscription and linear distribution of food resources in the lower Illinois valley most likely fostered local symbolic communities there to be territorial and relatively fixed in membership, whereas the less constraining environments of the lower Wabash–Ohio and Scioto–Paint Creek regions allowed the construction of local symbolic communities that archaeologically do not indicate their territoriality and that could have been relatively fluid in membership. Also, differences in environmental natural productivity and agricultural potential among the three areas are shown to have led to different patterns of residential aggregation and sedentism there. Household aggregation was greatest in the lower Wabash–Ohio area, where food resource productivity was highest. The Mann site is unique among Hopewell geometric earthworks in having a substantial residential

area within it. Illinois residential sites sometimes were larger than the one-to-two household habitation sites that characterized the Scioto–Paint Creek area. Settlement mobility appears to have been greatest in the Scioto–Paint Creek area, where food productivity was lowest.

All of these variations in the ceremonial and domestic spheres of Hopewellian life, within and among the three regions, call for fundamental revision of our notions of Hopewellian community organization. This review clearly reveals that the pan-Woodlands model of the Hopewellian community as a group of dispersed households associated with a single mounded cemetery or earthwork complex, as offered by Smith and Prufer, is overly simplistic. The oversimplification stems in part from an uncritical use of the concept of "community," as well as a tendency to treat all mounds and earthworks as if they were equivalent in function and interchangeable. Our review demonstrates that models of Hopewellian community organization must consider the various ways in which these different kinds of places were used to negotiate, define, and display membership in and boundaries among communities of several kinds.

CONSIDERING COMMUNITIES

Archaeologists today are increasingly focusing on communities as fundamental units of economic, political, and social integration above the level of the household (Abbott 2000; Adler and Varien 1994; Canuto and Yaeger 2000; Dancey and Pacheco 1997a; Kantner and Mahoney 2000; Kolb and Snead 1997; Varien 1999a). Community formation can be seen as an organizational response by individuals and households to a variety of local problems, including subsistence risk, resource competition, the demand for labor, and local resource deficiencies (Johnson and Earle 1987). Community organization can spread out subsistence risk through communal storage and relationships of reciprocity within and among communities. Community organization can provide individuals and households a measure of security through mutual defense of life, land, and resources. Communities may collectively invest labor and resources in projects that are beyond the capabilities of individual households (storage facilities, land clearance, public architecture, etc.). Community organization may afford individuals and households opportunities for economic specialization. For these reasons and more, community organization can be a useful focus for Hopewellian studies. A comparative perspective on community organization will allow us to see both how challenges varied across the Middle Woodland period landscape and how Hopewellian responses to these trials varied.

However, increasing interest in communities has brought with it considerable debate about their nature. The classic anthropological definition is given by Murdock: "the maximal group of persons who normally reside together in face-to-face association" (1949a:79–80). Thus, in the traditional anthropological sense, communities are territorially based social units constituted through coresidence or close residence and regular interaction. Alternatively, some recent archaeological studies of the community have deemphasized the spatial and residential aspects of the traditional definition, instead defining the community in symbolic and ideational terms as an "imagined construct" or a "discourse" (see especially Preucel 2000 and other papers in Canuto and Yaeger 2000). In this view, community can be thought of as a *process* of group identity formation wherein individuals actively construct and negotiate group identities and affiliations. Conceived in this way, community membership can be extremely fluid, unbounded, and entirely nonresidential. Of particular interest in the case of Hopewellian studies is the notion that monumental architecture may constitute a symbolic means of community formation: mounds, earthworks, and other man-made elements of the landscape may have been used as symbols to define community membership and boundaries (Charles 1995; Cohen 1985).

These different theoretical approaches to community studies need not be mutually exclusive, and each may be appropriate, depending on the nature of the problem under consideration. We have found it useful to differentiate three kinds of Hopewellian communities in this

study: residential communities, sustainable communities, and symbolic or political communities.

The *residential community*—as defined by Mahoney (2000), Varien (1999), and others—is closest in meaning to Murdock's (1949a) traditional definition of the community. Residential communities are defined by coresidence or close residence, and regular face-to-face interaction. As such, residential communities are uniquely conditioned by coresidence and limited means of communication and transportation. These conditions necessitate a limited geographic scale that uniquely shapes the interactions among individuals, households, and their natural and social environments. In the perspective adopted here, residential communities are a unique type of social formation because they are *territorially based social formations*—they are *both people and place* (see Varien 1999:21).

The tendency to uncritically equate the "site" or "settlement" with the residential community has been the source of some confusion in archaeological studies of community (see Tringham 1972). It is important to recognize, as did Murdock, that there is considerable variation in the spatial organization of residential communities: "With more or less settled residence, the community may assume the form either of a village, occupying a concentrated cluster of dwellings near the center of the exploited territory, or of a neighborhood, with its families scattered in semi-isolated homesteads" (Murdock 1949a:79–80). In the former case, the residential community may in fact equate to a single archaeological site or settlement; in the latter, the archaeological expression of the residential community will be a cluster of sites within a small vicinity allowing frequent, daily interaction.[1]

The restricted spatial scale of the residential community poses a demographic challenge to the long-term viability of this kind of social unit: In some cases, the residential community will not include enough members to ensure the availability of marriageable mates. This has given rise to the distinction between residential communities and *sustainable communities* (Mahoney 2000). Incest prohibitions and random factors set lower bounds on the population size necessary to ensure the availability of marriageable mates (Moore and Moseley 2001; Wobst 1974). Because members of small social units are mostly related to one another, children in small, lineage-based residential groups often find that they are surrounded by siblings and first cousins rather than potential mates when they reach marriageable age. Random variation in sex ratios at birth can further limit the number of potential mates in a small group—a boy might find that there simply are no eligible girls in his age grade. Minimum sizes for viable mating networks have been estimated at about 500 persons for social and demographic parameters typical of hunter–gatherers (Wobst 1974). Clearly, small residential communities (a single village, a cluster of dispersed households) sometimes fall well below this population size. In these cases, the minimum spatial and demographic scales of social interaction necessary to maintain a sustainable community over the long term exceed those of the residential community.

This last point makes it clear that it is unreasonable and unrealistic to conceive of residential communities as closed and rigidly bounded social units. In many cases, individuals must build and maintain relationships with others beyond their residential community in order to maintain a viable mating network. A host of other demands—for labor, defense, land, resources, trading partners, and others—act as further incentives for individuals and households to build and maintain social ties beyond their own residential community (Abbott 2000; Netting 1993). Changes in the spatial distributions of any of these demands and social resources over time may lead to a reworking of the particular residential communities networked together.

Recognition that individuals and households actively construct and negotiate group identities and affiliations that may cross-cut residential units and be quite fluid in membership and duration gives rise to the notion of the *symbolic community*. This concept emphasizes that symbols (e.g., ornamentation, dress, public architecture, etc.) may be used to define, communicate, and negotiate membership in a social group that transcends or crosscuts local residence groups (Charles 1995) for common political, economic, social, and/or religious purposes. Multiple residential communities, or segments

of them, may link together into a larger or different, self-identifying unit that is capable of united decision making and action, such as warfare, irrigation (Abbott 2000), or maintaining the order of the cosmos (Rappaport 1968, 1971). A number of researchers have recently focused attention on the regional scale of some mortuary programs, alerting us to the possibility that cemetery populations may constitute symbolic–political communities, including individuals drawn from multiple residential communities (see Carr, Chapters 3 and 7; Beck 1995a; Charles 1995; Peebles and Kus 1977).

The concept of the symbolic community is a broad one and includes a variety of kinds of social groups or networks traditionally recognized in anthropology, such as age grades, gender-based groups, cult societies, other sodalities, families or larger groups networked in formal trading relations, and transitory groups centered on particularly powerful and charismatic individuals. What is essential to the definition of each of these as a "community" is their constructed sense of identity and purpose. Also, symbolic communities of these various kinds are not defined by the physical imperatives of residential or sustainable communities, although a symbolic community may be coterminous with a sustainable one. The self-identification and common goals constructed by the members of a symbolic community can be the mechanisms that help maintain a sustainable community. Finally, symbolic communities often are not concerned with the possession of territory, though they may be practically circumscribed in the absolute distances from which their members come.

When a symbolic community is circumscribed geographically, either practically or by a common goal of owning, maintaining, or using a territory, we refer to it as a *local symbolic community.* Common, practical geographic limits of local symbolic communities are implied by well-documented, cross-cultural information on travel costs and the size of resource exploitation catchments (Chisholm 1962; Roper 1979; Sallade and Braun 1982; Stone 1991; Varien 1999). Time and energy costs associated with foot travel impose limits on the geographic distances over which resources are exploited. These distances can also be taken as the practical distances within which persons might interact fairly regularly and construct a local symbolic community. Most studies find that farmers practicing intensive agriculture try to limit their work activities and participation in work parties to within a one to two-kilometer radius of their residence. Under less intensive agricultural regimes, farmers regularly work fields at distances of three to five kilometers, with seven to eight kilometers being a good estimate of the maximum distance that farmers will regularly travel to fields. Hunter–gatherers, including highly mobile foragers, tend to limit their regular resource exploitation trips to within 10 kilometers of their residential camp. An upper, practical limit on frequent social interaction by land—the maximal practical expanse of a local symbolic community—can be estimated by an 18-kilometer radius, given a day's foot travel of 36 kilometers.

In all, symbolic communities can be rigidly circumscribed geographically or virtually unbounded. They can be stable for long periods of time or extremely transitory at different temporal scales. They can have relatively fixed and hereditary or highly fluid and voluntary membership. They may link whole households or lineages as units, or individuals independently of their residential community or kinship affiliation. Symbolic communities can be of many different kinds, and these may leave very different archaeological signatures.

Among the northern Hopewellian societies examined in this chapter, the symbolic communities for which we find evidence were localized, having been constituted by multiple hamlets in the vicinity of each other, e.g., within one valley or a sector of a valley. In the Illinois case, there is good evidence that local symbolic communities were also involved in the ownership and protection of territory, whereas in the Indiana and Ohio cases, it is unclear that local symbolic communities were territorial. In addition, it is probable that membership within local symbolic communities in the lower Illinois valley was relatively fixed, whereas in the Scioto–Paint Creek area, membership in and among local symbolic communities may have been more fluid (see below). Our use of one term, the local symbolic community,

should not gloss over the variations among regions in territoriality and fluidity.

Mounds, Earthworks, and Communities

Owing to their physical scale, mounds and earthworks are almost universally interpreted as public or corporate structures and, hence, intimately related to community formation and maintenance. Further, the foregoing discussion implies that mounds and earthworks can play very different roles in relation to different kinds of communities. Mounds used for burial might define and display the corporate identity of a relatively small residential community or, alternatively or simultaneously, might be used to define and display membership or participation in a much larger symbolic or sustainable community. One goal of this paper is to focus attention on this variability.

A second goal, following Clay (1991), is to highlight variability in the spatial relationships between mounds, earthworks, and communities. Clay pointed out that it is intuitively appealing, especially in the case of cemeteries or large mounds or earthworks, to assume that these structures formed the spatial foci of social groups and stood at the center of corporate group territories. Clay called this arrangement the "bull's-eye" model. Clay went on to point out that there might be alternative spatial arrangements and functions for mounds and earthworks, which we would add particularly holds in relation to different kinds of communities. Clay formulated one alternative, which we might call the "hinge" model—where mounds and earthworks are located along the edges rather than at the centers of corporate group territories, and serve as contexts for intergroup interaction and negotiation. In this model,

> the ritual sites represent cooperative activity loci and not corporate expressions of ritual activity. As such, they shifted from being the central places of group territories to loci between different groups that served as hinges between them. Expressive of Brose's [1979] emphasis upon cooperation between groups, they represent the architectural expressions of negotiations between groups.
>
> When the possibility of multiple intergroup cooperation is considered, the ritual settlement becomes an increasingly complicated pattern of overlapping territories and interacting corporate groups. (Clay 1991:20)

Note that Clay's alternative formulation does not *require* that a ritual precinct serving as cooperative activity loci be located only on the edges of corporate group territories. He does caution us that community boundaries may be fluid, multidimensional, overlapping, and continually renegotiated. Also, note that an earthwork used by multiple communities as either a bull's-eye or hinge need not symbolize territorial or corporate social units. A multicommunity religious group, for example, need not be territorial or corporate.

SMITH'S GENERAL MODEL OF HOPEWELLIAN COMMUNITIES

Bruce Smith (1992) developed a general model of Hopewellian communities using data drawn from primarily three regions: the Upper Duck River valley of south–central Tennessee, the lower Illinois River valley of west–central Illinois, and the American Bottom region of the central Mississippi River valley. Smith argued convincingly that Hopewellian communities in each region were fundamentally *farming* communities. In each region, there is clear evidence for a "premaize" household farming economy focused on a set of seven indigenous domesticated and cultivated seed crops: squash (*Cucurbita pepo*), sumpweed (*Iva annua*), chenopodium (*Chenopodium berlandieri*), sunflower (*Helianthus annuus*), erect knotweed (*Polygonum erectum*), maygrass (*Phalaris caroliniana*), and little barley (*Hordeum pusillum*). These seed crops became both abundant and ubiquitous in archaeobotanical assemblages across all three regions between about A.D. 1–200, long before maize (*Zea mays*) became abundant and ubiquitous, after about A.D. 900–1000.

Smith built his model of Hopewellian communities against this economic background. In the model, a fundamental principle of community organization in each region was expressed in a spatial and functional bifurcation into two distinct contexts: the *domestic* and the *corporate–ceremonial* spheres of Hopewellian life.

In Smith's view, the corporate–ceremonial sphere stood at the spatial and social center of Hopewellian community life, and was manifested in mounds and mortuary facilities, geometric earthworks, and a variety of structures devoted to nonmortuary, nondomestic activities. Communities were integrated at these corporate–ceremonial centers through investments of corporate labor, through participation in ritual and ceremony, and perhaps through redistribution and feasting. In contrast, the fundamental domestic sphere unit was the *Hopewellian household unit*. It included a single-wall-post structure housing a nuclear or extended family; food storage and processing pits; warm-season open-sided shelters; scattered post patterns; shallow sheet middens; terrace edge or gully trash dumps; and, rarely, isolated interments or clusters of human burials. The business of everyday life—subsistence production and consumption—was carried out in these domestic units. They were dispersed around corporate–ceremonial centers, either in isolation or grouped into loosely organized settlements of no more than three household units. Thus, in Smith's general model, Hopewellian communities were composed of small, dispersed, river valley farming settlements integrated through corporate and ceremonial activities focused on centers marked by mounds and earthworks.

Departure

This chapter uses Bruce Smith's (1992) general model as a point of departure. Whereas Smith's study focused primarily on the domestic sphere and on the household or hamlet level of analysis, this chapter brings more attention to variability in the ceremonial sphere and to the community level of analysis. In particular, we explore the possibility that ceremonial centers, and their mounds and earthworks, may have served as contexts for integrating several different kinds of communities, at several different geographic and demographic scales—residential, symbolic, and sustainable communities. In addition, this review considers two regions that are only tangentially referenced in Smith's study: the central Scioto and the lower Wabash valleys. We also consider, like Smith, the lower Illinois River valley. The central Scioto and the lower Illinois River valleys are well known for having the most flamboyant and best-documented expressions of Hopewellian ceremonialism in the Midwest. The Wabash–Ohio River confluence region is less well known, but offers an interesting comparative perspective by virtue of its geographic location midway between the other regions and its distinctive natural environment. Each region is also recognizable as a distinct cultural unit—a Hopewellian phase—and not simply as a geographic unit.

In speaking of the ceremonial sphere and ceremonial centers of Hopewellian communities, Smith (1992) tied the descriptor "corporate" to them. In the remainder of this chapter, we seldom use this term because, anthropologically, it implies some specific social conditions that are hard to demonstrate and/or that are probably not true in some of the archaeological cases at hand. What is meant by a corporate group is a body of persons who are united politically/jurally in being bound by the decisions and sanctions of their heads; economically by joint ownership, management, or use of property upon which the persons depend for their daily subsistence; and/or religiously by joint participation in ceremonies or adherence to religious propositions with supernatural sanctions (Befu and Plotnicov 1962:382–388). None of these conditions are strictly demonstrable or necessarily expectable for the potentially fluid symbolic and sustainable communities that assembled at the large geometric earthworks of the Scioto–Paint Creek and Mann areas, or the flood plain mound groups in the lower Illinois valley, save perhaps joint participation in religious ceremonies. Even in the latter, there is a distinction between religiously ordered "ceremonies" and less formal "gatherings." It is arguable that the local symbolic communities that built bluff-top mound centers in the lower Illinois valley were economically corporate, and that the small residential communities that sometimes built small isolated mounds and mound groups in the Scioto–Paint Creek area were jurally corporate (see below), but demonstrating these situations is harder. Given the uncertainty of corporateness for some kinds of Hopewellian ceremonial centers, and the variation in its political, economic, and/or religious nature among

ceremonial centers of different kinds, we find it prudent not to automatically link the term corporate to the term ceremonial center.

SETTING THE STAGE: ENVIRONMENTAL VARIABILITY ACROSS THE THREE REGIONS

The following section outlines environmental conditions within each of the three study regions (Figure 4.1) and identifies significant differences among them that could have contributed to differences in community organization. Some of the variables that are considered here include physiography and hydrology, which influence wild food resources—especially their species, gross productivity, density, diversity, seasonality, and aggregation or dispersal—and climatic variables, which influence gross productivity, agricultural potential, growing season length, and cold season stress. The manner in which community differences among the three regions relate to environmental differences among them is explored in the next section.

Lower Illinois River Valley

The lower Illinois River valley study area (Figure 4.1) encompasses the lower 115 kilometers (70 miles) of the valley and extends roughly 32 kilometers (20 miles) into the uplands on either side—an area of about 7,300 square kilometers. The lower Illinois River valley forms a deeply entrenched trough flowing through the Till Plains and Dissected Till Plains sections of the Central Lowland physiographic province (Figure 4.1) (Fenneman 1938). valley edges are abrupt, defined by steep-sided bluffs rising 50 to 75 meters above the valley floor. The flanking bluffs are broken and hilly, heavily dissected by many narrow and deep tributary streams and hollows. The upland topography softens to the gently rolling terrain characteristic of the Till Plains section 5 to 10 kilometers back from the valley margin.

The lower Illinois river is an underfit stream, occupying a valley that formerly served as the course of the much larger Mississippi river. The lower Illinois river valley is about three to five kilometers wide along most of its course, widening to about nine kilometers at its northern end where it joins the central Illinois valley. Most of the valley floor is covered by a series of late Pleistocene and Holocene terrace remnants, and alluvial fans emanating from tributary creek valleys. Seasonally inundated backwater lakes and sloughs are prominent features of the active flood plain. These backwater habitats represented a reliable, renewable, and easily exploitable source of fish and waterfowl (Styles 1981). The main channel was another productive source of fish, waterfowl, and mussels.

Asch and Asch (1985a) provide a reconstruction of the vegetation and resource potential of the lower Illinois valley. Much of the valley floor was essentially treeless, covered by prairie grasses. High-quality plant and animal food resources would have been scarce here. Tributary creeks and the active Illinois River flood plain supported ribbonlike stands of wet and mesic forests with greater potential for human exploitation in the form of pecans, hickory nuts, acorns, black walnuts, butternuts, hackberries, groundnut tubers, and wildbean. Upland forests—typically dominated by an oak–hickory association—occupied the broken, dissected valley margins for a distance of 5 to 10 kilometers from the valley. Deer, turkey, and squirrels would have been most abundant in these areas. Upland tallgrass prairies with little potential for human exploitation became dominant as the topography flattened out.

Most early historic observers described the upland oak–hickory forests as thinly timbered or barrens—essentially grasslands with scattered timber. Asch and Asch (1978, 1985a) have argued that this open oak–hickory forest type was a consequence of Native American forest management using fire. Natural succession in an oak–hickory association should trend toward a closed-canopy forest in the absence of fire. Asch and Asch (1978, 1985a) posited that Native Americans may have periodically burned these areas to increase the underbrush available for deer forage and to improve acorn, hickory nut, and hazelnut masts.

The position of the Illinois valley along the Mississippi Flyway places it along one of the world's greatest waterfowl migration corridors. Modern estimates of duck and goose migration

Table 4.1. Comparative Data on Duck and Geese Migration Corridor Populations[a]

Region	Duck migration corridor	Geese migration corridor
Lower Illinois valley	5,250,000–9,000,000	301,000–500,000
Lower Wabash–Ohio river confluence	226,000–750,000	151,000–300,000
Scioto–Paint Creek confluence	50,000–225,000	5,000–75,000

[a] Data from Bellrose (1976:20–23).

corridor populations in the lower Illinois valley are presented in Table 4.1 and discussed in the concluding section.

It is important to note that the human population of the lower Illinois valley was very sparse, or perhaps entirely absent, at the beginning of the Middle Woodland period (Charles 1992). Hence, Mound House phase populations were pioneering an open frontier, a unique situation among the three regions under consideration.

Wabash–Ohio River Confluence

The Wabash–Ohio river confluence study area (Figure 4.1) encompasses five counties in extreme southwestern Indiana—an area of roughly 10,000 square kilometers. This includes the Indiana side of the lower Wabash valley, from its confluence with the White river to its mouth (about 90 kilometers), and thence up the lower Ohio River valley to the mouth of the Anderson river (about 115 kilometers). The Illinois and Kentucky sides of the Wabash and Ohio valleys are given only cursory examination in this chapter, but there is no reason to believe that this introduces serious bias into the study.

The study area is coterminous with the Wabash Lowland physiographic province in southwestern Indiana (Figure 4.1)—a region characterized by low, rolling loess-mantled uplands and broad alluvial valleys traversed by meandering streams (Fidlar 1948). This area marks the beginning of the lower Ohio valley as a distinct environmental zone. It is distinguished from upstream reaches of the Ohio by its meandering course and significantly broader flood plain segments with well-developed valley–margin terraces and extensive backwater oxbow lakes and sloughs. These same characteristics distinguish the lower Wabash valley from its upstream reaches. Some of the broader meander loops and bottomlands near the Wabash–Ohio river confluence approach 13 to 16 kilometers in width—twice or three times the width of bottomland segments in the lower Illinois valley or the Scioto–Paint Creek region.

It has often been noted that the ecology of the Wabash Lowland has a Southern rather than a Midwestern cast; it represents the northeastern-most extension of a relatively mild climatic and hydrologic regime characteristic of the extreme lower Ohio valley and the northern portions of the lower Mississippi valley. That these factors had significant adaptive consequences is borne out by the observation that several plant and animal species and prehistoric cultures reach the northeastern-most extreme of their ranges here (Adams 1949; Green and Munson 1978; Higgenbotham 1983; Redmond 1990). Some comparative climate measures are presented below, and clearly demonstrate that this region is warmer, wetter, less stressful, and more productive than the lower Illinois valley or the Scioto–Paint Creek region.

The Wabash Lowland can be divided into four environmental subregions. Each subregion is defined by a complex association among soil type, elevation, flood frequency, and floral and faunal communities. The four subregions are highly correlated with landform and can be described as flood plain, low terrace, high terrace/lacustrine plain, and upland. Green (1984) presented a reconstruction of the presettlement vegetation and an estimate of the economic potential of each zone (Green 1984). All four subregions were heavily forested in presettlement times and supported significant stands of nut-bearing trees. Hickory and oak were foremost among these, and the low terrace zone harbored particularly dense stands of them. The flood plain zone stands out from the others in having a greater density and diversity of seeds, fruit,

sap, and cambium-bearing plants, along with a wide array of marsh and mud flat resources unavailable elsewhere.

The backwater lakes and sloughs of the flood plain environmental zone were important and geographically restricted sources of aquatic fauna. For most of the year, the flood plain and low terrace environmental zones probably harbored the greatest densities of terrestrial and semi-aquatic animals such as deer, turkey, raccoon, squirrel, and beaver. During the fall and winter months, some of these populations (especially deer and turkey) may have migrated to the more sheltered and less flood-prone, high terrace and upland environments (Munson 1988; Rudolph 1981; Smith 1975).

Modern estimates of duck and goose migration corridor populations in the Wabash–Ohio river confluence area are between those for the Scioto–Paint Creek area and the lower Illinois valley, as presented in Table 4.1.

Scioto–Paint Creek Confluence

The Scioto–Paint Creek confluence study area (Figure 4.1) encompasses the lower 40 kilometers of Paint Creek and adjacent portions of the Scioto valley for about 30 kilometers north and south of the confluence—an area of roughly 2,400 square kilometers. This region has the greatest physiographic diversity of the three study areas. It encompasses portions of the glaciated Till Plains section of the Central Lowland physiographic province, as well as both unglaciated and glaciated portions of the Allegheny Plateaus section of the Appalachian Plateaus province (Figure 4.1). Both the Illinoisan and the Wisconsinan glacial advances terminated within the study area. Gently rolling ground moraine topography characterizes those portions of the study area within the Till Plains section. Rugged relief and deep steep-sided valleys characterize those portions of the study area within the Allegheny Plateaus section. These characteristics are somewhat subdued in the glaciated portions of the Allegheny Plateaus. In contrast to the broad Scioto and Paint Creek valleys, tributary streams in the Allegheny Plateaus section tend to be V-shaped, with little or no flood plain development (Brockman 1998; Fenneman 1938). The large Hopewellian mound and earthwork complexes in the area are limited primarily to the broad terraces of the Scioto river and Paint Creek, where they cross through the Allegheny Plateaus section.

Both the Scioto river and Paint Creek are greatly underfit streams in the confluence region, occupying valleys carved out by much larger preglacial and glacial streams. The Scioto valley is about 3 to 5 kilometers wide in the vicinity of Chillicothe, Ohio; the Paint Creek valley is about 1.5 to 2 kilometers wide within the study area. A complex set of up to six Wisconsinan and Illinoisan age terraces flanks the modern flood plains: their differing elevations, compositions, and drainage regimes influence the biota supported. Backwater lakes and sloughs are not prominent bottomland features in either valley.

The study area was largely forested in prehistoric times. Shoreline and bottomland hardwood forests with prairie openings occupied the main valley flood plains. The better-drained terraces supported mesophytic forests with prairie openings. Acorns, maple sap, and edge-adapted fauna such as deer and turkey may have been the resources of primary interest here. The uplands supported mixed oak–hickory forests, oak–sugar maple forests, and mixed mesophytic forests. Hickory nuts and deer were likely the primary targets of upland exploitation (Gordon 1969; Maslowski and Seeman 1992). There is some evidence from the nearby Licking drainage that Hopewellian farming and forest management began to have significant impacts on forest composition (Wymer 1996, 1997). There is no archaeobotanical record from the immediate Scioto–Paint Creek area with which to address the issue.

Modern estimates of duck and goose migration corridor populations in the Scioto valley and the other regions are shown in Table 4.1.

Environmental Comparisons: Summary and Conclusion

Differences among the three study areas in their environments are significant; consequently, we might expect variations in community

Table 4.2. Comparative Data on Climate[a]

Climatic parameter	White Hall, IL	Evansville, IN	Circleville, OH
Mean annual temperature (crude measure of biotic productivity), °F	52.0	57.3	51.7
Mean January temperature° (measure of cold-season stress), °F	24.2	32.3	26.6
Median growing-season days (32°F base)	185.0	200.0	172.0
Rainfall (measure of agricultural potential), inches			
Apr.–June	11.1	13.7	11.6
July–Sept.	10.3	11.6	11.3
Total (Apr.–Sept.)	21.4	25.3	22.9

[a] Source: http://mccsws.uiuc.edu. (Midwestern Regional Climate Center 2000).

organization among them. One difference is in spatial scale. The Scioto–Paint Creek confluence study area is the smallest, roughly one-third the size of the lower Illinois valley region and one-quarter the size of the Wabash–Ohio river confluence region. At the same time, there are many more and much larger mound and earthwork complexes in the Scioto–Paint Creek area than in either of the other two regions. There may have been significant differences among the regions in population density, in the number and density of Hopewellian communities, and in the ways in which mounds and earthworks were used to express community identity or served as a context for integrative activities.

The density and distribution of wild food resources differ significantly between regions. Abundant, predictable, and easily exploitable aquatic resources, backwater lake resources, and migratory waterfowl are more readily available in the lower Illinois valley and the Wabash–Ohio river confluence areas than in the Scioto–Paint Creek area. Backwater lakes, sloughs, marshes, and mudflats are virtually absent in the Scioto–Paint Creek area, severely limiting the availability of easily exploitable fish, waterfowl, and other aquatic or semi-aquatic resources. Table 4.1 highlights the regional differences in the availability of migratory waterfowl.[2] The lower Illinois valley enjoys an incredible abundance of migratory ducks and geese, owing to its position along the Mississippi valley Flyway (Bellrose 1976). The lower Wabash–Ohio valley confluence region has a lesser but still significant seasonal migration. The availability of waterfowl is significantly less in the Scioto–Paint Creek confluence region. This contrast has important implications for community organization: Hopewellian populations in the lower Illinois valley and the Wabash–Ohio river confluence areas had the option of forming larger and more sedentary residential communities than did populations in the Scioto–Paint Creek area.

There are significant differences in climate among regions that could influence the spatial and demographic scales of Hopewellian communities (Table 4.2). The climatic variables chosen favor the Wabash–Ohio confluence area in each case. Compared to the Wabash Lowland, the lower Illinois valley and central Scioto valley are less productive, more stressful during the cold season, and drier through the growing season. The median growing season length in the Wabash Lowland exceeds that in the lower Illinois valley, mid-Ohio valley, and central Scioto valley values by two to four weeks. Differences of these magnitudes could certainly play a role in explaining interregional cultural variability (see Maslowski and Seeman 1992). The Illinois and central Scioto valleys are very similar in their climates.

The lower Illinois valley is unique among all the regions under consideration in that the distribution of productive resources is markedly linear and circumscribed. The region can be characterized as a ribbon of highly productive bottomlands and talus slopes with rich aquatic resources and nut-bearing forests. These are flanked by much less productive uplands, where nut-bearing forests quickly give way to prairie communities. Linearity and circumscription are less marked in the Scioto–Paint Creek area, where nut-bearing forests continue beyond the valley

Table 4.3. Comparison of the Natural Environments of the Central Scioto, Lower Illinois, and Lower Wabash–Ohio Valleys for Their Potential to Encourage Demographically Driven Sociopolitical Development[a]

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 sociopolitical development
Scioto valley	3	3	2	3	2	3	3
Lower Illinois valley	2	2	2	2	1	2	2
Lower Wabash–Ohio valley	1	1	1	1	3	1	1

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

bottoms into the uplands, and much less limiting in the Wabash–Ohio River confluence area, with its very wide flood plain. We can expect that the linear distribution in the lower Illinois valley would have tended to restrict mobility and influence the expression of territoriality among Hopewellian communities there.

The lower Illinois valley is also unique in that its most highly productive food patches, in the form of backwater lakes, are limited in their locations in the valley. In contrast, in the lower Wabash–Ohio region, the spatial distribution of highly productive food patches is more uniform, defined by a much more extensive system of sloughs and backwater lakes. In the Scioto–Paint Creek area, the most productive food patches are, again, uniformly distributed because backwater lakes simply do not occur. This third, unique characteristic of the lower Illinois valley, like its one-dimensionality and circumscription by less productive uplands, would have encouraged territoriality there.

Finally, owing to the topology of the river networks in question, the lower Wabash–Ohio area exhibits a much higher degree of connectedness than the other two areas. This may have implications for risk and opportunity, aggregation and dispersal. The rivers, sloughs, and backwater lakes within the lower Wabash–Ohio area provide easy transportation and communication within it, as well as access to points farther up and down the Ohio river; to the Midsouth through the Green, Tennessee, and Cumberland rivers; and to the Great Lakes through the Wabash river. The lower Illinois valley is intermediate in its connectedness. The low stream gradients of both the Illinois River and its tributaries, and the rich dendritic pattern of this stream system, make for easy water transportation throughout the area (Seeman 1979a:406–407). In contrast, the central Scioto valley and its tributaries have higher stream gradients, and major tributaries into the Scioto are much less frequent. These conditions constrain transportation and communication within the Scioto–Paint Creek region (Seeman, p. 406–407).

The several ways in which the central Scioto, lower Illinois, and lower Wabash–Ohio valleys differ from each environmentally, as just described, are summarized in Table 4.3. These multiple factors can be combined for each region into a gross estimate of its baseline potential for encouraging demographically driven increases in sociopolitical complexity (Table 4.3). The table assumes, for the sake of argument, that food availability translates into sedentism and population increases, and that these, along with circumscription of natural food resources and at least some ease of transportation and population interaction, encourage social tensions and, thus, forms of sociopolitical cooperation and development. Using this coarse logic, the lower Illinois valley has the optimal environmental potential for producing sociopolitical complexity. It is rich (though 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 social complexity at a supralocal scale. The central Scioto valley and lower Wabash–Ohio confluence are each less

optimal in these regards. 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 social competition. 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 social complexity would not have been so necessary.

In short, the relative degrees of Hopewellian sociopolitical development found in the three study regions, with the greatest complexity in Ohio, less in Indiana, and the least in Illinois, are not readily explained by a coarse, materialistic, environmental–demographic framework. Local social, ideological, historical, and/or other factors may have played equally critical roles in the varying rises of Hopewellian expressions across the three regions.

HOPEWELLIAN COMMUNITIES IN THE LOWER ILLINOIS RIVER VALLEY

The Mound House phase is an occupation of the lower Illinois river valley by peoples of the Havana (Hopewell) tradition between about 50 B.C. and A.D. 250. The available radiocarbon evidence and the absence of early Havana tradition ceramic types in the lower Illinois valley suggest that these people were immigrants who entered the region from a central Illinois valley homeland (Charles 1985, 1992, 1995; Farnsworth and Asch 1986). They were farmers who cultivated and domesticated oily- and starchy-seeded annuals. They established full-blown, premaize agricultural systems between about A.D. 1 and A.D. 200 (B. D. Smith 1992).

There appear to be three fundamental types of Middle Woodland sites (or site complexes) in the lower Illinois valley (Figure 4.2). (1) Hamlets formed of one to multiple households and located in the main Illinois valley, at the bases of bluffs and within the flood plain, are exemplified by Apple Creek (Struever 1968a), Macoupin (Rackerby 1969, 1982), Gardens of Kampsville, and Smiling Dan (Stafford and Sant 1985). Hamlets have also been documented as much as 40 kilometers up tributary valleys (Asch et al. 1979; Farnsworth 1973; Farnsworth and Koski 1985). The relationships between the inhabitants of these sites and the people who resided in the main valley are not yet clear. (2) Bluff-top, ceremonial–cemetery sites, comprised of multiple, small, conical burial mounds, are represented by the Elizabeth (Charles et al. 1988) and Klunk–Gibson (Buikstra 1976; Perino 1968**,** n.d.) sites**.** (3) Flood plain mound/ceremonial sites, with small conical mounds, larger loaf-shaped mounds, and/or a plaza organization, are exemplified by Kamp (Struever 1960), Mound House (Buikstra et al. 1998), Napoleon Hollow (Wiant and McGimsey 1986), and Peisker (Perino 1966b; Staab 1984; Struever 1968a). A fourth category of sites—special purpose/extractive camps—has been proposed, but to date these have been rather elusive in the archaeological record, except in upland areas (Asch et al. 1979; Farnsworth 1990). This formulation differs somewhat from Struever's (1968a, 1968b) now classic settlement model, which included bluff-base settlements, summer (flood plain) agricultural camps, regional exchange centers, and mortuary camps (see below).

Households and Hamlets

Our use of the term "hamlet" contrasts with Struever's earlier conception of a bluff-base camp. The concept of a hamlet reflects recent analyses of new and existing databases that indicate that small, sedentary, one to three-household hamlets, rather than large villages, are characteristic of Middle Woodland/Hopewell settlement systems (B. D. Smith 1992) in Ohio (e.g., Carskadden and Morton 1996; Dancey and Pacheco 1997a; Kozarek 1997; Pacheco 1996, 1997; Wymer 1997), the lower Illinois river valley (e.g., Stafford and Sant 1985), the American

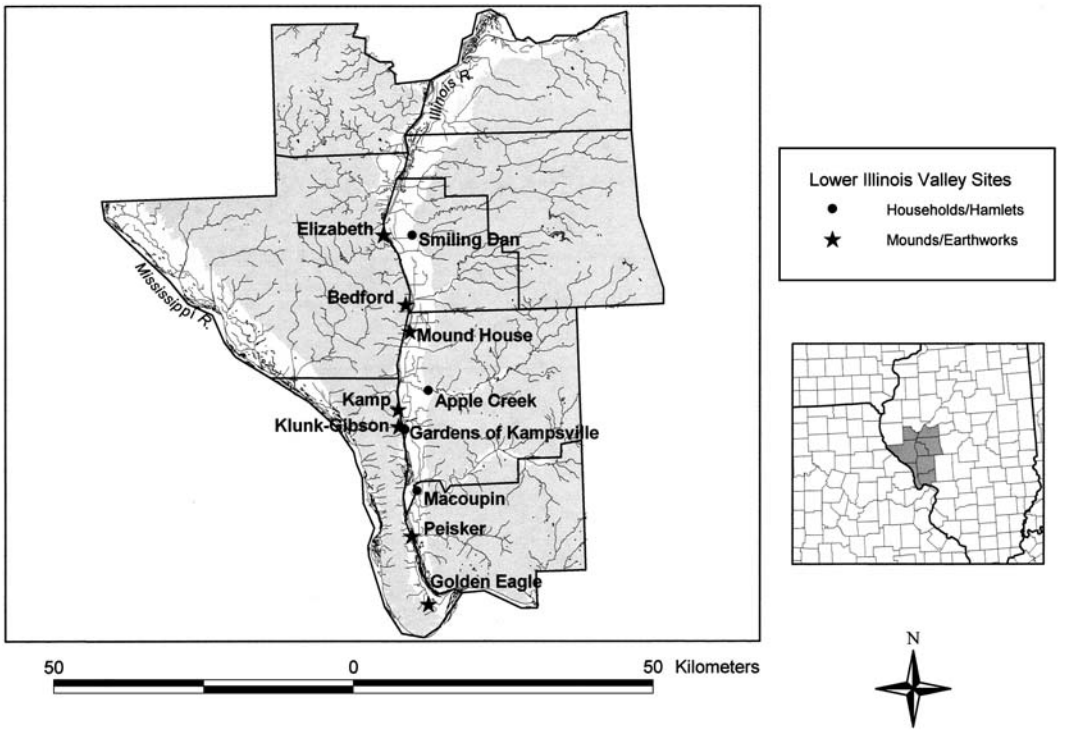

Figure 4.2. Hopewellian mound, earthwork, and base-camp sites in the lower Illinois valley.

Bottom of the Mississippi river valley (e.g., Fortier et al. 1989), and the Duck river valley of central Tennessee (e.g., various reports cited in B. D. Smith 1992). The hamlet concept was put forward originally as part of Prufer's (1964a, 1965) Vacant Ceremonial Center–Dispersed Agricultural Hamlet model of Ohio Hopewell settlement, but it was ignored in Illinois archaeology and elsewhere until the last decade, in part under the assumption by many that the material efflorescence of Hopewell must have been associated with substantial villages. This assumption was also reinforced by the size estimates for Illinois valley habitations provided by Struever and others. Struever's (1968:197, table 7) estimates range from 0.09 to 6.07 hectares, with a mean of 1.21 hectares. If the largest habitation, Mound House, is excluded, since it is actually included in his regional exchange center category, the next largest site is 2.48 hectares and the mean drops to 0.97 hectare.[3] Struever's estimates are further problematic in that almost all the habitations that he listed contain Havana and Pike Middle Woodland and White Hall early Late Woodland components, and all of his estimates are based on surface distributions (see also B. D. Smith 1992). Also unresolved for the region is the extent to which the larger sites, such as Apple Creek, Macoupin, and Gardens of Kampsville, represent larger communities (i.e., with more contemporaneous households) rather than longer-term or more frequently repeated occupations.

In Struever's settlement model, habitations were located at the bluff base at the interface of the upland and the flood plain resource zones, and were contrasted with supposed agricultural camps in the flood plain. Subsequent excavations of a site thought to be an agricultural camp—the Macoupin site—indicated that it was similar to the bluff-base hamlets, and that those two categories should be collapsed (Rackerby 1969, 1982). Subsuming the flood plain and bluff-base hamlets into the same category, and including data from more recent regional surveys, indicates that a better predictor of hamlet location is

proximity to a large, nonstagnant water source, such as the Illinois river or a major tributary (Asch and Asch 1978; Asch et al. 1979). Thus, hamlets might be located at the bluff base where the Illinois River flows near the bluff or where a secondary stream enters the valley and the river is more distant. Hamlets might also be located on levees or terraces in the flood plain adjacent to the Illinois river or larger tributaries. However, the discovery of the Smiling Dan site (Stafford and Sant 1985), in a small side valley with only a small stream flowing through it, suggests that further revision of the model may be necessary.

The Smiling Dan site, excavated in about 1980 as part of the Central Illinois Expressway mitigation project (Stafford and Sant 1985), is the only completely excavated Middle Woodland hamlet in the lower Illinois valley. Smiling Dan covered 0.67 hectare, and part of that area, on the northern margin of the site, includes only Late Woodland debris and features. Extensive stripping revealed three, or possibly four, structures. These were concluded on ceramic evidence not to have been occupied contemporaneously (Stafford and Sant 1985), but a more recent analysis suggests that at least two of the structures were in use at the same time (Charles and Shortell 2002). The structures were of single-post construction, subrectangular in shape, and roughly seven to eight meters across in either direction. Interior and exterior post alignments associated with one of the structures suggest the presence of benches, racks or screens. Pit features, hearths, and rock concentrations were clustered in and around each of the structures, and provide evidence of domestic activities including heating, cooking, storage, and refuse disposal. Instances of overlapping pit features and postmolds indicate some extended period of occupation or reoccupation. Midden deposits ranging from 30 to 60 centimeters thick were found throughout the site, and refuse deposits up to two meters deep were found in a stream channel bisecting the site. A series of eight radiocarbon dates spans some 400 years, and has three noticeable and statistically distinguishable modes (see Table 4.4, below). In sum, the evidence from Smiling Dan points to a relatively intensive occupation by one to three households for perhaps several hundred years, either continuously or episodically.

Middle Woodland hamlets do not appear to have been evenly distributed along the lower Illinois valley. A composite map of bluff-base hamlets (Struever and Houart 1972:62) indicates that they often cluster in groups of two or three and upward to five, with 0.8 to 1.6 kilometers between hamlets in a cluster and much larger distances among clusters or the less common, single hamlets. There are at least eight such clusters a long the lower Illinois valley.[4] In terms of the different kinds of communities defined in the theory section above, hamlets like Apple Creek, Macoupin, Gardens of Kampsville, and Smiling Dan, and closely spaced hamlets within a cluster, if they were contemporaneous, correspond to residential communities. It was within these places and restricted locales that the day-to-day activities and face-to-face interactions of life took place. The core of these settlements most probably consisted of two or three-generation extended families related through the male line, based on certain mortuary evidence (Charles and Buikstra 2002).

Ceremonial Centers

In general, there was a dichotomy in the nature and function of ceremonial sites, throughout the prehistory of the lower Illinois valley, between those located on the bluffs and those located on elevated ridges and terraces in the flood plain (Buikstra and Charles 1999; Charles and Buikstra 2002). The bluff-top sites were primarily funerary in nature, and reflected group identity and membership to the exclusion of other groups. In contrast, flood plain ceremonial sites were places where multiple groups interacted and were only secondarily used for funerals. By Middle Woodland times, this pattern included the construction of very large, loaf-shaped burial mounds along with conical mounds at some flood plain sites, but only conical burial mounds at bluff-top sites. The only exception to this pattern is the loaf-shaped Naples–Russell Mound 8 on the bluff top. The sheer size of the unusually large, loaf-shaped, flood plain mounds—up to 100 meters long and 6 meters tall—suggests an investment of labor

beyond that which could be marshaled by one or a few hamlets. The suggestion that some of these sites were organized around plazas (Buikstra 1976; Buikstra et al. 1998:1; Struever and Houart 1972) further argues for a wider participation in the ceremonies enacted there, as does their flood plain location, which made them easily accessible to distant social groups by water travel. While there are features, structures, debris scatters, and midden dumps present at the flood plain sites, occupation appears to have been temporary and seasonal, rather than year-round.

The Klunk–Gibson mound group provides one of the most thoroughly excavated examples of a bluff-top cemetery site (Buikstra 1976; Perino 1968, n.d.). The Gibson group included 6 mounds, the Ben Klunk group included 5 mounds, and the Pete Klunk group had at least 14 mounds. The three groups occupy adjacent finger ridges forming the bluff crest overlooking the Illinois river. The area was used for burial by Archaic and Late Woodland groups, but Middle Woodland use was the most intensive. The largest mounds were up to 20 meters in diameter and 6 meters tall. The smallest mounds may have been natural knolls. The mounds were arranged in a linear fashion following the ridge crests. Over 500 Middle Woodland burials were excavated from 13 mounds and one natural knoll (Braun 1979). Each of the Middle Woodland mounds contained a central tomb, often log-lined and roofed, and surrounded by earthen ramps. J. A. Brown's (1981) summary of the mortuary program identifies two burial tracks. The first track involved temporary storage and processing of corpses through the central tomb, eventually leading to final burial in and around the surrounding ramp as disarticulated or bundled remains. The second track led directly to burial in tombs or graves encircling the ramp. Brown suggested that the two tracks represent separate lineages. Charles (1995) extended this interpretation and suggested that the central tomb track may represent lineages that held dominant status because they resettled the lower Illinois valley earlier than did other lineages. The subordinate status of later immigrant lineages may have been expressed in the peripheral placement of burials in the second track (see below). It is clear that virtually all activity at these bluff-top sites was directed toward mortuary ritual and the treatment and burial of the dead.

Flood plain mound groups, exemplified by the excavated Kamp, Mound House, and Peisker sites, can be contrasted with the bluff-top cemeteries (Baker et al. 1941; Buikstra 1976:41–45; Buikstra et al. 1998; Perino 1966a, 1966b; Struever 1960). Like the bluff-top mounds, flood plain mounds were organized around a central tomb. However, the flood plain mounds are almost always larger than any of the bluff-top mounds, and with much larger central tombs. Sometimes the mounds are organized around a plaza. The larger flood plain tombs tend to contain more individuals within them than the bluff-top tombs, but overall the flood plain mound groups contain fewer burials per mound and per site**.** Most flood plain mound centers that have been excavated had burial populations between 2 and 19 individuals (Asch 1976). Further, burial in the flood plain mounds was largely limited to adult males, in contrast to the more inclusive burial program expressed in the bluff-top cemeteries. In short, access to burial in the flood plain mounds was more restricted, and the greater amounts of energy expended per individual in tomb and mound construction suggest that they held positions of social prominence. Buikstra suggested, "It is not unreasonable to suppose that these were individuals who exerted influence beyond the local community" (1976:44).

Excavations at the Mound House site provide the best evidence for the multicommunity function of the flood plain centers (Buikstra et al. 1998). Mound construction at Mound 1 was preceded by the preparation of a circular space some 20 meters in diameter, marked by a lens of yellow sand and surrounded by a series of at least three concentric rings of postholes filled with yellow clays or sands. Buikstra et al. (1998:59–74) interpreted this feature as the remains of a series of wooden screens or bent-pole structures that had been repeatedly built, dismantled, and rebuilt to demarcate sacred space as part of a ritual cycle. This ritual complexity is unparalleled at any of the bluff-crest mound groups and strongly suggests a broader, multicommunity function for this center. Charles and Buikstra (2002) suggested

that each flood plain center served to forge a social entity larger than a residential community—a "community of communities."[5] These broad gatherings would have provided opportunities for mate exchanges and other means of securing the far-reaching social ties necessary to maintain a sustainable community. Here, too, was a context for performances intended to forge symbolic communities of one kind or another through ritual enactments, gifting, displays of wealth and status, and so forth.

Relative to the flood plain and bluff-top dichotomy of ceremonial sites, the Elizabeth/Napoleon Hollow complex is somewhat enigmatic. Wiant and McGimsey (1986) saw the bluff-base Napoleon Hollow site as a ritual camp associated with the bluff-top Elizabeth mounds. The authors combined the complex with the Peisker site to form a category that they called the mound/ritual camp. The massive Naples–Russell Mound 8 on the bluff top, less than one kilometer north of Elizabeth, should be included in the site complex, especially since it overlooks the northern end of the Napoleon Hollow occupation. Significantly, recent C-14 dates (Kut and Buikstra 1998) confirm that this mound was built at the end of the construction sequence of the Elizabeth mound group. It therefore seems more likely that the Elizabeth/Napoleon Hollow/Naples–Russell complex represents a bluff-top cemetery that initially was used by a local group and that evolved into a bluff-top *and* bluff-base multigroup ritual site analogous to the flood plain Kamp, Mound House, and Peisker sites (Charles 1985, 1992; Charles et al. 1988). This unusual situation probably arose because the sites are located where the Illinois river hugs the western bluff for several kilometers and where there was insufficient space for large gatherings of people on the flood plain, alone, on that side of the river.[6]

Community Organization in the Lower Illinois Valley

Middle Woodland individuals in the lower Illinois valley belonged to at least three kinds of communities at differing geographic and demographic scales. At the most local level was the residential community, comprised of one to several extended families who lived in isolated hamlets or closely clustered hamlets of varying size, such as Apple Creek, Macoupin, Gardens of Kampsville, and Smiling Dan. At a wider scale, an individual participated in a local symbolic community that was comprised of members of several hamlets and was negotiated and maintained in part through ceremonial activities conducted at a bluff-top ceremonial center. Each local symbolic community used and claimed a territory, giving the community a political or economic dimension. At the broadest scale was the sustainable community, which was formed from multiple local symbolic communities and was negotiated and maintained through the ceremonial activities performed at a flood plain center. A sustainable community constituted a regional breeding population and probably had other cultural functions. There was an inherent structural tension between the structuring of people into a local symbolic community and the structuring of people into a broader sustainable community—between a desire for local control and the need for regional integration—which was played out materially in the distinction between the bluff-top and flood plain ceremonial centers. Each of these three kinds of communities is defined more fully now.

Each bluff-top ceremonial site defined membership in a corporate, territorial, political, symbolic community through inclusion in the site's cemetery. Age and sex distributions indicate that virtually everyone—young and old, male and female—was eventually buried in one of the bluff-top mound groups, with the exception of the very highest-status individuals, who were buried in the flood plain mound groups (Charles and Buikstra 2002). The identification of the bluff-top mound cemeteries as having been used by a local symbolic community, but not a sustainable community, is borne out by the sizes of their burial populations. These range between 25 and 170 individuals, where their excavation is relatively complete (e.g., Bedford, Gibson, Klunk, Elizabeth, Knight, L'Orient, Montezuma, Mappen, Parsell [Asch 1976; Charles et al. 1988]). These burial populations sizes are well below what would constitute a

sustainable breeding population (Wobst 1974), and would have been generated by yet smaller living populations over the decades.

It is quite likely that several neighboring residential communities used the same cemetery. The logic of this argument runs as follows. There is genetic continuity through successive mounds in a given mound group (Konigsberg 1990): biological variability within individual mound groups is relatively small compared to that evident between spatially distant mound groups along the lower Illinois valley trench (Buikstra 1976). However, by at least the later portion of the Middle Woodland period, a structural (i.e., spatial) distinction was made in the cemeteries between members of dominant lineages that utilized the central crypts and members of subordinate lineages that were buried in peripheral graves (Brown 1981). The dominant lineages may have resided in one or more hamlets, while subordinate lineages may have resided in other hamlets. Further, the dominant lineages may have been those who first resettled the lower Illinois valley during the Middle Woodland (founder settlements and daughter hamlets), whereas the subordinate lineages may have been late-comers (adopted hamlets of immigrant lineages) (Charles 1992). Thus, the bluff-top cemeteries can be interpreted as local symbolic, political communities that integrated multiple, status-differentiated residential communities, each formed of a hamlet or cluster of hamlets.

If the bluff-top mounds constituted identity markers related to subsistence territories (Charles 1992, 1995; Charles and Buikstra 1983), then there was not a direct mapping of individual residential communities onto discrete economic catchments. Instead, there was a correspondence among the local symbolic community, as a set of related lineages defined by reference to a bluff-top cemetery, a subsistence territory, and rights to its use to the exclusion of neighboring local symbolic communities. The conspicuous consumption of grave goods may have been a medium of status competition and/or social cooperation among individuals or residential communities. Bluff-top mound construction may have been a means for status competition and boundary contestation between neighboring local symbolic communities (Charles 1995).

In contrast, the flood plain ceremonial sites involved the coming-together of these economically competitive, real or fictive lineages from several local symbolic, political communities up and down the river valley. These sites provided a context for the construction of sustainable communities. The distribution of bluff-top mound groups and flood plain ceremonial centers accords well with this interpretation, as shown by the following calculations. A sustainable marriage network requires a minimum figure of about 500 people (Birdsell 1968; Wobst 1974). About 33 hamlets of 15 people each could account for the requisite 500 persons. If three hamlets comprised a bluff-top mound symbolic/political community, then only 11 of those communities were necessary to make up the sustainable community. By the end of the Middle Woodland period, bluff-top mound groups were spaced approximately every 5 kilometers along both sides of the Illinois valley, i.e., 2.5 kilometers of river length per mound group (Charles 1992). Only 27.5 river kilometers would have been necessary to accommodate 11 bluff-top mound communities and a sustainable community of 500 persons. Significantly, this distance corresponds fairly closely to the distance between large flood plain ceremonial centers—about 20 kilometers (Asch et al. 1979; Struever and Houart 1972)—suggesting that they were built and used by sustainable communities.

Estimates of population density can also be used to explore the relationship between flood plain mound centers and sustainable communities. Based on an independent set of excavated mound sites, Asch (1976) estimated a population density for Illinois valley Middle Woodland populations at 25 persons per river kilometer. At this density, flood plain ceremonial sites spaced at 20-km intervals along the river would each have accommodated a sustainable community of 500 persons.

Marriage networks would not have been the only structures or relations requiring sustainable communities. The exchange (e.g., feasting, gift-giving, formal partnerships) and funerary activities conducted at these sites would have

served to create a network of relationships that could have mediated subsistence risks and would have provided opportunities for the exchange of information (Charles and Buikstra 2002). Sustainable communities also would have provided another arena through which individual and lineage hierarchies would have been negotiated and contested (Charles 1992, 1995).

Summary

A Middle Woodland individual living in the Illinois valley would have been a member of three kinds of communities of differing scales and functions: a residential community comprised of a household, hamlet, or cluster, of closely spaced hamlets; a local symbolic, territorial, political, and economic community comprised of multiple households, hamlets, or hamlet clusters, focused on a bluff-top funerary site, and probably associated with a food resource catchment; and a regional sustainable community that was critical to marriage, status contestation, and possibly subsistence exchange, and that was materialized in a flood plain ceremonial center.

HOPEWELLIAN COMMUNITIES IN THE WABASH–OHIO RIVER CONFLUENCE REGION

Archaeologists have long been aware of the Mann site: a single, very large Hopewellian earthwork, mound, and habitation complex located along the lower Ohio river near its confluence with the Wabash (Adams 1949). However, until recently, only a handful of archaeological components in the Wabash Lowlands were recognized as related to the Mann site. These were linked to the site by the presence of complicated stamped ceramics. It has recently been possible to identify an additional 51 related ceramic-bearing Mann phase components by focusing on the distinctive attributes of the undecorated assemblage from the Mann site (Ruby 1993, 1997a). This same study identified an additional 60 components bearing temporally diagnostic Lowe and Copena Cluster bifaces in combination with the distinctive "Ohio-style" lamellar blades[7] characteristic of the Mann site blade assemblage. These 111 components, plus the Mann site and one additional mound (the GE mound), are now recognized as constituents of the "Mann phase" occupation of southwestern Indiana (Figure 4.3).[8] Because many aspects of the Mann site and its surrounding sites are unpublished, they are described in some detail here.

All of the available evidence suggests that Mann phase populations had made a significant commitment to agriculture. Mann phase seed assemblages are dominated by cultivated starchy seeds. At one well-documented site (Grabert), the ratio of recovered seeds to nutshells is among the highest of those documented for the Midwest during the Middle Woodland.[9]

Three site types subsume most of the functional variability in Mann phase settlements: households or hamlets, short-term extractive camps, and ceremonial centers. The Mann site, itself, stands in a class of its own, with both its earthen architecture and habitation remains, and cannot be relegated exclusively to either the ceremonial or the domestic sphere. It is distinguished from the other classes by its size, intensity of occupation, and complexity as measured by investment in mound and earthwork construction, the quantity and diversity of exotica present, and the range of activities evident.

Households and Hamlets

Households and hamlets of the Mann phase community conform quite closely to the small Hopewellian settlements composed of one to three households, as identified by B. Smith (1992). In surface collections, these households or hamlets are defined by the presence of utilitarian ceramics, rare occurrences of decorated ceramics, and a wide range of lithic tool types and debitage. Fifty-one components meeting this description have been identified to date in southwestern Indiana.

Test excavations at four of these sites—Grabert (12 Po 248), Hovey Lake (12 Po 10), Kuester (12 Vg 71), and Ellerbusch (12 W 56)—revealed a redundant pattern of small-scale

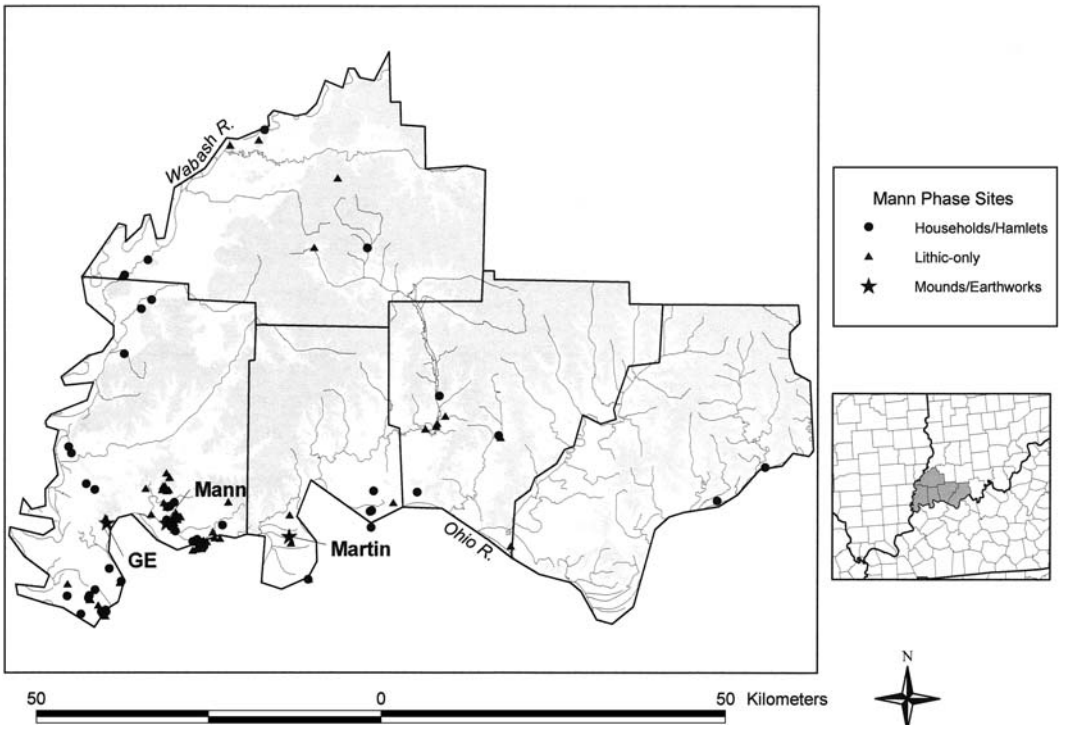

Figure 4.3. Hopewellian mound and earthwork sites in southwestern Indiana.

occupations represented by loose clusters of shallow bathtub or basin-shaped pits, thin middens, and scattered postholes. The basin-shaped pits always contained fire-cracked rock and often displayed direct evidence of *in situ* burning, suggesting food processing rather than storage. None of these sites has produced evidence of below-ground storage facilities.

The Grabert site is the largest and most extensively excavated of the four sites. The total area of scatter is 1.6 hectares, but most debris was limited to three individual midden concentrations ranging in size from 500 to 1,500 square meters (0.05–0.15 hectare). Block excavations exposed 93 square meters of the central and highest concentration and revealed the remains of at least two overlapping circular or oval, single-wall-post structures. The more completely exposed structure was no more than four meters in diameter. A structure of this size (12.6 square meters) would accommodate approximately five individuals.[10] This is toward the very low end of the range of Middle Woodland domestic household sizes reported by B. Smith (1992:figure 9.8 [4.5–130.5 square meters, 2–18 individuals).[11] Two corrected and uncalibrated radiocarbon dates (Beta-38550, 1780 ± 60 rcybp; Beta-38551, 1810 ± 60 rcybp) place the Grabert site occupation close to A.D. 150.

The regional, topographic distribution of 51 identified, dispersed households and hamlets of the Mann phase, beyond the Mann site, shows the same focus on main valley bottomland settings characteristic of Middle Woodland-period settlement elsewhere in the Midcontinent. Only three (6%) of the Mann phase habitations occupations occur in interior upland settings. The household distribution shows a marked preference for highly productive flood plain (38%), low terrace (42%) and high terrace/lacustrine plain (15%) soils. About 80% of the habitations located within the active flood plain or on low terrace landforms would have been exposed to significant risk of late winter and spring floods. This

suggests that they may have been occupied only during the warm season.

Short-Term Extractive Camps

The second element of the Mann phase community might be termed the short-term extractive camp. Unfortunately, none of these sites has been excavated, so their actual function remains speculative. Sites identified as short-term extractive camps are characterized by restricted tool assemblages, typically including only diagnostic projectile points, debitage reflecting tool maintenance activities, and lamellar blades. Ceramics are absent. Sixty components conforming to this description have been found to date in southwestern Indiana.

The extractive camps are more numerous than the household sites discussed above, have a wider spatial distribution, and occur in a more diverse array of environmental settings, as would be expected if they were extractive camps. Several sites occupy interior upland and tributary stream settings, in addition to those found in flood plain and terrace settings, which also were chosen for ceramic-bearing habitations.

A Ceremonial Center with Domestic Habitations: The Mann Site

The Mann site is located on a high, flat terrace that overlooks an extensive backwater slough and a broad expanse of Ohio river flood plain, about 20 kilometers upstream from the Wabash river confluence. The site consists of series of geometric earthworks, mounds and an extensive habitation area. The total site complex covers an area of about 175 hectares (Figure 4.4).

Mann Site Ceremonial Contexts

A series of aerial photographs, limited field observations, and amateur excavations reveal something of the nature and magnitude of ceremonial sphere contexts at the Mann site. As in the contrast between Illinois bluff-top and flood plain mound sites, there seems to be a dichotomy in the nature and function of ceremonial sphere contexts at Mann. Five small conical mounds on the eastern edge of the site appear to have had primarily funerary functions, and to have expressed group identity and membership on a scale consistent with a small residential or local symbolic community. On the other hand, a series of much larger geometric earthworks, loaf-shaped mounds, and platform mounds seems to express a nonmortuary ceremonialism that may have served to integrate a much broader suite of communities, analogous to the lower Illinois valley flood plain ceremonial complexes.

In all, the site contains two rectangular enclosures (IU 2 and 3), a third partial rectangular enclosure (IU 4), two C-shaped enclosures (IU 7 and 17), a circular enclosure (IU 16), a very long linear earthwork (IU 10), two large rectangular mounds (IU8 and 9), two large loaf-shaped mounds (IU 1 and 6), and six conical mounds (IU 5 and 11–15) (Kellar 1979; Ruby 1997:321–351).

Two rectangular enclosures dominate the western edge of the site. One (IU 2) is a three-sided rectangular enclosure 600 meters long and 300 meters wide, opening on Cypress Slough to the south. The work encloses a very large loaf-shaped mound (IU 1). The other work (IU 3) is a regular square 310 meters on a side, with 15-meter-wide gateways at the corners and midpoint of each wall. The size and design of this square enclosure are very similar or identical to those of 10 other Hopewellian mound and earthwork complexes in southern Ohio. These similarities strongly suggest direct contact between Middle Woodland populations at the Mann site and Ohio Hopewell populations.

The central portion of the site, east of the two square enclosures, is dominated by two large rectangular flat-topped mounds, two C-shaped embankments, and a large conical mound. The eastern portion of the site contains a linear embankment stretching some 700 meters, as well as five smaller conical mounds. A small circular enclosure is located along an intermittent stream defining the eastern edge of the site complex. These structures obviously represent a tremendous investment of labor. In fact, two of the Mann site mounds (IU 1 and 9) rank among the five largest Middle Woodland mounds in

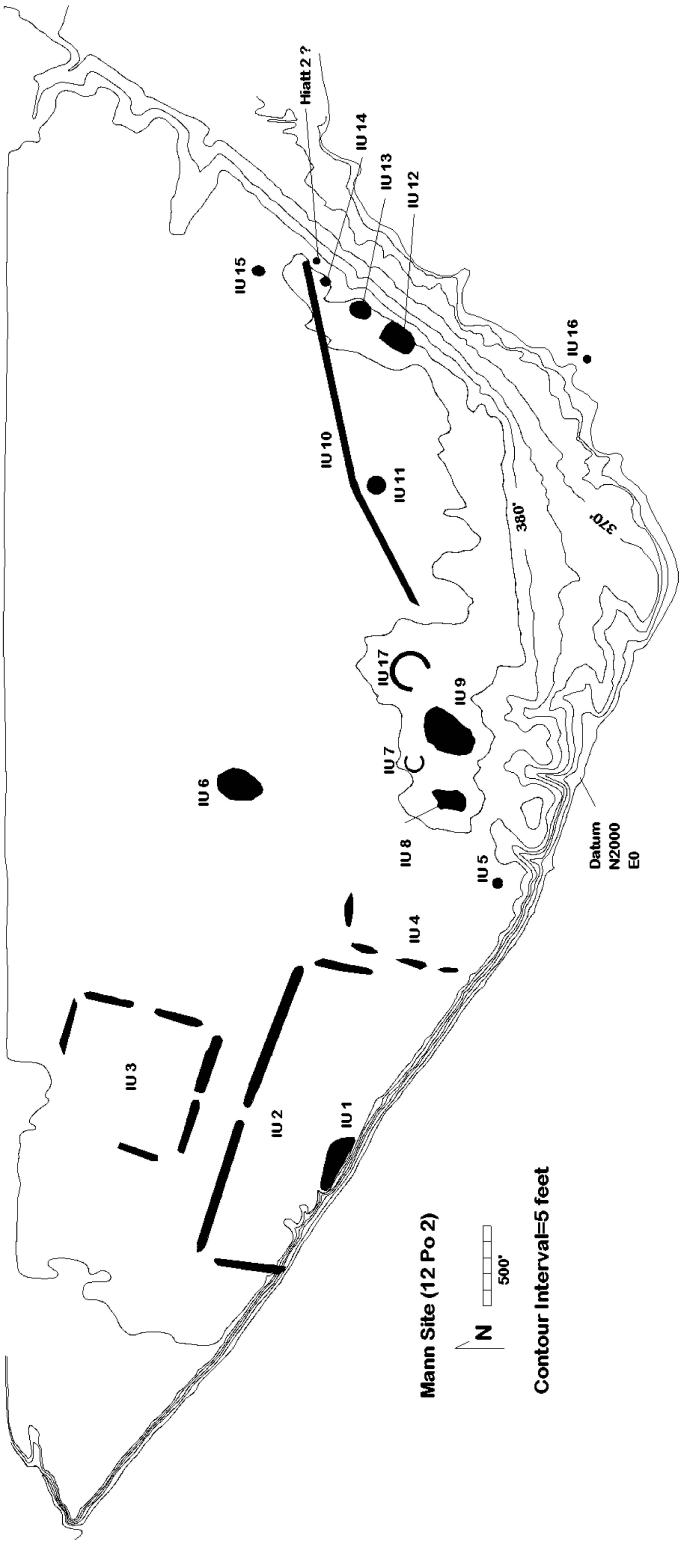

Figure 4.4. The Mann site, Posey County, southwest Indiana.

the Midwest (along with the nearby GE mound and the Seip–Pricer and Hopewell mound 25 in Ohio).

None of the Mann site mounds have been explored professionally. We do have two written accounts documenting amateur and antiquarian explorations in the largest of the flat-topped mounds (IU 9) and several of the smaller conical structures (Hiatt n.d.; Lacer n.d.).

Excavations in the large flat-topped mound (IU 9) indicate that it served as a stage for ceremonial activities not directly associated with burial of the dead. As documented below, such structures and activities are not unique to Mann phase contexts. Recent investigations of similar Middle Woodland mounds in south–central Ohio, the Midsouth, and the lower Mississippi valley suggest that such structures and activities were part of a distinctive, patterned expression of nonmortuary Hopewellian ceremonialism that has only recently been recognized.

Excavations in IU 9 produced evidence of at least three horizontal sand floors located at intervals well above the base of the mound. These strata may reasonably be interpreted as floors, as they are associated with several post molds, though no obvious pattern was documented; midden-like deposits of charcoal, burned bone, lithic debris, and broken pottery; and eight shallow, basin-shaped pits that contained redeposited materials reflecting nonmortuary ceremonialism. The pits contained a variety of exotic raw materials and finished artifacts, most of which had been subjected to intense fire or mechanical breakage, including galena, crystal quartz, obsidian, mica, engraved bone, drilled canines, turtle shell fragments, ceramic vessel fragments, and more. Several of the pits contained burned and unburned animal bone and charred nuts and seeds. The evidence suggests that feasting may have been one of the activities associated with the sand floors and pits on the mound. Charred material from one of the pits produced a radiocarbon date of A.D. 420 ± 45 (DIC-1017, uncalibrated [Kellar 1979]).

Importantly, there is little evidence to suggest that the ceremonialism reflected at IU 9 was directly related to mortuary activities. Burials and associated funerary objects are absent. Instead, some other form of ceremonialism is indicated, which may have promoted integrative functions that cross-cut social divisions based on residence or kinship. The midden-like deposits are similar to others more typically found in habitations, suggesting that food processing, consumption, and discard were important elements in the ceremonies conducted here. Thus, the platform mounds may have been used in ways that brought individuals and social groups together in order to share in common experiences, including ones involving food. Joint participation in or observation of the ritual destruction of symbolically charged and economically valuable goods and raw materials is also indicated.

In contrast, the group of five relatively small conical mounds at the eastern extreme of the site is clearly associated with mortuary activity and presumably expressive of kinship-related ties to ancestors. The largest of these mounds, IU 13,[12] is a relatively modest structure, about 40 meters across and 3–5 meters tall. About 25 people could have built a mound this size in a month.[13] The structure and contents of the mound are very similar to those of the bluff-top mounds in Illinois. At least 54 people were buried in and around a central log tomb and a set of surrounding earthen ramps. All segments of the population are represented: infants, children, adolescents, and adults, both male and female (Lacer n.d.). About one-half of these burials were accompanied by items for personal adornment or possibly for marking clan or sodality affiliation (Carr, Chapter 7; Carr et al., Chapter 13; Thomas et al., Chapter 8), including marine shell and freshwater pearl beads, copper earspools, and cut and drilled bear canines. The evidence from the other small conical mounds is more fragmentary, but consistent with the interpretation that these small conical mounds represent cemeteries used by one or several small, residential communities.

Mann Site Domestic Contexts

The most unique characteristic of the Mann site is the areal extent and density of its midden deposits. Surface surveys and midden stains visible

in aerial photographs document dense habitation debris covering an area of at least 40 hectares, unlike anything reported for Ohio Hopewell earthwork centers. Some fraction of the 40 hectares is attributable to a Late Prehistoric (Caborn–Welborn phase) occupation; however, all observers agree that the vast majority of this debris relates to the Middle Woodland occupation. The debris field is essentially continuous near the southern margin of the site. As one approaches the northern bound, away from the high terrace edge, the surface debris is entirely attributable to the Mann phase occupation and begins to resolve into a series of discontinuous patches, one-half hectare or less in size (Kellar 1979:102; Lacer n.d:1–4), and possibly indicating individual households.

Kellar's (1979) four Indiana University field schools conducted between 1964 and 1977 encountered habitation debris far in excess of what might be expected if the site had been occupied by only ritual specialists. Excavations in 1964 encountered a terrace-edge trash dump covering at least 100 square meters and extending almost 1 meter below the ground surface. Widely spaced excavations in 1966 and 1967 encountered clusters of shallow, basin-shaped pits, and two very large features approximately 2 meters across and up to 1.5 meters deep, with fills suggesting their use as earth ovens. In 1966, one 5 × 10-foot trench was excavated through midden deposits to a depth of more than 3 meters, apparently sampling a backfilled borrow pit. Finally, in 1977, excavations documented two large pit features: one a straight-sided, cylindrical flat-bottomed pit that may have served as a storage facility, and the other a very large (3 × 1.5+ meters), shallow basin containing alternating layers of burned limestone and midden debris, suggesting a very large food processing facility.

In short, each area tested to date has revealed high densities of food processing and storage facilities, and some very deep midden accumulations. No structures have been identified, but scattered postholes and the discrete midden patches suggest their presence. The available evidence on the internal organization of the site suggests a very weak spatial separation of ceremonial and domestic sphere activities: mounds, earthworks, and dense habitation debris are not clearly segregated in the most intensively surveyed, central portion of the site. While the density of habitation debris is impressive, the few available radiocarbon dates document almost three centuries of occupation during the Mann phase, from about A.D. 150 to 450. Thus, it is not necessary to conclude that a large population was present at any one time. Also, individual household units need not have been tightly integrated socially, politically, or economically. The organizationally independent midden patches on the periphery of the most heavily occupied area point to a long series of temporally and spatially shifting occupations by relatively small and autonomous social units. Elsewhere in the Wabash Lowlands, there is abundant evidence for small household or hamlet-sized occupations during the Mann phase. Even so, the density and intensity of habitation debris at the Mann site far exceeds any Middle Woodland site in either Illinois or Ohio.

The dates of the habitation remains within the Mann site relative to the dates of its square enclosures are not fully clear. However, square enclosures in Ohio that are very similar or identical to IU3 at Mann (see above) date between about A.D. 200 and 300 (De Boer 1997:232, 234; see also Greber 1997:215), in the middle of the span of dates for the habitation areas at Mann.

Ceremonial Centers Lacking Domestic Habitations

At least two other sites in the Wabash–Ohio river confluence area served ceremonial functions during the Mann phase. These differ markedly in scale, one being among the largest Middle Woodland constructions anywhere, the other much more modest in proportion.

The GE Mound

The GE mound, or Mount Vernon site (12 Po 885), is located in an upland setting near the mouth of the Wabash river, about eight kilometers west of the Mann site. The site was discovered in 1988 during county earth-moving operations. The site was subsequently subjected to

extensive looting, followed by several indictments and convictions under the Archaeological Resources Protection Act, and the recovery of a portion of the artifacts removed from the mound. Limited test excavations designed to determine the extent of the looting were conducted by the Indiana Department of Transportation (IDOT) in 1988 (General Electric Company 1997; Seeman 1992, 1995; Tomak 1990, Tomak 1994).

The GE mound reflects an investment of labor on a truly monumental scale. Prior to its disturbance, the GE mound was a loaf-shaped structure approximately 125 meters long, 50 meters wide, and 6 meters high. The site ranks among the five largest Hopewell mounds in the Midwest and was comparable in size to Seip–Pricer in south–central Ohio.

Information regarding the context of the artifacts recovered is sketchy at best, but the GE site was clearly the focus of a complex ceremonial program. The "main feature of the mound was a central deposit containing several thousand bifaces . . . this deposit was surrounded or capped with human burials and artifact deposits" (Seeman 1992:24). Most if not all of the artifacts appear to have been recovered at or near the mound floor, perhaps in formal deposits. No intact burials were recovered, but the presence of both burned and unburned human bone in the IDOT collections from the site suggests that extended processing and manipulation of the dead was a part of the mortuary program.

Often-spectacular status and ceremonial artifacts (Seeman 1992:table 1, 1995) were recovered from the mound in great diversity, suggesting that people were major players in Hopewellian interaction and procurement. Among the artifacts were more than 2,000 large ovate bifaces, most fashioned of Burlington chert from the lower Illinois valley area; at least 3 large crystal quartz bifaces; at least 10 obsidian bifaces; 5 mica cutouts; 13 copper earspools, 8 with silver covers; 3 copper panpipes, 2 with silver covers; copper nuggets and beads; and a size-graded series of 23 copper celts. The most temporally sensitive of these are the obsidian bifaces and the stylistic attributes of one of the silver-covered earspools. Both of these should date close to or after A.D. 100 (Rule, Chapter 18; Griffin 1965; Griffin et al. 1969; Hatch et al. 1990; Ruhl 1992, 1996; Ruhl and Seeman 1998). Seeman (1992) estimated that the GE assemblage was deposited between about A.D. 100 and A.D. 300. On this basis, GE is assigned to the Mann phase rather than the earlier Crab Orchard occupation of the region.

Several observations support the notion that this structure represents something more than just a burial ground—that it served as a context for integrative ritual, activity, and symbolism. First is the imposing size of the structure, itself, which certainly speaks of a significant cooperative investment. Second is the structure as a *monument*—a work possessing the attributes of prominence and persistence—an enduring symbol of social affiliation made manifest on the landscape (Charles 1985; Wheatley 1996:84–88). Third is the fact that many of the artifacts deposited in the mound had been intentionally destroyed through heating or smashing. Although we know nothing of the context of this destruction, it seems reasonable that the destruction of artifacts so evidently charged with wealth and symbolism had the potential to serve as the focus of an impressive public spectacle.

The GE mound appears to have been spatially as well as functionally divorced from the domestic sphere. There is no evidence of any domestic habitation immediately adjacent to the mound or in the nearby lowlands. In fact, the only evidence of associated activity in the vicinity of the mound comes in the form of chert debitage reflecting the production or refinement of bifaces for inclusion in the central deposit.

The Martin Site (12 Vg 41)

At least one other site in the lower Wabash region, the Martin site, appears to belong within the ceremonial sphere of the Mann phase Hopewellian community.[14] Martin consists of three small conical mounds preserved in a 19th Century cemetery. The largest stands less than two meters high. Because these have not been excavated, their attribution to the Mann phase is based on associated debris surrounding the mounds and is, consequently, less certain. Surrounding the

mounds is a low-density scatter containing lamellar blades and undecorated ceramics similar to those documented at the Mann site. The greatest density of materials is contained within a single 40×60-meter area.

The ceremonial centers of Mann, Martin, and GE are all located on upland or terrace landforms. It is possible that activities involving suprahousehold integration were scheduled to correspond to portions of the year when lowland habitats were inaccessible. This situation mirrors the accessibility in the Illinois valley of the elevated ridges and terraces where flood plain ceremonial sites were located.

Community Organization in the Lower Wabash–Ohio River Confluence

As in the Illinois case, and as we shall see for the Ohio case, there is evidence that Mann-phase peoples organized themselves into communities of varying demographic and spatial scales. Residential communities comprised of one or a few households were dispersed over the lower Wabash–Ohio river confluence landscape, much as they were in Ohio. The small size and apparently seasonal, warm-weather occupation of the Wabash–Ohio hamlets distinguishes them from bluff-base habitations in Illinois, which seem to have been occupied year-round, were commonly somewhat larger, and occasionally may have been much larger. Mann phase hamlets were certainly smaller than the clusters of two to five bluff-base habitations along the Illinois valley trench that possibly each constituted a dispersed residential community. Clusters of several small, one-household settlements found in some Ohio contexts (e.g., Pacheco 1996:26, 29, 1997:56, 58; see below) have analogs in the Mann phase area.

In contrast to the small, dispersed residential communities in the Mann region was a residential community of larger scale, to some unknown degree, within the Mann site. This residential community probably was as large as or larger than the bigger of the bluff-base settlements in the Illinois valley or the clusters of bluff-base settlements along that valley.

Small-scale mounded cemeteries in the Mann area, such as the five small conical mounds at the Mann site and the three at the Martin site, appear from their burial populations and mortuary programs to have functioned in forging (local?) symbolic communities composed of multiple residential communities represented by the scattered, often seasonal, hamlets. In structure and content, the cemeteries are similar to the conical bluff-top mounded cemeteries in the lower Illinois valley but are relatively few in number. There also is no clear evidence that the conical mounds in the Mann area were used as territorial markers to broadcast and validate claims to subsistence territories, as were the conical mounds in Illinois.

Sites like Mann and GE, marked by truly monumental public architecture and ceremonial facilities, were more closely linked to feasting and public pageantry than mortuary ritual, and likely served to integrate multiple residential and symbolic communities into a single, large, symbolic, and sustainable community organized on a regional scale. Mann and GE, eight kilometers apart, appear to have served partially different and partially overlapping functions within this regional community. Mann has rectangular enclosures and rectangular mounds for staging nonmortuary rituals as well as large, loaf-shaped mounds that, by analogy to GE and similarly shaped mounds in Ohio and Illinois (e.g., Hopewell Mound 25, the Seip–Pricer, Seip–Conjoined, Edwin Harness, and Kamp mounds, Mound House), would have been used for ceremonial displays and the decommissioning of fancy ritual items in deposits, attendant with anywhere from few to many burials. The GE site lacks earthworks and rectangular staging mounds and has only the one huge and rich mound created in the course of ceremonial display, decommissioning, and burial. In its size and diversity of fancy artifacts, it recalls Hopewell Mound 25 in Ohio, which was a specialized burial place for social leaders and other persons of social importance (Carr, Chapter 7).[15] The partially complementary functions of Mann and GE imply one regional, symbolic, and sustainable community rather than two smaller ones.

In their function as centers for gatherings of a sustainable community for considerable nonmortuary-related activity as well as burial, Mann and GE resemble the flood plain mound centers in the lower Illinois valley (see above). In their functional differentiation within one symbolic community, they remind us of the functionally differentiated earthworks within symbolic communities in Ohio (see below).

In total, the ceremonial sphere of the Mann phase and its archaeological manifestations both resemble and differ from those in the lower Illinois valley. The contrast between the clusters of small conical mounds that were used to bury persons from multiple residential communities and to create symbolic communities, and the large, loaf-shaped mounds that were the focus of larger sustainable communities, holds in both geographic regions. However, the material–spatial organization of symbolic and sustainable communities differs between the regions. In the Illinois case, the conical and loaf-shaped mounds that represented local symbolic communities and sustainable communities, respectively, were separated in distinct bluff-top and flood plain locations, whereas in southwestern Indiana, the conical and loaf-shaped mounds that represented these two social units, respectively, were sometimes located apart (e.g., Martin versus GE) and sometimes together (e.g., at Mann).

HOPEWELLIAN COMMUNITIES AT THE PAINT CREEK–SCIOTO RIVER CONFLUENCE

The confluence of Paint Creek and the Scioto River in Ross County, Ohio, has long been recognized as the center of the most flamboyant Hopewellian expression anywhere in the Eastern Woodlands. At least nine major mound and earthwork centers, several minor centers, and dozens of mounds or mound groups are concentrated within a 30-kilometer radius of the Scioto–Paint Creek confluence (Figure 4.5). Several of these centers are unmatched in scale anywhere outside the south–central Ohio area, enclosing areas as large as 31 hectares. No other region of Hopewellian development displays a comparable density of mound and earthwork centers or a comparable range or concentration of exotic raw materials or finished artifacts (Prufer 1964a; Squier and Davis 1848).

All of the early observers (e.g., Atwater 1820; Squier and Davis 1848) were struck by the scale and geometry of the works in Ross County, and it seemed intuitively obvious that the earthwork builders must have lived in large, permanent villages and supported their extravagances through an industrious agriculture. But despite more than 150 years of investigation, few if any occupations of any size have been identified in association with the great works.

Almost 40 years ago, Olaf Prufer proposed that Middle Woodland settlement patterns in the central Scioto region could be characterized by "a system of semi-permanent shifting agricultural farmsteads or hamlets, clustered around a series of ceremonial centers with which a number of such settlements identified themselves" (1965:137). The central tenets of Prufer's "model" were that individual settlements were small and dispersed, occupied for no more than a generation or so, and the monumental mound and earthwork centers were "vacant", in the sense that they did not serve the domestic residential needs of any significant number of people (Prufer 1965, 1997c).

A 1992 Society for American Archaeology symposium dedicated to a reevaluation of Prufer's "vacant center" model confirmed the utility of the model with only minor revisions (Dancey and Pacheco 1997b). Dancey and Pacheco formalized and extended Prufer's ideas as the "dispersed sedentary community model" (Dancey and Pacheco 1997b). In this model, the fundamental organizational unit of Ohio Hopewell society is a community of unspecified kind, composed of isolated, sedentary, farming, single or multiple-family households (hamlets) dispersed around a centrally located ritual precinct marked by mounds and earthworks. Specialized camps and activity loci related to the use and construction of mound and earthworks may be found within the ritual precinct, but there should be little if any evidence of domestic occupation. Individual communities, each identified with its own central earthwork group, are spaced

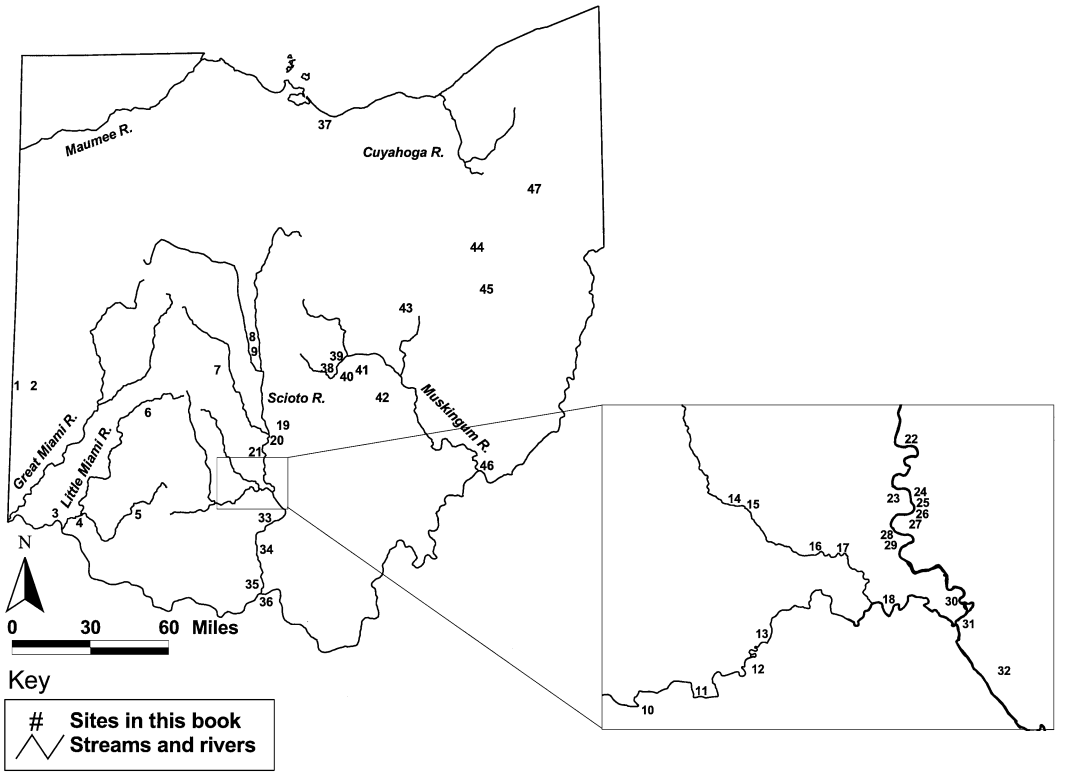

Figure 4.5. Hopewellian mound and earthwork sites in the Scioto–Paint Creek area and broader Ohio. Isolated mounds and mound groups are denoted by name only; earthworks are specified as such. (1) Pense, (2) Lee, (3) West, (4) Turner earthwork, (5) Boyles Farm, (6) Finney, (7) Rutledge, (8) Wright, (9) Melvin Phillips, (10) Rockhold, (11) Seip earthwork, (12) Baum earthwork, (13) Bourneville, (14) Frankfort earthwork, (15) Ater, (16) Hopewell earthwork, (17) Anderson earthwork, (18) Junction earthworks, (19) Snake Den, (20) Circleville earthwork, (21) Westenhaver, (22) Blackwater earthwork, (23) Dunlap earthwork, (24) Cedar Bank earthwork, (25) Ginther, (26) Shilder, (27) Hopeton earthwork, (28) Mound City earthwork, (29) Shriver earthwork, (30) Works East earthwork, (31) High Bank earthwork, (32) Liberty earthwork, (33) McKenzie, (34) Seal earthwork, (35) Tremper earthwork, (36) Portsmouth Square earthwork, (37) Esch, (38) Wells, (39) Eagle, (40) Stone, (41) Hazlett, (42) Rollins Ford Farm, (43) Martin, (44) Yant, (45) Kohl, (46) Marietta earthwork, and (47) North Benton.

at regular intervals along river courses, according to Dancey and Pacheco's schema. Pacheco's (1996a) description of Hopewellian communities in the central Muskingum region is perhaps the clearest expression of this. He described six independent Ohio Hopewell communities, each focused on an earthwork center. Where multiple earthworks fall within the apparent territorial bounds of a single community, he posited that this "is probably indicative of time, rather than additional communities" (Pacheco 1996:24). Territorial boundaries between contiguous communities are fixed on valley floors, but more open and fluid where they face into upland hunting grounds on valley margins (Dancey and Pacheco 1997a:7, figure 1.2b). Specialized camps supporting specific subsistence pursuits and extractive activities, as well as significant symbolic places, may be found throughout the community's territorial range. It is impossible to specify whether the Ohio Hopewellian communities envisioned by Dancey and Pacheco would be residential, local symbolic, and/or sustainable communities in the terms used in this chapter. The authors do not model enough about the social composition, functions, and activities of such hypothetical communities to define them to this detail.

At a broader scale, Dancey and Pacheco (1997a:9b) postulated that some of "the burial groups under the conjoined mounds at sites like Seip, Liberty, and Hopewell may represent the dominant lineages of several adjacent communities," elaborating on Carr and Maslowski (1995:338–339). Each such set of contiguous communities may have constituted a peer polity, focused on its own, centrally located public works. Dancey and Pacheco (1997a:9–10) suggested that the very largest mound and earthwork centers in each of the various southern Ohio regions may have served this role: for example, the Hopewell Mound Group in the Scioto–Paint Creek confluence region, the Newark complex in the Muskingum watershed, the Portsmouth works at the mouth of the Scioto, and Turner Earthworks in the region drained by the Great Miami and Little Miami rivers.

In Dancey and Pacheco's model, the organization of Ohio Hopewellian communities was based on a swidden agricultural subsistence strategy. Agriculture was developed enough to produce the dietary staples of the peoples and to have had a major impact on the local forest ecology (Dancey and Pacheco 1997a:11).

There is a growing body of empirical data in support of the most fundamental tenets of this model. Large nucleated settlements have not been identified in association with any major earthwork center or elsewhere on the landscape. Instead, wherever intensive and systematic surveys have been undertaken in the vicinity of the major Ohio centers, these reveal a pattern of small-scale domestic habitations located outside of the earthwork walls, along with a variety of special-purpose activity areas both inside and outside the walls. The specialized loci are variously interpreted as ritual camps, workshops, plazas, and blade manufacturing and use areas.

The following sections summarize some of this evidence and supplement it with notices of new data emerging from recent fieldwork in the region. After a long hiatus that witnessed only sporadic field investigations in the Scioto–Paint Creek region, the National Park Service has sponsored a ressurgence in field investigations in the area since 1994. Expansion of the former Mound City Group National Monument to include four additional Hopewellian mound and earthwork centers in Ross County, Ohio (the Hopeton Works, Hopewell Mound Group, High Bank Works, and Seip Earthworks), has prompted new surveys and excavations designed to evaluate the nature and integrity of the new park units, and to evaluate additional sites in the region for possible inclusion in the park. Recent investigations in the vicinity of Mound City, Hopeton, Hopewell, and Seip have not yet been fully reported, but the preliminary results support the contention that individual Hopewellian domestic habitations in the Scioto–Paint Creek region were small—more aptly described as households or hamlets than villages (contra Griffin 1996). The new research also documents a variety of special-purpose areas in association with these major enclosures.

Households and Hamlets

Habitations and Specialized Sites in the Immediate Scioto–Paint Creek Area

The McGraw site, excavated in 1963, remains the only published example of an excavated domestic habitation in the vicinity of the Scioto–Paint Creek confluence (Prufer 1965). There, Prufer found buried in the active Scioto River flood plain a midden deposit averaging about 18 centimeters thick and covering an area of about 0.12 hectare (about 30×40 meters). No remains of structures or other features were identified, possibly because the area excavated was a trash dump downslope of a work and/or habitation area (Carr and Haas 1996:28; Dancey 1991:38). Erosion and the difficulties of identifying postmolds and pits in the midden-stained soils remain other possibilities. The midden assemblage conforms to the expected composition of a domestic refuse deposit. The artifact assemblage is dominated by utilitarian ceramics, chert debitage, cutting tools, and projectiles. Only a few items hint at participation in Hopewellian ritual and long-distance procurement: some scrap mica, a copper awl or drill, two worked bear canines, a sandstone cone, and

five crude ceramic figurine fragments. By far, the bulk of the assemblage reflects more mundane concerns. Faunal remains were abundant throughout—mostly deer, with turkey, turtles, fish, and shellfish as subdominants. Flotation was not used, the technique having been in its infancy, but nonetheless, the midden yielded some wild plant food remains (nutshell and berry seeds), and a single cob and a few kernels of maize (*Zea mays*).[16]

There is little other direct evidence of subsistence practices, particularly with respect to agricultural practices, from Hopewellian sites in the immediate Scioto–Paint Creek area. A few samples from the Salt Creek valley are discussed below. However, cultivated and domesticated plant resources including cucurbits, sunflower, sumpweed, goosefoot, maygrass, knotweed, and little barley are consistently present in Hopewellian assemblages from sites in the nearby Licking River drainage (Wymer 1997). The co-occurrence of these plants along with genera characteristic of both mature and early successional forests suggests the operation of a forest swidden agricultural system (Wymer 1997). Hopewellian botanical assemblages from locations farther afield along the Ohio river, in southwestern and southeastern Ohio, are remarkably similar in the representation of cultigens and domesticates (Wymer 1996).

Systematic surface surveys and excavations at the Hopeton and Hopewell earthworks, yet unpublished, have provided evidence on habitations that complements that from McGraw. At Hopeton, systematic surface surveys under the direction of Ruby (1996, 1997c; Ruby and Troy 1997), Dancey (1997), and Burks et al. (2002) have produced the most comprehensive and detailed artifact distribution maps in the vicinity of any major Ohio Hopewell earthwork. Virtually the entire terrace surface within 1,000 meters of the earthworks was surveyed under conditions of good surface visibility (open, cultivated soils) at transect intervals of no more than 10 meters. In most areas, all artifacts—including chert debitage and fire-cracked rock—were individually piece-plotted. These detailed studies documented widespread Middle Woodland period activity across the entire landform, and three relatively dense concentrations of Middle Woodland period diagnostics: the "Triangle" (33 Ro 812), "Overly" (33Ro 110), and "Redwing" (33 Ro 813) components. In no case do the material densities approach those characteristic of nearby Late Woodland or Fort Ancient-period village occupations, such as Harness-28 (Coughlin and Seeman 1997; Seeman 1981a, 1981b), Gartner (Mills 1904; Troy 2002), and Baum (Mills 1906).

Two of the densest concentrations of Middle Woodland-period debris at the Hopeton Works were intensively investigated by archaeogeophysical methods and wide-area mechanical stripping: Mark Lynott's 1994 and 1998 investigations at the Triangle component and William Dancey's 1995 investigations at the Overly Tract (Dancey 1997; Lynott 1998a, 1998b, Lynott 2001; Weymouth 1996, 1998a, 1998b). In both areas, loose clusters of shallow refuse and rock-filled basins and occasional earth ovens were revealed, and no remains of structures were identified. Portions of both of these concentrations could be attributed to pre or post-Middle Woodland period occupations. Field observations suggest that the Middle Woodland period occupations were household or hamlet-scale habitations with evidence for a full range of domestic activities, but with no evidence of the intensive and structured use of space characteristic of later Ohio village-scale occupations. Surface survey, geophysical exploration, and limited subsurface testing at the Redwing component revealed what may be a specialized locus of activities that were more likely corporate–ceremonial than domestic (see below; also Ruby 1997b, 1997c, 1997d).

The flood plain below the Hopeton Works has not been as intensively surveyed, but there are indications of Middle Woodland activity in the area (Brose 1976). Ruby excavated a small-scale test trench in 1995 and identified a low-density midden deposit buried by a meter of alluvial sediments. It was radiocarbon dated to about A.D. 100 radiocarbon time (33 Ro 811, Beta-109961; see Appendix 4.1 and Dancey 1995).

Survey in and around the Hopewell Mound Group has failed to locate evidence of large,

nucleated villages (Seeman 1981a, 1981b). However, a recent shovel-test survey of 21 localities within a 10-kilometer radius did document widespread, if somewhat ephemeral, Middle Woodland activity in the vicinity. One of these localities ("Datum H") produced a relatively high proportion (approximately 25%) of undecorated ceramics, and is a strong candidate for a small-scale domestic habitation just outside the earthwork walls (Dancey 1996; Hopewell Culture National Historical Park 2003). Other recent work (see below) has documented indications of more specialized occupations, especially within the earthwork enclosure.

Habitations and Specialized Sites Elsewhere in the Scioto Drainage

Survey and excavation data on small habitations are also available from sections of the Scioto drainage farther north and south of the Paint Creek confluence. Three previously unpublished cases are summarized here. Each evidence short, ephemeral occupation compared to the McGraw and Murphy sites, with abandonment and reoccupation probable in two of the cases.

Madeira–Brown. The Madeira–Brown site (33 Pk 153) is an example of a Scioto Hopewell habitation in the Unglaciated Allegheny Plateau province, in a main valley setting. The site is located on a flood-prone low terrace in the Scioto river bottomlands in Pike County, Ohio, about 30 kilometers south of the Scioto–Paint Creek confluence. The nearest mounds or earthworks consist of a group of conical mounds located about 800 meters northeast. The "Graded Way" at Piketon (Fowke 1902:274–278; Squier and Davis 1848:88–90) is located about two kilometers north, and the Seal Township Works (Fowke 1902:179–181; Squier and Davis 1848:66–67) are located about eight kilometers south. The nearest major mound and earthwork complexes are located about 30 kilometers distance, at Liberty to the north and Portsmouth to the south.

The site was heavily investigated (Bush et al. 1989, 1992; Ohio Department of Transportation 1993).[17] Intensive surface collection identified a relatively light scatter of Late Archaic and Middle Woodland lithics and one possible Middle Woodland period ceramic sherd within an area of about 100 × 120 meters (1.2 hectares) (Bush et al. 1992). Plow-zone stripping exposed an estimated 25% of the total site area and revealed six refuse-filled pits and 53 postmolds (Ohio Department of Transportation 1993). Five of the refuse-filled pits were shallow and basin-shaped; the sixth was nearly one meter deep, with basal deposits of fire-cracked rock and charcoal suggesting its use as an earth oven. Additional diagnostic artifacts recovered include 7 fragmentary Vanport chert bladelets, 14 (probable) McGraw Cordmarked sherds, and 2 possible Chillicothe Incised or Turner Simple Stamped sherds. There is a possibility that substantial secondary refuse deposits could exist in nearby buried swale contexts not sampled (Ohio Department of Transportation 1993:23–24).

The postmolds suggest at least three structures (Appendix 4.2). One, only partially exposed, was circular, 6.8 meters in diameter, with an estimated floor area of 36.3 square meters, and capable of having accommodated about 8 individuals. This is the modal size for Middle Woodland habitation structures identified by B. Smith (1992:figure 9.8). One of the basin-shaped pits was inside the post pattern, and one of the possible Chillicothe Incised sherds was recovered from a posthole fill. A second, less complete arc of postholes overlaps the first and suggests a rebuilding episode. A third, incomplete post pattern about 20 meters away appears to describe a rectilinear structure, with rounded corners. It is estimated to have been a minimum 6.1 × 9.8 meters, with a floor area of 59.8 square meters, and capable of having accommodated 11 individuals. This area is toward the upper end of the size range for Middle Woodland habitation structures identified by B. Smith (1992:figure 9.8).

Baker (Ohio Department of Transportation 1993) interpreted the Middle Woodland component at Madeira–Brown as a hamlet-scale residential occupation within a settlement system that also included specialized logistical camps in upland settings. It should be noted that the site produced very few artifacts in comparison to other Ohio Hopewell habitations such as

McGraw and Murphy, and the contrast is even more striking when compared to settlements such as Smiling Dan in the lower Illinois river valley and Mann in the lower Ohio valley (Table 4.5).

Marsh Run. The Marsh Run (33 Fr 895; a.k.a. "Wal-Mart site") and Clarence Ford (33 Fa 81) sites provide the best examples of upland habitation sites in the central Scioto basin. Marsh Run is located on a gentle upland rise in the central Ohio Till Plains, in Franklin County, just southwest of Columbus, Ohio (Aument et al. 1991; Aument and Gibbs 1992; Cowan 2003a). The site is situated near a wetland depression at the headwaters of Marsh Run, a small stream that flows east to the central Scioto river, about 8 kilometers distance. The nearest mounds or earthworks are reported in Mills's (1914) *Atlas* and include two circular enclosures located approximately 4.8 and 6.4 kilometers away, and two isolated mounds located approximately 1.6 and 2.4 kilometers away. The major earthworks at Newark and Chillicothe are nearly equidistant, about 65 kilometers away.

The site was intensively investigated through survey, which revealed two concentrations of artifacts on two small knolls located about 100–150 meters apart within an approximately 1.5-hectare scatter. Both concentrations had diagnostic Hopewellian bladelets and were mechanically stripped, exposing some 4,392 square meters. The bulk of the artifacts and features on the two knolls relate to the Middle Woodland period. One concentration was estimated to have been about 0.14 hectare; the other, about 0.70 hectare. The underlying subplow-zone features, however, occupied much smaller areas, estimated at 100 and 240 square meters. One cluster included three postmolds and two shallow basin-shaped pits associated with heating, cooking, and/or processing functions, but not storage. The second cluster included 21 postmolds and 5 shallow, basin-shaped heating/cooking/processing pits. The postmold patterns cannot be confidently interpreted, but several linear alignments suggest the presence of rectangular structures, screens, or racks (Appendix 4.3). Some postmolds contained charred wood fragments or burned clay nodules, while others appeared to have been purposely removed, suggesting several periods of site use and reuse. No significant midden deposits were identified.

The material assemblage documents a wide range of domestic activities. The assemblage includes at least 1 diagnostic Middle Woodland projectile point, 2 drills, and 5 endscrapers; 102 whole and fragmentary bladelets and 7 bladelet cores; 4 celts, 2 pitted stones, 1 grinding stone, 1 fragmentary gorget, and 1 fragmentary pendant; and 149 grit-tempered sherds and many sherdlets. The small archaeobotanical assemblage is dominated by locally available nuts and wild varieties of goosefoot (*Chenopodium* sp.) and maygrass (*Phalaris* sp.). Cultivated cucurbit rind is present. Faunal remains are virtually absent, likely due to poor preservation.

Six radiocarbon dates were obtained from charred wood samples (Appendix 4.1). Four of these apparently relate to intermittent occupations during the Early and Middle Woodland periods. The spread among the calibrated dates more strongly supports a series of short-term occupations than a long period of continuous occupation, as discussed below and shown in Table 4.4.

Clarence Ford. The Clarence Ford site is also located in the rolling uplands of the central Ohio Till Plains, in Fairfield County just east of Columbus (Aument 2003; Aument and Gibbs 1992). The site overlooks the narrow flood plain of Sycamore Creek, a tributary stream that flows into the central Scioto valley about 20 kilometers to the west. There are no mounds or earthworks in the immediate neighborhood, but the Newark Works lie about 30 kilometers to the northeast.

The site is multicomponent, complicating estimates of site size, but the Middle Woodland component is probably less than 0.35 hectare. Limited testing identified a stone-lined earth oven separated by about 12 meters from a basin-shaped cooking/heating facility and three large and deep postmolds, 30 centimeters in diameter × 50–60 centimeters deep, with ceramic and stone chinking. A mud dauber's nest with a sedge stem imprint was found in the cooking/heating facility. The excavators interpreted

the postmolds as remnants of a structure, which the mud dauber's nest corroborates and suggests was built partly of sedge. Time constraints did not permit the full pattern of posts to be exposed (Aument 2003; Aument and Gibbs 1992).

The material assemblage included diagnostic bladelets, McGraw-series cordmarked ceramics, Chesser Notched bifaces, and groundstone items including pitted stones and celt and gorget fragments. The botanical assemblage includes exclusively wild plant food resources: sumac seeds and nuts including hickory nuts, black walnuts, hazelnuts, and acorns. Faunal remains are virtually absent, again likely due to poor preservation.

Aument and Gibbs (1992) note that the upland Marsh Run and Clarence Ford sites differ in several respects from valley-bottom sites interpreted as year-round sedentary hamlets, such as the Murphy I occupation (Dancey 1991; Pacheco 1997). The upland occupations are smaller, with fewer and less functionally diverse features, midden development is absent, there is evidence of periodic abandonment and rebuilding of structures, and the botanical assemblages are dominated by wild plant foods rather than agricultural products. These observations led Aument and Gibbs (1992) to infer that the sites may represent seasonal, fall–winter occupations, perhaps complementary to valley-bottom warm-season farming occupations.

Wade. The Wade site is located in the flood plain of Salt Creek—a good-sized tributary that drains the Unglaciated Allegheny Plateau south and east of the Scioto–Paint Creek confluence (Church and Ericksen 1997; Prufer 1975, 1997b). Excavations within a 0.16-hectare area revealed a loose cluster of shallow basins, hearths, earth ovens, and fire-cracked rock concentrations interpreted as heating or food processing facilities. Undecorated ceramics, chert debitage, cutting tools, and projectiles made up the vast majority of the recovered artifacts. A few pieces of scrap mica constitute the only evidence of nonsubsistence activities. No faunal remains were recovered, but this might be attributed to acidic soils and poor preservation. Virtually the same description could be applied to the limited excavations at the nearby Ilif Riddle I site reported by Prufer (1997b). Nutshell and economically important seeds including some possible cultigens (maygrass [*Phalaris* sp.] and goosefoot [*Chenopodium* sp.]) were recovered at Wade by flotation, along with wild seeds indicating disturbed habitats.

Church and Ericksen (1997) interpreted the Wade site as a seasonally occupied, household-scale settlement. Baker (Ohio Department of Transportation 1993) points out that the Wade site occupation was orders of magnitude smaller in its area of debris scatter, number of features, number of artifacts, and density of food remains than the McGraw and Murphy occupations, which are commonly described as "typical" Ohio Hopewell hamlets (see Dancey 1991; Prufer 1965). Thus, Baker suggested that Wade, which is in a flood plain setting, as well as small sites in the uplands, such as Marsh Run and Clarence Ford, may represent logistical camps that complemented more substantial residential occupations elsewhere.

Beyond the Scioto–Paint Creek area, in the neighboring Licking–Muskingum drainage basin, a few habitation sites have been documented by excavation, but are beyond the geographic scope of this study. The Murphy I site (Dancey 1991) was explored and reported most fully. Information is also available from excavations at the Murphy III and Cox B sites (Morton and Carskadden 1987; Pacheco 1996:27–28).

Patterning among Habitation Sites

Middle Woodland dwellings in the Scioto–Paint Creek area and neighboring drainages usually were isolated or occurred in twos or threes, the generational contemporaneity of which is hard to demonstrate. The two or three dwellings at the Marsh Run site described above, and three couplets of habitations in a small tributary of the Licking valley that likely date to three different periods (Pacheco 1997:56, 58), provide the

best evidence for multiple household residential sites. Other, less chronologically clear cases include clusters of up to six apparent habitations within one kilometer in the Dresden subregion of the Muskingum valley (Carskadden 1997:374), clusters of two or three apparent habitations within one kilometer in the Philo district of that valley (Carskadden 1996:321), some couplets of apparent habitations within one-half kilometer of each other in the upper Jonathan Creek subregion of the Muskingum (Pacheco 1996:31), and a group of up to seven possible habitations within one kilometer southwest of the Liberty earthworks (Seeman 1997). These groupings of households in the greater Scioto area all have fewer households than the larger of the bluff-based residential communities in the lower Illinois valley (e.g., Apple Creek, Macoupin, Gardens of Kampsville).

The probability that Scioto and neighboring Hopewellian farmers employed a swidden strategy, as evidenced by archaeobotanical information (Wymer 1997), suggests the possibility that they moved their residences periodically to remain near to their fields. Rainey (2003) has summarized ethnographic literature on the residential and field mobility of historic Native American farmers in the northeastern United States and found that villages were commonly moved every 10 to 20 years, usually in coordination with changes in the locations of fields, which were typically placed close to or within the villages. Field houses, which would have allowed the working of more distant fields and longer-term residential stability, were not used. In addition, Rainey estimated from the ecological successional nature of the wild plant food remains found in six Middle Woodland habitation sites in the Scioto area that fields abandoned upwards of 25 to 50 years were sometimes used for their secondary-growth wild resources, implying up to this duration between residential moves for some habitation sites. The paleobotanical records of some other sites imply shorter occupations. All of these durations are shorter than the 100 years of occupation estimated by Dancey (1991) for the Murphy I site, and more in accord with the multiple lines of evidence cited by Carr and Haas (1996) that indicate its substantially shorter occupation.

The periodic movement of residential sites by Scioto and neighboring Hopewellian peoples is also suggested by the multimodality of radiocarbon dates typically obtained from them (Table 4.4). Of nine Middle Woodland habitation sites with multiple, reasonable radiocarbon assays in the region, eight sites have two or three statistically distinct modalities, suggesting abandonments and later reoccupations, and only one site appears to represent a single occupation. This pattern is an expectable product of swidden farming, where residences are cyclically relocated to previously used areas in order to take advantage of the greater food resource diversity created there by former human disturbances and the less mature, more easily cut forests there. The length of reoccupation cycles for specific habitation locations in the sampled sites commonly falls between 175 and 300 years. The duration of cycles for household moves within a general area, with the potential use and reuse of many more alternative habitation sites within it by a local farming unit, could be significantly less, and is probably best estimated by the up to 25 to 50-year period of farming plot regrowth estimated by Rainey.

Specialized Activity Areas

There is comparatively little evidence of specialized extractive camps, such as nut-processing camps or fishing or shellfishing stations, that date to the Middle Woodland period. Exceptions include the apparently seasonal upland occupations at sites like Marsh Run and Clarence Ford (see above), and a few reported specialized sites in the Muskingum drainage in the Philo district (Carskadden 1996) and along a small seasonal tributary of Raccoon Creek (Pacheco 1997). There is also some evidence for Middle Woodland use of upland rockshelters throughout the heavily dissected hill country of southeastern Ohio. Remains at the rockshelters indicate that they were used markedly less during the Middle Woodland than the preceding Early Woodland period (Seeman 1996). Seeman suggests that this pattern is "consistent with increased sedentism

Table 4.4. Modalities in Calibrated Radiocarbon Dates from Middle Woodland Habitations[a]

Site	Number of dates	Means of modalities			Separation(s) among means of modalities
Ohio					
McGraw	11	A.D. 40	A.D. 315	A.D. 585	275 yr, 270 yr
Li 79.1	2	A.D. 137	A.D. 420		283 yr
Murphy I	6	40 B.C.	283 B.C.		323 yr
Marsh Run	3	180 B.C.	A.D. 120	A.D. 290	300 yr, 170 yr
Jennison Guard	3	A.D. 224	A.D. 398		174 yr
Decco	4	A.D. 320	A.D. 441		121 yr
Harness-28	3	50 B.C.	A.D. 380		430 yr
Newark Campus	2	A.D. 20	A.D. 540		520 yr
Locust	3	A.D. 176			One mode only
Illinois					
Smiling Dan	8	A.D. 50	A.D. 238	A.D. 400	188 yr, 162 yr

[a] Dates are reported by Carr and Haas (1996), Dancey and Pacheco (1997), and Stafford and Sant (1985). Dates taken from Carr and Haas, and Stafford and Sant, have been clustered into distinguishable modes, per procedures described in Carr and Haas. Dates taken from Dancey and Pacheco have been sorted into modes qualitatively, noting their standard deviations and disallowing any overlap among the standard deviations of dates in separate modes. An exception is the Jennison Guard site, where overlap among defined modes is minor. When a mode is defined by a single calibrated date with multiple intersect points, the average of the multiple intersect points has been used as the estimated mode. When a mode is defined by multiple calibrated dates, the average of the dates, and/or their multiple intersection points, has been used as the best estimate of the mode. For example, the calibrated dates reported for the Decco site include one with multiple intersections (A.D. 268/273/338) and three with single intersection points (A.D. 343, A.D. 381, A.D. 441). One mode (A.D. 320) is defined by the average of the three intersection points of the first date and the single intersection points of the second and third dates. The second mode (A.D. 441) is defined by the single intersection point of the fourth date.

and settlement pattern simplification, the concentration of settlement in a few high-yield environments, or both" (Seeman, p. 312a). To this might be added the intensification of farming systems and the increased dietary importance of cultigens compared to wild food resources (Wymer 2003).

There is considerably more evidence of specialized activity areas related to the mounded and enclosed ritual precincts in the Scioto–Paint Creek confluence area. The best-known example is the remains of a series of 8 to 10 formal wooden buildings constructed within the Seip Earthworks (Baby and Langlois 1979). The large size and formal architectural plan of these buildings mark them as something more than everyday domestic structures, and their contents suggest a specialized use (Greber et al. 2002). The layout of the buildings mirrors that of the submound charnel structures at Mound City and other burial sites, but the Seip buildings contained no human remains. All of the buildings had large numbers of bladelets and fragments of mica, but each was unique in other ways apparently related to the manufacture and use of varying kinds of ritual paraphernalia. One building had large quantities of mica and completed mica cutouts. Another yielded fragmentary mica, crystal quartz, and obsidian, as well as much of the skeletons of a gray fox and a salamander. It had an unusual line of functionally similar pits that ran diagonally across it, most of which contained large cobblestone cores. Two other buildings had, along one wall, a line of equally spaced pits that were each packed with small sandstone slabs and limestone cobbles arranged carefully in layers, and that had sticky black residues in their bottoms. The structures were ultimately taken down and covered with a low mantle of gravel and soil. Nearby are several prepared floors made by removing the topsoil down to the firm, gravelly subsoil. Some of these floors were large enough to be described as "plazas." The floors contain traces of open fires and large posts alternately raised and removed. These spaces, too, were ultimately mantled with a thin lens of gravel and soil (Greber 1997; Greber et al. 2002).

Another type of specialized activity area involved the use and manufacture of Hopewellian blades and cores. Small areas characterized by very high densities of lamellar blades and blade cores have been identified at the Liberty and Baum earthworks (Coughlin and Seeman 1997;

Greber 1997:217; Greber et al. 1981). These specialized sites appear to be found only in association with mounds and earthworks.

Other kinds of specialized activity areas are known from the Hopewell site. Moorehead (1922), and later Shetrone (1926), labeled two areas inside the earthwork wall "village sites". Seeman (1981a, 1981b) evaluated the nature of these supposed villages by controlled surface survey. He did not find debris at densities expectable for large nucleated villages. However, he did find evidence for widespread Hopewellian activity in and around the site, with the highest densities occurring within the earthwork enclosure. In some cases, the nature of the debris—fragments of obsidian, quartz crystal, and exotic Flint Ridge and Harrison County flints—suggests specialized locales devoted to the use or manufacture of ritual paraphernalia.

A recent systematic shovel-test survey directed by Ruby, Pederson, and Burks in the "Eastern Village" at the Hopewell Mound Group confirmed Seeman's conclusion (Burks and Pederson 1999, 2000; Pederson and Burks 2000). Only very low debris densities and two subsurface pit features were observed. Included in the fill of these two pit features were exotic (Southeastern) stamped and footed vessel fragments and modified human remains, suggesting activities beyond the mundane. One of the pits had a massive deposit of fire-cracked rock, suggesting food preparation and food sharing on a scale larger than the individual household. A similar shovel test survey of the "West Village" was directed by Pederson, Burks, and Dancey and documented somewhat higher debris densities, but again, quartz crystal and obsidian debitage point to nondomestic activities (Pederson and Dancey 2002; Pederson et al. 2002a).

Recent work at the Hopeton Earthworks has also identified areas of apparently specialized activities. In 1996 and 1997, the National Park Service sponsored controlled surface collection, resistance survey, and systematic subsurface testing at the Redwing component—one of the three densest concentrations of Middle Woodland debris documented at the site (Ruby 1997b, 1997c, 1997d). Whereas the other two concentrations are located in terrace-edge settings and optimally placed for exploitation of flood plain, riverine, and terrace subsistence resources, the Redwing component is located about 100 meters southwest of Hopeton's large geometric enclosure, apparently oriented toward that feature rather than any clearly identifiable aspect of the natural environment.

When the surface-collected assemblage from the Redwing area is compared to the debris densities reported for other Hopewellian occupations and the early Late Woodland Harness-28 village in the vicinity (Coughlin and Seeman 1997; Seeman 1981), it is apparent that the density of diagnostics is far below that seen on village-scale occupations, and is comparable to that of household-scale occupations. However, the range of utilitarian debris is restricted, and the assemblage includes some exotic raw materials: ceramics are entirely absent, blade cores are virtually absent, and the assemblage has a relatively high proportion of nonlocal materials including obsidian, quartz crystal, and certain cherts. The subsurface investigations identified only one cultural feature: a sheet midden between 20 and 30 centimeters thick and no more than 30 meters in diameter. The cultural materials recovered from this midden are again remarkable for their restricted range. The assemblage is dominated by lamellar blades, whereas bifaces, groundstone tools, and faunal remains are absent, and fewer than a dozen ceramic sherds were recovered. Two conventional radiometric determinations on wood charcoal help to date the component. One, at about A.D. 50, is consistent with other Hopewellian activities in the region (Beta-109963; see Appendix 4.1). The second date, at about A.D. 800, falls within the local Late Woodland period (Beta-109964; see Appendix 4.1) and suggests that some portion of the deposit can be attributed to this later time. In short, the Redwing component appears to represent something other than an ordinary domestic habitation.

Various features related to ceremonial activity have been encountered in recent investigations in and around the earthwork walls at Hopeton. Beneath the earthwork wall at the northwest corner of the great rectangular enclosure are a burned area and a deposit of wood charcoal containing mica flecks atop a prepared

surface composed of thin layers of silt, sand, and clay. These prepared and burned surfaces are interpreted as the remains of ceremonial activities that marked the initiation of construction on this earthwork segment. The charcoal has been dated to about A.D 20 radiocarbon time (Beta-96598; see Appendix 4.1) (Ruby 1997b). A lens of redeposited midden located above the base of the wall on the lower north (exterior) slope of this same earthwork segment has recently been dated to about A.D 110 radiocarbon time (Beta-109962; see Appendix 4.1). This midden may have been deposited at the time of construction from a nearby nonearthwork context, or may have been redeposited by erosion from higher up on the earthwork wall. More recent work has documented additional burning and a prepared clay basin at several locations beneath and adjacent to the west and south walls of the rectangular enclosure (Lynott 2002a, 2002b; Lynott and Weymouth 2001a, 2001b; Weymouth 2002).

Farther afield from the Scioto–Paint Creek area, the DECCO-1 site provides a final example of an apparently specialized, non–domestic site. The site is located in Delaware County, on the flood plain of the Olentangy River, a major tributary to the Scioto river in the Till Plains north of Columbus, Ohio (Aument et al. 1991; Cowan 2003b; Phagan 1977, n.d.a, n.d.b). Mounds and earthworks occur in the general vicinity, but none are directly associated with the site. The Newark complex is the nearest major Hopewellian center, located about 50 kilometers to the east.

Surface survey identified four concentrations within an area of about 60 × 145 meters (0.87 hectare) and diagnostic artifacts indicating multiple occupations from the Archaic through the Historic periods. Excavation revealed a Middle Woodland building: a circular, single-post structure, about 12.8 meters in diameter (Appendix 4.4). The individual posts were large, approximately 20 centimeters in diameter, and spaced at about 1-meter intervals. A bigger post, 30 centimeters in diameter, occupied the center of the alignment, and four other posts are scattered in the interior. The center post was dated to A.D. 370 radiocarbon time (Appendix 4.1), and one of the outer posts was dated to A.D. 270 radiocarbon time (Appendix 4.1). A few other apparent postmolds are scattered outside of the circular alignment in no clear order. Some postmolds were tightly packed with fire-cracked rocks, suggesting that the structure was intentionally dismantled.

A pot containing carbonized hickory nuts was found in a small pit within the post pattern and dated to A.D. 240 radiocarbon time (Appendix 4.1). A second pit within the post pattern contained red ocher, and another pit containing red ocher was found about 15 meters outside the post pattern. A second pot, containing large pieces of mica (up to 12.5 centimeters), was found in a stone-lined earth oven approximately 50 meters east of the structure. This feature was dated to A.D. 250 radiocarbon time (Appendix 4.1). At least three other cooking/heating pits were found in and around the structure. A poorly defined area of dark soil, chert debitage, and ceramics (and some historic pottery and nails), approximately 5 × 10 meters in area and 15 to 40 centimeters deep, may represent a midden deposit located about 15 meters outside the structure. Two burial features were found about 3 meters outside the structure, but a Late Prehistoric radiocarbon date from one of the features calls into question their association with the structure (Appendix 4.1).

Phagan (n.d.a) interpreted the site as a "living site of the 'average' woodland people". However, several lines of evidence argue that the site was used for ceremonial rather than domestic purposes. Only five diagnostic Hopewellian lamellar blades were recovered in an assemblage of more than 4,000 chert flakes and tools—suggesting a relatively short-term or specialized Middle Woodland-period occupation.[18] The presence of considerable quantities of mica and red ocher in cache or deposit contexts points to ceremonial activities. Perhaps the strongest evidence that the site was ceremonial rather than domestic in use is the size of the structure itself. Its floor area—128.8 square meters, capable of accommodating about 18 persons—is larger than all but 1 of the 57 Hopewellian habitation structures measured by B. Smith (1992:figure 9.8), and is more comfortably classed with the larger ceremonial structures in Ohio.

Summary

There is now considerable evidence in support of the most basic tenets of Prufer's vacant center model and Dancey and Pacheco's updated version, the dispersed sedentary community model. Hopewellian settlements in the Scioto–Paint Creek confluence region are clearly small and dispersed, and most of the activity areas directly associated with the major earthwork centers are attributable to ceremonial activities rather than domestic occupations. There is evidence that Dancey and Pacheco's model overstates the degree of residential stability characteristic of Scioto Hopewell habitations. Rather than long-term stability over centuries, this review finds that individual domestic settlements were likely abandoned and reoccupied on scales measured in decades at most.

Community Organization in the Scioto–Paint Creek Confluence Region

Although most of the fundamental features of Prufer's and Dancey and Pacheco's models of Scioto Hopewell community organization now appear to be firmly established empirically, these models are largely silent on two critical issues. The issues are: (1) whether earthwork-mound ceremonial centers were functionally differentiated, and (2) whether at least some centers served multiple local symbolic communities rather than just one. Understanding the dynamics of Scioto Hopewellian community organization requires that both question be answered, one way or another.

Functional Differentiation among Mounds and Earthworks

Historically, researchers in the Illinois valley area have devoted much more attention to variability between ceremonial sites than have archaeologists in the Ohio area. Much of this interest can be traced to the work of Stuart Struever, who proposed a complex typology of nondomestic sites in the 1960s (Struever 1968; Struever and Houart 1972): bluff-crest cemeteries, mortuary camps, and flood plain mound groups that served variously as "local transaction centers" and "regional transaction centers" involved in the exchange of "Interaction Sphere" goods. This same interest continues among Illinois valley archaeologists, who are actively documenting and seeking to explain and interpret variability among Illinois valley ceremonial contexts (see especially Buikstra and Charles 1999; Buikstra et al. 1998; Farnsworth 1990; Styles and Purdue 1991; Wiant and McGimsey 1986).

In contrast, there has been very little research along these lines in the Ohio region. This is something of a paradox, because the pioneering 19th Century research of Squier and Davis (1848) included an overriding concern with classifying mounds into functional categories: mounds of sepulcher, defensive works, sacred enclosures, and the like. Prufer (1964a, 1997a) continued this concern to some extent, recognizing a functional distinction between the hilltop enclosures and the lowland geometric works. However, there has been very little discussion of possible functional variability beyond this most basic division. In the most recent general formulation of Ohio Hopewell settlement systems—Dancey and Pacheco's (1997a) dispersed sedentary community model—variability among mound and earthwork centers is largely attributed to differences in the timing or duration of earthwork use and construction, and other authors follow suit (e.g., DeBoer 1997; Greber 1997). (For further details on the history of ideas about Hopewellian ceremonial site variation by Illinois and Ohio archaeologists, see Carr, Chapter 3, Previous Models of Hopewellian Communities.)

There are several lines of argument that can be marshaled as evidence for functional differentiation of Hopewellian mound and earthwork sites in the Scioto–Paint Creek confluence region. First, there is evidence that functional differentiation among earthworks has deep roots in ancestral Adena ritual. Clay (1987, 1986, 1991) and others (Niquette et al. 1988; Seeman 1986) have argued that the Adena ritual landscape contained several different kinds of sites, including mounds, paired post wooden enclosures, ceremonial circles (circular earthworks with interior ditches and exterior embankments), and large ditched enclosures. These authors argue that these different site types served various functions, including burial sites, meeting places, loci

for staged mortuary ritual, and specialized centers for the acquisition of raw materials (e.g., clay, galena) and the production of ritual paraphernalia. It is reasonable to expect that the yet wider range of mound and earthwork forms, submound structures, and other ritual features attributable to Hopewellian hands represents an elaboration on the Adena tradition of functionally differentiating ritual spaces.

Second, in Ross County, alone, a bewildering variety of construction is found: single mounds, mounds in groups, mounds in lowlands, mounds on hilltops; conical mounds, loaf-shaped mounds, effigy mounds; enclosures with mounds, enclosures without mounds; geometric earthworks, irregular earthworks; lowland enclosures, hilltop enclosures. The sheer variety of forms and locations of Hopewellian mounds and earthworks almost assuredly reflects some degree of functional differentiation.

Third, recent work at the Spruce Hill Works in the Paint Creek valley has provided additional evidence that the hilltop enclosures of southern Ohio were functionally distinct from the lowland geometric works (Ruby 1998). Very early on, Squier and Davis (1848) and others ascribed to these works a defensive function, owing to their placement on often precipitous hilltops, their often massive encircling embankments, and occasional architectural details such as reentrant gateways and parapets that are reminiscent of a number of well-known European hilltop fortifications of the prehistoric and historic periods. Prufer (1997:313a) has continued to champion the view that "the primary function of the enclosures was defensive, although it is clear, and not especially surprising, that some ceremonial functions were also carried out in the context of these edifices." The Spruce Hill case provides little support for the martial hypothesis. The area enclosed is likely too large, and the walls too low, to have offered much protection, yet the site clearly differs from the geometric Baum earthwork located immediately below it and the nearby Seip geometric enclosure. In contrast to Seip and despite years of amateur and professional exploration, Spruce Hill has never produced evidence of human burials or large quantities of Hopewellian debris—domestic or otherwise. Instead, the evidence amassed to date consists of a small quantity of Hopewellian lithic and ceramic debris focused on the gateways leading into the enclosure, and prodigious quantities of burned, even vitrified, rock and soil—again, in association with the gateways. Activities that involved intense burning appear to be a common characteristic of Hopewellian hilltop enclosures, with similar evidence having been reported at Fort Ancient (Moorehead 1890), Foster's Crossing (Fowke 1902; Moorehead 1890), Fort Miami (Moorehead 1890), Four Mile Creek (McFarland 1887), and the Pollock Works (Riordan 1995, 1996, 2002).

Squier and Davis (1848:181–183), too, noted that many of the most prominent hilltops overlooking the lowland mounds and earthworks bear traces of intense burning, perhaps the remains of signal fires or ceremonial pyres. Christopher Turner (1983, 1999, 2000) recently undertook a systematic survey of the horizons surrounding the Hopeton Works and mapped a number of burned rock piles or "fire cairns." He found that several of these mark locations along sightlines defined by gateways in the Hopeton enclosures. In three cases, burned stone piles correspond with sightlines indexing calendrical solar and lunar rise events: the May cross-quarter sunrise, the minimum south lunar extreme, and the maximum south lunar extreme.

It is far from clear whether this burning is related to some specific ritual activity, to conflict and conflagration, or simply to a construction technique common to these hilltop enclosures and analogous to the timber-laced vitrified forts of western Europe (see Cotton 1955; MacKie 1976). At any rate, similar evidence has not been found in association with the lowland enclosures, which suggests that the hilltop sites hosted an entirely different set of activities.

Fourth, evidence of functional differentiation also comes from at least three sites in south–central Ohio: Cedar Banks and Ginther in the Scioto–Paint Creek area, and Marietta, at the mouth of the Muskingum (Pickard 1996; Prufer 1968:41–45; Shetrone 1925; Squier and

Davis 1848:73–77).[19] These sites are predominated by rectangular platform mounds and apparently represent a nonmortuary ceremonialism similar to that described above for the Mann site platform mounds (Pickard 1996; Prufer1968: 41–45; Shetrone 1925; Squier and Davis 1848:73–77). Limited testing in one of the Marietta platform mounds has recently yielded a Middle Woodland artifact assemblage in association with charred material radiocarbon dated to the second and third centuries A.D. The internal structure of the mound revealed a series of prepared horizontal activity floors composed of thin lenses of clays, sands, and gravels similar to those documented in Mann mound IU 9 (Pickard 1996). The functional differentiation of Marietta, Cedar Banks, and Ginther from other earthworks in south–central Ohio is also hinted at by the correlation of their flat-topped mounds with embankments that are only square in shape or are dominated by squares. This is also the situation at the Mann site. Farther afield, Middle Woodland platform mounds have also been reported from several locations in the Midsouth and lower Mississippi valley: the Pinson, Johnston, and Ames Plantation sites in western Tennessee (Kwas and Mainfort 1986; Mainfort 1986; Mainfort and Walling 1992; Mainfort et al. 1982; Peterson 1979), the Ingomar site in northeastern Mississippi (Rafferty 1983, 1987), the Walling site in Alabama (Knight 1990b), the Leist site in the Yazoo Basin (Phillips 1970:368–369), and the Marksville site in the lower Mississippi valley (Toth 1974). Taken together, all of these platform mound sites suggest the existence of a particular expression of Hopewellian ceremonialism that was not focused on mortuary processing but, instead, used earthen platforms as stages for ceremonial performance and/or participation.

Several other kinds of evidence that point to the functional differentiation of ceremonial centers in the Scioto–Paint Creek confluence include systematic and significant differences among them in their orientations relative to celestial phenomena; in the age and sex distributions of their burials; in the sizes of their burial populations; in the body treatment (cremation or inhumation) given the deceased; and in the range of social roles of the deceased, as indicated by grave goods. These variations suggest differences among centers in the kinds of rituals enacted at them and/or in the social segments that they served. These and other arguments are presented in detail by Carr (Chapter 3).

In sum, many kinds of archaeological evidence and lines of reasoning suggest that mound and earthwork ceremonial centers in the Scioto–Paint Creek area varied in their functions and the range of activities that occurred at them. An earlier Adena tradition of functionally differentiated earthworks, the great range of shapes and locations of Hopewellian mounds and earthworks, clear evidence for differences among earthworks in the kinds of activities and rituals that did and did not take place in them, such as mortuary activities, and a functional distinction between sites that had platform mounds for stages and those that lacked them and had only burial mounds each point to a complex, richly differentiated, ritual landscape that was constructed by Hopewellian peoples.

Multiple Centers within Residential Communities and Multicommunity Ceremonial Centers

If mound and earthwork centers in the Scioto–Paint Creek region varied in their function, as they seem to have, a question naturally arises as to whether they differed functionally in the specific ways that bluff-top and flood plain ceremonial centers did in the lower Illinois valley. There, each bluff-top mound group served to integrate and define a local symbolic community through burial in a common cemetery, whereas each flood plain mound group was a context for interaction between several of these local communities from up and down the valley, which formed a demographically sustainable community. This multiscalar organization of Havana Hopewell ceremonial and sociopolitical life contrasts with Dancey and Pacheco's model of community organization in the Scioto–Paint Creek area, where mounds and earthworks are envisioned as having functioned in only one

manner, analogous to the bluff-top mound groups in the lower Illinois valley. In the Dancey–Pacheco model, scattered homesteads or small clusters of them, which we call residential communities, were integrated into a local symbolic community, in our terms, through common burial and interaction at a centrally located ritual precinct marked by a mound and/or earthwork complex. In Clay's (1991) parlance, Dancey and Pacheco's model is essentially a "bull's-eye" model. Is it possible that some earthwork-mound complexes in the Scioto–Paint Creek confluence also were gathering places for multiple local symbolic communities, rather than only one?

The most compelling form of evidence that some mounds and earthworks in the Scioto–Paint Creek confluence region did serve as centers for multiple local symbolic communities is that many contemporary earthwork-mound complexes in this region are simply "too close" together to have stood at the territorial centers of distinct local symbolic communities. The tight clustering of earthwork-mound complexes in the Scioto–Paint creek area suggests, instead, an interrelated ritual landscape of functionally differentiated ceremonial centers, at least many of which were each made and used by multiple local symbolic communities, of varying numbers over generations (Ruby 1997c). In other words, we are suggesting that earthworks of multiple functions were found within and/or among the territories of local symbolic communities, and that these earthworks were commonly used by persons from multiple local symbolic communities rather than single ones.

To make this argument requires a rough estimate of the likely catchment sizes of Scioto Hopewellian local symbolic communities. Both cross-cultural and Ohio Hopewell-specific data are useful in this regard. Cross-cultural studies of the travel costs and the sizes of resource exploitation catchments of farmers and hunter–gatherers have been summarized by Varien (1999:153–155) and reported above (see Considering Communities). Most studies have found that farmers that use swidden techniques, which probably are analogous to the ones used by Scioto Hopewell peoples (Wymer 1996, 1997), regularly cultivate fields at distances of three to five kilometers, with seven to eight kilometers being a good estimate of the maximum distance of travel. We can take these distances also as the practical distances within which swidden farmers might interact fairly regularly and construct a local symbolic community. This catchment size, in turn, matches well with archaeological data on the sizes of Hopewellian local symbolic communities in central Ohio. Some of the best-documented Hopewellian site distributions in the Ohio valley are those in the central Muskingum valley region, as a result of a long-term research program there (Pacheco 1989, 1993, 1996). The data suggest that local symbolic communities in this area had catchment radii of the order of 3 to 5.5 kilometers. A well-defined cluster of small habitation sites, mounds, and a small earthwork in the Dresden subregion of the central Muskingum has a diameter of about 6 kilometers, or a catchment radius of about 3 kilometers (Pacheco 1996:29, fig. 2.11). A second, well-defined cluster of small habitation sites, mounds, and earthworks in the upper Jonathan Creek subregion of the central Muskingum valley has a diameter of about 11 kilometers, or a catchment radius of about 5.5 kilometers (Pacheco 1996:31, fig 2.11).[20] The central Muskingum valley, within the Appalachian highlands, is physiographically similar to the Paint Creek and Scioto valleys.

Comparison of the above ethnographic and archaeological estimates of local symbolic community sizes to the distances between earthwork-mound complexes in the Scioto–Paint Creek region indicates that these complexes were very probably not the centers of distinct local symbolic communities, and that a bull's-eye model of Scioto Hopewell community organization is unlikely. Several ways of presenting the data are relevant, here, to drawing this conclusion. First, the Hopeton Works and Mound City Group provide a well-dated, specific case in point. These two works are directly opposite one another on either side of the Scioto river. They are less than 2.5 kilometers apart, or have a catchment radius between them of only 1.25 kilometers. This radius is substantially less than the 3 to 5 kilometer radii found cross-culturally

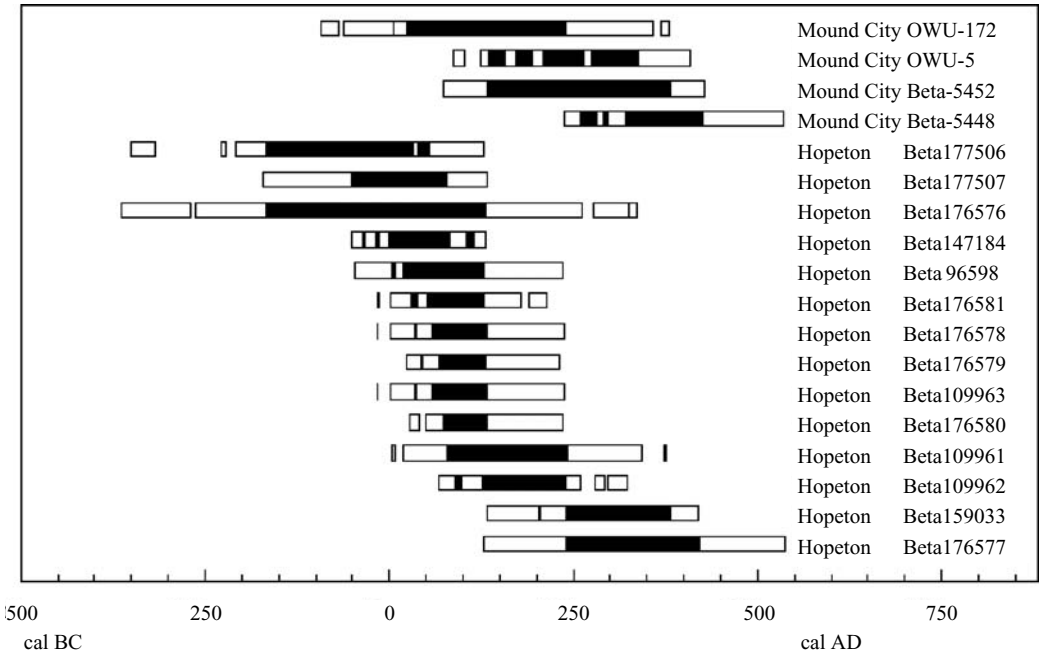

Figure 4.6. Calibrated radiocarbon dates from the neighboring Scioto valley earthwork sites of Mound City and Hopeton. The solid bars indicate the one standard deviation ranges for the dates. The open bars indicate the two standard deviation ranges. Multiple solid or open bars for a date reflect its multiple point estimates on the calibrated time curve (Stuiver and Reimer 1993; Stuiver et al. 1998). See Appendix 4.1 for dates and archaeological proveniences.

and archaeologically likely to have been the rough size of Scioto Hopewellian local symbolic communities, implying that Hopeton and Mound City are too close to have been ceremonial complexes each at the center of its own local symbolic community territory (Ruby 1997c). In fact, the two works are less than an hour's walk apart.[21]

Until recently, it was possible to maintain that the two sites were sequential in time and, hence, explain away their problematic proximity. However, a series of recent radiocarbon dates (Figure 4.6, Appendix 4.1) demonstrates that the two works were built and used simultaneously and probably resided within one local symbolic community.

That earthwork-mound complexes in the Scioto–Paint Creek region are too proximate to have stood at the centers of distinct, local symbolic community territories can be illustrated in a second way, using an approach developed by Adler and Varien (1994; Varien 1999, 2000). They examined the spatial distribution of "great house" public architecture in the Mesa Verde region of Colorado and found it to be bimodal. Great houses tended to cluster either at distances of less than one kilometer from one another or at distances of between five and seven kilometers from one another. They interpreted the first mode as the spacing of multiple great houses within the territory of a single community, and the second mode as the distances between individual communities (Varien 1999:172–174).

A similar organizational principle appears to hold for the public architecture (earthworks) in the Scioto–Paint Creek confluence region. A histogram of nearest-neighbor distances for 14 major geometric earthworks in the Scioto–Paint Creek confluence region (Figure 4.7)[22] has at least three modes: one at 2–4 kilometers, which would equate to a 1 to 2 kilometer catchment radius; a second at 8–10 kilometers, which would correspond to a 4 to 5 kilometer catchment radius; and a third at 18–20 kilometers, or a 9 to 10 kilometer catchment radius. Clearly, many sites are very closely packed. In fact, all but

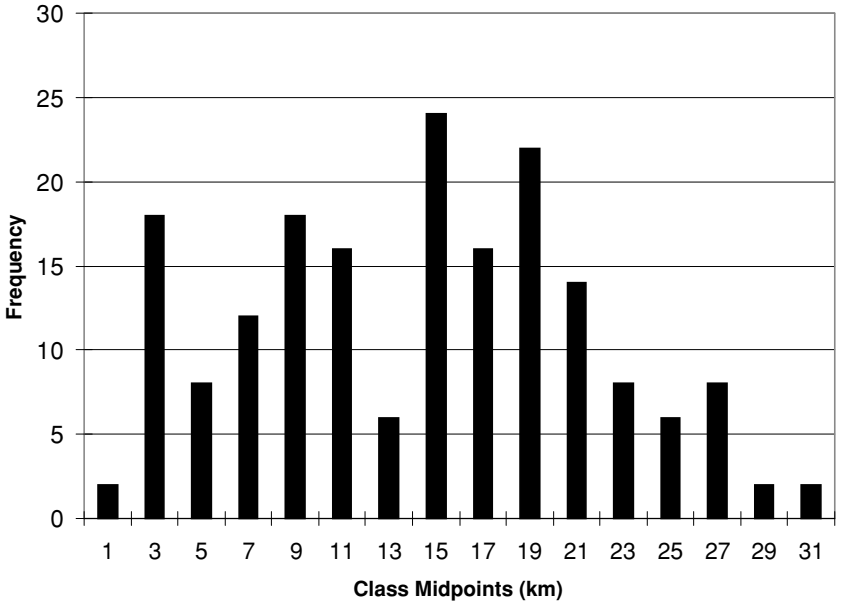

Figure 4.7. Histogram of nearest-neighbor distances for fourteen earthworks in the Scioto-Paint Creek confluence area. First through fourteenth nearest-neighbor distances are included for each earthwork. See Note 22 for a listing of the fourteen earthworks.

three sites (79%) have a neighbor within an hour's walk, less than 4.5 kilometers away, or a catchment radius of less than 2.25 kilometers. These earthwork-mound site catchments are substantially less than the 3 to 5 kilometer-radius catchments found for swidden farmers cross-culturally and for Hopewellian local symbolic communities in the central Muskingum. Only one Scioto Hopewellian earthwork-mound complex has a catchment radius of 4.5 kilometers or greater with a neighbor—Frankfort, at 9.3 kilometers from Hopewell, or a catchment radius of right around 4.5 kilometers. Frankfort is about two hours' walk from Hopewell.

The results of this nearest-neighbor analysis, to follow Varien's lead and the available cross-cultural and central Muskingum information on local symbolic community catchment sizes, suggest that most centers are too close to each other to comprise the centers of local symbolic communities. The first mode in the Scioto Hopewell histogram, with a 1 to 2 kilometer catchment radius, appears to represent multiple earthwork-mound complexes within the territory of a single local symbolic community. The second mode, with a 4 to 5 kilometer catchment radius, appears to indicate the distances between individual local symbolic communities (see just below). The third mode, with a 9 to 10 kilometer catchment radius, seems to represent the distances between broad, sustainable communities comprised of multiple local symbolic communities (see below, Comparisons: Similarity and Difference).

A third way by which it can be revealed that earthwork-mound complexes in the Scioto–Paint creek region are too close together to represent the centers of individual local symbolic community territories is through the use of Theissen polygons. If Theissen polygons are constructed[23] around each of the 14 works (Figure 4.8), the works are allocated widely varying support areas. The areas range from a low of 9 square kilometers at Mound City to a high of 197 square kilometers at Frankfort (Appendix 4.6). Such widely varying support areas would not be expected for local symbolic communities in similar environmental conditions and of roughly similar sizes.

If analysis is restricted to just those 10 sites for which there is some reason to expect at least

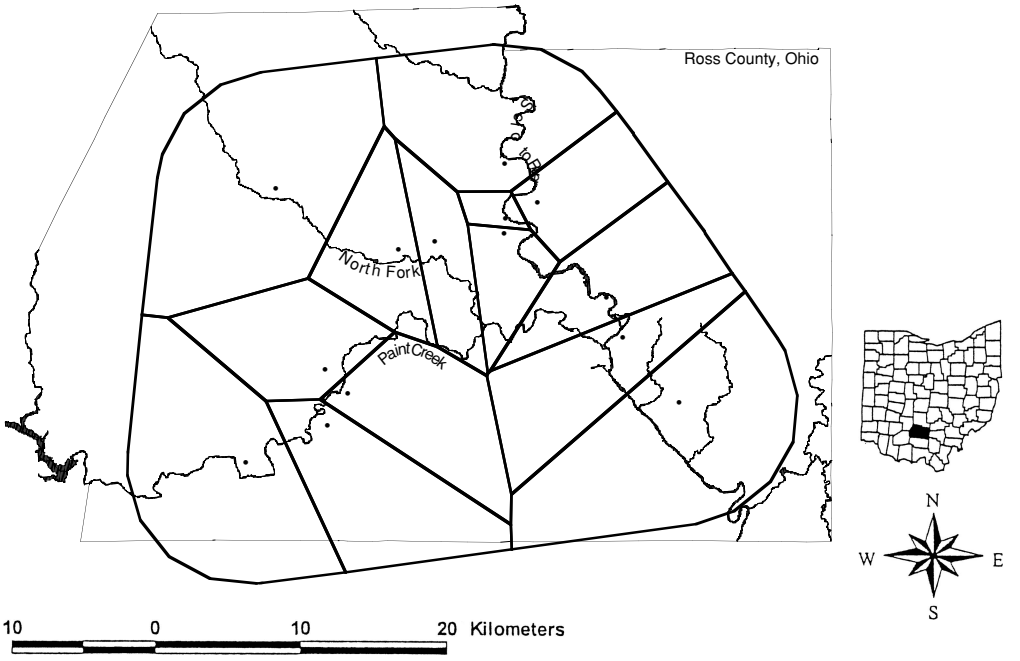

Figure 4.8. Theissen polygons for fourteen earthworks in the Scioto–Paint Creek confluence area. See Note 22 for a listing of the fourteen earthworks.

their partial contemporaneity (whether on the basis of radiocarbon dates, artifact styles, or architectural similarity),[24] essentially the same three modes of nearest-neighbor distances appear: at 2–4 kilometers (i.e., a 1 to 2 kilometer radius), 8–10 kilometers (i.e., a 4 to 5 kilometer radius), and 16–18 kilometers (i.e., an 8 to 9 kilometer radius) (Figure 4.9). If the 10 sites are analyzed within Theissen polygons, then the areas allocated to each work are highly variable: 54 to 205 square kilometers (Appendix 4.6). Neither the close distances between most adjacent earthwork-mound complexes nor their widely varying supporting areas lend credence to the notion that each lies at the center of a local symbolic community, let alone a sustainable community capable of long-term reproduction.

Fourth, to put these results in more tangible terms, almost all of the 10 sites have at least one very close neighbor within about an hour's walk (4.5 kilometers) and many close neighbors within about two hours' walking distance (9 kilometers), and almost all sites could be reached within a half-day's walk (18 kilometers). Even those sites on the farthest fringes of the distribution are within a single day's walk of their most distant neighbor (< 36 kilometers).[25]

Figure 4.10 illustrates this more tangible picture of the spatial distribution of earthwork-mound complexes in the Scioto–Paint Creek region. Drawing a catchment of 5 kilometers radius around each of the 10 ceremonial centers, which averages the cross-cultural and central Muskingum estimates of the expanse of a local symbolic community, shows the extensive overlap among catchments. Similar overlap is found in the 5 kilometer radius catchments around a more restricted set of 6 earthworks of tripartite or closely related geometery in the Scioto–Paint Creek confluence area (Figure 4.11), which are most easily demonstrated empirically to have been at least partially contemporaneous.[26] Clearly, if Hopewellian local symbolic communities were centered around ceremonial precincts, then each community would have been associated with multiple centers, even at this restricted spatial scale. The multiple centers within a local symbolic

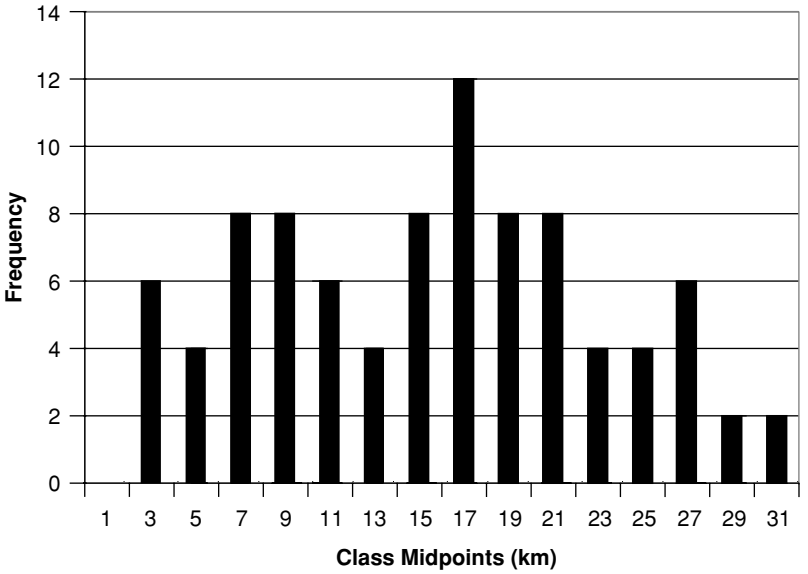

Figure 4.9. Histogram of nearest-neighbor distances for ten earthworks in the Scioto-Paint Creek confluence area and suspected to have been fully or partially contemporaneous. First through tenth nearest-neighbor distances are included for each earthwork. See Note 24 for a listing of the ten earthworks.

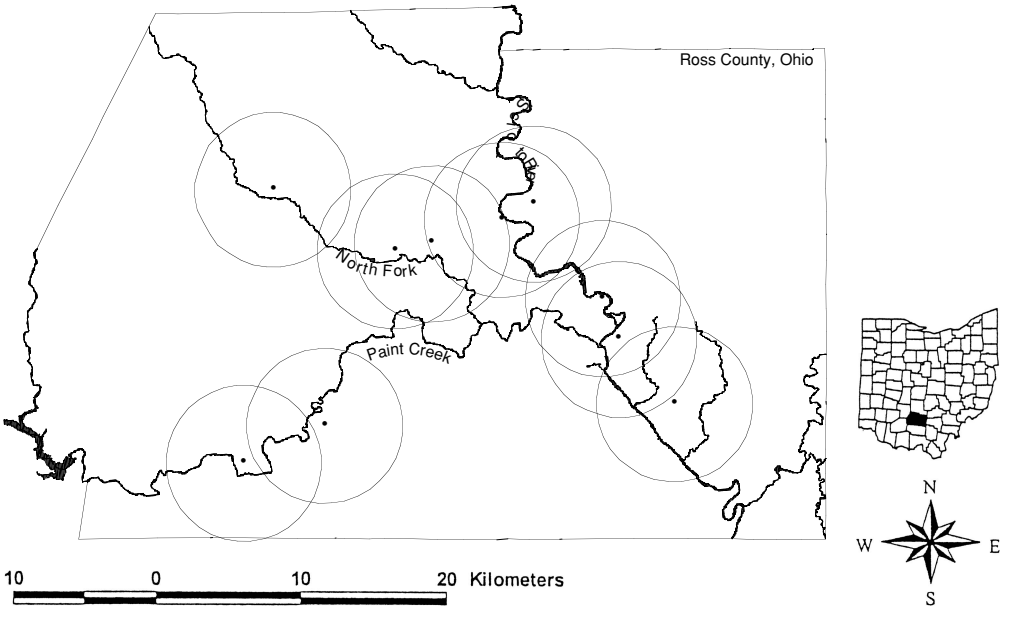

Figure 4.10. Five kilometer radius catchments around ten earthworks in the Scioto–Paint Creek confluence area and suspected to be fully or partially contemporaneous. See Note 24 for a listing of the ten earthworks.

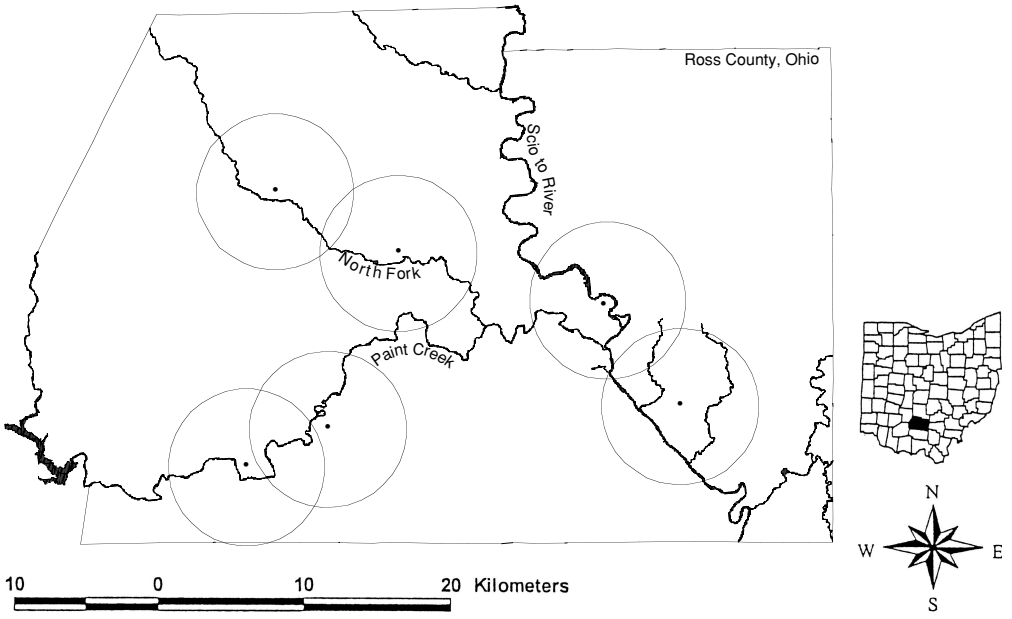

Figure 4.11. Five kilometer radius catchments around six tripartite earthworks in the Scioto–Paint Creek confluence area that are more easily argued empirically to have been at least partially contemporaneous. See Note 26 for a listing of the six earthworks.

community would most probably have been functionally differentiated, and also would necessarily have served multiple local symbolic communities.

The distribution of six coeval sites and their catchments in Figure 4.11 supports a more particular interpretation involving functionally differentiated earthworks within local symbolic communities. The distribution has a number of unique properties. First, the works form three spatial pairs, the members of each pair being spaced at six to nine kilometers apart. Second, each pair is located in a separate drainage—main Paint Creek valley, the North Fork of Paint Creek, and the Scioto valley. None of the three pairs of earthworks overlap with one another. Third, if analyzed within Theissen polygons, then each work is allocated an approximately equal area with relatively little variance (Appendix 4.6; range, 173–209 square kilometers; mean, 195 square kilometers; SD, 15 square kilometers). Importantly, these equivalencies among paired earthworks in the three valleys are expectable if each pair represented a separate local symbolic community, if the communities were similar in nature, and if each had two functionally differentiated earthworks within it.

This specific conclusion, as well as the more general conclusion that local symbolic communities might have multiple, functionally differentiated earthworks within them, is reiterated by analyses made by Carr (Chapter 7). The two analyses corroborate each other, ours based on regional catchment analysis and his on intrasite burial analysis of some of the same sites we examine here. Carr points out that there are three segregated groups of burials under each of the Seip–Pricer, Hopewell 25, and Edwin Harness mounds, which were built within the Seip earthwork in main Paint Creek valley, the Hopewell earthwork in the North Fork of Paint Creek, and the Liberty earthwork in the Scioto valley, respectively. From analyses of the burials in these mounds, using multiple forms of evidence, Carr concludes that the three burial clusters under each mound represent members from three different communities in the three different valleys, and that each community had within them two functionally differentiated earthwork centers with tripartite symbolism.

A final variant on the argument that earthwork-mound complexes in the Scioto–Paint Creek confluence are too close together for each to be a center of a local symbolic community, with the conclusion that multiple local symbolic communities built and used individual earthworks, is implied in a labor analysis made by Wesley Bernardini (1999; see also refinements in Bernardini 2004). The argument is not as strong as those made above, because it assumes certain conditions that can be estimated only roughly; however, this is balanced by results with wide confidence limits. Specifically, from estimates of the volume of earth used to construct the 11 largest earthworks in the Scioto–Paint Creek area, Bernardini calculated that, on average, 100 people could have built almost any of the large earthworks in one year of 40 workdays. The 40 workday year is based on certain ethnographic records of the time allocated by communities in middle-range societies to their public works. The average construction effort also assumes a five-hour workday and the amount of earth that could be dug up, transported, and deposited in this time. Bernardini then applied this construction model to five of the six earthworks in the Scioto–Paint Creek area that can easily be argued to have been at least partially contemporaneous by their similar tripartite shapes and equivalent acreage—Seip, Baum, Liberty, East Bank, and Frankfort (see Note 26). When a population density of one person per square kilometer is assumed, following estimates by Pacheco and Dancey (n.d.) for the well-documented, neighboring, central Muskingum valley area of Ohio, the labor pools of 100 persons used to build these five sites overlap extensively in space. The overlap implies that many people in the region would have participated in the construction of several earthworks in their lifetime, and that any single earthwork would probably have been built by people from multiple local symbolic communities. The pattern of overlap is extensive enough that this conclusion would hold even if some of these earthworks were functionally differentiated and there were more than one earthwork per local symbolic community. These qualitative conclusions of Bernardini's appear to be quite robust: a reduction in labor pool size or an increase in the work effort per year by up to a factor of nine would still produce overlap in the labor pools.

Several other strong arguments that some of the mounds and earthworks in the Scioto–Paint Creek confluence region were multicommunity centers are presented by Carr in Chapter 3.

Summary

As in the lower Illinois valley and lower Ohio–Wabash valley cases, there is good evidence in the Scioto–Paint Creek region that earthwork-mound sites were functionally differentiated, and that single local symbolic communities built and/or made use of multiple, functionally differentiated earthwork-mound sites. There is little support for a simple bull's-eye model that portrays a series of local symbolic communities, each focused around its own central mound and/or earthwork center. Moreover, given the short distances that separate most of the major earthworks in the region, it is unlikely that these served as group symbols that identified the territorial claims of individual local symbolic communities, in contrast to the situation in the lower Illinois valley. Further, given that in the Scioto region, multiple local symbolic communities, in all probability, commonly used singular earthwork-mound complexes suggests that these communities could have been relatively fluid in membership. Gatherings of people from several local symbolic communities in these ceremonial centers would have provided contexts for community affiliation to be negotiated. This situation would contrast with the Illinois one, where bluff-top centered, local symbolic communities were probably territorial units and, thus, likely more bound in social composition. Finally, that multiple local symbolic communities in the Scioto area probably used singular earthwork-mound sites suggests that such sites probably served more than one type of community: not only local symbolic communities, but also a larger sustainable community. The Scioto–Paint Creek ceremonial complexes appear to have provided the contexts for performances intended to forge broader, demographically sustainable communities at a much larger scale than a local symbolic community through ritual enactments,

gifting, displays of wealth and prestige, and so on.

COMPARISONS AMONG REGIONS: SIMILARITIES AND DIFFERENCES

This review took B. Smith's (1992) general model of Hopewellian community organization as a point of departure. While the basic tenets and general framework of that model hold true, our review points up a number of subjects where Smith's model glosses over significant interregional variability in community organization. We begin with variability in aspects of community organization pertaining to households and proceed to that involving ceremonial centers.

Households, Sedentism, and the Natural Environment

Although it is clear that the small, largely autonomous household was a constant element in the lower Illinois valley, the lower Ohio–Wabash area, and the Scioto–Paint Creek region, there is considerable variation in the ways in which households related to each other and to ceremonial centers. One way is in their degree of aggregation over the landscape. This is seen most clearly in the anomalous size and density of the domestic occupation present at the Mann site, which indicate significant aggregation of households there. No other contemporary site in any of the three regions approaches this scale of occupation. We have gone to some length to emphasize that this need not and probably should not be interpreted as a well-integrated village or "urban" center. The basic social unit here may still have been a relatively autonomous household unit. Nonetheless, this anomaly highlights that relationships between individual Hopewellian household units in general were driven by a complex web of economic, ecological, social, and political forces that acted both centripetally and centrifugally. In the case of the lower Ohio–Wabash area, it is possible that its relatively higher resource potential—as measured by greater rainfall, a longer growing season, warmer temperatures, and the extensive flood plain, backwater, and riverine resources that were available—as well as the concentration of resources near the Wabash–Ohio confluence specifically, may have favored aggregation here on at least a seasonal basis to a degree not seen in Illinois and Ohio. In all, despite some broad interregional similarities in the organization of Hopewellian domestic spheres, there was also considerable interregional variability.

Household aggregation also differed in degree between the lower Illinois valley and the Scioto–Paint Creek area, although more subtly. No habitation sites with more than two or three possibly contemporaneous households are known for the Scioto–Paint Creek region. In contrast, the larger of the bluff-base residential communities in the lower Illinois valley (e.g., Apple Creek, Macoupin, Gardens of Kampsville) probably witnessed somewhat larger congregations of households, although their numbers are hard to estimate firmly. At a broader scale, clusters of habitation sites, which string along within a kilometer or so of each other, occur in both regions. Their relative commonality for the two regions is unknown. The range of habitation sites per cluster is similar in the two areas—up to six or seven (Carskadden 1996:374; Seeman 1997:244; Struever and Houart 1972:62)—but the total number of households per cluster may have been somewhat larger in the Illinois case, given the generally large size of bluff-base residential communities there. The contemporaneity of habitation sites within a cluster cannot be judged.

Beyond household aggregation, one can also contrast the "intensity" of occupation of hamlets among regions, intensity being an uncontrolled mix of number of years of occupation and seasonality of a hamlet and, to a degree, the number of households per hamlet. Information on this characteristic is available for the lower Illinois valley and the Scioto–Paint Creek area, and indicates greater occupational intensity in the Illinois case. At a qualitative level, one argument in favor of a real difference between the two areas is that Illinois Hopewell habitation sites never suffered an "identity crisis." Workers in Illinois had no difficulty in locating and excavating relatively large and

substantial Hopewellian habitations, as witnessed by the numerous excavations published by the mid-1960s: Weaver (Wray and MacNeish 1961), Snyders (Montet-White 1963; Powell 1957; Struever 1961; White 1963), Pool and Irving (McGregor 1958), Havana (McGregor 1952), and Clear Lake (Fowler 1952). Several other monograph-length treatments of nonmound Middle Woodland contexts in the lower Illinois valley have appeared in the years since: Smiling Dan (Stafford and Sant 1985), Massey and Archie (Farnsworth and Koski 1985), and Napoleon Hollow (Wiant and McGimsey 1986). In contrast, the first significant excavation of a Hopewellian habitation site in Ohio was not published until 1965 (Prufer 1965), and McGraw remains the only excavated Hopewellian habitation in the Scioto–Paint Creek region proper. Also, only a few clear habitations have been excavated in the much broader southern Ohio region (e.g., Murphy I, Madeira–Brown, Marsh Run, Clarence Ford, Wade). It is true that this difference in site recovery may result in part from the particular institutional history of research in the respective regions: the University of Illinois, the University of Chicago, Northwestern University, the Center for American Archaeology, and the Illinois Department of Transportation have all been active in the Illinois valley for many years, whereas almost all institutional interest in Ross County archaeology has been on the part of the Ohio Historical Society, and their work largely ended before World War II. At the same time, there is also reason to suspect a real difference between Illinois valley and Scioto–Paint Creek Hopewellian habitations, with the Ohio sites having been smaller or less intensively occupied and, hence, harder to find.

This difference between the Illinois and the Ohio situations can be shown quantitatively. Table 4.5 highlights a comparison between the Smiling Dan site in the lower Illinois valley and the McGraw site near the Paint Creek–Scioto confluence. Data from the Murphy I site, located near the Newark Earthworks in a major drainage that neighbors the Paint Creek–Scioto region, are also shown. Murphy is included in the comparison to temper any bias that might be introduced because McGraw was less intensively investigated than Smiling Dan: Murphy was systematically sampled and stripped in a fashion comparable to Smiling Dan. In B. Smith's (1992) model, all three of these would be examples of small farming settlements made up of one to three household units. However, there are significant differences among the three. Smiling Dan contains a midden dump in a stream channel that is up to two meters deep and extends across the north–south span of the Middle Woodland occupation. No refuse deposit of comparable magnitude has been identified at any Ohio Hopewell site. Ceramics and chert debitage are much more frequent at Smiling Dan than at McGraw or Murphy. When standardized to densities per square meter, the density of ceramics at Smiling Dan is nearly 3 times higher than that at McGraw and more than 200 times higher than that at Murphy. The density of chert debitage is 5 to 7 times higher at Smiling Dan than at McGraw and Murphy, and the density of blade tools ranges from almost 2 to 10 times higher

Table 4.5. Comparison of Artifact Density at the Smiling Dan Site, Illinois, versus the McGraw and Murphy Sites, Ohio

	Smiling Dan[a]		McGraw[b]		Murphy[c]	
	Total	Items/m^2	Total	Items/m^2	Total	Items/m^2
Site area (m^2)	6,705		1,236		10,000	
Ceramics	138,350	20.63	9,946	8.05	858	0.09
Debitage	65,355	9.75	1,691	1.37	>18,000	>1.80
Lamellar blades	2,254	0.34	233	0.19	>300	>0.03

[a] Smiling Dan site data from Stafford and Sant (1985:39, table 11.1). Ceramic total includes minor Late Woodland and Black Sand components, totaling approximately 1,691 sherds. Debitage total includes flakes plus cultural blocky fragments.
[b] McGraw site data from Prufer (1965:10, 60, 85, table 3.1).
[c] Murphy site data from Dancey (1991).

at Smiling Dan than at McGraw and Murphy. This example minimally suggests that sites in Illinois were probably occupied and reoccupied over longer durations than those in Ohio. The probable 25 to 50-year duration of swidden-based cycles of field relocation and possibly household relocation and site reuse in the greater Scioto area is relevant here (see Hopewellian Communities at the Paint Creek–Scioto River Confluence: Households and Hamlets, above).[27] When it is considered that Smiling Dan is a relatively small bluff-base hamlet in the Illinois valley compared to some others there (e.g., Apple Creek, Macoupin, Gardens of Kampsville), the Ohio–Illinois comparison is all the more significant.

The intensity of occupation marked in both Illinois and Ohio habitation records pales in comparison to that evidenced at the Mann site in Indiana. Wide areas of midden accumulation, some very deep midden deposits, and high densities of food processing and storage facilities at Mann all suggest long periods of habitation by more households than in the Illinois and Ohio cases.

There are a number of environmental differences among the three regions that would have influenced patterns of household aggregation and sedentism. The lower Illinois valley and the lower Wabash region are more similar in terms of productivity (Table 4.3). Both regions are marked by extensive backwater lakes and sloughs that serve as concentrated, fixed, and predictable sources of aquatic resources. Both regions also sit astride some of the most important waterfowl migration corridors in North America. These factors would have promoted more frequent, longer, and/or aggregated occupations of favored locales in the lower Illinois and lower Wabash valleys. In contrast, backwater lakes and sloughs are comparatively rare along Paint Creek and the central Scioto, and the major waterfowl migration corridors largely bypass these valleys. Populations in south–central Ohio had fewer opportunities for frequent and extended sedentism in favored locales.

Also affecting household aggregation and sedentism in the three regions would have been the structure of their environments. The lower Illinois valley environment is distinctive among those of the three areas in being highly linear and circumscribed—a trench of very productive bottomlands flanked by less productive upland forests and prairies. This linearity and circumscription of productivity in the Illinois case would have tended to restrict mobility and to distribute populations more closely to each other, up and down the main valley trench. In contrast, the environments in the central Scioto and lower Wabash regions are less markedly linear and circumscribed in their productive areas. The contrast in productivity between the bottomlands and the surrounding uplands in these two regions is more subdued, and populations could have more easily dispersed over these landscapes, if they chose to. This was the case in Ohio (e.g., the upland sites of Clarence Ford, Marsh Run, and Strait) but not at the Mann site in Indiana.

Ceremonial Centers and Community Organization

In the ceremonial sphere, there is a wide range of variability that received little emphasis in Smith's (1992) model. In all three regions examined here, ceremonial centers differed greatly in size and complexity, in the kinds of ceremonies and activities (e.g., mortuary, nonmortuary, or both) that occurred in them, and in the size and composition of the social units engaged there (see also Carr, et al., Chapter 13). All three regions had functionally differentiated ceremonial landscapes. Minimally, each region had relatively small, conical mounds and mound groups with clear mortuary associations that contrasted with other, often larger, constructions with a wider range of ceremonial foci, including strong evidence for nonmortuary ceremonies. Examples of small conical mounds and mound groups are the bluff-top cemeteries in the lower Illinois valley, the Martin site and a cluster of such mounds in the Mann site in Indiana, and small isolated mounds and mound groups in the Scioto–Paint Creek area as well as small mounds within and around geometric earthworks there. These were the gathering places of local symbolic communities or portions of them. More multipurpose

ceremonial centers include those with loaf-shaped burial mounds in all three regions—flood plain mound sites in Illinois, the Mann site in Indiana, and some geometric earthworks in Ohio (e.g., Seip, Liberty, Hopewell). Multipurpose ceremonial centers and facilities also include ones lacking mortuary associations: the platform mounds at the Mann site in Indiana and several sites in Ohio, and the mound-free geometric earthworks and hilltop enclosures in Ohio. These works were likely built and used by multiple local symbolic communities that comprised sustainable communities. A simple "bull's-eye" model of Hopewellian community organization, where one ceremonial center stands at the center of a community and where there is only one kind of community at one scale, does not fit well for any of the regions considered.

In addition to having had ceremonial sites of diverse functions, all three regions share in having had local symbolic communities that used and/or encompassed multiple ceremonial centers. In Illinois, some local symbolic communities included, and all used, both bluff-top cemeteries and flood plain mound complexes. In Indiana, some local symbolic communities probably used both the Mann site, with its platform mounds, and the huge, loaf-shaped GE burial mound. In Ohio, single local symbolic communities sometimes used both earthworks that had a major presence of burial mounds and those that did not: Seip and Baum, Liberty and Works East, and Mound City and Hopeton, respectively, for example.

Each of the three study areas had communities of multiple scales, including residential, local symbolic, and sustainable communities. The small conical mounds and the earthworks and loaf-shaped mounds that respectively characterized local symbolic communities and sustainable communities were mentioned above. In addition, the geographic scales of both local symbolic communities and sustainable ones corresponded reasonably well between at least the lower Illinois valley and the Scioto–Paint Creek regions, where data for assessing community sizes are available. Table 4.6 summarizes the relevant information taken from earlier portions of this chapter.

However, on a finer level, note in Table 4.6 that the geographic sizes of local symbolic communities in the lower Illinois valley were

Table 4.6. Comparison of Geographic Sizes of Communities of Different Kinds in the Lower Illinois valley and Near the Scioto–Paint Creek Confluence

	Spacing (catchment diameter) in	
Kind of distance	**Lower Illinois valley**	**Scioto–Paint Creek area**
Within a local symbolic community		
Ohio: primary mode in histogram of interearthwork distances[a]	n.d.	1–5 km (Mode: 2–4 km)
Between local symbolic communities		
Illinois: between bluff-top cemeteries[b]	5 km	
Ohio: secondary mode in histogram of interearthwork distances[a]		5–13 km (Mode: 8–10 km)
Between sustainable communities		
Illinois: between flood plain mound groups[c]	20 km	
Ohio: tertiary mode in histogram of interearthwork distances[a]		13–25+ km (Mode: 18–20 km)
Ohio: average distance between centroids of paired sites with tripartite symbolism[d]		20.7 km

[a] See Figures 4.7 and 4.9.
[b] From Struever and Houart (1972:61).
[c] From D. K. Charles (this chapter).
[d] Figure 4.11.

somewhat smaller than those in the Scioto–Paint Creek area. This may indicate somewhat higher population densities, and hence more compact local symbolic communities, in the lower Illinois valley. Higher population densities would not be unexpected there, given the valley's greater natural food productivity as well as the circumscription and patchiness of natural food resources, which would have constrained mobility and encouraged sedentism. Also note that sustainable communities in the two regions were of similar geographic scale. This implies that, on average, more local symbolic communities constituted a sustainable community in the lower Illinois valley than in the Scioto–Paint Creek area and, in turn, may reflect the greater geographic breadth and sociopolitical integration of individual local symbolic communities in the Scioto–Paint Creek area. This result is entirely in line with standard interpretations of the greater sociopolitical complexity of Ohio Hopewellian societies than of Havana Hopewellian ones (J. A. Brown 1979; Struever 1965).

In four other ways, however, the ceremonial landscapes in Illinois, Indiana, and Ohio differed. First is in territoriality. Theory outlined by Saxe (1970), Goldstein (1980, 1981), and Charles (1985) predicts that groups are more likely to use formal cemeteries to symbolize the relationship between corporate groups and their customary territory under conditions of restricted mobility. Charles's (1985) argument that bluff-crest conical mound groups served as territorial markers—"corporate symbols"—is compelling for the lower Illinois River valley. The mounds are regularly spaced, are placed along with bluff-base habitation sites at critical food patches in the natural environment, and have burial populations representative of whole communities. The circumscribed and linear nature of the Illinois valley, and the restricted distribution of highly productive, backwater lake food patches there, would have encouraged the territoriality of local groups. This territorial setup is not, however, suggested by the distribution of major mound and earthwork centers in either the Scioto–Paint Creek or lower Ohio-Wabash areas. The Ohio and Indiana regions are characterized by a relatively few, very large geometric earthworks and large, loaf-shaped mound sites that are centralized within the overall settlement system. The sites are simply too clustered to have served as territorial markers for individual local symbolic communities.[28] Instead, the large, geometric earthworks and loaf-shaped mound sites in Ohio and Indiana were each locations where multiple local symbolic communities congregated and ensured the integrity of a broader sustainable community. This greater social connectivity within the lower Ohio–Wabash and central Scioto valleys, in contrast to the territoriality of local social groups in the lower Illinois valley, was encouraged by the two-dimensional, less circumscribed, and more productively uniform nature of the lower Ohio–Wabash and central Scioto valleys compared to the lower Illinois valley.

The second, and related, way in which the three regions possibly differed is in the fluidity of membership in their local symbolic communities. In Illinois, where local symbolic communities centered on bluff-top cemeteries appear to have been territorial, it would not be unexpected for these communities also to have been fairly bounded in social composition. In the Scioto region, the possibility that local symbolic communities were more fluid in their membership is suggested by the fact that multiple ones probably used single earthwork-mound complexes, providing opportunities for group affiliation to be negotiated. The situation in the Mann phase is unclear.

The third manner in which ceremonial spheres were organized differently in the three regions regards whether single ceremonial centers served as the focus of communities of more than one kind: specifically, a local symbolic community and a sustainable community. In Illinois, these two types of communities were centered at different, spatially segregated sites. Local symbolic communities were centered on bluff-top, conical-mound cemeteries, whereas sustainable communities assembled at flood plain sites, often with loaf-shaped mounds. In the Mann phase, conical and loaf-shaped mounds that marked local symbolic communities and sustainable communities, respectively, were sometimes separated spatially, as in the Martin and GE mounds, and sometimes located together, as at

the Mann site. The same appears to be true in the Scioto–Paint Creek area. Small conical mounds, wherein a few, important persons, probably representative of a local symbolic community or part of one, were buried (e.g., Rockhold, Bourneville), are sometimes found spatially apart from neighboring earthwork complexes where that community and others may have gathered as a broader sustainable community (e.g., Seip) (see Carr, Chapter 3). In other instances, such small conical mounds are found within and just outside earthwork complexes with large, loaf-shaped mounds (e.g., Seip, Liberty, Hopewell), indicating that both local symbolic and sustainable communities used the earthworks.

The final, striking difference in the community organization of the three regions is in the number and spatial arrangement of sites that may be interpreted as ceremonial centers. In the lower Ohio-Wabash area, there are at best three such centers (Mann, GE, and Martin), with the largest and most complex centers (Mann and GE) centrally located within the overall settlement system. Only one center, Mann, includes a geometric earthwork. The whole area was probably integrated into one regional symbolic and sustainable community. In the lower Illinois valley, both the bluff-crest mounds and the larger flood plain mound groups are more frequent and more regularly spaced along the length of the main valley trench. Multiple sustainable communities are indicated. There is only one geometric earthwork in the valley, at its far southern end–Golden Eagle–which again may have integrated the whole area as one large symbolic community. The Scioto–Paint Creek area stands apart from the other two in having more and larger ceremonial centers and more geographically centralized centers than in the Illinois case. At least nine major mound and geometric earthwork centers and several minor earthworks are concentrated within a 30 kilometer radius of the Scioto–Paint Creek confluence. In the later Middle Woodland, six or more of these sites (Seip, Baum, and Spruce Hill?; Hopewell and Frankfort; Liberty, and Works East), with two or three in each of three valleys, were the ceremonial centers used by probably three distinct local symbolic communities that resided in the three valleys. It appears that the communities were allied ceremonially through the burying of their dead together and constituted a single regional symbolic and sustainable community (Carr, Chapter 7). Community organization at earlier time planes in the region has yet to be defined.

At this point, the reader can appreciate the much greater complexity of Hopewell community organizations compared to the one community–one ceremonial center model posited by Smith for the Woodlands, and Prufer, Dancey, and Pacheco for the Ohio area. The much more marked variation in Hopewellian community organization among regions than recognized in the models posed by these researchers should also be clear.

CONCLUSIONS

Hopewellian communities in the Havana, Mann, and Scioto regions were organized at several spatial and demographic scales. At the smallest scale, individuals in each region were organized into residential communities defined by coresidence or close residence, and regular face-to-face interaction. At the same time, individuals participated in wider symbolic and sustainable communities that served social, political, economic, and demographic ends beyond those that could be met by the local residential community

In each of the three Hopewellian regions examined here, residential communities were comprised of one to a few nuclear or extended family households (hamlets), and occasionally of clusters of two or more hamlets. These residential communities were spread over the landscape, partly in response to the nature of their farming practices. There are differences among regions in the degree of household aggregation and sedentism, but nucleated villages are absent in all three regions. The availability of highly concentrated and predictable resources—especially backwater lake resources and migratory waterfowl—in the Havana and Mann regions promoted larger and longer occupations and reoccupations of favored locales there. In the Havana case, the linear and spatially restricted distribution of highly

productive resources along the narrow, circumscribed trench of the lower Illinois valley favored a relatively rigid and stable partitioning of subsistence territories along the length of the valley. Here, mounded cemeteries sited on prominent bluff tops served to integrate adjacent residential communities into larger, local symbolic communities with common economic interests in the highly productive resource zones. The placement of these cemeteries at prominent points in the landscape served to display and validate these territorial claims vis-à-vis other similar communities up and down the length of the valley. There is little evidence for a similar use of mounded cemeteries as territorial markers in the Mann and Scioto regions.

Although environmental differences among the Havana, Mann, and Scioto regions account for empirically measurable differences in household sedentism and aggregation in the three areas, they alone do not explain the unusual elaboration of social complexity in the Scioto area. The lower Wabash–Ohio area and the lower Illinois valley, not the Scioto–Paint Creek area, had a higher natural food availability, greater potentials for sedentism and population growth, and/or better opportunity for regional social intercourse. The lower Illinois valley had the greatest circumscription of natural food resources and potential for social competition and concomitant social development.

All three study areas contain ceremonial centers that likely served as contexts for the integration of spatially and demographically more expansive communities, which were organized minimally at two different regional scales: that of the local symbolic community and that of the sustainable community. In each area, these centers reflect investments of labor far in excess of that available to individual residential communities. Centers that were the focus of local symbolic communities were comprised of conical burial mounds and were dominated by mortuary ceremonialism. Centers that served sustainable communities included unusually large, loaf-shaped burial mounds for a restricted number and set of persons, but also sometimes platform mounds and geometric earthworks. The sites evidence complex nonmortuary ceremonialism, including feasting and the conspicuous display and consumption of wealth—activities often implicated in the negotiation of status and the building of cooperative alliances.

Our review suggests that the simple "bull's-eye" model of Hopewellian community organization is no longer viable for at least the three regions explored here, despite the fact that it has carried weight in the Scioto case for nearly 40 years and was generalized to Hopewellian societies across the entire Woodlands. In the bull's eye model, a Hopewellian community is portrayed as a community of one unspecified kind that was comprised of dispersed households focused on one centrally located ritual precinct of one kind marked by mounds and earthworks. Instead, Hopewellian social-ritual landscapes in each of the three study regions were populated by communities of multiple scales—residential, local symbolic, sustainable, and sometimes very broad regional symbolic ones. Two or more kinds of ceremonial sites of differing functions were built and used by single local symbolic communities, and multiple local symbolic communities used single ceremonial sites. The three regions vary as to whether some single ceremonial sites were the gathering places of both a local symbolic community and a sustainable community and whether different ceremonial centers were built and used by these different kinds of communities. The regions also may differ in the degree to which their local symbolic communities were fluid in membership, as a function of community territoriality. The concepts of community and the variability in Hopewellian community organization disentangled here hopefully will provide archaeologists a firmer foundation for investigating Hopewellian communities in the future.

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Marsh Run, Clarence Ford, and Madeira–Brown habitation sites in Ohio. We appreciate Kitty Rainey's GIS drafting of Figure 4.5.

NOTES

1. As will be seen below, this distinction is particularly relevant to Hopewellian communities.
2. Waterfowl population estimates vary widely from year to year, and modern waterfowl migration corridors are likely shaped by modern agriculture and development. Hence, these figures should be used with caution, placing greater reliance on the general trends than the absolute figures.
3. Asch et al. (1979:82) inexplicably inflate Middle Woodland site sizes, stating that many larger Middle Woodland flood plain settlements "cover 2 to 4 ha., and a few are 15 or more ha. in area." Since no new survey data are cited, and since the numerals correspond well with the data Struever presents, except for the areal units, this may be a typographical error, with hectares substituted for acres. Two large sites at each end of the lower Illinois valley, Naples to the north and Duncan Farm to the south, may cover areas in the 15-hectare range and be the large sites to which Asch et al. (1979) refer. However, the depth, areal continuity, and time span of the deposits have yet to be established. Moreover, both of these are flood plain/ceremonial sites rather than habitations.
4. The clustered distribution of hamlets is not entirely certain, in that it was not defined by Struever through either systematic or representative surface survey. Some between-cluster spaces may have had occupations. However, the tight spacing of those hamlets that are known archaeologically is clear, and these clusters can be compared to the presence or absence and the approximate sizes of hamlet clusters in other regions.
5. In fact, similar use of these flood plain settings stretches back into the Middle Archaic.
6. The perhaps opportunistic and compromised bluff-top and bluff-base locations of the Elizabeth/Napoleon Hollow/Naples–Russell complex gives pause in the attempt to define ceremonial site location as a fully firm, historically deeply rooted, symbolic ingredient for the creating of ceremonial site function (*cf.* Buikstra and Charles 1999). Conversely, since this complex was the earliest of the large, Hopewellian ceremonial sites in the lower Illinois valley (Kut and Buikstra 1998), we may be witnessing the interplay between agency and tradition in the production of the complex. Ultimately, the traditional symbolism of the flood plain locations came to dominate.

   Recent excavations at the Mound House site (Buikstra et al. 1998) also document a situation in which the ritual/ceremonial activities at a site changed over time. In this case, mound/mortuary components were added to a location already serving as an important ritual site.
7. "Ohio style" blades are long and thin compared to the short and wide blades characteristic of the Illinoisan Fulton blade tradition. See Greber et al. (1981) and Montet-White (1963, 1968).
8. At present, funding considerations have not permitted a search for Mann phase components beyond the Indiana side of the Wabash and Ohio rivers. This is not a serious limitation, as there is every reason to believe that the Indiana side encompasses the full range of variability in environment and settlement types that would be encountered if the analysis were extended across the rivers into Illinois and Kentucky.
9. In the archaeobotanical samples from the Mann and Grabert sites, about 80% of the identifiable seeds belong to one of four starchy seeded annual plants believed to have been cultivated in Midwestern premaize agricultural systems: maygrass (*Phalaris caroliniana*), goosefoot (*Chenopodium* sp.), knotweed (*Polygonum* sp.), and little barley (*Hordeum pusillum*). Cucurbit rind fragments are present in the Mann site samples. A common, relative measure of the degree to which a subsistence economy has shifted from a focus on nut resources to the intensive collection and production of seed crops is the ratio of the number of seeds to grams of nutshell in archaeobotanical assemblages. The Grabert site seed:nutshell ratio is a remarkably high 169 seeds per gram nutshell, among the highest values reported for any contemporary Midwestern sample.

   The faunal assemblage from Grabert is small in size and restricted in species diversity, emphasizing terrestrial mammals. In short, the faunal assemblage is characteristic of a small-scale, short-term, warm-season occupation (Ruby 1997; Ruby et al. 1993a). Analysis of faunal remains from two refuse-filled pits at the Mann site is similarly restricted in focus to terrestrial mammals, with seasonal indicators pointing to a late winter/spring occupation (Garniewicz 1993). The small samples from both sites make it difficult to determine whether the restricted assemblages truly reflect short-term domestic occupations or whether they might reflect more specialized ceremonial activities (Garniewicz 1993; Styles and Purdue 1986, 1991).
10. Following Cook: "For measuring space a fair rule of thumb is to count 25 $ft.^2$ for each of the first six persons and then 100 $ft.^2$ for each additional individual" (Cook 1972:16, as cited in B. D. Smith 1992:figure 9.8).
11. Only 1 of the 26 ceremonial structures reported by Smith (1992:figure 9.8) was smaller than this, and most had floor areas greater than 130.5 square meters.
12. Charles Lacer, Jr.'s Mound 6.
13. The mound contains about 3,139 cubic yards. At approximately four cubic yards per person per day, 25 people could have built this mound in about 30 days.
14. The Kleinknecht Earthwork (12 Vg 454) is a final possible Mann phase ceremonial structure. This circular earthwork, 40 meter in diameter and up to 1 meter tall, is located about 3 kilometers north of the Martin Site.

A lamellar blade fragment similar to those characteristic of the Mann site blade industry was recovered within about 100 meters and is the only clue to the nature and cultural affiliation of the earthwork (see Ruby 1997:418).

15. The precise nature of the burial populations at the GE mound and the two loaf-shaped mounds at Mann, and the degree to which they were analogous to loaf-shaped mounds in the flood plain of the Illinois valley or in the Scioto–Paint Creek area, is unclear. There is too little known about the layout of the deposits and burials on the floor of the GE mound, and neither of the large, loaf-shaped mounds at Mann has been excavated.
16. The Hopewellian age and association of this particular maize have been called into question (Ford 1987), but Prufer (1997c) stands by the original interpretation on contextual and taxonomic grounds. Other studies attest to the presence of maize in Hopewellian contexts (Conard et al. 1984), although it does not appear to have been a staple food until after about A.D. 900–1000 (Bender et al. 1981; Smith 1992).
17. Church and Ericksen's (1995) final report of additional investigations was not available at the time of writing.
18. Artifacts from DECCO 1 have not been fully analyzed to date, and their usefulness for functional interpretation is further complicated by the multicomponent nature of the site.
19. The Marietta site (Squier and Davis 1848:73–77, plate XXVI) is comprised of a large square embankment, a small square embankment, and a small circular embankment and ditch combination. The three geometric forms are not directly conjoined. The large square contains four platform mounds, the small square is empty, and the small circle contains a large conical mound. The Cedar Banks work is a truncated square that contains a platform mound. The Ginther site (Shetrone 1925) is about a third of a mile from Cedar Banks, and is comprised of an isolated platform mound and empty embankment-and-ditch circle. The platform mound had a prepared floor at its base with two pits suggestive of feasting, two hearths, and postholes in a semi-regular pattern. Significantly, the floor had no burials or ceremonial caches of raw materials or artifacts on it. The mound was fully excavated.
20. The upper Johnathan Creek site cluster has five very small earthworks within it, which Pacheco (1996:24) attributes to construction over time rather than multiple communities. The estimate of a 5.5 kilometer catchment radius for this site cluster assumes that no two of these ceremonial centers were contemporaneous. However, even if all of these small earthworks were used simultaneously, representing five residential communities, the average nearest-neighbor distance between earthworks is about four kilometers, equating to catchment radii of two kilometers. The distance between the farthest two earthworks in the area is 10 kilometers, equating to catchment radii of 5 kilometers if only these two centers were contemporaneous. These various estimates, of 2, 5, and 5.5 kilometer radii, fall close to the 3 to 5 kilometer catchment radii found cross-culturally for swidden agriculturalists and the 3 kilometer radius found for the Dresden subregion of the central Muskingum. A third area within the central Muskingum drainage that Pacheco surveyed for habitation sites, mounds, and earthworks—the Granville subregion—is too close to the gigantic Newark earthworks to assess its probable dimensions (Pacheco 1996:24, fig. 2.3). Newark has a fairly continuous scatter of habitation sites around it, up to 20 kilometers away (Pacheco and Dancey n.d.).
21. Normal human walking speed is about 4.5 kilometers per hour. The Scioto does not pose much of a barrier here: one could easily wade the river here, and several Historic period fords cross the river at this point.
22. The 14 sites are Baum, Frankfort, High Bank, Hopeton, Hopewell, Liberty, Mound City, Seip, Works East, Anderson, Dunlap, Shriver, Spruce Hill, and Bourneville Circle. The Universal Transverse Mercator coordinates (UTM Zone 16, North American Datum 1927) for these sites are listed in Appendix 4.5.
23. In this study, Theissen polygon boundaries are limited along the edge of the study area to a maximum distance of eight kilometers from the center. Given the time and energy constraints on movement, this likely represents an upper bound on the area regularly exploited from the center.
24. The sites for which there is chronological information and that are included in the study are Baum, Frankfort, High Bank, Hopeton, Hopewell, Liberty, Mound City, Seip, Works East, and Anderson. For their chronology, see Figure 4.6 and Appendix 4.1 (on Mound City and Hopeton) as well as Carr (Chapter 7), Greber (1983, 2000), Prufer (1961, 1964a), Ruhl (1996), and Ruhl and Seeman (1998).
25. These estimates are based on unrealistic assumptions of level ground, straight-line journeys, and the like, but nonetheless, the implications hold true.
26. There are six sites in the Scioto–Paint Creek confluence area that are uniquely associated with one another by virtue of a common architectural element: a rectangular enclosure of approximately 300 meters on a side, with openings at the midpoints and corners of each wall. The sites are Seip, Baum, Frankfort, Hopewell, Works East, and Liberty. All but Hopewell also share a basic tripartite geometry composed of a square, a large circle, and a smaller circle or polygon. The six sites are located in three different valleys: the Scioto valley, the main Paint Creek valley, and its North Fork. For the chronology of these sites, see Carr (Chapter 7), Greber (1983, 2000), Prufer (1961, 1964a), Ruhl (1996), and Ruhl and Seeman (1998).
27. The durations between the means of three statistically distinguishable radiocarbon modes at Smiling Dan (162 and 188 years) fall within the lower end of the range of the durations between the means of distinguishable

radiocarbon modes in single sites in Ohio (121–520 years) (Table 4.4). Thus, the radiocarbon dates from Smiling Dan and Ohio habitation sites do not indicate significantly shorter cycles of reoccupation of habitation locations in Illinois than in Ohio. Lengths of cycles of habitation site reoccupation, of course, are distinct from lengths of occupation of habitations, which together describe the degree of mobility of a group of people.

28. In Ohio, this concentration is also true for smaller, isolated mounds and mound groups (Seeman and Branch n.d.).

Gathering Hopewell

Society, Ritual, and Ritual Interaction

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