SOCIOPOLITICAL IMPLICATIONS OF MISSISSIPPIAN MOUND VOLUME

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Variation in the scale of Mississippian mound building is an important measure of regional settlement hierarchies. However, factors thought to determine the size of platform mounds are subject to two contradictory interpretations. Mound volume is said to result from either the duration of mound use or the size of the labor force recruited by leaders for mound construction. To evaluate these competing propositions, a sample of excavated mounds is examined and four variables are recorded for each mound: a mound volume index, the duration of mound use, the number of construction stages, and the number of mounds at the site. The relationships among these variables are summarized, and the relative merits of the two competing interpretations are assessed. It is concluded that not all of the variation in mound volume can be explained by duration of use, that additional factors must be considered, and that the social context of mound construction probably differed at large multiple-mound sites and smaller mound sites.

La variación en la escala de la construcción de montículos de la cultura mississippiense es una importante medida de las jerarquías regionales de asentamiento. Sin embargo, hay dos interpretaciones contradictorias para explicar el tamaño de los montículos. En primer lugar, se considera que el volumen de los montículos es el resultado de la duración de su uso o bien de la cantidad de la fuerza de trabajo reclutada por los dirigentes para la construcción de los montículos. Para evaluar estas dos proposiciones, se analiza una muestra de montículos excavados y para cada uno de ellos se consideran cuatro variables: un índice del volumen del montículo, la duración de su uso, el número de etapas constructivas y la cantidad de montículos en un sitio dado. Las relaciones entre estas variables se resumen y se evalúan los meritos relativos de las interpretaciones contradictorias. Se concluye que no toda variación en el volumen de montículos puede explicarse por la duración de su uso, dado que deben considerarse otros factores y que el contexto social de construcción de los montículos probablemente difería en sitios grandes con múltiples montículos en comparación con sitios más pequeños con montículos.

In the American Southeast, precolumbian horticultural societies known as Mississippian created regional political territories marked by central places with large earthen mounds. The various political and ceremonial activities at mound centers were arenas of power and authority for Mississippian leaders. Archaeologists investigating Mississippian political formations consider the scale of mound building at centers to be an important indicator of regional settlement hierarchies, long recognized as a signature of complex society (Johnson 1977). A settlement hierarchy of large and small mound centers is often seen as an indicator of dominant and subordinate relationships in the regional leadership structure (Anderson 1994). Yet the identification of regional settlement hierarchies is rendered problematic in the Mississippian case because there are two contradictory interpretations of the sociopolitical implications of mound building; some claim that mound size or volume reflects the duration of mound use, whereas others argue that mound volume reflects the ability of leaders to amass a large labor force. In this article we examine the empirical bases for these two competing interpretations, evaluate the degree to which the two interpretations are supported by evidence, and assess the implications of our findings for understanding Mississippian sociopolitical organization.

The archaeological feature of importance is the platform mound. These ancient monuments are flat-topped earthen pyramids created by successive construction episodes over a period of time. Each

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new mound-construction stage was superimposed over an earlier stage. In this manner, many platform mounds were expanded to massive proportions, but there is a wide range in the size and number of platform mounds found at Mississippian centers. Using these criteria, Claudine Payne (1994:Table 3-6) has constructed a site-size classification of 268 Mississippian mound centers. She finds that 144 sites are in the smallest class, with one to three mounds, and only 17 centers are in the largest class, with more than 16 mounds. The Cahokia site, with 100 mounds, is far larger than other centers. Monk's Mound at Cahokia, the largest Mississippian mound, covers 6 ha at the base and stands 30.1 m high (Collins and Chalfant 1993:319). Although Mississippian platform mounds are a form of monumental architecture, most are relatively low-volume constructions no more than 3 m high (Payne 1994:100).

Platform mounds play a central role in archaeological investigations of Mississippian sociopolitical organization. Historical and archaeological research supports the following assumptions about the sociopolitical significance of platform mounds: platform mounds served as residences and mortuaries for high-rank individuals and groups (Swanton 1911; Waring 1968); sites with platform mounds mark political centers in regional settlement systems (Peebles and Kus 1977; Steponaitis 1978); control of platform mound construction and use legitimated and sanctified important leadership roles (Anderson 1994; Blitz 1993; Hally 1996; Lindauer and Blitz 1997; Steponaitis 1986); and the duration of platform mound construction and use coincided with the duration of the chiefly polity that used the mound (Hally 1996). These interpretations of Mississippian platform mounds are not considered particularly controversial.

Such is not the case with another frequently discussed characteristic of Mississippian platform mounds: the sociopolitical implications of mound size or volume. Perspectives on this topic have changed over time. Archaeologists in the 1970s tended to consider the labor demands of mound building as excessive, and the impressive volume of the mounds was seen as a direct reflection of equally impressive organizational capabilities (Haas 1982; Steponaitis 1978). More recently, archaeologists such as Muller (1997) and Milner (1998) have calculated labor estimates suggesting that mound building would not have placed a serious burden of time and energy on Mississippian populations or even have required complex leadership structures.

Although it has long been evident that there is a wide range of variation in the volume of individual mounds and in the scale of mound construction at Mississippian sites, archaeologists have been slow to quantify these differences in a systematic way (Payne 1994). Nevertheless, the scale of mound building at Mississippian sites has become an important measure of regional settlement hierarchies. Specific settlement patterns, such as the number of mounds at a center and the distances between centers, are attributed to specific forms of sociopolitical organization (Anderson 1994; Blitz 1999; Steponaitis 1986). Although mound-center size hierarchies are commonly considered to be an archaeological correlate of ranked society (Peebles and Kus 1977), variation in Mississippian mound volume is the subject of two widely held interpretations that appear contradictory. Some investigators consider the duration of mound use to be the primary factor determining mound volume, and others claim that mound volume is primarily the result of the number of people in the labor force that constructed the mound. Because each interpretation has very different implications for understanding mound-center size hierarchies, it is important that the relationship between duration of mound use and mound volume is investigated and the apparent contradictions are resolved. Let us examine the basis of each interpretation.

Mound Volume: Duration of Use or Chiefly Power?

In the duration-of-use interpretation, it is assumed that mound volume increased as long as the mound was in use because the occupation of a platform mound entailed periodic construction episodes or stages. These periodic construction episodes are revealed archaeologically in the multistage strata characteristic of Mississippian platform mounds. As the duration of mound use increased, mound volume also increased as more construction stages were added. According to this line of reasoning, the largest mounds are those that were used over the longest periods of time and were repeatedly expanded by the addition of new stages (Hally 1994:157).

The competing interpretation of mound volume may be termed the chiefly power interpretation. By *chiefly power* we refer to a leader's ability to compel compliance to a central authority. The ability to wield power and accomplish social and political goals in competitive situations is expected to vary among chiefs, tied as it is to degrees of rank, charisma, prestige, and other factors. Proponents of the chiefly power interpretation consider mound volume to be the direct product of the quantity of labor invested in construction. In a model of political economy widely attributed to Mississippian societies, the ability to amass and direct labor for mound construction is under the control of chiefly elites or leaders as a form of corvée labor (Haas 1982), tribute extraction (Steponaitis 1978), or communal intensification rites (Knight 1986).

Viewed this way, the volume of mound construction is an indirect measure of the scale of chiefly power, in the form of labor allocation, available to leaders at a mound center. Variation in mound volume should reflect variation in the size of the labor force mobilized by a chief. This assumption provides a rationale for arranging regional mound centers into site-size hierarchies thought to represent dominant and subordinate political relationships. Because relative demographic strength is so important for corporate group or community success in the competitive interaction of kin-based societies such as the Mississippians (Carneiro 1967; Milner and Schroeder 1999), the scale of mound construction at sites implies a corresponding scale of chiefly power.

Two recent studies of regional Mississippian settlement systems serve to illustrate the two contrasting interpretations. In their analysis of the distribution of Mississippian platform-mound centers in the Lower Chattahoochee–Apalachicola River region of Alabama, Georgia, and Florida, John Scarry and Claudine Payne (1986:82) state that "settlement duration" cannot account for the variation in mound volume at regional sites. They acknowledge that duration of mound use is a potential factor in the variation of mound volume at sites, but it is considered to be of secondary importance. Although Scarry and Payne admit that they lack an adequate chronology of mound-center occupations, they go on to reconstruct a site-size hierarchy based on the volume of mounds at sites. This site-size hierarchy, in turn, is their basis for inferring a hierarchy of political relationships between the leaders of regional mound centers.

In contrast, Mark Williams and Gary Shapiro reject the chiefly power explanation of mound volume in their study of Mississippian mound-center settlement patterns in the Oconee River region of Georgia. Instead, they consider duration of mound use to be the primary factor that produced the observed variation in mound volume at regional centers. They state, "Mound volume is a poor indicator of the power held by the chief of a particular village. This is because it is directly related to the longevity of a mound's use and renewal. . . . Thus mound volume, and possibly centrality of mound site, are inadequate means of identifying subordinate sites" (1996:147–148).

Is mound volume the result of the duration of mound use or the measure of a chief's ability to amass a large labor force for mound construction? The question is of central importance because the volume of mound construction at sites is used to identify Mississippian settlement hierarchies and infer political relationships between the leadership structures at large and small mound centers. If the duration-of-use interpretation is correct, however, then an important archaeological correlate of ranked society, the regional settlement hierarchy, may be called into question. The two interpretations have been advanced mainly by assertion. There has been no systematic effort to evaluate the two theories by examining relationships among the basic properties of mounds.

Data and Methods

A sample of 35 excavated Mississippian platform mounds was examined in an effort to evaluate the two interpretations of mound volume (Table 1). Four basic variables were recorded for each mound: a mound volume index, the number of major mound-construction stages, the duration of mound use in years, and the number of mounds at the site where the sample mound is found. Following a method used by Payne (1994:107–110), a mound volume index was calculated for each case as basal length × basal width × height/1000. An index of mound volume facilitates rough comparison of the sizes of mounds and mitigates such factors as slope

Table 1. Mound Sample.

Site	Mound Name	MVI[a]	Stages[b]	Duration[c]	Mounds[d]	References
1HA7	White	5.2	2	1400–1550	1	Welch 1991, 1998
1HO27	Omussee Creek	2.9	4	1275–1350, 1450–1550	1	Lorenz and Blitz 2002; Neuman 1961
1JE12	Bessemer Oval	3.5	6	1000–1200	3	Welch 1991, 1998
1JE14	Bessemer Rectangular	3.8	6	1000–1200	3	DeJarnette and Wimberly 1941; Welch 1994
1PI85	Lubbub Creek	8.2	6	1150–1450	1	Blitz 1993
1TU500	Moundville R	33.6	8	1350–1450	29	Gage 2000; Knight 1995
1TU56	Hog Pen	5.1	2	1200–1300	1	Welch 1998
8LE1	Lake Jackson 3	5.9	12	1250–1450	7	Jones 1982; Payne 1994
9BR3	Two Run Creek	1.5	4	1250–1375	1	King 1996; Wauchope 1966
9CH1	Irene Primary	11.2	8	1200–1450	2	Anderson 1994; Caldwell and McCann 1941
9CK5	Wilbanks	8.0	3	1100–1200, 1250–1375	1	Hally 1996; King 1996; Sears 1958
9CY62						
	Cemochechobee A	1.1	5	1150–1300	3	Lorenz and Blitz 2002; Schnell et al.1981
9CY62	Cemochechobee B	1.9	10	1150–1300	3	Lorenz and Blitz 2002; Schnell et al. 1981
9GE4	Scull Schoals B	2.1	6	1275–1425, 1450–1575	2	Williams 1992; Williams and Shapiro 1996
9GE5	Dyar	27.8	14	1200–1275, 1425–1575	1	Smith 1994; Williams and Shapiro 1996
9MG46	Little River A	1.7	2	1525–1575	1	Williams and Shapiro 1990, 1996
9QU1	Gary's Fish Pond	1.4	3	1350–1450	1	Huscher 1971; Lorenz and Blitz 2002
9ST3	Estatoe	1.0	2	1450–1550	1	Anderson 1994; Kelly and DeBaillou 1960
11MS2	Cahokia 31	51.4	10	1100–1150, 1250–1350	100	Fowler 1997; Sullivan 1997
12VG1	Angel F	20.8	4	1325–1450	11	Black 1967; Hilgeman 2000
16IV11	Bayou Goula 1	3.0	3	1200–1350	2	Jeter and Williams 1989; Quimby 1957
16WBR1	Medora A	5.8	3	1200–1350	2	Jeter and Williams 1989; Quimby 1951
22CS502	Owl Creek 2	2.8	6	1100–1250	5	Rafferty 1995
22CS502	Owl Creek 5	1.2	2	1100–1250	5	Rafferty 1995
22HO502	Old Hoover	2.7	6	1250–1500	5	Lorenz 1992, 1996
22LW510	Pevey G	3.5	3	1200–1350	9	Livingood 1999
22TS500	Bear Creek	2.9	4	1100–1250	1	Bohannon 1972; Rafferty 1995
22WS500	Winterville G	7.7	7	1200–1450	23	Brain 1989
22AD500	Anna 5	7.0	4	1200–1650	6	Ian Brown, personal communication 2003; Cotter 1951
25MG2	Town Creek	2.0	2	1150–1350	1	Coe 1995
40HA3	Hixon	5.8	4	1200–1300	1	Neitzel and Jennings 1995; Sullivan 2001
40HN1	McKelvey	2.2	2	1100–1300	1	Webb and DeJarnette 1942; Paul Welch, personal communication 2003
40HY14	Obion 6	42.6	5	1100–1300	7	Garland 1992
40MG31	Hiwassee Island	12.1	7	1100–1200, 1300–1425	1	Lewis and Kneburg 1946; Sullivan 2003
40MR6	Toqua A	14.7	16	1200–1500	2	Polhemus 1987; Sullivan 2000

[a]Mound volume index.
[b]Number of mound construction stages.
[c]Duration of mound use in years A.D.
[d]Number of mounds at site.

and irregular contours. The number of major mound-construction stages tallied for each mound in Table 1 is the total as recorded by the excavators. Small discontinuous fill episodes, when identified as such by the excavators, were not counted as major construction stages, but we made no effort to evaluate the accuracy of the excavators' observations. Duration of mound use was calculated as the total number of years in the phase interval spans for all components associated with mound use. The number of mounds variable in Table 1 presents the count of mounds at the site where each sample mound occurs. As will become apparent below, it is important to identify if the sample mound occurs at a single-mound site or a multiple-mound site. Because the chiefly power interpretation assumes that the size of the labor force had an influence on mound size, the number of mounds variable serves as a proxy measure of population size at a site.

The sample of excavated mounds in Table 1 is drawn from an unknown or hypothetical population of Mississippian platform mounds. In selecting the sample, our primary concern was to identify factors that might limit the accurate measurement of the four variables. For this reason, we excluded many mounds from the sample for lack of data: incomplete excavation, pre-excavation damage that prevented accurate volume or construction-stage measurement, or chronological ambiguities. In several cases (1PI85, 9BR3, 9CK5, 9QU1, and 22CS502 in Table 1), we included a damaged mound in the sample because mound dimensions were recorded prior to significant alterations and the horizontal and vertical excavations appeared to be extensive enough to detect all major construction stages and all components associated with mound use. We excluded Caddo platform mounds in the trans-Mississippi Southeast from the mound sample because of possible divergent cultural traditions, our lack of familiarity with regional archaeology, and unresolved chronological issues in regional sequences. The result of these selection criteria is a sample of mounds from several regional Mississippian variants or archaeological cultures in Alabama, Florida, Georgia, Illinois, Indiana, Louisiana, Mississippi, North Carolina, and Tennessee (Figure 1).

A possible source of error in these data is the potential variation in the accuracy of the estimated time spans used to measure the duration of mound use. The difficulties encountered in attempts to correlate absolute chronologies based on radiocarbon and relative chronologies based on ceramic seriation are well known. In the American Southeast, prehistoric archaeological phase intervals of less than 100 years are uncommon. Two-hundred-year phases are common, however, perhaps partly because of the standard error ranges of radiocarbon assays. Indeed, at least one archaeologist has advocated the use of standardized, arbitrary 200-year phases for constructing late-prehistoric chronological frameworks in the Eastern Woodlands (Lewis 1990:40-43). It is beyond the scope of this study to undertake a critical evaluation of the phase time spans in the samples. Consequently, the duration of mound use is the maximum number of years in the estimated phase time spans provided in current references (Table 1).

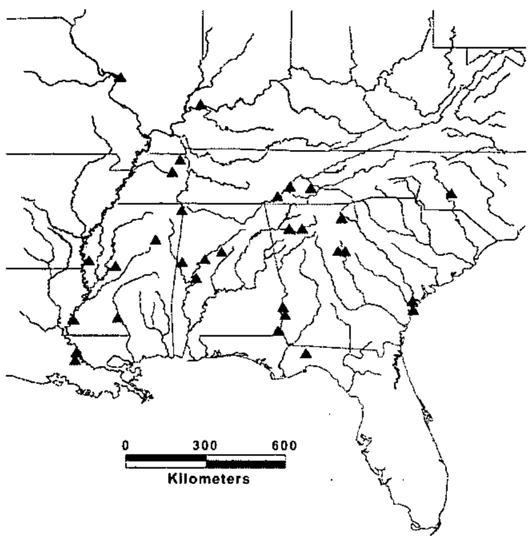

Figure 1. Location of sites in the southeastern United States used in this study.

Analysis and Results

Histograms of the mound sample variables reveal some informative patterns (Figures 2–4). Mound volume indexes range from 1.0 to 51.4, although only five mounds have a mound volume index over 15.0: Moundville R, Dyar, Cahokia 31, Angel F, and Obion 6 (Figure 2). Given that the vast majority of recorded Mississippian platform mounds have volume indexes below 10.0 (Payne 1994:figures 3-14, 3-16), it is not entirely unexpected that

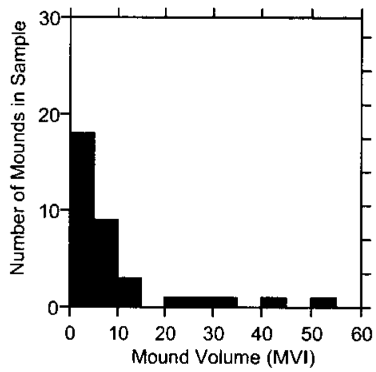

Figure 2. Histogram of mound volume index (MVI).

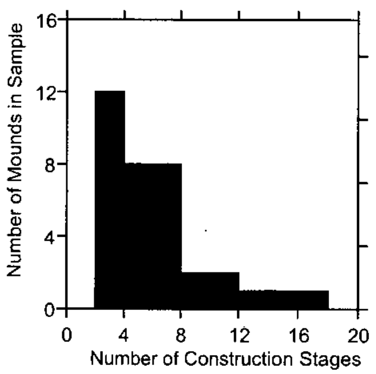

Figure 3. Histogram of mound construction stages.

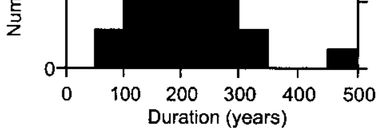

Figure 4. Histogram of mound duration.

the largest mounds are apparent outliers in the sample. A decay pattern is also evident in the distribution of the number-of-stages variable; only a minority of mounds has more than ten construction stages (Figure 3). The chronological variable, duration of mound use, visually and statistically conforms to a normal distribution (Figure 4). There are no apparent breaks in the distribution that would justify the creation of site hierarchies based on duration alone. The duration of use range is 100–450 years, with a mean of 183 years and a median of 150 years. Also, there appears to be a rough periodicity in mound construction: the average occupation span per construction layer is 25–50 years. Of course, construction stages may have been added to mounds at shorter intervals than our chronological methods can measure. These data suggest, however, that mound construction may have been an infrequent, even once-in-a-lifetime event at many sites, lending support to claims that mound construction did not place a significant burden of labor on most Mississippians.

A clearer view of these relationships emerges with a biplot of duration and mound volume index (Figure 5). The most significant feature is that the five large mounds are visually distinct. If we exclude these five apparent outlier mounds from consideration, then one can see that there is a slight trend toward increasing mound size as duration increases. Three of the largest mounds also come from large sites with nine or more mounds. If we exclude all of the mounds from the largest sites, then we get the best-fit line observed in Figure 5. The equation for this line can be expressed as follows: mound volume index = .88 + (.03 × duration). This equation provides an average relationship between mound volume and duration for the sample of mounds at sites with less than nine mounds. This equation may be useful to future researchers searching for a way to control for duration and state whether other mounds are larger or smaller than average compared with our sample. We have not bothered to reproduce the best-fit lines for the whole sample or for the large sites because the y-intercepts for these lines are greater than eight and are clearly skewed by incomplete data.

Figure 6, a biplot of duration and number of stages, shows an even clearer pattern. There is a slight (but visually apparent) trend toward increasing numbers of stages as the duration of mound use increases. Such a pattern makes logical sense. Early historic accounts suggest that mound construction was periodic and that it accompanied significant events, such as world-renewal ceremonies or the death of a chief (Swanton 1911; Waring 1968). If mounds were in use for a longer period of time,

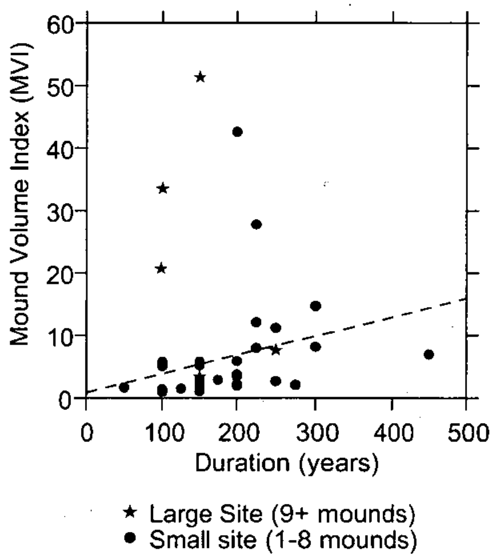

Figure 5. Biplot of duration and mound volume. The dotted line represents the best-fit line for sites with eight or fewer mounds.

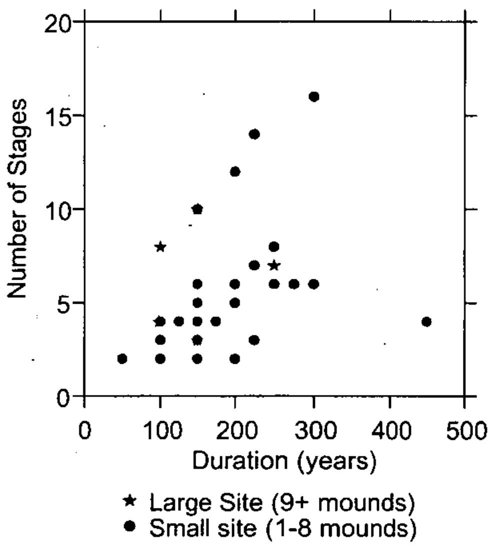

Figure 6. Biplot of duration and number of mound construction stages.

then more of these events, and therefore more stages of construction, should have occurred. It may be significant that six of the mounds (Cahokia 31, Cemochechobee B, Dyar, Lake Jackson 3, Moundville R, and Toqua A) appear to fall along the same accelerated slope. These sites have a much lower average duration per construction layer,

Table 2. Rank-Order Correlations (r_s) of Mound Variables.

	Duration	Stages
MVI	.33	.52
	(.05)	(.001)
Duration	—	.46
		(.005)

Note: The values in parentheses are the probability of getting an equal or stronger correlation from a randomly generated sample.

12–18 years, than the other mounds, where 25–50 years is typical. The sample size is too small to explore this further, but this might be an interesting source for further research.

Spearman's rank-order correlation (r_s) can supplement the visual plots and provide a mathematical measure of the relationships among variables. Spearman's r_s is useful because it makes no assumptions about the distribution of the data, yet the results can be interpreted the same way as other correlation coefficients. As the plots would suggest, there is a middling correlation between mound volume index and number of stages (.52) and number of stages and duration (.46), but there is less correlation between mound volume and duration (.33; Table 2). One way that the correlations can be read is to say that the square of the correlation coefficient is the proportion of the total variability of variable x that can be accounted for by variable y. In other words, the number of stages can explain 27 percent of the variability in mound volume, and duration can explain 21 percent of the variability in the number of stages but only about 11 percent of the variation in mound volume. It would appear that there are additional factors outside of the variables examined thus far that have a greater statistical effect on mound volume than duration alone.

The five largest mounds appear to be outliers in this sample and might be skewing certain calculations. Moreover, three of the five largest mounds are at multiple-mound sites. This observation alerts us to the possibility that the social conditions of mound construction for these largest mounds at the largest sites, such as the size of the mound labor force or mound-construction effort, might be different than the circumstances of mound construction for smaller mounds at smaller sites. We can examine this possibility with the number-of-mounds variable. This variable is statistically independent of mound volume index, so we may use it

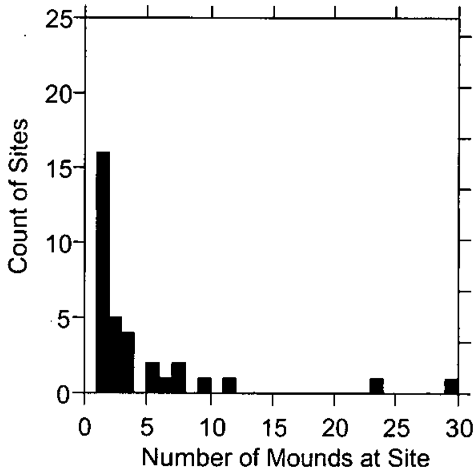

Figure 7. Histogram of the number of mounds at sites, excluding Cahokia.

Table 3. Rank-Order Correlations (r_s) of Mound Variables in Site-Size Categories.

	Single-Mound Center	Minor Center[a]	Major Center[b]
MVI and Duration	.57	.64	–.31
	(.02)	(.01)	(.61)
MVI and Stages	.57	.28	.90
	(.02)	(.34)	(.04)
Duration and Stages	.58	.41	.10
	(.02)	(.15)	(.87)

Note: The values in parentheses are the probability of getting an equal or stronger correlation from a randomly generated sample.
[a]Sites with two to eight mounds.
[b]Sites with nine or more mounds.

to stratify our sample before calculating correlations for the primary variables. Figure 7 is a histogram of the number of mounds, excluding Cahokia.

To judge from Payne's (1994) study of variation in the number of mounds found at Mississippian mound sites, we can consider sites with nine or more mounds to be in the largest category. For our sample, this largest category includes the Cahokia, Moundville, Angel, Pevey, and Winterville sites. We divided the mound sample into three groups: single-mound sites, minor centers (sites with two–eight mounds), and major centers (sites with nine or more mounds). The outlier distribution of the largest mounds, the distribution in Figure 7, and the similar site-size patterning in Payne's study provide the empirical support for this procedure.

Correlations between mounds in each site grouping and the primary mound variables are presented in Table 3. These results reinforce the idea that mound building at major centers was distinctly different from mound building at single-mound sites or minor centers. In fact, there is a negative correlation (–.31) between mound volume index and duration at major centers (probably an accident of sample size, n = 5). Interestingly, the single-mound sites and the minor centers have similar coefficient values. These observations suggest that the same kinds of "rules" about mound construction were in effect at most sites and that these rules were only different at the major centers. Most important, duration has a much stronger correlation with mound volume if mounds from the major centers are excluded. Duration explains about 11 percent of the variation in mound volume when all mounds are considered together, but it accounts for 41 percent of the variation if the mounds from major centers are excluded.

Although it has a good correlation, duration alone does not explain all of the variation in mound volume. We may be dealing here with a more elusive set of causal factors that stem from variability in the effort invested in mound construction. The chiefly power interpretation of mound construction assumes that powerful or charismatic chiefs elicited more construction effort than less persuasive chiefs, but there are few clues in the archaeological record that permit us to measure chiefly influence over construction effort. Because the relationships among the primary mound variables for the largest mounds at the largest sites are different from those at smaller sites, it would be informative to know if mound-construction efforts also vary between large and small sites. One might conclude, intuitively, that such is the case because of the absolute differences in the volume of mound construction at mound sites with more or larger mounds.

One reason to expect differences in the social rules of mound construction is the assumption that the largest sites were occupied by multiple corporate groups. At Mississippian multiple-mound centers, it is common for one platform mound to be much larger than the other mounds (Payne 1994:97). If the smaller mounds were corporate-group structures erected by different social segments, then these largest mounds may represent the pooled labor efforts of all constituent groups, "either as integrative communal projects to counterbalance the differentiation inherent in competitive corporate groups or, alternatively, as a form of tribute that directly acknowledged a ranked social hierarchy" (Lindauer and Blitz 1997:194). Because mounds at smaller sites exhibit a higher correlation between duration and volume, perhaps mound construction was maintained on a more regular or predictable basis at small sites in comparison with mound construction at the largest sites. In contrast, different social rules of construction at the largest sites may have altered the relationship between duration and volume. In other words, the timing of mound-construction episodes at the largest sites may have been dictated more by unpredictable or volatile sociopolitical events directed by powerful chiefs and less by regular or predictable social rules such as periodic renewal ceremonies.

Conclusions

At the beginning of this article we presented two competing interpretations of Mississippian platform-mound volume. Simply put, some researchers claim that big mounds are big because they have been used for a long time, whereas others argue that big mounds are big because a powerful chief amassed a large construction force. The issue is of anthropological significance because the scale of mound construction is used to identify regional settlement hierarchies, which are then used to infer aspects of Mississippian sociopolitical organization. Our tests have shown that somewhere between 10 and 40 percent of the variation in mound volume can be explained by duration alone. The rest of the variation is unexplained by the variables we have. This unexplained remainder in the variation of mound volume could be the product of a host of other factors such as random variation, differences in tools used to dig and move soil, and age/sex differences in the composition of the labor force (assuming that young men could pile up more dirt than others over the same amount of time). It could also be explained by variation in chiefly power.

Statistically, the largest sites do not conform to the same patterns as the smaller sites, so perhaps there were different social rules for mound construction at the largest sites that changed the relationship between volume and duration. We do not know what these different rules were, although it is reasonable to suggest that the answer has something to do with the manner in which labor was mobilized at major centers. Unfortunately, we only have a small and unrepresentative sample of mound data from major centers, so further analysis must be done on a case-by-case basis.

Proponents of both interpretations can find comfort in these conclusions. The "durationist" can point out that as much as 41 percent of mound volume is controlled by duration and that much of the rest of the variation could probably be explained by other rather pedestrian factors if we could only measure them. A "powerist" can say that the big sites are the key and that the relationship between duration and mound volume breaks down at these sites, leaving plenty of statistical room to argue for the influence of chiefs. Either way, our examination of this issue forces attention on often-overlooked assumptions.

We hope that now, when archaeologists identify settlement hierarchies based on the volume of Mississippian platform mounds, they will construct their ideas more carefully. Although we have taken this inquiry as far as the data will allow, we can suggest two ways this might be accomplished when an expanded sample of mounds becomes available. First, to further understand the variation in mound volume, a measure of mound-construction effort applicable to individual mounds is required. Neither the mound volume index nor the duration of use can measure how much effort was invested in each construction episode. For that purpose, a measure of mound stage volume might reveal variation in the construction effort invested in each building episode during the history of an individual mound and for a sample of mounds. Second, investigators could begin to take a more sophisticated statistical approach to the discussion of mound volume and demonstrate that even when duration is factored into the mound-building equation, a particular mound is, in fact, larger than expected.

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