

Washington University in St. Louis
Washington University Open Scholarship

All Theses and Dissertations (ETDs)

January 2010

An Archaeological Model of the Construction of
Monks Mound and Implications for the
Development of the Cahokian Society (800 - 1400
A.D.)

Timothy Schilling

Washington University in St. Louis

Follow this and additional works at: <https://openscholarship.wustl.edu/etd>

Recommended Citation

Schilling, Timothy, "An Archaeological Model of the Construction of Monks Mound and Implications for the Development of the Cahokian Society (800 - 1400 A.D.)" (2010). *All Theses and Dissertations (ETDs)*. 313.

<https://openscholarship.wustl.edu/etd/313>

This Dissertation is brought to you for free and open access by Washington University Open Scholarship. It has been accepted for inclusion in All Theses and Dissertations (ETDs) by an authorized administrator of Washington University Open Scholarship. For more information, please contact digital@wumail.wustl.edu.

WASHINGTON UNIVERSITY IN ST. LOUIS

Department of Anthropology

Dissertation Examination Committee:

Tristram R. Kidder, Chair

David L. Browman

Michael D. Frachetti

Gayle J. Fritz

John E. Kelly

Jennifer R. Smtih

Gregory Vogel

AN ARCHAEOLOGICAL MODEL OF THE
CONSTRUCTION OF MONKS MOUND AND IMPLICATIONS FOR THE
DEVELOPMENT OF THE CAHOKIAN SOCIETY (800 – 1400 A.D.)

by

Timothy Michael Schilling

A Dissertation presented to the
Graduate School of Arts and Science
of Washington University in
partial fulfillment of the requirements
for the Degree
of Doctor of Philosophy

December 2010

Saint Louis, Missouri

Copyright by
Timothy Michael Schilling
December 2010

Abstract

This dissertation presents a model for the development of Cahokian society through the lens of monumental construction. Previous models of Cahokian society have emphasized the accumulation of individual power and domination of the many by a few. Using analogies from the ethnography and ethnohistory of Dhegian Siouan speakers, I argue the Cahokian system likely contained both achieved and ascribed statuses mediated through a worldview that emphasized balance and integration of the whole. In the face of a growing population, this kind of structural organization may have precluded the development of class conflict and, at the same time, permitted the development of large-scale societies.

The analysis of monumental construction focuses primarily on the construction of Monks Mound. Through a combination of stratigraphic and chronometric data, the construction of Monks Mound is argued to be a definable and discrete event in the history of Cahokia. In this view, Monks Mound is a ritual vehicle created to integrate a large population.

Acknowledgements

Writing a dissertation and completing graduate school is one of the most challenging and rewarding experiences that I have undertaken. In my graduate career, numerous individuals have helped, inspired, or mentored me and need to be acknowledged for their contributions to my professional and personal development. Foremost, among these are T. R. Kidder and John Kelly. T.R. served as my graduate advisor, teacher, and mentor. Without T.R.'s guidance, graduate school would have been more challenging and less rewarding. John Kelly introduced me to Cahokia archaeology by setting me up with "a small project" on Monks Mound. Little did any of us know how small the project would be. To this list of mentors, I specifically want to highlight Gayle Fritz and David Browman who have directly and indirectly guided this dissertation through comments and conversation. Finally, I wish to acknowledge the outside readers, Jen Smith and Greg Vogel who have given up time at a particularly eventful point in the semester.

Overall, I wish to thank the Wash U Department of Anthropology and the Wash U community as whole. Wash U is one of the great schools and I am proud to be a part of this community. In particular, Kathleen Cook and the other administrative staff have been particularly helpful with the bureaucratic end of graduate school.

Outside of the immediate Wash U community, numerous individuals need to be acknowledged. The folks at Cahokia — especially Mark Esarey and Bill Iseminger — have made Cahokia a world class resource for the state of Illinois and a wonderful place to work. This dissertation is largely based around data collected in 2007. The fieldwork

portion of the project included over 40 individuals who worked tirelessly in the August heat. There is not room to name them all here, but I wish to thank all of those who helped or came out to visit. In this same vein, workers with the Illinois Historic Preservation Agency and the Illinois State Museum deserve to be recognized for their inputs in the restoration project.

As with any project dealing with a site the scale of Cahokia, this dissertation owes much to the work of earlier researchers. Even though the work presented here is the result of original analysis, it could not have been done without generations of previous research and hard work.

Table of Contents

Abstract.....ii
Acknowledgements.....iii
Chapter I: Introduction 1
 Physical Context..... 7
 Description of Monks Mound.....9
 Cultural Context..... 12
 The Emergent Mississippian Period (800 – 1050 A.D.) 17
 The Mississippian Period (1050 – 1400 A.D.) 20
 Mound building and Mississippian Social Organization..... 27
 Cahokian Social Organization 31
 The Meaning of Platform Mounds 35
 An Alternative Manner of Organization 38
Chapter II: Research Design 49
 The Archaeological Background of Monks Mound..... 49
 The Initial Archaeological Research 52
 The Modern Archaeological Era..... 55
 Salvage Projects..... 56
 University Based Research..... 57
 Conservation and Repair 64
 Differing Views of the Timing and Construction of Monks Mound 66
 Reed, Bennett, and Porter Model..... 68
 Expectations: Reed et al. Model 72
 Woods Model 72
 Expectations: Woods Model..... 73
 Pauketat model 74
 Expectations: Pauketat Model 75
 The Event Model 76
 Monks Mound and the Cahokia Site..... 76
Chapter III: 2007 Excavations 78
 The Northwest Locality 80
 The East Face Locality 85
 Stratigraphy..... 89
 Face 1 89
 Face 2 92
 Face 3 100
 Face 7 114
 Face 8 118
 Face 9 120
 Face 10 123
 Face 11 125
 Face 12 127

Face 13.....	129
North Wall.....	131
South Wall.....	140
Geoarchaeological Analysis.....	143
Phosphate Measurement.....	144
Particle Size Analysis.....	145
Sequential Loss on Ignition.....	145
Magnetic Susceptibility.....	146
Results.....	147
Discussion.....	150
Micromorphology.....	151
Discussion.....	151
MM35.....	151
MM86.....	151
MM105 and MM107.....	152
MM114.....	152
Radiocarbon Dating.....	152
A Synoptic View of the East Slope.....	155
Summary.....	159
Chapter IV: Soil Coring in the Vicinity of Monks Mound.....	167
Objective.....	167
Field Methods.....	168
Laboratory Methods.....	170
Results.....	170
Field Observations.....	171
Laboratory Analysis Results.....	173
Discussion.....	175
Stratigraphic mapping.....	175
Modeling the Pre-mound Surface.....	179
Calculating the Volume of Monks Mound.....	186
Laboratory Analysis.....	187
Summary.....	189
Objective 1 and Objective 3.....	190
Objective 2.....	190
Chapter V: A High Resolution Construction Chronology of Monks Mound.....	192
An Introduction to the Bayesian Approach for Chronological Modeling.....	192
The Chronometric Dataset from Monks Mound.....	202
Submound dates.....	202
Moundfill Dates.....	206
Summit Dates.....	210
Other Chronometric Dates.....	214
Parameters and Phasing.....	216
Two Chronological Models of Monks Mound.....	219
Model 1.....	221

An Alternative View of Mound Building Chronology	226
Model 2.....	227
Discussion	233
Chapter VI: Monks Mound in the Context of the Cahokia Site.....	236
Modeling Considerations.....	238
Powell Tract.....	238
The West Plaza	244
Ramey Field.....	248
Tract 15A.....	253
Interpretive Center Tract II.....	258
Mound 51.....	260
Mound 72.....	261
Monks Mound First Terrace	264
Miscellaneous Areas	265
Modeling Results	265
The Powell Tract	266
West Plaza	268
Ramey Field – Mound 34	269
Ramey Field – Palisade	269
Tract 15A.....	270
Mound 51.....	272
Mound 72.....	272
Monks Mound First Terrace	273
Miscellaneous Dates	274
Chapter VII: Continuity and Change: Monks Mound and the Construction of the Cahokian Polity	275
A Settlement History of the Cahokia Site	278
Cahokia (800 A.D. – 1100 A.D.).....	281
Cahokia (1100 A.D. – 1200A.D.).....	293
Cahokia (1200 A.D. – 1400 A.D.).....	299
A Social History of Cahokia.....	300
Cahokian Society (800 A.D. – 1100 A.D.)	301
Cahokian Society (1100 A.D. – 1200 A.D.).....	307
Cahokian Society (1200 A.D. – 1400 A.D.).....	314
References Cited.....	323
Appendix 1. Monks Mound Micromorphology Notes	359
Appendix 2. Soil core descriptions	360
Endnotes	375

List of Figures

FIGURE 1. MONKS MOUND FROM THE EAST ON A SNOWY DAY, COURTESY OF GALEN PATTERSON.	1
FIGURE 2. MONKS MOUND TOPOGRAPHIC MAP.	10
FIGURE 3. THE CAHOKIA SITE.	11
FIGURE 4. SELECTED LARGE MOUND SITES IN THE AMERICAN BOTTOM.	13
FIGURE 5. CULTURAL CHRONOLOGY OF THE AMERICAN BOTTOM AFTER J. KELLY 1990:117.	15
FIGURE 6. PAST EXCAVATIONS ON MONKS MOUND.	63
FIGURE 7. REED ET AL. MODEL.	68
FIGURE 8. SCHEMATIC OF MODEL PROPOSED BY SKELE (AFTER SKELE 1988; FIGURE 52)	71
FIGURE 9. LOCATION OF EXCAVATIONS DISCUSSED IN TEXT.	79
FIGURE 10. NORTHWEST PROFILE DRAWING.	81
FIGURE 11. DETAIL OF STRATUM 2 AND STRATUM 3, FACING SOUTH. NOTE THE OVERALL ARC-SHAPED STRUCTURE.	83
FIGURE 12. FAULTING ON THE NORTHWEST CORNER. NOTE THE ROOT CAST, CIRCLED.	84
FIGURE 13. COMPOSITE STRATIGRAPHIC DRAWING OF THE EAST FACE EXCAVATIONS, LOCATIONS AND COLORS APPROXIMATE.	86
FIGURE 14. PHOTOGRAPH OF EAST FACE EXCAVATIONS.	87
FIGURE 15. FACE 1 STRATIGRAPHY.	89
FIGURE 16. LOESS FILL OVERLYING FACE 1, CA. 152-154 MAMSL.	91
FIGURE 17. FACE 2 STRATIGRAPHY.	92
FIGURE 18. DETAIL OF SLUMPING ON FACE 2.	94
FIGURE 19. DETAIL OF POSSIBLE SURFACE, FACE 2.	95
FIGURE 20. STRATUM 26. A IS AN OVERALL VIEW, B IS A DETAIL.	99
FIGURE 21. FACE 3 STRATIGRAPHY.	100
FIGURE 22. FACE 4 STRATIGRAPHY.	103
FIGURE 23. DETAIL OF CLAYEY SEDIMENTS OBSERVED IN FACE 4.	105
FIGURE 24. FACE 5 STRATIGRAPHY.	107
FIGURE 25. DETAIL OF U SHAPED INCISION ON FACE 5.	108
FIGURE 26. PHOTOGRAPH OF FACE 5.	108
FIGURE 27. FACE 6 STRATIGRAPHY.	109
FIGURE 28. AUTOMOTIVE TIRES EXCAVATED FROM FACE 6.	111
FIGURE 29. OVERVIEW OF FEATURE 1.	112
FIGURE 30. DETAIL OF SOD-BLOCK CONSTRUCTION.	113
FIGURE 31. FACE 7 STRATIGRAPHY.	114
FIGURE 32. FACE 7 DETAIL (FACING WEST), NOTE SOFT SEDIMENT DEFORMATION IN THE NORTHERN DEPOSITS (CIRCLED).	117
FIGURE 33. FACE 8 STRATIGRAPHY.	118
FIGURE 34. FACE 9 STRATIGRAPHY.	120
FIGURE 35. FACE 9 THROUGH FACE 13. NOTE DOME-SHAPED FEATURE VISIBLE IN THE CENTER OF THE EXCAVATION UNIT.	122
FIGURE 36. FACE 10 STRATIGRAPHY.	123
FIGURE 37. FACE 11 STRATIGRAPHY.	125
FIGURE 38. FACE 12 STRATIGRAPHY.	127
FIGURE 39. FACE 13 STRATIGRAPHY.	129
FIGURE 40. NORTH WALL PROFILE.	131
FIGURE 41. PROFILE OF BAREIS 1971 SOUTH SLOPE EXCAVATION.	135
FIGURE 42. A COMPARISON OF THE MODERN ANGLE OF ORIGINAL ANGLE OF REPOSE (A) AND THE MODERN ANGLE OF REPOSE (B).	137
FIGURE 43. UNIT 10.	139
FIGURE 44. SOUTH WALL PROFILE.	140
FIGURE 45. FACE 7 SOUTH WALL/EAST FACE NOTE DEFORMED SEDIMENTS.	141

FIGURE 46. A HISTORICAL MODEL OF THE TAPHONOMY OF THE EAST FACE	157
FIGURE 47. MAP SHOWING CORE LOCATIONS, RED LINE HIGHLIGHTS 129 AMSL	169
FIGURE 48. TERNARY PLOT OF PARTICLE SIZE ANALYSIS.	175
FIGURE 49. PRE-MOUND TREND	181
FIGURE 50. DEM DISPLAYING THE MORPHOLOGY OF BANKLINE NEAR THE CAHOKIA SITE. COMPARE THE EASTERN AND NORTHERN PORTIONS TO THE AREA IMMEDIATELY ADJACENT TO THE MOUND SITE.	184
FIGURE 51. PPM PHOSPHATES.....	187
FIGURE 52. OxCAL MODEL EXAMPLE.	197
FIGURE 53. MODELED AGE OF EXAMPLE.	198
FIGURE 54. SCHEMATIC OF MONKS MOUND.	200
FIGURE 55. SUBMOUND DATES MODELED AS ONE PHASE.....	217
FIGURE 56. TPQ MOUND BUILDING.....	219
FIGURE 57. SCHEMATIC OF MODEL 1.	222
FIGURE 58. TIME REQUIRED FOR MOUND TO REACH FOURTH TERRACE.	223
FIGURE 59. AGE OF THE SUB-MOUND SURFACE (MINIMUM AGE FOR THE FOURTH TERRACE).	224
FIGURE 60. TIME REQUIRED TO BUILD FIRST TERRACE.	225
FIGURE 61. MAXIMUM AGE FOR THE INCEPTION OF FIRST TERRACE CONSTRUCTION.....	226
FIGURE 62. COMBINED DATES.....	227
FIGURE 63. MODEL 2 TIME REQUIRED TO BUILD STAGE A'.....	229
FIGURE 64. MODEL 2 TIME REQUIRED TO BUILD STAGE A.	229
FIGURE 65. BEGIN STAGE A'	230
FIGURE 66. MODEL 2, TERRACE 1 CONSTRUCTION INTERVAL.....	232
FIGURE 67. MODEL 2. MINIMUM AGE OF FIRST TERRACE.....	232
FIGURE 68. SCHEMATIC OF POWELL TRACT MODEL.....	244
FIGURE 69. MERRELL TRACT MODEL SCHEMATIC.....	248
FIGURE 70. PALISADE MODEL SCHEMATIC	252
FIGURE 71. WOODHENGES MODEL SCHEMATIC.....	257
FIGURE 72. MOUND 72 MODEL SCHEMATIC.....	263
FIGURE 73. THE OSAGE COSMOLOGY OVERLAIN ON A VIEW OF MONKS MOUND FROM THE SOUTH.....	311

List of Tables

TABLE 1. FACE 1 SOIL DESCRIPTIONS.	90
TABLE 2. FACE 2 SOIL DESCRIPTIONS.	93
TABLE 3. FACE 3 SOIL DESCRIPTIONS.	101
TABLE 4. FACE 4 SOIL DESCRIPTIONS.	104
TABLE 5. FACE 5 SOIL DESCRIPTIONS.	108
TABLE 6. FACE 6 SOIL DESCRIPTIONS.	110
TABLE 7. FACE 7 SOIL DESCRIPTIONS.	115
TABLE 8. FACE 8 SOIL DESCRIPTIONS.	119
TABLE 9. FACE 9 SOIL DESCRIPTIONS.	121
TABLE 10. FACE 10 SOIL DESCRIPTIONS.	124
TABLE 11. FACE 11 SOIL DESCRIPTIONS.	126
TABLE 12. FACE 12 SOIL DESCRIPTIONS.	128
TABLE 13. FACE 13 SOIL DESCRIPTIONS.	130
TABLE 14. NORTH WALL SOIL DESCRIPTIONS.	133
TABLE 15. SOUTH WALL SOIL DESCRIPTIONS.	142
TABLE 16. SOIL ANALYSIS RESULTS.	149
TABLE 17. MICROMORPHOLOGY SAMPLE LOCATIONS.	151
TABLE 18. RADIOCARBON ASSAYS AS REPORTED BY ISGS AND BETA ANALYTIC, INC, REPORTED AS CONVENTIONAL AGES.	155
TABLE 19. GRID COORDINATES OF CORES LOCATIONS.	168
TABLE 20. PROVENIENCE OF SOIL SAMPLES.	170
TABLE 21. RESULTS OF LABORATORY ANALYSIS.	174
TABLE 22. SUBMOUND DATES.	206
TABLE 23. MOUNDFILL DATES.	210
TABLE 24. SUMMIT DATES.	211
TABLE 25. RADIOCARBON DATES FROM THE SURFACE OF TERRACE 1.	213
TABLE 26. ARCHAEO-MAGNETIC DATES FROM FIRST TERRACE.	213
TABLE 27. OTHER RADIOCARBON DATES FROM TERRACE 1.	213
TABLE 28. OTHER PROVENIENCES.	215
TABLE 29. POWELL TRACT DATES.	239
TABLE 30. WEST PLAZA DATES.	246
TABLE 31. RAMEY FIELD DATES.	250
TABLE 32. TRACT 15A DATES.	254
TABLE 33. ICTII DATES.	260
TABLE 34. MOUND 51 DATES.	261
TABLE 35. MOUND 72 DATES.	264

Chapter I: Introduction

The Cahokia site stands out as an anomaly in the archaeological record. The incredible investment in construction at the site makes Cahokia without parallel in ancient North America. Monks Mound (Figure 1) specifically, exemplifies this aspect of the site and in many ways compares better with monumental architecture elsewhere in the world than any other contemporary or near contemporary Indian construction. Currently, researchers believe much of the construction at the site happened over the course of just a few centuries, indicating the population of the Cahokian social network was perhaps the largest in pre-Columbian North America (Hall 1991, J. Kelly 1991b, J. Kelly et al. 2003, Lopinot and Pauketat 1997). On the other hand, Cahokian material culture did not differ appreciably from any other contemporaneous Eastern Woodland people (Milner 1998,



Figure 1. Monks Mound from the East on a snowy day, courtesy of Galen Patterson.

Muller 1997, Welch 2006, Wilson et al. 2006). Although Cahokian society underwent dramatic changes in the centuries around the turn of the first millennium c.e. (A.D.), other societies in the Midwest and Southeast underwent similar changes but no other monuments nearing the scale of Monks Mound were constructed.

The goal of this dissertation is to understand potential reasons for this disjuncture. In particular, I seek to explain why Monks Mound was such an outsized monument built by a society with little visible social differentiation. Key pieces of the explanation may come from the history of Monks Mound (Cobb and King 2005). By understanding how and when this monument was built, insight may be gained into its ultimate meaning and reason for being. However, Monks Mound only comprises a portion of the site. To understand the mound in context, I created a settlement history of the site using multiple geoarchaeological and chronometric datasets. Because of this heavy emphasis on chronology, it is imperative to discuss temporal data consistently; therefore, all dates referred to in this discussion are calibrated unless specifically noted. The history of the built environment at Cahokia provides possible social and political reasons for building a monument on such a scale.

This research relied heavily on a dataset collected during repair work done in 2007 on Monks Mound. Although the project addressed potentially catastrophic slumping on the mound, excavations exposed the most extensive stratigraphic picture of the mound to date. The removal of nearly 3000 m² of soil from the eastern and northwestern slopes revealed important new information regarding the internal structure and construction methods used in building the mound (Schilling and Kelly 2009). Even though these excavations were massive by usual standards, this volume only represents about 3/10 of 1

percent of the mound's volume and the work provided only a small window into the entire mound; however, observations from this work demonstrated a complex internal stratigraphy that suggested the mound may have been built in a very short time. Subsequent soil coring work has helped define the geological and geomorphological setting of the mound and provide a necessary framework for reinterpreting the mound's construction chronology. Taken together these data present a much abbreviated and later chronology than normally supposed. Examining this new chronology of Monks Mound in relation to the history of the site provides the basis for theorizing about social organization and social processes at Cahokia. This alternative model differs from the prevailing view.

So, why does this research matter? Questions of how to organize societies and the means for implementing these organizational strategies have been debated since the dawn of Western intellectual tradition. Archaeology indicates the population of Cahokia was likely made up of people from multiple ethnic backgrounds (Alt 2006a). Leadership and authority would have been necessary to coordinate these large, diverse social groups. Presumably, the proper form and method for integrating numerous and diverse peoples in acceptable ways was a primary topic of consideration for the ancient Cahokians, too. These questions still resonate with us today, with discussions about the extent of Federal control over states or the future of the European Union at the large end of the scale and questions of how local institutions operate falling into the smaller end.

Many researchers have identified the form and organization of the Cahokia polity as central questions at Cahokia (Emerson 1995, J. Kelly 1996b, Milner 1998, Pauketat 2003b). The study of ancient social and political organization is a question of great

anthropological interest in general (Carneiro 2003, Fried 1967, Renfrew 1974, Sahlins 1958, Service 1975). There are numerous models of the Cahokian political economy, with some stressing class division and degrees of conflict between elites and commoners (Alt 2006a, Emerson 1995, Pauketat 2002), and others emphasizing cooperation and social cohesion (Blitz 2009, J. Brown 2006, Byers 2006, J. Kelly 1996b, L. Kelly 2000). In this dissertation, I propose a historical model of the development of Cahokia, which though still speculative in many ways, uses both archaeological and analogical data to suggest a model of social organization based in cooperation and deliberation¹ (contrast with Carneiro 2010 for example). Drawing on ethohistoric analogs (La Flesche 1995), I develop the thesis that Cahokian social organization and decision-making was designed to balance natural forces, of which human action was a component, as opposed to aggrandizing a small component of society. In this view, Cahokian society was fundamentally a vehicle for the ritual management of the world, and although competition and the accumulation of individual power likely happened, society was structured to achieve balance. Individual power would be offset by structural mechanisms requiring the assent of the whole. This model does allow for power individuals; however, individualism was tempered by group-oriented structures.

This model requires understanding Monks Mound not as representative of an individual, a measure of social control, or the manipulation of a labor force. Rather, I argue the mound was a component of a ritual landscape embedded in a religious/symbolic system that facilitated social integration. Landscapes and the built environment are one means by which ancient societies created their worlds and as such can give insight into how they articulated with that world (Bayliss et al. 2007b, Cobb and

King 2005, Knapp and Ashmore 1999, Pauketat and Alt 2003, Renfrew 2001b, Shanks and Tilley 1992, Wesson 1998)². For this reason, it is imperative to understand how the builders of Monks Mound may have perceived Monks Mound and the process of building a mound. In subsequent discussion, I develop the cosmological context for earthen mounds. From this context, a sociological imperative for such undertakings may be found.

Through this discussion, I develop a model for why Monks Mound was built. The model incorporates a view mound building in Eastern North America based on the idea that mounds are world icons and are situated in a system of meanings that has deep history in Native American mythology (Knight 2006). This system worked both consciously and unconsciously to integrate the largest population north of the Valley of Mexico in the face of growing population and attendant resource stresses. Integration successfully balanced the need for complexity with an egalitarian³ ethos. Ultimately, this research is a step towards situating the Cahokian polity within the framework of the site and understanding monumentality in ancient North America.

Chapter II describes the three most widely cited models of the mound's construction. All of these models require a gradual construction sequence, but gradualism is not a necessity for mound construction. Accordingly, I add a fourth model where construction was rapid and the mound was built as a whole. After these models are described, I create archaeological expectations of each that can be falsified. The following two chapters describe recent fieldwork done on Monks Mound. Chapter III presents the results of excavations done in 2007. Although these excavations were undertaken to remediate slope failures on the mound, they provide a unique window into

the construction history of the mound. Excavations were done in two locales: the Northwest Corner and the East Face. These data provide essential grounding for models of how the mound was built. Chapter IV details the results of soil coring done in 2008. Although much work has emphasized the mound, little has explored the pre-construction landscape and modification beneath Monks Mound. The soil coring data provide both new insight into the mound in context and a secondary data set for evaluating the mound's construction history.

In Chapter V, I present the results of Bayesian model of the radiocarbon dataset from Monks Mound. Previous workers have only used radiocarbon dates for a very general understanding the chronology of the mound. I argue that these data provide the most accurate chronology of the mound, and the data can be modeled in a mathematically way to create a fine-scale model of the most probable time of mound construction. Using these techniques, Chapter V presents two possible empirical models of mound construction. Model One indicates the mound was built in a single stage and was completed in less than a decade, albeit at a much later date than is commonly accepted. Model Two supports a longer, multistage construction chronology that began earlier than most researchers believe. In Chapter V, I present an argument for accepting Model One as the preferred model.

Chapter VI extends this technique to the radiometric database from the entire Cahokia site. Here, I present temporal implications of stratigraphic relationships as described by previous researchers. Although the data are from a very limited number of proveniences, modeling portrays the landscape at Cahokia as developing in a very dynamic, purposeful way.

Chapter VII provides a synthetic model of Cahokia describing a history of the social development of ancient polity centered on the site. The multiple radiometric analyses are linked with data about the demographic and settlement history of the site. Together these data are explained in relation to the theoretical framework of social organization laid out in Chapter II. The history presented in Chapter VII is a model which new archaeological data can be tested. Importantly, the analytical framework allows new data to be incorporated and the model to be updated without abandoning the basic framework.

Physical Context

The Cahokia site is located about 15 kilometers southeast from the confluence of the Missouri and Mississippi Rivers. The site lies within a section of the Mississippi River Valley known as the American Bottom. Here the floodplain is relatively wide and the river follows an alluvial depositional regime with deposits laid down since the beginning of the Holocene forming the valley fill (Grimley et al. 2007). Through time, the river has become progressively less meandering with the final pre-modern regime characterized by an island-braided pattern that appears about 1000 years ago (Bettis et al. 2008:369). With the transition to the island-braided pattern, the river migrated to the western valley wall. Its course was impounded between steep limestone bluffs on the west and past meander belts on the east. The Cahokia site is located at the ancient confluence of Cahokia and Canteen Creeks, and is positioned atop overbank deposits related to the Edelhardt course (*circa* 5500 – 3600 BP) (Rissing 1991) of the Mississippi River.

Riverine and backswamp environments dominate the American Bottom.

Archaeological research indicates Indians exploited these environments effectively (see Milner 1998 for the most recent in-depth discussion of American Bottom environments).

The surrounding uplands — composed of Illinois Episode and Wisconsin Episode

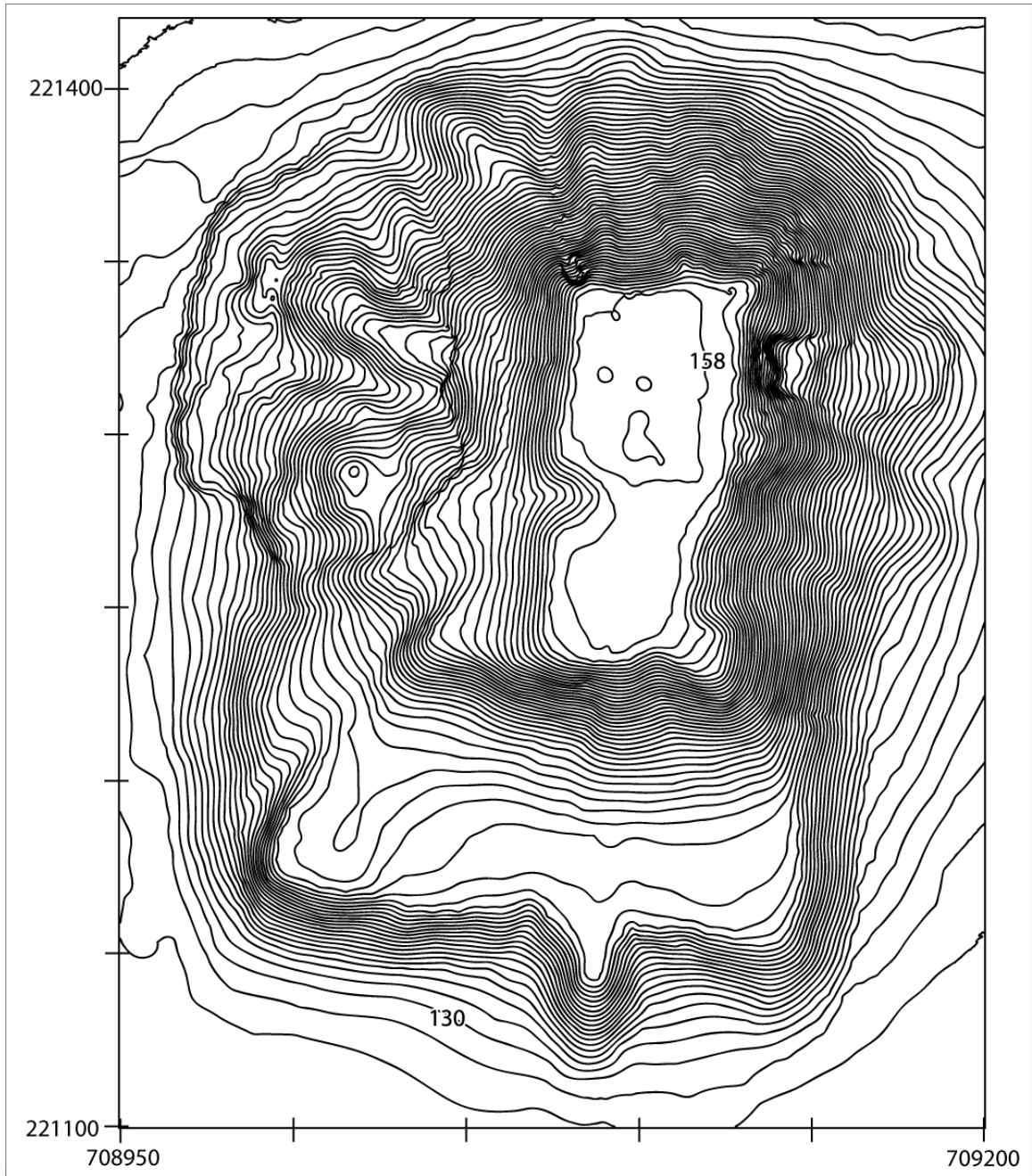
Aeolian deposits overlying much earlier limestones and sandstones (Grimley et al. 2007)

– consist of prairie and upland forest environments.

Description of Monks Mound

Monks Mound (Figure 2, Figure 3) lies at the center of the Cahokia site. It is usually described as a quadrilateral flat-topped pyramid (a frustum by definition). Archaeologists believe the mound is composed almost entirely of earth either scraped or quarried from the adjacent landscape⁴. Taking measurements from the 128 mamsl, the mound is slightly over 30 meters tall, 320 meters North to South, and 294 meters East to West (Fowler 1997:87).

Traditionally, the mound is described as having four terraces. Two terraces or surfaces (Terrace 1 and Terrace 3) supported wooden buildings (Benchley 1975, Reed 2009). Terrace 1 projects to the south and rises about twelve meters above the surrounding landscape. Terrace 3 represents the upper most use surface of the mound and lies at about 156 meters above sea level. A ramp, and probable stairway, connects Terrace 1 and Terrace 3 (Bareis 1975b, Reed 2009). Terrace 4 is the upper surface of a clay cap (Fischer 1972) that may have represented the ritual termination of the mound. Terrace 2 was formed when the western side of Terrace 3 collapsed (Collins and Chalfant 1993, Dalan et al. 2003, Hajic 2005). A small platform mound was constructed on the Southwest corner of Terrace 1 (Benchley 1975) and some researchers speculate a small conical mound was built on the Southeast corner of Terrace 3 (Dalan et al. 2003, Reed 1969, 2009)⁵.



Monks Mound

after Oates 2005

Interval 50 cm, mamsl

UTM Zone 15, WGS1984

Figure 2. Monks Mound topographic map.

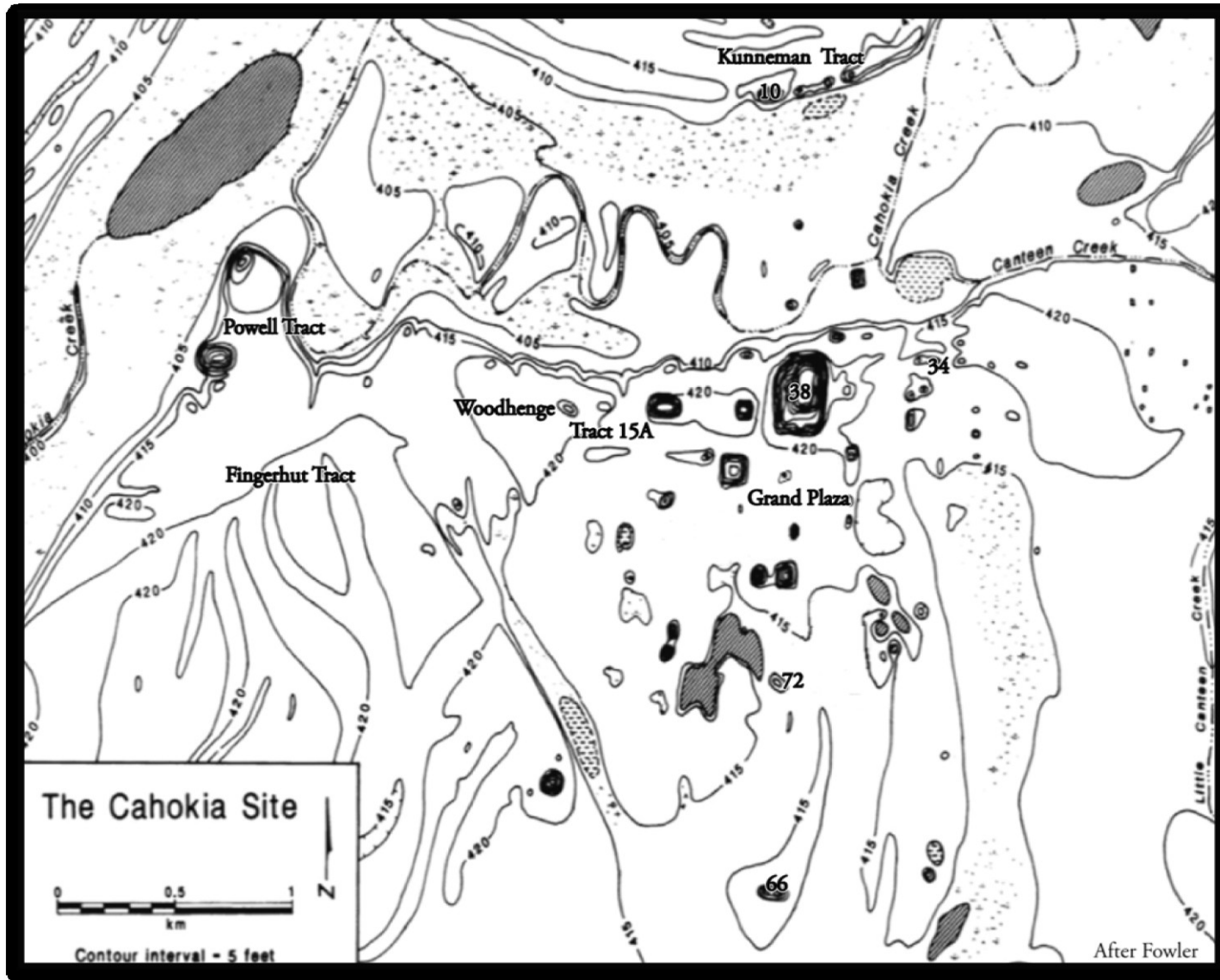


Figure 3. The Cahokia Site.

Cultural Context

Traditionally, the American Bottom is divided into a northern and southern section with the northern section running approximately from the confluence of the Missouri River to Prairie du Pont Creek and the southern section from Prairie du Pont Creek south to the Kaskaskia River⁶. In addition, archaeological data suggests stylistically similar materials to those found at Cahokia have a much broader range than the geographic constraints of the American Bottom (Hall 1991, Pauketat 2004).

Archaeological survey and excavation demonstrates the Cahokia phenomenon likely encompassed the uplands to the East of Cahokia (Koldehoff 1989, Pauketat 2002, Woods and Holley 1991) and as far west as modern Washington, Missouri (Meinkoth et al. 2000:180-181). In recognition of this, John Kelly (1990b) and others argue for an expanded American Bottom region that includes the Illinois Uplands and Missouri. Furthermore, Cahokian related materials have been found as far away as Aztalan in Wisconsin (Goldstein and Richards 1991, J. Kelly 1991a) or the Lower Mississippi Valley (Brain 1989, Wells and Weinstein 2007).

Cahokia, as typically described by archaeologists, was a settlement defined most conspicuously by over 100 earthen mounds. It represents the largest, by volume, collection of Native American mounded architecture North of Mexico. In this same vein, other, spatially discrete clusters of mounds, believed to represent single autonomous communities, surrounded Cahokia. Monks Mound at Cahokia is the largest earthen mound in all of North America, but there other very large mound communities in the immediate area (Figure 4).



Figure 4. Selected large mound sites in the American Bottom.

The cultural historical sequence is divided into a series of contiguous phases that follow the North to South geographic division of the American Bottom (Figure 5). Occupation at the Cahokia site falls roughly into the 800 A.D. to 1400 A.D.⁷ time frame; therefore, the following discussion of the cultural sequence in the American Bottom is based on the archaeological remains from this time.

At this point, a note about terminology and the function of these cultural chronology charts and descriptions is needed. The most widely accepted cultural chronology for the American Bottom comes out of the FAI270 project of the late 1970s and early 1980s (Emerson et al. 2006). The chronology was used to organize the vast array of data coming from the project⁸ and to facilitate communication between researchers (Bareis and Porter 1984, J. Kelly personal communication 2010). The chronology for the time of interest consists of three main periods — the Late Woodland, the Emergent Mississippian, and the Mississippian.

Underlying the chronology was an assumption of cultural continuity. Researchers believed that the locus of culture change was changes related to the adoption of an agricultural lifestyle. Change was seen as gradual and evolutionary. More recently, some scholars propose a more abrupt pace of change with later cultural expressions radically different from those coming just a few years before; in this model, change was punctuated and culture was discontinuous. This has led to Fortier and McElrath (2002, see also Pauketat 2002) proposing revisions to the chronology based on presumed cultural differences that arose in a very short time period. These changes replace the Emergent Mississippian Period with a Terminal Late Woodland Period.

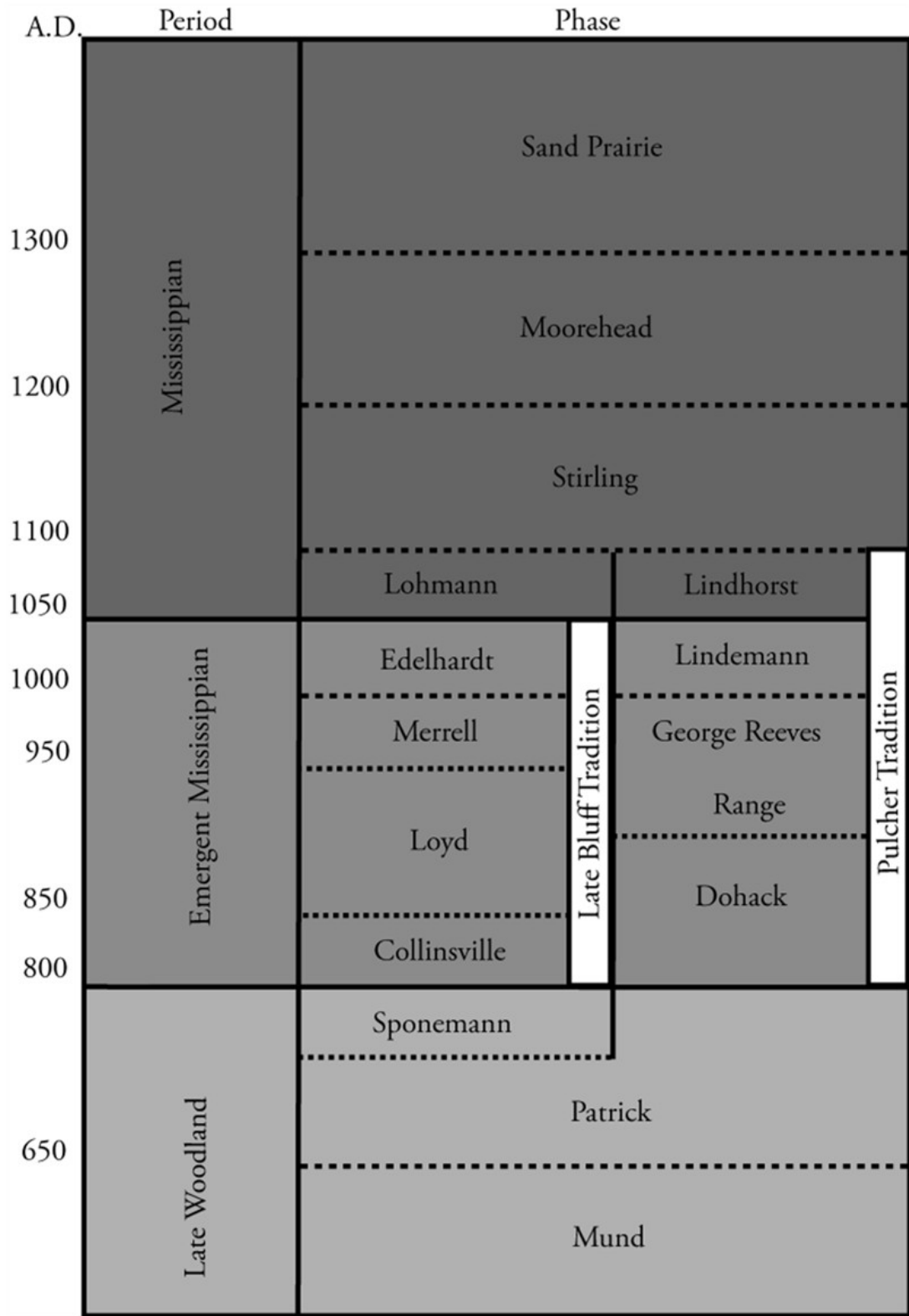


Figure 5. Cultural Chronology of the American Bottom after J. Kelly 1990:117.

Fortier and McElrath's (2002)⁹, terminology emphasizes the view that Mississippian culture is a significant break with earlier ways of doing things and is fundamentally different. In particular, the proposed revised chronology highlights the so-called Big Bang in the Bottom (Pauketat 1997) at about 1050 A.D. as the primary event in the later prehistoric period at Cahokia. In this view, demographic and cultural change represents a disjuncture where events happening in the early Lohmann Phase created such drastic change that culture and society after this were radically different from before the Big Bang. During the Big Bang, Cahokian society was restructured and broke with ancient ways of doing things (see discussion below).

Based on the research presented in this dissertation, the earlier FAI270 chronology is preferred. Preference is given to the earlier chronology since it emphasizes continuity. Continuity in material culture may be seen in shared motifs between Late Woodland, Emergent Mississippian, Mississippian, and Historic Indians as noted by Fortier and Jackson (2000:139-140) in the confluence region. Farther away from Cahokia, platform mounds and other forms of monumental architecture are found in much earlier contexts (Carr and Case 2005, Gibson and Carr 2004, Kidder 2004a, Saunders et al. 1997). Although Cahokia does appear quantitatively different from anything before or after, it clearly is rooted in American Indian practices that pre-date the site (Hall 1997, J. Kelly 2008b). This temporal framework provides a useful way for thinking about the social context that led to the construction of Monks Mound.

The Emergent Mississippian Period (800 – 1050 A.D.)

The Emergent Mississippian Period in the American Bottom is separated into two traditions that follow the previously discussed North and South division. Researchers classify materials from the North as the Late Bluff Tradition while materials from the south are classified as the Pulcher Tradition (Griffin 1977, J. Kelly 1990b). Grit-grog tempering defines Late Bluff pottery whereas Pulcher pottery is limestone tempered (J. Kelly 1993). These two traditions are the best documented, although Kelly (1990a:126-128; see also Milner 1998:63) believes more identifiable pottery traditions may have existed within the region.

Cahokia is part of the Late Bluff Tradition with grit-grog tempered pottery dominating the early assemblages (J. Kelly 1980). Late Bluff assemblages consist of jars, bowls, hooded bottles, seed jars, and stumpware forms (Milner 1998:17-18). Late Bluff jars are often either plain or have cord marking on the body below the neck. Milner (1998:20) indicates tools seem to become slightly more uniform through time. In general, tools were made from flakes fashioned into arrowheads or scrapers, with projectile points made in a stemmed style. Large Mill Creek chert hoes are first found in the Emergent Mississippian, both finished specimen and chipping remains tend to be sparse (J. Kelly 1991a:71, Milner 1998:85).

Late Bluff settlement patterns show continuity with the earlier Patrick Phase settlements. Late Bluff settlements consist of a variety of types from small homesteads to larger villages (J. Kelly 1990a:128). Later in time, there is an increase in settlement types with the inclusion of much larger villages and perhaps the beginnings of mound building

(J. Kelly 1990a:135). Settlements are generally restricted to the American Bottom and the adjoining uplands with communities becoming more densely packed through time (more buildings/unit of space) (J. Kelly 1990a:144). Although no large communities have been excavated in the Late Bluff area to provide unequivocal support and archaeologists must rely on inferred analogs to the Pulcher tradition, during this time, archaeologists believe communities have central plaza areas with structures organized into courtyard groups. Usually, there would be a single pit in the plaza areas with smaller pits associated with the courtyard groups (J. Kelly 1990a). Structures were built using single posts set in the ground with house basins excavated into the subsurface. Structures are generally small, ranging from 4 to 14 m² at Cahokia (Lopinot and Pauketat 1997).

Overall, the picture developed in the Emergent Mississippian Period is one of small-scale, self-sufficient villages (J. Kelly 1990a). There appears little in the way of political integration beyond everyday face-to-face interaction, *i.e.* villages were independent political units. By the Edelhardt Phase, population density at Cahokia is generally low with perhaps around 2000 people living at the site (Lopinot and Pauketat 1997:118-119). At Cahokia, researchers believe people began aggregating at the site during the late Emergent Mississippian period (J. Kelly 2008b). At the same time, the population of other mound sites and some villages grows. Together these data suggest a region-wide trend towards aggregation at some important places.

During Emergent Mississippian Period, Indians in the American Bottom cultivated many different kinds of plants (Fritz 2000, Johannessen 1993, Lopinot 1997, Simon and Parker 2006). The Emergent Mississippian pattern is likely an intensification of an earlier diversified subsistence regime (Fritz 1992, Johannessen 1993). Of particular

focus were chenopod (*Chenopodium berlandieri* ssp. *jonesianum*), erect knotweed (*Polygonum erectum*), maygrass (*Phalaris caroliniana*), sumpweed/marsh elder (*Iva annua* var. *macrocarpa*), maize (*Zea mays* ssp. *mays*), squash and gourds (*Curcubitaceae*), sunflower (*Helianthus annuus* var. *macrocarpus*), and, perhaps, little barley (*Hordeum pusillum*) (Fritz and Lopinot 2002:97, Lopinot 1997:61). In addition to cultivated plants, Emergent Mississippian subsistence included wild-gathered fruits (most notably persimmon (*Diospyros virginiana*), strawberry (*Fragaria virginiana*), and grape (*Vitis* sp)); nuts (*Carya* spp., *Juglans nigra*, and *Quercus* spp.), although the possibility of arboriculture should not be discounted (Fritz 2000); and other edible leafy plants. Other cultivated, economic plants include tobacco (*Nicotiana* sp.). Though not a subsistence plant, it was cultivated for use in a variety of ceremonial and ritual contexts (Wagner 2000).

Maize and the four starchy seeds were cultivated in fields (Lopinot 1997:61). Johannessen (1993) believes people as early as the Late Woodland Period were farmers who practiced similar field agriculture. Emergent Mississippian agriculture may have been in the form of an outfield/infield system where crops were grown in large fields away from settlements and smaller garden plots were kept closer to the domestic locales. This assertion derives from excavation and interpretation done in the Pulcher Tradition area where large villages dating to this time have been excavated (J. Kelly 1990a). Large Late Bluff villages displaying this sort of agricultural patterning are postulated for Cahokia but given the later reworking of the Cahokia site, the pattern is not well demonstrated (Woods 1991).

Faunal materials from Emergent Mississippian components throughout the American Bottom indicate fish and water fowl were the predominant animal foods, with deer and other mammals making up a smaller component of the animal diet (L. Kelly 2000:76). Emergent Mississippian patterns indicate a shift away from deer exploitation as compared to earlier Late Woodland patterns: there are fewer deer in Emergent Mississippian assemblages relative to Late Woodland assemblages (Holt 1996, L. Kelly 2000). Lucretia Kelly (2000:75) suggests Emergent Mississippian faunal patterning indicates increasing population pressure brought on a move toward more intensified agriculture and the procurement of smaller mammals as well as an increase in the exploitation of fish and fowl. These adjustments may have been in response to the decrease in deer resources brought on by smaller hunting territories resulting from an increasingly crowded landscape.

The Mississippian Period (1050 – 1400 A.D.)

The previously defined North and South division of material culture holds up through through the first phase of the Mississippian period. The early Mississippian Period at Cahokia is called the Lohman Phase (1050 to 1100 A.D.). The Lohman Phase, in particular, is an exceptionally short archaeological phenomenon; however, researchers do occasionally subdivide it and the other most proximate phases for differing analytical purposes (Holley 1989, Pauketat 1994, 1998a). After 1100 A.D., the North and South division of the American Bottom is no longer evident and the entire American Bottom Region is subsumed under a single series of chronological phases (Stirling, Moorehead, and Sand Prairie).

The Mississippian period material assemblage includes several new additions or elaborations on previous elements. Shell as a tempering agent for pottery become popular after 1050 A.D, although earlier examples of shell tempering have been identified at Cahokia (J. Kelly 1980, Pauketat 1998a, J. O. Vogel 1975) and limestone was still used near the Pulcher mound site (Griffin 1977, J. Kelly 1993). Other major markers for the early Mississippi Period include Powell Plain and Ramey Incised pottery. Pauketat and Emerson (1991) place great weight on the appearance of Ramey Incised pottery in particular as a marker of the creation of a new elite ideology indicating the rise of a chiefly authority centered at Cahokia.

In Emergent Mississippian contexts, exotic or extra-local materials occasionally are encountered. Mississippian contexts show a great increase in materials or finished objects that likely originated outside of the American Bottom (J. Kelly 1991b, Milner 1998, Pauketat 1994). Pottery, likely coming from the Coles Creek area in the Northern Lower Mississippi Valley, has been found in both Late Emergent Mississippian and Early Mississippian contexts at Cahokia (Bareis and Lathrap 1962, Fowler 1999, Holley 1989, J. Kelly 1980, 1991b, Sullivan and Pauketat 2007). However, these tend to be relatively rare finds.

Tool manufacturing seems to follow the earlier Emergent Mississippian pattern of few formal tools; however, there are instances of finely crafted Mississippian lithics coming from burials. The lithic assemblage from Mound 72, in particular, stands out (Fowler 1999). Especially well made arrow points were found with the Mound 72 burials, some of these were made with from local cherts but others were produced on non-local lithic material milner (Milner 1998:83-85). Not all non-local points are from burial

contexts, as points made in similar styles and on non-local materials from the Mid-South are found occasionally in habitation debris in the American Bottom (Ahler and DePuydt 1987, Pauketat 1994:93). Other elements of lithic assemblages include groundstone tools (celts, axes, and adzes), discoidals or chunky stones, and grindstone.

Exotic materials in Mississippian contexts also include a variety of minerals and ores. Perhaps some of the most spectacular examples is a sheet of copper rolled to form a tube from Mound 72 (Fowler 1999). Copper materials have also been recovered from the top of Monks Mound (Fischer 1972) and from the pre-Mound 34 levels (J. Kelly et al. 2007). Copper ore likely came from the Lake Superior region, although the precise mechanism of transport is unknown. Copper has been found in one Emergent Mississippian context at Cahokia; however, it does not become more widely spread until the Mississippian period (J. Kelly 1980, Pauketat 1994:15). Other non-local minerals found in Mississippian contexts include fluorite, barite, quartz, hematite, galena, and fire clay (Emerson et al. 2002, J. Kelly 1991a, b, 2006, P. J. O'Brien 1991, Wilson et al. 2006).

Finally, marine shell is an exotic material that seems to be limited to Mississippian contexts at Cahokia (Kelly 2006; Pauketat 1993). Marine shell (primarily *Busycon* spp.) from the Gulf of Mexico is found in the American Bottom. Marine shell is most predominant at mound sites although limited quantities have been found in non-mounded locales. Marine shell was used to make many different things including beads, dippers, and pendants. The presence of microdrills in association with disk beads suggests shell working was a local affair (Pauketat 1994:101-102).

Mississippian Period subsistence patterns are an elaboration of Emergent Mississippian patterns; however, some differences do appear. Plant lists from archaeological sites do not show any substantive changes in terms of the kinds of plants utilized. Contrary to the popular perception, the Cahokians relied on a diverse set of plants. Recent research indicates the importance given the value of maize in the Cahokian diet may be over emphasized (Fritz and Lopinot 2002). Traditional models of the rise of Cahokia indicate the intensification of maize cultivation was a causal factor in population increases in the American Bottom. Fritz and Lopinot (2002:93) offer an alternative model with intensification occurring in all cultivated crops and that maize was only a component of a diverse subsistence system.

Zooarchaeological remains indicate an increased emphasis on deer through the Early Mississippian period perhaps suggesting the outlying populations provisioned Cahokia (L. Kelly 2000). After 1100 A.D, there is an increase in bird remains from Cahokia. Later Mississippian Period assemblages suggest more localized provisioning and a move back towards aquatic resources.

Recent research at Cahokia demonstrates the variability of food remains and the importance to consider context (L. Kelly 2000). At Cahokia, unusually rich feasting deposits — originally excavated in the 1960s from beneath Mound 51 – have demonstrated how food is mobilized in specific social situations (L. Kelly 2001, Pauketat et al. 2002). This analysis provides important insight into the scale of public events at Cahokia and demonstrates significant differences between public or ritual contexts and quotidian contexts. In particular, Lucretia Kelly (2001:354) believes, due to the kinds of animals and kinds of elements represented from these elements, leaders were responsible

for provisioning large-scale feasts at Cahokia. These data point to the massive scale mobilization of labor at Cahokia. With almost 9000 deer represented by remains from a single provenience (L. Kelly 2001:346) in this short-lived deposit, it is safe to say that some events at Cahokia involved many more people than the hypothesized population of the site (Pauketat and Lopinot 1997).

Sometime around 1050 A.D., there is an abrupt shift in the type, scale, and location of settlements in the American Bottom. Single post housing rapidly gives way to a wall trench type, although hybrid forms have been documented. Pauketat and Alt (2005:225) speculate the shift in construction technique signals the change from familial housing construction like is found in the Emergent Mississippian period to a standardized house construction method performed by teams. They argue for the development of task groups controlled by a central authority causing the shift in house construction practices. In this scheme, one team dug wall trenches then another group may have set pre-fabricated walls into the trenches. Although plausible, this explanation seems out of place in other contexts where scholars believe little in the way of centralized social control existed yet people built houses with wall trenches, (Cobb and Garrow 1996). In light of the construction of wall trench houses in the absence of centralized control in other parts of the Southeast, it seems unlikely that wall trench houses are an indicator of centralized control at Cahokia.

Through time, structure size and shape changes. Late Woodland and Emergent Mississippian structures were generally small and square whereas Later Emergent Mississippian and Early Mississippian period structures were larger and more rectangular shaped (Merher and Collins 1995). Structures demonstrate a greater diversity than in

earlier times with T-shaped, L-shaped, and circular structures found in excavation (Pauketat 1998a; Wittry and Vogel 1962). By the end of the Mississippian period, houses reverted to a more square shape but house sizes averages six times greater in area than their Late Woodland predecessors (Milner 1998:95).

At Cahokia, a shift from the smaller courtyard and plaza communities to a landscape dominated by much larger mound and plaza groups marks the onset of the Mississippian period . Domestic occupation at Cahokia moves to slightly lower and presumably wetter locales. It is at this time that Cahokia begins to take on its final shape with settlements moving beyond the high ground along the ancient meander (Milner 1998). Early in the Mississippian period, population increased markedly throughout the region (Lopinot and Pauketat 1997; Milner 1998). At the same time, the number and scale of mound sites increased dramatically. Nucleation seen at Cahokia is a region-wide occurrence (J. Kelly 1992), but Cahokia stands out relative to other populated places. The regional settlement pattern shifts from a relatively dispersed pattern to one with some larger mound sites interspersed among smaller communities and farmsteads. The mound/farmstead pattern represents a change from earlier ways where people tended to live in nucleated villages (Emerson 1997b). After 1050 A.D. outside of a few large mounded communities, much of the population lived in smaller dispersed communities (Milner 1998:157-158). Population figures seem to peak at Cahokia near 1050 A.D. whereas regionally the population peaks around 1100 A.D. Afterwards there is a steady decline until 1400 A.D. (Benson et al. 2009). After 1400 A.D., Mississippian materials are replaced in the American Bottom archaeological record, supplanted by materials related to the Oneota tradition to the North (J. Kelly 2008b).

Pauketat (2004) believes demographic changes are a component of a the invention of a new belief system at Cahokia. These changes appear so rapidly that he believes the development of the belief system was connected to the appearance in the sky of a supernova at 1054 A.D. (Pauketat and Emerson 2008)¹⁰. These changes involved the creation of a class system at Cahokia where a small subsection of the population was able to install themselves and their descendants at the top of a social hierarchy, effectively creating a class based system at Cahokia. Pauketat calls the events of 1054 A.D. and the attendant changes at Cahokia, the “Big Bang in the Bottom” (Pauketat 1997). He believes this represents a fundamental break with the previous ways of doing things where older communal lifestyles were supplanted with a new social order headed by a few elites (Pauketat and Emerson 2008). Although linked to a single event, the supernova of 1054, Pauketat and Emerson place great causative influence on the increasingly diverse and growing population of Cahokia through the late Emergent Mississippian and Mississippian Periods.

Thus, throughout the Emergent Mississippian and Mississippian Periods, the population of the American Bottom and surrounding regions grew. Growth was likely the result of both natural increase and immigration (Alt 2006b, Pauketat and Emerson 2008). As can be seen in subsistence and settlement patterning, people living in the mid-continent region needed to respond to new challenges brought on by increasing population pressures (G. A. Johnson 1982, Wright 1984). One of these responses may have been moundbuilding at Cahokia.

Mound building and Mississippian Social Organization

Mississippian societies are associated with monumental architecture, the transition to an agricultural lifestyle, and a specific set of material culture styles (Blitz 2009, Cobb 2003, Griffin 1985, B. D. Smith 1990). Researchers usually believe Mississippian societies were hierarchically organized with unequal social relations institutionalized in a general Mississippian social structure. In particular, power was restricted to a **genealogically** related set of individuals with varying degrees of power vested in a single chief (cf. Anderson 1994, Hally 1996, Knight 2001, Pauketat and Alt 2003:170, Pauketat and Emerson 1997b). Thus, to most, Cahokia represents a chiefdom (see for example J. Kelly 2008a, Milner 1998, Pauketat 1994, 2001:81). Based on general theories of chiefdoms and chiefly politics, one way chiefs affirmed their power and secured their place in society was through monumental construction (Blanton et al. 1996, Earle 2001, Renfrew 1973, Trigger 1990).

Mississippian platform mounds, and Monks Mound in particular, are examples of monumental architecture (Collins and Chalfant 1993). Although square to rectangular flat-topped pyramidal structures were built in other times, the ubiquity and scale of platform mound building after 1000 A.D. stands out. Opinions are divided about what large platform mounds may say about past societies (Blitz and Livingood 2004). Some argue that large platform mounds are indicators of long occupation histories (Historical Models). Others believe that large platform mounds represent powerful people (Power Models).

Using historical and ethnohistorical analogies (e.g. Bartram 1792, Swanton 1998) some researchers see platform mounds as indicating the existence of a chiefly lineage

because early explorers observed platform mounds supporting buildings believed by early observers to be the residence of a chief (Hally 1993, 1996, Livingood 2008, Wesler 2006). In this view, mound construction usually happened following a generational change such as at the death of a leader after which the successor would add on to the previous chief's platform mound as a way of legitimizing the new chief's position (Cobb 2003, Cobb and King 2005, Hally 1996:174). Moundbuilding was a necessary activity for any new chief as a way of consolidating their hold on power and ensuring a continuation of the chiefly lineage. By building on top of the previous chief's mound, the new chief would reinforce their claim to power by establishing a connection with the power structure of the previous generation. Consequently, mounds with the longest histories are the largest because more equivalent stages were involved in their construction. In this view, the great size of Monks Mound could be seen as a consequence of a long history of chiefs building on previous mounds (Reed et al. 1968).

Alternatively, platform mounds may suggest the existence of chiefs since mound construction required the mobilization of a vast amount of labor that only a chief could accomplish (Carneiro 2010:146). At Cahokia, archaeologists (Dalan et al. 2003:176, Emerson 1995) theorize that platform mound building was a component of a political economic system that resulted from the actions of a few aggrandizing individuals. Elites built mounds to symbolize and reinforce their elevated status. In this line of thinking, mound size can be used as a relative indicator of social power with larger mounds representing people that are more powerful. Because of its great size (relative to other mounds), Monks Mound indicates that the most powerful individuals in Cahokian society lived at Cahokia.

In a slightly different perspective, Pauketat (2000, Pauketat and Alt 2003:170) argues the importance of mound building can be seen through the negotiation between elites and commoners. He believes the very act of constructing sacred spaces creates unequal power relations between these actors. In a process Pauketat (2000:121) calls “subjective co-optation,” elites appropriated communal symbols by the act of sponsoring or directing mound building. Building monumental architecture reinforced and amplified pre-existing power differentials while new ones were created. Hence, in a wholly undirected and seemingly natural manner, leadership became institutionalized and positions of power were restricted to a small group of interrelated elites.

For Pauketat, platform mounds are not merely a representation of hierarchy but a key element in how these hierarchies arose. Pauketat argues that by participating in mound building, commoners willingly entered into relationships that ultimately restrained their ability to act freely. By giving into centralized coordination required for mound building, commoners were willing participants in their own domination because “...monumental practices objectified the coordination as a place if, not ultimately, as a class of aristocrats associated with that place” (Pauketat 2000:124).

Recently, Pauketat (2000, 2007) has argued that Cahokia may properly be called a state¹¹ with elites having the ability to control or dominate commoners, even to the point of state sanctioned coercion. On the surface, this idea seems to conflict with the chiefdom notion where ultimate decision-making authority is invested in a single individual, but the root of Pauketat’s state or coalition model are similar to chiefly models. Specifically, Pauketat (1997:47) uses a competitive model of society that stresses the fundamental divide between elites and commoners similar to the chiefly models of Mississippian

society (Blitz 2009). However, Pauketat believes Cahokia required a greater bureaucracy than afforded by chiefly models. Pauketat's recent work has been focused on expanding this idea (Pauketat 2001, 2007) although it has been met with some criticism (Beck 2009). Rather than trying to understand if dominant social classes existed at Cahokia, he accepts class antagonism as a given and believes the Cahokian data should be used to explain how social classes arose (see also Emerson 1997a).

Similarly, Holt (2009) forwards the idea that Cahokia was the center of a state-like organization. Using an ethnographic analog developed from Geertz's Balinese work, she believes that elites at Cahokia ruled the masses through the enactment of awe-inspiring rituals. In effect, Cahokia was a theater state where its purpose was to perform rituals and ceremony rather than administration or governance. Although Holt is open to other interpretations, she suggests Cahokian leaders can be equated — at least in relation to relative power — to Balinese Brahmins and that class differentiation underlay Cahokian politics.

In these views, platform mounds indicate a locus of chiefly power so much so that platform mounds may be a component of an "architecture of power" (Emerson 1997b:171). The idea of mounds as architecture of power is taken farther in studying regional data. Using ideas derived from accounts of explorers and general theories of economy researchers propose that relative sizes of mounds are useful for understanding power relations among communities (Emerson 1997b, Steponaitis 1986, Welch 1991). Elites living at larger communities with larger mounds were more powerful than people living at smaller communities with smaller mounds (Emerson 1997a). This idea has led to the development of typologies of scale. Smaller chiefdoms with only one level of

political control above the local community are referred to as simple chiefdoms. Higher levels of control (as measured by the investment in mounded architecture) indicate complex chiefdoms. In complex chiefdoms, a single individual living atop the largest platform mound in a region dominated lesser chiefs (Steponaitis 1978). Owing to its great size, researchers believe Cahokia was a complex chiefdom with a powerful chief living at the site, perhaps atop Monks Mound (Anderson 1997, Beck 2003, Pauketat 2002).

Cahokian Social Organization

Theoretical arguments about platform mound building and Cahokian history play out in interpretations of changing Cahokian social organization. On the one hand, proponents of the Historical Model argue for a long evolutionary trajectory leading up to the formation of a paramount chiefdom (Milner 1996, Muller 1997). On the other hand, adherents to the Power Model believe Cahokia rapidly transformed into a political capital with individuals living at Cahokia transformed from leaders of village societies to rulers of something approaching a state in the space of a few generations.

In the Historical Model¹², the paramount chiefdom of Cahokia is rooted in the transition to an agricultural lifestyle, which began before 800 A.D. By virtue of its location relative to resources (productive land, wetland resources, firewood, etc.), Cahokia was simply the most successful of many chiefdoms that arose in the American Bottom in the late centuries of the first millennium A.D. Effectively, chiefs at Cahokia were able to attract more followers because of these natural advantages. With their ability to marshal superior numbers, Cahokian leaders were able to achieve some degree of control or influence over similarly constituted chiefdoms in the American Bottom. The

structure of the Cahokian chiefdom could be thought of as pyramidal with only steps between local elites and the ultimate authority at Cahokia.

Milner (1998:129) suggests the best evidence for social ranking and chiefs comes from burial and settlement data. Because of the lavish burials in Mound 72 and the extensive mounded architecture, he argues Cahokia is where paramount elites lived. At lesser mound sites, burials in mounds and smaller mounds represent local elites. Commoners lived in small outlying non-mounded communities and were buried with few, if any, items. Otherwise, Milner argues, there is little data to indicate major social differences among Cahokia related peoples, suggesting that social differences may be of degree rather than kind. Milner models the development of Cahokia as the trajectory of a few highly ranked people living at a single relatively well-placed settlement who achieved supremacy over other elites living at less well-placed settlements. In this model, elites at Cahokia were provisioned by the surplus from the entire population with no intermediaries between the supreme authority and commoners. Supremacy was institutionalized in the office of a paramount chief living at Cahokia (Milner 1998:169).

Contrasting the Historical Model, the power-based perspectives highlight changing social relations as the key to rise of the Cahokian polity (Pauketat 2001). In this view, elites living at Cahokia were indirectly supported by the produce of a commoner segment. Support for the Cahokian paramounts was obtained from lower level elites living at outlying mound centers. Here, there are more levels of administration between the local level and the Cahokian authority.

In Power Models, Cahokia arose to prominence very quickly and was able to hold sway for over a century. Ideology played a large role in organizing the Cahokian polity

with decisions made by a “divine chiefship” (Emerson 1997b:271); however, inequality was infused through dimensions all of Cahokian’s lives (Emerson and Pauketat 2002). Among those who believe that unequal access to the means of production was the basis for unequal political power, burial data, house size, pottery styles, and settlement data are the most widely cited evidence for systemic inequality (Emerson 1995, Pauketat 1994, 2000, Pauketat and Emerson 1991, Wilson et al. 2006). Inequality is most easily seen in the architectural and burial data. Differentiation within other kinds of data are difficult to see at best (Wilson et al. 2006).

Adherents of either view see the history of Cahokia as the rise and fall of a powerful chiefdom, replete with class-based social inequality and control hierarchies. There is almost universal agreement (Milner 1998, Muller 1997, Pauketat 2002) that sometime after about 1000 cal A.D. fundamental changes, *i.e.*, the Big Bang, occurred in Cahokian society and a few individuals were able to assert their will over others creating, in effect, a top-down society with elites living at Cahokia dominating regional political economies and perhaps serving as a model for subsequent Mississippian societies (Pauketat and Emerson 1997a). Almost all point to the construction of Monks Mound as an indicator of those changes (Dalan et al. 2003, Emerson 1997a, Pauketat 1998b, Reed 2009).

The primary difference between these views¹³ is the degree of institutionalized social inequality that may have been a factor in Cahokian society. Milner lies at the minimal end, suggesting that ranking within and between clans certainly existed but that differentiation is difficult to see. Pauketat, Emerson, and others believe in much greater inequality, with institutionalized power evident within Cahokian society. Both, however,

agree that burial and architectural data are the most secure indicators of these kinds of relationships as these were the kinds of materials most easily manipulated by elites.

In a recent critique of archaeological interpretations of the burial data from Cahokia, Brown (2006) argues that differentiation within the burial data may be a result of ancient mythologies and beliefs about the structure of the world. Burials in Mound 72, in particular, were not about individual power and a person's status in life, but the burial — both the human remains and included materials — were a ritual deposit designed to ensure the continuation of the world. The materials do represent power, per se, but given how Native American perceived their world, they reflect a society that was using cosmology to create meaning and order. In this model, the power in building Monks Mound arose from the ability of the structure to mobilize labor as opposed to any one individual's ability to dominate the political process.

Based on his discussion, Brown suggests that domination and subordination models of Cahokia may not be proper and class-based power differentials should not be taken as a given in the Cahokian data. Relevant to this dissertation, he believes much theorizing about Cahokian social organization and process is needed (see discussion below). Ultimately, Brown's discussion is useful because it serves as a template for reevaluating the way material culture was used in Cahokian society. Importantly, Brown argues that materials, especially sacred or highly charged items, were used as integrative symbols designed to create social cohesion rather than means for reifying power inequities.

The Meaning of Platform Mounds

As recently noted by Livingood (2008:4-5), the idea of chiefdoms and chiefly social organization are deeply rooted in Mississippian archaeology. Most archeologists are comfortable declaring that Mississippian societies were chiefdoms and focus on defining the type of chiefdom represented by the archaeological remains. Others have found the chiefdom label wanting — especially for Cahokia (e.g. Pauketat 2007) — but most arguments revolve around the scale of the chiefdom and rarely question if there was a chief or elite class at all. By invoking traditional explanations of platform mounds and how they were used, Monks Mound becomes the locus of regional political economic power.

So, how does this view of Monks Mound affect our understanding of Cahokian social organization? Almost automatically because of its size and central location, Monks Mound becomes **the** sign of elite power — a symbol manipulated by elites for reifying their position at the top of a social hierarchy. However, does this view correspond with Native American views of platform mounds? Here it is useful to bring up the work of Knight (2006) and his discussion of Mississippian moundbuilding symbolism. Knight's work provides a possible emic perspective where mounds are meaningful and iconographic to the builders¹⁴. While many archaeologists see mounds as a consequence of power concentrated in the hands of a few individuals, Knight's perspective emphasizes the intrinsic meaning associated with mounds and the act of construction.

In this widely cited piece, Knight (2006) discusses possible meaning for Native American terms applied to platform mounds and despite a wide degree of variation, most if not all, are associated with autochthony, the underworld, birth, fertility, death, burial,

the placation of spirits, emergence, purification, and supernatural protection (see also Hall 1997, Knight 2006:425). Perhaps more importantly, Knight (2006:425) suggests platform mounds "...are related to ideas of native southeastern belief, and they find objective expression in the artificial mound as an earth or world icon." Some mounds, in particular, are seen as earth navels, earth centers, or places of emergence purposefully constructed as such (Knight 2006:422-425).

The historical time depth associated with these ideas is debated (Pauketat and Alt 2003). Hall (1997) suggests mound building in Middle Woodland contexts was embedded in Native American cosmology, drawing explicit analogies to the kinds and sources of sediments encountered in mounds on the Upper Missouri River and historic Plains Indian mythology. In particular, he believes clayey soils found in an otherwise silty matrix represent a component of the Native American creation myth. Hall's work is especially salient because he suggests continuity in Native American cosmology pre-dates Cahokia. Similarly, Kidder et al. (2009) draw possible connections between the stratigraphy of Mound A at Poverty Point (c. 1600 B.C.) and Native American color symbolism.

Pauketat and Alt (2003) hold a different view. They argue,

...most of the pre-Mississippian peoples of the American Bottom at 1050 AD would have possessed only vague, unmarked senses of what mounds signified. The cross-generational or pan-regional transmission of more than this – that is, the special knowledge about the function and meanings of mounds – would have been inhibited by the temporal and spatial gaps in mound construction across the Mississippi valley. (Pauketat and Alt 2003:168-169)

In his discussion of mounds at Cahokia, Pauketat argues that early in the Cahokian sequence, mounds were not important "earth icons"; rather, they gained

symbolic importance somewhat later, perhaps after 1100 A.D. (Pauketat 1993:146)¹⁵. In fact, Pauketat and Alt (2003) believe the Mississippian moundbuilding tradition was invented at Cahokia. In their view, connections to early traditions or moundbuilding in other places were tenuous at best.

A lack of continuity in the historical time depth of the meaning of mounds because there is no immediate moundbuilding tradition in the American Bottom is difficult to accept. Given the ubiquity of moundbuilding across Eastern North America, the meaning of mounds would be firmly established in mythology and oral tradition by the turn of the first millennium A.D.

Cahokian society included groups who came from faraway places and who may have brought new ideas about kin, cosmos, and community (Alt 2006a, Pauketat 2003b). Discontinuous population movements, where one group simply packed up and moved far away in a single coordinated effort, may explain geographic gaps in mound construction throughout the Midcontinent region. Furthermore, people were building platform mounds and other earthen structures in the Midcontinent and Lower Mississippi Valley well before the construction of Monks Mound (Buikstra and Charles 1999, Chapman 1980, Kidder 2004b, Knight 2001, M. J. O'Brien and Wood 1998, Rolingson 1998, Saunders et al. 2005). If Cahokia was a multi-ethnic community, as many researchers believe, then, arguably, ideas about moundbuilding that developed in other places may have arrived in the American Bottom with new people coming into the region. There is no reason to assume that Cahokians invented moundbuilding anew or that their ideas would be out of line with prevailing Native American ideas about the meaning of mounds.

Overall, these studies demonstrate the symbolic importance of Native American platform mounds (see also Lindauer and Blitz 1997). With such a central place in a shared cosmology and the prominent place these mounds were given in community planning, platform mounds may be considered public architecture. Public architecture concretizes¹⁶ abstract notions about social, political, or historical beliefs. Thus platform mounds were important “conveyor(s) of social meaning” (Wesson 1998:94). In the Native American view, platform mounds provide a communal icon that represents individual social groups (Blitz 1999) and may serve as a connective structure (Assmann as cited in Amborn 2006:81, see also Gosden and Lock 1998) that “...not only links the past and the social present, it also creates links within these dimensions on the basis of a common horizon of experience which unites people and gives them orientation.” (Amborn 2006:81)¹⁷. When understood in this way, platform mounds are inherently powerful, not solely because of labor expenditure or hierarchy necessary for their construction; rather, they are powerful things because of what they are — necessary components of the universe and their ability to link people together. This view of platform mounds gives Monks Mound — and the other mounds at Cahokia — a social reason for being.

An Alternative Manner of Organization

If Monks Mound is not a sign of elite domination, then why was Monks Mound built and by what kind of social organization? In the American Bottom, people needed to deal with a rapidly growing population (Milner 1998, Pauketat and Lopinot 1997). Integrating people for long periods of time in ways that were socially acceptable was a

pressing concern. Effectively, societies can be organized in one of two ways, either from the top down or the bottom up. Chiefly models propose Cahokia was designed to aggrandize the chief, a top down model. However, worldwide people often organize from the bottom-up rather than from the top down where community is privileged over individual concerns.

How do bottom-up societies integrate people? In bottom-up societies, societies are often integrated through a common systems of beliefs or ideas about how the world works *i.e.*, cosmologies (Renfrew 2001b). Pre-literate societies often concretized cosmologies in the built environment where the landscape took on meaning that signified connections “between society, the supernatural, space, and time” (Wesson 1998:94). Renfrew (2001b) calls such places, “Locations of High Devotional Expression” (henceforth LHDE), which are effectively monuments to ideas rather than people. LHDE can be recognized by unusual architecture, unusual scale, or unusual locations. Renfrew argues these places were built outside of “normal” political economies and need to be understood as the result of “a powerful belief system” rather than in the contexts of Western notions of power and wealth. Renfrew (2001b:23) makes the point of emphasizing the potential egalitarian nature of sacred centers. In effect, some locales are important because of the ideas they embody rather than the power of the individuals associated with the place. Renfrew’s discussion does not preclude the association of a powerful elite class with sacred places, but the substance of his argument is that sacred places should not automatically be considered loci of elite power¹⁸.

Worldwide, ethnographers have pointed out how complex, yet relatively decentralized societies can organize without the investment of power in a single

individual or a solitary political hierarchy, instead using ritual and ceremony as a means of integration (D. H. Johnson 1994, Tuzin 2001, Weissner 2002). People built mounds as a necessary component of ensuring continuity in the world and at the same time forged social bonds ensuring successful integration (Adler and Wilshusen 1990, Vega-Centeno Sara-Lafosse 2007:153). In fact, the very act of building a mound can be seen as a ritual process disconnected from the finished monument (Knight et al. 2010). Besides building a massive edifice, people who built Monks Mound would have participated in a great ritual. As Holt (2009, see also Pauketat 2002) argues, mounds would have been built willingly, but leadership was needed to coordinate and manage the undertakings. Communal aspects of moundbuilding would be more evident as opposed to individual contributions, and mounds would be communal symbols rather than signs of elite domination. Thus, in ancient Cahokian society, building Monks Mound may have been a ritual in its own right and serve as a ritual integrative device rather than an explicit means to power.

Although others have forwarded the idea that one of the purposes of mound building was the integration of people (Dalan et al. 2003, Pauketat 2000), ultimately they argue mound building serves to aggrandize a small subsegment of the population so that the product of the labor expenditure is restricted to use by a few who could afford to undertake moundbuilding. Theoretically, mounds are transformed into badges of rank or symbols of political-economic power. As seen in the argument by Renfrew, LHDE exist outside traditional economies — one cannot possess a LHDE. In the case of Monks Mound, since it was a ritual product (see also Knight et al. 2010, Pauketat and Alt 2003), access may not have been controlled by those most able to finance and organize its

construction. In this framework, Monks Mound may have been an “inalienable possession” (sensu Mills 2004), important as a communal symbol justifying the existence of a community rather than a badge for those who were politically savvy.

Understanding Monks Mound as something more than a monument to elite power and how Monks Mound relates to ancient Cahokian social organization requires an understanding of how ancient peoples may have seen themselves in relation to their world (Hall 1997, Reilly and Garber 2007). Drawing on recent ideas of historical connections between ancient Cahokians and Dhegian Sioux speakers, the most likely descendants of the ancient Cahokians (Blitz 2009, Diaz-Granados and Duncan 2000, Hall 1997, J. Kelly 1996b, Welch 2006:220-224), the following discussion develops a possible model of Cahokian social organization using Native American cosmology from the Eastern Woodlands in general, and Dhegian Siouan speakers in specific as a possible mode of organizing Cahokia¹⁹.

Native American beliefs were intrinsically connected to the world around them. Indians saw themselves as a component of a natural larger world and structured their lives according to their place in their cosmology (A. C. Fletcher and La Flesche 1992 [1911], La Flesche 1995, Mooney 1898, Swanton 1952). Native American existence was conditioned by cultural practices designed to ensure harmony within their world. Individuals had membership in clans, and clan relationships provided structure for Indian social life. Although ancient Indians certainly had multiple social identities, clan membership, above all, provided the basis for political and social relations.

Clans had specific political authority, religious responsibility, and cosmological relationships designed to ensure continuity of the tribe (society)²⁰. In their cosmology,

each clan had a particular purview, a portion of which may be considered secular and other domains which may be sacred, but these purviews were so enmeshed that often it is impossible to clearly separate secular from sacred. Authority in Osage villages consisted of a two-headed authority structure whereas one set of leaders came from the Sky moiety, and the other came from the Earth moiety. The Sky moiety was charged with ensuring the spiritual health of the village where the Earth moiety regulated more material matters. However, inter-village decision-making was exercised by a body of priests (Rollings 1992). In the early historic period there were twenty-four clan priesthoods each representing a specific part of the cosmos (La Flesche 1995:49). A group of priests called the House of Mystery made collective decisions relating to the whole of the Osage. Depending on the scale and importance of the decision, groups were variously composed. A full House of Mystery was needed to make decisions that affected the whole of the tribe. The full historic Osage House of Mystery may have consisted of as many as seventy-two priests, each of whom needed to attend for any large-scale decisions to be made. Although structured around differing kinship arrangements, decision making in other Dhegian groups were arranged similarly (Fletcher and La Flesche 1992 (A. C. Fletcher and La Flesche):135).

Priesthoods could be obtained after a rigorous initiation process which was based on achieving knowledge or ritual information. Welch (2006:221) suggests, "...the priests were commoners, not a status group distanced from and dominant over commoners." In chiefdoms, positions of influence are restricted by genealogy and only individuals of the right birth can become chiefs. Within the proper lineage, power is restricted so that there is only one chief. Some argue that chiefly societies can be corporate societies (Blanton et

al. 1996). This idea may extend back to Renfrew (1974) who attempted to describe societies that had leadership but leadership was not based on an individual. Although the idea of corporate chiefdoms has been used by others, Renfrew (2001a) expressed his concern about creating a term that describes a chiefdom without a chief. Following Renfrew (2001a), although the House of Mystery provided leadership, it was not dominated by a single individual and consequently, the Osage cannot be considered a chiefly society. At the same time, Osage society appears more flexible than is called for by a chiefly model. In particular, the “last to come” priests indicate the number of influential positions was not structurally fixed but could expand to include others.

At a conceptual level, I see a possible model for Cahokia during its apogee coming out of our understanding of the Osage. The historic Osage tribal system encompassed five villages linked through kinship and the House of Mystery. Although Cahokia as a whole sociopolitical phenomenon likely included many more people than the early historic Osage, Cahokia may have been organized in a similar manner. In more general terms, Native American history is replete with various types of confederacies and other kinds of sociopolitical unions where relatively equally ranked groups united to form a single political body. Although these kinds of organizations had leaders, leadership was not institutionalized in a hereditary or class-based position. This kind of organization provides an alternative to the chiefly model. Beck (2003) suggests these kinds of social organizations may be called constituent hierarchies and proposes that early Cahokia may have been organized along these lines. Similar ideas about Cahokia are also forwarded by Brown (2006), Kelly (1996b, 2006), Milner (1998) and Trubitt (2000). In the Osage, the power and authority of the House of Mystery was restricted to large-scale

issues both secular and sacred whereas local decisions were addressed by local power structures which did not include genealogically based leaders. Power and authority in the House of Mystery came from its structural arrangement of the priests, which reproduced the Osage cosmology. Thus, power was not embedded within individuals; rather, power arose from the structure of the necessary parts of the universe giving sacred authority to the decision-making process. Power arose through the belief that sacred forces invoked by these arrangements ultimately sanctioned these decisions. In its most elemental form, the full House of Mystery may be seen a confederation or a sociopolitical union that reproduced the cosmos.

In opposition to the pyramidal chiefly models, the alternative developed here can be thought of as a fractal model (Haude and Wagner 1999) embodying elements of heterarchy (Crumley 2005) rather than being hierarchical²¹. The entire structure is composed of roughly equivalent elements. Each element is composed of smaller units that are structurally similar to the whole. On the other hand, the system has emergent properties where the decision making and issues addressed by the whole are different than the individual elements, a property eloquently expressed by the relationship of the individual village hierarchies and the House of Mystery from the Osage system. Systemically, the decision-making structure beyond the local level in the Osage model was designed to ensure continuity of the tribe and harmony within the whole as opposed to village specific issues.

At this point, it is necessary to discuss how heterarchy may have worked at Cahokia. A fractal analogy conveys ideas inherent in segmentary societies (Haude and Wagner 1999). The primary problem Cahokians contended with was how to integrate an

increasingly growing population. In the social model I propose, integration was achieved through segmentation and replication of existing structures rather than a restructuring of Cahokian worldviews. Conceptually, Cahokian political structure would have grown outward rather than upward as population grew. Diachronically, segmentation may not have been something that resulted in settlement relocation. Fissioning may not require a person to change residence; rather, segmentation may have operated at the level of the social identity with new clans, sodalities, or other kinds of institutions added through fissioning of older ones and the incorporation of new individuals without a fundamental change in the nature of social relations. In a cosmological sense (and social), to accommodate growth or change it would be easier to add similar elements rather than constant re-ordering of existing ones.

Classic segmentary models often appear in the ethnography of Africa and Asia (Edward E. Evans-Pritchard 1950, Edward E. Evans-Pritchard and Fortes 1940, Southall 1988), but have found limited consideration in the archaeology of Cahokia (but see Byers 2006)²². Recently, this trend is changing with some workers considering segmentation and a diversity of approaches in the Cahokian literature (J. Brown 2006, J. Kelly 2006, Welch 2006). The model proposed here is an expansion of these ideas and considers Monks Mound in relation to these kinds of societies. This model has much in common with the way earlier societies worked in the American Bottom. As suggested by Kelly (1990a), Late Woodland and Emergent Mississippian societies may have grown or expanded by a fission/fusion process. Blitz (1999) argues that a similar process worked in later Mississippian societies in the Southeast.

Together, the general model of sacred centers proposed by Renfrew and the ethnographic accounts of the sacred organization of Dhegian speakers suggest the possibility of complex yet acephalous social structures. This way of organizing society may provide the key for understanding how the labor for monumental construction at Cahokia was recruited, organized, and maintained. These kinds of structures could allow people to organize a vast expenditure of energy for very short amounts of time; power differentials arising during these events would be similarly fleeting or situational. Welch (2006:230) describe such an organization as, "...a tangle of multiple heads and interwoven lines of authority. To put in practical terms, in some Mississippian societies the request 'take me to your leader' might elicit multiple responses."

Leadership and organization was clearly needed to build the mounds at Cahokia; Cahokia was a complex society. However, positions of leadership and organizational principals need not be devised based on class antagonism or hierarchies embedded in the relations of production. Access to authority (and thus power), in the Osage clan system, was a mix of merit-based pathways and hereditary pathways and was exercised in relation to specific ends (La Flesche 1995, Welch 2006:231). This kind of society could be thought of as egalitarian²³ because those desiring authority could seek it regardless of their genealogy but complex as occasionally authority and influence would be concentrated in the hands of a few. Institutionalization of ultimate authority within a single lineage or preordained set of people is not called for in this model. Often times in these kinds of societies, the concentration of authority is actively discouraged through social process and ethos engendered in these processes.

Ranking in this form does not need to be institutionalized in class or genealogical relationships; rather, ranking may have arisen through segmentation. In the historic Southeast, fissioning often created ranked relations between “mother and daughter kingdoms” where the fissioning groups were less highly ranked than parent groups. Ranking resulting from fissioning was a component of a specific history (Blitz 1999:569). High status social positions in the Osage were a combination of hereditary based and merit based. Similarly in the Omaha, certain ritual duties and statuses were passed down along patrilineal lines whereas other statuses were attained. These kinds of organization may indicate a long history of fissioning and fusioning where lines of power were continually reconfigured as a result of trying to balance egalitarian ideals with the realities of individual accumulation.

Even though there was ranking between and among clans, it did not need to lead to domination and subordination. Egalitarian kinds of relations can be created and enforced by structural devices. For example, within the House of Mystery, some undertakings required all divisions of society must be represented, but not all had equal influence or could control the agenda. The notion that all portions of the House of Mystery needed to be present for certain decisions may represent a structural device that precluded the development of institutionalized ranking. While certain groups could control aspects of the agenda, the important decisions or potentially harmful undertakings could only occur if all elements assented.

The alternative social model of Cahokia argues that Monks Mound was a LHDE. Monks Mound was a component of a larger sacred landscape that concretized sacred ideals in the built environment. In doing so, members of many interrelated political units

came together to create the sacred landscape at Cahokia. Building the mound was a necessary ritual required to form a larger, regional political structure. This structure was based on the notion of a cosmological whole where numerous complementary interacting elements were required to do important cosmological things such as creating a world icon like Monks Mound. Many small-scale elements were linked together through common beliefs about their necessary place in producing a healthy universe. Smaller-scale decisions were made in the context of individual villages. Similar to the Osage, notions of individual status were counterbalanced by structural, devices and individual accumulation did not automatically result in positions of political authority.

Chapter II: Research Design

The Archaeological Background of Monks Mound

Early Accounts of Monks Mound

Europeans first settled in the American Bottom at the turn of the eighteenth century, with the founding of the Cahokia Mission in 1699. Archaeological excavation on Monks Mound has documented the use of the first terrace by French priests who resettled the local Cahokia Indians there (Walthall and Benchley 1987). Excavations by workers from the University of Wisconsin, Milwaukee, encountered indications of two buildings and a cemetery, which they argue are the remains from a French Mission and associated Indian occupation dating to circa 1735 and 1752. Although Monks Mound was certainly known in the American Bottom region, the earthwork remained unnoticed by the wider scientific world until the beginning of the nineteenth century. One possible exception is a mention by George Rogers Clark, who may have noted Monks Mound in a letter to the editor of *American Museum* magazine when he described the largest mound he ever witnessed near the Caw River (Cahokia Creek) (Skele 1988:17-19). Although Kelly (personal communication 2009) suggests Clark may have seen the Pulcher Mound site, located to the south, rather than the mounds at Cahokia. The first documented reference to Monks Mound comes from Brackenridge (1811), a traveler and scholar interested in the ancient ruins of the region. On a trip in 1811 to visit French Trappists — a different group than those who lived on the first terrace in the eighteenth century — near Monks Mound (Fowler 1997:15), he first saw the ancient monument. While he did not document

the mound site in a systematic manner, he was struck by the scale and apparent antiquity of the mounds. Brackenridge's enthusiasm led him to publish articles and descriptions of the mounds. Brackenridge is credited with discovering the Cahokia Mounds by virtue of being the first to publish but this attribution is somewhat spurious since there were people living in the area —indeed surveyors mapping the American Bottom laid township and section lines very close to Monks Mound (Messenger 1808:76 as cited in Fowler 1997:7).

The monks who were living in the vicinity of Monks Mound sold the property in 1813. Monks Mound went through a series of owners until 1831 when T. A. (Amos) Hill bought the property (Skele 1988:20-21). Hill's tenure provides the first recorded excavations into the mound. He dug a well about half way up the west side and constructed a house, including a basement, on the summit. The location of the well is known and the remains were capped by concrete in the recent past. Accounts of the digging of Hill's well suggest he encountered "evidence of human occupation down to the level of the surrounding plain" (Skele 1988:21). Precisely what he found and where (stratigraphically) is not known. In this same vein, the location of Hill's house is unknown but a somewhat more descriptive report of Hill's basement was written by McAdams in 1883 (cited by Moorehead 2002:113). McAdams indicated that Hill's basement penetrated the surface of the mound, likely through the third terrace based on drawings by done by Karl Bodmer in 1834 (Figure 5), down to about 3 meters (10 feet) below surface.

Sediments in the basement profile were described as consisting of black humus or mould (viz clayey) soils with occasional deposits of lighter colored soils. McAdams suggested the lighter sediments were found in bunches about the size a man could carry

(Moorehead 2002:113), perhaps one of the first times basketloading was documented in Monks Mound. In addition to Hill's construction projects, DeHass (1869:269) reports Hill encountered numerous artifacts when he removed a three meter (ten feet) tall mound from the surface of Monks Mound. Presumably this is the same small conical mound reported and drawn by Featherstonhaugh (1844:266-267, Fowler 1997:96). Importantly, DeHass' observation does not confirm the existence of such a small mound on the southern edge of the third terrace, rather he gives second hand information about artifacts in Hill's possession. As noted by Fowler (1997:17), the only documentation of the small mound comes from Featherstonhaugh's drawings done in the early 1830s (cf. Reed 2009:61). The mound is conspicuously absent from Bodmer's 1834 drawing. If the present morphology of the mound is similar to the conditions present when Featherstonhaugh made his drawings then it is entirely possible that no mound did exist. Depending upon one's perspective there does appear to be a rise on the southeastern corner of the third terrace, however this is mostly an illusion caused by the slump-induced topography of the mound. Rather than being a purposefully constructed projection, the southeastern corner of the third terrace likely represents the intact edge of the mound augmented by slumping immediately to the north.

Monks Mound and much of the core of the modern park was sold to Thomas Ramey in 1864, whose heirs owned the land and lived at the base of the Northwest corner of Monks Mound until 1923 when the park was established. In sum, during the first half of the nineteenth century scholarly pursuits at the site focused largely on documenting the extant architecture; when writers did speculate about other questions like the nature and origin of the mounds it was based on very few data points.

The Initial Archaeological Research

Through the second half of the nineteenth century, workers continued the tradition of mapping — aided in part by Ramey’s refusal to give permission for excavation. The early decades of the latter half of the nineteenth century saw detailed maps of Monks Mound published by J.J.R. Patrick, a local scholar who commissioned the first detailed survey of the mound in the 1870s (Fowler 1997:19) and McAdams (1882:62), who recorded dimensions and locations of both Monks Mound and other mounds at Cahokia. The McAdams map also probably served as the basis for a map of Cahokia published by Thomas (1894) as part of work with the Bureau of American Ethnology.

Archaeological excavations into Monks Mound during the early period are rare and when they did occur documentation is lacking. McAdams (1882:62) excavated near Monks Mound, described as “at the foot of the Cahokia temple” where he found a large deposit containing human burials and a large collection of intact pottery vessels. McAdams also reports Mr. Ramey excavated a tunnel approximately 8 meters (about 25 feet) above the ground surface on the north side of the mound that penetrated about 30 meters (90 feet) into the mound. (McAdams 1883:2). He indicates the sediments excavated from the mound were similar to the fills seen in the basement excavated by Hill on the upper surface of the mound.

In this period, professional anthropologists and scholars sporadically visited Cahokia. Charles Rau (1867), who lived in the area in the mid-nineteenth century and later became an early curator of the Department of Archaeology of the United States

Museum, published an early article suggesting, in the past, Indians occupied an area from Monks Mound to the mouth of Cahokia Creek (near modern day East St. Louis) because of the number of surface artifacts and earthen mounds found along the ridge of high ground running through this area. Rau was primarily interested in the ancient pottery of the area and he did not share his views whether he believed the aboriginal occupation was synchronic or diachronic. Later, in the next decade, Fredric W. Putnam visited Monks Mound with Patrick. Their observations are part of the Twelfth Annual Report of the Peabody Museum (Putnam and Patrick 1880). Although professionally trained archaeologists and anthropologists did visit the area, in the late nineteenth century local scholars did much of the archaeology of Monks Mound and the Cahokia site. Besides Patrick, other notables are Peet (1891a, Stephen D. Peet 1891b) who published descriptions of Monks Mound and a sandstone tablet found near Monks Mound and Snyder (Walton 1962) who was an early advocate for the preservation of the mound.

Shortly after the turn of the twentieth century, David Bushnell Jr. (1904) while working as an archaeological assistant at Harvard University published a description of Monks Mound for the Peabody Museum of American Archaeology and Ethnology. Bushnell, born in St. Louis to a prominent family, went on to become a seminal figure in American Archaeology (Swanton 1942). Although his career took him well beyond the Cahokia site, he returned in the 1920s when he commissioned the first aerial photographs of the site. This work is still widely cited (e.g. Fowler 1997) and represents one of the first uses of aerial photography in North American archaeology.

Archaeological excavation programs during early twentieth century were focused on the question of the natural versus the cultural origin of Monks Mound. The popular

consensus (for a notable exception see DeHass 1869) through the nineteenth century, reflecting the broader social and political trends of the time, was that Monks Mound was either a natural feature of the landscape or that the mounds were built by a “pre-Indian race of mound builders” (Fowler 1997:98). Widely held views of Native Americans during this time would not permit the idea that these people or their ancestors could build such a considerable earthwork. Although many earlier writers conjectured about the origins of the earthwork (Kelly 2002a:9), it was not until the early twentieth century when systematic studies of the mound were first implemented. A. R. Crook (1914, 1915), Director of the Illinois State Museum, undertook the first project designed to understand in an explicit manner, the construction and origins of the mound. This project consisted of excavating twenty-five auger borings in the north face of Monks Mound. After a study of the sediments and the geomorphic contexts of the mound, he initially concluded Monks Mound and the other mounds at Cahokia were remnants of glaciation and alluviation (Crook 1915:74-75).

The origin and nature of Monks Mound took on particular salience with the intensification of preservation efforts. In the 1920s Morris Leighton, a geologist, and Warren K. Moorehead questioned Crook's interpretation and revisited the mound (Kelly 2002a). They undertook an excavation campaign in 1922 that included borings and test excavations. Excavations consisted of five pits, three excavated into the north end of the summit and two dug into the east slope (Fowler 1997:99). Workers excavated the pits to a depth of about .9 meters (3 feet) and then augered through the bottom to a depth of approximately 5.3 meters (17.5 feet) — for a total depth of more than 6.1 meters (20 feet) below surface. Moorehead, bolstered by Leighton's analysis, concluded the mound was

definitively an artificial construction. On the strength of these findings, Crook (1922) modified his views and accepted that Monks Mound was a constructed feature of the landscape. The State of Illinois purchased Monks Mound in 1925 and the state park opened a year later (Kelly 2002a:42).

The Modern Archaeological Era

During the middle twentieth century, research into Monks Mound waned. However, at the Cahokia site, either with salvage work or for research purposes, excavation continued. In 1941, Harriet Smith (1969) excavated Murdock Mound (Mound 55) as salvage prior to the construction of a subdivision which was built in the Grand Plaza area south of Monks Mound. The archaeological project was halted due to the beginning of World War II.

There is a hiatus at the site until the middle 1950s when projects by The University of Michigan (Griffin and Spaulding 1951) and the Thomas Gilcrease Foundation of Tulsa, Oklahoma (Perino 1957) focusing on the Ramey Plaza and Mound 34 in particular were undertaken. Michigan's project also included work north of Mound 42. These early projects provide the first radiocarbon dates for the site, and the Mound 34 work exposed an area interpreted as a copper workshop beneath the mound (Kelly et al. 2007). While the Ramey Plaza work was going on, Preston Holder with Washington University in St. Louis excavated Mound 10 of the Kunnemann group located north of Monks Mound (Pauketat 1993). Holder's work exposed in profile remains from a large, burned, thatch-covered building beneath Mound 10. Other work at Cahokia during the

1950s includes the salvage work done by Joseph Caldwell from the Illinois State Museum. Caldwell's crews were able to expose a profile through Mound 31 before it was leveled to make way for the construction of a discount store southeast of Monks Mound (Sullivan and Pauketat 2007).

Salvage Projects

In the 1960s, the tempo and pace of investigation escalated. Highway projects associated with the construction of Interstate 255/270 cut through the center of the Cahokia site with the highway running about 250 meters north of Monks Mound. The scale of the impact of highway construction necessitated that salvage operations be divided between numerous institutions Donald Lathrap and Charles Bareis (1962) oversaw work for the University of Illinois at Urbana-Champaign. The UIUC component focused on the highway right-of-way through an area known as the Powell Tract along what is traditionally considered the western perimeter of the site. Powell Tract work yielded numerous features and house pits that were analyzed by Patricia O'Brien for her dissertation which was later published by the Illinois Archaeological Survey (P. J. O'Brien 1972). In addition to Bareis and Lathrap's work, Bluhm, also with UIUC, excavated and tested west of Mound 45 and south of Mound 46 prior to railroad and industrial construction in the area.

Closer to Monks Mound, Warren Wittry and crews from the Illinois State Museum investigated two parcels of land known as Tract 15A (Merrell Tract) and Tract 15B (Dunham Tract). On Tract 15A workers encountered an intense occupation and remains of several iterations of the Woodhenge structure, interpreted by Wittry (1996) as

calendrical structures. Wittry revisited the Woodhenge area in 1977 and 1978. On Tract 15B along the right of way for the relocated Sand Prairie Lane, just west of Monks Mound, workers excavated the remains of an intense and apparently continuous occupation, including both superimposed houses and larger circular structures that are probably public architecture (Fowler 1997:29). Wittry also excavated into Mound 5, north of Monks Mound, as part of mitigation for Highway 255/270 right-of-way (Fowler 1997:29). Later, in 1968 through 1972, Bareis performed salvage work at the Gem Site before the construction of a shopping center that leveled much of the remains of the Powell Mound (Mound 86). Excavation at Area 2 of the Gem Site showed that the Powell Mound was constructed above an earlier pit or basin that was abandoned and filled (Bareis 1975b). The mound was constructed at an undetermined time later. The mound was constructed as a series of smaller mounds and combined into a single platform, but, only one stable surface can be seen in the stratigraphic sequence. Photographs of the destruction of the Powell Mound demonstrate an organically enriched surface at approximately 8.2 meters above the original ground surface (Ahler and DePuydt 1987, Figure 2). A log-lined burial pit and an upright post were found in association with this surface.

University Based Research

Attention turned back towards Monks Mound in the middle 1960s with several universities carrying out field projects on the mound (Figure 6). The first project to investigate Monks Mound in the modern era was done by Washington University in St. Louis, represented by John Bennett and Nelson Reed, in cooperation with the University

of Illinois at Urbana-Champaign, directed by James Porter (Reed et al. 1968). Washington University crews focused on the summit of the mound, and UIUC workers, led by Bareis, excavated at the interface of the first and third terraces as well as excavating a small trench into the third terrace. Work under the auspices of Reed, Bennett, and Porter ran from 1964 until 1971 and was supported by the Illinois Archaeological Survey and the National Science Foundation as well as by local business groups and private individuals. The project was designed to understand the timing and structure of mound construction as well investigate the use of the fourth terrace excavation.

Initial work on the project began in 1964 with a series of excavation units on the summit of the main platform. In 1965, workers excavated three solid soil cores into the mound. Results were promising enough that the project was expanded in 1966. Excavation in 1966 included the removal of six solid soil cores and the excavation of a trench (2m wide by 7m long by 6m deep) to test the core interpretations. In the seasons of coring, nine cores were done in total. Seven were placed through the third and fourth terraces and two were done through the first terrace. The test trench was placed at approximately the interface of the third and fourth terraces. Later, in 1970 and 1971, almost the entire fourth terrace was excavated to a depth of 1.0 to 1.5 meters below surface. Washington University also undertook a project to investigate the south ramp where workers encountered evidence of prehistoric stairs leading up the ramp. Additionally South Ramp excavations found remains from a late Woodland Patrick Phase occupation immediately south of Monks Mound (Lotz 1971).

Reed and his colleagues interpreted the soil cores in a 1968 *American Antiquity* article (Reed et al. 1968). Despite a lack of context and the inherent difficulties of using soil cores to interpret a complex structure like Monks Mound, they suggest the mound was built in fourteen stages (Reed et al. 1968:144, Figure 7) over a course of about 250 years (Reed et al. 1968:145). Their model was based on inferred stratigraphic continuity of limonite²⁴ deposits, but as they recognized in their article, using limonite deposits as an indicator for stable mound surfaces may not be the best proxy measurement for a used mound surface (Reed et al. 1968:141). Results from the fourth terrace and south ramp excavations are less widely disseminated; notes are on file at Washington University in St. Louis and at the Illinois State Museum but no publication exists. Fred Fischer (1972), a student at Washington University and field supervisor for the fourth terrace prepared a manuscript detailing the results of the fourth terrace excavations. Excavation uncovered a large building (13x39 meters) on the fourth terrace that was rebuilt at least twice. The Washington University project provided the first radiocarbon dates from Monks Mound (see Chapter 5).

University of Illinois crew working on the interface of the first and third terrace placed a trench running up the south slope of the third terrace. The trench was originally excavated in 1964 and then re-opened and expanded in 1971 and 1972 (Bareis 1975a, b). Among the numerous contributions of Bareis' work, three stand out. First, workers discovered a surface (likely) associated with the immediate post-construction period. In trenches spanning the interface between the first and third terraces, a surface possibly extending from the third terrace clearly runs underneath a surface associated with the first terrace (Bareis 1975b:13). Later coring work by Woods (as reported in Martignoni 2003)

confirms this work and asserts the first terrace is stratigraphically superior to the first — a set of relationships which has not been confirmed. Based on sherds recovered from the fill beneath the surface, Bareis concluded that construction occurred during the Fairmont Phase (ca. 900 to 1050 A.D.). Second, Bareis suggested the first and third terraces were built as a series of small, clayey mounds of earth in-filled with siltier or sandier sediments (Bareis 1975a:10). The terraces were then faced with lighter colored sediments to preserve the moisture content of the internal clay structure. Finally, though not a focus of the reports in 1975, Walthall and Benchley (1987:20) report that Bareis discovered a significant early historic component including two burials at the juncture of the first and third terraces. Burial one was associated with early historic material culture including a glass pendant and glass beads (Walthall and Benchley 1987:40). Burial One likely dates to the early historic period (ca. 1735-1752). The second burial was exposed in a wall profile and left in situ. Based on stratigraphic similarity, the two burials are probably contemporaneous (Walthall and Benchley 1987:20).

At the same time that the Washington University in St. Louis and the UIUC projects were done, Melvin Fowler with the University of Wisconsin at Milwaukee (UWM) embarked on a long-term project to investigate site planning and to map the site (Fowler 1997). This research defined what is now considered the limits of Cahokia site. Using a photogramic map, Fowler hypothesized Cahokia was designed according to a central plan and was tied together by important linear relationships defined and marked by large in-ground posts. To test this hypothesis Fowler and his students excavated at three loci: the Southwest Corner of Monks Mound, the East Lobes of Monks Mound, and Mound 72.

In 1968, 1969, and 1971, Elizabeth Benchley, a graduate student at UWM under the direction of Fowler, excavated the platform mound located on the southwest corner of Monks Mound. Fowler believed workers would find a marker post used to define both an East to West and a North to South axis of the site (Fowler 1969:19). Although no marker post was found, workers did find a series of superimposed buildings and constructions; debris associated with these occupations was also recovered (Benchley 1975:16). On the immediate first terrace surface, workers uncovered a floor or activity area and an associated fire basin. These earliest deposits were covered by silts interpreted as slopewash from the summit of the main mound. Superior to the wash, excavators found two contemporary buildings that were burned. The buildings were wall-trench type construction. A platform mound built in at least nine stages covered the burned buildings (Benchley 1975:19). Workers were only able to excavate the surface of the final platform stage so it is not possible to determine if each building stage supported a building or not. On the final platform, a building and fire basin was exposed. The final platform was disturbed by both prehistoric and historic intrusions. Although workers failed to find a marker post, Benchley believes these excavations confirmed Fowler's hypothesis since small postmolds were found in the predicted location (Benchley 1975:19).

Kenneth Williams, another UWM graduate student, was assigned to investigate the East Lobes of Monks Mound. Fowler speculated that the East Lobes were purposeful constructions designed to access the fourth terrace. To test this hypothesis, Williams headed excavations done in 1971 that would investigate the origin, function, and timing of the lobes' construction (Williams 1975:21). Excavations consisted of a series of trenches running north-to-south and two pits aligned east-to-west.

Fowler targeted Mound 72, a low, ridge-topped mound south of the Grand Plaza, for the final component of this project (Fowler 1999). From the outset the mound did not appear particularly impressive; however, Fowler speculated it was located in an important position and likely covered the remains of a marker post on the north to south axis of the site. Between 1967 and 1972 crews directed by Fowler completely excavated Mound 72. Workers recovered the remains of a single individual lying on a platform of shell beads accompanied by the remains of over 300 individuals and a vast amount of items made of exotic materials (J. Brown 2006, Fowler 1999). In addition, they found archaeological indications of a marker post in the predicated location. After the 1971 field season, work at Monks Mound and Cahokia slowed. A vast quantity of data was produced in this short time and needed to be written up. At the same time, the FAI 270 project drew archaeological attention to other parts of the American Bottom.

Although fieldwork declined after the early 1970s, the Cahokia site was placed on the UNESCO World Heritage list in 1982. The UNESCO World Heritage list provides a frame for future investigation of Monks Mound which has been aimed primarily towards preservation and conservation (http://whc.unesco.org/pg.cfm?cid=31&id_site=198).

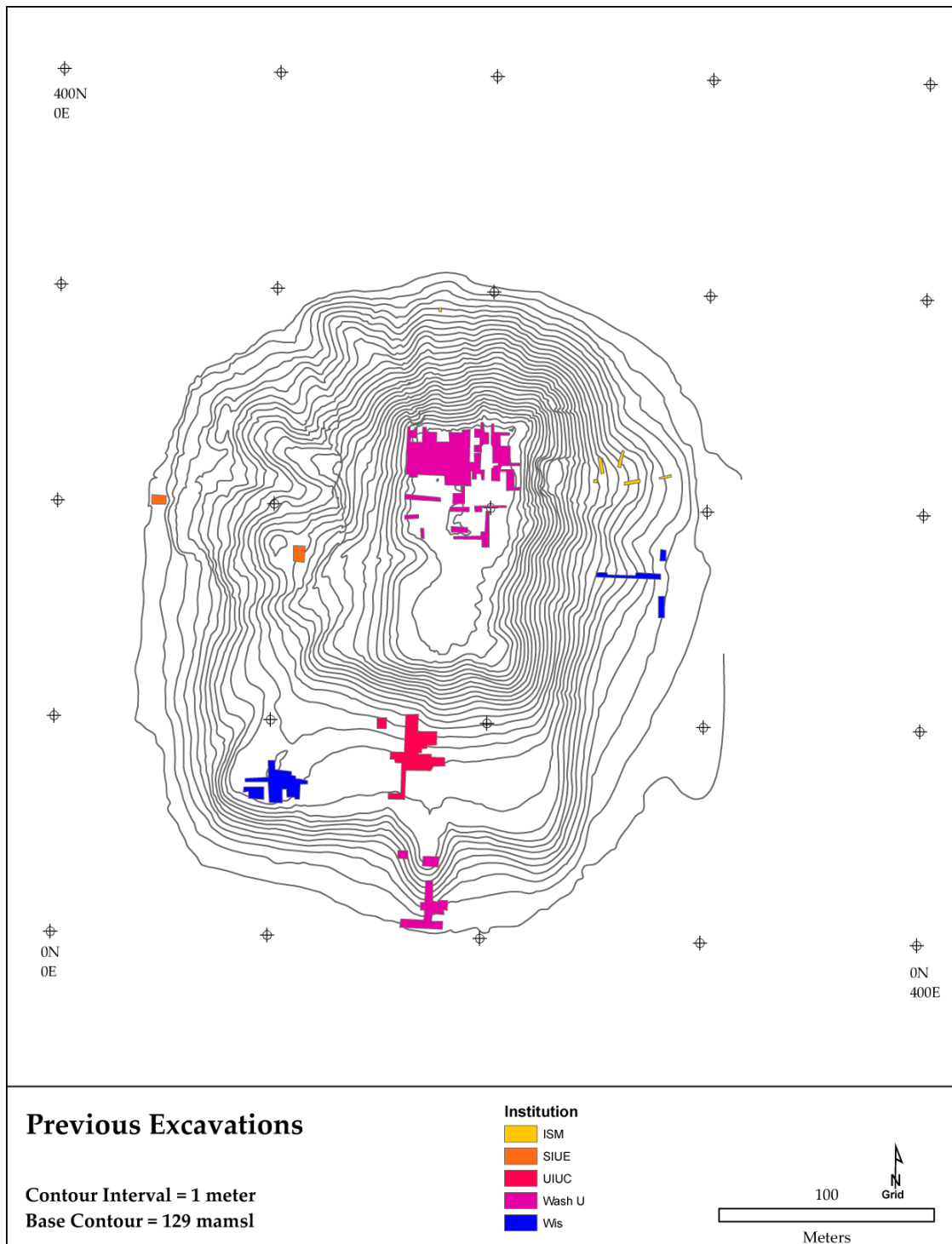


Figure 6. Past excavations on Monks Mound.

Conservation and Repair

Interest turned back to Monks Mound in the middle 1980s after a mass sediment failure or slumps on the east face caused workers to question the stability and long-term integrity of the earthwork (McGimsey and Wiant 1984:1). As part of the development of a policy to address the conservation of Monks Mound, Charles McGimsey IV and Michael Wiant of the Illinois State Museum excavated six backhoe trenches and five solid soil borings to better understand the structure and history of the mound. Their work cast doubt on the Reed et al. model by questioning the markers used as indications of stable mound surfaces. However, they did not offer an alternative model since they could not discern any obvious patterning in mound construction. In fact, Skele (1988:97-98) believes there is a general agreement between the findings of Reed et al. findings and McGimsey and Wiant. McGimsey and Wiant's results can be summarized as:

1. Slumping on Monks Mound is both a modern and prehistoric problem.
2. Monks Mound overlies rich midden deposits of undetermined function and structure.
3. The construction and subsequent history of Monks Mound is complex. Individual features should be investigated before their relationship to the whole can be understood (McGimsey and Wiant 1984:36-38).

Continued slumping on the western side prompted investigations by Collins and Chalfant (1993) from Southern Illinois University at Edwardsville. This work consisted of the excavation of a six x four meter excavation block and the cleaning of eight one-meter wide profiles along the slump scarp.

In 1986, a conference was held to determine the best course of action for future remediation and conservation efforts (Emerson and Woods 1993). At this time a hands

off policy was determined to be the best way to manage future slumping, although provisions for future study were made.

Other work at the Cahokia site during the 1980s included survey and excavation at the ICT (Interpretive Center Tract) II. ICT II, located southeast of Monks Mound, was chosen as the location for the new interpretive center. Field work was done between 1984 and 1986. Workers excavated 5,833 m² and processed 466 features (Woods and Holley 1997:225).

Even though a passive management plan was implemented during the 1990s, Monks Mound continued to slump. In response to slumping on the West side which moved almost a meter downslope and a slope failure on the East Face near the lobes during the spring of 1995, a geotechnical project, done by Southern Illinois University at Edwardsville, under the direction of William Woods, investigated possible causes and remediation for this slumping. Projects by SIU-E included coring immediately west of Monks Mound and excavating test pits preliminary to the installation of de-watering wells designed to remove excess groundwater from the mound. The installation of de-watering wells also required boring horizontally into the western slope, during the boring operations workers encountered coarse materials believed to be limestone or sandstone (Rose 1998). Subsequent auguring designed to delineate the extent of the deposits was not able to reach the hypothesized depth of the coarse materials due to ground water intrusion leaving open the question of the extent and nature of the materials (Martignoni 2003; Rose 1999).

Although research into Monks Mound during the 1990s was aimed towards preservation and conservation, other work at the Cahokia site brought new insight into

other monumental construction at the site (Dalan 1997; Dalan et al. 2003; Holley et al. 1993; Watters Jr. et al. 1997). In particular, Rinita Dalan (1993) demonstrated that the construction of the Grand Plaza required a vast amount of earthmoving. Her work suggests the above ground architecture represents only a portion of the labor expended at the site, since a comparable amount was needed to fill numerous borrow pits dug to construct mounds. Later work by Dalan and colleagues from SIU-E expanded on her work using geoarchaeological methods to investigate several mounds and other features of the landscape (Watters Jr. et al. 1997).

In spite of the installation of de-watering points in the western slump of Monks Mound, slope failures continued. In response to movements in 2004, John Kelly and Ed Hajic (Hajic 2005; Kelly and Schilling 2009) excavated three solid soil cores from the western slump and one from the east slope, which also began to move again. This work was done as preparation for soil borings, which were examined by Shively Geotechnical Services, Inc. who was contracted to develop a plan to address slumping on the mound. In addition to soil borings, crews from Shively also mapped Monks Mound in detail providing the first high-resolution map of the mound. Hajic's descriptions document numerous slip faults along slickenside planes within both slumps, and this work also yielded new radiocarbon dates for the premound surface.

Differing Views of the Timing and Construction of Monks Mound

Most conceive of Monks Mound as an accretionary monument that was built according to one of three basic construction models. The models differ based on the length of time and number of construction episodes, but all maintain Monks Mound arose

incrementally and the final form of the mound is a palimpsest of its construction history. Fundamentally, the mound was constructed through many temporally discrete events where construction was undertaken as a series of small, disconnected projects each designed to create a flat, level surface.

Incrementalists can be subdivided into those who believe construction took place over about a 250-year period and into those who believe construction took a much shorter time. On the one hand, Reed et al. (1968), who believe Monks Mound is so large because it has a long history, typify the long chronology view. Proponents of the Historical Model for the development of Cahokian society use this construction model as support for their reconstruction (e.g. Milner 1998, Muller 1997). On the other hand, Woods (2001; see also Dalan et al. 2003) and Pauketat (1998b) argue for shorter chronology based on fewer but larger construction elements. Accordingly, they are proponents of a Power Model of mound building. Even though there are differences in detail, incrementalists see Monks Mound as crucial for understanding the social organization of the Cahokian polity since either Monks Mound implies the existence of a society divided by class at an early date or it implies the existence of a stratified social structure capable of organizing the labor for a more rapid construction.

Although most see the construction of the mound as occurring incrementally—by the addition of subsequent mound stages—there is no a priori reason that the mound could not have been built as a single integrated project. Consequently, it is necessary to add a fourth model of mound construction to the previously mentioned models. This model is one where the mound was built very quickly with its final form predetermined because the mound was built as a unified whole with a specific goal in mind. The

following discussion outlines these four models of the construction of Monks Mound and develops archaeological signature for each.

Reed, Bennett, and Porter Model

The first data-based construction model was presented Reed et al. (1968). Based

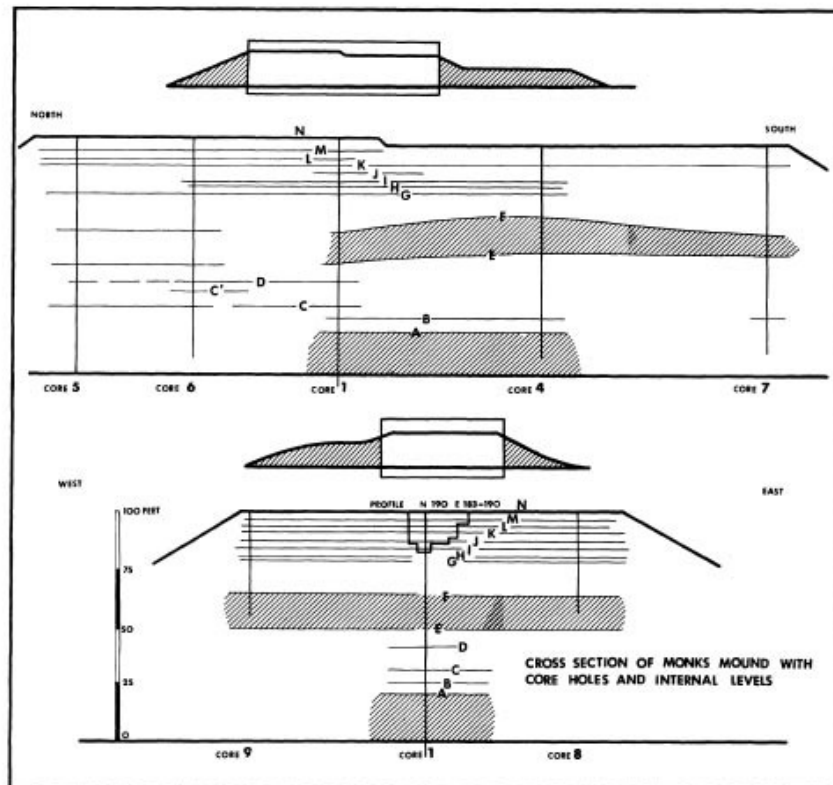


FIG. 7. Major internal soil features of Monks Mound as suggested by coring evidence.

Figure 7. Reed et al. model.

on their 1968 soil coring, they proposed a fourteen-stage model for the construction of the bulk of the mound located beneath the third and fourth terrace. In their model (Figure 7), mound construction commenced about 950 A.D. (Reed 2009, Reed et al. 1968:141). The initial ten meters of the mound was constructed very rapidly, perhaps as a single project. This stage, Stage A, consists of a black organic clay that they suggest was sourced from the adjacent Edelhardt Meander. Stage A was encountered in two cores (Core 1 and Core 6), and perhaps a third (Core 4) but the elevation of the surface and the thickness of Stage A deposits varied greatly. The initial clay deposits encountered in Core 1 terminate at about 131 mamsl whereas similar deposits stop at approximately 129 mamsl in Core 4. The upper elevation of the initial clay deposits observed in Core 6 is almost one meter higher (about 132 mamsl) than those in Core 1 (Reed et al. 1968:143, Figure 6).

If Stage A, as defined by Reed et al., does represent an initial flat topped platform mound then the surface was not very even (cf. Reed et al. 1968:143). No specific function is ascribed to Stage A and the authors do not directly state what they believed occurred on the surface. However, their use of ethnographic analogies and evidence from the surface of the fourth terrace indicates they believe Stage A represents a functional equivalent to other Mississippi platform mounds (Reed et al. 1968:145, Reed personal communication 2008). Thus, Stage A and all other stages, with perhaps the exception of Stage C1 and Stage G, were platforms for ephemeral architecture.

Construction of Monks Mound then proceeded in a series of equivalent stages. Two exceptions to this general model are presented. First, in a discussion of Stage C1 identified in Core 6, Reed and colleagues argue this stage may represent a localized

building episode. Second, they suggest Stage G may represent a mound cap because they believe this stage is composed of a single mass of clayey sediments (Reed et al. 1968:143). Stage G, as they note, was not found in all soil cores reaching this depth. Although the authors present a general model of the construction of sequential and equivalent staging, they do note general difference through the stratigraphic column. Most notably, all stages below Stage G are relatively massive (over about 3 meters in thickness) whereas stages above Stage G are thinner (approximately 1 meter thick) and generally made of coarse material.

In this model, Monks Mound was completed by about the middle of the twelfth century A.D. This aspect of the model is anchored by large-scale excavation on the fourth terrace which provided three radiocarbon dates and associated material culture (Fischer 1972). The final Mississippian Period occupation on the fourth terrace consisted of at least a single large wall trench or wall-trench type building covered over by an approximately 1.5 meter thick clay cap.

As a test of this model, Reed et al. (1968:141-142) excavated a 5.5 meter deep trench through the summit of the fourth terrace. Based on this excavation, they believe workers encountered at least six stable mound surfaces defined by laterally extensive limonite banding (Reed et al. 1968:142, Figure 5). Two of the surfaces have been verified by subsequent excavation. These surfaces, Stage M1 and Stage M2, were exposed in the summit excavations during 1970 and 1971 and prove to be a single occupation stage with a rebuilding episode (Fischer 1972). No fill episodes were found between Stage M1 and Stage M2. Of the remaining four mound stages, only Stage J is flat and parallel with the surrounding landscape. In the soil coring, they identified Stage J in five of eight cores,

suggesting a laterally extensive interface. They also argue five mound stages were found in the soil cores based on either the co-occurrence of limonite and sand or limonite and charcoal deposits. Excavation of the pit did not confirm these same stages. Thus, even though Reed and his colleagues believed they found six stable mound surfaces, only one — and perhaps two — represents clearly defined mound use stages. The other four stages that they identified may be more properly defined as transitions in permeability or short term, possibly on the order of weeks or months, hiatuses in construction.

In 1988, Mikels Skele published a retrospective on Monks Mound. As part of this work, Skele reinterpreted the then mound construction data (largely the work of Reed et

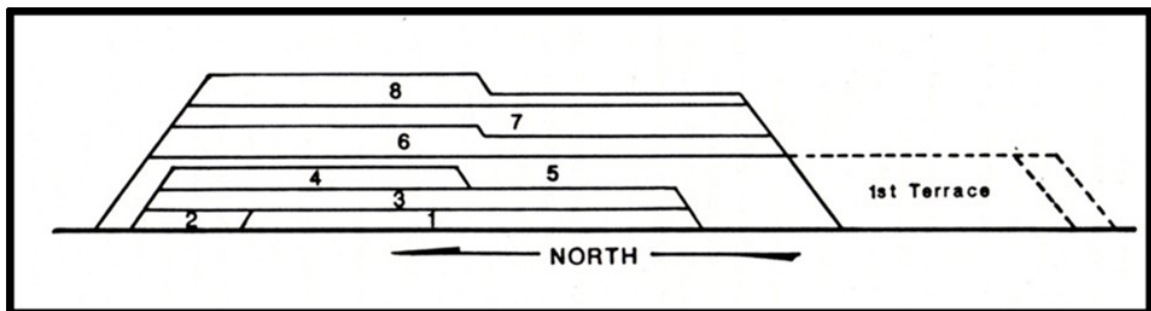


Figure 8. Schematic of model proposed by Skele (after Skele 1988; Figure 52)

al., supplemented and integrated with the work of Bareis and Wiant and McGimsey) and proposed a pared-down construction model for the earthwork (Figure 8). Skele argued Monks Mound overlies an earlier occupation and subsequent mound construction proceeded in eight stages that were either single level or bi-level spanning the Edelhardt through Moorehead Phase (Skele 1988:102). The northern portion of the mound in some stages rose considerably above the southern portion of the mound in the same manner as reflects the modern morphology of the third and fourth terraces. The first terrace was built in either a single or perhaps two massive efforts late in the sequence.

Expectations: Reed et al. Model

The Reed et al. model would be supported by a long chronology of perhaps two or three centuries and many mound stages each having a building on top, with each building stage representing successive chiefs. Radiometric assays from sediments beneath the mound should indicate mound building commenced no later than 950 A.D. and been completed by 1200 A.D. Discrete mound surfaces should be identifiable by the existence of multiple mound faces, and multiple mound surfaces. These should be identifiable by the existence of multiple layers of A horizon soils or identifiable long-term construction hiatuses buried by discrete mound filling events.

Woods Model

Contrasting with the Reed et al. model, Woods (2001) presents a construction model where Monks Mound was a highly engineered construction project. Woods argues the mound was constructed in a series of stages over about a 100-year period. Although this is the same time scale as suggested by Reed et al., Woods' model of construction sees the bulk of the mound as constructed in a about half the time required by the longer chronology model. Labor expenditure on Monks Mound during the subsequent 150-year occupation consisted of maintenance or remodeling of the overall structure.

The first stage consisted of constructing a six-meter tall clay core. The clay core was covered by two clay buttresses on the northern and southern end. A series of clay layers interspersed with coarser sediments were then emplaced between the buttresses, up to an elevation of about thirteen meters above the surrounding land surface. The initial clay platform covers the same area as the base of the mound without the first terrace (cf. Skele 1988:79, Woods 2001: Figure 1). According to Woods (2001:6), the leaders of the

Cahokian society purposefully engineered this arrangement of sediments to keep the core permanently moist. Woods speculates that the hydrodynamic properties of these sediments would pull ground water into the mound up to about nine meters. The first thirteen meters of the mound was built as a single project and done in a very short amount of time. The subsequent sixteen meters was built as a series of platforms for above-ground facilities. The main part of the mound, the rectangular platform without the first or second terrace arose in about 100 years (Woods 2001:7). The initial mound construction in this model began around the turn of the first millennium, about 950 A.D. and was completed by the end of the Lohmann Phase (Emerson and Woods 1993:102). Subsequent construction involved maintenance and repairs. For example, Woods suggests the second terrace was added sometime in the thirteenth century to cover a major slump episode. Likewise, the first terrace was also a later addition designed to shore-up the southern slope.

Expectations: Woods Model

Woods' model requires a shorter, one to two century, chronology mostly built in the early eleventh century. Radiometric assays should indicate the mound was built no earlier than 950 A.D. and was completed by 1100 A.D. Fewer but larger mound stages each supporting a building are called for in this model. Mound stages should be identifiable by the existence of horizontal layers of A horizon soils. Mound building in Woods' model was pursued by the addition of layers atop a foundation, so younger mound stages should be constrained by the initial footprint of the mound. Therefore, in this model, multiple mound faces are not expected on the sloping sides of the mound;

rather there should be one contiguous mound face that marks the termination of mound surface strata.

Pauketat model

Pauketat (1997:43, 2000:120, see also Pauketat and Alt 2003:158) presents a model similar to Woods', but somewhat more abbreviated. In this model, construction began on Monks Mound sometime around 1050 A.D and was completed by 1150 A.D. Pauketat believes the central clayey core was constructed purposefully and rapidly (Pauketat and Alt 2003:165). Differing from the Woods model, however, Pauketat places the beginning of construction about 100 years later. After the construction of the mound core, subsequent additions of stages or blanket mantles, done on a yearly basis, account for the remainder of mound building. Recent comments by Emerson, Pauketat, and Alt (Emerson et al. 2008:222) indicate the hypothesized yearly additions to the mound did not add to the overall mound height in an appreciable manner. These comments suggest an important divergence from the Woods model, which suggests at least sixteen meters of mound height — more than 50 percent of the mound's height — was added through stage additions.

Although Pauketat and his colleagues argue for an abbreviated chronology, Pauketat, in particular, argues, “no Mississippian platforms and few other central features were constructed as one-time labor projects” (Pauketat 2000:122)²⁵. These comments indicate an incrementalist viewpoint of the construction of Monks Mound, albeit a compressed one.

Pauketat's model may be considered a synthetic view of mound construction where history ultimately created the final form of the mound. In his view, history is the cumulative practices of ancient people; thus, the regular interactions of people created the mound in a continuous series of yearly renewal or construction events (Pauketat 2001, Pauketat and Alt 2003). Drawing on analogies from the Kunneman Mound (Pauketat 1993), Mound 31 (Sullivan and Pauketat 2007), Mound 55 (H. M. Smith 1969), and others from Cahokia, he suggests mound building in general was pursued on a regular basis (Pauketat 2002, Pauketat and Alt 2003). In this way, the construction of Monks Mound proceeded incrementally, no different from the construction of any other Mississippian mound.

Expectations: Pauketat Model

Pauketat's model rests on the existence of a still shorter construction chronology, spanning perhaps two or three generations, but many mound stages either stacked in a layer cake manner or built by the addition of blanket mantles. Radiometric assays from pre-mound contexts should not be later 1050 A.D. Radiometric assays from the last construction episode should pre-date 1150 A.D. In an importance divergence from the previously discussed models, Monks Mound grew upwards and outwards at the same time by the addition of blanket mantels. In Pauketat's model, multiple mound faces are expected with later ones burying earlier ones. Based on a graphical representation of Pauketat's model (Pauketat 2000:121), mound faces should be separated by approximately one to two meters of mound fill.

The Event Model

In the alternative model based on Dhegian analogs developed in the preceding chapter, Monks Mound serves an iconographic function and the ritual process behind mound building served to create a new regional social institution. Consequently, the mound would be built as a single project²⁶. This would require a clearly identifiable construction chronology spanning a very short duration and no evidence that the mound was used as a platform for perishable architecture until it rose to the near final height. The span of the radiometric ages from submound deposits and mound surface deposits should not be longer than a single generation or twenty years. Since moundbuilding at the scale of Monks Mound would require a large population density, the mound should date to later in the Cahokian sequence when population levels are at the greatest. The mound's internal structure may exhibit many types of construction methods since the ultimate goal was the building of a large monument necessitating improvised labor usage and leadership structure rather than a rigid plan. Labor would have been utilized to build quickly rather than building fastidiously. Cosmological associations of construction materials, such as the type of material or the environment it represents are also expected, since the mound would be an embodiment of ideas embedded in a ritual process rather than a demonstration individual power. The following chapters test these ideas against archaeological data from Monks Mounds and Cahokia.

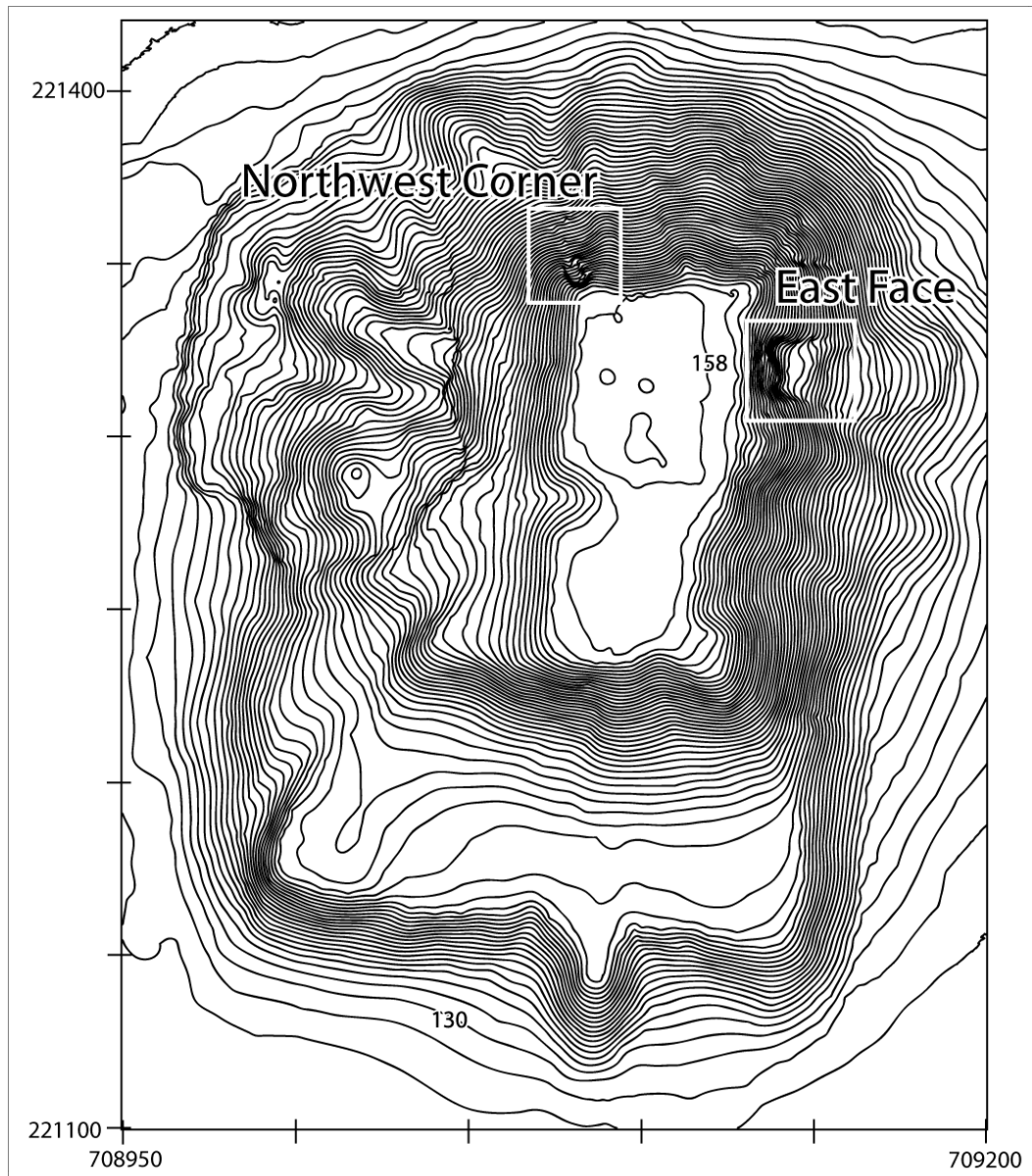
Monks Mound and the Cahokia Site

Finally, prevailing construction models require that Monks Mound is one of the oldest mounds at the site. In this view, the mound serves as the physical and sacred center of the site, which then grew outward as the mound arose. Following from this idea,

radiometric dates from Monks Mound should indicate the mound pre-dates other monumental construction. In contrast, the alternative model requires that Monks Mound be built only after a sufficient population was present.

Chapter III: 2007 Excavations

In the summer of 2007, personnel from the Cahokia Mounds State Historic Site contracted the Central Mississippi Valley Archaeological Research Institute to monitor the excavation and stabilization of three erosional features on Monks Mound (Figure 9). Archaeological data derived from this project are presented below. The work was initially supervised by Timothy Schilling, and later led by a combined team of John E. Kelly, Tristram R. Kidder, and Schilling. The analysis and discussion presented in this dissertation are the work and thoughts of the author and in no way represent the opinions of the other two researchers. This being said, data collection was the result of the exceeding hard work of over 40 different individuals who spend the first three weeks of August 2007 laboring under extremely hot and trying conditions.



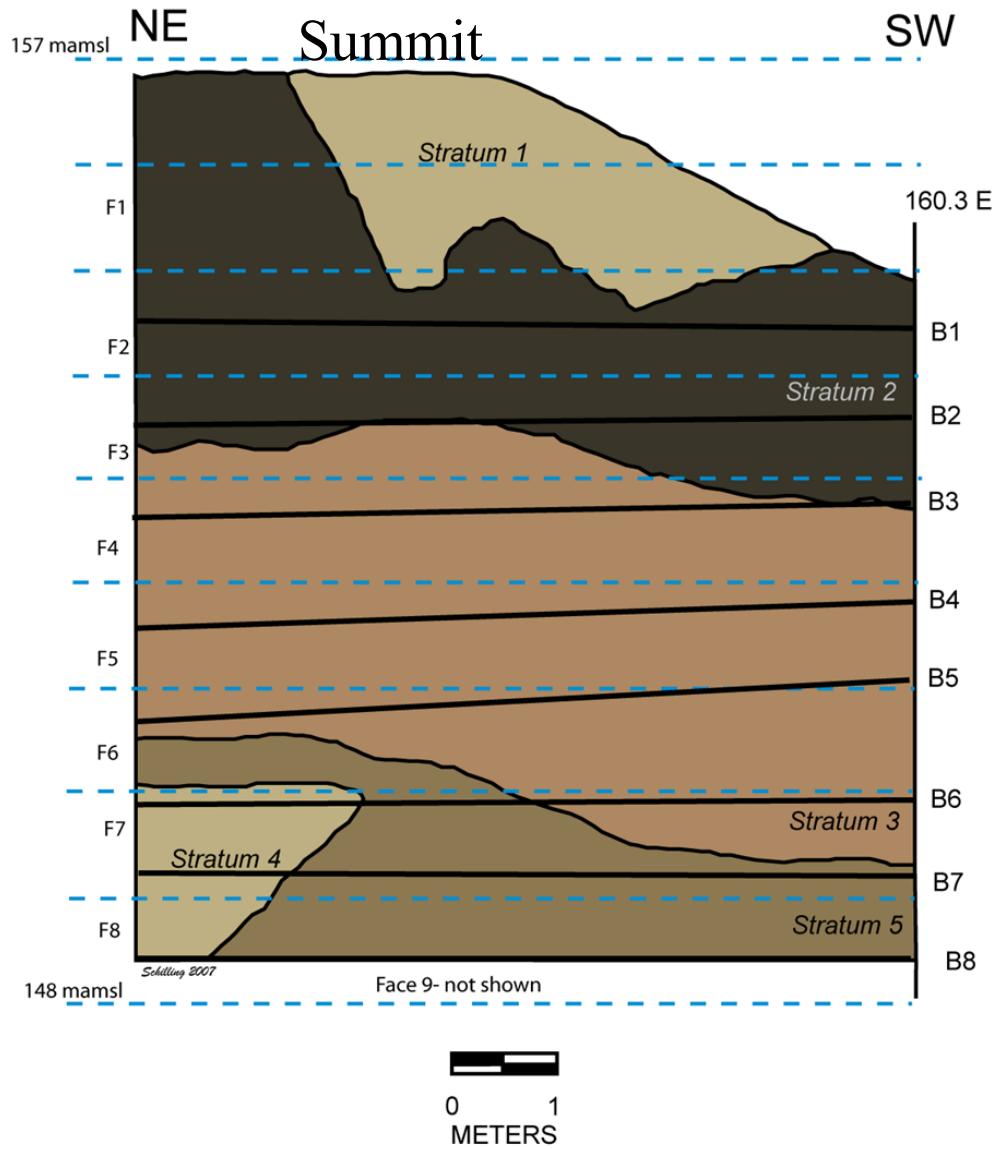
2007 Excavation Areas

Interval 50 cm, mamsl
UTM Zone 15, WGS1984

Figure 9. Location of excavations discussed in text.

The Northwest Locality

The first area addressed as part the 2007 Monks Mound Stabilization Project was the slope failure on the Northwest corner. This section describes the excavations at the Northwest locality. The Northwest locality consists of an area approximately 7.5 meter wide by 9 meter deep (i.e., from ca. 157.16 mamsl to 147.96 mamsl) (Figure 10). The final extent of work was based upon the identification of the slickenside surfaces visible as excavation progressed. As initially designed a series of vertical and horizontal cuts formed the limits of the unit. The cuts resembled stair steps. Steps were numbered from top to bottom sequentially. Vertical cuts were named “Faces” and horizontal cuts were called “Benches”. A total of 8 Faces and 8 Benches were needed to remove the slickenside surfaces. Benches ranged from 1.0 to 1.5 meters across and faces measured from .75 to 1.5 meters in height.



Northwest Profile

Figure 10. Northwest Profile drawing.

Work began on August 1, 2007 with the scraping of the vegetation and root layer on the Northwest Locality. This initial effort removed the O- and A-soil horizons and was done to provide a clearer view of where the slip face exited the ground surface. No

artifacts or archaeological features were seen during or after the removal of the A-horizon.

Full-scale excavation commenced on August 2, 2007 and was completed on August 3, 2007. Excavation revealed five subsurface strata. These were numbered Stratum 1 through Stratum 5. Stratum 1 and Stratum 4 were composed of a yellowish (10YR 6/4) silt. Stratum 1 and Stratum 4 likely represent portions of an erosional gully that was filled in the recent past. The gully ran from the Northwest corner of the mound downslope and toward the Northeast. Sediments at the head of the gully were poorly consolidated and in several instances, voids developed within the loess where repairs had washed out leaving only a thin surficial crust held together by the root mat from overlying vegetation.

In contrast, Stratum 2, Stratum 3, and Stratum 5 consisted of multiple colored layers of basketloaded fills. These were intact moundfill deposits. Stratum 2, Stratum 3, and Stratum 5 were structurally similar but contained different color sediments which had slightly different textures. These differences suggested the materials came from different sources locations. Therefore, strata were separated because of color and texture differences. Basketloads were generally horizontal, but overall strata were arc-shaped (Figure 11). The highest point of each stratum was located towards the center of the excavation trench. Bedding at the edges was significantly lower than the center. Beds observed in the western wall ran horizontally along the North/South axis.



Figure 11. Detail of Stratum 2 and Stratum 3, facing South. Note the overall arc-shaped structure.

The arc shaped structure likely resulted from the mounding of basketloads. It is not possible to determine if the mounding represented a dome-shaped feature or a ridge-shaped feature. In the vertical direction, between 16 and 20 loads per meter were observed. Boundaries between individual basketloads and between strata were clear. There was no mixing between deposits. Clear boundaries suggest a rapid depositional sequence since there was not time between baskets for soils to become mixed or for turbation to occur. Overall, this sequence implies a large construction effort — nearly nine vertical meters were constructed without interruption.

At least two post-depositional fractures were observed. One fracture was seen in Face 5. Deposits along the western side of the fracture were displaced about 14 cm, relative to the eastern side (Figure 12). A root cast crosscut the fracture. This relationship indicates the fracture has stopped moving and is likely ancient. The other fracture, observed in Face 4, is less distinct than the fracture in Face 5. A single chert flake of unknown provenience was recovered during the excavation. Backfilling of the trench

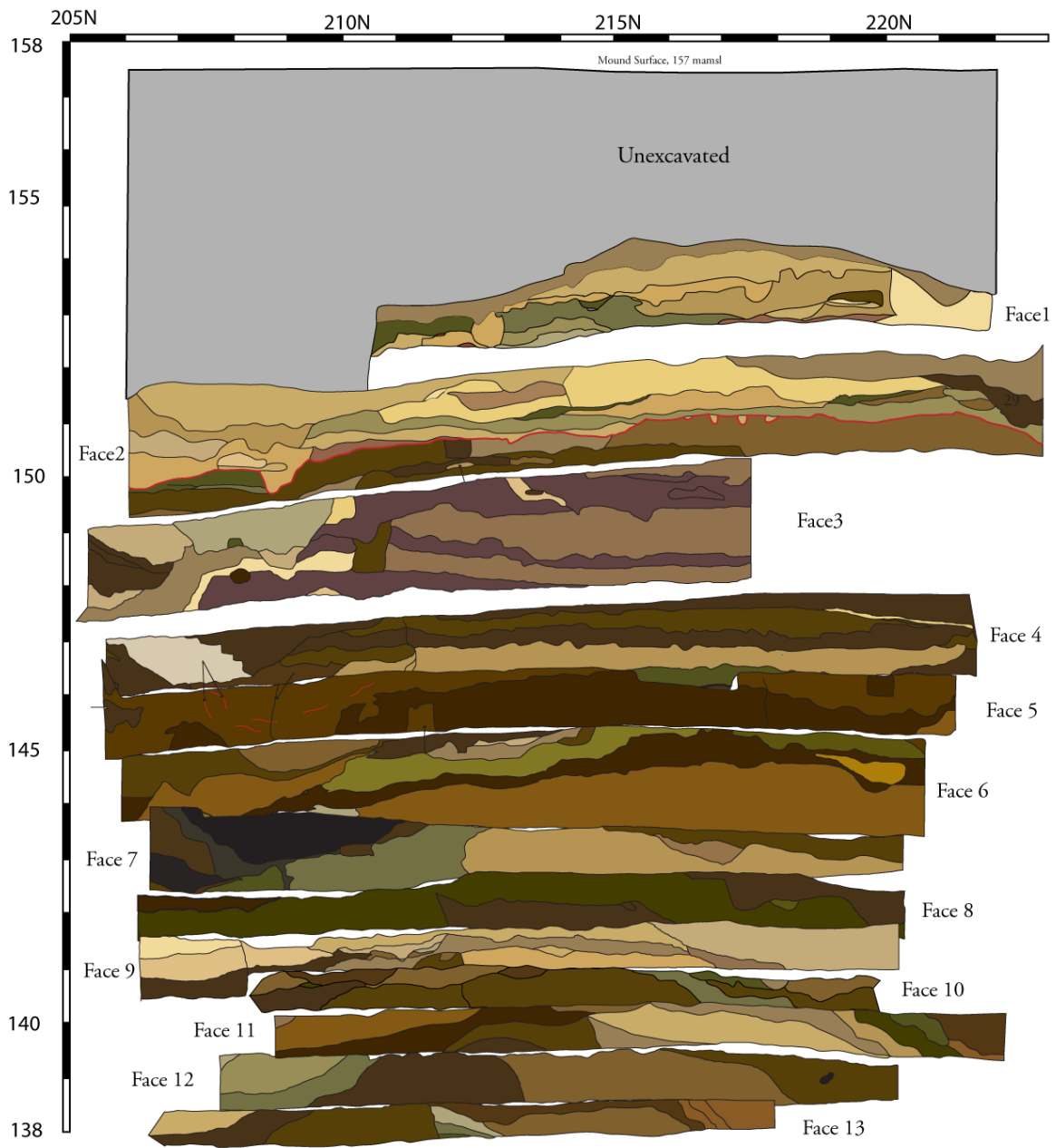
began immediately after excavation ceased and proceeded continuously until finished on August 10, 2007.



Figure 12. Faulting on the Northwest corner. Note the root cast, circled.

The East Face Locality

The removal and repair of the East face was much larger in scale than the northwest corner (about 20 m North to South x 16 m vertical elevation). As with the northwest corner, the removal of the previous slump material and the identification of the slickenside surface. Workers cut a total of 13 Benches and Faces (Figure 13, Figure 14). The work to remove the fill commenced on August 6, 2007 and the cutting of the final Bench was completed on August 10. Three days were spent prior to the filling and compaction of the new sediments completing the photography, mapping, and sampling for sediments. The filling of the cut was begun on August 13 and the entire project was completed by August 22.



MAMSL

Figure 13. Composite stratigraphic drawing of the East face excavations, locations and colors approximate.

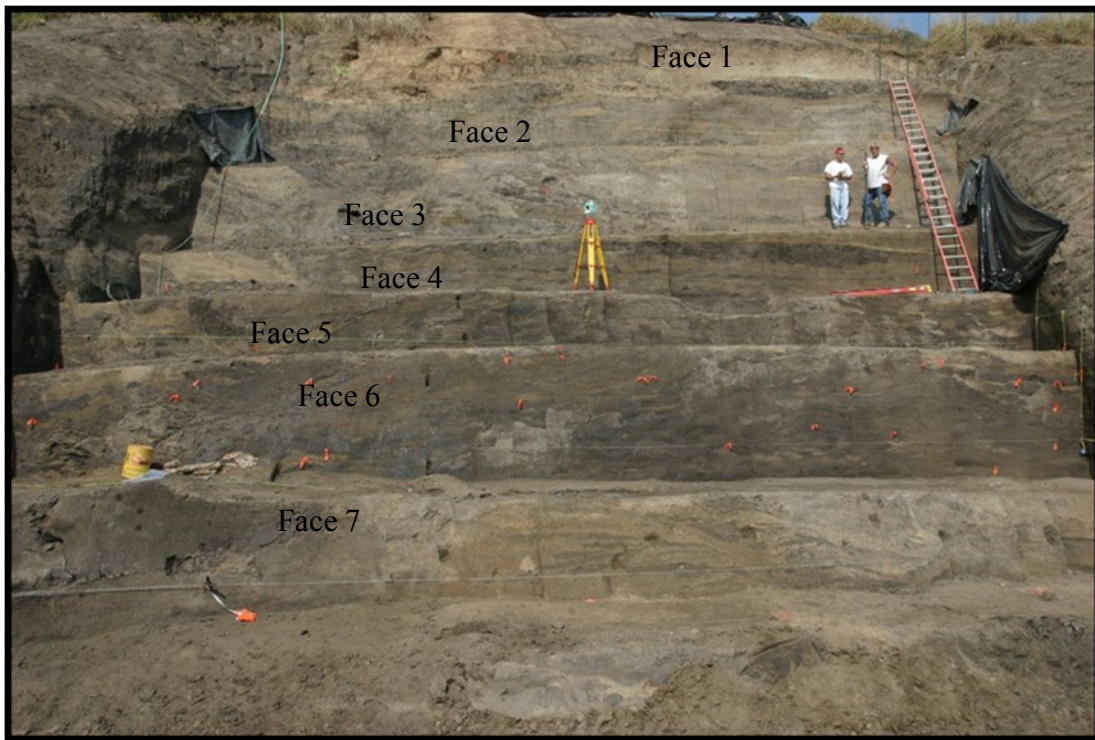


Figure 14. Photograph of East Face excavations.

Archaeological monitoring began by cleaning the faces and benches as each was exposed. Due to the extent of the failed slope, it became necessary to cut larger benches and faces. Consequently, the increased area of mound exposure required a shift from simple monitoring to a more involved archaeological documenting process where a larger crew cleaned, photographed, mapped, and collected sediment samples of the exposed surfaces within a restricted time period. Since there was a high risk of additional failure of the exposed faces, it was imperative that crews recover as much archaeological data as possible. Archaeological work was guided by the need to recover data without unnecessarily extending duration of exposure of the more fragile interior mound sediments.

Archaeological documentation proceeded by cleaning and mapping the excavation faces. Lateral profiles to the north and south were also documented. Even though the excavation faces did not penetrate more than 2 m in depth normal to the slickenside surface, nonetheless this work was extremely important in defining aspects of the mound construction techniques. Previous excavations have had to rely on either small windows into the mound stratigraphy or horizontal exposure, neither of which are particularly useful for understanding the broad picture of moundbuilding. Due to the complex nature of the East Face excavations, data and observations are first presented according to arbitrary levels (i.e., by each face). Following the presentation of individual faces, a synoptic interpretation is presented.

Stratigraphy

Face 1

Upper Elevation: 154.300

Lower Elevation: 152.700

North extent: 221.750

South extent: 210.566

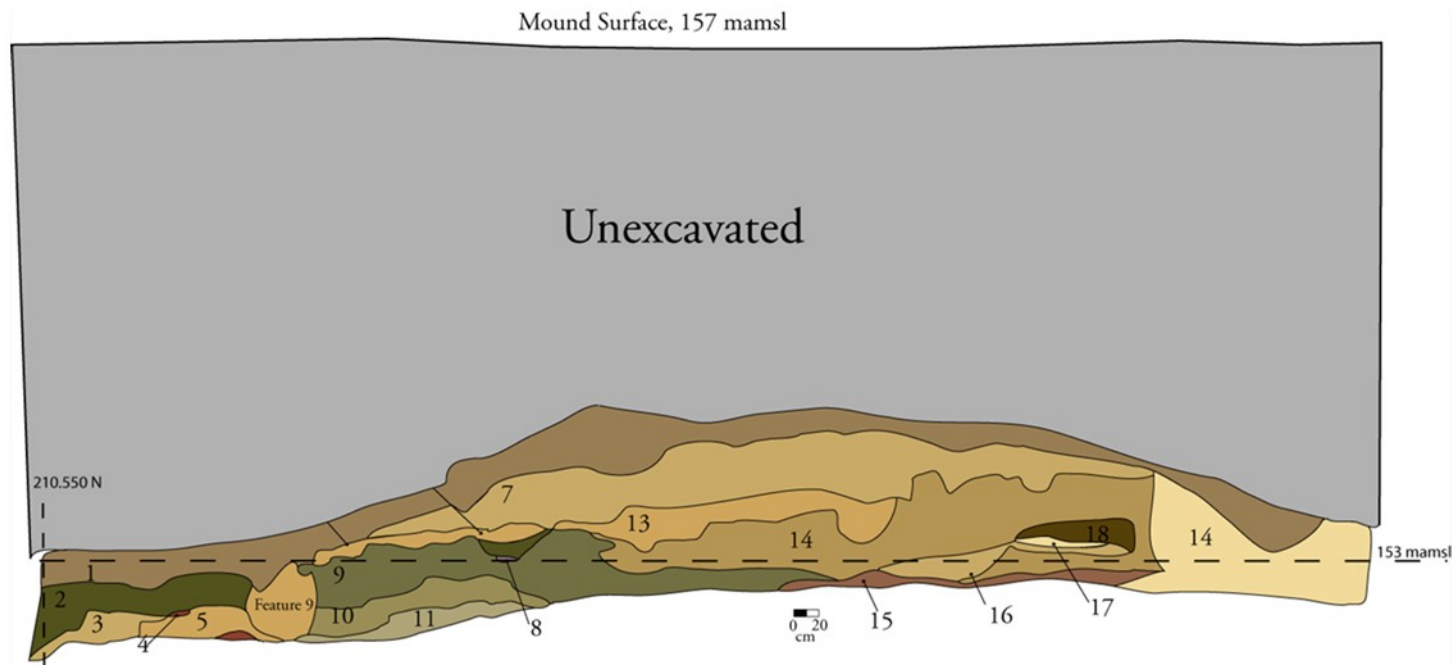


Figure 15. Face 1 Stratigraphy.

Unit	Color	Texture	Redox	Comments
1	10YR 4/3	silt		Numerous roots
2	10YR 3/3	silt	FeO2	Mottled w/ 10YR 2/1
3	10YR 6/4	fine sand	FeO2	Mottled w/ 10YR 2/1 and occasional 10YR 3/2 silt, roots
4	10 YR 6/4 to 10YR 7/4	silt	FeO2	
5	10YR 3/3	clayey silt		Roots
6	10YR 5/4	silt		Occasional 10YR 2/1 clay, numerous roots
7	10YR 3/3	silt	FeO2	Mottled w/ 10YR 3/2, numerous roots
8	10YR 4/3	silt	FeO2	Roots
9	10YR 5/4	silt	FeO2	Few roots
10	10YR 3/2	clayey silt		Few roots
11	10YR 6/4 to 10YR 6/6	fine sand	FeO2	Few roots
12	10YR 6/6	silty clay	FeO2	Mottled w/ 10YR 5/1, 2.5YR 4/8 inclusions, 10YR 6/4 clay (small)
13	10YR 6/4	silt to silty clay	FeO2	Mottled w/ 10YR 6/3 silty clay, 2.5YR 6/8, 10YR 5/1 and 10YR 4/2 clay and silty clay inclusions
14	10YR 6/3	silty sand	FeO2	Mottled w/ 10YR 5/2 silt, very small 10YR 7/3 (very small)
15	10YR 5/2	silty clay		
16	10YR 6/3	silty clay		Mottled w/ 10YR 5/6 (large)
17	10YR 6/3	silty clay	FeO2	Mottled w/ 10YR 5/2
18	10YR 5/3	silty clay	FeO2	Mottled w/ 10YR 4/2

Table 1. Face 1 soil descriptions.

This face was the upper most excavated cut. Stratigraphy (Figure 15)

demonstrated at least two episodes of previous modern slump repair, most readily in the Stratum 1 and Stratum 14 relationship where a massive deposit of loess (Figure 16) overlies a slightly older deposit of similar sediments. Figure 16 shows the loess on the outermost of the East Face. These sediments were easily identifiable and clearly different from the kinds of fills used by the Cahokians. Multiple applications of loess repair fills have been documented since at least the middle 1960s (Collins et al. 1993). One feature, Feature 9, was encountered in Face 1. Feature 9 was likely a rodent burrow or resulted from the incomplete filling of modern slumps or slope failures.



Figure 16. Loess fill overlying Face 1, ca. 152-154 mamsl.

Face 2

Upper elevation:151.800
Lower elevation:149.400
North extent:224.70
South extent:208.141

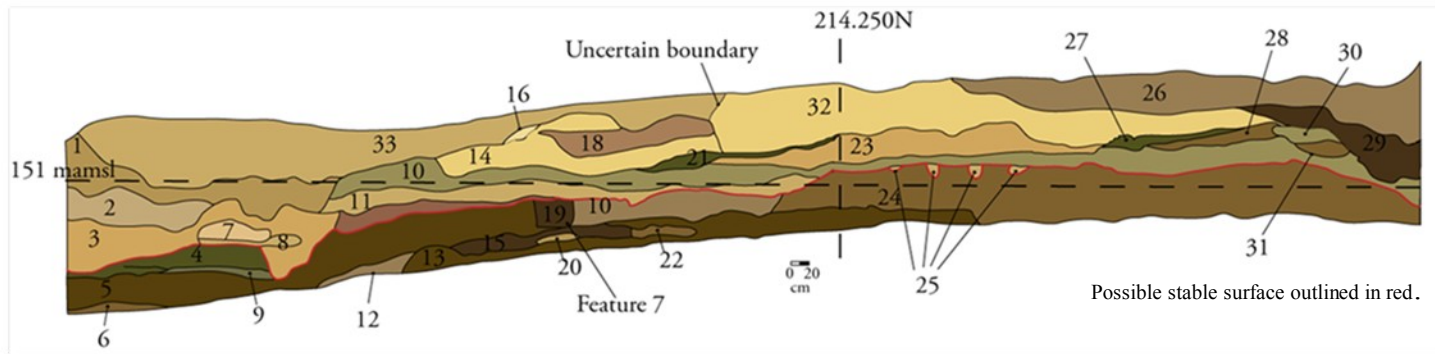


Figure 17. Face 2 stratigraphy.

Unit	Color	Texture	Redox	Comments
1	10YR 3/1	silt	FeO2	Mottled w/ 10YR 7/6 silt
2	10YR 6/4	silty clay	FeO2	Mottled w/ 10YR 4/1 silty clay
3	10YR 5/1	silty loam		Mottled w/ 10YR 7/4 and 10YR 4/2 silty clay
4	10YR 6/2	silty clay	FeO2	Mottled w/ 2.5YR 5/8 clay and 10 YR4/1 silty clay
5	10YR 3/1	silty clay		Mottled w/ 10YR 6/2 silty clay
6	10YR 4/1	silty clay		
7	10YR 5/2	silty clay	FeO2	Many organics
8	10YR 3/2	silty clay		
9	10YR 6/2	silty clay		
10	10YR 5/3	silty clay	FeO2	Mottled w/ 10YR 5/2 and 2.5YR 4/8 silty loam
11	10YR 6/2	silty clay		Mottled w/ 2.5YR 4/8 silty clay
12	10YR 3/3	silty clay	FeO2	Mottled w/ 10YR 5/8 silt to silty clay
13	10YR 5/2	silty clay	FeO2	Mottled w/ 10YR 6/4 silty clay and 10YR 3/2 clay
14	10YR 4/2	silty clay		Mottled w/ 10YR 7/6 (large) fine silt and 10 YR 4/1 silty clay
15	10YR 4/2	silty clay	FeO2	Mottled w/ 10YR 4/8
16	10YR 5/3	silty clay		
17	10YR 7/6	fine silt		
18	10YR 5/2	silt	FeO2	Mottled w/ 10YR 6/4 silt (large) possible basketloading
19	10YR 3/1	clay		Mottled w/ 10YR 6/3 silty clay
20	10YR 2/1	silty clay		
21	10YR 7/3	silty clay	FeO2	Mottled w/ 10YR 6/2 and 10YR 4/3
22	10YR 3/2	silty clay		Mottled w/ 2.5YR 4/8 silty clay, organics
23	10YR 4/1	silty clay	FeO2	Mottled w/ 10YR 6/1 silty loam
24	10YR 5/2	silty clay	FeO2	Mottled w/ 10YR 6/2
25	10YR 3/6	fine sand	FeO2	Possible features?
26	10YR 3/1	clay	FeO2	extensive roots
27	10YR 4/2	clayey silt	FeO2	
28	10YR 3/2	silt	FeO2	
29			FeO2	mottled 10YR 3/3 sandy silt, 10YR 5/3 silt, lenses of 10YR 6/3 snady silt
30			FeO2	mottled 10 4/3 silt, 10YR 5/3 silt, 10YR 7/3 sandy silt, 10YR 3/2 silt, occasional roots
31	10YR 2/2	clayey silt	FeO2	
32	10YR 3/2	silt		
33	10YR 5/3	silt		recent loess fill

Table 2. Face 2 soil descriptions.

The upper layer of Face 2 (Figure 17, Stratum 14) consisted of modern loess fill, likely related to repairs after the 1984 slumping. On the southern portion of Face 2 (c. 208N-212N), slumping and/or erosion created a u-shaped incision into the mound face. This gully appears as a major feature of the East Face and could be traced down the mound slope in the excavations. The gully was later filled (Figure 18) but when cannot be reliably determined. It is not possible to determine the timing of fill deposition other than to place it after the initial construction of the mound and before repairs done after the



Figure 18. Detail of slumping on Face 2.

1984 slumping. Fill may have been emplaced either through natural process or by human agency, or more likely by a combination of both.

In addition to the erosion feature, workers identified a possible stable surface (outlined in red on Figure 17) between 150 mamsl and 151 mamsl (Figure 19). The surface was identified by a color and texture change between strata. This surface may align with a surface identified on the north wall of the excavation trench. A certain

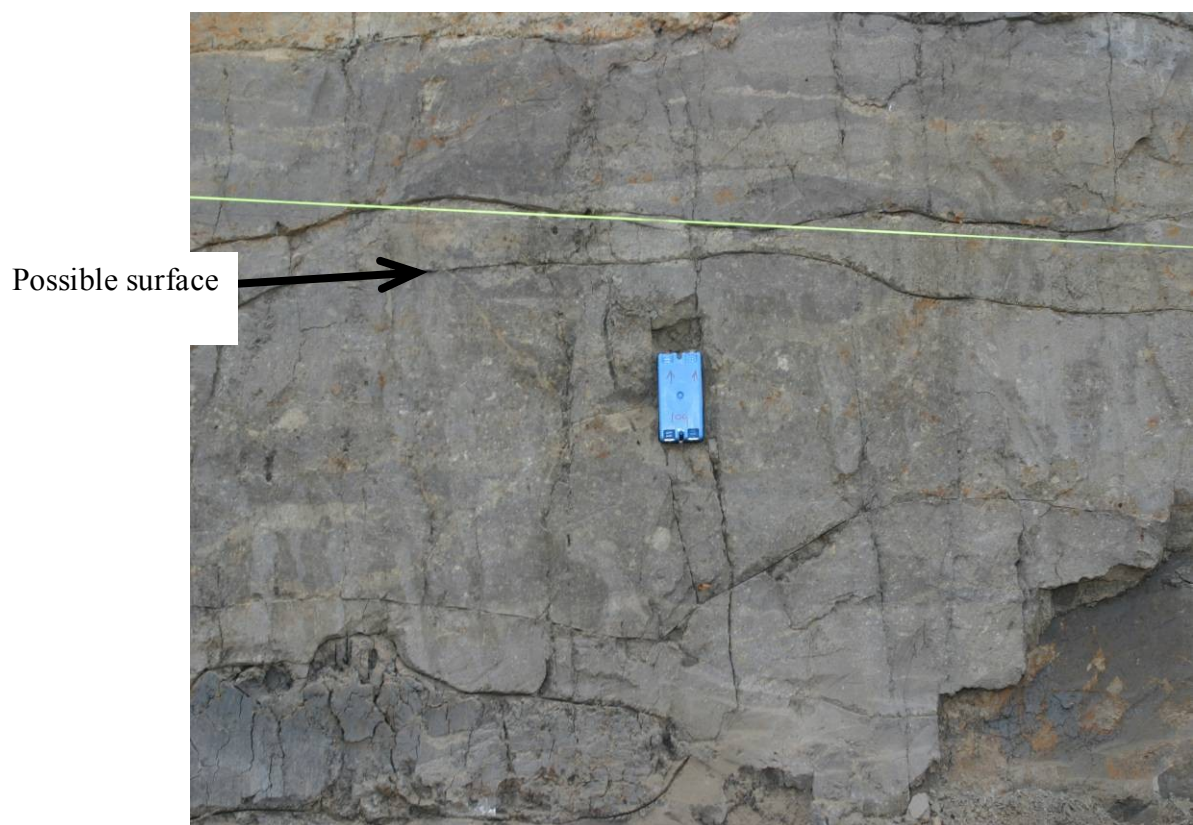


Figure 19. Detail of possible surface, Face 2.

connection with the surface in the North wall could not be reliably established due to more recent slumping. One feature was identified in Face 2 (Feature 7). Feature 7 (labeled Unit 19 in profile) may have been a post pit excavated into the surface. No

artifacts were found in association with Feature 7. Four possible truncated postmolds were also identified. These features, designated Stratum 25, were filled with a light colored sandy sediment. Below the possible surface, intact moundfill deposits were encountered. Many units inferior to the surface consisted of deposits with lenticular stratification and may suggest they originated as slopewash. One possible basketloaded stratum was identified (Stratum 18) below the surface.

Although workers identified Stratum 25 in the field as possible post molds, their position and fill suggests these may be erosional or rodent intrusions cut into a moundfill stratum during construction rather than excavated into a stable mound surface. This putative surface (Figure 17 and Figure 19) was identified by connecting the upper surfaces of three strata (Stratum 4, Stratum 10, and Stratum 24). There was no indication to suggest this surface was exposed to weathering for a significant period of time. Even though these strata are generally parallel to the ground surface, this orientation should not be taken as an indication that the unit is a mound surface as many normally parallel fill features were encountered throughout the excavation profile. It appears that some fill units were deposited horizontally without being used as surfaces for any appreciable duration.

Moreover, it may be possible to discount the superior surface of these strata as a mound surface in the conventional sense by a consideration of the overall context. Stratum 4, Stratum 10, and Stratum 24 were all described as silty clays or sediments having high clay content. If one considers contexts where mound surfaces have been clearly identified, e.g. the summit of Monks Mound, then one is immediately struck by the specific sediment types associated with mound summits. On the one hand, summits

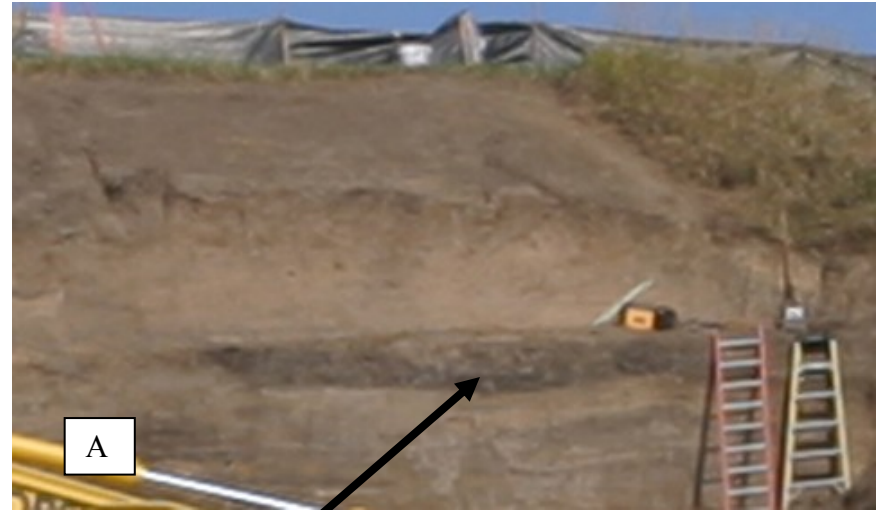
where activities took place generally consist of coarser sediments. One presumes that coarser sediments were emplaced specifically as fine-grained silts and clays would tend to bake out and crack when dry and when wet the surfaces would become very slick or muddy. Neither situation lends itself to functioning well as a place to conduct any kind of regular activity. On the other hand, mound summits were often capped by thick clay sediments after the summit buildings were no longer used (Kidder 2004a, Pauketat 1993). If these strata represent this kind of deposition then the mound surface should be beneath Stratum 4, Stratum 10, and Stratum 24. This does not seem to be the case as nothing identified as a feature was found in the immediate inferior layers. Overall, the surface-like appearance may be attributed to the use of resistant sediments that may have been deposited at the same time perhaps even intentionally done rather than being the result of the use of the superior surface of the stratum as a typical mound surface.

Located above Stratum 25, Stratum 26 (Figure 20) consisted of a stiff clay sediment that may be related to the clay cap identified by Reed and his colleagues in the early 1970s (Fischer 1972). As in the instance of Stratum 25, unambiguous connection with sediments from the fourth terrace is unclear. Stratum 26 does not demonstrate loading or stratification. The lack of obvious loading may indicate that the sediments were deposited when damp and subsequently fused to form a massive deposit. This kind of deposition argues for the proximate origins as a culturally emplaced unit and against Stratum 26 as relating to the archaeological investigations of Reed and his colleagues (Fischer 1972). If Stratum 26 was the remnant of the clay cap pushed over the mound's edge by archaeologists in the early 1970s then the stratum should be heterogeneous or

display obvious indicators of disturbance which it did not. Stratum 26 appears to be an in situ mound construction unit.

Stratum 26 is an important stratigraphic marker that appears in lower excavation faces, but the timing of deposition is not well understood. Relatively, Stratum 26 is one of the final cultural units, but the absolute timing is unknown. Stratum 26 may have been purposefully emplaced to arrest erosion on the East face during or immediately after the mound's construction; it may have been placed sometime after the initial construction but during the mounds use; or Stratum 26 may represent part of the undisturbed clay cap that was the final act of mound building on the Fourth Terrace.

Figure 20. Stratum 26. A is an overall view, B is a detail.



Face 3

Upper elevation: 151.100
Lower elevation: 147.300
North extent: 217.800
South extent: 205.700

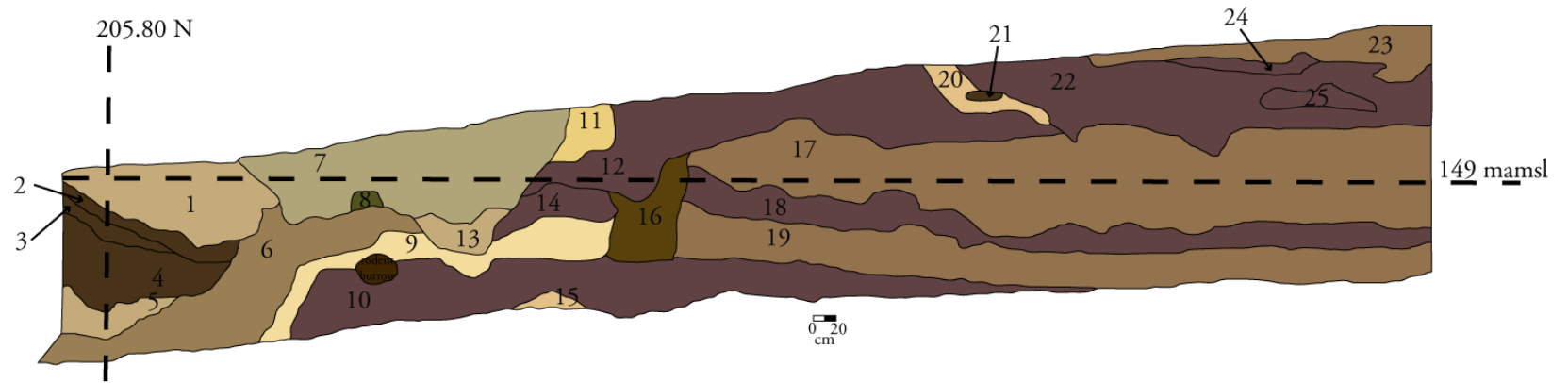


Figure 21. Face 3 stratigraphy.

Unit	Color	Texture	Redox	Comments
1	10YR 3/2	Silt	FeO2	massive structure
2	10YR 4/2	Clay	FeO2	Rootlets
3	10YR 4/2	Clay		homogenous mixture w/ 10YR 6/2 silt
4	10YR 4/2	Clay		abundant roots, blocky structure
5	10YR 6/4	Silt	FeO2	massive structure
6	10YR 5/3	Silt	FeO2	mixed w/ 10YR 3/2 clay, abundant roots
7	10YR 6/2	Clay		mottled w/ 10YR 7/6 silt
8	10YR 4/3	Silt	FeO2	mottled w/ 10YR 3/2 and 10YR 6/3 silt
9	10YR 5/3	Silt		occasional 10YR 6/4 silt, rootlets, basketloading (?)
10	10YR 3/2	Clay		mottled w/ 10YR 5/3 silt, rootlets, basketloading (?)
11	10YR 6/4	sandy silt	FeO2	mottled w/ 10YR 3/2 (occasional), rootlets
12	10YR 3/2	Silt		mottled w/ 10YR 5/3, rootlets
13	10YR 5/3	Silt	FeO2	mottled w/ 10YR 6/4 and 10YR 3/2 silt
14	10YR 3/2	Clay	FeO2	mixed w/ 10YR 5/3 silty clay
15	10YR 5/4	Silt	FeO2	
16	10YR 3/3 10YR 4/3	Silt		Feature 5
17	10YR 5/4	Silt	FeO2	basketloading (?)
18	10YR 3/2	silty clay	FeO2	
19	10YR 5/3	Silt		10YR 4/6 lensing
20	10YR 6/2	Silt		massive structure
21	10YR 3/2	Clay	FeO2	mottled w/ 10YR 5/3 clay
22	10YR 3/2	Clay	FeO2	blocky structure, abundant roots
23	10YR 5/2	Silt	FeO2	10YR 6/6 to 10YR 7/6 silt lensing
24	10YR 3/2	Clay	FeO2	blocky structure, occasional roots
25	10YR 3/2	silty clay		occasional fine sand lenses

Table 3. Face 3 soil descriptions.

Units in this face were largely similar to Face 2 (Figure 21). On the southern portion of the face, the gully was observed. Dark clayey fill (Unit 22) similar to Stratum 26 from Face 2 was encountered on northern half of the face. This unit was thicker than the unit from Face 2 perhaps indicating the clay sediments were subject to slumping after deposition such that the sediments flowed down the mounds face. Workers encountered a sandy layer overlying the clayey stratum. Both basketloading and lensing were seen in inferior strata.

One feature, Feature 5 (labeled Unit 16 in profile drawing), was found in this level. Feature 5 was similar to Feature 7 seen in Face 2, but Feature 5 did not originate at

an identifiable mound surface. If it is assumed that Feature 5 and Feature 7 are homologous and constructed by the Cahokians then they may represent features associated with the mound's internal structure rather than with surface activities. Alternatively, the ultimate origin of these features is difficult to discern and they may be related to more modern activity. For example, Moorehead (1929) cored the eastern slope of the mound. In doing so, he first excavated pits approximately 1 meter deep and then augered through the bottom of the pits. Although the precise location of Moorehead's pits is unknown, Feature 5 and Feature 7 generally match the description provided by Moorehead and no artifacts were found when excavating or cleaning the features. Furthermore, it is unexpected that the Cahokian's placed post or pits on the side of Monks Mound. Based on this information it is plausible that Feature 5 and Feature 7 are the remains of past excavations, such as Moorehead's, rather than ancient activity.

Face 4

Upper elevation: 147.900
Lower elevation: 146.000
North extent: 222.500
South extent: 205.800

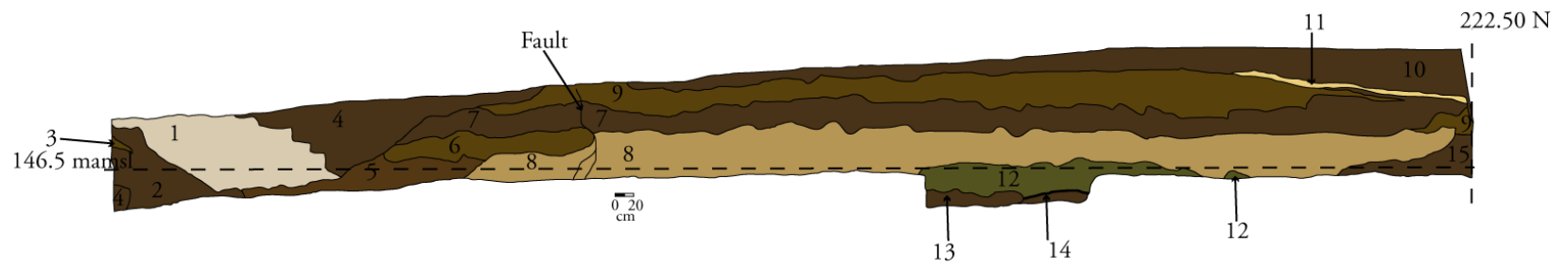


Figure 22. Face 4 stratigraphy.

Unit	Color	Texture	Redox	Comments
1	10YR 5/3	silt	FeO2	mixed w/ 10YR 4/2 and 10YR 5/8 silt
2	10YR 3/2	silty clay		
3	10YR 4/3	silt	FeO2	basketloaded(?)
4	10YR 3/2	silty clay	FeO2	mottled w/ 10YR 3/1 and 2.5Y 6/4 lensing
5	10YR 3/1	clay	FeO2	blocky angular structure, organics
6			FeO2	basketloaded 10YR 3/2 clay
7			FeO2	basketloaded 10YR 4/1 clay, 10 YR 5/3 silt, and 2.5y 6/4 silt
8		silt and silty clay	FeO2	basketloaded 10YR 5/2, 10YR 3/2, 2.5Y 4/2 and 10YR 3/1
9	10YR 4/1	clay	FeO2	blocky angular structure, possible basketloading
10	10YR 4/2	silty clay		mottled w/ 10YR 5/3 and 2.5Y 6/4 sandy silt, basketloading or broadcast fill?
11	2.5Y 6/4	silt	FeO2	Organics
12	10YR 3/1	clay		abundant organics, thin lenses of 2.5Y 6/4 silt, mottled w/ 10YR 5/3 silt, basketloaded
13	10YR 4/2	silty clay	FeO2	Organics
14	10YR 4/2	clay		basketloaded, possible broadcast fill, thin lenses of 10YR 6/3 silt
15	10YR 4/2	clay		thin lenses of 10YR 6/3, organics

Table 4. Face 4 soil descriptions.

Face 4 repeats the pattern seen in Face 2 and Face 3 (Figure 22). For the southern half, the gully was prominent. The northern portion displays the clayey sediments overlain by mottled deposit. Field workers suggest these overlying sediments were basketloaded, but photographs are unclear and perhaps indicate these sediments are slopewash. Although the general pattern is similar to overlying units, Face 4 demonstrates two important features. First, Face 4 gives a clear example of how differential permeability can influence the formation of iron oxide within the mound. Figure 22 demonstrates a situation where iron redox features formed at the boundary between different textured sediments. In this case, the underlying sediments were impervious to moisture, allowing water to pool and precipitate suspended iron. As can



Figure 23. Detail of clayey sediments observed in Face 4.

clearly be seen, redox deposits indicate transitions that may or may not be related to use activities. Second, a vertical fault was observed just south of the center of Face 4. The fault to have been ancient and has stabilized. In this instance, the fault did not appear related to the recent slumping of the mound. This fault points to a complex history of movements on the East Face indicating that this particular face may have a long history of instability.

Face 5

Upper elevation: 146.700

Lower elevation: 144.900

North extent: 220.200

South extent: 205.200

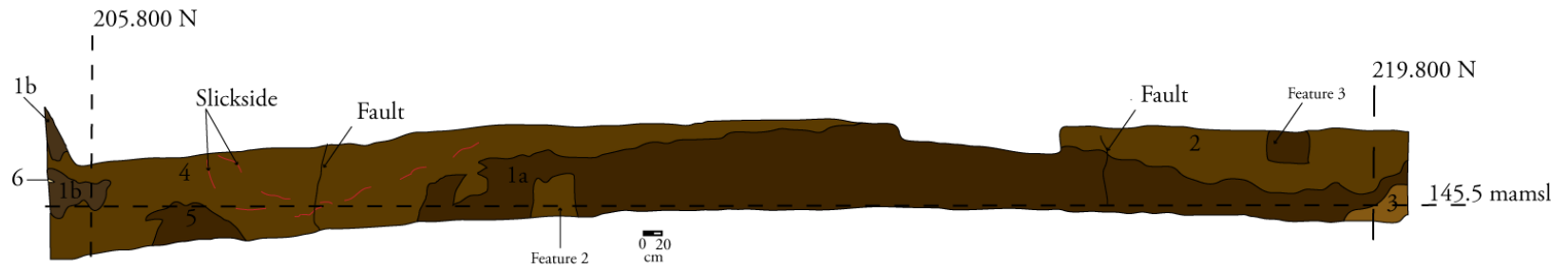


Figure 24. Face 5 stratigraphy.

Unit	Color	Texture	Redox	Comments
1a	10YR 3/2	silty clay		mottled w/ 10YR 2/2 clay, occasional 10YR 4/3 sandy silt lenses
1b				similar to 1a
2	10YR 3/2	silty clay		mottled w/ 10YR2/1 and 10YR 4/3 silty clay (large)
3	10YR 3/3	sandy loam	FeO ₂	10YR 5/4 and 10YR 3/2 lensing
4				basketloaded 10YR 3/1 sandy silt, 10YR 3/3 sandy loam, and 2.5Y 4/3 silt
5	10YR 2/1	clay		mottled w/ 10YR 2/2 clay, 2.5Y 4/3 silt lenses
6	3.5Y 6/3	sand		

Table 5. Face 5 soil descriptions.

In Face 5, the gully continued on the southern portion of the Face (Figure 24). Sediments on the northern portion were likely basketloaded but clear basketloads were not seen. The dark clayey sediments seen in Face 2, Face 3, and Face 4 were not encountered. Two slickenside surfaces were observed running to the East out of the u-shaped incision (Figure 25 and Figure 26). These are clear indicators that the failures on



Figure 25. Detail of U Shaped incision on Face 5.



Figure 26. Photograph of Face 5

the East slope resulted from movement along numerous slip surfaces. Mound conservation efforts should take into account the possibility of multiple failure points in any single slope failure.

Face 6

Upper elevation: 145.200
Lower elevation: 143.700
North extent: 219.700
South extent: 205.900

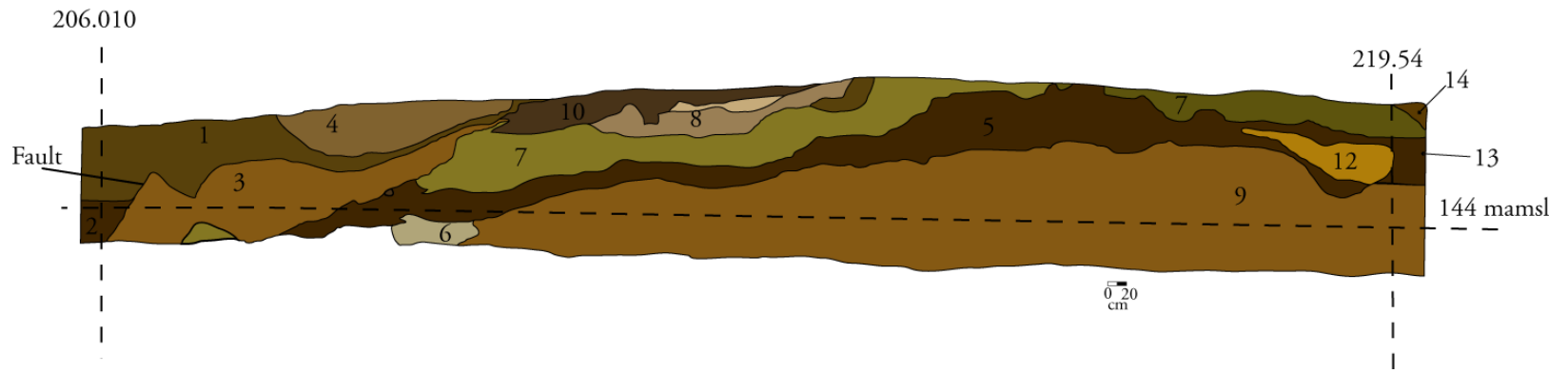


Figure 27. Face 6 stratigraphy.

Unit	Color	Texture	Redox	Comments
1	10YR 4/2	silt	FeO2	basketloaded w/ 10YR 6/4 and 10YR 5/6 silt
2	10R 3/2	silty clay		mixed w/ 10YR 6/4 and 10YR 3/2 silt
3	10YR 3/1	clay	FeO2	blocky angular structure, organics
4	10YR 3/2	silty clay		mottled w/ 10YR 6/3 silt, slump (?)
5	10YR 3/2	clay		organics, possible basketloading
6	2.5Y 6/3	silt	FeO2	mottled w/ 7.5Y 6/4 and 10YR 4/3 silt
7	10YR 4/3	silt	FeO2	basketloaded w/ 10YR 5/3, 2.5Y 5/4, and 10YR 6/3 silt
8	10YR 4/4	silt	FeO2	basketloaded or broadcast fill
9	10YR 3/2	silt		loaded w/ 10YR 6/2 silt, sod block construction feature
10	10YR 4/3	silty clay	FeO2	broadcast fill
11	10YR 4/2	silt	FeO2	basketloaded w/ 10YR 6/4 and 10YR 7/4 silt
12	10YR 3/1	clay	FeO2	basketloaded w/ 2.5Y 6/4, 10YR 5/1 and 10YR 4/6 silt, organics
13	2.5Y 5/3	sandy silt		probably basketloaded
14	10YR 3/2	silty clay		basketloaded (?), blocky angular structure

Table 6. Face 6 soil descriptions.

Face 6 generally repeated the pattern seen in Face 5; however, there are important differences that should be discussed in detail (Figure 27). First, a series of modern automotive tires joined together by metal wire were excavated from the base of the gully. This likely represents an undocumented attempt to either arrest erosion in the channel or to stabilize and fill the channel as preparatory to restoration work. Several metric sized tires were seen in the fill (Figure 28). The presence of automotive tires at the base of the incision clearly demonstrates the channel post-dates 1977 when metric size designations were introduced by American tire manufacturers.



Figure 28. Automotive tires excavated from Face 6.

Second, the automotive tires were found immediately superior to Unit 3, a dark, massive clayey deposit. This clayey stratum overlay a wood and limestone feature designated Feature 1. Feature 1 consisted of at least two cypress posts (ca. 30-40 cm. diameter) and numerous limestone slabs (about 8 cm. thick). The posts were lying horizontal to the ground surface but it is likely that they were initially upright and collapsed in the distant past. At least some of the limestone may have overlain the posts. The limestone was disturbed in by the excavator but it is likely that the feature consisted of numerous large slabs perhaps weighing nearly 50 kg each. The collapse of Feature 1 is likely causative or contributive to the erosion and slumping on the East Face. Feature 1 probably represent a single short-live surface within the mound. This surface was likely buried very quickly since no erosion or soil formation was observed in association with Feature 1. Individual basketloads of sediment could be traced around the feature indicating that the feature was buried within the mound so quickly that turbation did not occur. The gully feature did not affect Feature 1. Log and limestone construction was unexpected as the location is extremely distal relative to the center of the mound. One

small bone, identified as a bird bone by Lucretia Kelly (2007, personal communication) was found in association with Feature 1. The bone found within the matrix disturbed by the excavator.

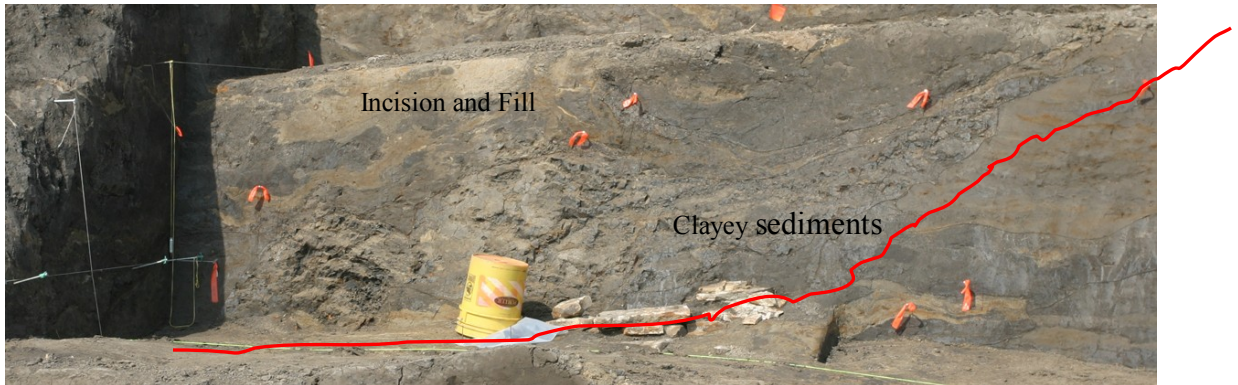


Figure 29. Overview of Feature 1.

Third, although a variety of loading types were seen in Face 6, one usual construction technique stands out. Stratum 9 consisted of an almost 2.5 meter high wall of sod-block construction (Figure 30). Sod-block construction (Van Nest et al. 2001) is a technique where the top few centimeters of a source deposit is stripped and stacked upside-down like bricks within a mound. Sod block construction is readily apparent by an inverted sequence where sod blocks show a root mat or humus layer beneath a lighter colored sediment. Although sod-block construction does not appear anywhere else in the visible profiles, the stratigraphic positioning of Stratum 9 indicates that sod-blocks were used as a regular part of mound construction since the entire stratum is in a normal horizontal position.



Figure 30. Detail of sod-block construction.

Face 7

Upper elevation: 144.000
Lower elevation: 142.500
North extent: 219.490
South extent: 206.150

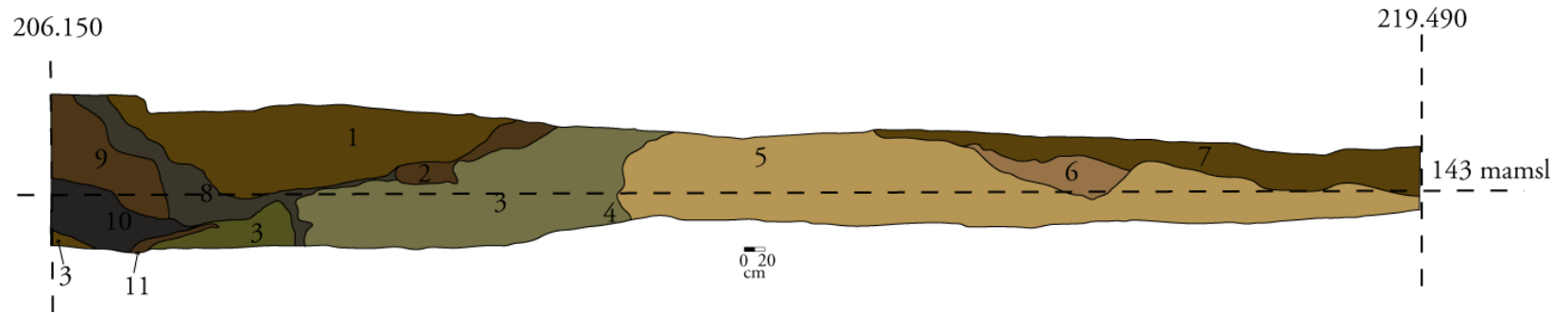


Figure 31. Face 7 stratigraphy.

Unit	Color	Texture	Redox	Comments
1	7.5Y 2/0	silty clay loam	FeO ₂	
2	7.5Y 3/4	silt loam		
3	10YR 3/2	silty clay loam		
4		silty clay loam		basketloaded w/ 10YR 5/3, 10YR 2/1, 7.5Y3/4
5				basketloaded w/ 10YR 3/2 silty clay, 7.5Y 3/4 silt loam, 10 YR 5/3 silt
6			FeO ₂ , Mn	basketloaded w/ 10YR 5/3 silty clay, 7.5 YR 3/4 silt
7				basketloaded w/ 7.5YR 3/2 silt, 10YR 3/2, 10YR 5/3
8	10YR 2/1	clay	FeO ₂	
9	10YR 2/1	sandy loam	FeO ₂	
10	10YR 2/2	loam	FeO ₂	occasional 10YR 4/3 silty sand and 10YR 3/3 silty clay mottling
11	10YR 3/1	silty clay	FeO ₂	

Table 7. Face 7 soil descriptions.

Face 7 was consistent with the gully and construction fill pattern seen in superior sediments (Figure 31). Fill sediments in the southern half of the face displayed both clear basketloading and mottling suggesting that some of the fill consists of sediments washed down during construction of the mound. Within the fill sediments, workers observed soft sediment deformation indicating that subsequent construction warped earlier deposits as the mound was built. While the mound was under construction, surfaces and slopes were probably very unstable places (

Figure 32).



Figure 32. Face 7 detail (facing west), note soft sediment deformation in the northern deposits (circled).

Face 8

Upper elevation: 142.800
Lower elevation: 141.700
North extent: 220.000
South extent: 206.240

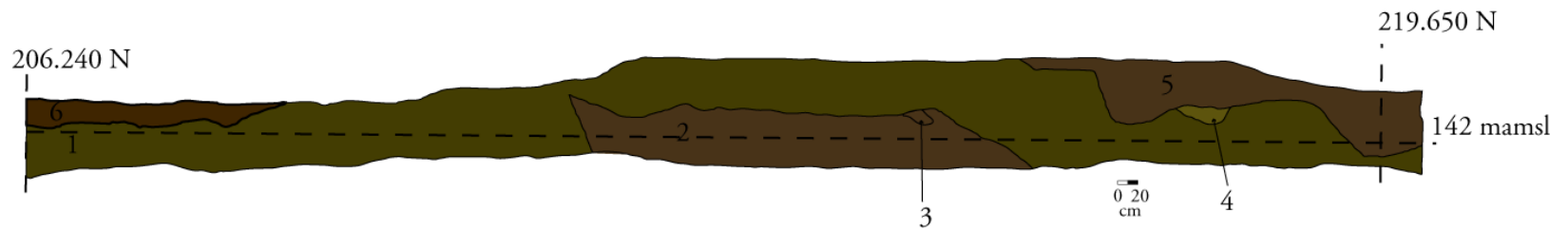


Figure 33. Face 8 stratigraphy.

Unit	Color	Texture	Redox	Comments
1	10YR 3/2	silty clay		lenses of 10YR 5/3 silt and fine sand
2			FeO2	basketloaded 10YR 3/2 clayey silt and 10YR 5/3 silt
3	10YR 2/2	clay		
4				basketloaded 10YR 2/1 clay and 10YR 6/3 silt
5			FeO2	basketloaded 10YR 2/1 clay and 10YR 5/4 silt
6	10YR 2/1	clay	FeO2	mixed w. 10YR 5/4 silt, no loading observed

Table 8. Face 8 soil descriptions.

Face 8 displayed the well described gully /fill pattern (Figure 33). The gully is less prominent and does not cut as deeply into the mound deposits as previous iterations of the channel did. Fill deposits exhibited both basketloading and mottling.

Face 9

Upper elevation: 141.800
Lower elevation: 140.400
North extent: 219.900
South extent: 207.000

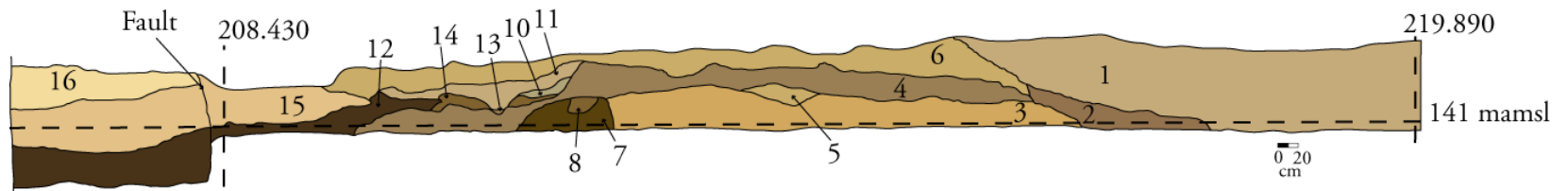


Figure 34. Face 9 stratigraphy.

Unit	Color	Texture	Redox	Comments
1			FeO2	basketloaded 10YR 6/3 silty clay, 10YR 2/1 clay, 10YR 5/3 clayey silt
2			FeO2	mix of 10YR 2/2 clay, 10YR 5/3 silt, 10YR 6/3 fine sand and silt
3			FeO2	basketloaded 10YR 5/3 silt, 10YR 4/3 clayey silt, 10YR 3/3 clayey silt – occasionally mottled w/ 10YR 2/1 clayey silt, 10YR 6/4 fine sand
4			FeO2	mixed deposit w/ 10YR 4/3 clayey silt, 10YR 3/3 clayey silt, 10YR 5/3 fine sand; wash deposit
5				heterogeneous mix w/ 10YR 6/3, 10YR 5/3, and 10YR 4/3 silty clay; wash deposit
6				homogeneous mix w/ 10YR 3/3 and 10YR 2/1 silty clay; wash deposit
7				mix w/ 10YR 3/3 and 10YR 3/2 clayey silt; wash deposit
8	10YR 3/3	clay		mottled w/ 10YR 5/4 sand; massive wash deposit
9				fine laminations of 10YR 6/3 silt and 10YR 4/2 silt; wash deposit
10	10YR 6/3	sand		mottled w/ 10YR 4/4 silty clay; wash deposit
11	10YR 6/4	fine sand	FeO2	
12	10YR 3/2	silty clay		mottled w/ 10YR 2/1 clay and 10YR 6/3 silt
13				mixture of 10YR 5/3 and 10YR 3/2 silty clay; wash deposit
14				mixture of 10YR 3/2 and 10YR 6/3 silt
15				laminated deposit of 10YR 3/2, 10YR 5/3 and 10YR 6/3 silt, sand, and clay; wash deposit

Table 9. Face 9 soil descriptions.

Face 9 consisted entirely of fill deposits, both basketloaded and mottled wash deposits (Figure 34). Fill deposits were laminar (very thin beds) running north to south. Although bedding generally extended horizontally, Face 9 displayed a dome-shaped structure where the centers of beds were elevated in relation to the northern and southern extents. Either the beds were originally horizontal and subsequently deflected, or sediments were deposited as small stacks. A distinct color and texture difference was noted where deposits to the south of the edge of the dome feature were darker and clayier than deposits to the south (**Error! Reference source not found.**). This same general pattern carried through to the base of the excavations, although the

bottom of the dome shaped structure did become wider in a north/south direction. During scraping of the Face 12 and Face 13 water would occasionally seep from the mound, indicating the mound may function as an unintended aquifer. In this instance, compressed clays found in the lower level of the mound prevent water from draining through the bottom of the mound. Other clayey fills also trap meteoric water which when removed allowed water to flow out of the sides of the mound. Throughout Face 9 through Face 13 (Figure 34, Figure 36, Figure 37, Figure 38, and Figure 39), several faults were noted, but these deposits appeared stable and the faulting was likely ancient.



Figure 35. Face 9 through Face 13. Note dome-shaped feature visible in the center of the excavation unit.

Face 10

Upper elevation: 141.000
Lower elevation: 140.200
North extent: 220.200
South extent: 208.600

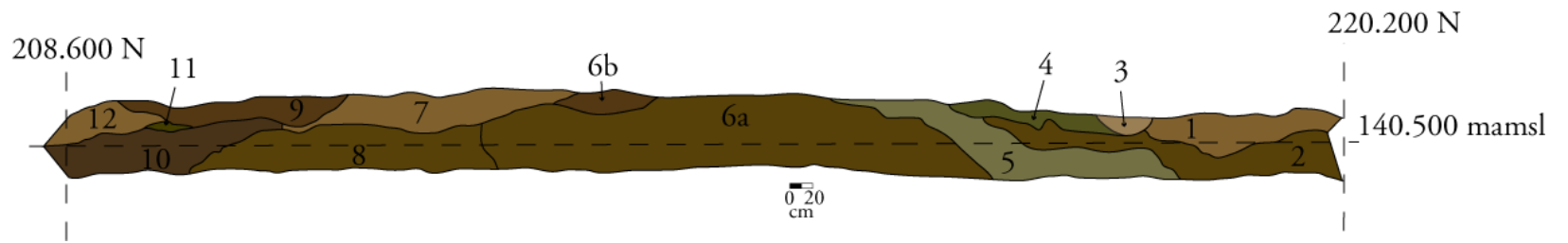


Figure 36. Face 10 stratigraphy.

Unit	Color	Texture	Redox	Comments
1				laminated beds of 10YR 3/2 silty clay, 10YR 3/3 silty clay, 10YR 3/1 clayey silt, and 10YR 6/2 sandy silt; wash lenses
2			FeO2	deformed laminations of 10YR 3/2, 10YR 5/3, 10YR 3/2 and 10YR 4/6 clayey silt; wash lenses
3			FeO2	lenses of 10YR 3/2 silty clay mottled w/ 10YR 5/4
4			FeO2	10YR 3/2 silty clay, 10YR 4/2 silty clay, and 10YR 6/3 silty sand; wash lenses
5			FeO2	massive deposit 10YR 4/2 silty clay, deformed internal structure described as marbled, occasionally laminated with 10YR 4/3 silty clay and 10YR 4/2 silty clay
6a			FeO2	laminated beds of 10YR 4/3 silty clay and 10YR 3/2 clayey silt; mottled w/ 10YR 5/3 silt; wash lenses
6b			FeO2	mixed deposit of 10YR 3/1 silty clay and 10YR 3/2 silty clay interbedded with 10YR 4/3 lamina; wash lenses
7	10YR 4/2	silty clay		mottled w/ 10YR 4/3 and 10YR 5/3 silty clay; wash lenses
8				deformed deposit (marbled appearance) 10YR 4/2, 10YR 5/3, and 10YR 3/2 silty clay; wash lenses
9	10YR 3/2		FeO2	mottled w/ 10YR 5/2
10	10YR 3/1	silty clay	FeO2	mottled w/ 10 YR 5/3 silty clay
11	10YR 4/2	silty clay		mottled w/ 10YR 5/3 silty clay
12	10YR 4/3	sandy silt	FeO2	mottled w/ 10YR 5/3

Table 10. Face 10 soil descriptions.

Face 11

Upper elevation: 139.200
Lower elevation: 138.300
North extent: 219.840
South extent: 208.810

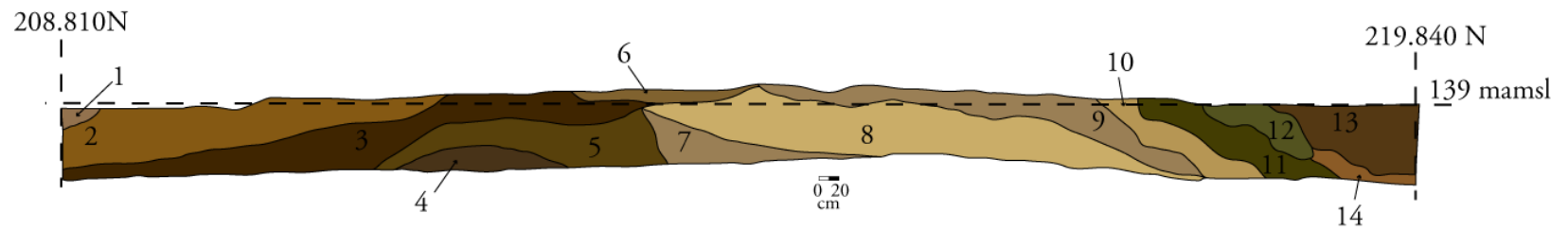


Figure 37. Face 11 stratigraphy.

Unit	Color	Texture	Redox	Comments
1	10YR 5/3	clayey silt		mottled w/ 10YR 6/4
2			FeO2	mottled 10YR 4/3 and 10YR 6/1 silty clay
3				basketloaded 10YR 3/1 and 10YR 5/3 silty clay, occasional sand loads
4			FeO2	mottled 10YR 3/2 and 10YR 6/4 clay
5			FeO2	mottled 10YR 3/2 and 10YR 6/3 silty clay
6			FeO2	10YR 3/1 silty clay w/ 10YR 5/3 laminations; wash deposit
7			FeO2	basketloaded 10YR 3/3 and 10YR 3/2 silty clay
8			FeO2	probable basketloading 10YR 5/3 silty clay, 10YR 3/2 clay, and 10YR 4/4
9				basketloaded 10YR 3/1 and 10YR 5/3 silty clay
10			FeO2	basketloaded 10YR 5/4 and 10YR 5/3 silty clay, 10YR 5/6 sand, 10YR 5/1 clay
11			FeO2	probably basketloading 10YR 2/1 clay, 10YR 4/2 and 10YR 4/3 silty clay
12				10YR 4/2 fine sand mottled w/ 10YR 2/1 clay – wash deposit?
13				basketloaded 10YR 3/2 silty clay, 10YR 2/2 clay, 10YR 4/1 clay
14				mottled 10YR 3/2 and 10YR 5/2 silty clay – wash deposit?

Table 11. Face 11 soil descriptions.

Face 12

Upper elevation: 138.700
Lower elevation: 137.800
North extent: 218.450
South extent: 207.700

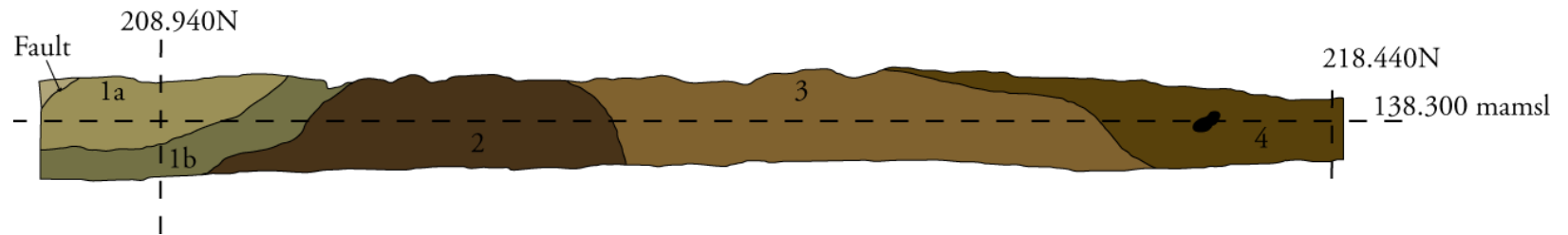


Figure 38. Face 12 stratigraphy.

Unit	Color	Texture	Redox	Comments
1a				basketloaded 2.5Y 5/2 sandy silt; 10YR 3/2, 10YR 3/3, 10YR 3/1, 10YR 4/2 silty clay; occasionally mottled w. 7.5YR 5/8
1b				similar to 1a but more mixing between basketloads
2				laminated beds of 10YR 4/3, 10YR 2/1, 10YR 3/1, and 10YR 5/3 silts and silty clays; wash lensing (?), mottled w/ 7.5TR 4/6
3				basketloading (?) 10YR 3/2, 10YR 3/3, 10YR 5/4, 10YR 4/4 silty clay mottled w/ 7.5YR 4/4
4				basketloading or broadcast fill 10YR 4/1, 10YR 4/2, 10YR 2/1 mottled w/ lighter color soils, possibly disturbed

Table 12. Face 12 soil descriptions.

Face 13

Upper elevation: 137.400
Lower elevation: 138.000
North extent: 219.700
South extent: 206.450

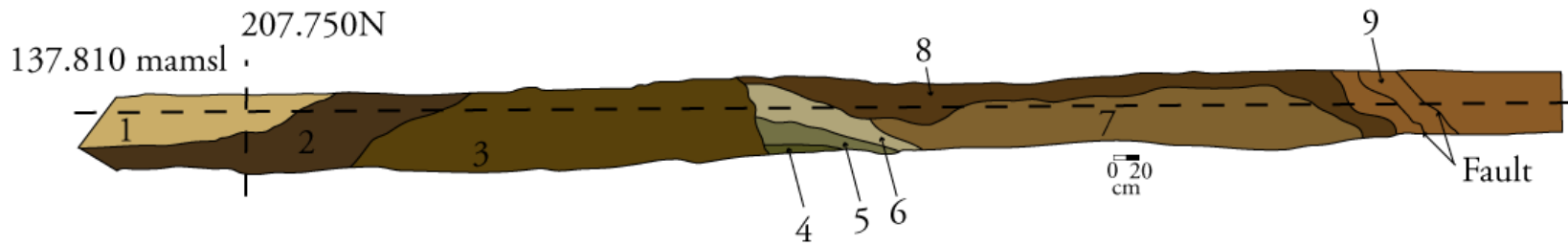


Figure 39. Face 13 stratigraphy.

Unit	Color	Texture	Redox	Comments
1			FeO2	basketloaded 10YR 3/2, 10YR 4/2, 10YR 2/1 silty clay, mottled with 10YR 2/1 and 10YR 5/3 silt
2	10YR 2/1	clay	FeO2	massive clay deposit, occasional 10YR 5/3 mottling, water seep
3				arc shaped basketloading 10YR 2/1 clay, 10YR 4/3, 10YR 4/2, water seep
4			FeO2	mottled 10YR 3/1 and 10YR 4/4
5				basketloaded 10YR 3/2, 10YR 3/3, 10YR 4/3
6				basketloaded 10YR 3/2 silty clay, 10YR 4/4 sand, 10YR 3/1 silty clay, 10YR 4/3 sand
7				deformed basketloading (wavy) 10YR 3/4 and 10YR 4/6
8				10YR 2/2, water seep
9				vertical layering (tilted basketloading?) 10YR 3/2 and 10YR 4/2 silty clay

Table 13. Face 13 soil descriptions.

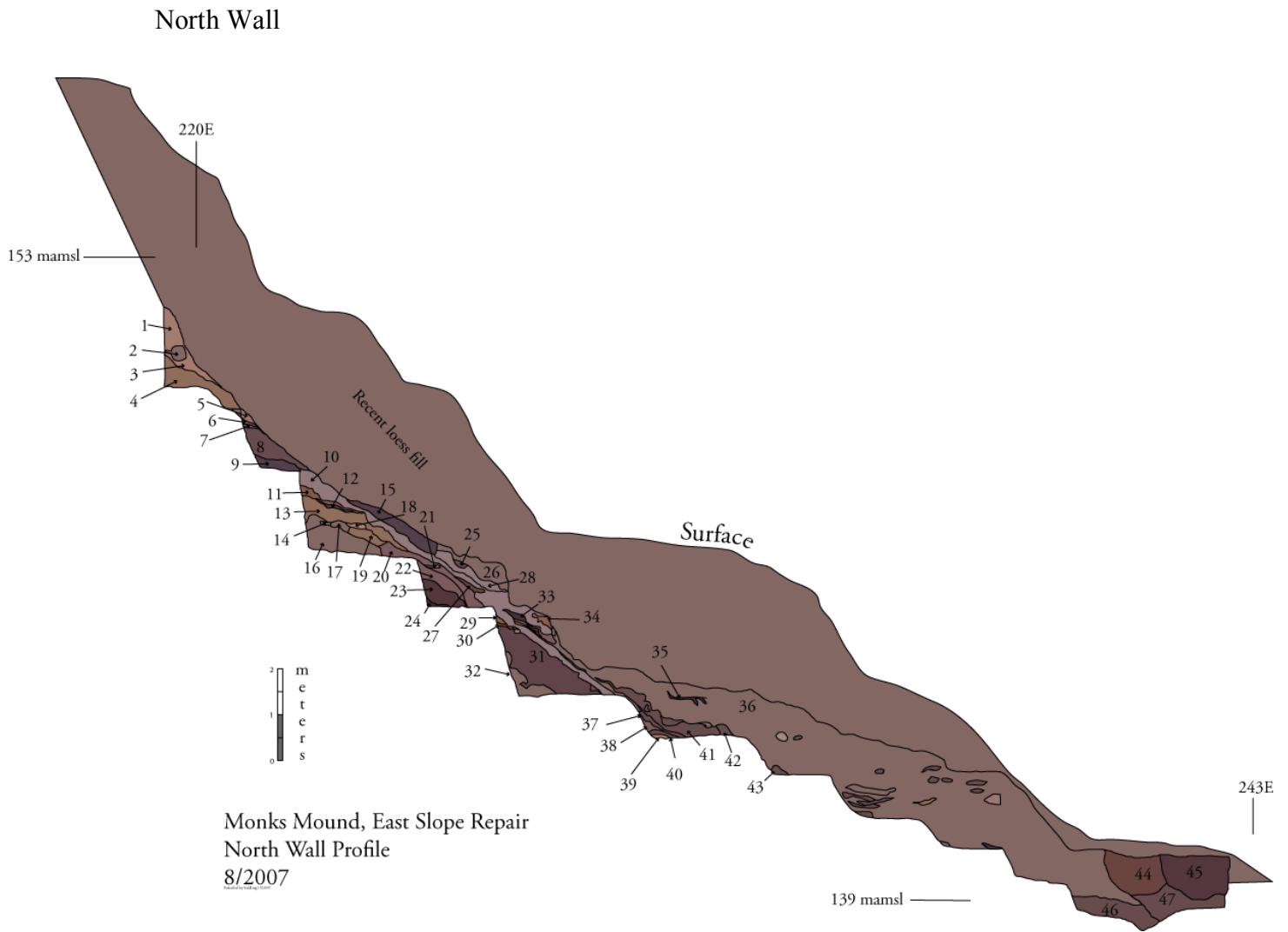


Figure 40. North wall profile.

Unit	Color	Texture	Redox	Comments
1	10YR 4/3	silt	FeO2	Roots
2	10YR 3/1	clay		blocky angular structure, roots
3	10YR 5/3	silt	FeO2	occasional roots
4				basketloaded 10YR 4/3 silt and 10YR 3/2 silt
5	10YR 5/2	silty clay	FeO2	mottled w/ 10YR 6/2 silt and 10YR 4/1 silt
6	10YR 4/2	silt	FeO2	mottled w/ 10YR 5/2 and 10YR 5/2 silt
7	10YR 4/2	silt		mottled w/ 10YR 6/6 silt
8	10YR 3/2	sandy silt	FeO2	mottled w/ 10YR 3/1 sandy silt and 10YR 6/1 silt
9			FeO2	basketloaded 2.5Y 2.5/1 clay, 10YR 4/1 silt, 2.5YR 5/3 silt
10	2.5Y 2.5/1	silt	FeO2	very compact, occasional lenses of 2.5Y 5/6 silt
11				mottled 2.5R 4/3 silt, 2.5Y 2.5/1 silt, 10YR 3/2 silt
12			FeO2	basketloaded 2.5Y 2.5/1 silty clay, 10YR 4/1 silt, 2.5Y 5/3 fine silt
13			FeO2	mottled 2.5Y 5/3 silt and 2.5Y 4/2 silt
14	2.5Y 5/3	silt		mottled w/ 2.5 Y 3/1 and 2.5Y 8/6 silt
15	2.5Y 2.5/1	silt	FeO2	Roots
16	2.5Y 3/1	silt	FeO2	mottled w/ 2.5Y 5/4 silt and 2.5Y 5/8 silt
17				basketloading 2.5Y 3/1 silt, 2.5Y 5/4 silty clay, 5Y 5/8 silty clay, 10YR 3/2 silty clay
18			FeO2	mottled 2.5Y 6/3 silt and 2.5Y 4/2 silt, charcoal flecking
19			FeO2	mottled 2.5Y 5/3, 2.5Y 4/2, 2.5Y 3/2, 2.5Y 5/2 silt
20				layered 2.5Y 3/2 through 2.5Y 4/6 silt; wash lenses (?)
21	5Y 3/1	silt	FeO2	massive deposit
22			FeO2	layered lenses (wash deposits) 10YR 4/2 fine silt, 10YR 3/1 clayey silt, 10YR 3/6 silt, 10YR 5/8 silt
23	10YR 2/2	clay		massive deposit
24				layered 10YR 2/1 clayey silt and 7.5Y 2/4 silt; wash deposits
25				mottled 10YR 3/2 silty clay and 10YR 2/1 clay
26			FeO2	mottled 10YR 5/3, 10YR 4/5, 10YR 3/1, 10YR 6/4 silty clay
27			FeO2	mottled 10YR 3/3 and 10YR 4/3 silt
28				mottled 5Y 3/1 silt and 10YR 4/4 silt
29				mottled 7.5Y 3/4 and 10YR 3/3 silt
30				mottled 7.5Y 3/4 and 10YR 3/3 silt
31				massive deposit of 5Y 2.5/1 mottled w. 10YR 4/4 silt, many small pockets of entrained silts and clay – slump?
32	5Y 3/1	clay	FeO2	
33	10YR 2/1	silty clay	FeO2	massive deposit
34				mottled 7.5YR 3.5/3 silt, 2.5Y 4/2 silt, 10YR 4/3 silt

Unit	Color	Texture	Redox	Comments
35	10YR 2/2	clayey silt	FeO2	
36				mottled 7.5Y 2/0 clayey silt, 5Y 2.5/1 clayey silt, occasional streaks of 10YR 3/4 silt
37	10YR 3/2	silty clay		mottled w/ 10YR 2/1 silty clay
38	10YR 3/2	silty		mottled w/ 10YR 2/1 silty clay
39	10YR 3/2	clayey silt	FeO2	mottled w/ 5Y 5/8 silt
40				mottled 10YR 3/2 silty clay and 10YR 2/1 silty clay
41	10YR 3/2	clayey silt	FeO2	mottled/ 2.5Y 2.5/4 silty clay, 10YR 5/4 silty clay (streaks), 10YR 3/1 silty clay
42	7.5Y 3/2	silty clay	FeO2	mottled w/ 10YR 4/3 silty clay and 5Y 5/8 silty clay
43	7.5Y 3/2	silt		mottled w/ 10YR 3/2 sandy clay
44	10YR 3/2	silt		mottled w. 10YR 4/3 – recent slump
45				mottled 10YR 3/1 and 10YR 3/2 – recent slump
46	10YR 3/2	fine silt	FeO2	mottled w/ 10YR 2/1 silty clay
47	10YR 3/2		FeO2	recent slump

Table 14. North Wall soil descriptions.

The North Wall profile demonstrates several important features that are clues to the specific history of the East Face and to Monks Mound in general. First, workers identified a silty to fine sand stratum (Unit 10) running down the face of the North Profile. Unit 10 likely represents the exterior of the mound in the immediate post-construction period. In previous presentations, (see Kidder, Kelly, and Schilling 2007 for example) we have suggested this face represents the penultimate mound stage with a final mound stage obliterated through turbation, erosion, and slumping. In the discussion below, I present a detailed consideration of Unit 10 that differs from this previous view.

Logic dictates the simplest explanation for Unit 10 is that these sediments were buried under a later blanket mantle²⁷. This explanation suggests the presence of at least two mound stages, Unit 10, the penultimate stage, and a missing stage, the ultimate stage. Presumably these mound stages are equivalent in function and the surface of the ultimate stage represents the exterior of the mound when the mound was utilized by the Cahokians. Alternatively, and the interpretation I prefer, Unit 10 could represent the

ultimate face of the mound as constructed. This surface consists of coarse-grained materials that were, perhaps, tamped in place. The surface sediments were then exposed to weathering that leached the fine-grained particles from the matrix and removed much of the organic matter yielding the light coloring. My recent observations from recent excavations at the Cahokia site suggests trampling and leaching local soils yields light-colored sediments. One only needs to observe the impact of modern archaeology at the site to get a sense of what the ancient ground surface would have looked like when a construction at the scale of Monks Mound occurred. Images in Dalan et al. (2003) bring forth similar conclusions. With the number of people carrying earth at ancient Cahokia, the upper surface of most ground surfaces would have been trampled and leached, not unlike what I believe the ultimate surface of Monks Mound would have looked like immediately after construction.

In this reconstruction, I argue that sediments eroding from the upper levels of the slope buried the lower levels and preserved it the mound face. The buried mound face is represented by Unit 10. This interpretation may be supported by Bareis' (1975a) work on the south face where he encountered a stratum similar to Unit 10, although the wash deposits on the south face were somewhat thicker (Figure 41).

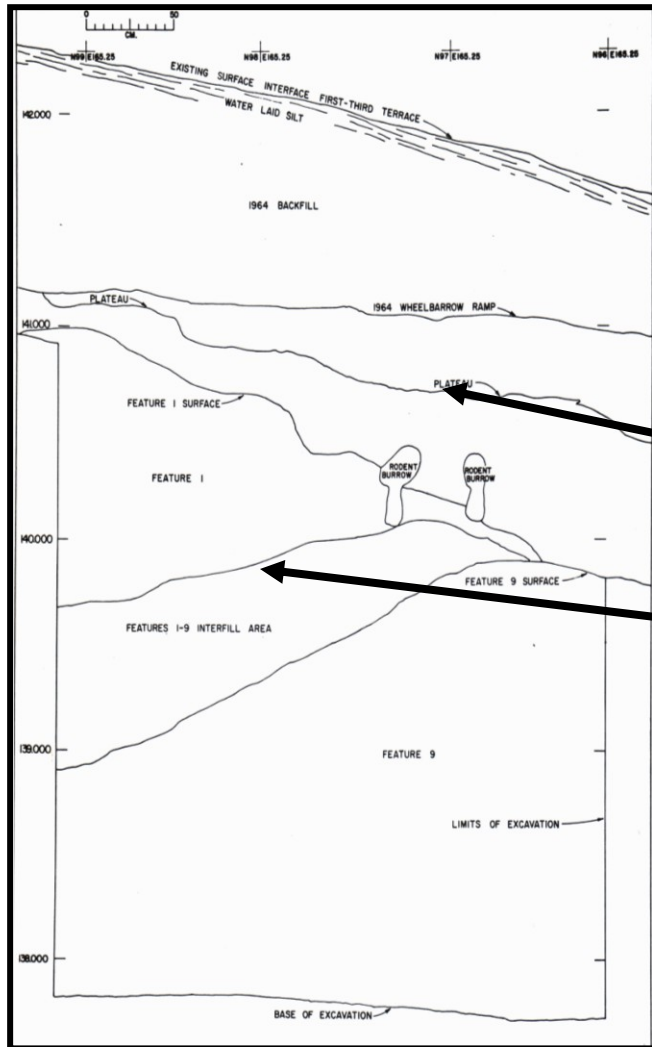


Figure 41. Profile of Bareis 1971 south slope excavation.

Bareis (1975a) suggested these sediments were purposefully emplaced and designed to act as drains, but based on color and texture descriptions, the light colored sediment seen by Bareis is probably sediment washed down when the mound was newly constructed. Bareis' stratum thickened as the angle of repose lessened. In the higher angle locales, the stratum was approximately ten to fifteen centimeters thick, similar to Unit 10 in the East Face. Although there is no secure evidence one way or the other, it is possible to conjecture that a thin humus layer developed on top of Unit 10 as vegetation grew on the mound face and the slopes became relatively stable.

Sometime later, likely during the early historic period, human activity induced erosion of the upper slopes and subsequently caused sediments to be deposited over the lower slope obscuring or obliterating any normal soil sequence that may have developed on the initial mound face. Erosion may have been especially intense during the Trappists' and Hill's ownership when both farmed mound surfaces in the first half of the nineteenth century (Fowler 1997). Later during the end of the nineteenth and early twentieth centuries, the mound was cleared at least three times promoting further erosion (Chappell 2002). Finally, the impact of archaeological investigation in the 1960s and 1970s must be also mentioned as a vector for sediment transport.

The affect of the numerous clearing and sediment movement can be seen in a comparison of the ancient slope identified through excavation and the modern slope measured along the Northeast corner (Figure 42). Sediment translocation can account for the preservation of Unit 10 and the blanket like appearance to subsequent deposition. This model of the stratigraphic sequence is bolstered by a consideration of Unit 10 and the overlying soil sequence.

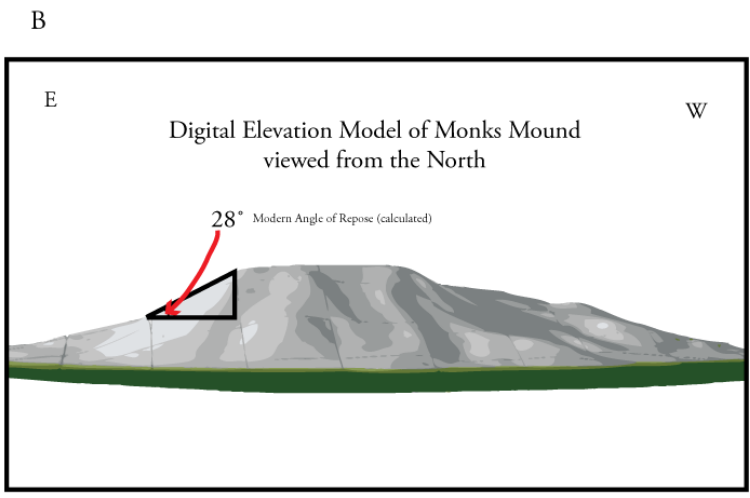
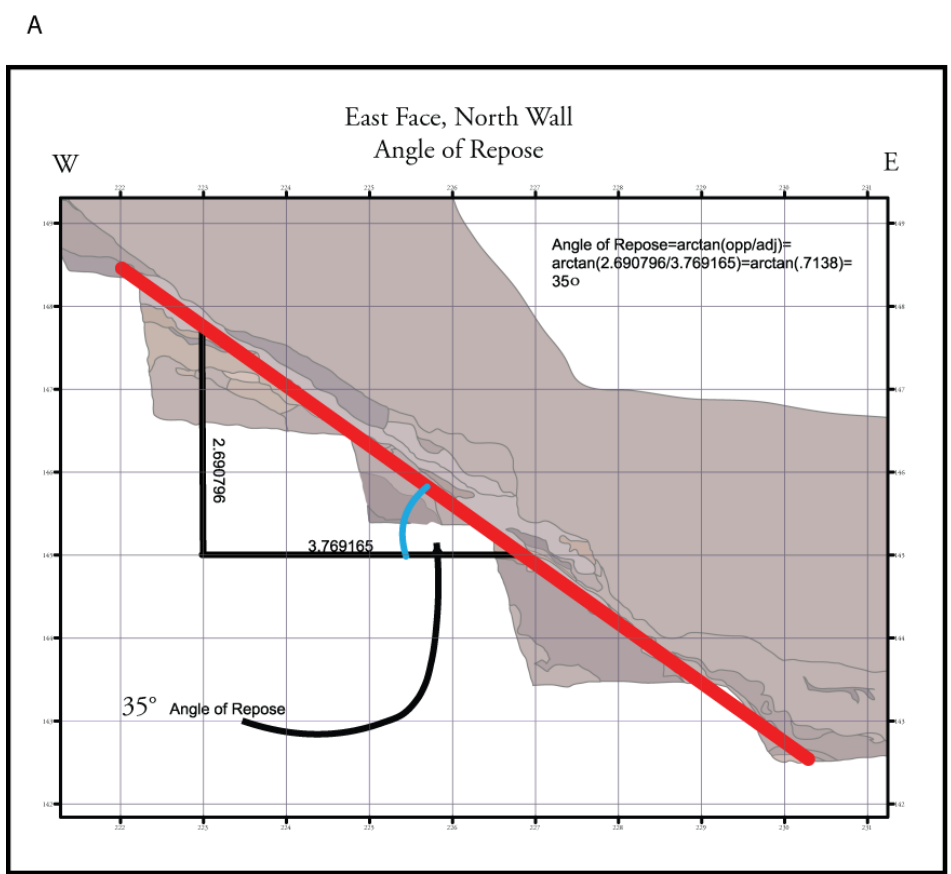


Figure 42. A comparison of the modern angle of original angle of repose (A) and the modern angle of repose (B).

There is precious little intact undisturbed fill overlying Unit 10 but photographs suggest superior sediment were not loaded (Figure 43). Either pedogenesis and subsequent erosion removed all traces of loading, or it did not exist in the first place. If the fill above Unit 10 was not loaded, then it is likely the overlying sediments were not a component of mound construction. The most likely origin of the overlying sediments is that these materials were probably re-deposited material sourced from higher up the slope. As seen in the photos, Unit 10 is deformed and has a blob-like appearance. This probably resulted from water penetration and subsequent liquefaction of parts of Unit 10 and happened sometime after the mound was abandoned. Water would act as a lubricant and cause internal deformation of the slope as weight accumulated. This may suggest the East slope is especially susceptible to water penetration since the sediments exposed by Bareis on the south face did not display similar deformation.

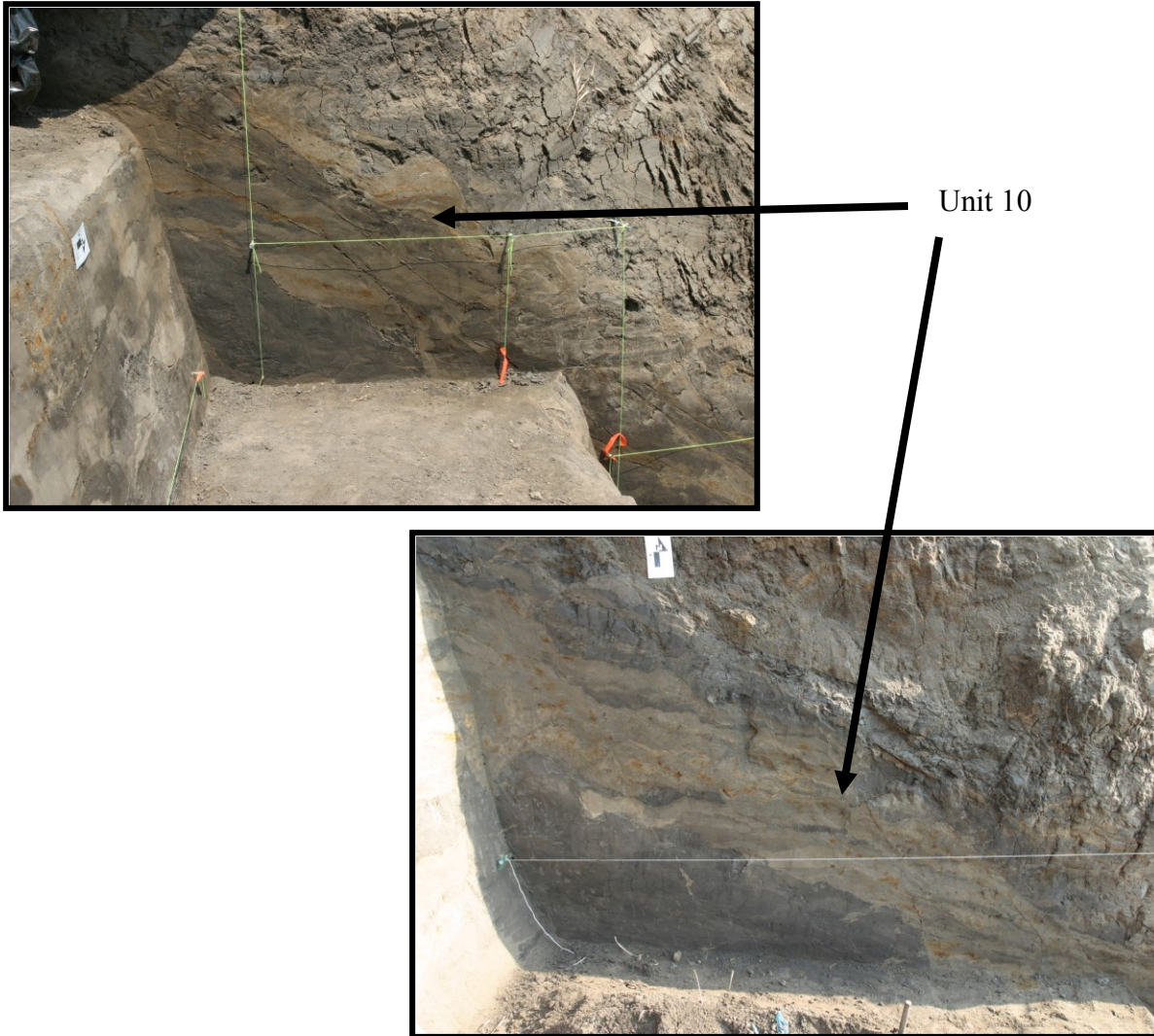


Figure 43. Unit 10.

South Wall

The south wall (Figure 44) differs somewhat from the stratigraphy seen on the North Wall. Stratigraphy seen in the south wall reinforces the disturbed nature of the southern portion of the excavation unit as this profile consisted of modern fills as well as

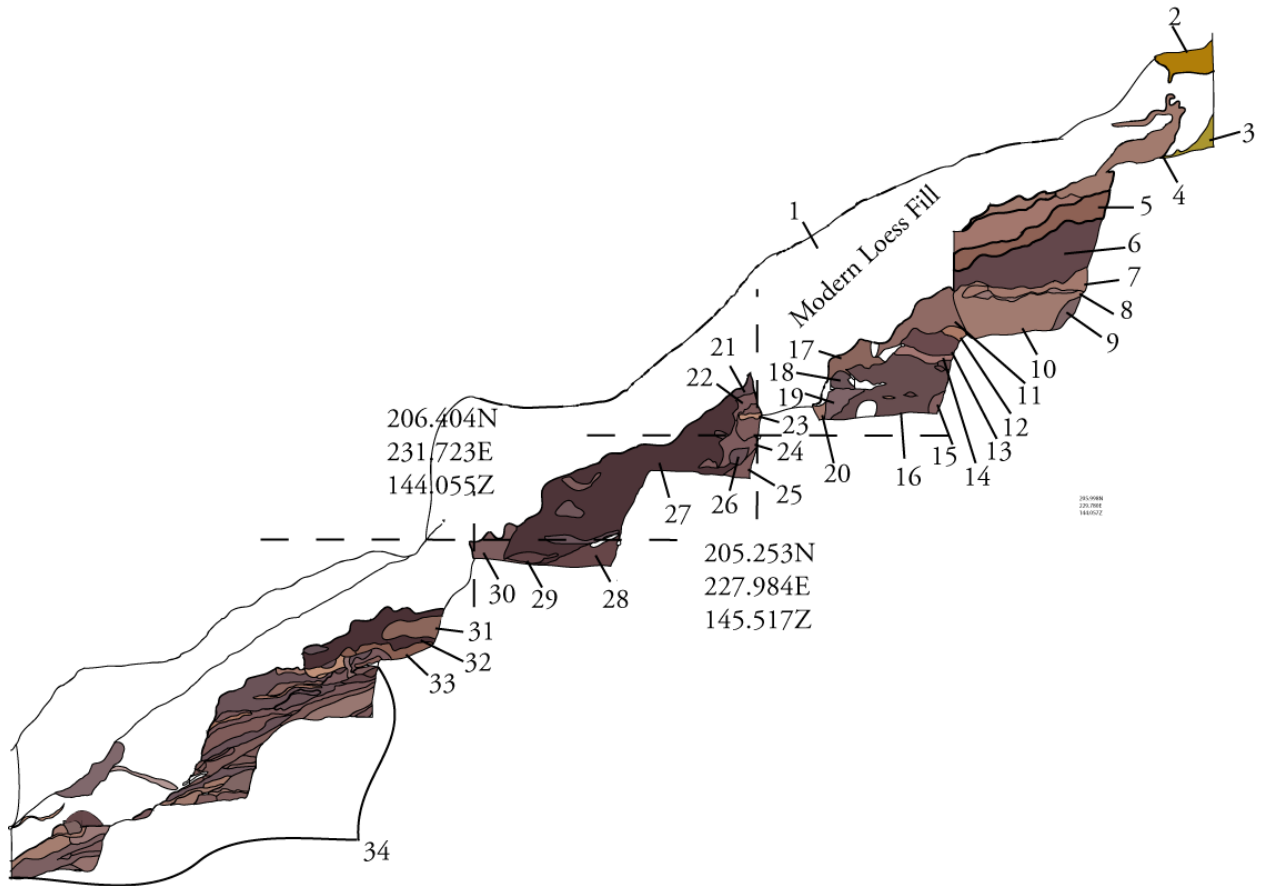


Figure 44. South Wall Profile.

ancient sediments deformed through saturation and pressure (Figure 45). Stratum 34 in the profile demonstrates a high degree of liquefaction. These were basketloaded sediments that literally flowed out of their initial positions. The upper portion of the profile (superior to Face 7) was disturbed by slump repair and subsequent slope movement.



Figure 45. Face 7 South wall/East Face note deformed sediments.

Unit	Color	Texture	Redox	Comments
1				Modern loess
2				Modern loess
3				Modern loess
4	10YR5/3	Silt	FeO2	
5	10YR4/4	Silt	FeO2	Mottled w/ 10YR3/1 silty clay and 10 YR6/3 silt
6	10YR3/2	Clay	FeO2	
7	10YR5/3	Silt	FeO2	Mottled w/ 10YR5/2 and 5Y5/6 silt
8	10YR5/3	Silt	FeO2	
9	10YR4/1	Clay	FeO2	
10	10YR5/3	Silt	FeO2	Mottling
11	10YR4/3	Silty Sand	FeO2	
12	10YR5/4	Silty Sand	FeO2	Bands of 10YR4/3 and 7.5YR5/8
13	10YR3/2	Silty Clay	FeO2	
14	10YR5/3	Silty Sand	FeO2	
15	10YR4/2	Silty Clay	FeO2	
16	10YR4/3	Silty Clay		10YR5/8 Mottling
17	10YR4/3	Sandy Silt	FeO2	Mottled w/7.5YR5/8
18	10YR3/1	Silty Clay		Some sand
19	10YR4/1	Silty Clay		
20	10YR5/3	Silty Sand		
21	10YR3/1	Silty Sand		
22	10YR4/2	Sandy Silt	FeO2	
23	10YR6/4	Sand	FeO2	
24	10YR4/2	Sandy Silt	FeO2	
25	10YR4/2	Silty Clay		Deformed layering
26	10YR3/1	Silty Clay	FeO2	
27	10YR2/1	Clayey Silt	FeO2	Occasional sandy bands (Fill?)
28	10YR3/2	Silty Clay		Mottled w/10YR4/4 and 10YR5/3 silty clay
29	10YR3/2	Silty Clay	FeO2	10YR4/2 silty clay banding, occasional sand
30	10YR3/1	Silty Clay		
31	10YR4/3	Sandy Silt		Mottled w/10YR3/2 clayey silt, 10YR5/6 silt
32	10YR2/1	Clayey Silt		Mottled w/10YR5/2 and 10YR4/6 clay silt
33	10YR4/4	Silty Clay		Banded w/10YR3/2, 10YR4/6, and 10YR2/1 silty clay
34				Basketloaded 10YR2/1, 10YR3/2, 10YR4/6 medium brown silt to silty clay, occasional sands, heavily deformed, soft sediment deformation

Table 15. South Wall soil descriptions.

Geoarchaeological Analysis

Although the observed stratigraphy provides the basis for the interpretation in the subsequent discussion, finer-scale, laboratory-based analyses were done to provide multiple lines of evidence supporting the conclusions. Analyses included:

1. phosphate measurement
2. particle size analysis,
3. sequential loss-on-ignition
4. magnetic susceptibility.

All analyses, except for magnetic susceptibility, were performed at the Geoarchaeology Lab at Washington University in St. Louis. Magnetic susceptibility was completed by personnel from the Midwest Archaeological Center in Lincoln, Nebraska. One hundred and twenty-three 5 cm x 10 cm Kubiena type soil samples were taken for micromorphological study. Because of limited time and expertise, only five were analyzed by Cynthia Fadem of the Earth and Planetary Science Department at Washington University in St. Louis.

All laboratory work was done to understand the proximate origins of specific strata. In particular, the underlying research question was: do any strata represent the surface of a mound stage²⁸? The following analyses were chosen for their ability to provide insight into the degree or kind of human-influence on sediments. A judgmental sampling strategy was used where sediments that clearly were not mound surfaces were used to compared to strata or interfaces where the degree of human modification was in question.

Phosphate Measurement

Phosphate research has a long history in the American Bottom (Eidt 1977, McElrath and Williams 1981, K. Williams 1975, Woods 1977). Phosphate enrichment in sediments occurs when bacterial action breaks down complex phosphates associated with living matter, such as nucleotides necessary for energy transport in living cells like adenosine triphosphate, adenosine diphosphate and adenosine monophosphate. Decomposed phosphates can then become mineralized and fixed within the soil column (Crowther 1997). Sediments with elevated phosphate levels may correlate with increased organic inputs. For this project, a semi-quantitative measurement approach was chosen (Holliday and Gartner 2007:324, 327). Samples were air dried and disaggregated using a ceramic mortar and pestle. Phosphates were extracted using a mild acid extraction procedure (3 percent HCl and .2 percent H₂SO₄ diluted with distilled H₂O at a 15:1 strength). Extractable phosphates (P_{ext}) were then quantified using a colorimetry process using a LaMotte Smart 2 spectrophotometer. The process measures the strength of indicator dyes and compares these values to a known curve to obtain a measure of the amount of phosphates in a sample (Bethel and Mate 1989). The process is considered semi-quantitative because there is no way to account for error in the measurement process. The instrument manufacturer states an accuracy of ± 2 ppm, but each measurement is made as a single value. Since the goal was to use phosphate to identify possibly anthropogenically enriched sediments, this method is appropriate. Research (e.g., Terry et al. 2006) suggests anthropogenic phosphate enrichment occurs at orders of magnitude of difference, well beyond any machine induced error.

Particle Size Analysis

Although textures were described in the field, these descriptions can be idiosyncratic and are subject to observer bias. Particle size analysis quantifies the proportion of differing grain sizes and facilitates empirical comparison. The hydrometer method was used (American Society for Testing and Materials 2003, Gee and Bauder 1986). In this method, samples (about 50 g) are dispersed in a one liter column of water and allowed to settle. Measurements are taken at specific intervals over a twenty-four hour period. The particle size distribution of a sample is then calculated using standardized equations derived from Stokes' Law. This analysis may be useful as an indicator a stable mound surface since past research has demonstrated last two use surfaces below the clay cap beneath the Fourth terrace were composed of a coarse light colored sediment (Fischer 1972).

Sequential Loss on Ignition

Sequential Loss on Ignition is a method for understanding the organic carbon and carbonate content of a sediment sample (Heiri et al. 2001). In loss on ignition, samples (ca. 15 g) are first dried to a constant weight. Then samples are heated to 550° C and weighed. Samples are then heated a second time to 950° and weighed again. Percentage of organic carbon and carbonate are calculated using standard equations. This method is useful for understanding anthropogenic sediments since human activity dramatically increases the organic carbon content of sediments. Sediments exposed to the atmosphere are expected to show elevated organic carbon since these sediments would be susceptible to vegetation and/or animal and insect inputs.

Magnetic Susceptibility

Magnetic susceptibility has a long history of successful use at the Cahokia site (Dalan 1993, Dalan and Bevan 2002, Dalan et al. 2003, Holley et al. 1993). Magnetic susceptibility is useful for understanding the degree of magnetic enhancement of sediments resulting from the production of biomagnetic particles and clay translocation. This technique was used for its utility in distinguishing natural soils from anthropogenically enhanced soils. Samples were collected in the lab and packed into 1.5 cm³ cubes. The cubes were then sent to the Midwest Archaeological Center where magnetic susceptibility readings were done under the direction of Mark Lynott. A Bartington MS-2 instrument was used.

Results

Sample ID	Soil Phosphate (ppm)	Clay %	Silt %	Sand %	% OC	% Carbonate	Low Freq Sus	Corrected Low Freq	Hi Freq Sus	Freq Dep %
MM35	61.9	n/a	n/a	n/a	n/a	n/a	10.80	1.08	10.10	6.48
MM86	112.4	n/a	n/a	n/a	n/a	n/a	13.70	1.37	13.10	4.38
MM105	83.8	n/a	n/a	n/a	n/a	n/a	27.40	2.74	27.00	1.46
MM114	103.4	n/a	n/a	n/a	n/a	n/a	27.90	2.79	26.90	3.58
MM6	68.6	18.0	63.1	18.9	2.33	3.06	29.00	2.90	28.90	0.34
MM11	51.5	18.7	76.9	4.3	2.73	3.45	24.80	2.48	24.50	1.21
MM15	68.4	17.4	75.0	7.6	2.30	3.07	28.80	2.88	28.60	0.69
MM17	58.8	20.2	76.8	3.0	2.95	3.69	31.20	3.12	30.90	0.96
MM18	75.6	21.1	70.8	8.1	3.12	3.93	28.40	2.84	27.50	3.17
MM24	89.8	16.3	65.7	18.0	1.85	2.51	28.00	2.80	27.30	2.50
MM26	56.4	22.0	73.4	4.6	3.13	4.02	26.20	2.62	26.00	0.76
MM27	51.9	25.8	62.6	11.5	2.83	4.45	23.90	2.39	24.00	-0.42
MM30	72.8	25.5	64.8	9.7	2.67	3.56	27.50	2.75	27.30	0.73
MM31	62	25.2	66.1	8.7	2.42	3.30	28.60	2.86	28.50	0.35
MM34	65.5	19.8	69.0	11.2	3.85	4.69	35.50	3.55	35.00	1.41
MM43	61.1	28.6	67.4	4.1	4.07	5.05	17.10	1.71	16.70	2.34
MM45	58	13.8	82.3	3.9	3.70	4.55	31.60	3.16	31.30	0.95
MM47	59.6	17.8	76.7	5.5	3.35	4.22	26.90	2.69	26.40	1.86
MM49	55.9	27.9	69.1	2.9	4.16	5.16	17.60	1.76	17.10	2.84
MM50	30.2	32.4	66.9	.7	5.10	6.23	11.00	1.10	10.70	2.73
MM51	69.3	28.4	71.0	.6	5.12	6.09	11.00	1.10	10.60	3.64
MM54	76.6	12.7	75.0	12.3	2.85	3.47	30.60	3.06	30.00	1.96
MM55	96.6	12.7	79.6	7.7	2.79	3.64	27.60	2.76	27.10	1.81
MM56	44.7	44.1	54.3	1.6	6.13	7.41	11.00	1.10	10.60	3.64

Sample ID	Soil Phosphate (ppm)	Clay %	Silt %	Sand %	% OC	% Carbonate	Low Freq Sus	Corrected Low Freq	Hi Freq Sus	Freq Dep %
MM59	64.8	8.4	79.7	11.9	2.34	3.08	33.60	3.36	33.10	1.49
MM60	77.6	19.5	73.5	7	4.35	5.25	23.00	2.30	22.20	3.48
MM65	47.3	39.1	55.4	5.5	5.64	6.80	11.90	1.19	11.70	1.68
MM67	45.2	11.6	79.6	8.8	3.47	4.10	27.30	2.73	27.10	0.73
MM68	46.3	0.0	91.0	9.8	1.77	2.22	33.80	3.38	33.10	2.07
MM80	67.4	16.0	81.3	2.7	3.36	3.92	22.90	2.29	22.50	1.75
MM81	44	8.0	85.4	6.6	2.91	3.44	31.20	3.12	30.60	1.92
MM82	29.7	8.0	83.5	8.5	2.79	3.42	33.60	3.36	33.10	1.49
MM83	62.5	21.6	75.6	2.8	4.01	4.72	27.60	2.76	27.20	1.45
MM85	71.4	21.8	75.9	2.3	4.93	5.70	18.00	1.80	17.90	0.56
MM89	40.5	14.4	80.2	5.3	4.10	4.98	34.10	3.41	33.50	1.76
MM90	73.6	7.6	80.9	11.5	2.30	2.93	31.20	3.12	30.90	0.96
MM94	70.9	22.9	72.7	4.4	4.04	4.74	21.40	2.14	21.20	0.93
MM95	89.2	7.6	75.5	16.9	2.17	2.85	38.30	3.83	37.60	1.83
MM96	126	15.6	78.3	6.1	3.25	4.00	29.50	2.95	28.80	2.37
MM97	55	12.1	76.8	11.1	2.60	3.19	33.60	3.36	33.20	1.19
MM98	94.2	6.6	63.4	30.0	1.98	2.50	38.80	3.88	38.40	1.03
MM99	121.8	16.9	71.8	11.3	3.06	3.83	29.60	2.96	29.40	0.68
MM109	111.6	18.6	76.5	4.9	3.33	3.87	28.50	2.85	28.20	1.05
MM111	88.4	29.5	64.8	5.7	4.37	5.04	21.30	2.13	21.10	0.94
MM112	107.8	14.5	61.4	24.2	2.41	2.75	32.90	3.29	32.20	2.13
MM113	108.2	30.1	62.8	7.0	7.40	4.37	23.10	2.31	22.80	1.30
MM118	81.2	5.4	65.7	28.8	2.13	2.70	40.60	4.06	39.80	1.97
MM119	114.6	15.4	79.2	5.3	2.53	3.19	28.20	2.82	27.60	2.13
MM28	111.8	23.3	65.1	11.6	3.73	4.41	30.90	3.09	30.70	0.65
MM2	70	16.3	76.0	7.7	3.68	4.37	23.60	2.36	23.40	0.85
MM3	87.8	7.4	80.8	11.8	2.41	2.95	28.40	2.84	28.10	1.06

Sample ID	Soil Phosphate (ppm)	Clay %	Silt %	Sand %	% OC	% Carbonate	Low Freq Sus	Corrected Low Freq	Hi Freq Sus	Freq Dep %
MM37 Str A	107.4	n/a	n/a	n/a	n/a	n/a	11.80	1.18	11.20	5.08
MM37 Str B	63.7	n/a	n/a	n/a	n/a	n/a	26.80	2.68	26.20	2.24
MM37 Str C	65.8	n/a	n/a	n/a	n/a	n/a	15.90	1.59	15.00	5.66
MM37 Str D	61.1	n/a	n/a	n/a	n/a	n/a	12.10	1.21	12.10	0.00

Table 16. Soil analysis results.

Discussion

Results of the quantitative analyses suggest at least one stable surface within the mound, but this stratum was not particularly long lived. Specifically, phosphate measurements from MM112, MM113, and MM114 — all taken from the unit immediately below Unit 25, Face 2 exhibit elevated levels of phosphates. These samples were composed of about twice as many ppm of phosphates as non-enriched or control samples. Organic carbon levels were generally elevated in relation to the rest of the samples also. On the other hand, these samples were magnetically “quiet” and did not indicate elevated levels of magnetic particles (compare to values suggested by Dalan (1997) for examples of magnetically enhanced sediments). The geochemical analyses point to an enrichment vector not present in the other samples. In this instance, the enrichment vector may be likely anthropogenic activity, such as the deposition of organic materials that bacteria then synthesized into constituent components. Organic materials likely came from the summit and associated human activity there. On the other hand, these sediments were not in situ long enough for magnetic enhancement through pedogenic process to occur. Alternatively, these elevated values may be the result of the using source material with elevated phosphates and organics rather than the result of enrichment that occurred after the sediments were emplaced on the mound. The second explanation is the preferred one since no clearly identifiable visual indicators of surface exposure, like root casts or biopores, were seen.

Micromorphology

Five soil samples, representing proveniences that warranted closer scrutiny due to questions over the proximate origins of the stratigraphy were thin-sectioned and the sections were submitted to Cynthia Fadem of Washington University in St. Louis. Fadem described the thin-sections. Fadem's notes are presented in Appendix 1.

Sample ID	Northing	Easting	Elevation
MM35	219.863	229.677	143.540
MM86	217.672	222.266	147.828
MM105	218.744	218.329	151.463
MM107b	218.958	218.357	151.387
MM114	224.332	219.849	150.867

Table 17. Micromorphology sample locations.

Discussion

MM35

MM35 was recovered from the North profile, specifically from the hypothesized mound face surface. The mound face demonstrated clear upper and lower boundaries. Fadem described the transition from underlying sediment to surficial sediments. Her observations suggest the upper sediments are relatively homogeneous and inorganic whereas the lower — moundfill — are more mixed and contain more organic matter.

MM86

MM86 was excavated from the boundary of the clayey unit in Face 4 and overlying sediments. Fadem's observations suggest the overlying unit is of a slopewash origin with soil peds clearly entrained in the deposit. These sediments were exceptionally uniform in composition as suggested by similar particle size and shape. Colors did differ.

On the other hand, the clayey unit is a distinct organic stratum. These observations support a natural origin for the overlying layer.

MM105 and MM107

MM105 and MM107 was recovered from Unit 24, Face 2. Stratigraphically, this unit appears contiguous with Unit 25 and may be the results of the same depositional episode. Fadem's analysis suggests a degree of wash-related deposition. This indicates Unit 24 in Face 2 is not a loaded stratum but a depositional feature. This likely resulted from the natural transportation of sediments from the stacks used for mound construction.

MM114

MM114 was extracted from the North wall profile at the level of Face 2. MM114 crosscut the light colored surface running down this face. Fadem's discussion suggests this surface is wash-related and not culturally emplaced, although this sample may have been impacted by more recent slumping.

Radiocarbon Dating

Materials from two contexts from the East Slope excavations were submitted to Illinois Geological Survey and Beta Analytic Inc. for radiometric analysis. The Northwest Corner excavations did not yield any contexts or materials suitable for radiometric assay. All radiocarbon dates were done using the standard accelerated mass spectrometer process.

The first context was a sod block construction feature encountered at 144.3 masl. Organic materials (A1159 – .024 g and Beta241384 – .07 g) from this context are associated with a soil attached to ancient turf blocks used as construction materials. Uncarbonized organic remains, consisting of rootlets, grass stems, and leaves, were recovered by rinsing 10 L of soil through a #270 geologic sieve. After drying, remains were identified microscopically by Gayle Fritz of Washington University in St. Louis as consisting of leafy or grass fragments although the fragments were highly degraded and not identifiable to a specific taxon. No obvious signs of disturbance were noted by the excavators. Because of the short-lived nature of the materials, excavators believed the remains likely represent the age of the ancient turfline and by extension may be useful for dating the sod block construction.

Results from the two different labs suggest some degree of disagreement (Table 18). There was no observable archaeological reason to suggest the cause of the variance as the samples both were taken at the same time and from the same larger turf block. On the other hand, the $\delta^{13}\text{C}$ ratios differed greatly between the two samples suggesting the remains of several plants, at least one C4 and one C3 plant, were incorporated into the sample and the remains from the C3 plant were considerably older than the remains from the C4 plant. Dates reported by the labs were corrected for $^{13}\text{C}/^{12}\text{C}$ isotopic fractionation and then were normalized to a -25ppm based on the PDB-1 standard.

A sample with multiple aged organic remains suggests two possibilities. Either A1159 (955 ±15rcybp) correctly dates the turf and Beta241384 (770 ±40rcybp) is younger intrusive material or Beta241384 is the most correct terminus post quem for the turf blocks and A1159 represents relic plant remains in the sod. If A1159 correctly dates

the turfline then the sod blocks may be primary construction materials. If Beta241384 correctly dates the turfline then the sod-block construction may be a repair undertaken after the mound was constructed and in use for some time. Accepting Beta241384 as the most correct requires believing that substantial construction was done on Monks Mound into the 14th century. Few archaeologists would agree with this interpretation.

With the level of information available both situations are equally plausible, although I prefer the former rather than the latter because the date for A1159 is generally in line with radiocarbon dates from the rest of Monks Mound. The latter situation requires special pleading allowed for but not well supported by the extant understanding of the stratigraphy.

The second context was Feature 1 (143.7 masl). Samples from the logs posts in Feature 1 were identified as *Taxodium* sp (cypress) by Neil Lopinot (Lopinot and Fritz 2008) of the Center for Archaeological Research, Missouri State University. Lopinot counted 25 rings in a 3 cm. sample of the posts. Since both posts measured approximately 30 cm. diameter, he indicates the trees from which the posts were made may have been at least 125 years old. Furthermore, Lopinot noted the outer surface of the posts were severely degraded. Two uncarbonized samples were selected and one of each was sent to the radiocarbon labs (A1160 –1030 ±15 rcybp and Beta241385 – 960 ±40rcybp). When selecting a portion for radiometric assay, care was taken to choose only the outer parts available in an effort to avoid induced time lag due to old wood.

Even though care was taken to avoid dating old wood, this sample may not date mound building activities for several reasons. First, cypress is a particularly long lasting wood. Wood harvested may be useful for several generations after cutting. Second,

cypress is not a locally abundant species. Obtaining cypress would involve a higher cost, in terms of time and transportation. Finally, cypress (and cedar) has symbolic and ritual importance. For these reasons, cypress would be seen as a high value item and would be subject to a greater probability of curation as compared to other species. A high probability of curation would weaken the association between the harvesting of the tree and its ultimate burial in the mound. In addition, field workers noted the possibility of post-depositional disturbance, albeit likely ancient disturbance, further casting doubt on a strong association of the cutting of the wood and any observable mound construction episodes. Lab measurements on these two samples tended to agree better than on the samples from the sod block feature. In any event, these dates do provide a terminus post quem for construction above Feature 1.

Lab Number	δ ¹³ C	RCYBP	Standard Error	95% Probability	Context	Lab
A1159	-14.0	955	15	1023-1154 A.D.	Sod Block (144.3 masl)	ISGS
A1160	-22.2	1030	15	988-1024 A.D.	Feature 1	ISGS
Beta241384	-25.1	770	40	1185-1289 A.D.	Sod Block (144.3 masl)	Beta Analytic
Beta241385	-22.9	960	40	996-1166 A.D.	Feature 1	Beta Analytic

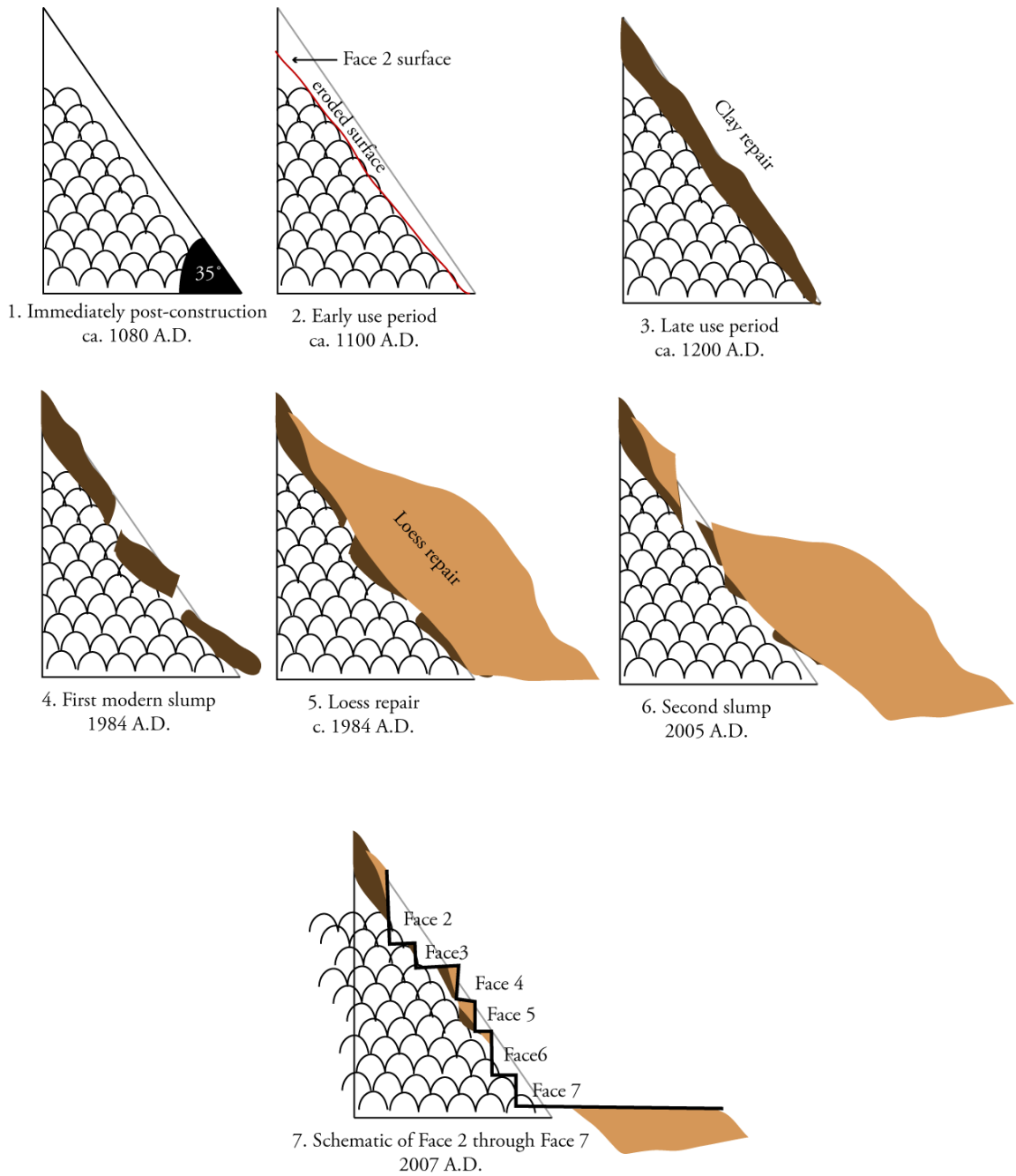
Table 18. Radiocarbon assays as reported by ISGS and Beta Analytic, Inc, reported as conventional ages.

A Synoptic View of the East Slope

Having described the stratigraphy and ancillary analyses done on materials from the East Face, these data are useful to create a single overarching historical sequence for the area of Monks Mound between the Northern and Southern Lobes on the east side of Monks Mound below the third and fourth terraces. The discussion of the sequence visible on the East slope begins with the initial construction as a starting point.

From the stratigraphic profiles, the mound appears to have been built as a series of small interconnected stacks of earth (see the discussion in the Northwest locality in particular). Within the smaller piles, the Cahokians utilized a wide variety of soils, sometimes juxtaposing very different types against one another. Results of the excavation on the East slope imply construction occurred over a long enough time for erosion to occur as basketloaded strata are interspersed with slope wash deposits. Mound construction seems to have occurred relatively rapidly because no soil development was observed on surfaces within the portion exposed by the excavations. Porter (1974) made similar observations on the Mitchell Mounds where eroding sediments were covered by later fills without intervening use levels, indicating construction was relatively quick but long enough for deterioration to occur.

Surfaces within the mound were created and occasionally used. Feature 1 clearly indicates there were occasional breaks in the construction activities. The date from the stratigraphically equivalent sod block construction feature immediately to the north suggests this likely occurred in the eleventh century A.D. (either between 1023-1053 A.D. [29.9 percent probability] or 1080-1154 [65.5 percent probability]). Other radiocarbon dates from Monks Mound suggest the later decades of the eleventh century A.D. are most probable. Figure 46 presents a historical model of the taphonomy of the East Face. This model is described below.



The Taphonomy of the East Face 1080 A.D.-2007 A.D.

Figure 46. A historical model of the taphonomy of the East Face.

When the mound reached its near modern height, construction ceased or slowed long enough for a stable surface to develop naturally. Workers documented this surface in the north wall of the excavations (Unit 10). The mound may have remained in this configuration long enough for a gully(s) to develop in the East face. The horizontal stratum documented in Face 2, initially interpreted as a mound surface, may be the results of erosion along the East face. In this model, erosion along the East face was sporadic but catastrophic. When erosion did occur, it removed relatively thick layers of sediment, but when not eroding, the surface did stabilize long enough for organic matter to accumulate from small wash events. Catastrophic erosion is indicated by the morphology of the surface — particularly Units 5, 10 and 24 (although these units may also be wash deposits like is expected in a valley between two of the stacks used to build the mound). In this instance, the geochemistry points to short-term stability. Sometime later, the Cahokians renewed the mound by filling erosion scars on the East face and then overlaying a resistant clay sediment face to stem further erosion²⁹. On top of the clay face, a sandy wash lens formed as the materials from the summit (Fischer 1972) slowly washed down slope.

After Monks Mound was abandoned, the slope remained relatively stable. Sediments from the edges of the Fourth terrace eroded and were deposited down at lower elevations preserving traces of the ancient slope near the midway point of the mound (Unit 10, North Wall). The upper portion of the ancient slope may have eroded at this time. In addition, elements of Feature 1 probably began to collapse or move and cause — or at least contribute to — the erosional channel described on the southern portion of the upper faces and benches. Sometime after the construction of the mound but before the

modern period, slumping began on the East slope (McGimsey and Wiant 1984). Repairs after 1984 consisted of burying the failing slope with a light colored loess soil. The East slope appears to have stabilized temporarily for a number of years when slumping re-occurred in 1995 and then again in 2005.

Summary

Excavations in the summer of 2007 removed approximately 2400 cubic meters of earth from Monks Mound. In relation to most other modern archaeological work, this is an extraordinary volume of excavation, but in relation to Monks Mound, the excavation represents .3 of one percent of the mound by volume. As noted above, nowhere did excavation penetrate more than 2 meters into undisturbed sediments. The 2007 project only provides a very small glimpse into this amazing monument.

Overall, while these data do not absolutely falsify earlier models of mound construction, they cast doubt on earlier views. Specifically, the Reed et al. model (1968:142-143) calls for the existence of at least three mound stable mound surfaces in the upper four meters of elevation. In the 2007 excavations, these were not visible. The Northwest corner excavations should have exposed, at a minimum, level L near 156 mamsl, level K near 155 mamsl, and level J near 154 mamsl. Excavations on the Northwest corner did not encounter the expected mound surfaces at these elevations (Figure 10). The Northwest corner did demonstrate variation in source material with differing colored and textured placed adjacent to one another. Field observations indicate there was no appreciable time break between depositions. Variation in source material

likely accounts for the soil breaks defined by Reed and colleagues rather than temporal discontinuity.

Similarly, the Woods model requires the existence of multiple mound surfaces in the upper sixteen meters of the mound. Only one clearly identified surface was seen (Unit 10, North Wall). This surface likely connects the surface identified as M1/M2 by Reed and colleagues. On the other hand, comparing the stratigraphic profiles between these locales demonstrates the difficulty of trying to create a single integrated profile with these two data sets. No stratigraphic break from one profile could be securely matched to the other. This observation negates the both Reed's and Woods' model since both hypothesize the upper level of the mound were built by simply adding soil in a layer cake fashion. If this was the cases, then stratigraphically continuous layers should be observed from the Northwest corner and the East face.

Pauketat's model calls for the existence of many thin either blanket mantles or layers within the uppermost elevations of Monks Mound. Although Pauketat does not state precisely how thick these layers should be, he (2000:121 Figure 9.3) reinterprets the profile presented by Reed et al. (1968: Figure 5) as indicating at least three surface and fill episodes should be seen in the upper five meters of the mound. The construction stages should be covered by blankets of soil — a blanket mantle kind of construction technique. The existence of blanket mantles is in doubt as Feature 1 from the East face demonstrates the edges of the mound were in place and used for a very short time before the summit was built. If the mound was constructed by the addition of blanket mantles as suggested by Pauketat, then it is expected that the mound would grow both upward and outward simultaneously. The existence of Feature 1 indicates the mound did not grow

outward as it arose. Feature 1 was located less than two meters from the exterior of the mound, a condition that precludes a blanket construction method. Furthermore, observations from both the Northwest corner and the East face demonstrate only a single verifiable mound face. Pauketat's model calls for numerous "very thin" construction episodes so accordingly, numerous very thin mound faces should have been observed. The data are contrary to this position.

At the same time, important information about the mound's structure and construction techniques can be discussed. In particular, five points need greater explanation. First, stratigraphy from both the Northwest and East Faces suggests the mound in these two areas was constructed as a series of smaller piles of earth which were interconnected to form a larger structure. These observations agree well with observations made by Bareis (1975a) and Collins (1993). Bareis noted parts of the southern slope underlying the third terrace was built in a similar manner, whereas Collins observed dome-like stratigraphy on the face of the western scarp separating the second from the fourth terrace. Similar construction techniques have been noted in Mound 66 (Moorehead 1929) and Mound 72 (Fowler 1999) at Cahokia (cf. Bareis 1975b:13) as well as in East Texas at the George C. Davis site (Newell and Krieger 1949:58-62), in Mound A at Poverty Point, Louisiana (Haag 1976, Kidder et al. 2009), the Angel Mounds in Indiana (Monaghan and Peebles 2009), the eastern Oklahoma (G. Vogel et al. 2005) and in Hopewell earthworks of the Ohio River Valley (Lynott, pers. comm.. 2008). Although Bareis suggests this construction method implies that a specialized class of mound engineers built the mound, I offer an alternative interpretation. Mound construction of this kind implies a relatively large labor force was spread out over the entire mound at

any one point in time. In this model, leadership would not need to have knowledge of how to place soils according to physical properties, but rather soil placement would be a function of coordinating many relatively small work groups. Relative to engineering concerns, the only centralized knowledge needed for soil placement would come from knowing the final mound dimensions. This does not preclude leaders who understood the cosmological implications of soil sourcing and placement.

Second, specific soils were utilized for their physical properties. Although previous workers (e.g. Emerson and Woods 1993) argue that at least some Cahokians had a specialized knowledge of the hydrological and geophysical properties of soils, data confirming or denying this hypothesis are equivocal. Yet, it is clear that some soils were chosen and emplaced specifically for their ability to resist erosion. The dark clayey soil encountered on the East Face is a good example of soil used to prevent erosion. This is important because bands of clayey soils within the mound do not necessarily indicate a mound use surface. Skele's (1988) model includes two instances where he identifies a mound surface based on the existence of a clayey stratum in the Reed et al. (1968) cores. Although Skele does not explicitly state why he believes these are surfaces, it is possible to infer that he believes these stratum are similar to the clay stratum found covering the Stratum M2 on the upper surface of the mound. The use of clay soils to stabilize the East slope indicates clay soils were used for repairs as well as capping and therefore the presence of clayey soil is not an explicit indicator of a mound use surface.

Third, stratigraphy seen in 2007 suggests the mound failure — slumps, erosion, or faulting — occurred during Mississippian times as well. The timing of mound repair is not well documented and may have been a continual process or something that occurred in a

series of relatively infrequent events. Slope failure was and is a complex process, with each individual failure the result of a specific set of circumstances. Although each failure is individual, failures do appear to have occurred most regularly in areas where differing soil types were juxtaposed. Slope failures seem to have preferentially occurred at the boundaries between coarse and fine sediments such as along the ancient slope (Unit 10) identified in the north wall. In some cases, at least, slope failure appears to be a function of the method used for construction because optimal sediment types were not chosen or soils with differing resistance to water were deposited near to one another.

Fourth, Feature 1 suggests that short-lived activities did occur on the mound before it reached its completed dimensions. Although I believe only a very small portion of Feature 1 was exposed, its actual dimensions are unknown. Feature 1 is not the first time limestone deposits have been encountered in Monks Mound (Rose 1998). Horizontal borings in the west side of the mound demonstrated that limestone was a component of construction but these remains were found much lower in the mound than Feature 1 so a connection between Feature 1 and other limestone deposits cannot be proven. In the American Bottom, other limestone and log features have been found in Mississippian Period contexts such as mortuary features (Milner 1984), but stone slab and log construction is not an exclusive indicator of a mortuary context. Farther away in space and time, a log lined chamber was found in the late Mississippian Period Craig Mound at Spiro, Oklahoma (J. Brown 1996), limestone is frequently found in Late Woodland mounds in Missouri (M. J. O'Brien and Wood 1998) and log-lined tombs are known in Middle Woodland contexts throughout the Mid-Continent (Buikstra and Charles 1999). Furthermore, Walker (1936), within the Great Mound at Troyville, Louisiana, and

Morgan (2003) in Mound B at Bottle Creek, Alabama both have identified ephemeral features within earthen constructions that they believe were structural elements designed to hold sediments in place until subsequent layers were deposited. The point here is that caution should be used when evaluating unexpected features within mounds as the construction process may not have involved just the repetitive act of piling soil.

The available information neither immediately suggests a function for Feature 1 nor is there any way to make a secure analogy to other slab and log constructions across the region. Even though it is not possible to say if Feature 1 was an element required for mound construction, such as a marker post or perhaps an altar, or an element buried during mound construction, like a charnel facility or a central chamber, the surface underlying Feature 1 was not exposed to weathering processes long enough for soil to develop or for basketloads to become mixed. Therefore, Feature 1 does not indicate a mound surface as traditionally thought of in Mississippian contexts.

Last of all, although the East face excavations indicate a relatively rapid construction sequence, mound construction did take some amount of time. Slope wash and erosion was seen in the stratigraphy. These kinds of deposits suggest some degree of weathering did take place, but this is expected since construction would need to be extended over several seasons given the scale of construction. Any model of Monks Mound needs to consider a reasonable construction time, likely punctuated by short hiatuses. A model of this sort has precedence as Knight (2001) and Morgan (2003:71) speculate feasting and other activities took place on mounds as they were built.

These data lend support to the event-based model of mound construction. However, the data do indicate that mound construction may be thought of as a series of

individual interconnected events drawn out over a relatively short time, perhaps on the order of years. Still, construction was executed over a short enough time to support the idea that mound construction could be considered a single ritual albeit an extended one. These data may also support a model of labor organization that was not exceptionally centralized, but where small work groups could have pursued mound construction for limited time. An examination of the construction method indicates construction may have been pursued by small groups dispersed in time. Tasks overlapped and construction continued until the project was finished. In this reconstruction, a central plan was needed with agreement required for the final dimensions of the mound³⁰, but centralized direction of labor is not necessary.

This kind of model of construction has been proposed by Vega-Centeno Sara-Lafosse (2007) as a way that mounds were built at Cerro Lampay, Peru. The mounds at Cerro Lampay entomb earlier architectural units. The process of burying earlier buildings appears to have happened as a major architectural project done over a short period of time (Vega-Centeno Sara-Lafosse 2007:158) — presumably it was done by design and proceeded as a definite project with a beginning and an end. At the same time, the project was somewhat discontinuously undertaken and labor required constant encouragement through feasting. At Cerro Lampay, construction was a process. Stratigraphic data support a similar idea for Monks Mound. Building Monks Mound was a process, also. More directly, although Monks Mound was built as a single integrated project, it need not have been built day after day in a single unbroken construction activity.

Data from these excavations are important for understanding mound construction *qua* labor organization. In the interpretation presented here, a class of mound engineers is

unlikely; rather construction techniques suggest a decentralized process³¹ that proceeded continuously, punctuated by very short duration — perhaps days, weeks, or even months — hiatuses or that mound construction while continuous occurred sporadically across the entire structure. Excavations also demonstrated a wide variety of soil usage, indicating some degree of repair or ancient stabilization efforts. In sum, these data are vital for advancing a view that Monks Mound was constructed as a totality and then maintained for a number of generations.

Chapter IV: Soil Coring in the Vicinity of Monks Mound

Objective

For over 100 years, workers have attempted to understand how and when the ancient inhabitants of the American Bottom built Monks Mound. Perhaps because of the truly monumental scope of construction, researchers have focused their efforts most intensely on the mound itself. As a consequence of a moundcentric view, little empirical data exists about the geomorphological setting and pre-mound contexts of the monument. On the other hand, geoarchaeological investigation of areas away from Monks Mound such as the Grand Plaza, have yielded a wealth of information about the complexity of human modification and preparation of the local substrates (Holley et al. 1993).

The large amount of information about the geological contexts of the rest of the Cahokia site highlights the dearth of specific information about Monks Mound. In fact, the sparsity of contextual information about Monks Mound forces researchers interested in the construction of the monument to make numerous untested assumptions to make even rudimentary statements about the mound. For example, the volume of Monks Mound can only be approximated because basic facts such as the elevation of the pre-mound surface have not been securely established (Fowler 1997:87). These data are particularly relevant for the argument advanced in following chapters and subsequently, for building a historical model of Monks Mound. Therefore, in addition to the excavations done during the summer of 2007, a coring project was undertaken to improve our understanding of the mound and its setting. Data from this project provide a secure

point from which to evaluate other aspects of the current archaeological database. The project had three underlying goals. They were:

1. Establish the basic geological/geomorphological context of the prefound surface.
2. Gauge the degree of landscape preparation done before the construction of Monks Mound.
3. Understand the relationship of Monks Mound to the relic Edelhardt meander.

Field Methods

Fieldwork consisted of extracting twenty four, 6.4 cm (2.5 in) solid soil cores (Table 1) from the base of Monks Mound using a Giddings Soil Core machine provided by the Illinois State Museum.

Core	Site Northing	Site Easting	UTM Northing	UTM Easting	Elevation
2008071604	202.724	318.877	221305.3	709235.6	132.549
2008071605	270.175	289.406	221373.2	709207.4	131.658
2008071603	176.303	295.098	221279.4	709211.2	133.304
2008071703	153.621	302.736	221256.6	709218.3	131.19
2008071602	134.41	286.205	221237.8	709201.4	131.578
2008071601	97.698	274.391	221201.4	709188.7	129.974
2008071503	41	189	221146.4	709101.9	131.813
2008071502	26.776	159.846	221132.8	709072.4	131.511
2008071501	37.522	123.925	221144.2	709036.6	130.759
2008071404	39.028	92.853	221146.3	709005.4	130.326
2008071403	50.705	63.635	221158.5	708976.4	129.685
2008071402	95.082	55.508	221202.9	708969.1	130.177
2008071401	126.486	53.749	221234.3	708968.0	130.187
2008071701	156.54	71.603	221263.9	708986.6	132.877
2008071702	155.368	62.407	221263.0	708977.3	131.561
2008071201	171.258	53.83	221279.0	708969.0	130.23
2008071103	218.837	49.882	221326.5	708966.1	129.176
2008071102	282.312	90.054	221389.1	709007.7	128.404
2008071101	301.744	141.638	221407.5	709059.8	128.586
2008070801	307.03	169.041	221412.3	709087.4	129.2
2008080203	70.703	271.422	221174.5	709185.2	129.303
2008080202	28.271	239.222	221132.8	709152.0	129.461
2008071504	28.402	235.387	221133.0	709148.2	130.137
2008080201	22.816	220.719	221127.7	709133.4	130.191

Table 19. Grid coordinates of cores locations.

Fieldwork began on 7/08/2008 and was completed on 8/02/2008. Cores were located at about 30 meter spacing following a line that can be approximated by the 129-meter topographic line (Figure 47). Cores were placed to penetrate through slope wash

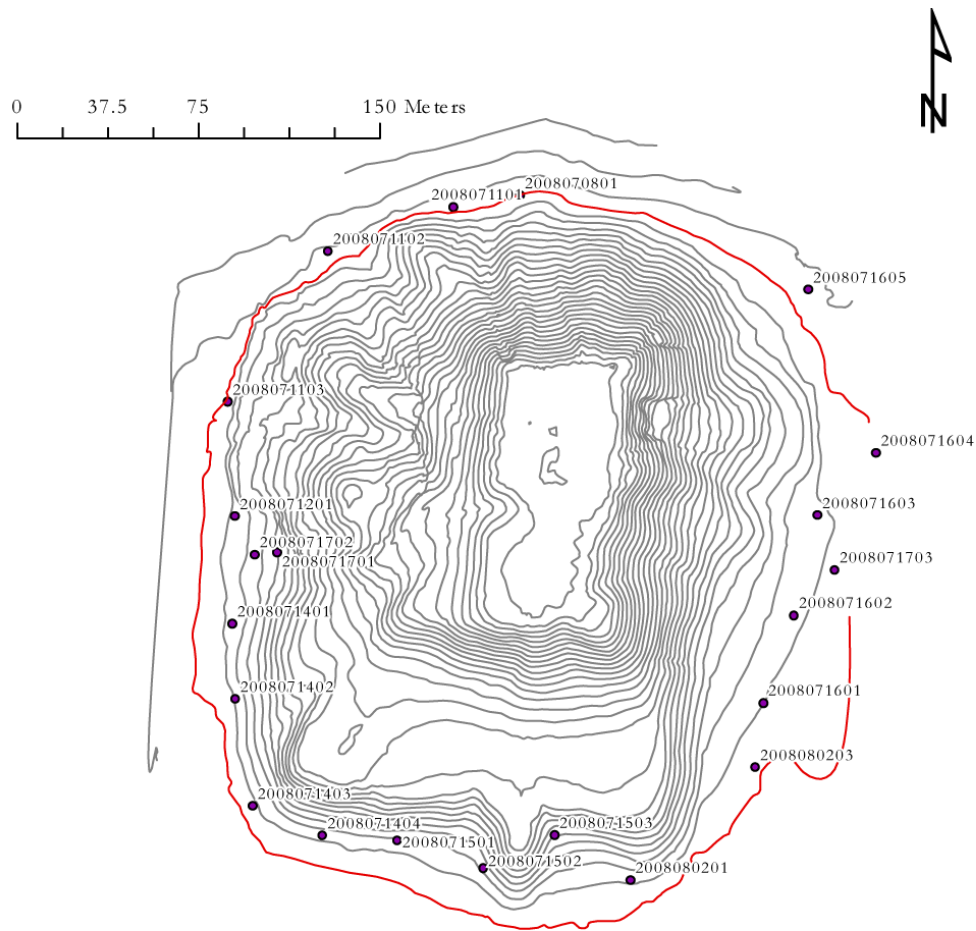


Figure 47. Map showing core locations, red line highlights 129 msl
1 meter interval
deposits and into undisturbed sediment. Descriptive data recorded in the field included
Munsell color, field texture, and soil horization, as well as the presence/absence of
artifacts, organics, and redox features, following guidelines employed by the Natural
Resource Conservation Service and the United States Geological Survey and summarized

by various authors (Birkeland 1999, Schoeneberger et al. 2002, Soil Survey Division Staff 1993, Soil Survey Staff 1999, G. Vogel 2002). Suspected slope wash deposits were designated B_w horizons following Goldberg and MacPhail (2006). A B_w designation was chosen to indicate these were soils weathered from the parent deposits (i.e., Monks Mound). Cores holes were backed filled using sterile loess sediments provided by the Cahokia Mounds State Historic Site. Locations were recorded using a total station and measurements were made using the local Cahokia Grid System.

Laboratory Methods

Nine soil samples (Table 2) were taken from specific proveniences and analyzed in the laboratory.

Sample Number	Provenience (cmbs)
200807110101	Ab (260-280)
200807110201	Ab (231-252)
200807110301	3Ab (148-163)
200807140301	Bw (47-218)
200807140402	Ab (180-188)
200807150102	Ab1 (169-177)
200807150103	Ab2 (177-193)
200807150202	Bw3 (157-161)
200807150301	Ab1 (111-119)
200807150302	2Ab (179-189)

Table 20. Provenience of soil samples.

Lab analyses consisted of phosphate measurement, loss-on-igniton, particle size analysis, and magnetic susceptibility as described in the previous chapter.

Results

Results are presented in two sections: Field observations and Laboratory Analysis.

Field Observations

Core descriptions are presented in Appendix 1. Although cores penetrated the modern slopes of the mound, no attempt was made to interpret the depositional history of the entire stratigraphic column. In the recent past (since ca. 1850) the mound has been covered in thick overgrowth and tree which were subsequently cleared. This can clearly be seen in photographs and images presented in Fowler (1997:34, 88, 94, 99) which suggest at least two episodes of land clearing. The growth and clearing episodes would have led to periods of intense erosion followed by short periods of stasis. This picture is further complicated by instances of farming in the nineteenth century; modern excavation; and slumping and repair all of which contribute greatly to the surficial disturbance around the mound. Because of this high degree of disturbance, larger exposures are needed to understand the more recent depositional history of the mound. In spite of a lack of stratigraphic distinctiveness and the immense amount of taphonomic changes in the upper portions of the layers of the slope wash deposits, the juncture of slope wash deposits and undisturbed soils was positively identified in fifteen cores. The juncture was uncertain in nine. Even though the juncture was identified, no samples were submitted for radiocarbon dating. Where suitable materials were encountered, stratigraphic or associational uncertainty argued against submitting samples for dating.

Stratigraphic data from the interface of undisturbed pre-construction soils and construction sediments were used to create a hypothetical picture the premound surface and of the immediate mound construction times. Given the current extent of these data,

this should be considered the best understanding of the pre-mound surface for now. More extensive excavation is needed to refine this model.

Soil coring encountered deposits containing charcoal, lithic fragments, bone fragments, or pottery fragments (midden) in four soil cores (2008071103, 2008071201, 2008071401, and 2008071501). The interface between the underlying sediments and the midden was in all instances either abrupt or clear, with no soil development observed in the undisturbed soils. The average elevation of these deposits was 127.655 amsl. These cores were located along the western edge of the mound. All of these deposits occurred in the same stratigraphic order and were overlain by basketloaded sediments or slope wash deposits. Core 2008071605 encountered a buried A horizon containing a zone with abundant roots and grass stems at a similar elevation. Transitions at the base of the buried A horizon were clear to diffuse.

Nineteen cores encountered C horizon soils but the transition between either moundfill or slope wash was not immediately apparent. Ten cores displayed a thin (about ten to twenty cm) stratum consisting of fine sand to clay. This stratum was found between undisturbed sediments and obvious wash or fill episodes. This stratum is likely an A_p where the previous (pre-mound or peri-construction activity) top soil was destroyed through trampling. In the remaining nine cores, the interface between the pre-mound sediments and mound construction was either poorly preserved or difficult to securely identify.

Laboratory Analysis Results

Results of the laboratory analysis are presented in Table 2. Particle size analysis is presented in Figure 48.

Sample ID	Soil Phosphate (ppm)	Clay %	Silt %	Sand %t	%OC	%Carbonate	Low Freq Sus	Corrected Low Freq	Hi Freq Sus	Freq Dep %
2008-07-11-01-01	82.2	24.0	57.3	18.6	2.98	4.12	17.50	1.75	17.10	2.29
2008-07-11-02-01	61.1	13.1	58.3	28.6	1.16	1.62	21.20	2.12	20.90	1.42
2008-07-11-03-01	124.2	6.9	47.1	46.1	3.32	4.42	35.70	3.57	35.20	1.40
2008-07-14-04-02	60	4.8	49.0	46.2	1.47	2.41	30.40	3.04	29.90	1.64
2008-07-15-01-02	108.4	4.8	52.0	43.2	1.46	2.52	34.80	3.48	34.10	2.01
2008-07-15-01-03	58.2	22.9	68.8	8.2	2.54	4.01	29.50	2.95	28.70	2.71
2008-07-15-02-02	93.6	17.9	31.6	50.5	1.71	2.37	41.00	4.10	40.00	2.44
2008-07-15-03-01	109.6	12.6	81.1	6.3	1.67	2.59	28.10	2.81	27.50	2.14
2008-07-15-03-02	73	8.5	45	46.5	1.54	2.39	31.50	3.15	30.90	1.90

Table 21. Results of laboratory analysis.

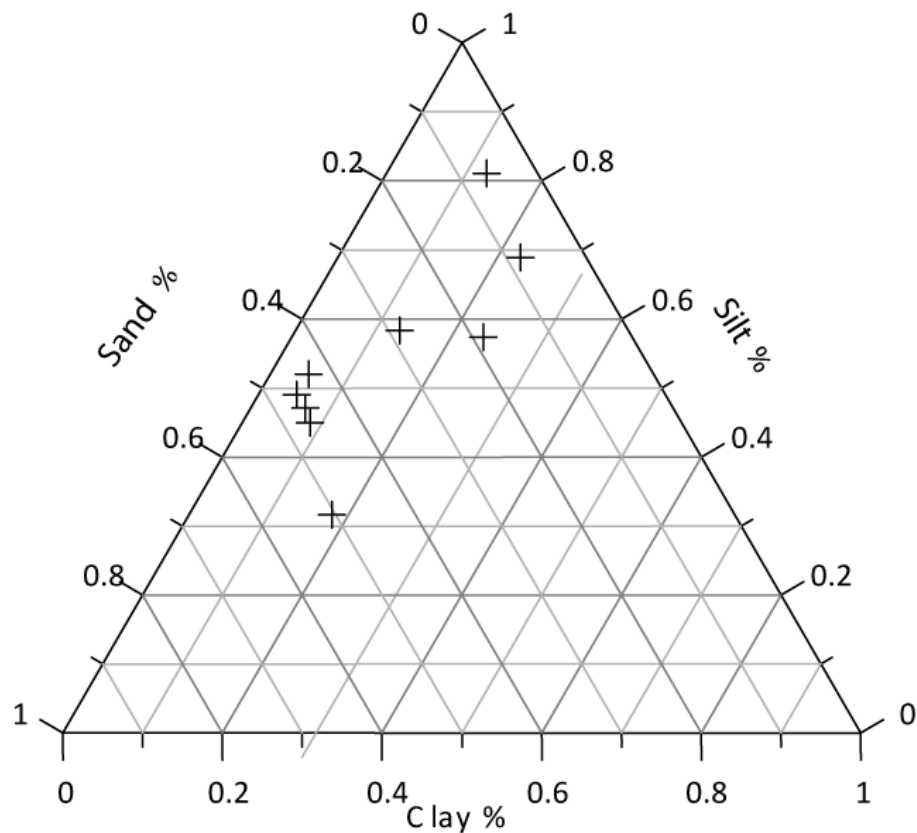


Figure 48. Ternary plot of particle size analysis.

Discussion

Stratigraphic mapping

Properly locating and interpreting the interface between in situ sediments and slope wash or emplaced deposits form the key to subsequent interpretation in this study. The prefound surface was identified as the upper boundary of the first stratum inferior to the first episode of slope wash deposition.

McGimsey and Wiant (1984:31) highlight this problem in their discussion of the 1984 soil coring on Monks Mound. In three cores and a backhoe trench they noted a

well-defined midden deposited on top of undisturbed sediments. They suggest the depositional circumstance of the midden represents one of two possibilities, either the midden is in situ or it is redeposited as a part of mound construction. Although McGimsey and Wiant did not offer a preferred interpretation they place the base of the mound at the interface of the midden soils and the undisturbed sediments indicating the midden is part of the mound construction (McGimsey and Wiant 1984:32-33, Figure 19 and Figure 20) .

This inclusion may be partially justified because they report no “A horizon soil development” (McGimsey and Wiant 1984:41) at the interface of the midden and undisturbed sediments. A midden that was deposited and then subject to exposure is expected to exhibit pedogenesis as soil formation gradually occurs. The lack of soil development leads to the conclusion the midden is not in situ.

A lack of pedogenic features in the clearly undisturbed premound sediments led Hajic (2005:5) to argue that the Cahokians removed the top soil in some places before the construction of Monks Mound. The recent soil coring (see above “Results”) also encountered a similar kind of interface between certain undisturbed submound sediments and sediments that could be either a buried soil or moundfill sediments. In most archaeological instances, midden or buried soils are expected to display at least incipient pedogenic features since these soils are expected to have been subject to weathering. On the other hand, submound soils like those beneath Monks Mound, which were first subject to disturbance and then buried rapidly are not expected to demonstrate pedogenic features.

An abrupt transition between undisturbed soils and overlying midden or fill deposits is expected because of the impact of pre-mound activity and/or construction and filling on the top soil sequence. Trampling either before or concurrent with construction would have completely destroyed any soil structure, A horizon development, or pedogenic features in the top several centimeters of the submound solum (see Butler (1995) Ros (2004), Kozlowski (1999), McDonald (2007), Pietola (2005), Andres-Abellan (2005), Rapp and Hill (1998:32) and references therein for studies of soil trampling and zoogeomorphological processes). Soil trampling associated with the number of people living at the Cahokia site and construction at the scale of Monks Mound would have homogenized any midden or top soil deposits and the boundary between the disturbed zone and undisturbed sediments would be abrupt. The disturbed zone should be classified properly as an A_p horizon. The stratigraphic profile would resemble a column dug into a recently plowed field. Quickly burying the surface would preserve the profile and yield what was seen by McGimsey and Wiant (1984) and Hajic (2005).

The expectation for soil profile for the interface between emplaced sediments and incidental sediments based on this reasoning is (from top to bottom) $C_{\text{mounfill}}-A_{\text{pb}}-C_{\text{undisturbed}}$. In the case of the slope wash deposits, the expected sequence is $B_w-A_{\text{pb}}-C_{\text{undisturbed}}$. In these kinds of situations, slope wash coming off the mound immediately after it was built would have buried the A_p horizon. The $A_{\text{pb}}-C_{\text{undisturbed}}$ portion of the solum should be considered as premound. Importantly, the sequence only addresses relative time and general classification. There are no implications of absolute timing. The A_{pb} horizon could include materials related to a time immediately before mound

construction or the A_{pb} horizon could include materials deposited relatively distant in time from the period of mound building.

To speculate on the pre-mound geomorphological environment, it may be useful to think about the pre-mound surface as similar to a plaza. Plazas are regular features of the American archaeological landscape (see for example M. Heckenberger 2005:292, Kidder 2004a). Across the ancient Americas (especially Eastern North America and Amazonia), plazas were the focus of community life. At the Cahokia site, at least five discrete plazas have been identified (Fowler 1997, J. Kelly 1996b). Archaeologically, plazas are usually considered to be uninhabited, although strictly speaking this is not exactly the case. Research clearly demonstrates plazas have histories and were not static features of the landscape (Kidder 2004a). Importantly, plazas were the locus of large-scale community activity. As a consequence plazas were devoid of vegetation and subject to constant mechanical disturbance through regular intense foot traffic.

Heckenberger and colleagues (2003:1712) note the impact of plaza use on vegetative communities may last on the order of centuries (see Kidder 1998:151 for a discussion of human impact on the landscape in the Mississippi River Delta). Rather than thinking about the pre-mound surface as a stripped location, it may be better to think of the pre-Monks Mound landscape as a location with a long history of intense use. Monks Mound was likely built over a historically important locale that would have been amenable to moundbuilding.

The data provided by the coring and recent mapping refine our knowledge of the pre-mound landscape in three other ways. Core data are useful for understanding the slope of the pre-mound surface, soil texture data suggest ancient environments of deposition,

and map data provide insight into possible ancient borrowing north of Monks Mound along the ancient bankline.

Finally, these cores suggest the mound was built rather quickly. No buried landscapes were identified. If the mound was constructed in a series of episodes over the course of many episodes spanning decades to centuries, one would expect a series of stable surfaces buried by slope wash deposits. This sequence is expected since after each stage of mound construction there would be a short period of wash coming off the new added mound layers. The mound would stabilize after a period of time (on the order of months to perhaps a year) permitting plants and soil formation to begin in the wash deposits. Subsequent mound building would begin this process anew. Therefore, the sequence should demonstrate a series of A horizon soils buried by episodic colluvial deposition. In the sections of the cores identified as intact beneath the modern landscape (*circa* 1850) all cores penetrated massive slope wash deposits (>1 meter) indicating that at least the initial construction of Monks Mound were done in a single massive effort. Data about the latest efforts — if indeed there were any — was unavailable due to more recent disturbance.

Modeling the Pre-mound Surface

To develop a better understanding of the premound surface, I modeled the elevation of this surface using the ARCGIS 9.3 software. Coordinates for soil cores and the corresponding elevation for the submound/mound interface, (X and Y) originally surveyed in the local system were first converted to a global system (State Plane NAD 1983, Illinois Zone 16N fips 1202). This step was necessary for using these data in

geographically based software. This datum and projection were chosen in particular since this system was chosen by survey crews in 2005. Although transformation inaccuracies are inevitable, at the resolution of this analysis any induced inaccuracies are meaningless. Cores without a readily identifiable interface were excluded from the analysis. To minimize edge effects, nine surface locations from outside of the survey area were added to the model. Data from the three cores excavated by McGimsey and Wiant (1984) were also included because these provide information about the central portion of the mound.

Data were modeled using a linear trend surface interpolator. This routine creates a least squares surface using a polynomial regression equation to understand general trends within the data. A trend surface necessarily is an abstract or generalized surface and was chosen because of a scarcity of data points. In trend analysis a line is best fit to a set of data point. The process is similar to creating a regression line for two-dimensional data set. Future work with more data points may better model the submound surface using different interpolation techniques such as kriging or inverse distance weighing.

In spite of a scarcity of fine-grained data, there is a clear trend to the premound elevation (Figure 49).

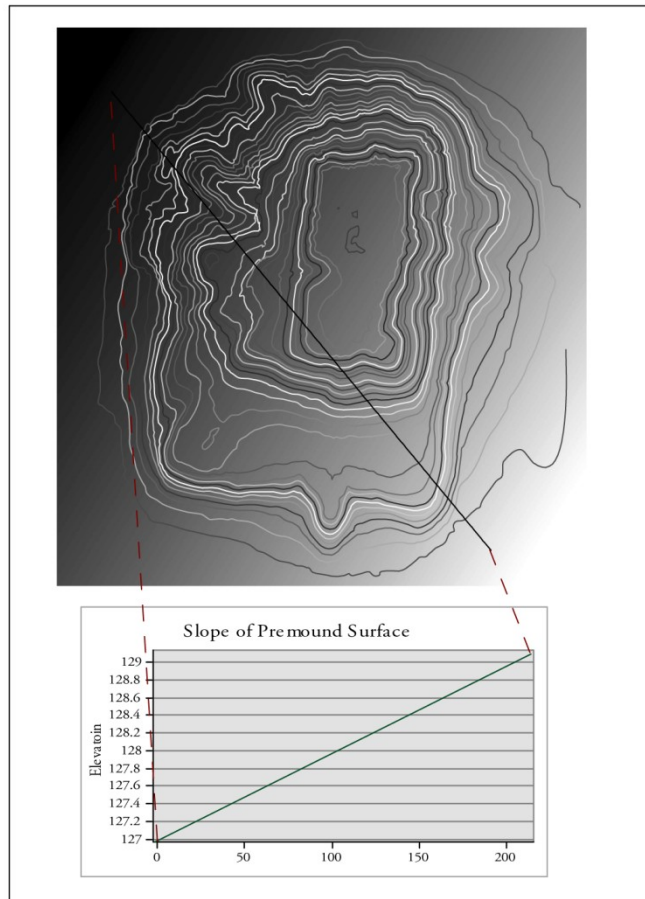


Figure 49. Pre-mound trend

The southern and eastern sides of the pre-construction surface have the highest elevations while the northern and western edges are considerably lower. From the southeast corner to the northwest corner of the mound, the subsurface elevation drops by at least 2 meters, actual drop may be closer to 3 meters. The slope of the pre mound surface has also been noted by Hajic (2005:8) who suggests Monks Mound may be built over a local topographic high³².

The trend observed in the pre mound surface may be influenced by nineteenth century disturbance on the Northwest corner where Ramey constructed a house after

1864. However, coring in areas clearly not affected by Ramey's household, and a review of previous excavation, also suggests this general trend is valid. Work by Williams (1975:63, see also Williams n.d.) on the southeastern Lobe, indicates in situ natural levee sediments lie around 128 to 129 amsl. Unpublished work from the Washington University in St. Louis excavations at the base of the southern ramp also suggests the old ground surface is at 128.25 amsl (Lotz 1971). Both of these excavations encountered an early cultural occupation that corresponds chronologically with the midden discovered by McGimsey and Wiant. Slope wash deposits from Monks Mound covered these early middens, in both instances. Taken as a whole, these data suggest Monks Mound overlies an early occupation. The early occupation surface dips toward the Northwest.

Whether the premound slope is the result of settling (compression) or a pre-existing condition is not known. Since the surface of the fourth terrace appears flat, in both modern photos and in historic drawings, I suggest this is a pre-existing condition. Trend analysis of the premound surface indicates the ancient Cahokian built Monks Mound on an uneven plane that dips toward the Edelhardt meander. A tilted foundation may exacerbate the modern and ancient slumping of the western and northern slopes.

In addition to being necessary to understand the geological context of the mound/premound interface, properly identifying the mound/premound interface is imperative for understanding the relationship between the Edelhardt meander and Monks Mound. Although the general relationship of the Edelhardt meander and Monks Mound are well understood —Monks Mound is constructed atop soils deposited as overbank fines from the Mississippi River when it flowed through the Edelhardt meander (e.g., Fowler 1997, Milner 1998) – specifics of this relationship are lacking. For example,

Dalan and her colleagues (Dalan et al. 2003:69) note that Monks Mound was constructed atop Helm's Ridge, a sand ridge that they believe is a point bar deposit from the Edelhardt Channel of the Mississippi River³³. A review of the morphology of the Edelhardt channel clearly demonstrates Monks Mound is on the cut bank and therefore cannot lie atop point bar deposits of the Edelhardt channel (Saucier 1994). The Cahokia site must lie on top of Spring Lake aged point bar deposits and be draped by Edelhardt overbank fines. Helm's Ridge has uncertain associations, but assuming the Cahokia site lies on Spring Lake point bar sediments, Helm's Ridge must be younger than the Spring Lake channel. Dating of the Spring Lake channel is uncertain although it can be bracketed by the inception of a high sinuosity meandering system within the American Bottom (*circa* 10,600 rcybp) and the Edelhardt aged channel (*circa* 5500-3600 rcybp.) (Grimley et al. 2007).

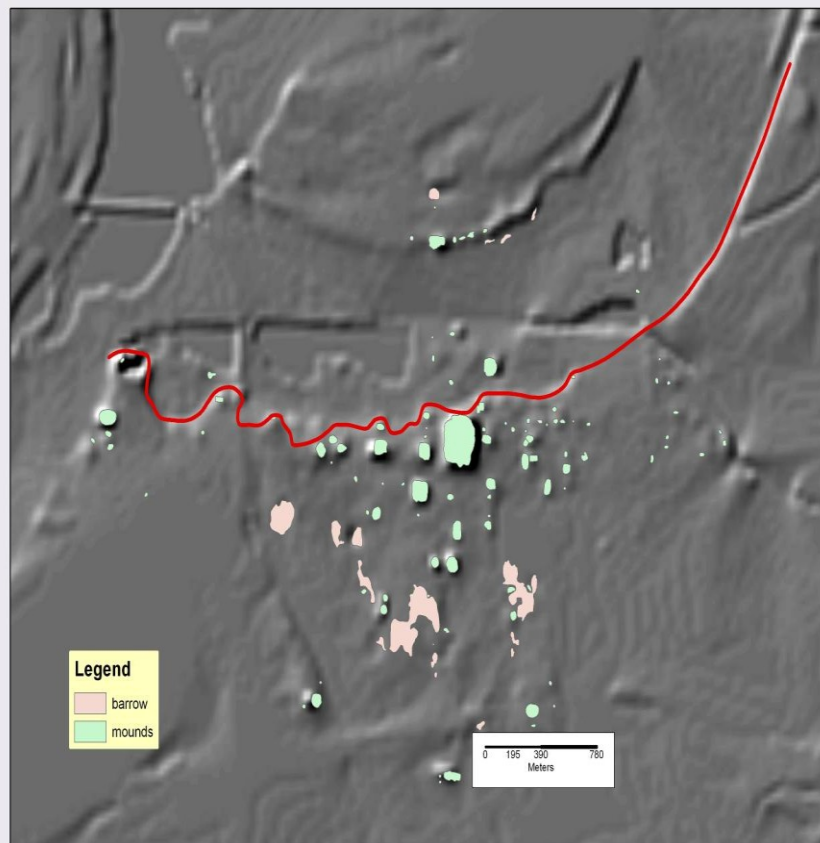


Figure 50. DEM displaying the morphology of bankline near the Cahokia site. Compare the eastern and northern portions to the area immediately adjacent to the mound site.

The gross morphology of the landform underlying Monks Mound is a cut bank, but the topography north of Monks Mound and extending east and west the length of the state historic site is unusual when compared to other places along the Edelhardt meander (Figure 50). Based on the morphology of the bankline, it is not unreasonable to suggest this area was modified through borrowing by the Cahokians. The bank line may also have been reclaimed because fill deposits may have been identified in excavation by Bareis (as cited by Fowler 1997:72). It is not known if the fill identified by Bareis is related to the construction of Mound 17, just to west of the Bareis' excavations, or to other earth moving projects, ancient or modern. Kelly and colleagues have also identified a

reclaimed borrow area beneath Mound 34 to the west of Monks Mound along the Edelhardt bankline (John Kelly 2009, personal communication).

Another possibility for the unusual morphology of the ancient bankline north of the Cahokia site may be erosion. Fowler (1997:72, see also Pauketat and Koldehoff 2002) cites Perino as noting severe flooding in the 1940s eroded the escarpment north of Monks Mound. If flooding were the cause of the unusual morphology of the modern topography, then one wonders why flooding affected the bankline differentially. The edge of the Edelhardt aged channel east and north of the Cahokia site is demonstrably smoother than the portion immediately adjacent to the site.

Slope wash deposits ranged from >40 percent sand to almost entirely silt or clay. Although I initially believe that a discrete signature of slope wash from the fourth terrace would be identifiable based on grain size, high levels of sand do not correlate with specific locations, such as the northern slope, where slope wash deposits from the fourth terrace would be expected. Results may be influenced by the location of the core. In general, coarser soils were found along the southern and eastern slopes. The southern and eastern slopes are closer to the sandy soils found in the Grand Plaza (Dalan et al. 2003). This may suggest sourcing of moundfills, especially the fills used to build the upper levels, was based on location of the source in addition to other characteristics such as color or symbolic association. Then again, since slope wash soils are a sample of sediments that eroded at any one particular time and the sample is sorted by gravity, materials from the fourth terrace may be present in the stratigraphically lowest slope wash deposits, but their contribution to the overall deposit may be overshadowed by sediments from other contexts.

Calculating the Volume of Monks Mound

Although not one of the immediate goals of the project, by using the interface of mound/submound soils as an approximate basal or pre-mound elevation, it is possible to gain a finer-grained understanding of the volume of soil contained by Monks Mound. Estimates of the volume of the mound range widely from over 820,000 m³ to less than 600,000 m³ — a little over 15 percent difference (as cited by Milner (1998:144), see also Galaty (1996:37) and Dalan et al. (2003:108)). To place the need for a finer-grained understanding into perspective, the range of variation in these estimates is approximately the same as the volume of Mound A at Poverty Point (ca. 238,000 m³ — the next largest earthen mound in Eastern North America (Kidder et al. 2009)). The method used to estimate the volume of Monks Mound requires creating a model of the mound's surface and a model of the submound surface. These two surfaces can then be used with the cut/fill routine in a GIS or mapping software to understand the volume of the mound.

Data produced from the 2005 mapping of Monks Mound were used to model the present surface of the mound. The previously described trend model of the pre-mound surface was used as the beginning surface. To minimize edge effects, surface elevations outside of the immediate survey area were included in the model. These points represent a proposed limit of slope wash deposits. Since the two surfaces encompassed an area well beyond the limits of the mound, the datasets were trimmed to the limits of the mound as approximated by the grid coordinates of the 129-meter topographic line. This method provides a conservative estimate of mound volume since slope wash deposits clearly

extend beyond the proposed limits. From this method and these data, I estimate the volume of Monks Mound to be between 730,000 m³ and 740,000 m³.

Laboratory Analysis

Samples submitted for laboratory analysis were chosen on a judgmental basis. All samples were from contexts believed to be related to the submound surface. Laboratory analysis was done to detect any signatures of anthropogenic enrichment. Several general trends are evident in these data and should be discussed in greater depth. First, soil phosphate levels were generally high (Figure 51)

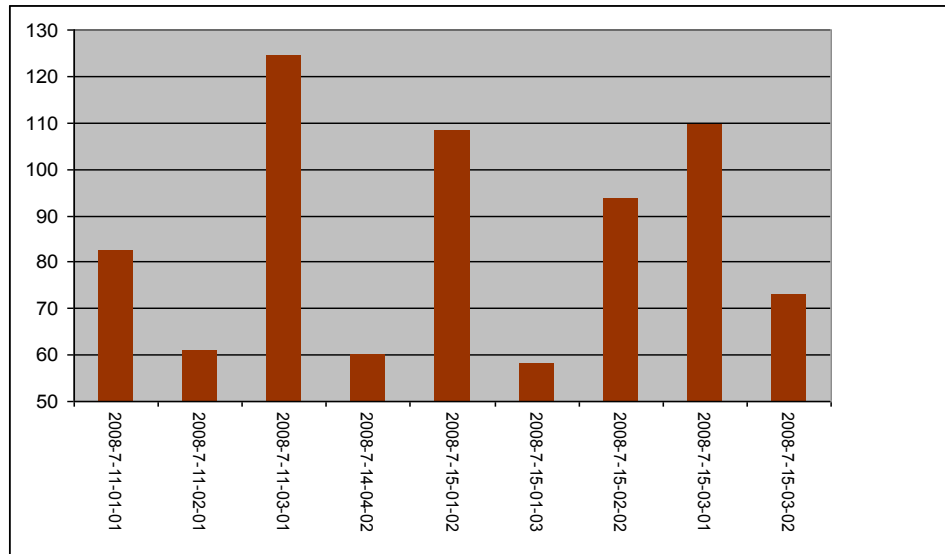


Figure 51. Ppm phosphates

Six out of nine samples generated phosphate levels over 70 ppm. A research project that I did on sediments in the area using similar methods suggest that phosphate levels greater than 70 ppm are enriched compared to normal phosphate levels (Schilling 2008). Human-related activity is the most likely source of phosphate enrichment at the

Cahokia site. These results suggest in at least six instances, anthropogenically modified sediments were encountered. Of the five, the three most enriched soils were identified as slope wash. The two remaining were in situ soils. The four samples falling below this threshold were identified as buried A_(p) horizons.

Second, organic carbon levels were generally low (mean = 1.54 percent). High organic carbon contexts are expected for midden areas or other occupation surfaces. The relatively low organic carbon levels paired with high phosphate levels in the slope wash deposits may indicate either organic carbon has been removed through leaching or during the initial erosion events; or the kinds of human activities that enriched the soils with phosphates are not associated with organic carbon.

Third, in comparison to moundfill deposits, the low field magnetic susceptibility of these samples was, with one exception, similar. No clear patterning was seen. This is not unexpected since fill and wash sediments were derived from the same sources. One possible reason for the lack of magnetic enrichment may be found in the context of these samples. Magnetic enrichment most readily occurs in stable surfaces that are subject to pedogenic factors (Dalan and Banerjee 1996). Since the soils tested were either slope wash or plowed soils which were buried quickly, these soils were not subject to in situ soil formation processes especially when compared to surfaces exposed for long periods of time. As Dalan (Watters Jr. et al. 1997) suggests, magnetic susceptibility in mounded contexts is best done using multiple kinds of analyses on the same sample. Future analysis may benefit from the addition of other geophysical techniques.

Finally, particle size analysis of soils found at the contact between the slope wash/mound deposits and submound soils were sandy or silty soils, no clay components

were identified. These soils are likely a mix of overbank deposits from the Edelhardt Channel of the Mississippi River. Such a mixture is not unexpected given the degree of hypothesized anthropogenic disturbance on the pre-mound surface.

Laboratory analysis of the selected soils from the submound surface suggests a pattern corresponding with the expected pattern for a zone of anthropogenic disturbance. Phosphate levels were high while organic carbon levels and magnetic susceptibility were low. Interface soils were a relatively homogeneous mix between silts and sand — albeit trending toward sandier soils. The most likely explanation for this patterning is that these sediments were subject to disturbance and, at the same time, exposed to environmental inputs for some degree of time. High phosphate levels suggest inputs of organic matter that were relatively completely broken down. Elevated levels of phosphates can also be achieved by removing plant cover so phosphates accumulate in the soil column. Low levels of organic carbon most likely resulted from leaching exacerbated by a lack of vegetative cover. Low magnetic susceptibility readings imply the soils were not subject to in situ weathering. On the whole, the soil analysis presents a picture where the top several centimeters of the pre-mound surface was subject to human disturbance.

Summary

At the outset of this chapter, three research objectives were outlined. They were:

1. Establish the basic geological/geomorphological context of the pre-mound surface.
2. Gauge the degree of landscape preparation done before the construction of Monks Mound.

3. Understand the relationship of Monks Mound to the relic Edelhardt meander.

Based on these data, the research objectives are summarized as:

Objective 1 and Objective 3.

Sub-Monks Mound soils consist of both overbank fines likely deposited by the Mississippi River while the Edelhardt channel was occupied. Soils trend from finer to coarser along a north to south line. This is somewhat unexpected in a normal overbank sequence, but with the proximity of Monks Mound to Helm's Ridge (Dalan et al. 2003:70, Figure 20), the results are not out of line. Research is needed to confirm the age and origin of Helm's Ridge. The morphology of Helm's Ridge and the Edelhardt channel indicate the ridge cannot be a point bar since it is on the cut bank side of the channel (cf. Dalan et al. 2003:69).

Objective 2.

The ancient Cahokians likely did little to specifically prepare the surface before the construction of Monks Mound. Submound soils have the structural appearance of plowed soils, i.e. an unstructured zone overlying an in situ deposit with a sharp break between the two. Disturbance during the construction of the mound may explain why the soils look plowed. In spite of a lack of visible soil preparation, the location of Monks Mound was probably prepared in a cultural or symbolic manner such as the placement of specific materials, the use of special plants, or ritual cleansing. Engineering considerations, such as the construction of a level platform or stripping A horizon soils

likely were secondary to cultural aspects of construction such as the choice of symbolically appropriate soils and their locations relative to the mound.

This coring also provided additional information about the possible mound construction chronology. Based on the observations made from these soil cores, initial efforts at mound building were done on a very large and continuous scale. All identifiable slope wash deposits were massive with no internal periods of stability. With a stage model where construction was done at a generational periodicity, such as proposed by Reed et al. (1968) one would expect slope wash deposits to be interrupted by stable landscapes.

Chapter V: A High Resolution Construction Chronology of Monks Mound

By 1300 A.D., the monumental landscape of the Cahokia site consisted of a palimpsest of unique yet interrelated mounds and spaces connected through a common history. Consequently, any understanding of the history of the Cahokian landscape needs to have high-resolution chronological models of the individual elements. A high-resolution model is particularly relevant for Monks Mound given its scale and assumed social importance.

Although work at Monks Mound has produced a sufficient number of radiocarbon dates to allow the creation of a fine-scale chronometric history of the monument, the techniques for evaluating these data create ambiguity in interpretation. Consequently, opinions are divided over the absolute beginning of mound construction and the ultimate duration of mound construction. In this chapter, I first evaluate the chronometric database from Monks Mound, and then I model the construction chronology using a Bayesian modeling framework. Interpretations derived from this analysis are later used to develop a social history of the Cahokian polity.

An Introduction to the Bayesian Approach for Chronological Modeling

Traditional statistical studies in archaeology rely on one of two types of statistical inference. Workers usually use either descriptive statistics that summarize trends in

populations of things, or they use exploratory data analysis to infer the possible underlying processes responsible for patterns in archaeological remains (Baxter 2003, Buck et al. 1996, Drennan 1996, M. Fletcher and Lock 2005). Statistical analysis is often used to create models (e.g. Clarke 1972) or heuristic devices to explain some past phenomenon. Since the late 1980s, researchers working primarily in Great Britain have promoted and developed a Bayesian approach to archaeological analysis (Baxter 2003:178). Bayesian statistics differ from standard approaches by incorporating prior knowledge into the modeling process and using a probabilistic view of uncertainty rather than a frequentist view (Gelman 2005:12). Bayesian analysis is rooted in the work of Reverend Thomas Bayes (1763) who proposed that the posterior probability [posterior belief] of a happening is proportional to the likelihood [probability of a happening] times the prior probability [*a priori* belief] or $\Pr(\text{parameters} \mid \text{data}) \propto l(\text{parameters} \mid \text{data}) * \Pr(\text{parameters} \mid \text{data})$ (Buck et al. 1996:21). As a general framework for archaeological research this insight is useful because the probability of past phenomena, such as the location of archaeological sites or the probability of events occurring in a specified order can be modeled in a manner that takes into account previous knowledge in a quantifiable and systematic manner. Based on the modeled information new insights can be derived or new data collection strategies can be created.

Although the Bayesian framework has existed for over 300 years, until the development of inexpensive and readily available computers, these kinds of analyses were not done because they require immense amounts of calculations for even the simplest analysis. Along with the development of powerful computers, new mathematical routines based on Markov Chain/Monte Carlo (MCMC) simulations have allowed

researchers to begin to implement a Bayesian framework. This can be seen in the development of various computer programs specifically designed to model radiocarbon dates (Bronk Ramsey 1995).

Before describing the mechanics of radiocarbon modeling, a discussion of the modeling process as used in this dissertation is necessary. Although modeling, especially as used in archaeology, holds various meanings to individual researchers (see for example Kohler and van der Leeuw (2007) or chapters in Beekman and Baden (2004)), the approach used herein is an explicitly mathematical approach. The ultimate goal of the modeling process is to understand archaeological phenomena in an empirical way (Kohler and van der Leeuw 2007:3). These can then be used to create historical explanations of past cultural activity. Models are situation-specific and no one model fits all scenarios, but the modeling process is applicable anywhere archaeological phenomena can be quantified. For discussion purposes, I have formalized the approach used in this dissertation as a four-step process: define the problem; develop a mathematical model; compute; and evaluate and reassess. This is similar to an approach advocated by Buck et al. (1996, Chapter 13) and Bayliss and Bronk Ramsey (2004:29-35). In practice, there is much blending and moving back and forth between individual steps in the process.

Although Bayesian modeling is commonplace in many social sciences, especially in predictive epidemiological modeling, the method has only seen limited use in archaeological research. Most commonly, workers use Bayesian methods to investigate site chronologies provided by radiocarbon dating (Bronk Ramsey 2001) or spatial analysis (Robertson 1999). Because the calibration of radiocarbon dates yields a range of probable dates (Stuiver et al. 2004), researchers have developed numerous computer

programs specifically to model radiocarbon chronologies based on the application of Bayes' Theorem (Bronk Ramsey 1995, 2001, Buck et al. 1999, Danzeglocke et al. 2009). The following discussion describes the basic operation of the OxCal 4.0 computer program although the discussion is applicable to any Bayesian modeling program.

Using the four-step process noted above, the first step is to define the problem. If the analysis occurs after data collection, then the problem should be designed to utilize the existing data to the fullest. On the other hand, if the problem is defined before the data acquisition, then the problem can be used to guide collection strategies. Either way, the problem should be phrased explicitly in terms of chronology.

OxCal is designed around the terminology and principal utilized in a Harris Matrix (Harris 1989, Harris and Reece 1979). Harris Matrices are formalized schematics of the stratigraphic relationships between contexts from archaeological excavations. From the schematic relationships, step two can be implemented. Step two requires the worker to define the archaeological contexts in a mathematical way. In mathematical terms, contexts may be defined as $>$ (greater than) or $<$ (less than); or a $:$ (colon) may be used to described contexts where there is no stratigraphic or other reason for a priori ordering of the data. In this stage data are grouped according to the mathematical model. Groupings may be based on a number of criteria including but not limited stratigraphic order, the nature of boundaries, and the type of deposit. OxCal calls these "Phases" following Harris (1979). Phases can be limited either by externally derived termini — a priori data, or by the minimum and maximum of the dated elements from specific contexts — an uninformative prior model³⁴, depending on the available data, model structure, and research questions. Data are then modeled based on the mathematical understanding of

the contexts, considering things like ordering of elements, the relationship between the elements drawn primarily from the nature of the contacts between deposits, and the parameters (termini).

The third step in the process is to run the model. Running the model causes OxCal to first calibrate all radiocarbon determinations in the input structure. Calibrations are based on data provided by Stuiver et al. (2004). After calibration, likely date ranges for Phases are created using a Markov Chain Monte Carlo simulation process. Radiocarbon dates are then recalibrated to reflect a priori information. For example, if a terminus post quem is programmed into the model, then the calibrated date range of subsequent dates will be adjusted to reflect this parameter. Along with calibration and subsequent modeling, OxCal computes an agreement index to allow the researcher to evaluate the model. Conceptually boundaries are useful for modeling radiocarbon calibrations. To see how this works, suppose that an archaeologist working in England is interested in knowing when a particular deposit containing charred wheat may date to. In this case, the deposit lies below the remains of a fort that was burned when William the Conqueror invaded England in 1066 A.D.. A coin bearing the image of Alfred the Great, who became king of England in 871 A.D., was found mixed in with the deposit. Contextually, then the age of the wheat can be constrained by the minimum age of the coin (871 A.D.) and the age of the burning event (1066 A.D.). Suppose a radiocarbon date was run on the wheat and it gave an uncalibrated radiocarbon age of 1150 ± 25 years before present. Given the stratigraphic constraints, it is possible to say the real age of this specimen must lie between 871 A.D. and 1066 A.D.. This forms a chronological model that can be programmed into OxCal (Figure 52). This model yields a modeled age for the wheat

sample and a statistic to judge if the model is correct. The statistic is called an agreement index.

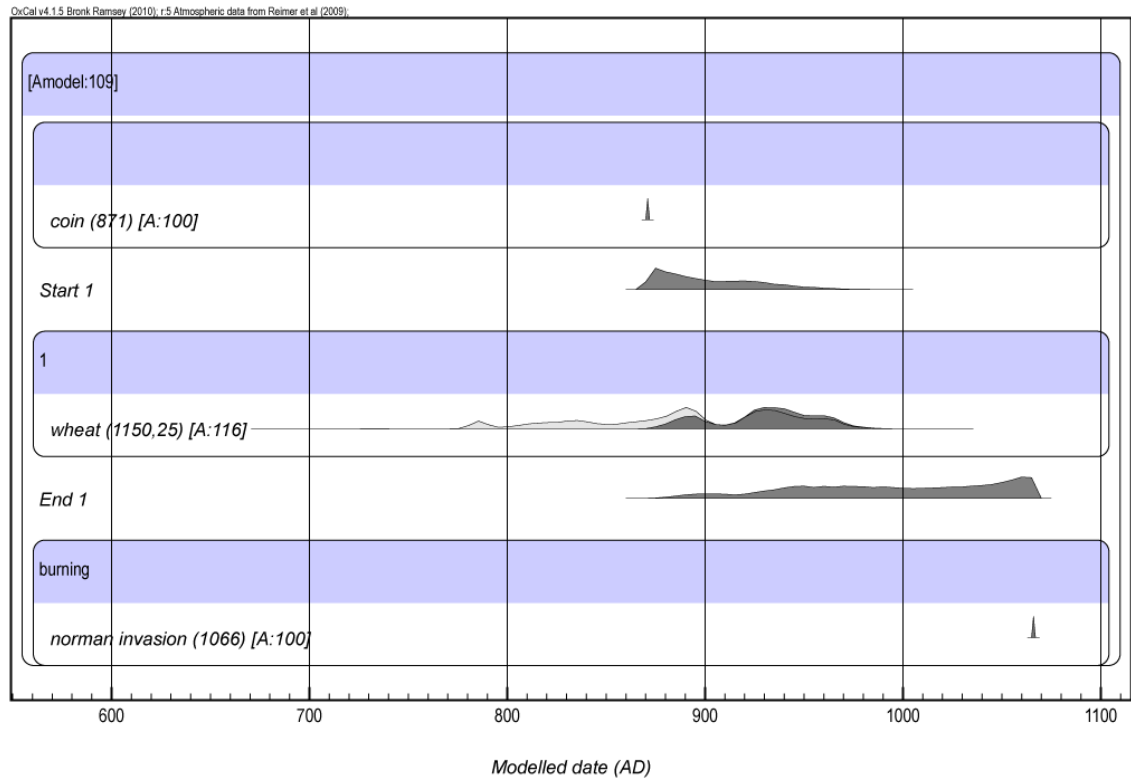


Figure 52. OxCal Model Example.

In the above figure, modeling suggests the wheat date can be constrained between the 871 A.D. and 1066 A.D.. Constraining the date moves the distribution of the calibrated probable age.

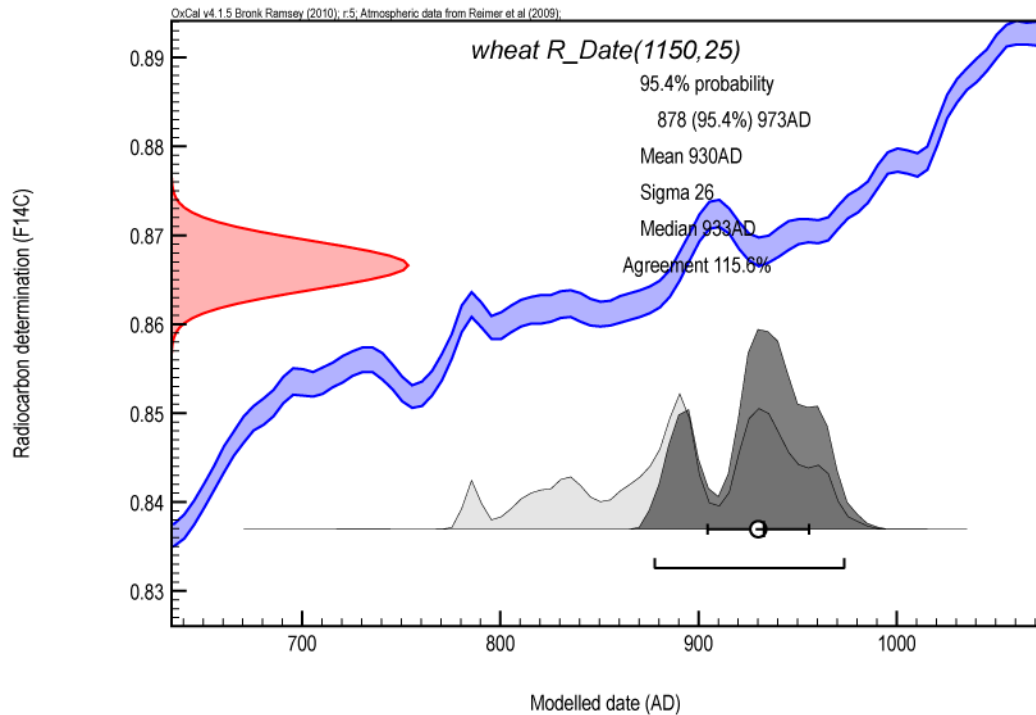


Figure 53. Modeled age of example.

Figure 53 shows the a posteriori age of the deposit. In this instance, the mathematical impact of the terminus post quem (871 A.D.) moved the modeled age distribution towards a younger date. The unmodelled distribution is shown in light grey while the dark gray shows the modeled distribution. As stated in the model 100% of the probability of the calibrated age of the sample must be between 871 A.D. and 1066 A.D.. Consequently, the calibrated age of the sample was recomputed to reflect this situation. Since calibration is based on the ratio of radioactive carbon in a sample and the probability that the ratio is similar to a known sample, the constraints allow for a refinement in the calibration to reflect the stratigraphy and history. In this example, known dates were used as boundaries. In practice, radiocarbon dates from known

contexts can be used to create boundaries. Once, models are created, they can be queried for things like the span between boundaries or levels of agreement.

The agreement index (A) is used to judge the agreement between the model and the observed data. A threshold of 60 is considered similar to 5 percent confidence interval for the χ^2 test of simple combinations of normal distributions. Models with agreement indices below 60 are considered inconsistent with the data (Bronk Ramsey 1995:427-428). Models have three kinds of agreement, A, A_{model} , and A_{overall} . A indicates how well an individual date agrees with the model. A_{model} relates to the agreement of the entire model. A_{overall} is similar to A_{model} but is a product of the individual agreement indices.

The agreement index is essential to the fourth stage of the modeling process where the researcher evaluates and reassesses the model. In this stage, the researcher appraises the results. If the model is consistent with the data then no more modeling is necessary. If the model is inconsistent with the data, then reasons for the inconsistency should be investigated and the model should be re-computed. When agreement is reached between the model and the data, aspects of the model can be queried to understand temporal aspects of the distributions.

The following discussion creates a model for elements of the construction chronology of Monks Mound. The discussion highlights two important points that need further elucidation. First, these are models to be tested rather than explicit statements of the state of the knowledge. Although I do believe these are the most correct interpretations of the available data, they are subject to change given new information. The second point is derived from the first. The model presented here is the result of a systematic incorporation of both contextual and statistic data. As new data become

available the process presented here is open to the incorporation of these data. Modeling the Construction Chronology of Monks Mound

The problem for this analysis was defined as: what is the construction chronology of Monks Mound? In other words, when was the mound built and how long did it take to build? For understanding this potentially very complex archaeological problem, I created a formal model to direct subsequent analysis (Buck et al. 1996). The construction chronology can be derived from knowing the ages of the initial and terminal construction events. In mathematical terms, the construction chronology of Monks Mound can be stated as $A < B < C$, where A represents the age of the submound surface, B represents a time when the building on the fourth terrace was constructed, and C represents a time after the construction of the first terrace (Figure 54). In addition to being the simplest and most inclusive, this model also explains stratigraphic positioning. Excavation demonstrates C overlies B, which overlies A. Modeling the problem in this way neatly

Monks Mound Profile, viewed from the East

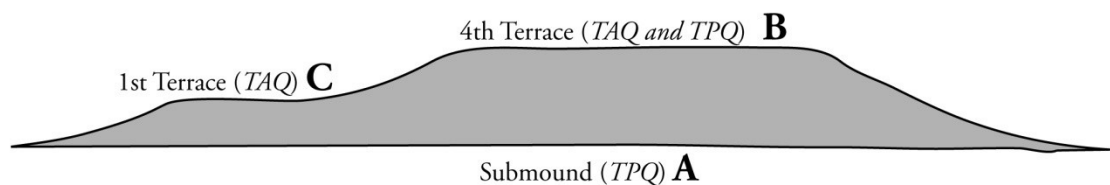


Figure 54. Schematic of Monks Mound. directs subsequent analysis by limiting the probability of calibrated date ranges for any one stratum according to the observed stratigraphy.

Establishing the age of deposits immediately beneath the mound from a wide number of readily identifiable contexts is the most direct way to establish a terminus post quem (TPQ) for mound building. However, given the context of submound deposits, i.e., the largest earthen mound in North America and the iconic element of the Cahokian landscape covers these deposits, it is unlikely that traditional excavations will ever be able to recover datable materials from the submound surface. Therefore, workers must rely on dating organic remains recovered from soil cores or excavations that penetrate slope wash deposits as a TPQ for Monks Mound. There are seven radiocarbon samples that may serve as possible TPQs.

Dates from summit deposits yield a terminus ante quem (TAQ) for the construction of the main body of the mound (Fischer 1972). The TAQ establishes a maximum age for the end of the main phase of mound building. Three samples collected and dated by Nelson Reed and his colleagues serve as a TAQ for the main mound construction (Fowler 1997).

Excavation done by SIU-Edwardsville and reported on by William Woods' students (Skele 1988, see also Bareis 1975) indicates first terrace sediments overlie a surface that may originate at the mound's summit; consequently, they argue the first terrace is a later addition to the main body of the mound (Martignoni 2003, Skele 1988). Thus, surface dates from the first terrace serve as a TAQ for the time of construction for the fourth terrace. Materials collected and reported on by Elizabeth Benchley represent a *TAQ* for the first terrace (Benchley 1975).

The Chronometric Dataset from Monks Mound

There are twenty-nine radiocarbon and five archaeomagnetic dates from Monks Mound. As noted above, workers recovered these dates from a wide number of contexts over the course of the past four decades of archaeological research. Not all of these data are useful for creating a history of the mound construction. In certain instances, either the contexts are not particularly appropriate to understand mound construction or the material may be subject to a number of particular problems, such as the “old wood problem.” (Schiffer 1987, Robert E. Taylor 1987) Before an accurate construction model(s) of Monks Mound can be made, researchers need to know with a degree of certainty when the mound was first initiated and when the mound was finished. For this reason, it is best to group the chronometric data by context and consider each instance individually.

Submound dates

Eight existing radiocarbon dates (Table 22) come from contexts that are stratigraphically inferior to mound construction. Hypothetically, each represents a TPQ, yet the goal is to create a high-resolution temporal model of mound construction. Therefore each data point must be considered in relation its stratigraphic position and what the sample actually dates, ensuring the greatest precision possible.

Two of these dates probably represent time periods far removed from the immediate pre-mound period. I2309 (1110 ± 70 rcybp) recovered by Reed et al. in 1968 and reported by Fowler (1997:212, see also Reed et al. 1968) likely, based on the judgment of Reed and his colleagues and Fowler, sampled organic material living during the pre-mound, Late Woodland period. Unfortunately, there is no independent way to

check the validity of these statements as no information about a more specific provenience is available. Therefore, given the great uncertainty with this date, it should be used only as a very general TPQ. The second date, ISGS1252 (1190 ±90 rcybp), was recovered by McGimsey and Wiant (1984) from a solid soil core excavated through the Northeast quadrant of the fourth terrace. Based on the elevation of the sample (127.8-126.69 masl) which is below the pre-mound surface as found through investigations reported on earlier in this dissertation and the date returned, there is a high potential for this sample also to relate to activity well before the time of interest. Similar to I2309, this sample is only useful as a very general TPQ.

More recent work has produced a suite of six dates that may serve as TPQs for mound construction. four were recovered by Hajic and Kelly in 2005 and one was recovered by Williams in 1971 (Hajic 2005, K. Williams 1975). Of the five Hajic and Kelly dates, Hajic argues one sample (BETA207042- 1010 ±40 rcybp) is from a submound context whereas the four other dates (BETA207039 – 980 ±40 rcybp, BETA207040 – 960 ±60 rcybp, BETA207041 – 950 ±40 rcybp, and BETA207044 – 900 ±40 rcybp) come from the earliest levels of mound fill and are not well associated with the premound surface. Hajic's assessment is based on stratigraphy seen in the soil cores and the sample's elevations. Hajic believes these samples were located above any in situ natural levee sediments, which based on his observations, consist of gray to grayish brown silty clay loam as seen in Core 3 (Stratum 12ABb). He believes Core 3 is the only core where an intact alluvial surface was encountered. Accordingly, Core 1 terminated before the approximate levee depth. Cores 2 and 4 penetrated alluvial sediments, but there was no in situ soil formation between the sediments and the mound fill. Hajic

(2005) attributes the absence of a humic soil stratum to ancient stripping and borrowing. Overlying the alluvial surface in Core 3, workers encountered approximately 50 cm of organic enriched silty loams and sands, which Hajic identified as the initial moundfill episodes.

Although Hajic presents a compelling argument, I believe there is another more plausible explanation of the elevation and depositional sequence. Examining previous work around the base of Monks Mound, there is clear evidence for late Emergent Mississippian period and possibly earlier occupation (Lotz 1971, McGimsey and Wiant 1984, K. Williams 1975). Soil coring by McGimsey and Wiant demonstrates midden deposits covered by moundfill with no classic A horizon expression seen between the midden and moundfill sediments. The midden deposits ranged from about 30 to 110 cm thick and were initially encountered at approximately 127.5 mamsl. Here, I suggest Hajic's interpretation of the sedimentary sequence is too conservative as a result of using in situ pedogenic features as the marker for the premound surface. Rather it is more likely that the 50 cm of organic enriched silty loams and sands identified by Hajic is an anthropogenic soil related to a premound occupation and this anthropogenic soil is in fact the premound levee surface. The pedogenic markers that Hajic was looking for have been obliterated by anthropogenic activity — although technically anthropogenesis is a form of pedogenesis. If this is the case then the submound surface may be closer to 127.5 mamsl rather than 126.5 mamsl as argued by Hajic. Accepting a revised stratigraphy has implication for the radiocarbon sequence, as BETA207041, and BETA207044 now become immediate TPQ's for mound building. BETA207042, though still a TPQ, relates to an older time and is less useful for a high precision model. Since Core 1 only reach

129 mamsl, the dates (BETA207040 and BETA207039) from this core are not useful for TPQ's. This reinterpretation also agrees better with the stratigraphy and chronology seen by Williams (1975). This interpretation is also supported by data collected in 2008 and reported on in the previous chapter.

The sample recovered by Williams (1975:22-24), WIS587 (925 ± 60 rcybp), was taken from a Feature 284 excavated into undisturbed soil and covered by thin lenses of various colored sediment. This sample may exacerbate some of the confusion over Monks Mound as Fowler (1997:212) reports the date as 1150 ± 60 BP whereas Williams (1975:24) reports 925 ± 60 BP as the date. Bender et al. (1973:612) agree with Williams therefore the 925 ± 60 BP is the value used in this analysis.

Despite the radiometric determination, Williams (1975:24) argues Feature 284 is a Patrick (ca. 800 A.D.) phase house covered by later occupation debris. If the radiocarbon date is correct, then the feature likely dates to the Edelhardt Phase or later. Williams' stratigraphy suggests slope wash from the construction of Monks Mound then buried Feature 284. The latter interpretation then would indicate that the date is particularly useful as a TPQ since construction sediments from mound building cover the feature. For modeling purposes, second scenario is preferred over the first.

Since, in most cases, radiocarbon dating only indirectly dates human activity, it is imperative to date materials that induce as little a time lag as possible. In the instances of materials dated by Hajic, these samples are believed to be from a surface buried by mound building and therefore relate to a time just before mound building. These contexts are ideal for high resolution modeling because after mound construction the contexts would be covered by meters of earth thereby cutting off the ground surface from new

carbon inputs and lessening the chance for contamination by later carbon. It is important to note the samples recovered by Hajic only represent a time when the plants living ground surface were actively interacting in the carbon cycle and only by proxy can we use these dates as a TPQ since human behavior was the activity that removed these materials from the carbon cycle. The Williams' sample represents a similar situation. The sample, burnt thatch and ash (K. Williams 1975), was certainly related to human activity, and since mound construction sediments cover the feature, the period of interest must be later.

Sample No.	RCYBP	Standard Error	Reference	Comments
BETA207044	900	40	Hajic 2005	Kelly and Hajic Core 4, sub-East slump
WIS587	925	60	Williams 1975, Bender 1973	East lobes, "Burnt thatch layer with ash lens interspersed. East lobes N150-152."
BETA207041	950	40	Hajic 2005	Kelly and Hajic Core 3, sub West Slump
BETA207040	960	60	Hajic 2005	Kelly and Hajic Core 1, sub West slump
BETA207039	980	40	Hajic 2005	Kelly and Hajic Core 1, interior West slump
BETA207042	1010	40	Hajic 2005	Kelly and Hajic Core 3, sub West Slump
I2309	1110	70	Reed et al. 1968	ISM Core, "Preceeds Monks Mound. Late Woodland occupation."
ISGS1252	1190	90	McGimsey and Wiant 1984	Wiant & McGimsey core 1, midden, 127.8-126.69

Table 22. Submound dates.

Moundfill Dates

Moundfill dates may be the least useful and most problematic of all chronometric determinations from Monks Mound (Table 23). Because these dates are from material buried deep within the mound and only in rare instances are the contexts readily observable, the associations of these materials are suspect. In fact, even without the

uncertain contexts these data may not be necessary because the time of construction is well constrained by submound and mound surface dates. Even though the dates are useful in a very general manner as a TPQ for construction since construction must have occurred after these materials were removed from the carbon cycle, more secure contexts exist. Hence, moundfill dates are not used in the construction models, but for consistency and completeness these dates are briefly described.

There are six dates recovered from moundfill contexts. Perhaps the most famous of these, I2308 (1020 ±100 BP), was recovered by Reed et al (1968). I2308 consisted of “a piece of wood (Reed et al. 1968:144)” excavated with a Shelby tube soil sampler at a depth of approximately 21.5 (71 feet) meters below the fourth terrace surface. The discussion of the sample is somewhat limited although Reed et al. imply the sample is in primary context because of its size (Reed et al. 1968:144). On the other hand, they suggest even if the wood does not represent remains from in situ aboriginal activity, it is still useful for dating the earlier stages of the mound (Reed et al. 1968:144). This statement is certainly true because the age of the sample does serve as a TPQ for mound building, but the I2308 is less useful for high-resolution dating mound building than Reed and his co-authors believe because I2308 only measures a time after which the wood was removed from the carbon cycle. The context of the sample suggests I2308 was deposited with a basketload of building sediments since the sample was superimposed on dark clayey sediment within the mound. It is very unlikely that the prehistoric builders of Monks Mound utilized these clayey deposits as a mound surface since the dense bottomland clays do not drain well and when dry the soils are subject to cracking, neither which are optimal qualities for house floors or activity areas. This idea is further

supported by work reported by Fischer (1972) who noted soils associated with the fourth terrace building were coarse-grained sands and silts rather than fine-grained clays. Given the unsuitability of the underlying soil for occupation, sample I2308 is probably old wood deposited in the primary context for the moundfill rather than in-situ cultural material as implied by Reed et al. In this instance, I argue I2308 better dates the age of the moundfill source sediments than the age of the mound.

Four dates, BETA241384 (770 ±40 rcybp), BETA241385 (960 ±40 rcybp), A1159 (955 ±15 rcybp), and A1160 (1030 ±15 rcybp), also fall into the moundfill category. These samples were recovered as part of the 2007 East Slope repairs. Although the context of these samples is better documented than other moundfill samples, they are not without problems (see Chapter III). BETA241384 and A1159 were excavated from a sod block construction at 144.3 mamsl. The sample was rinsed through a #270 screen and the organic material was recovered. Uncarbonized grass-like stems and leaves were then submitted to two different radiocarbon labs for dating. The context of these remains is such that it is unclear if the deposit represents a primary mound building episode or if it represents a later repair. Either the sod-block construction was emplaced during the construction of the mound, representing an important variation from other observable mound construction techniques, or the sod-block construction was utilized to repair erosion after the mound was constructed. Disturbance and subsequent repair have obscured the relationship between the one observable mound face and the sod-block stratum, making interpretation equivocal.

Similarly, BETA241384 and A1160 may not represent a secure context for modeling purposes. The samples, taken from a log and limestone slab feature (Feature 1)

encountered during the slope excavations, were identified as *Taxodium sp.* (cypress) by Neil Lopinot (Lopinot and Fritz 2008). Feature 1 likely was constructed on a stable surface, albeit of unknown duration. The feature may represent a chamber buried within the mound that either collapsed during subsequent mound construction or sometime in the distant past causing a localized slump. In either event, the material submitted for radiocarbon dating was taken from a very long-lived tree species that is rare in the American Bottom and is especially resilient as a building material, resulting in a relatively high probability of a curation induced or other kind of time lag. In this instance, there is little to securely associate the cutting of the tree with the construction of the mound.

The final two dates were recovered by Kelly and Hajic in 2005 – BETA 207039 (980 ± 40 rcybp), and Reed et al. in 1966 – M1636 (840 ± 150 rcybp)³⁵. As noted by Hajic, BETA 207039 was recovered from the interior of the western slump. As a result, the materials are not particularly useful for modeling since they are neither associated with a clear mound surface nor were they in original context. M1636 was run on charcoal recovered from Level L (cf. Fischer 1972, Reed et al. 1968) of Reed et al.'s stratigraphy. Level L may not represent an occupation level compared to Level M1 and Level M2 as described by Fischer (1972); rather, it may represent a seasonal or other temporary hiatus in construction. Nevertheless, Reed and his coauthors argue the sample is useful as an indicator of the latest period of mound construction. However, provenience information for the materials neither is available nor is the sample described beyond charcoal.

Sample No.	RCYBP	Standard Error	Reference	Comments
BETA241384	770	40	This Dissertation	Sod Block
M1636	840	150	Reed et al. 1968	Reed's Level L
A1159	955	15	This Dissertation	Sod Block
BETA241385	960	40	This Dissertation	Feature 1
I2308	1020	100	Reed et. 1968	ISM Core, ca. 10 meters above pre-mound surface. First construction stage
A1160	1030	15	This Dissertation	Feature 1

Table 23. Moundfill dates.

Summit Dates

Summit dates represent terminus ante quem (TAQ) for mound building. From a definitional standpoint, any element located on the most stratigraphically superior contexts could serve as a TAQ, but the nearer (stratigraphically) these materials are to the event of interest, the greater the certainty becomes. Two contexts serve as TAQs for different stages of mound building — the surface of Terrace ¾ (Table 24) and the surface of Terrace 1 (Table 25).

All Terrace ¾ dates, W525 (870 ±55 rcybp), W527 (890 ±60 rcybp), and WIS528 (970 ±60 rcybp – erroneously reported as W970 by Fowler 1997:212), were recovered by Reed and Washington University in St. Louis workers during the 1970 field season (Bender et al. 1973). Samples submitted for dating were recovered from identifiable and documented features found on the upper surface of the main mound. All samples consisted of wood fragments from posts used in the construction of the summit building. These samples can be unambiguously connected to human activity but they are subject to the “old wood problem” in that no documentation exists describing from where, in relation to the outermost growth rings, the sample was extracted. In addition, no

mention is made of the species of wood, although recent reports by Reed (2009:35) indicate L. Conrad identified the wood samples as hickory (*Carya* sp.).

Although dates from these samples may represent “old wood,” the problem is not especially troublesome to the overall model. As noted by Fischer (1972), these materials were used as posts in a building. In this instance, the old wood problem may be somewhat attenuated by the examination of material culture associated with the fourth terrace building. The scant material remains recovered from the fourth terrace excavations suggests the summit building was in use during the Stirling Phase (ca. 1100 A.D. to 1200 A.D.) (Fischer 1972; John Kelly, personal communication 2007). The calibrated radiocarbon dates for the samples agree with this assessment. If the calibrated dates were significantly older than the Stirling Phase, then the samples may be subject to the “old wood problem.” Since the calibrated dates generally coincide with the material culture, I argue, although the samples may return dates that are slightly older than the completion of mound building, this problem is not significant.

Sample No.	RCYBP	Standard Error	Reference	Comments
WIS525	870	55	Fischer 1972, Fowler 1997	Fourth terrace
WIS527	890	60	Fischer 1972, Fowler 1997	Fourth terrace
WIS528	970	60	Fischer 1972, Fowler 1997	Fourth terrace

Table 24. Summit dates.

There are fourteen dates available from the first terrace (Table 25, Table 26, and Table 27). The dataset consists of both radiometric determinations and archaeomagnetic measurements. All materials and dating was done by Benchley (1975) as part of the UWM investigations in 1971. UWM crews took three radiocarbon samples (WIS365 –

840 ±55 rcybp, WIS546 – 805 ±60 rcybp, and WIS547 – 825 ±60 rcybp) from a building (Building A) constructed on the surface of Terrace 1. One date, M982 (850 ±100 rcybp) may have come from fill below the mound constructed on the corner of the first terrace, but its provenience is suspect (Benchley 1975). All of these dates came from construction elements of the building but there is no discussion of what precisely was dated, giving the possibility of a sample induced time lag in the dates (i.e., old wood). On the other hand, the archaeomagnetic samples (O623 – 1120 A.D. ±25, O272 – 1135 A.D. ±25 years, O396 – 1160 ±25 years, and O395 – 1180 ±25 years) may be connected to human activity on the surface of Terrace 1. One final archaeomagnetic date (O273 – 1230 A.D. ±17) comes from the summit of the platform mound and is discussed in the following chapter. In this instance they are most likely related to the burning of Building A immediately prior to the construction of the small platform mound on the first terrace. The possibility of a lag created by the radiometric dating is somewhat ameliorated by comparing results of two datasets. These two independent dating sources appear to correspond well (Benchley 1975:30). The dates do not immediately suggest very old wood. Benchley obtained five other radiocarbon dates (WIS443 – 670 ±55 rcybp, WIS362 – 690 ±50 rcybp, WIS549 – 720 ±55 rcybp, WIS545 – 740 ±55 rcybp, and I2947 – 760 ±95 rcybp), but these are less useful for precision modeling because they are not from well-associated mound construction contexts.

Sample No.	RCYBP	Standard Error	Reference	Comments
WIS546	805	60	Benchley 1975	First terrace, "Log 24 lying on floor of Fea. 113. Large burned building."
WIS547	825	60	Benchley 1975	First terrace Bldg A
WIS365	840	55	Benchley 1975	First terrace, "Post 2 of burned structure."
M982	850	100	Benchley 1975	First terrace, "Below primary mound."

Table 25. Radiocarbon dates from the surface of Terrace 1.

Sample No	Age (A.D.)	Standard Error	Reference	Comments
O623	1120	25	Benchley 1975	First Terrace outside bldg
O272	1135	25	Benchley 1975	First Terrace Bldg A
O396	1160	25	Benchley 1975	First Terrace Bldg A
O395	1180	25	Benchley 1975	First Terrace Bldg A
O273	1230	17	Benchley 1975	First Terrace, Top of platform mound

Table 26. Archaeomagnetic dates from First Terrace.

Sample No.	RCY BP	Standard Error	Reference	Comments
WIS443	670	55	Benchley 1975	First terrace, Fea. 113, post No. 1, N72.23 E103.19 "below platform mound"
WIS362	690	50	Benchley 1975	First terrace, "Burned floor. Below platform mound."
WIS549	720	55	Benchley 1975	First terrace, "Burned wood in matrix of ash from burned basin. Feature 149 predates primary mound. N78-80 E100-101"
WIS545	740	55	Benchley 1975	First terrace, "Charcoal from Fea. 139. Burned building on top of platform mound. Burned post."
I2947	760	95	Benchley 1975	First terrace, "Fill above primary mound. Date corrected 422 years for fractionation (4.25 factor). (Blakeslee n.d.: Table 8)"

Table 27. Other radiocarbon dates from Terrace 1.

Other Chronometric Dates

The final category of dates includes any contexts that are not particularly germane to the question of mound construction chronology (Table 28). These are BETA207043 (118 years bp), WIS586 (640 ± 55 rcybp), and M1637 (670 ± 100 rcybp). M1637 came from a context described as a residential structure and excavated by Bareis in 1964 (Reed et al. 1968:144). The structure overlies slope wash deposits from the mound and dates to a period late in the Mississippian times. This date likely relates to activities unrelated to mound construction. WIS586 was recovered by Williams (1975) in 1971 and likely represents post-construction activity. BETA207043 was reported by Hajic (2005). The sample consisted of uncarbonized plant remains recovered by coring in the Eastern slump. Given the shallow depth; the amount of modern disturbance and repair; and the date returned this sample is clearly of modern origins.

Lastly, an attempt was made to obtain new dates from fourth terrace materials. The choice of organic samples was sparse but a sample of a bone from a dog burial associated with the M1/M2 levels was obtained from the Illinois State Museum collections. Results from this sample were unreliable. Initial results yield a late Archaic/early Woodland date. Subsequent assay run on the same sample returned a Middle Woodland date. These assays were determined to be uncertain. A portion of bone from the same burial was sent to another lab who determined not enough carbon remained in the sample for accurate dating.

Sample No.	RCYBP	Standard Error	Reference	Comments
BETA 207043	118	NA	Kelly and Hajic 2005	East Slump, modern
WIS586	640	55	Williams	East lobes, N168.9
M1637	670	100	Reed et al. 1968	west edge of Monks Md., "Late Mississippian wall trench house on top of slope wash from Monks Mound"

Table 28. Other proveniences.

Parameters and Phasing

The Bayesian modeling process is a simulation process. Depending on the initial parameters, the probabilities of various scenarios are assessed based on calculated probabilities. Importantly, Bayesian methods assume initial uncertainties to be a component of the proposition rather than an outcome of the analysis, thus making Bayesian methods more transparent than previously utilized ways of understanding the radiometric database from Monks Mound (e.g., Reed et al. 1968). In the model presented here, stratigraphic data are a priori certainties, but radiometric determinations associated with each stratum have a degree of uncertainty. Stratigraphic data therefore, can be used to assess the radiometric dataset since these parameters are boundaries.

The initial presentation and description of the radiocarbon dataset presented above is the first step in sorting the plausible from the possible. Although I presented a rhetorical model, many of the assertions are based on formally modeling aspects of the dataset. For example, I argue several dates relate to a period before mound construction. Support for this assertion comes from the aforementioned archaeostratigraphy as well modeling the radiometric database from submound contexts. From a modeling standpoint, all of the submound dates can be thought of as representing a single pre-mound period (Figure 55).

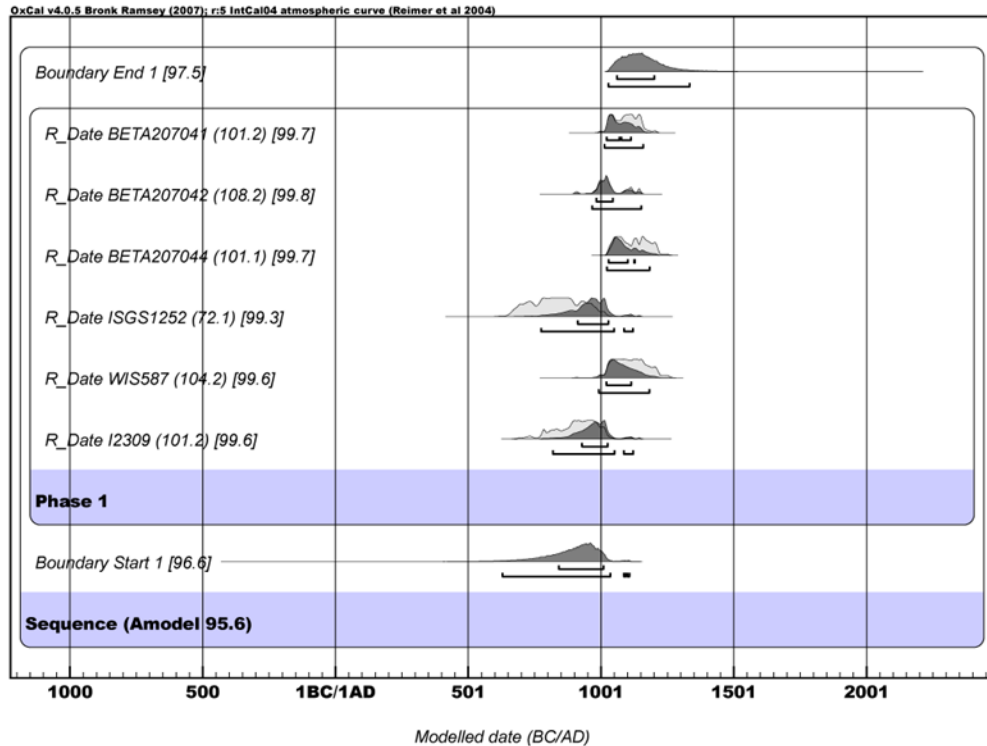


Figure 55. Submound dates modeled as one phase.

Statistical indices ($A_{\text{model}} = 95.6$) drawn from modeling these dates as a single phase suggest the entire dataset can be modeled as a temporally discrete phase. For the purpose of modeling the construction of Monks Mound this is a useful bit of information but only in a general sense. None of the data are clear outliers. Because the single phase submound model was constructed using an uninformative prior probability that is, no a priori statements were made about the time frame of the model. It is useful to further investigate the data set, especially since the goal is to establish a specific temporal event — a TPQ. The modeled distribution of the radiocarbon dates suggest that two dates, I2309 (712 to 1037 A.D. 95% probability) and ISGS1252 (665 to 1012 A.D. 95%

probability), while in agreement with the model, do not represent the latest time period in the phase, which by definition is a time after which mound building commenced.

At the same time, the four other calibrated date ranges correspond well — BETA207042 (1016 to 1147 A.D. 95% probability), WIS587 (1029 to 1114 A.D. 95% probability), BETA207041 (1026 to 1125 A.D. 95% probability), and BETA207044 (1031 to 1128 A.D. 95% probability) — suggesting all else being equal, these dates are more related to each other than to the two, which fall at the early end of the scale. This approach is similar to the one advocated by Steier et al. (2001) and Lu et al (2001) although in a strict Bayesian framework, source of the prior information is irrelevant (Bayliss and Bronk Ramsey 2004:37)

A review of the literature about these dates does reveal some prior certainties, such as researchers believed I2309 (712 to 1037 A.D. 95% probability) to represent a Late Woodland pre-mound occupation, and the elevation and stratigraphic sequencing of ISGS1252 (665 to 1012 A.D. 95% probability) suggests it was recovered from a context that was inferior to the most recent premound surface (McGimsey and Wiant 1984, Reed et al. 1968). Combined, these data can become the basis for the next modeling step. The second iteration of a pre-mound model is more useful for thinking about the construction of Monks Mound than the first iteration which used an uninformative prior certainty. In the second iteration, the pre-mound dates can be modeled as two phases. One represents a time period before and distant from construction and the other represents a time immediately before mound construction. Dates from the second phase were modeled as representing a single event (mathematically, dates were combined using an error weighted approach), in other words, a TPQ (Figure 56). Figure 55 represents both the a

priori distribution and the a posteriori distribution. The a priori distribution is indicated by the light colored curve while the darker curve is the date distribution after it is computed based on the model specifications. In this instance, modeling changes the probability distribution very little. The little that is changed suggests the distribution of the modeled dates should be earlier in time as compared to viewing the dates without any constraints.

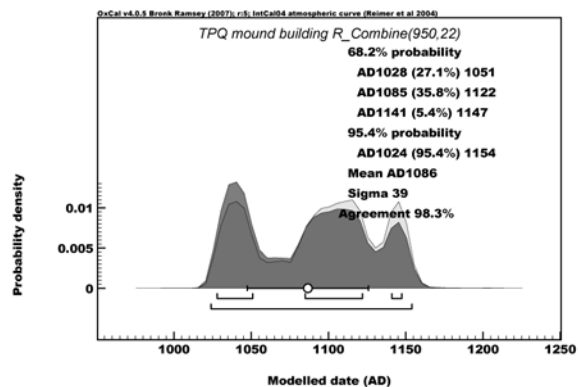


Figure 56. TPQ mound building.

Two Chronological Models of Monks Mound

At an operational level, Bayesian simulation integrates multiple calibrated date ranges and stratigraphic position through a Markov Chain Monte Carlo simulation process to produce probabilities of events happening within likely intervals and at likely times (Bronk Ramsey 1995). The previous discussion has explained the conceptual basis for the following analysis, but because the modeling process is especially sensitive to initial conditions and constraints, the parameters and limits of the any model needs to be discussed in some detail.

Given the specificity of the modeling process — especially as it relates to constraints, it should be no surprise that the Monks Mound dataset can be modeled in several ways. To account for the possible variation in outcomes, I modeled the dataset in two ways. Model 1 presents the idea that there is no meaningful horizontal differentiation within Monks Mound. In this model, it is taken as a priori that final basal dimensions were set with the initial construction effort. Model 2 creates a temporal framework where there is horizontal stratigraphy within the mound; as the mound was expanded upward it also grew outward. Although the differences in outcomes are very small in relation to the overall results, when viewed at a human time scale there is in fact considerable variation. As noted by Bayliss and Bronk Ramsey (2004:38), multiple models for any one site may be necessary.

The basic a priori assumption of either model is that the occupation at Cahokia spans the time from 800 A.D. -1400 A.D. Previous research demonstrates earlier occupation, but occupation appears discontinuous. The 800 A.D. lower limit was chosen as a generous boundary since the occupation most clearly associated with the Mississippian Period occupation begins sometime well after this time. In the same vein, the Mississippian Period occupation of the Cahokia site is over by 1400 A.D. (Kelly et al 2007), making 1400 A.D. a well established temporal boundary for understanding Cahokia.

Model 1

Model 1 was constructed by positing that the construction of Monks Mound can be thought of as two phases of activity (

Figure 57). Phases were modeled as sequential, meaning there may or may not be any time interval between the phase boundaries. Initial constraints were based on stratigraphic information *i.e.*, Phase A must occur before Phase B. In this model Phase A is a time after the deposition of the submound materials but before the building of the structure on the summit. Dates associated with the submound materials serve as a TPQ for Phase A. Phase A is the amount of time required to build the main mound. Phase B was defined as the time of construction of the first terrace. The construction of the first terrace is constrained by the age of the cutting of the wood for Building A and Building B on the southwest corner of the first terrace. Finally, summit dates represent an important time period *i.e.*, the termination of main mound construction. This date is not possible to know directly although it can be approximated as the time of the cutting of the trees for the building on the uppermost surface. Dates from posts recovered from the fourth terrace are available; in this model the dates are combined to represent a single event.

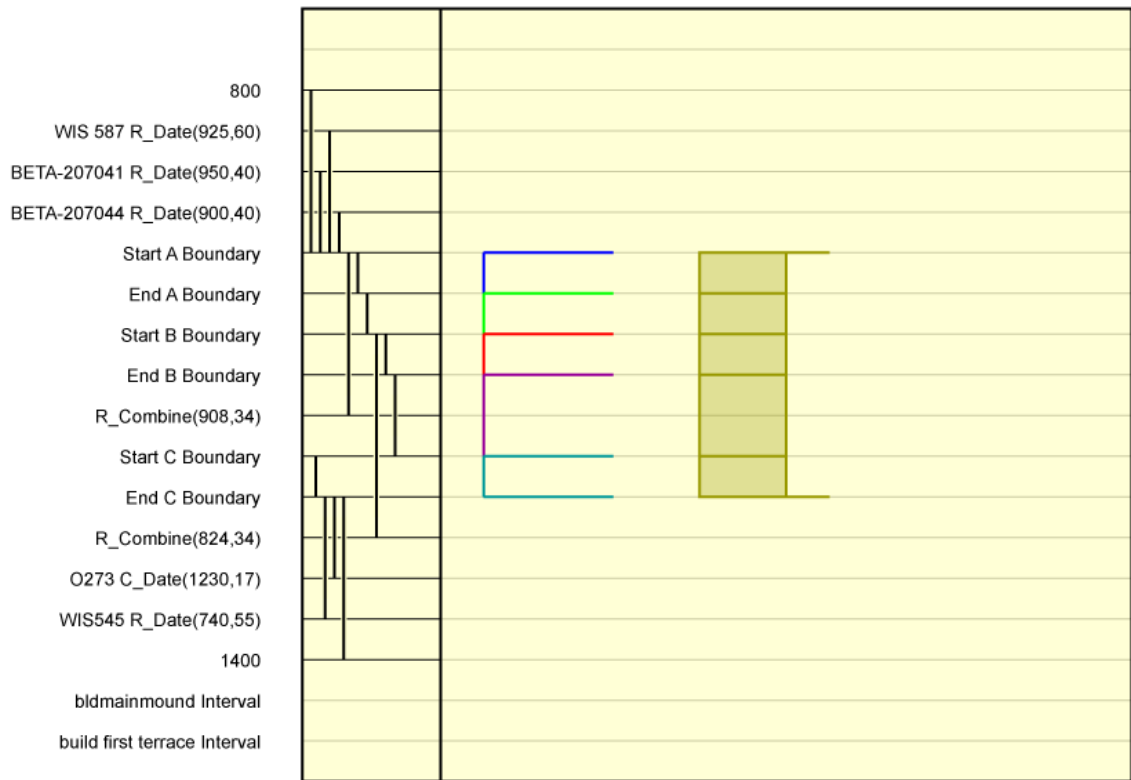


Figure 57. Schematic of Model 1.

Importantly, none of the constraints were used in modeling the phases, but rather these dates serve as boundaries. Phase A and Phase B are empty phases defined by these external limits. In this model the time of construction of the main mound is the time between the minimum age of Phase A and maximum age of Phase B. The time of construction for the first terrace is the time between the minimum age of Phase C and the maximum age of Phase B. Model 1 uses the stratigraphy presented above where the materials dated by Hajic were deposited before the construction of Monks Mound, although the model supports either interpretations since if these samples are in fact from mound fill contexts then they still serve as TPQs for mound construction. This model has important implications for both the rate and timing of mound construction.

First, the Model 1 suggests the main body of the mound arose to near modern height in a very short time period (Figure 58). Based on the model parameters, the time interval required to attain the height of the fourth terrace has approximately a 95 percent probability of falling between 0 and 58 years. The interval shrinks to between 0 and 12 years if a 68 percent probability is used. Summary statistics of the probability distribution for the construction interval suggest the probability may be even shorter, with values of 3 years and 9 years obtained for the median and mean (10 year standard deviation). Perhaps a better measure of the probable time span of construction is seen in the modal value. Most of the calculations suggest a period of about 2.5 years. This time interval appears almost twice as often as the next interval of 7.5 years, which is also very short relative to the current model of the duration of mound construction.

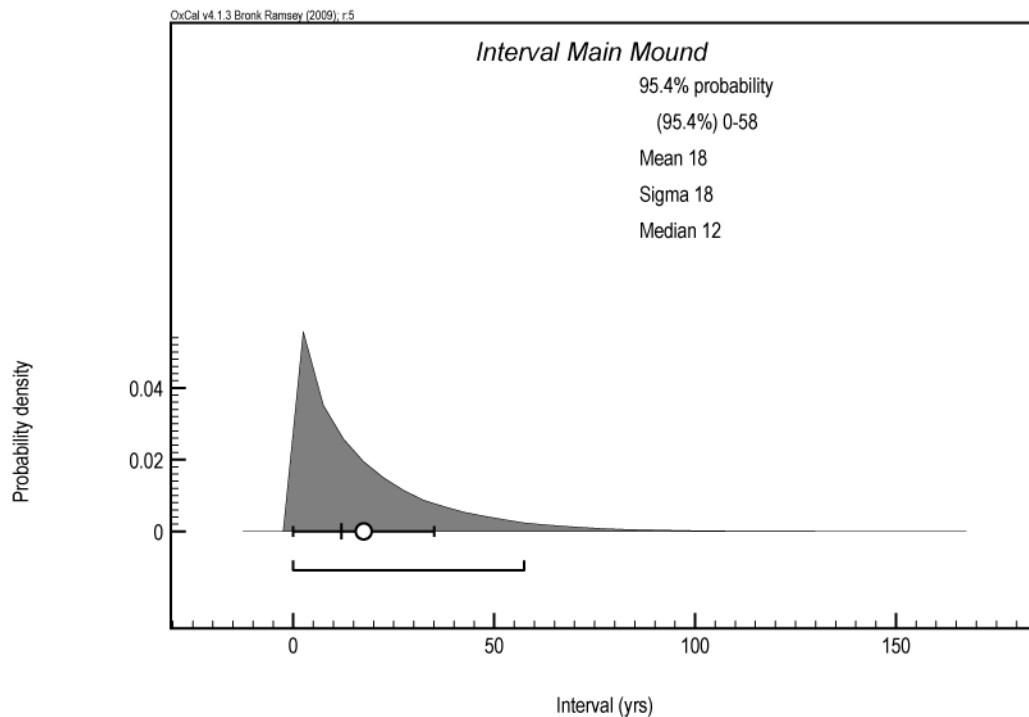


Figure 58. Time required for mound to reach fourth terrace.

Second, the mound may have attained its full height much later than previously thought (Figure 59). The model indicates the lower temporal limit of the a posteriori distribution of the fourth terrace dates most probably lies in an interval between about 1048 A.D. and 1156 A.D (95.4% probability). The median and mean of this distribution falls in the early twelfth century A.D. The mode of this distribution peaks between 1080 A.D and 1120 A.D (mean 1100 A.D., mode = 1099 A.D.). By adding the construction interval to the date of the pre-mound surface, a likely TPQ for the use of the fourth terrace can be seen as the onset of the Stirling phase since the time of interest must occur after the source material was removed from the carbon cycle.

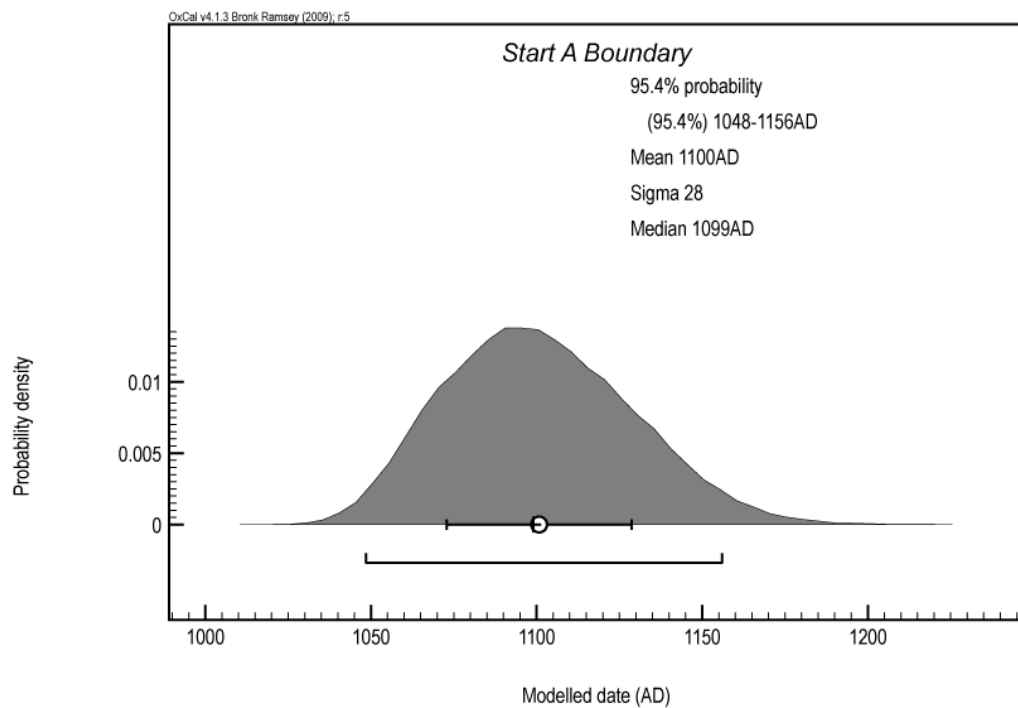


Figure 59. Age of the sub-mound surface (minimum age for the fourth terrace).

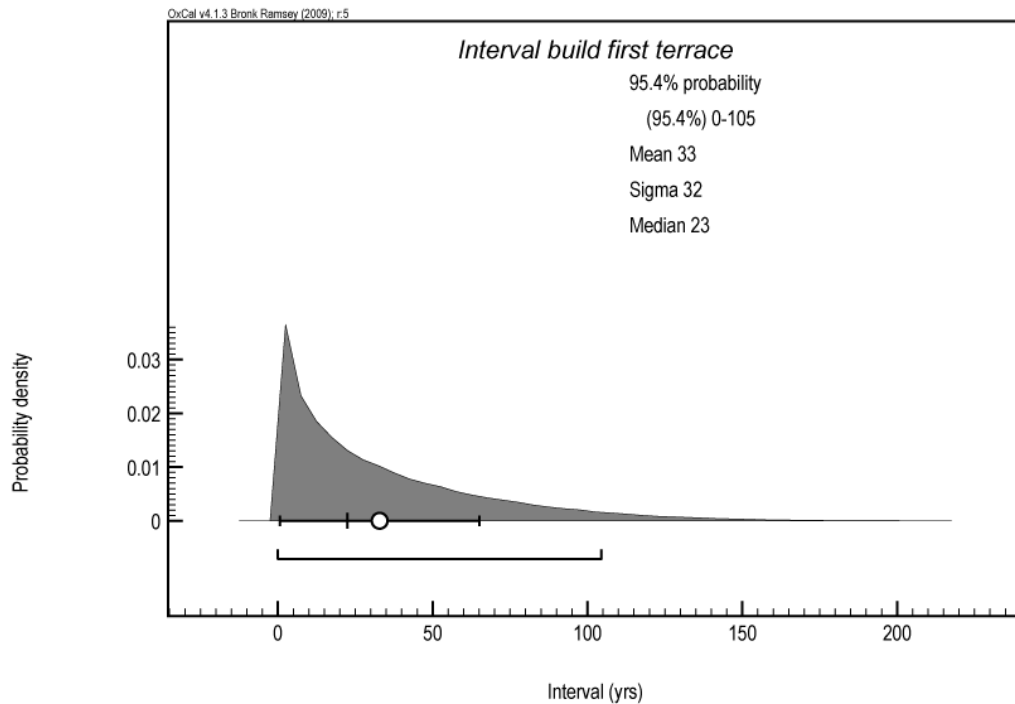


Figure 60. Time required to build first terrace.

Third, the construction interval for the first terrace is similarly brief. The 95.4 percent probability range is approximately 105 years, but the distribution is long tailed with the peak modal distribution falling in less than 10 years and the mean measuring about 35 years (Figure 60).

This model indicates the first terrace was constructed during the early-to-middle Stirling phase, perhaps around the 1150 A.D., suggested by the mean and median dates of the probability distribution function. In this case the probable date distribution is more normally distributed than the distribution for the beginning date of the final phase in the model with the modal peak falling near the median and mean (Figure 61).

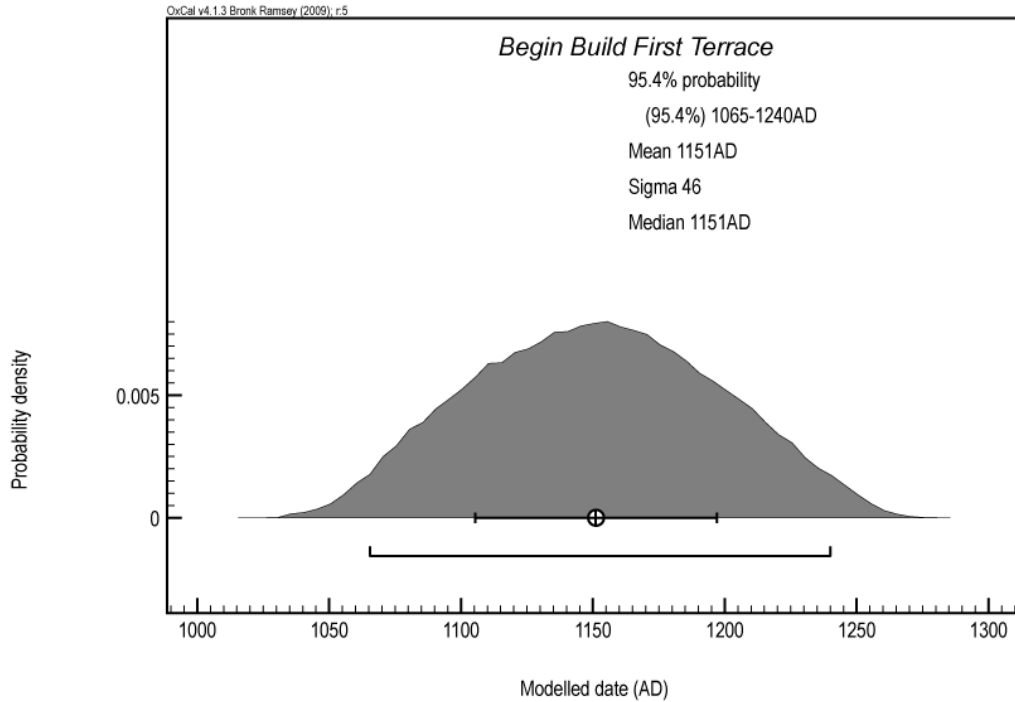


Figure 61. Maximum age for the inception of first terrace construction.

An Alternative View of Mound Building Chronology

One of the primary points brought forth in Model 1 is that the mound was constructed very rapidly. The Bayesian analysis suggests the highest probability for the duration of mound construction lies somewhere less than 2.5 years. This range is short enough that it implies the submound and summit dates are a single event. Using an error weighted mean technique, a modeling of the submound, summit dates, and first terrace dates as a single event is, in fact, a statistically defensible proposition (Figure 62). This model indicates the most probable time for construction is in the mid-twelfth century. On the other hand, there is a chance that construction could have happened in the end of the eleventh century. The distribution is discontinuous with multiple modal peaks. This is likely an artifact of using older radiometric determination with longer standard errors. In

any event, the model does demonstrate a high probability that the age of the pre mound and mound's surface are extremely close.

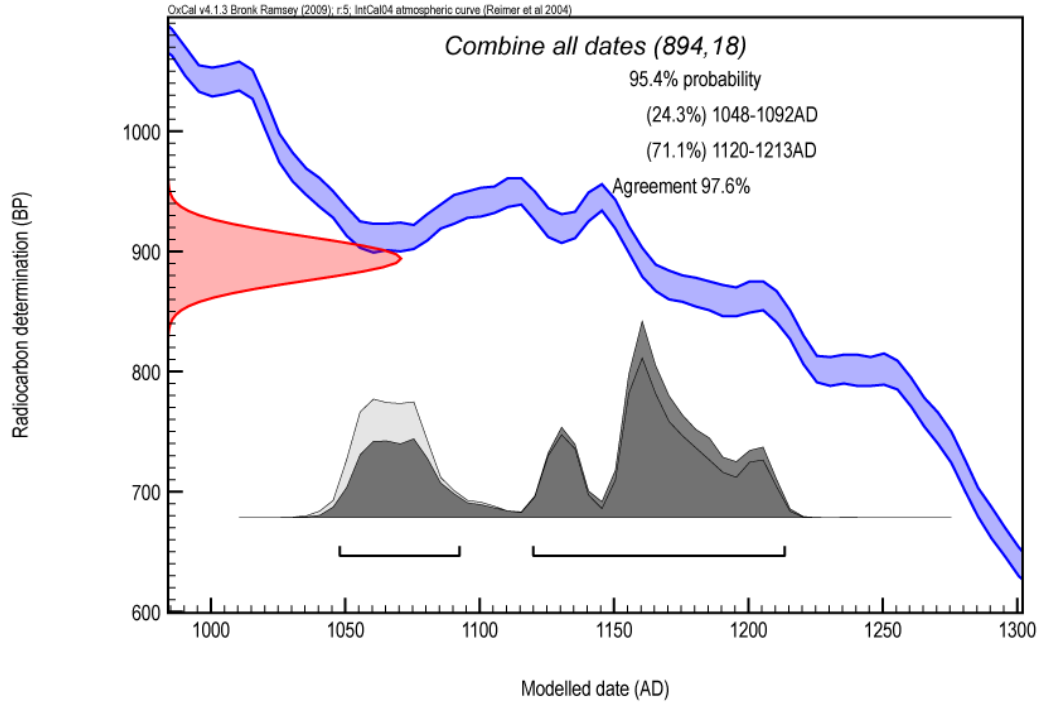


Figure 62. Combined dates.

Model 2

Model 2 was created using the same basic stratigraphic model as Model 1, however the possibility of an early Monks Mound phase was integrated (Phase A' < Phase A < Phase B). Phase A' was included to cover the case where Monks Mound was built in at least two stages. BETA 207042, I2309 and ISGS1252 are seen as *TPQs* for stage 1 since these samples are from the most inferior and most central contexts. WIS 587, BETA 207041, and BETA 207044 were used to as a *TAQ* for Phase A' and a *TPQ* for Phase A. Although the two models differ considerably, especially when the results are

considered at the human scale, there are certain broad patterns in the data which hold important implications for the overall construction history of the mound.

First, Model 2 suggests that the construction interval for the Stage A' has a 95 percent probability of falling in the range from 0 to 44 years (Figure 63). This interval is similar to the entire interval from Model 1. Perhaps more interesting, the mean and median calculations, 11 and 7 years respectively, imply a very rapid pace of construction for a hypothetical stage 1 (mode = 2.5 years). Examining the area underneath the curve clearly shows the majority of the probabilities fall on the shorter end of the time-scale, also arguing for a very short construction history. Similar results are seen for the construction of a hypothetical Stage 2 (Figure 64). An aggregate of the Stage 1 and Stage 2 intervals suggests that Monks Mound may have taken as long as 100 years to construction, but based on the global statistics this interval is more likely to be about 24 years (11 years + 13 years). Aggregate modal values suggest a 5 year interval.

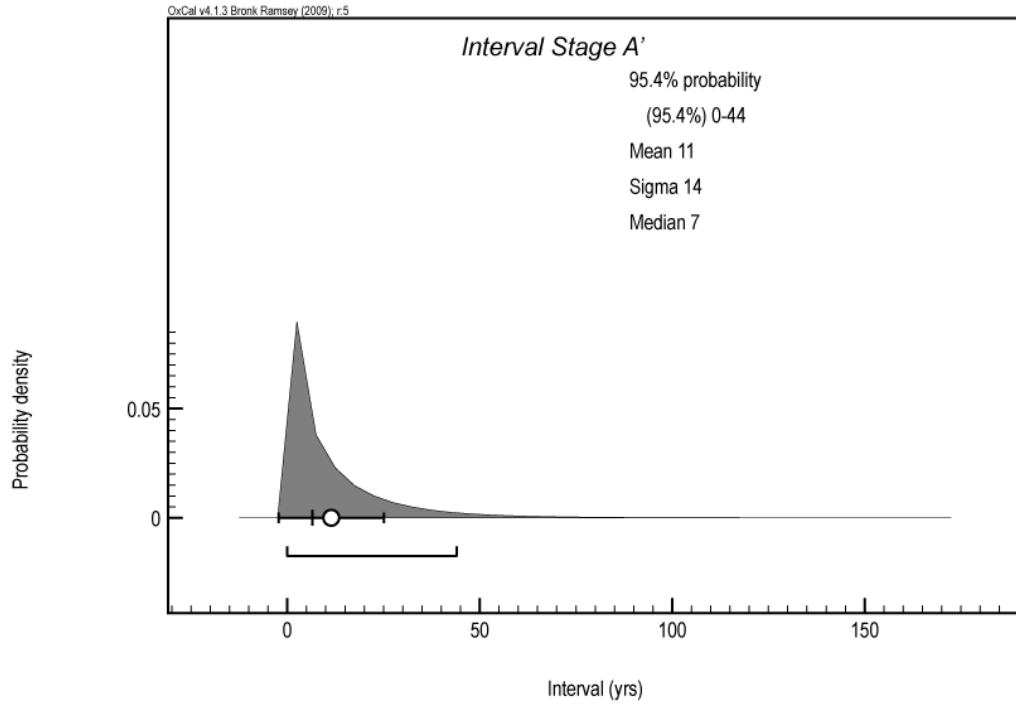


Figure 63. Model 2 time required to build Stage A'.

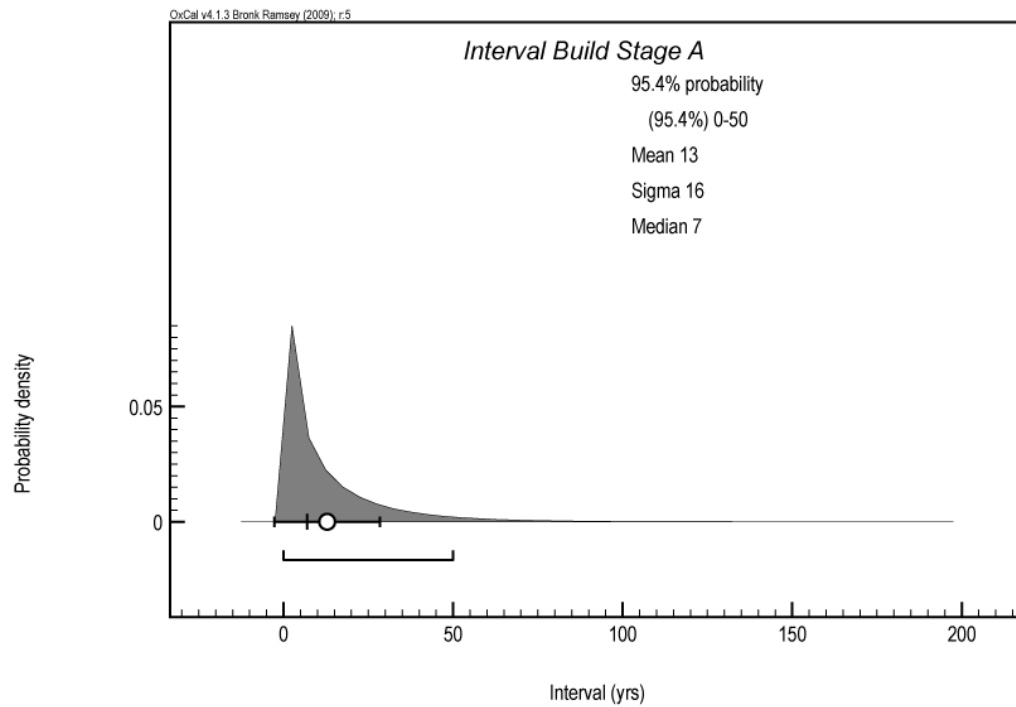


Figure 64. Model 2 time required to build Stage A.

In addition to the differences between the duration of construction the two models suggest differences in the actual timing of construction. Model 2 suggests a later, relative to the expected if one accepts I2308 and ISGS1252 as immediate prior to mound construction, than expected date for the onset of construction of Stage A'. Model 2 indicates a late Edelhardt to early Lohman Phase construction. The 95 percent range covers a very wide range of dates possibly from Merrell to the Stirling phases (Figure 65). An examination of the curve suggests the actual date may lie in the later Edelhardt phase or about 1025 A.D (mode = 1025 A.D.). Model 2 places initial construction on Monks Mound before the Big Bang and may fit well with an older more gradual view of the construction even though such a model is not well supported by the extant geoarchaeology (see Chapter IV and Chapter V).

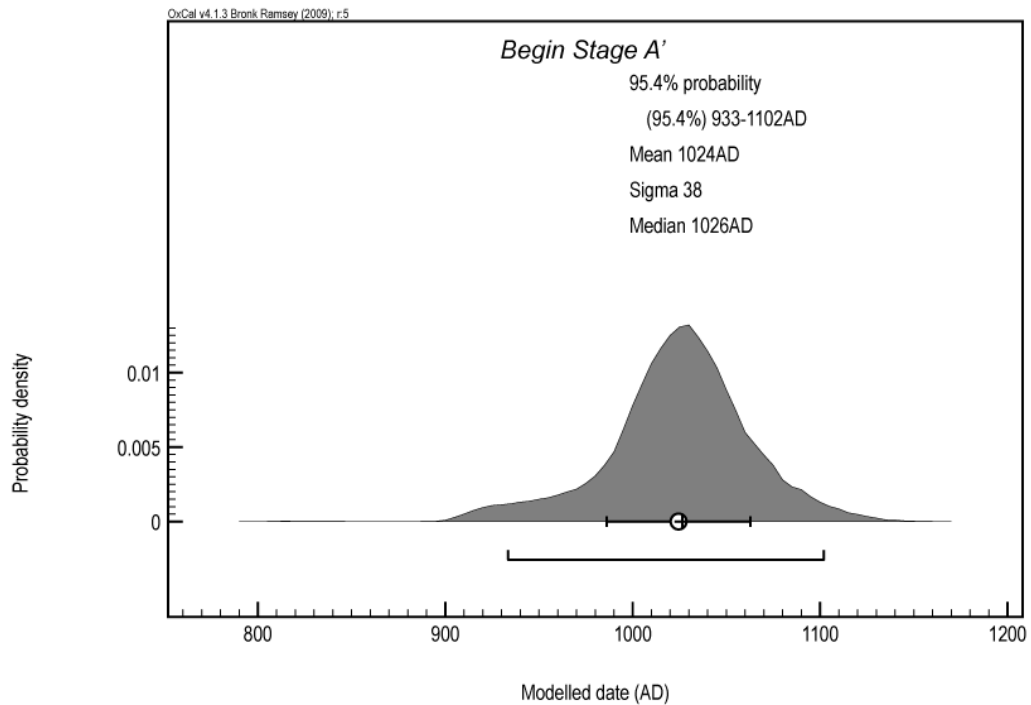


Figure 65. Begin Stage A'.

Finally, Model 2 suggests the first terrace may have taken up to 72 years to build. The effects of changing the constraints can be seen as this interval is less than the time required by Model 1, although summary statistics suggest the first terrace was also built very quickly (Figure 66). As would be expected with moving the TPQ for the mound earlier, Model 2 indicates the first terrace may have been constructed earlier than as modeled in Model 1. Model 2 also suggests the first terrace was built sometime in the eleventh century although the 95 percent probability range covers an almost 200-year range (Figure 67).

Although Model 2 is a possibility, it requires accepting two radiometric determinations (I2309 and ISGS1252) as immediately prior to mound construction. Most researches disagree with this idea. In light of the previously accepted interpretations and the geoarchaeology presented in the earlier chapters, Model 2 is a less viable alternative.

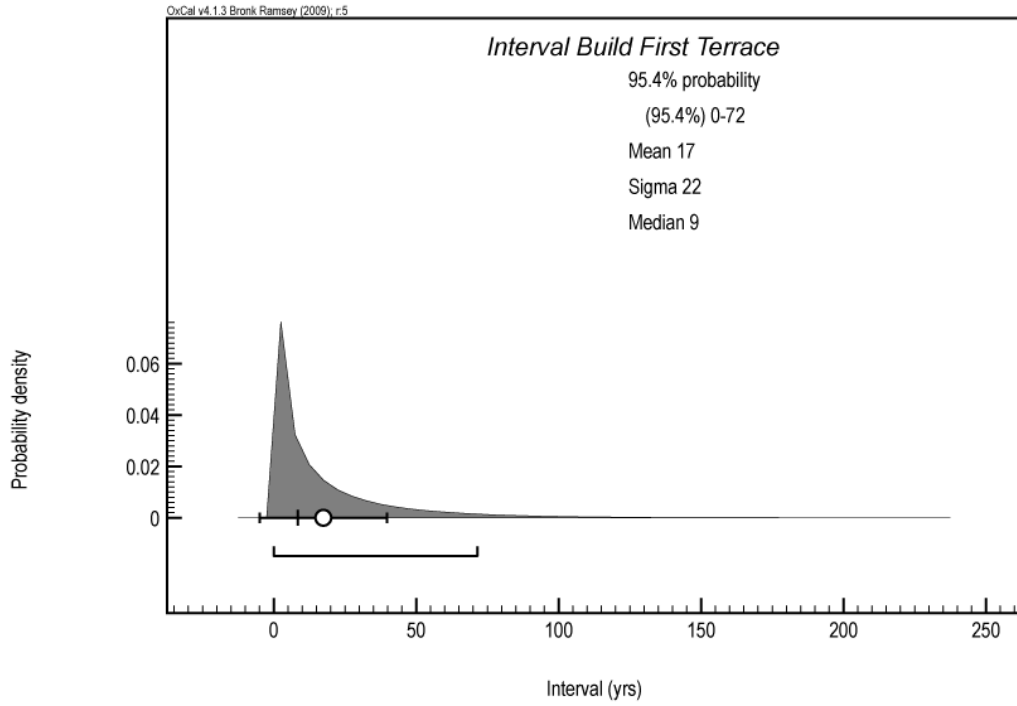


Figure 66. Model 2, Terrace 1 construction interval.

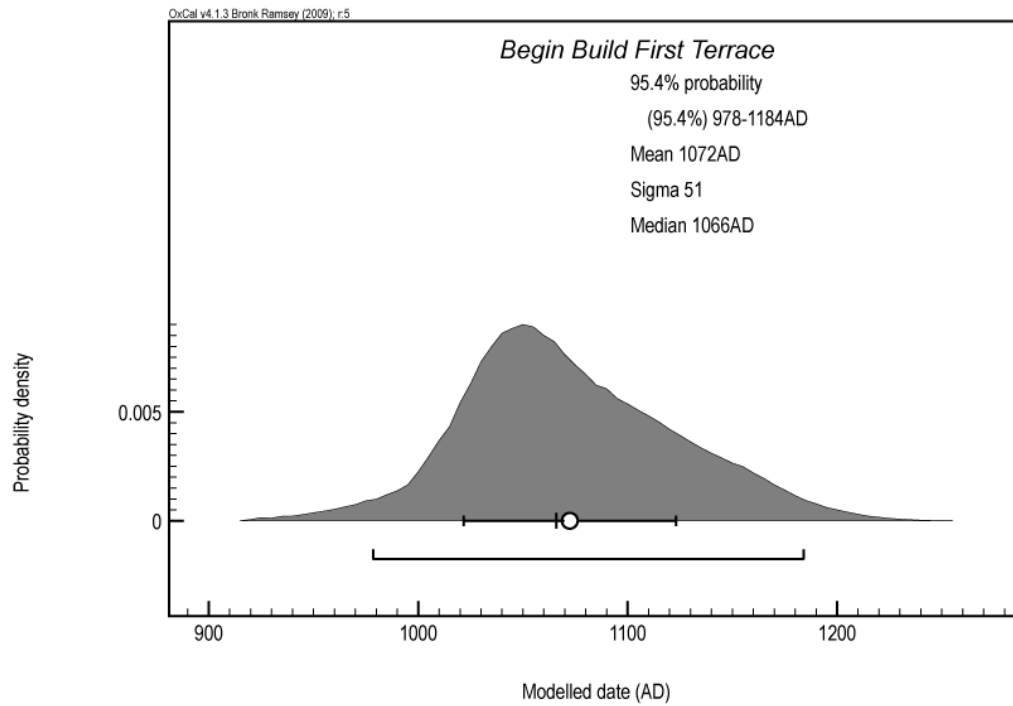


Figure 67. Model 2. Minimum age of First Terrace.

Discussion

The Bayesian analyses presented here suggests the gradualism implicit even in the most recent ideas about the construction of Monks Mound is not warranted (Pauketat 1998b, Pauketat and Alt 2003). In particular, the chronology presented by Reed et al. does not agree with the analysis models presented here. Construction on Monks Mound did not begin before 950 A.D. Nor do the models support a 250-year span of construction activities. The Woods' (2001) model can also be falsified based on this analysis, as the mound was constructed much later than 1000 A.D. A century-long construction chronology is also not tenable in light of these models. Pauketat's model is only weakly supported since 95% of the construction duration is included in a 58-year interval, but the modes of this distribution suggest the construction interval is much shorter. At the same time, Pauketat places the inception of construction near 1050 A.D. This assertion is not completely falsified by the chronometric models, as there is some probability that mound construction began as early as 1048 A.D. but the modal distribution of the age for mound construction lies much closer to 1100 A.D. than 1050 A.D.

These results suggest the construction of Monks Mound was an event (*sensu* Beck et al. 2007). An event-based construction model begs the notion that construction was conceived and executed with a single goal or purpose and the project was undertaken with final finished dimensions and a set form already known. Other researchers have noted there seems to be a scale relationship between large mounds and large plazas that was fixed from the outset (I. W. Brown 2003, Lewis et al. 1998), giving oblique support for an event-based model. The radiocarbon analyses presented above support a very short

chronology for mound construction. Given the above assumptions, I believe it is unlikely that the mound was built in more than a single generation.

Most who would disagree with this model would argue that Native Americans could not have mobilized labor and efficiently moved earth on the scale required to build the mound so quickly. The most widely cited estimates for how efficiently part-time labor could build the mound are based on Erasmus (1965) who performed experiments that demonstrated a single individual could transport about 1.75 m³ of earth per six-hour day. Either implicitly or explicitly, some variation of this model is assumed for the construction of Monks Mound. Unfortunately there is little ethnography from the Eastern Woodlands to judge this model. Then again, a better analog for moundbuilding in the Eastern Woodland may come from Southern Sudan. Evans-Pritchard (E. E. Evans-Pritchard 1935:62-63) recorded accounts of the construction of a 17 meter x 30 meter diameter earthen mound by the Nuer³⁶ in the early part of the twentieth century.

Evans Pritchard writes

The building of the mound was a gigantic task. It was constructed of wet ashes mixed with baked and unbaked earth, for the material was excavated from two large vacated cattle camps where ashes and other camp debris had grown from year to year and became sodden and agglutinated by many seasons of rain. The workers who built it stood one above the other in tiers from the base of the pyramid, a pile of tusks was buried in the centre of the mound, and one or two protruded from its summit. It does not seem there was any systematic conscription of labour in the building of mound but people came voluntarily from all over the countryside to assist and often brought bullocks with them for sacrifices. They would spend three or four nights in one of the temporary grass shelters, which others since departed to their homes, had put up; and when the food that they had brought with them was finished, they would return to their homes also, and their places would be taken by other pilgrims. The flesh of the sacrificed bullocks was divided among the workers and lengthened their supplies. It is said that people brought handfuls of ashes to add to the mound from Gaajok and Gaajak and Gaagwang countries as an act of piety.

In the Nuer example, apparently moundbuilding was done until the prescribed dimensions were reached. Work was done using a bucket brigade method maximizing earth moving. The cone shaped mound reached its final size in three or four years with efforts spread out over a couple of month per year by different groups (D. H. Johnson 1994:92).

This view suggests the context of building Monks Mound may be fundamentally different from other construction models. Whereas most workers see the Cahokian landscape growing around a central monument, which also increases in size through time, my analysis, proposes that Monks Mound was the result of changes occurring in a much more developed society. It may be more appropriate to think of Monks Mound as the echo of the Big Bang rather than the fuse that lit it. The following chapter explores the history of the Cahokia site more fully.

Chapter VI: Monks Mound in the Context of the Cahokia Site

The present understanding of the cultural chronology of the Cahokia site is built around the idea that Cahokia was occupied in one way or the other from the late 800s through about 1400 A.D. (Dalan et al. 2003:69, Fowler 1997:208). This history is derived from the seriation of surface collected material (e.g., Fowler 1997, Salzer 1975, Wittry and Vogel 1962) and materials excavated from a limited number of contexts (e.g. Hall 1975, Holley 1989, P. J. O'Brien 1972). Seriations were then dated using radiocarbon from feature contexts at Cahokia or by cross-dating using stylistic similarity with collections from other sites as an indicator of contemporaneity.

The use of ceramic seriation as a measure of time is subject to two critiques. First, seriation tends to make occupations appear longer or more uniform than may be represented by other dating methods (Bronk Ramsey 2009). Seriation effectively smoothes an otherwise event-based sequence (Bronk Ramsey 2003). Creating fine-scaled histories requires placing individual events within an absolute framework; ceramic seriation cannot do this precisely as it is a relative dating method. Moreover, ceramics are not directly dated and therefore requires a chain of assumptions that induce uncertainty into the dating process. Moreover, ceramic dating assumes a temporal continuum but absolute dating methods produce points in time. Boundaries between ceramic periods are therefore arbitrary whereas absolute times are calculated. Second, the Cahokia sequence relies heavily on the chronological framework established by the American Bottom/FAI

270 project (Holley 1989:260-261). Although the American Bottom ceramic sequence was created through an iterative process using materials collected and dated from both the Cahokia site and the American Bottom region, (Bareis and Porter 1984) relying on this regional view requires accepting models of ceramic and cultural change obscure variation. In essence, one must assume that ceramic change, which occurred at one place, was rapidly accepted across the entire region (cf. Fortier et al. 2006, Holley 1989, Pauketat 1998a). This assumption is only viable if one privileges regularity in ceramic change at the expense of other data such as radiocarbon dating. Furthermore, as noted by Milner (1998:21-23), the absolute chronology of the American Bottom sequence may not be well modeled.

In spite of this critique, ceramic seriation is suitable for understanding general chronologies, but there are better tools for creating high resolution histories (see Bayliss et al. 2007a, Buck et al. 1991, Reece 1994, Whittle and Bayliss 2007). As seen in the previous chapter, Bayesian analysis of radiocarbon dates is useful for creating high-resolution chronologies of individual construction sequences. The same can be said for larger spatial units such as archaeological sites. In spite of the limitations of the radiometric database at Cahokia, using this kind of analysis may permit finer scale models of the cultural occupation(s) than are presently available (cf. Fowler 1997:207). Modeling involves understanding the temporality of each locale of the Cahokia site for where radiometric data exists. From these individual elements, a larger temporal model is then created.

Modeling Considerations

Of the multiple possible ways to create a temporal model of the Cahokia site, the most effective way, perhaps, is to divide the landscape into individual elements. The central element in Cahokian domestic life was the house. Houses in turn were grouped around a central open area, or plaza, first appearing as far back as the Late Woodland and early Emergent Mississippian period (Collins 1997, J. Kelly 1990c). Unfortunately, no excavation program has been designed to specifically understand the history of any one plaza group³⁷, or the entire Cahokia site for that matter (Fowler 1997:208). Most of the modern excavation at Cahokia has been done as salvage operations; therefore, analysis must rely on data generated opportunistically, and datasets that are not ideal for the question at hand.

Powell Tract

Nine radiocarbon dates were run on materials collected from the Powell Tract (Table 29). All materials except for M1295 are from feature contexts. Workers recovered M1295 from approximately 20 cm (.6' to .9') below Feature 197 (Fowler 1963). The excavators noted the sample may have been contaminated. Based on the possibility of contamination and the lack of associations, M1295 is not useful for modeling. Although the remaining materials are from feature context, modeling requires an understanding of the depositional circumstance of each feature since remains from different types of features provide different kinds of chronometric data.

Location	Lab No.	RCYBP	Standard Error	Material	Reference	Comments
Powell Tract	WIS58	1000	65	charcoal	Bender et al. 1966:533	Period 4, Fea 227 Date suggested as ca.300 years early (Blakeslee n.d.:Table 2) same as M1293
Powell Tract	M1295	1915	150	charcoal	Fowler 1963:50; Crane and Griffin 1963:236	Unassociated material. Below Feature 197
Powell Tract	M1293	1190	75	charcoal	Fowler 1963:50; Crane and Griffin 1963:236	Period 4, Fea 227. Dates seem too early, charcoal from fire basin in center of House 15 (Fea 202)
Powell Tract	ISGS163	1170	80	charcoal	Coleman 1974:115	Period 5, Fea 198
Powell Tract	M1294	1125	75	charcoal	Fowler 1963:50; Crane and Griffin 1963:236	Period 5, Fea 217, House 21, charcoal from floor of House 21 (Fea 217)
Powell Tract	ISGS141	1025	150	maize	Coleman 1974:115	Period 3, Fea 331
Powell Tract	M1292	1055	75	charcoal	Fowler 1963:49; Crane and Griffin 1963:236	Period 3, Fea 234, House 26, charred layer of floor of House 26
Powell Tract	ISGS140	1000	80	cucurbita	Coleman 1974:115	Period 3, Fea 331
Powell Tract	ISGS130	950	75	Carya/nut shell	Coleman 1974:115	Period 3, Fea 331

Table 29. Powell Tract dates.

ISGS163 was recovered from House 13 (Feature 198). Lathrap, as cited by Coleman (1974:115), believes this sample to post-date the use of House 13 and is part of the in-filling depositional sequence. In modeling terms this date is a *TAQ* for House 13. There is no stratigraphic data to suggest the proper age of House 13. O'Brien (1972:18), noted this ambiguity. Using pottery analysis, she chose to place House 13 into her Phase V, which O'Brien saw as the latest occupation of the Powell Tract (1972:31-32). Other researchers, (e.g., Lathrap (Coleman 1974:115), (Hall 1975) and (Holley 1989)) believe Phase V should be early and represents a Late Woodland occupation of the Powell Tract.

Based on the radiocarbon date returned from the assay, the earlier interpretation is preferred. In this analysis, I take ISGS163 to be included in a phase separate from the Mississippian period occupation. Since ISGS163 is related to the post occupation period for the earliest remains, it is used as a *TAQ* for the earliest occupation.

Three samples (M1292, M1294, and ISGS163) are identified as charcoal from house basins (Fowler 1963, P. J. O'Brien 1972). Workers recovered M1292 from a charred layer (Feature 234) on the floor of House 26 (Fowler 1963:49). There is no information as to whether or not the charcoal was recovered from a single specimen or was a mixture of charcoal from many pieces of wood. In this instance it is best to treat the sample as a mixture of many elements and recognize that this sample while useful is not the best for high precision modeling. In any event, the charred layer probably represents one of the last activities associated with House 26. If House 26 was used for a substantial time after the deposition of Feature 234 then it is unlikely that the charred materials would have remained a single coherent whole. Subsequent human activity would have dispersed Feature 234. Feature 234 serves as a *TAQ* for the Emergent Mississippian occupation.

Bareis collected sample M1294 (Fowler 1963:50), a charcoal sample, from the floor of House 26 (Feature 217). The precise relation of this deposit to the history of House 26 is not known. For modeling purposes an assumption of use relatedness must be made. This is a well acknowledged assumption in the American Bottom. Because researchers usually assume abandoned houses are buried rapidly (Holley 1989:17, J. Kelly 1982:275). Materials excavated from the lowest units of house basins are generally assumed to relate to the use of the house. In the case of M1294, excavators did not

separate pre-abandonment materials from post-abandonment. With this lack of separation, it is impossible to sort use materials from the immediate post occupational material. Although this point may appear trivial, it is an important and necessary distinction since post occupational material would provide a TAQ for the use of the house, and use related material would provide a TAQ for the construction of the house and a TPQ for abandonment (and consequently a TPQ for the Emergent Mississippian occupation). In the absence of better stratigraphic data, M1294 is assumed to relate to the use of House 26.

Five radiocarbon samples are associated with discrete identifiable features. Three of these were run on charcoal and three were performed on nut shell or seeds. The six assays represent two discrete feature contexts. Three samples (ISGS130, ISGS140, and ISGS141) were taken from Feature 331, a storage pit. M1293 and WIS58 sampled Feature 227 and consisted of charcoal from this large fire basin. These two radiocarbon dates were run on a sample of the same material as a check between the Michigan and Wisconsin labs (Bender et al. 1966:533). Because these two dates were check samples, it is assumed that M1293 and WIS58 were run on a sample from the exact same archaeological material should represent the exact same moment in time.

The context of all of the samples from Feature 331 is such that they can be seen to represent a single event, specifically the filling of Feature 331. This assumption is warranted for two reasons. First, all of these are short-lived materials. Radiocarbon assay returns a measurement that relates to the last time the materials were actively absorbing carbon from the environment (Robert E. Taylor 1987). Thus, the plant remains date an activity well; this activity was the harvesting of the plants. If it is assumed that storage

pits are cleaned on a yearly or bi-yearly basis to minimize the chance utilizing spoiled or rotten food (an assumption based on a 2 year range of storage for plant foods), then all of these items are food plants that were likely deposited in the pit the final season or seasons of use of the pit. On the other hand the remains may date to immediately after the pit was no longer used as a storage place having been deposited along with fill. Either scenario suggests the remains date to late in the pits use life. Second, abandoned storage pits are believed to be have been rapidly filled (Holley 1989:17, J. Kelly 1982). An open storage pit would have been a safety hazard and would make a natural dumping place for domestic waste. In any event, pits would have been open, but not utilized for storage, for a very narrow time window minimizing the chance of later contamination. With these constraints, I expect the remains to date within ± 5 years of abandonment, from a radiocarbon perspective this time period is effectively a single instant. This assumption is borne out analytically where the dates can be modeled as a single event. Since Feature 331 is associated with the end of the Mississippian sequence on the Powell Tract, it stands as a TPQ for the occupation.

Of the five feature contexts, only stratigraphic relationships between three are known. Based on observed stratigraphy M1292 and M1294 should be older than M1293. No other stratigraphic relationships between contexts dates by radiometric assays are demonstrable. Although there is a paucity of stratigraphy between dated contexts, excavation demonstrates at least three instance of superimposed construction (P. J. O'Brien 1972:8-9, 15-16). These data are useful for modeling the duration of occupation on the Powell Tract based on the following assumptions:

The early boundary of the Late Woodland occupation is constrained by the limits of the Late Woodland period whereas the abandonment of House 13 constrains the late boundary.

The early boundary of the Emergent Mississippian occupation is constrained by the early limit of the appearance of defining traits (ca. 950 calA.D.) whereas Feature 234 constrains the late boundary.

The early boundary of the Mississippian occupation is constrained by the appearance of Mississippian traits (ca. 1050 A.D.) whereas Feature 331 constrains the late boundary.

Using the above described assumptions and the observed stratigraphy, the radiocarbon chronology of the Powell Tract can be described as (Figure 68):

The probable age radiocarbon age (Z) of the the Powell Tract occupation is

$400 < Z_{\text{Late Woodland}} < A < 950 < Z_{\text{Emergent Mississippian}} < B < 1050 < Z_{\text{Mississippian}} < D$ where

- A = Fill House 13
- B = abandon House 26
- C = abandon Feature 331

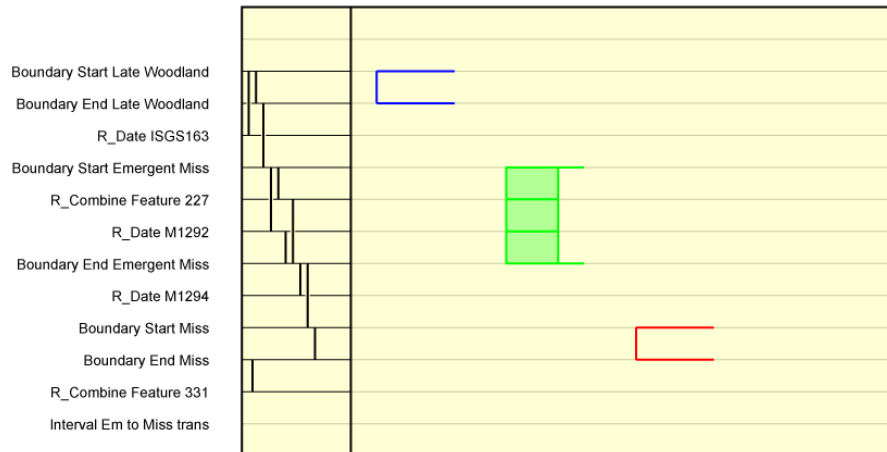


Figure 68. Schematic of Powell Tract Model.

The model assumes three general time period of occupation that are sequential. Since there is not stratigraphic evidence to indicate on way or the other, noa priori statement is made if they are contiguous or if there is a gap between the phases. The termination of each occupation can be measured by the abandonment of specific features. All charcoal dates were offset to account for the probability that the radiocarbon present in the charcoal does not represent the most recent time when the wood was actively interacting with the carbon cycle. A twenty-year period was chosen assuming old growth trees would not be used for fuel, twenty years represents the midpoint of the life of a 40 year old tree. Since none of the remains are described as in situ building materials, curation is not a factor.

The West Plaza

The radiocarbon dataset from the West plaza consist of nineteen dates (Table 30). Five are associated with Wittry and Vogel's (1962) highway work, four were done by

ISGS on materials recovered by Salzer (1975), and the remaining ten were run by Kelly (J. Kelly 1997a) . Materials from the 15B excavations were submitted by Wittry assayed by the University of Michigan (M1332-M1336) and have large published standard errors. All of these radiometric determinations were done on carbonized wood (charcoal) as was standard for the time. No description of what kind of wood or where in relation to the outermost part of the tree is available. In instances where the same context was duplicated by more recent dates the Michigan dates were excluded from analysis. Materials from the Beloit excavations were submitted by Lathrap and were reported by ISGS in 1986 (Liu et al. 1986:79). All of the materials submitted by Lathrap are reported as organics without a detailed description. Dates obtained by Kelly were done on well-identified samples of short lived plant material. All are associated with what he believes to be the latest occupations in the West Plaza.

Location	Lab No.	RCYBP	Standard Error	Material	Reference	Comments
Tract 15B	M1335	765	200	wood	Crane and Griffin 1964:5	Feature 77. Acculturated Late Woodland (?).
Tract 15B	M1332	515	100	wood	Crane and Griffin 1964:5	Feature 43. Sand Prairie phase structure.
Tract 15B	ISGS3831	590	70	wood	Kelly 1997	red oak, H43
Tract 15B	M1333	825	100	wood	Crane and Griffin 1964:5	Feature 44. Acculturated Late Woodland (?).
Tract 15B	M1336	885	200	wood	Crane and Griffin 1964:5	Feature 113. Acculturated Late Woodland (?).
Tract 15B	ISGS3836	630	70	wood	Kelly 1997	Ulmus americana, H59
Tract 15B	ISGS3835	670	70	wood	Kelly 1997	ash, H59
Tract 15B	ISGS3832	600	70	wood	Kelly 1997	red oak, H43
Tract 15B	M1334	385	90	wood	Crane and Griffin 1964:5	Feature 59. Sand Prairie phase structure.
Merrell Tract	ISGS3826	530	70	Carya spp	Kelly 1997	F341
Merrell Tract	ISGS276	860	80	charcoal	Liu et al. 1986:79	Feature 319 fill
Merrell Tract	ISGS3823	610	70	Carya spp	Kelly 1997	F341

Location	Lab No.	RCYBP	Standard Error	Material	Reference	Comments
Merrell Tract	ISGS3824	600	70	Carya spp	Kelly 1997	F341
Merrell Tract	ISGS3829	560	70	maize	Kelly 1997	F349
Merrell Tract	ISGS3830	650	70	maize	Kelly 1997	F349
Merrell Tract	ISGS281	1080	80	charcoal	Liu et al. 1986:79	Feature 319 floor
Merrell Tract	ISGS283	1220	80	organics	Liu et al. 1986:79	Feature 319 floor
Merrell Tract	ISGS3825	420	70	maize	Kelly 1997	F349
Merrell Tract	ISGS280	1050	80	organics	Liu et al 1986:79	Feature 319 floor

Table 30. West Plaza dates.

Contexts for Wittry's 15B excavations include three single post wall houses (House 44 sample M-1333; House 77 sample M1335; and House 113 sample M1336) and two wall trench houses (House 43 sample M1332 and House 59 sample M1334). Fowler associates M1332 with household construction; therefore M1332 specifically serves as a TPQ for House 43 and for the last phase in general. Samples from House 44, House 77, and House 113 may be related to the last Emergent Mississippian occupations since they consisted of organic material from the floor of the houses. The abandonment of these structures are TAQ's for the end Emergent Mississippian occupation. The time of abandonment of House 43 and House 59 represent TPQ's for the end Mississippian occupation.

Samples from the Beloit excavations (ISGS276, ISGS280, ISGS281, and ISGS283) were all recovered from Feature 319(cf. Fowler 1997:213, Liu et al. 1986:79), a houses basin believed to be from the early Emergent Mississippian period. Three samples (ISGS280, ISGS281, and ISGS283) were recovered from the floor of the house and represent materials concurrent with the occupation of the house. The dates of these

materials offer a TPQ for the end of the early Emergent Mississippian occupation on the Merrell Tract. ISGS276 consisted of organic material from the fill of the house basin and are associated with a period after the use of the house (see comments by Lathrap cited in Liu et al. 1986:79, Salzer 1975:4). ISGS276 represents a TAQ for Feature 319 and for the earliest occupation of the West Plaza.

In a project designed to improve the understanding of the end of the Cahokian sequence, Kelly (1997a) submitted six sample from three contexts from the Merrell Tract and four sample from two contexts from Tract 15B. Samples from the Merrell Tract consisted hickory nut fragments from Feature 341 and carbonized maize from Feature 349 and Feature 371. Charcoal from logs associated with Structure 43 and Structure 59 from Tract 15B were also submitted. These samples were building material associated with the construction of these structures.

Using this outline as a basic model, the data from the west plaza are modeled as three discrete phases (Figure 69). The first phase is bound by the onset of the Loyd phase (start 900 calA.D.) and terminates before Feature 319 was filled. The second phase is associated with single wall post houses, a common trait of the Emergent Mississippian period. The early limit (ca. 980 calA.D.) on the second phase was inferred from archaeological collections and the later limit was defined by the probable age of abandonment of Houses 44, 77, and 113. , The final occupation was based on the appearance of Sand Prairie materials and the early limit was determined by the combined age of the building materials for House 43 and House 59. The upper limits were derived from the abandonment of House 43 and House 59. In this model, limits in some cases were derived from data external to Cahokia (e.g. the beginning of the Emergent

Mississippian period), this method is not the preferred method for high precision modeling. It was however necessary since there is a lack of materials associated with the beginning of occupations for the Merrell Tract. All dates are either terminal or post occupation material. Future work should focus on understanding the onset of these phases by dating, where possible, in situ initial construction remains.

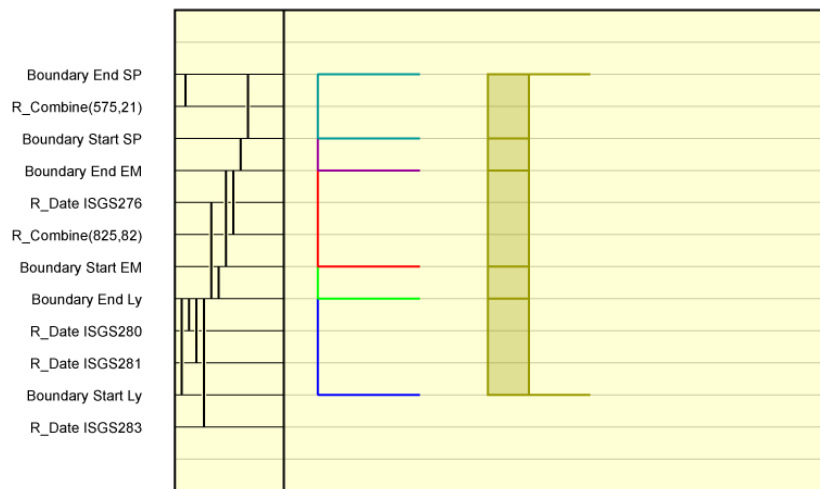


Figure 69. Merrell Tract model schematic.

Ramey Field

Archaeological work in the Ramey Field produced some of the first radiocarbon dates from Cahokia. These early dates were part of the work done by Griffin and Spaulding (1951) who excavated three test trenches into Mound 34. Their work yielded six radiocarbon dates (Table 31). Two samples (M33A and M33B) were recovered from contexts inferior to Mound 34 and represent *TPQ*'s for mound construction. Two (M635 and M636) are contemporaneous with the use of Mound 34 and are *TAQ*'s for mound construction. The remaining two (M670 and M672) are not stratigraphically associated

with any specific activity that is useful for understanding the Mound 34 sequence and are not particularly useful for modeling.

Location	Lab No.	RCYBP	Standard Error	Material	Reference	Comments
Ramey Field	WIS444	750	55	charred wood	Bender et al. 1971:475	Feature 28. Burned post. E461.80-461.87.
Ramey Field	WIS493	810	45	charcoal	Bender et al. 1973:230	House 4. Support beam. N315.38-315.48.
Ramey Field	GX859	815	85	Charcoal	Anderson 1973:92	Charcoal. E461-462 N277-279. House feature previous to palisade construction.
Ramey Field	WIS495	850	50	charcoal	Bender et al. 1973:230	House 4. Timber on floor. N315.80-215.90
Ramey Field	WIS494	900	55	charcoal	Bender et al. 1973:230	Structural timber.
Ramey Field	GX860B	1350	85	carbonized organics	Fowler 1997:213	House 4. Too early.
Ramey Field	GX860A	1310	65	carbonized organics	Fowler 1997:213	House 4. Carbonized material from inside vessel 2. Too early. Treated with hot dilute HCL and NaOH.
Ramey Field	WIS359	690	55	charcoal	Bender et al. 1970:339	Stockade. E461.64-461.70 N336.80. 40-80cms below surface.
South Stockade	WIS366	890	55	wood	Bender et al. 1970:340	South Stockade area southeast of Fox Mound. 100 cm below surface.
Mound 34	M670	960	125	charcoal	Crane and Griffin 1959:181	Associated material identified as Trappist complex. Date much too old for associated material.
Mound 34	M636	660	100	charcoal	Crane and Griffin 1959:181	Sample should date with Mound 34 in time
Mound 34	M635	670	100	charcoal	Crane and Griffin 1959:181	Carbon from "ceremonial fire" next to ramp on west side of Mound 34.
Mound 34	M33A	700	150	charred plants	Crane and Griffin 1956:666	Charred plant material from pit under Mound 34. Solid carbon method.
Mound 34	M33B	900	150	charred plants	Crane and Griffin 1956:666	Same as M33A.
Mound 34	M672	480	100	charcoal	Crane and Griffin 1959:182	Same context as M670. Date more recent than expected.
Mound 34	A1447	870	15	Bone	Kelly 2010	

Location	Lab No.	RCYBP	Standard Error	Material	Reference	Comments
Mound 34	A1448	640	15	Bone	Kelly 2010	
Mound 34	A1449	630	20	Bone	Kelly 2010	
Mound 34	A1450	645	15	Bone	Kelly 2010	

Table 31. Ramey Field dates.

Other radiocarbon dates from the Ramey Field locality are associated with the Wisconsin excavations in the west palisade area. Radiocarbon dates were run on materials inferior to the palisade (WIS444, WIS 493, WIS 494, WIS 495, and Gx859) and on materials from the final version of the palisade (WIS359). Two dates (Gx860A and Gx860B) were run on samples of pottery residue from vessels associated with the early occupation, but Fowler (1997:207) suggests these dates are skewed due to contamination. Since the palisade crosscuts the early plaza the beginning of palisade construction terminates the early plaza occupation. The final version of the palisade acts as a *TPQ* on the earlier iterations. Wisconsin also ran a radiocarbon date on a post from the palisade wall trench in near the Fox Mound (Mound 60) along the southern edge of the palisade. Unfortunately, provenience for this sample is lacking (WIS366). The radiometric database for the Ramey Field area is scant in relation to the archaeological resources; consequently only definitive statements can be made about the palisade and Mound 34.

The Ramey Field data can be modeled as two separate models: Mound 34 and the Palisade. The only meaningful information that can be gleaned for the extant radiocarbon data from Mound 34 is the time of mound construction. Where the construction of Mound 34 fits into the chronology of the East Plaza cannot be determined from the current database since there is no radiocarbon database for the remainder of the East Plaza.. The Palisade sequence is more complicated and can be modeled as two phases

consisting of a pre-palisade occupation and a palisade occupation — at least through the third iteration.

Based on observations by Kelly et al. (2007), the bulk of Mound 34 was likely constructed very rapidly as a single event. Given the nature of construction, it is unlikely any radiometric determinations will date precisely to the period of mound construction — any dates from submound contexts or fill contexts will predate construction while any materials from the upper surface may postdate construction but this determination is tempered by the realization that dates on charcoal may present an old wood problem. The stratigraphy is such that modeling requires using a tpq/taq logic. The radiometric database from Mound 34 consists of eight dates, but two of the dates (M33A and M33B) were run very early in the history of radiometric dating and have very long standard errors. Consequently, these data were not used for modeling, although models were run including and excluding these data. Using the data does not change the results. For clarity these dates were excluded from the model.

There are four dates from pre-mound contexts that are useful for modeling. Assays were by the Illinois State Geological Survey on materials collect by Kelly et al. in 2009 (J. Kelly and Brown 2010). Dates are from secure submound contexts represent short lived materials. These data are models as a tpq in OxCal.

There are two assays run on materials from the terrace adjoining Mound 34 (M635 and M636). These dates are assumed to represent a time after the construction of the mound since stratigraphically the terrace overlies the mound proper, suggesting the terrace is older than the mound. Any materials from the terrace should represent later depositional contexts. The materials are only described as charcoal, no description of tree

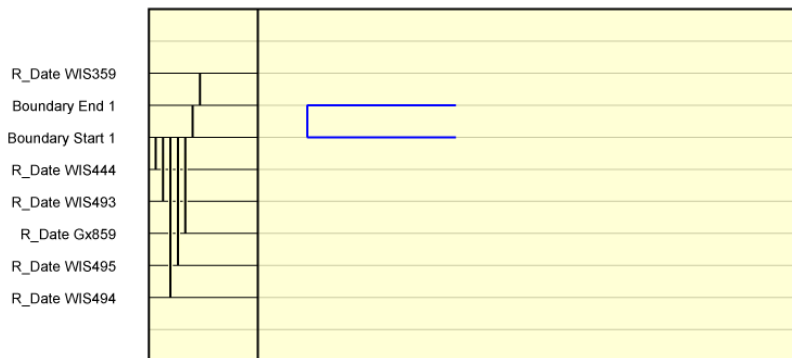
species or the precise location of the portion assayed exists. These data do allow for the possibility dating wood that was growing before the construction of the mound and introduce an unquantifiable level of uncertainty in the model. Furthermore, the 14C dates are associated with very long standard errors (± 100 years). Therefore the results should be considered provisional. Given their context and the assumption the charcoal is not from heartwood, these data do provide a necessary constraint for modeling. In any event, the model is constructed in such a way that new data can easily be included. Data from Mound 34 can be expressed mathematically as: Submound age \leq Mound Summit age.

The model for the East Palisade area is stated as (Figure 70):

$A < B < C$ where:

A = the age of pre-palisade deposits

B = the time of Palisade 1, Palisade 2, and Palisade 3



C = the age of Palisade 4

Figure 70. Palisade model schematic

Tract 15A

There are twenty eight radiocarbon dates from Tract 15A (Pauketat 1998a). The radiocarbon database of Tract 15A (Table 32) is perhaps the best extant data set in relation to the excavated remains as samples come from a wide range of stratigraphic contexts. The earliest dates (temporally) come from a series of Emergent Mississippian to Mississippian structures. Although these dates are associated with pre-Woodhenge construction there is little stratigraphic data to suggest internal order. These dates (I2012-I2016, I2069-I2071, and M1340) were all done in the 1960s and have very long standard errors. These dates are less useful for modeling but are included for completeness purposes.

Location	Lab No.	RCYBP	Standard Error	Material	Reference	Comments
Tract 15A	M1341	905	120	wood	Crane and Griffin 1964:5, Wittry 1973:45	Features 174 and 369. Posts from Woodhenge.
Tract 15A	M1340	1025	110	wood	Crane and Griffin 1964:5	Floor of house 74. Single post construction.
Tract 15A	I2014	1000	100	charcoal	Fowler 1997:213	Feature 289. Mississippian refuse pit.
Tract 15A	I2070	990	135	charcoal	Fowler 1997:213	Feature 368. Mississippian refuse pit.
Tract 15A	I2016	980	90	charcoal	Fowler 1997:213	Feature 338. Mississippian refuse pit inside Circle 2.
Tract 15A	I2012	910	100	charcoal	Fowler 1997:213	Southeast of Circle 2. Woodland refuse pit.
Tract 15A	I9458	940	75	charcoal	Pauketat 1998:45	H205
Tract 15A	M1337	805	100	wood	Crane and Griffin 1964:5	House 2. Wall-trench structure associated with Ramery Incised ceramics.
Tract 15A	I2071	890	135	charcoal	Fowler 1997:213	Features 371 and 369. Mississippian refuse pits.
Tract 15A	I2069	875	105	charcoal	Fowler 1997:213	Pit feature 153. Mississippian refuse pits.

Location	Lab No.	RCYBP	Standard Error	Material	Reference	Comments
Tract 15A	M1338	725	100	wood	Crane and Griffin 1964:5	House 32 east of Circle 2. Intrudes into Circle 1 post pit 112. Therefore must date later than Circle 1.
Tract 15A	I2013	920	100	charcoal	Fowler 1997:213	Pit Feature 297.
Tract 15A	I9459	990	75	charcoal	Pauketat 1998:45	Feature 401
Tract 15A	I9460	980	75	charcoal	Pauketat 1998:45	H209
Tract 15A	GX926	1135	80	charcoal	Hall 1966; Pauketat 1998:45	Feature 311
Tract 15A	I9457	880	75	charcoal	Pauketat 1998:45	H407
Tract 15A	WIS1136	990	60	wood	Bender et al. 1981:146	Juniperus sp. same sample as WIS1133
Tract 15A	WIS1133	890	60	wood	Bender et al. 1981:196	Juniperus sp.
Tract 15A	M1339	685	100	wood	Crane and Griffin 1964:5	House 35
Tract 15A	WIS1130	920	60	wood	Bender et al. 1981:145	Juniperus sp.
Tract 15A	WIS1128	940	60	wood	Bender et al. 1981:145	Juniperus sp.
Tract 15A	I9464	440	75	charcoal	Pauketat 1998:45	H212
Tract 15A	I2015	1060	90	charcoal	Fowler 1997:213	Feature 108. Mississippian wall-trench structure.
Woodhenge Circle 2	WIS948	1085	55	wood	Bender et al. 1979:121	Feature 548
Woodhenge Circle 2	WIS969	1060	55	wood	Bender et al. 1979:121	Feature 548
Woodhenge Circle 3	WIS976	760	55	charred wood	Bender et al. 1979:121	Feature 340
Woodhenge Circle 3	WIS984	685	55	charred wood	Bender et al. 1979:121	Feature 506, House 302
Woodhenge Circle 4	WIS988	1135	55	charred wood	Bender et al. 1979:121	Feature 539

Table 32. Tract 15A dates.

The post 1100 A.D. (Pauketat 1996, 1998a) sequence from Tract 15A lends itself particularly well to modeling because of the quality and provenience of the samples- most are construction features associated with superimposed versions of the Woodhenges which provide excellent *TPQs*. The following discussion is based on Wittry's (1996) discussion of the archaeostratigraphy of the Tract 15A. The earliest occupation in the

Woodhenge area is not documented by radiocarbon dating. The earliest (stratigraphically) radiocarbon date is sample WIS988 associated Woodhenge II. The sample consisted of charcoal from a post.. This sample provides a *TPQ* for Woodhenge II and subsequent iterations of Woodhenge. Six samples (WIS948, WIS969, WIS1128, WIS1130, WIS1133, and WIS1136) are all associated with Woodhenge III. These samples provide a *TPQ* (in this case the *TPQ* can be modeled as a phase providing an a priori model for subsequent aspects) for Woodhenge III and later version. WIS984 and M1341 were recovered from posts associated with Woodhenge V and provide the upper temporal boundaries for Woodhenge IV. WIS976 was recovered from a pit superimposed on a house which is believed to be after the final use of Woodhenge V and thus provides a *TAQ* for Woodhenge V (Pauketat 1996:80, Wittry 1996:28). WIS976 consisted of a wood charcoal sample therefore its context may be less secure as a *TAQ* given the possibility of time lag induce by old wood. Three final samples, M1337, M1338 and M1339, also serve as *TAQs* for the Woodhenges as these samples were wood charcoal recovered from the floor of houses imposed on the remains of Woodhenge V. In this instance, an assumption of relative contemporaneity is made for modeling purposes. This is one weakness that may be address by a obtaining more dates on short lived material.

Additional dates have been done by Pauketat (1998a:45-46), who submitted ten pottery sherds for thermoluminescence dating to the TL Laboratory at the University of Missouri at Columbia. TL dating returned a wide range of dates that fall well outside the expected range. Pauketat discounts the validity of these dates. Based on his discussion, these dates are not used for modeling.

The model for the radiocarbon sequence from Tract 15A can be expressed as

(Figure 71):

$A < 1100 < B < C < D < F < G$

Where:

A = pre-Woodhenge I occupation

B = Woodhenge I occupation

C = Woodhenge II occupation

D = Woodhenge III occupation

E = Woodhenge IV occupation

F = Woodhenge V occupation

G = post Woodhenge occupation



Figure 71. Woodhenge model schematic.

Interpretive Center Tract II

ICTII produced thirteen (Table 33) radiocarbon dates (Holley 1989:456). In relation to the number of excavated features (N = 468, at least 71 of these were wall trench structures (Collins 1990)), the number of radiocarbon dates is staggeringly small. In his discussion of the dates, Holley discounts the reliability of the age assessments because many of the dates were on wood species that he believes exacerbates the old wood effect (Holley 1989:455). On the other hand, some of the perceived problem with the dates may be from attempting to use the determinations as a measure of contemporaneity as opposed to using these dates as termini. The effect of Holley's perception of radiocarbon assays can be seen in his statement that dates from Feature 178 which assayed earlier than expected were problematic because they were all charred in the same event (Holley 1989:455). These dates should be earlier since the cutting of the wood must logically happen before it was used for fuel or in the construction of the structure. This distinction is necessary but difficult to make since Holley believes Feature 178 represents a catastrophically burned structure making it impossible to sort remains from the construction and use of the building. Furthermore, given the nature of the deposit, it would be incorrect to believe the remains are the most recent materials rather than an average of the age of the tree. The charring of the wood only happened after this sequence so the dates may not be as far out of line as Holley believes. To be used properly, each date must be analyzed by context and understood in relation to what the most likely use, *e.g.* wood charcoal from a fire pit may be an indicator of the time of

usage (although such samples probably represent an average of the tree as opposed to the time of cutting) whereas wood used in construction may be a *TPQ*. No materials came from unambiguous construction contexts nor were any samples selected of short lived materials. Due to the sample selection process, the radiocarbon database from ICTII is less than adequate for fine-scale modeling. In this instance, the radiocarbon samples represent a likely average age of the tree and have little to do with the cultural activity in question. The dates are nothing more than very general *TPQs*. Consequently these data are not modeled as the results would be spurious.

Location	Lab No.	RCYBP	Standard Error	Material	Reference	Comments
Interpretive Center Tract II	BETA19474	970	60	charcoal	Holley 1989	Lohmann phase.
Interpretive Center Tract II	BETA19486	1320	80	charcoal	Holley 1989	Early Stirling phase. Date seems to early for ceramic phase associations.
Interpretive Center Tract II	BETA19492	1050	70	charcoal	Holley 1989	Early Stirling phase. Date seems to early for ceramic phase associations.
Interpretive Center Tract II	BETA19487	1050	70	charcoal	Holley 1989	Early Stirling phase. Date seems to early for ceramic phase associations.
Interpretive Center Tract II	BETA19490	1010	60	charcoal	Holley 1989	Moorehead phase. Date seems to early for ceramic phase associations.
Interpretive Center Tract II	BETA19475	1100	70	charcoal	Holley 1989	Late Stirling phase. Date seems to early for ceramic phase associations.
Interpretive Center Tract II	BETA19485	960	60	charcoal	Holley 1989	Lohmann phase.
Interpretive Center Tract II	BETA19473	960	100	charcoal	Holley 1989	Lohmann phase.

Location	Lab No.	RCYBP	Standard Error	Material	Reference	Comments
Interpretive Center Tract II	BETA19480	950	60	charcoal	Holley 1989	Late Stirling phase.
Interpretive Center Tract II	BETA19478	940	80	charcoal	Holley 1989	Late Stirling phase. Date seems to early for ceramic phase associations.
Interpretive Center Tract II	BETA19484	930	80	charcoal	Holley 1989	Late Stirling phase. Date seems to early for ceramic phase associations.
Interpretive Center Tract II	BETA19491	800	80	charcoal	Holley 1989	Moorehead phase.
Interpretive Center Tract II	BETA19479	1030	70	charcoal	Holley 1989	Late Stirling phase.

Table 33. ICTII dates.

Mound 51

Materials selected for dating from Mound 51 consisted of samples from deer bone and short-lived plant material (Table 34). The discussion presented by Chmurny(1973:59) highlights the unease that archaeologists working at Cahokia have with radiocarbon dating. Chmurny notes that when taken as a whole the radiocarbon database from sub-Mound 51 dates too late with the distribution skewed by assays run on deer bone. On the basis of pottery, Chmurny suggests the deer bone dates are incorrect and the plant dates are more correct. One possible reason for the deer bones dates returning anomalously late dates is contamination by humic acids and the incomplete removal of this contamination (Ambrose and Krigbaum 2003:159). In the intervening years, advances have been made in the extraction of collagen for bone dating which has improved the accuracy of bone dates (R. E. Taylor 1992) but there is a good chance the deer bone dates are not correct for the chronometric age of the deer. Another reason may relate to the diet of the deer. If the deer were eating maize then the proportion of $^{13}C/^{12}C$

may need to be corrected for fractionation-induced time inaccuracies — that is a diet of corn (C4 pathway plants) does not result in similar isotopic uptake of ¹⁴C as a diet composed of C3 plants. Fowler (1997:214) suggests these dates need to be corrected for isotopic fractionation. Given the ambiguities, the plant dates are seen as the most accurate dates because of earlier problems in properly dating bone. Dates from the deer bone are not used for modeling.

Location	Lab No.	RCYBP	Standard Error	Material	Reference	Comments
Mound 51	GX950	1145	65	thatch	Fowler 1997:214	Charred thatch - Corrected for fractionation. Stratum E. Out of line with other dates and stratigraphy.
Mound 51	WIS351	780	60	Deer bone	Bender et al. 1970:642	Deer bone - corrected for fractionation. Stratum F.
Mound 51	WIS352	800	65	Deer bone	Bender et al. 1970:642	Deer bone - corrected for fractionation. Stratum H.
Mound 51	WIS356	810	50	Deer bone	Bender et al. 1970:642	Deer bone - corrected for fractionation. Stratum D1.
Mound 51	WIS360	815	60	Deer bone	Bender et al. 1970:642	Deer bone - corrected for fractionation. Stratum D2.
Mound 51	WIS391	850	65	Caraya shell	Bender et al. 1970:643	Nut hull - corrected for fractionation. Stratum D2.
Mound 51	WIS390	890	65	Caraya shell	Bender et al. 1970:642	Nut hull - corrected for fractionation. Stratum G.
Mound 51	WIS389	900	50	Caraya shell	Bender et al. 1970:642	Nut hull - corrected for fractionation. Stratum H.
Mound 51	M1784	910	110	thatch	Crane and Griffin 1972:208	Charred thatch - corrected for fractionation. Outside pit.
Mound 51	WIS350	750	50	Deer bone	Bender et al. 1970:641	Deer bone - corrected for fractionation. Stratum E.
Mound 51	ISGS2573	760	95	thatch	Bender et al. 1970:642	Charred thatch - corrected for fractionation. Stratum F.
Mound 51	WIS355	680	60	Deer bone	Bender et al. 1970:642	Deer bone - corrected for fractionation. Stratum G.

Table 34. Mound 51 dates.

Mound 72

Mound 72, a small ridge top mound (Fowler 1999:3), lies at the southern end of the the site. Fowler and crews from the University of Wisconsin, Milwaukee excavated much of Mound 72 from 1967 to 1971 as a component of a larger project designed to

understand community patterning at Cahokia. Subsequent smaller scale projects were done in the following decades. Fowler believed Mound 72 was located along an important north to south axis that also ran through Monks Mound. Based on maps from the project, he believed they would find a marker post buried beneath the mound. Excavation exposed the, perhaps, most finds recovered from Cahokia. In addition to the hypothesized marker post, excavators found the remains of at least 260 individuals arrayed in a series of pits (Fowler 1999:3). One burial stood out amongst the rest, the central “Beaded Burial” was associated with an enormous amount of grave good including pottery, projectile points, marine shell, copper, and potential retainer sacrifices.

Mound 72 presents interesting challenges for fine-scaled modeling. In relation to the amount of excavation, there are few radiocarbon assays, and the extant ones were done on either charcoal or wood fragments from construction features (Table 34). Therefore, none of the materials necessarily are contemporary with the past associated behavior. Some, like the charcoal dates may be related more to the age of the tree than cultural activity. Others, given their use as building material, may approximate the building activity well. Because of the kinds of samples used for radiometric dating, all dates from Mound 72 TPQs none are unambiguously a TAQ. Even though the database could stand some improvement, the stratigraphy from Mound 72 is superb for fine-scaled modeling. The Mound 72 excavations clearly delineate a series of stratigraphically superimposed events that are bound by radiometric determinations. This sequence minimizes the number of necessary assumptions as relationships are governed by the laws of stratigraphy.

Based on ceramics, stratigraphy and radiocarbon dating, Fowler (Fowler 1999) created an eight stage model for Mound 72. For the purposes of modeling in this study, Fowler’s model can be collapsed to three periods; this is a necessary conflation because there are only three contexts dated by radiocarbon. The Mound 72 model consists of two periods (Period 1 and Period 2). Period 1 represents after the erection of Feature 1 — the post on the Cahokia Axis but before the final burials in Mound 72sub1 and Mound 72sub2. Period 2 models the time between the end of construction of Mound 72sub1 and Mound 72sub3 and the final construction on Mound 72. In this model, as suggested by Fowler Mound 72sub1 and Mound 72 sub2 are coeval. Fowler believes the entire construction in this area is less than 100 years. The model for Mound 72 can be stated as (Figure 72):

$$(A < B < C)$$

$$C - A < 100 \text{ years}$$

Where

A = the age of the construction of Feature 1

B = the age of the burials on Mound 72 sub1

C = the age of the midden overlying the final stage

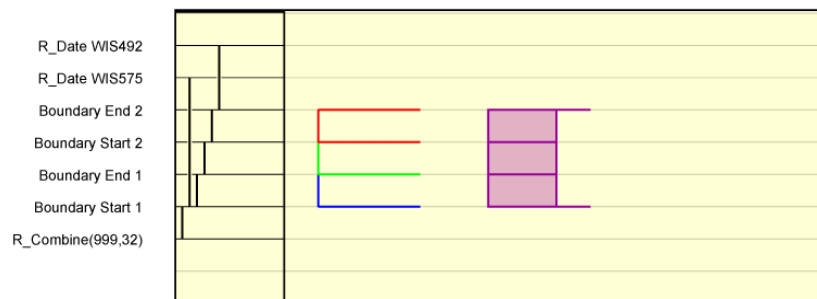


Figure 72. Mound 72 model schematic.

Location	Lab No.	RCYBP	Standard Error	Material	Reference	Comments
Mound 72	WIS298	1020	55	wood	Bender et al. 1969:230	Feature 1. Cribbing log A from bottom of post pit.
Mound 72	WIS447	1015	60	charcoal	Bender et al. 1971:476	Feature 205. North midden.
Mound 72	WIS575	920	60	wood	Bender et al. 1973:612	Fea 229. Portion of cedar litter pole from burial #210. S865-865.3.
Mound 72	WIS492	900	55	charcoal	Bender et al. 1973:229	Feature 227. Central midden.
Mound 72	WIS293	970	50	wood	Bender et al 1969:230	Feature 1. Cribbing Log B materials from bottom of post pit. S865-E.83.5.

Table 35. Mound 72 dates.

Monks Mound First Terrace

Excavation by Benchley (1975) produced a number of chronometric assays (see Chapter V) that are useful for dating the construction of the mound on the southwest corner of the first terrace. Two assays (WIS545 and O273) done by Benchley provide a *TAQ* for the final identified mound construction stage. WIS545 was run on charcoal from the upper stage. A precise description of the sample is not available, it is not known if the sample represents charcoal from a fire pit which may suggest contemporaneity or charcoal from build materials which may indicate a *TPQ* for the summit building. In either event, the date still provides a time after which the final mound stage must have been standing and therefore a *TAQ* for construction although in the latter case the date is less accurate. The other chronometric date consists of an archaeomagnetic reading. Again, a precise provenience is lacking but an assumption contemporaneity with the use of the building is warranted and therefore the date is a *TAQ* for construction. The OxCal program can utilize both probabilistic statements such as calibrated radiocarbon dates and absolute statements such as archaeomagnetic dating so these determinations pose little problem from an operational standpoint.

Miscellaneous Areas

Radiocarbon dates from two other locals at Cahokia, are less well associated. First, a single radiocarbon date was produced with excavation at Mound 55. This date (M1290) was run on charcoal associated with slope wash from the mound and in theory should provide a *TAQ* for Mound 55. Given its relatively loose association, it is not used for modeling in this analysis. At the same time two radiocarbon dates are reported from the Collinsville Airport excavations, on the eastern edge of the site. These dates (M1297 and M1296) are not well associated with building activities at the site, but may be useful to define a general late period of occupation.

Location	Lab No	RCYBP	Standard Error	Material	Reference	Comments
Airport area	M1296	725	75	wood	Fowler 1963:50; Crane and Griffin 1963:237	Wall-trench structure. Charred wood from top of House 3
Airport area	M1297	675	75	charcoal and maize	Crane and Griffin 1963:237	Charcoal and charred maize from refuse pit with Sand Prairie ceramics. Not corrected for isotopic fractionation.
Mound 55	M1290	600	75	charcoal	Crane and Griffin 1963:236	post molds below loess pyramid.

Modeling Results

This section presents of OxCal models created using the above described radiocarbon data. Previous models of the settlement at Cahokia rely on a mixture of pottery seriation, correlation with external sites, and to a lesser extent radiocarbon dates derived from excavation (Pauketat 1998b). These models have served to create a broad understanding of the Cahokia site with occupation beginning at about 800 A.D. and

ending around 1400 A.D. (Benson et al. 2009, Milner 1998, Pauketat and Emerson 1997a). Although numerous patterns have been identified suggesting a dynamic chronological structure to the site (Pauketat and Lopinot 1997), the precision permitted by the phase-based chronology tends to conflate the history of the site into a series of well ordered boxes.

Perhaps the best example of this can be seen in the so called “Big Bang” (Pauketat 1997). A convergence of demography, mound building, and inferred centralization of authority marks the “Big Bang,” but the intersection of these traits may in part be the result of our inability to tell time rather than an actual socio-cultural phenomenon. The results of the radiocarbon dating suggest the construction of the landscape and settlement history may be more vibrant than is allowed by the traditional phase-based approach.

The Powell Tract

The Powell Tract data indicate three temporally discrete occupations. The initial occupation occurred in the Late Woodland. The beginning date is not known—for modeling purposes it was arbitrarily set at 800 A.D. – but a terminal date of the end of the ninth century A.D. is likely based on the calibrated range of the filling of House 13 (mean = 874 A.D., median = 875 A.D.). The modal range of this distribution is particularly flat with a 95.4 percent probability of falling between 803 A.D. and 945 A.D. Two slight peaks are identifiable: they are between 831 A.D. and 853 A.D. (15.3 percent probability), and between 904 A.D. and 930 A.D. (18.2 percent probability). This kind of distribution suggests the model is likely deficient in data. In spite of the dearth of data,

the model indicates the Early Period is temporally discrete from the later periods. The gap between the earlier Late Woodland occupation and the later Emergent Mississippian occupation is likely on the order of two to three generations given that over 50 percent of the probability distribution for the interval between the filling of House 13 and the beginning of the currently accepted limits of the Emergent Mississippian period is between 20 and 124 years.

The second period represented at the Powell Tract falls between 950 A.D. and about the end of the tenth century. Although a precise time is preferable, the data do not point out a clear trend except to say the occupation was certainly over by 1030 A.D. A more likely end date, based on modal probabilities, indicates the occupation was short term, perhaps less than a single generation with the mean and median of the probability distribution falling near 980 A.D. The distribution curve, while steeper than the curve for the previous boundary still does not display a marked modality. The 95 percent probability range runs from 950 A.D. to 1030 A.D. The probable length of the time gap between the end of the middle phase of occupation and the later phase has a 95 percent probability of being in the range of 20 years to 102 years.

The final period lies between 1050 A.D. and the final decades of the eleventh century, perhaps as late as 1100 A.D. This would appear to be the final occupation before the construction of the Powell Mound. Given the current level of information, the temporal relationship between this occupation and the construction of the Powell Mound is murky. Based on Ahler and DePudyt's (1987), work the Powell Mound was constructed sometime after the beginning of the Stirling Phase (ca. 1100 A.D). The final phase of this occupation appears to fall short of this time by about 20 years, the modeled

time does not extend past 1100 A.D. perhaps indicating a hiatus — at least in this area of the Powell Tract.

West Plaza

Modeling the West Plaza data clearly indicates the limitations of the existing data sets. The extant material culture suggests there may be a long continuous occupation (J. Kelly 1996a, Pauketat 1998a, Salzer 1975), but because of the way that materials were chosen for radiometric analysis, these data can only address a limited number of questions. This being said, the radiocarbon data are useful for addressing several points.

First, if the assumption regarding the materials from the floor of Feature 319 is correct then this house may better fit the current temporal definition of the Edelhardt phase than the Loyd Phase. The age range for a time between the use of the house and the fill has a modal peak just after 1000 A.D. The house is clearly an early pit house, suggesting the radiocarbon dates likely all relate to the filling of the house with later materials than to the use of the house during the Edelhardt phase.

Second, the Michigan dates on the single post houses from the Merrell Tract tend to be later than expected. In this instance, the modal peak for a time immediately after the construction of the three single post structures lies from about 1040 A.D. to 1060 A.D. On the Merrell Tract, it would seem as though single-post house construction continued into the early Lohman Phase.

Finally, the Sand Prairie Phase construction can be well placed in time. Based on the model, the Sand Prairie occupation began after 1320 A.D. but was certainly underway by 1330 A.D. (maximum modal distribution of beginning boundary = 1325 A.D.). The

late occupation in the West Plaza area was over by about the end of the fourteenth century A.D. (maximum modal distribution for the end boundary = 1385 to 1395 A.D.). These data suggest the final occupation on the Merrell Tract lasted approximately 75 years or about three to four generations.

Ramey Field – Mound 34

The Ramey Field data are limited but still informative (J. Kelly and Brown 2010). Mound construction began in the fourteenth century. The probability distribution function has two modes: one in the first quarter of the fourteenth century and the other in the last quarter of the fourteenth century. The earlier modal peak is greater, indicating a greater likelihood that this is the correct age determination for a time after the submound contexts were actively receiving carbon inputs.

Mound construction was completed in the fourteenth century. The probability curve is relatively widespread throughout the second half of the fourteenth century, however this is likely the result of very long standard errors associated with the mound surface contexts assays.

Mound construction was likely very rapid. Modeling indicates a very short time was required to reach the summit, likely less than five years. From a conceptual standpoint, this should be thought of as a single construction event, because the duration is so short as to be beyond the resolution of radiocarbon dating.

Ramey Field – Palisade

The Palisade data, although limited in extent, provide interesting insights into the time of construction (Iseminger et al. 1990). Based on available data, the palisade was

constructed just after the turn of the thirteenth century (95.4 percent range = 1158 to 1261 A.D.; Mean = 1201 A.D.; Median = 1204 A.D.). The age of the beginning of palisade construction was defined as a time after the 95.4 percent probability distribution of the calibrated pre-palisade dates. This date is somewhat unexpected but it should not be. Previous workers have relied on uncalibrated dates (e.g., Fowler 1997) which place the beginning range near 1150 A.D. As Hall (1991:10) has demonstrated, simply calibrating dates tends to make the ages younger.

In this same way, the traditional age of the fourth iteration of the palisade is also unexpected. The data suggest the last palisade wall was built after the middle-to-late fourteenth century (Mean = 1353 A.D.; Median = 1368 A.D.). This distribution is likely skewed toward the early end of the spectrum since the radiocarbon date that anchors the construction of the fourth palisade was taken from a post. The radioisotopes dated in this sample relate to the age of the tree and only secondarily to the age of the post since the tree was only actively interacting with the carbon cycle before it became a post.

Tract 15A

The data from Tract 15A may be one of the best selected data sets from a modeling standpoint. The Woodhenges are well excavated and samples are well provenienced permitting fine-scale chronological modeling (Wittry 1996). This being said, modeling required arbitrarily setting a TPQ for building Woodhenge I because there is no dated material from this iteration. Based on the work of Pauketat (1996), the beginning of the Stirling Phase (1100 A.D.) was chosen for this boundary. Although

arbitrary, this date corresponds well with the extant data. Running the model with this value does not invalidate the model.

The computer model demonstrates occupation at Tract 15A may have begun in the early decades of the eleventh century A.D. (mean begin occupation = 1032 A.D., median = 1031 A.D., modal peak = 1015 A.D. to 1045 A.D.). The precise relationship between this occupation and the subsequent Woodhenge features is unknown, although they are likely contiguous based on the probability of the end date of occupation which, when modeled in the absence of the 1100 A.D. limit has a modal distribution peaking at the end of the eleventh century (1095 A.D. to 1100 A.D.). Subsequent construction and use of the Woodhenge structures indicates about a 20-year rebuilding cycle. In this model, the Woodhenge V period ends by the beginning of the thirteenth century A.D.

This model should be understood in light of our lack of knowledge about how the Woodhenges were used. The model suggests a 20-year construction cycle; whether this represents a single construction for an event occurring every twenty years or whether the periodicity corresponds with a rebuilding because the use life of the structure was approximately twenty years is unknown. Whatever the case, the model does indicate construction was undertaken at about twenty year intervals throughout the Stirling Phase.

The final occupation on Tract 15A begins in the early years of the thirteenth century (modal peak = 1200 A.D. to 1235 A.D., mean = 1218 A.D.). The radiocarbon database for this occupation is sparse but data indicate the occupation may have been as long as three generations (95 percent probability = 0 to 76 years, mean = 26 years, mode < 10 years) with Tract 15A abandoned near mid-century (mean = 1244 A.D., modal peak = 1225 A.D. to 1265 A.D.).

Mound 51

Modeling suggests Mound 51 was built after the mid-1100s A.D. Combining the radiocarbon dates (Chmurny 1973) from the plant material yields a discontinuous distribution with 19 percent of the distribution falling between 1045 A.D. and 1099 cal A.D. and 76 percent found between 1119 A.D. and 1253 A.D. The mean and median of the distribution both are in the latter half of the twelfth century as is the modal distribution. These data suggest Mound 51 was built toward the end of the Stirling Phase although there is a lesser probability of a Lohman Phase construction. The model presented here is slightly later than the one presented by Chmurny (1973), but it is important to note Chmurny presented uncalibrated radiocarbon dates. In light of the effects of calibration, the model presented here is in agreement with Chmurny's model and can be considered an updating. These results can be contrasted with information presented by Pauketat and his co-authors (2002:258) who argue, "All strata date to the late-eleventh-century "Lohman" phase (A.D. 1050-1100)³⁸, based on 12 radiocarbon assays and large quantities of diagnostic pottery sherds...". Calibration indicates the deposits should date to the Stirling Phase or shortly after 1150 A.D. This point is important because it suggests the feasting activities usually ascribed to the early Cahokia may be a normal component of the Cahokian history or at least less temporally restricted than previously believed. Alternative, these data may point to the difficulties of sorting late Lohman Phase pottery from Stirling materials, especially in short-lived contexts.

Mound 72

Mound 72 demonstrates the utility of modeling radiocarbon dates. Traditionally workers describe Mound 72 as dating to the Lohman Phase (Fowler 1999). However,

describing the mound in this manner obscures the internal history of the monument and its place in the larger historical events at Cahokia. Results of modeling indicate the first stages of Mound 72 were built in middle decades of the eleventh century. The best estimate of the modeled time for the construction of Mound 72sub1 and Mound 72sub2 is in the 1060s A.D. Modeling suggests the next stage of construction, the final entombment occurred somewhat later. After a period of perhaps a generation, the mound was completed. Based on field observations construction probably happened as a single event. Modeling indicates the event occurred in the final decade of the eleventh century (Mean = 1092 A.D., Median = 1090 A.D.). A graph of the modal values is particularly flat but indicates the most probable time to be in the final decades of the eleventh or beginning of the twelfth century. Overall, this model improves our knowledge of the Mound 72 sequence by demonstrating that the use of the area has a definite history constrained to a series of events occurring throughout the Lohman Phase.

Monks Mound First Terrace

Modeling the radiocarbon dates from the summit of the first terrace mound indicates the construction and occupation on the Southwest corner most likely occurred after the final decade of the twelfth century (Mean = 1190 A.D., Median = 1189 A.D.; 1175 A.D. to 1205 A.D. modal peak). These data are slightly earlier than but do not disagree with the analysis presented by Benchley (1975). The construction of the platform mound on the first terrace seems to correlate well with the onset of the Moorehead phase.

Miscellaneous Dates

The sample taken from the slope of Mound 55 (M1290) yields a calibrated range of 1276 A.D. to 1438 A.D. (95 percent), but as noted in the previous discussion, this date only serves as a weak *TAQ* for mound construction. Dates from the Collinsville Airport indicate a later Moorehead Phase occupation is represented by these dates (95 percent range = 1220 A.D. to 1395 A.D.).

As seen in the previous chapter, I argue Monks Mound was built more quickly and later than previously supposed. The models of the Cahokian landscape as presented above suggest that Monks Mound was built in the context of a well-populated location that has a distinct history, which can be teased out. The following chapter presents the history derived from the combined analyses and presents a history of the Cahokian polity using a symbolic model of Monks Mound.

Chapter VII: Continuity and Change: Monks Mound and the Construction of the Cahokian

Polity

Cahokia is a special place. In addition to the obvious scale of ancient activities and central place it held in Cahokian societies, both professional and avocational archaeologists have produced an immense amount of data that allow for much finer-scale interpretation than is possible at many other archaeological sites. Furthermore, cooperation between the State of Illinois, professionals, and the local community has created a truly world class resource. The vast scale of the data provides unique opportunities at Cahokia that rarely exist in the Eastern Woodlands. But, at the same time, the massive size of Cahokia (relative to other archaeological sites in ancient North America) is challenging. Even understanding the construction chronology of Monks Mound requires utilizing perspectives from numerous projects. In some ways, trying to understand Monks Mound from any one particular dataset may be like “touching the elephant”³⁹. Although relying primarily on stratigraphic and radiometric data, I combined as many datasets as possible to understand the temporal and geological circumstance of Monks Mound. Even though the data are far from complete, they provide a clearer picture of Monks Mound than was previously available, and from this perspective, several generalized statements about the mound can be made.

First, Monks Mound was constructed rapidly. Excavations from the 2007 season suggest that the areas of the mound we examined were built without appreciable hiatuses.

On the Northwest corner almost nine meters of elevation were exposed. The entire sequence suggests the Northwest corner was built entirely as a single episode of stacked basketloads of soil. Had this locality arisen through either layers of mound stages as proposed by Reed et al. (1968) and Woods (2001) or as a series of blanket mantles (Pauketat 2002), there should have been observable breaks in the construction sequence. The East Face presents a similar picture, but the size (nearly 16 m high and 19 m wide) of the exposure affords a view of the complexity of the internal structure and provides a degree of nuance not available from the Northwest corner excavations.

Excavations on the East Face give a sense of the duration of construction. Although there was no observable soil formation inferior to the one identifiable mound surface, the stratigraphy suggested there were short-term breaks or hiatuses in construction. In particular, construction in this locality halted long enough for a limestone and log structure (Feature 1) to be built and presumably used. Nevertheless, the surface on which this feature was constructed was not exposed to the elements long enough for soil development or even turbation to take place. In fact, it was possible to trace out individual basketloads on the surface indicating the short duration of exposure to the elements and a minimal post-depositional disturbance. Furthermore, a short duration of mound construction is displayed in the general stratigraphic sequence. Some of the stratigraphic units identified in the East Face were colluvial or wash episodes demonstrating that some parts of the mound arose faster than others with enough time before creating a level surface that some of the individual construction elements underwent short-term erosion. Modeling these data, past observations, and radiometric

assays in a Bayesian framework indicates a very high probability that Monks Mound was built in under a generation, perhaps in less than five years.

Second, Monks Mound was constructed as monumental architecture — architecture designed and executed on a scale not seen in the contemporary Native American world. Soil coring and mapping done as part of this dissertation indicates the mound contains as much as 730,000 m³ of soil. Additionally, coring located the original ground surface beneath Monks Mound and demonstrates the premound surface slopes almost three meters from Southeast to Northwest. On the one hand, this slope is not the optimal placement for a large earthen structure and probably exacerbated slumping on the western slope. On the other hand, the Ancient Cahokians may not have had a choice given the necessity to place Monks Mound — the center of the world — in that particular place. Although, conjectural, given the meaning of platform mounds in Eastern North American Indian beliefs, it may have been necessary to put Monks Mound in that specific location in spite of poor topography.

Finally, Monks Mound was built later in Cahokian history than previously believed. Based on the analysis presented in previous chapters, construction began sometime after 1080 A.D., and more likely near 1100 A.D. Previous construction histories required much longer for construction and see Monks Mound as being a central place in the development of the Cahokia site. In these histories, Monks Mound was begun either near 900 A.D. (Reed et al. 1968) or 1000 A.D. (Dalan et al. 2003) with the bulk the mound being up by about 1100 A.D. Based on the geoarchaeological observations and the modeled duration of construction, the inception of construction probably occurred later.

A Settlement History of the Cahokia Site

Overall, these data present a very different picture of the Cahokia site than past workers have proposed. The altered view begs a revised understanding of how the site developed in general. Therefore, I modeled the chronology of the site as a whole using previously collected data. This chronology implies the need to reassess Big Bang in the Bottom (Pauketat 1998b)⁴⁰ as many researchers subscribe to this model as the best current history of the site.

The Big Bang model argues that near 1050 A.D., a remarkable convergence of population occurred at the site. Pauketat and Emerson (2008:80), most recently, have described the Big Bang as,

...a moment, or an event horizon, dating to about ad (*sic*) 1050, when a large village was physically rebuilt into a planned Indian city, Cahokia, centered on great new constructed plazas and earthen pyramids.

Concurrent with the nucleation were cultural and political changes where growing populations invented new ways of living (J. Kelly 1992). These new ways of living and organizing their world are what archaeologists call Mississippian. Cahokians were able to extend hegemony over the American Bottom with the concentration of power in a small elite segment of the population. Elites held on to power until about 1200 A.D. when the Cahokia polity collapsed⁴¹.

In the model that I propose, the Big Bang has a history and was drawn out of a much longer temporal sequence. I see a large population as a necessary condition before monumental construction occurred. In this view, building Monks Mound served to integrate the regional population (Adler and Wilshusen 1990, Renfrew 2001b). Ritual

and political relationships created during this fusion process forms the basis for a new pan-regional political body. I argue the political body was similar in morphology to earlier political units and operated in a way that was familiar to the people who created it. In effect, the new political body was a “scaled” up version of earlier village councils (J. Kelly 1996b). The fusion process would have created new opportunities for leadership positions available to those who desired them. At the same time, the body would need to incorporate pre-existing lines of power, in effect, creating a complex⁴² yet decentralized organization.

To create a single model of the Cahokian settlement requires understanding how the built landscape developed through time as a consequence of a chain of causes and effects. The Cahokian sequence traditionally is divided into a series of archaeological periods and attendant phases. This sequence covers the entire American Bottom region and necessarily integrates data far from the Cahokia site proper. The following discussion is founded on an internal view of the Cahokia site. Accordingly, I use different large-scale categories; the spatial scale is restricted to the Cahokia site — extending on the east approximately 2 kilometers from Monks Mound just beyond Mound 1, on the west to the limits of the Powell Mound Group, north to include the Kunneman Mounds, and south to the Rattlesnake Mound (Mound 66). This area is divided into three principal locales, Eastern, Central, and Western. Eastern area runs from approximately Mound 1 to the edge of the East Plaza. The Central area spans the distance from the East Plaza to the West side of Tract 15A. The West area encompasses the areas from Tract 15A to the Powell Mounds. In a similar way I divide the time-scale into three large units, differing from ones commonly in use. Rather than using a phase-based approach, I divide the

temporal continuum based on chronometric ages derived from major landscape changes. This is necessary because the phase-based approach is developed for understanding broad scale patterns of material culture change that may or may not correlate with the history of the built environment and the political history of the Cahokian polity.

The Early Period is from about 800 A.D. to 1100 A.D. It corresponds with the Late Woodland, Emergent Mississippian, and Early Mississippian Periods at Cahokia. The Middle Period is the time interval between 1100 A.D. and 1200 A.D. The Middle Period overlaps with the Stirling Phase but it is defined based on landscape change rather than material culture variation. The Late Period begins at 1200 A.D. and continues until prehistoric abandonment of the site or approximately 1400 A.D.

Because this framework is based solely on the Cahokia dataset, it may be the most appropriate for a site-specific discussion. This is not to say that Cahokia developed in the absence of regional developments, in fact the contrary — that Cahokia developed because of regional developments — is likely true. However, understanding how the history of Cahokia fits into the history of the Mid-Continent first requires an understanding of the history of Cahokia. I specifically want to highlight the uniqueness of Cahokia as a place and a sociological phenomenon. Many researchers have addressed how the happenings at Cahokia may be like those that occurred throughout Southeastern North America around the beginning of the first millennium A.D. (Fowler 1973, J. Kelly 1991b, Knight 1997, Pauketat and Emerson 1997b:3-5), I want to demonstrate the uniqueness of the Cahokia site.

Bringing all of these data together provides a temporal skeleton that needs to be dressed with data from other investigations and material culture studies at Cahokia.

Consequently, the following discussion though privileging the radiocarbon data includes information derived from these kinds of studies.

Cahokia (800 A.D. – 1100 A.D.)

People first settled the high ground at the confluence of Canteen and Cahokia Creeks sometime around 800 A.D. Although earlier Middle Archaic, Late Archaic, Early Woodland and Middle Woodland people lived on what would later become the Cahokia site (Emerson and Fortier 1983, J. Kelly 1997b:9-10, Nassaney et al. 1983), there does not appear to be a direct connection between the earlier Archaic people and the later Mississippian moundbuilders. Materials and radiocarbon dates from the Powell Tract (Bareis and Lathrap 1962) and in the vicinity of Monks Mound (McGimsey and Wiant 1984, Reed 2009:54, K. Williams 1975, Woods 2001) place the first occupations related to what was to become the Cahokia site to no earlier than the eighth century A.D. although the bulk of the data points to occupation starting after 800 A.D.

Little is known about the earliest occupation except to say that there is a relatively extensive area along Cahokia Creek that people occupied (Pauketat and Lopinot 1997:111). Earliest occupation appears restricted to the Western and Central portions of the site. There may be unidentified occupation to the west but modern land use precludes systematic investigation of this area. The current path of Collinsville Road seems to mark the southern edge of the earliest occupation whereas the north limit may conform to the edge of the Edelhardt Meander (Dalan et al. 2003).

Materials underneath Monks Mound may date to eighth or ninth century (K. Williams 1975:22), whereas materials from the Powell Tract may indicate a later, perhaps

middle ninth century occupation (see above and P. J. O'Brien 1972). The temporal distribution of datable materials suggests occupation may have been sporadic or discontinuous. In contrast, Dalan and colleagues (2003:69-70) argue for a more continuous and contiguous occupation.

At present, the data to clearly rule out either hypothesis are lacking. If there was an uninterrupted occupation that spanned nearly five hundred years, then one would expect a circumstance similar to the Range Site (J. Kelly 1990c:67) with multiple “stacked” occupations represented by intense feature superpositioning. While later occupation at Cahokia is certainly intense, early feature superpositioning is lacking especially when compared to Range (cf. J. Kelly 1990c:79, P. J. O'Brien 1972). Due to a low occurrence of Late Woodland feature overlapping, occupation at Range is believed to have shifted through time. Because of the lesser degree of superpositioning at Cahokia, a similar or even shorter-term pattern is expected. Although some portion of the Cahokia site appears to have been occupied from 900 A.D. until 1100 A.D., thus establishing a historical continuity, not all places were occupied during this period suggesting a discontinuous geographic distribution.

Data supporting the early occupation illuminates an interesting anomaly that should be pursued. Work done by SIU-E as part of a project designed to drain water from the western slope of Monks Mound exposed Late Woodland remains at the bottom of a large borrow area directly to the west and partially underlying the mound (Dalan et al. 2003:141-142, Martignoni 2003, Woods 2001). This topography was confirmed through the recent soil coring and was briefly mentioned by Reed and colleagues (1968) who indicate that Bareis excavated a Moorehead Phase house (ca 1250 A.D.) near the surface

of the pit. According to Woods (2001:4), the deeply buried remains date to the eighth century and likely were a refuse pit, house basin, and posts. Based on an over two meter thick stratigraphic sequence, Woods believes the Late Woodland features were truncated perhaps in the thirteenth century A.D. when the borrow pit was stripped of overlying soils to be used for patching the West Slump and the construction of the first terrace on Monks Mound.

In spite of the radiometric dates from Benchley (1975, see also the previous discussion) which indicate the first terrace was built by the middle of the twelfth century, this discovery has important implications. Dalan and colleagues (2003:109-110, see also Dalan 1997:93) argue much of the soil for the initial construction of Monks Mound came from lateral borrowing in the Grand Plaza area and from borrows in the immediate vicinity of the mound. Borrowing from the Grand Plaza was identified by an absence of a hypothetical meter thick clay deposit, which, according to Dalan (1997:93) makes up the clayey sediments found in the center of Monks Mound. Given the soils encountered by the coring project, this may be a tenuous proposition as these data suggest the most likely source of the fill soils for Monks Mound was the Edelhardt Meander.

Recent paleobotanical work by Lopinot and Fritz (2008) also indicates the soil for the lower portion of Monks Mound likely came from a grassy wet area. In particular, they suggest that wetland plants found in fills, "...perhaps grew in the Edelhardt meander scar and other frequently inundated places in nearby portions of the American Bottom. Both also may have thrived along and within borrow pits, which may have been exploited periodically as part of periodic renewal rituals involving public mound construction activities." (Lopinot and Fritz 2008:3) Since the Grand Plaza lies on the highest part of

the Edelhardt Meander, these kinds of plant remains indicate that materials for the base of Monks Mound did not come from scraping sediment out of the Grand Plaza area. During the Mississippian Period, the Grand Plaza would have been too dry for wetland plants to live.

In Dalan's (Dalan et al. 2003:135-138) reconstruction, much of the sediment used in the initial ten meters of Monks Mound was scraped out of the area south of Monks Mound. This area was reclaimed after a very short time by the Cahokians for use as the Grand Plaza. The amount of sediment brought in to fill the Grand Plaza was equal to the amount used the amount removed making the exercise in building the Grand Plaza the equivalent of excavating a hole and then almost immediately refilling it (Dalan 1993). In Dalan's view, this sequence makes pottery from the basal units of reclaimed borrows useful for dating Monks Mound.

In a nutshell Dalan and colleagues (2003) believe materials recovered from the bottom of filled "borrow pits" serve as a TAQ for the construction of Monks Mound because the borrows were excavated into a surface exposed by previous borrowing that was done to construct Monks Mound (Dalan 1997:91 Figure 5.1). Thus materials found buried within the borrow pits could not have been deposited until after the borrow pits existed. Accordingly, these materials postdate the pits borrows that according to Dalan et al. are contemporary with Monks Mound. Therefore, Monks Mound must pre-date the borrow pits and associated material culture. This brings us to the problem: the borrow pit on the west side identified by Woods is the closest borrow pit to Monks Mound. Based on the logic presented by Dalan and colleagues (Dalan et al. 2003:109, see also Reed et al. 1968) this would have been a source for soil for Monks Mound and consequently,

mound building must have occurred no later than the eighth century A.D. because sherds found by Woods indicates an eighth century TAQ for the pit.

Alternatively, the borrow area described by Woods may not be a culturally constructed feature; rather, it may indicate the unmodified topography of the Cahokia site (see also comments by Dalan et al. (2003:63)). If the borrow most proximate to Monks Mound is not a cultural feature, then perhaps others borrows are also natural features and using pottery from the base of the most proximate borrow pit may not be the best way to date the construction of Monks Mound (cf. Dalan et al. 2003:109-110, Holley et al. 1993).

Still a third scenario is equally plausible. Given the proximity of the borrow pit to Mound 41- the borrow pit is approximately 100 meters east of Mound 41 (see Fowler 1997:55) - it is not much of stretch to suggest that the soil from the borrow went into the construction of this mound instead of Monks Mound. In this instance, Mound 41 would be one of the earliest mounds at the site, although most recent authors agree mound building at Cahokia is unlikely before the approximately 1000 A.D. at the earliest (Dalan 1997, Fowler 1997, Pauketat 1998b).

One final model needs to be considered. This borrow pit may have been filled with soil from other places. The early materials at the bottom of the pit may date the age of the fill rather than the age of the filling of the borrow pit. These are all testable scenarios, but with the extent of the data set and the analysis presented in this dissertation, the second scenario is the preferred one because it is the simplest explanation. This discussion is not a critique of the logic of dating mounds by dating borrow pits adjacent to the mounds. Dalan's logic for using the adjacent borrow pits as

TAQ's for mound construction is sound in most cases, but the logic for dating Monks Mound on the basis of hypothetical stripping activity requires making connections that are contrary to the observed data and accepting tenuous assertions.⁴³

Pauketat and coauthors (2005) argue excavations done as part of a waterline project which cut across the Grand Plaza adjacent to Ramey Street and Collinsville Road bear out Dalan's reconstruction of the Grand Plaza. On the basis of relatively abrupt soil transitions they argue the landscape was first stripped and then filled in at least two episodes. This project, however, did not do geoarchaeological analysis. As recently noted by Johnson et al. (2008) interpretation of soil processes in sandy soils, especially the kind encountered in the Grand Plaza, require close attention to detail because numerous biological and physical processes can result in distinct horizonation. Indeed, Johnson and colleagues demonstrate soil horizonation in sandy soils from Iowa was the result of physical weathering although the profiles could be easily interpreted as resulting from anthropogenic action. Until soil studies of the kind suggested by Johnson and colleagues can be done in the Grand Plaza, the question what of caused the horizonation seen by Pauketat and others is unresolved. Given the complex nature of soil formation and the high degree of anthropogenic disturbance at Cahokia, more attention to detailed soils studies is needed.

Even though there is a dearth of well excavated early locales at Cahokia, and major subsequent disturbance, it is not unreasonable to presume that the earliest occupation conformed to a generalized Woodland village pattern seen throughout the American Bottom (J. Kelly 2002b) . On the one hand, the data may point to a small population moving their houses — perhaps only short distances — over the span of

centuries. On the other hand, the existence of a single supersized village cannot be ruled out (J. Kelly 2008b).

Using data from the Range site as a model, several long-standing traits linked to social and political organization make an initial appearance. First, a general pattern of settlements with a central plaza comes into being. Related to the plaza settlement layout, a communal or community-based central feature often can be found in the plaza. Depending on the age, scale, and perhaps importance of the plaza, the type of central feature may be a post, a structure, or a series of pits frequently located on the axes of the cardinal directions. Although there is variation at Range, this pattern is a common settlement layout type and likely presupposes the mound and plaza layout so often seen in later Mississippian settlements across the Southeast (Lewis and Stout 1998).

Second, social differentiation and leadership is apparent. Kelly (1990a) argues that moieties similar to those seen ethnographically may have developed during this time period. At the Range site, especially during the George Reeves phase, there is clear differentiation in structure size. If these outsized structures represent houses or residences then it may be proper to postulate these houses were the residences of leaders. It is not clear what leadership would be based on and what areas of life leaders would be needed for, although it is likely that leaders would serve both political and ritual or religious functions.

Third, although there is a clear community pattern, the villages were probably short-lived in any one particular configuration or location. This is because settlement plan configurations likely changed, temporally and geographically, through a fission/fusion

process (see also Blitz 1999, J. Kelly 1990c:86) where the desire for and advantages of unity were tempered by the reality of factionalism and problems of aggregation.

Later (900 A.D. to 1000 A.D.) archaeological remains at Cahokia suggest a similar pattern but settlement was at a larger scale and denser. Materials and radiocarbon dates indicate the West Plaza area was first utilized (Salzer 1975). Data from beneath the East Slump of Monks Mound suggest this area was also occupied during this time (K. Williams 1975). Occupation on the Powell Tract seems to have undergone a hiatus during this time with the early occupation ending by the first decades of the tenth century.

The end of the Early Period (ca. 1000 A.D. to 1100 A.D.) marks some of the most important changes at the Cahokia site. Occupation intensifies and people begin modifying the landscape in substantial way and building mounded architecture (Dalan et al. 2003, Fowler 1999). Occupation expands south from these core areas near Monks Mound and the West Plaza. To the West, people move back to the Powell Tract and spread out into the Fingerhut locality (J. Kelly 1997b). In the North, the Kunneman locale is first occupied (Holley 1990, Pauketat 1993). At this time, there appears little in the way of overt social differentiation between plaza communities, with much of the remains from domestic or residential locales, although there is some variation in structure size (Collins 1990, Dalan et al. 2003, Holley 1989, Pauketat 1994, Pauketat and Lopinot 1997, Salzer 1975). On the one hand, there were clearly some locations that were more important than others (based on the size of buildings) at each individual plaza community, and therefore differentiation within communities, but between communities near Cahokia there is little discernable variation. On the other hand, based on the orientation of structures, some

believe settlements were organized by a centralized authority and laid out along a “Cahokia Grid” system (Collins 1997:128, Fowler 1999)

Toward the middle to end of this period, (post-1050 A.D.), plazas are expanded and some unusual (for the time) architecture is constructed. On Tract 15A, the Cahokians began building large circular buildings (Pauketat 1998a). Concurrently, people vacate the West Plaza area and, in this locale, former habitation areas become public space (J. Kelly 1996b) Based on material distribution found in surface collections done east of Monks Mound, the first iteration of the East Plaza also comes into being (J. Kelly 1996b). To the south of Monks Mound, Mounds 56 and Mound 49 were constructed (Holley et al. 1993). Holley and his co-authors (1993) believe the Grand Plaza was also built during or perhaps a little before the middle of the eleventh century A.D. based on the presence of early Lohman phase pottery excavated from filled borrow pits. Although this assessment is not unreasonable, it may be better to say that the Grand Plaza was built no earlier than the middle of the eleventh century since this is the actual relationship implied by the presence of early Lohman Pottery in pre-plaza fills. These materials may or may not be contemporary with the fill activity. Their model also places the construction of Mound 56 and Mound 49 in the mid-eleventh century since borrows presumably filled in during the construction of the Grand Plaza were the source of the soil for Mound 56 and Mound 49. Still slightly farther south and slightly later in time, Mound 72 was built.

At this point, a critical evaluation of the Grand Plaza is necessary. Most maps and other visual reproductions of the Cahokia site imply the existence of the Grand Plaza because there is a large flat area devoid of architecture defined by the placement of Monks Mound and other mounds (Fowler 1997:195). Generally workers believe

orientation of Monks Mound, Mound 48⁴⁴, and Mound 55 indicates the plaza must lie south of Monks, east of Mound 48, and west of Mound 55, and perhaps north of Mound 56 (for differing views of the extent, scale, and timing of the Grand Plaza see Dalan and colleagues (1993:56, 2003:130)). The data for the existence of the Grand Plaza are not unambiguous, however. For example, Dalan and co-authors indicate there may be a temporal dimension to the Grand Plaza, where the plaza evolved over time or, alternatively, the Grand Plaza may be composed of numerous smaller plazas, each with an individual function (Dalan et al. 2003:130-131).

Perhaps the greatest reason most authors subscribe to the singular model of the Grand Plaza is the orientation and presumed age of Monks Mound. The ramp extending off the first terrace clearly extends to the south, although it should be noted that the first terrace did not exist until after 1150 A.D. almost 100 years after the initial hypothesized formation of the Grand Plaza. However, the late construction of the first terrace does not preclude the possibility of an earlier ramp to the south (Skele 1988:102). This kind of argument allows alternatives to be proposed that may fit the archaeological data better.

Research into the relationship between mounds and plazas in the Southeast suggests the logic of locating mounds is based on the location of plazas - *i.e.*, mounds are built around plazas (Kidder 2004a). Indeed this general logic would preclude the construction of Monks Mound until after the Grand Plaza was created⁴⁵. Based on arguments presented in previous chapters about the age of Monks Mound and the source of the soils, there is no reason to suspect Monks Mound does not fall into this general pattern.

By 1100 A.D., I believe the basic layout of the Cahokia site was in place. In general, several mound and plaza locales were strung out along the southern banks of Cahokia and Canteen Creeks⁴⁶. This pattern likely evolved from and has much continuity with an earlier village pattern found in the earliest times at Cahokia. Initially restricted to the immediate scarp along the Edelhardt Meander, occupation expanded southward to perhaps as far south as Mound 66 (J. Kelly 2002a:43). Through the earliest occupation, the nature of plazas seems to change. Early on, these kinds of locations served as the center of village life, or were at least ringed with houses and the occasional public building (Dalan et al. 2003:98). Near 1100 A.D., the nature of the plaza at Cahokia seems to change from a central component of everyday residential life to a more strictly ceremonial kind of use. Rather than being surrounded by houses, plazas appear enclosed or bordered by mounds with residential space outside of the mounded enclosures (Dalan et al. 2003:102). Residential or domestic spaces move to the remaining unoccupied areas of the site. There is some suggestion that space may have been at a premium since lower, swampier locales were settled at this time (Dalan et al. 2003, Pauketat 1998a).

It is during this time when the underlying design principles of the site become evident. As noted by many earlier workers, the mounds and plaza are laid out (arranged?) according to recognizable geographic relationships (Dalan et al. 2003, Fowler 1969, J. Kelly 1996b, Reed et al. 1968). This is to say, there is a clear directionality to the layout of the various plazas and mound groups based on the cardinal points of the compass. Taking this idea farther, Fowler (1999:5, Figure 1.3) believed lines drawn from specific landmarks defined major axes of the site. Fowler defined a major axis running north to south through Mound 72, Monks Mound, and Mound 10. Others (Ahler and DePuydt

1987, Reed et al. 1968, Sherrod and Rolingson 1987) have joined in connecting the dots by proposing an East-West axis. The intersection of the axes happens at a point on the first terrace of Monks Mound, thus giving primacy to the construction of Monks Mound in the chronological sequence. In this viewpoint, the site was built in relation to this central monumental element. This interpretation is not without problems. As noted by Dalan et al. (2003) the first terrace was built relatively late in the sequence — based on the analysis presented here sometime in the late twelfth century - long after the central elements of the site plan were in place.

The purpose of this discussion is not to evaluate the reality of specific axes, but rather to note the Cahokians emphasize arranging elements of the site into specific directions. Research demonstrates directionality as a fundamental concept in the pre-Columbian worldview (J. Brown 1997). Directionality is also ubiquitous in other site elements throughout the historical sequence in the American Bottom. For example, the arrangement of pit features in plazas from much earlier contexts suggests directionality was an important notion pre-dating Cahokia (J. Kelly 1990c). If we can accept that one of the principal factors responsible for the layout of the Cahokia site was directionality, *i.e.*, specific directions had implicit meanings and associations, and this idea precedes the construction of Monks Mound, then there is no reason to assert temporal primacy to Monks Mound on the basis of site layout. Indeed, the location of Monks Mound may be determined by the site layout rather than *vice versa*.

The concept of centrality, a necessary component of a directional worldview, was likely considered well before Monks Mound was conceived (J. Kelly 1996b). The center may have been marked by a post (see J. Kelly 2003 for a discussion of the importance of

posts in Mississippian contexts), a building, or by nothing at all. Sites may have been positioned because of their relation to a hypothetical or historically important place that through time lost its specific importance and became a referent as opposed to a thing. The West Plaza may have been located where it is because the plaza was west of a commonly perceived center rather than west of an actual built element. In short, the existence of a center in no way presuppose the existence of Monks Mound (cf. Reed 2009). This notion, can be seen in the Prime Meridian in Greenwich, England. Modern geographic definitions of East and West are established by a simple brass strip placed outside of the Royal Observatory — a completely arbitrary point embedded in the historical circumstances of post-Reformation England.

Cahokia (1100 A.D. – 1200A.D.)

After 1100 A.D. construction increased in both quantity and scale. Although only a small proportion of the mounds have been dated, most date to this time period or have some component associated with the twelfth century (Dalan et al. 2003:112). The termination of Mound 72 and the construction of Monks Mound and the first Woodhenge mark the beginning of an unprecedented time of building. Residential occupation moves out of the core of the site and the more central locations may have been reserved for special functions (Lopinot and Pauketat 1997:109).

In contrast to earlier work (e.g., Holley et al. 1993), I believe this is when the Grand Plaza reached its final form. This is possible to say because it is the time when the mounds flanking the Grand Plaza were erected. The above radiocarbon analysis suggests

Monks Mound and Mound 51 were built during this time. Although the areas around Mound 48, Mound 55, and Mound 56 were used before twelfth century — perhaps suggesting a southern plaza (associated with Mound 72?) — mound building only happens around 1100 A.D. (Dalan et al. 1993, Dalan et al. 2003, J. Kelly et al. 2003, Pauketat 1993, H. M. Smith 1969).

The dominant theme after 1100 A.D. is centrality. Previously, settlement at the site was clustered around many smaller central places. After about 1100 A.D., the site acquires a clear central focus with the erection of Monks Mound and the use of the building on top as a ceremonial or non-domestic space (Fischer 1972, Reed 2009). During this time, the site layout may have taken on additional meaning with the built relationship between Monks Mound and the Woodhenges⁴⁷. As noted by Lankford (2007a) a likely analog for the Woodhenge features is the Sun Dance Lodge known from Plains ethnography and ethnohistory (see also Hall 1985). By climbing the central pole of the Sun Dance Lodge, spirits gained access to the Path of the Souls. This entrance was located to the West where the Milky Way arose each night. If we consider the directional relationship of Monks Mound to the Woodhenges, the relationship between this world (Monks Mound) and the entrance to the Path of the Souls (the central pole of the Woodhenge) would seem to be replicated well in layout of Cahokia at this time.

By the mid-twelfth century, Monks Mound achieved its near-modern form. The iconic shape of a hulking platform projecting to the south would have been evident by about 1150 A.D. Ephemeral construction, buildings with relatively short lives, were built on the southwest corner of the first terrace and on the summit. Most portrayals of the mound at this time present a well-defined quadrilateral with smooth slopes covered in

carpets of well kept green grass (see for example the cover artwork of Emerson and Pauketat 1997), but a closer inspection of Monks Mound would reveal flaws in this façade. In particular, the East Slope may have experienced erosion and/or slumping and repair at this time.

Although the mound projects a vision of permanence, the architecture on the summit was rebuilt or renewed at least two if not three times, as documented by the summit excavations of the late 1960s and early 1970s (Fischer 1972, Reed 2009). The summit excavations provide a key bit of information about differential construction methods for the mound. This project suggests the summit was a long-term surface in use for at least long enough to need rebuilding. Over perhaps one hundred years, the surface was covered by about forty centimeters of sandy silt, although these sediments were deposited in at least two events: the initial construction and a later renewal. This unique sedimentological signature is not found in any of the soil cores done by Reed and colleagues.

I believe this unique signature indicates the ultimate goal of mound building was the construction of this summit area. Data from the summit excavations indicates that Monks Mound was not renewed according to the standard means. This work clearly demonstrates a long-term occupation that was maintained or rebuilt without adding large amounts of fill. Rather the summit was overlain with a thin layer of sand (cf. Pauketat 2000). These observations imply Monks Mound did not grow through the gradual addition of building episodes and, as originally constructed, it was not an accretionary monument. Instead, the mound was built as a single planned construction.

The Grand Plaza would have been well defined by this time. Domestic or residential space south of Monks Mound was displaced by mounds, most notably Mound 46, Mound 48, Mound 51, Mound 55, and Mound 49 may have been important boundary markers for the Grand Plaza (see Dalan 1993, Pauketat et al. 2005).

Sometime in the middle decades of the 1100s, the first terrace was added to the south side of Monks Mound. It is tempting to speculate the construction of the first terrace is associated with the renewal of the summit building, but there are no data to directly inform this claim. In the later decades of the twelfth century, dramatic changes occurred on Monks Mound. Perhaps the greatest event was the collapse of the western slope (Dalan et al. 2003, Woods 2001).

This a somewhat controversial assertion but it is warranted based on the slim data available. The western slump and second terrace have been a source of speculation since the nineteenth century. It wasn't until the middle 1980s when mass movement along the western slope revealed the extent of post-construction changes (Collins and Chalfant 1993, Emerson and Woods 1993). Excavation by archaeologists from SIU-E revealed intact deposits on the so called second terrace covered by colluvium. Based on these data, Collins and Chalfant (1993:331) argue the second terrace was a purposefully constructed feature of the mound that has sunk or moved downward in elevation approximately one meter through subsequent slumping. Later work suggests the extent of slumping may have been greater than recognized by Collins and Chalfant, with Dalan and colleagues (2003:141) arguing that slumping on the western side impacted the building on the summit of the mound after 1200 A.D. An examination of the profiles obtained by Collins

and Chalfant (1993:323-324) do lend credence to larger slumping hypothesis as Unit II correlates well with Strata M1 and M2 identified by Fischer (1972).

Both Unit II and Strata M1/M2 are light colored sands associated with Stirling Phase artifacts, and interestingly enough both display two depositional episodes although these are not well defined in Unit II. If these strata are the same, then the surface identified by Collins and Chalfant may have slumped over twelve meters in vertical elevation as proposed by Dalan et al. Based on the late twelfth century age of the in situ material culture, it would seem likely that the slumping first occurred during this time with no subsequent re-occupation. This general chronology agrees with Dalan et al. (2003), although they see subsequent deposits as a result of patching by thirteenth century Cahokians. Data presented by Collins and Chalfant indicate a natural origin for sediments overlying Unit II/Strata M1 and M2. In this instance, the explanation of processes forwarded by Collins and Chalfant seems a better fit with observations made by Hajic (2005) and by the author in 2008 where only a single construction unit overlain by massive silting was identified.

The end of the twelfth century also saw the enclosure of Monks Mound and the Grand Plaza by the first iteration of the Grand Palisade. Two other developments mark the end of the twelfth century. First, Woodhenge construction does not occur after the end of the twelfth century. Although we have no firm data pointing to when the last Woodhenge was used, the above model suggests the Woodhenges were not constructed after 1200 A.D. Second, the mound on the southwest corner is built near the turn of the century.

To this list of events, I also suggest we can add the capping of Monks Mound. There are precious few data points that bear on the question of when Monks Mound was capped. Reed (2009:70) believes the mound may have been capped as late as the end of the thirteenth century (although he does allow for a possible reoccupation) based on a single Wells Incised plate found during excavation of the cap. Brown (2001, see also J. O. Vogel 1975), on the other hand indicates Wells Incised pottery first appears around 1200 A.D. In any event if we assume the pottery is contemporaneous with the sourcing of the clayey sediments used in the cap, then we know the capping may have occurred as early as 1200 A.D., or as late as 1300 A.D. (Pauketat 1994). This method of dating is dubious because the most commonly cited and agreed upon pottery sequence comes from Holley (1989) and was derived from frequencies of sherds encountered in excavated samples. Using a single sherd as an indicator of time is problematic because seriation requires many sherds. It is not possible to create a seriation from a single sherd.

Based on the intensity of use of the summit (two incidences of rebuilding and perhaps a third minor later component—although data are ambiguous, to say the least, about the third) it is unlikely the summit was used for more than about 100 years. Collins and Chalfant suggest their Unit II—which I argue is a portion of the mound's summit displaced by slumping—dates to the late Stirling or early Moorhead phase. Chronometrically, this is somewhere in the end of the twelfth or beginning of the thirteenth century, or about 1200 A.D. After 1200 A.D. the nature and character of settlement at Cahokia is greatly changed.

Cahokia (1200 A.D. – 1400 A.D.)

Most authors describe the post-1200 A.D. period as a time of decline at Cahokia. Population estimates (Lopinot and Pauketat 1997), construction patterning (Trubitt 2000), and landscape usage (Dalan et al. 2003) clearly indicate the trend toward expansion and growth evident in the eleventh and twelfth centuries was reversed. In contrast to the centralizing tendencies of the 1100s, later times were marked by fragmentation. The expansive twelfth century site was reduced to occupation around Monks Mound and to the east. After the construction of the Grand Palisade, Monks Mound was no longer the physical center of the site. Rather the mound was located adjacent to a single plaza to the East. Occupation on Monks Mound was restricted to the first terrace (Hamlin 1997), although Reed (2009) suggests the summit may have been used for funerary platforms or other kinds of scaffolds. Directly west of Monks Mound, close enough to be covered by slope wash deposits, Bareis (as cited in Reed et al. 1968) excavated a small house basin dating to this time period. On the ICTII tract a small residential occupation continued.

During this time, the palisade was reconstructed at least three times. Outside the palisade to the east, a plaza associated with Mound 34 was built. Still farther east, Mound 1 and Mound 2 also were constructed. To the west, Tract 15A was reoccupied as a domestic locale albeit for a relatively short time. South of the Powell Mound group, a small domestic occupation continued (J. Kelly 1997b). Later occupation appears ephemeral in comparison to the earlier settlement. Post-1200 A.D. occupation may be seen to mirror the earliest occupations; the farther away in time one gets from the twelfth century, the less intense settlement becomes. The final settlements related to the Mississippian occupation of Cahokia occur in the fourteenth century. Late remains have

been found on the Merrell Tract, the first terrace of Monks Mound, the Ramey Plaza, and in the immediate vicinity of Monks Mound. Dalan and colleagues (2003:78) characterize this as a “rump” occupation with Cahokia just remnant of its former glory. Yet, as the radiocarbon data suggest, these people still had the wherewithal to construct the final version of the palisade sometime near the middle of the fourteenth century.

A Social History of Cahokia

To most authors, the archaeological data from Cahokia suggest the development of an increasingly stratified society coming out of relatively simple predecessors (see among others Milner 1998, Pauketat 1994, Pauketat and Alt 2003, Pauketat and Emerson 1997a, Reed 2009)⁴⁸. These views derive in part from the standard historical model giving temporal primacy to Monks Mound, the construction of which served to anchor subsequent developments. As Monks Mound grew so did the Cahokia polity and, consequently, so did the power of the individuals living atop Monks Mound⁴⁹. However, the settlement model presented above does not support the standard evolutionary view of Cahokia. Certainly, the population of Cahokia grew — and consequently the polity became more complex, but increasing social stratification *vis a vis* institutionalized social inequality or some form of class structure is not a necessary conclusion (cf. Pauketat 1994:168). Below, I present a model for the historical development of the Cahokia site that considers how and when Monks Mound was constructed as a vehicle for understanding the structural changes in the Cahokian polity via a fission/fusion process.

Cahokian Society (800 A.D. – 1100 A.D.)

As noted earlier, social process at Cahokia in the earliest times can probably best be described as a fission/fusion process associated with tribal type formations or egalitarian social structures with leadership attained through a combination of ascription and attainment. During the Early Period, Cahokia consisted of one or two interrelated communities along the banks of Cahokia Creek (one near the Powell Mounds and one in the vicinity of Monks Mound although it is not clear by any means that the community near the present day Monks Mound may have temporal primacy). Most authors believe at this time Cahokia was organized as a simple chiefdom.

Given the ubiquity of the term chiefdom in the academic literature and virtual catchall use for societies of this time (as well as my desire to shift the discussion from one emphasizing the actions of a few cultural entrepreneurs to a view that emphasizes collective social action (Pauketat 2003a, 2007)), one should be clear about terms and meanings. In this sense, the archaeological remains do not suggest either the local differentiation or non-local integration necessary to fit the definition of a chiefdom (see for example Carneiro 1981, Earle 1997, Price and Feinman 1995, Sahlins 1958, Scarry 1996, Stanish 2004, Steponaitis 1991, Wright 1984). Rather the remains suggest small-scale communities, likely interrelated by blood and necessity with little in the way of formalized leadership positions beyond those attained through age, gender status, or merit (Benson et al. 2009:470).

The tenth and eleventh centuries at Cahokia were a time of demographic increase. The number of people at Cahokia grew likely from both internal growth (J. Kelly 1990a) and the addition of people from farther away (Alt 2006b). By 1100 A.D., Cahokia was a

burgeoning place with plaza communities located along the banks of Cahokia Creek for a distance of almost five kilometers east to west, and perhaps three and a half kilometers north to south (Dalan et al. 2003:70). In the later decades of the eleventh century, there is a notable shift in the construction of plaza communities where residential locales are replaced by mounded architecture. Concurrent with this change from plaza communities to a mound and plaza settlement plan is an occupation of lower, more flood-prone areas (Dalan et al. 2003:69-70). This change has been ascribed to an increasing ritualization of the plaza⁵⁰ and perhaps an increasing social distance between the residents of the mounds and others (Pauketat 1994:173-174). Without denying the importance of this spatial reorganization, it may be useful to consider alternative reasons for this change in the construction and use of plazas. One reason for the reorganization of Cahokia may be the rise of large-scale competition in the form of teams sports like chunky (Holt 2009, Wittry 1996).

As noted by DeBoer (1993, see also Pauketat 2009 for a popular description of chunky) chunky is a Native American game that has an (inferred) historical trajectory similar to corn agriculture and the bow and arrow in the Cahokia region. Although there is no direct data, presumably, chunky was played at Cahokia. The typical layout of an early plaza with central pits and relatively perishable architecture would not have been conducive to playing chunky. The shift from the non-mounded plazas with an emphasis on posts and pits to the more specialized mounded plazas may have been in response, at least partially, to the widespread importance of the chunky game (see Bartram 1853, Stepehn D. Peet 1883 for descriptions of chunky yards). Pauketat and Emerson suggest that chunky became an important avenue for political competition. In relation to the

development of the chunky game, they argue chunky was, “a sport now believed to have been politicized or redefined by Cahokians in c. ad 1050.” (Pauketat and Emerson 2008:82). Chunky would have provided a platform for political competition between both communities and individuals within communities. Political competition and status derived from chunky would be based on individual abilities, and perhaps serve as a structural device that would provide a counter authority derived from hereditary linkages. At the same time, a team sport such as chunky would, perhaps, create rivalries between communities that would increase the overall stress in the American Bottom.

It is the competitive relationships between the early communities at Cahokia that sets the stage for the twelfth century aggregation at Cahokia. By 1100 A.D., the relationships between the relatively autonomous communities strung out along Cahokia Creek would have been stressed by competition that was a by-products of increasing scale and population density, both of which would have tested the bounds of the normal organizational structures (G. A. Johnson 1982, Rappaport 1968). In relation to the social model that I proposed, this social stress would have been seen as an imbalance in the world that needed to be corrected.

Ethnographic research suggests scalar stress can be ameliorated or the tendency to fission can be attenuated by a single successful, popular, powerful, or well-liked individual (Bandy 2004:323). Such an individual, like the in the central burial in Mound 72, may have held late eleventh century Cahokia together by keeping the peace and serving as the *de facto* judges in settling disputes between the distinct but related people at Cahokia. Although such a person would have been held in high esteem, there is little to suggest that this individual would have to be a member of a supra-ordinate social class, a

high rank, or even of a ruling lineage (J. Brown 2006, 2010). American Indian ethnography and ethnohistory suggests individuals who have the ability to mobilize large populations often arise from humble origins and do not accrue personal power or multi-generational status consequential to their ability to get people together or diminish fissioning tendencies (Edmunds 1985).

In death and burial, this individual's status may be evident in the burial patterning of Mound 72. On the other hand, Brown (2006:210) believes the burial patterning to be a ritual allegory designed "to ensure the continuity of human life." To Brown, burials in Mound 72 represent specific mythological figures and were arranged to assure the world continued through the reenactment of their cosmological roles. Although I generally agree with Brown's assessment, Mound 72 is unprecedented in the Cahokian world and likely tells a mythological story. To me, the idiosyncratic nature of the Beaded Burial argues for the notion that this person was, in life, a highly regarded person (Binford 1971, J. Brown 1971:104-105). This person in life may have been imbued with ritual powers and the ability to communicate beyond this world; but these powers would only weakly translate into political or economic power (J. Brown 2010). The central burial was not simply a volunteer or somebody chosen at random. This stature in life may brought about the burial circumstances (Feinman and Neitzel 1984:57) since this individual would have remained important, or perhaps became more powerful when no longer in this world (Pauketat 2010).

In this scenario, the central burial from Mound 72 may have been, in life, similar to any of a number of historically known Indian prophets⁵¹. A good analog for how this individual functioned in society may, perhaps, be seen in Wodziwob, a Northern Paiute

prophet credited with instituting the 1870 Ghost Dance. The Ghost Dance of 1870 and later versions were part of a revitalization movement that spread throughout the Northern Plains during the late nineteenth century (Carroll et al. 2004). In historic Indian societies, prophets and other religious figures often arose or augmented their status in response to cultural stress or crisis. These stresses can either be tangible, like famine, or disease, or sociological such as the one hypothesized for the mid-eleventh century A.D. at Cahokia (Vokes 2007:318-319, Wallace 2003:86-91).

Based on the material culture interred with the Beaded Burial, his reputation extended well beyond the Cahokia site and the American Bottom. Some authors see this diversity of material culture as representing wealth and tributary relationships from distant peoples (Fowler 1999, Pauketat and Emerson 1997a). On the other hand, by analogy to Wodziwob, these materials may be items brought by individuals who had learned the rituals and ceremonies performed in life by the central burial. In essence, Cahokian ideas may have been spread throughout the Mid-Continent by individuals coming to learn from the Holy Man and returning to their homes with these ideas. At the same time, the human remains usually interpreted as wealth associated with the central burial may be indicator of the sacred nature of the deposit. These remains may be something akin Mauss' (Hubert and Mauss 1964, Mauss 1990:14-17) fourth obligation where individuals were sacrificed to "purchase" the favor of the spirits.

With the death of the prophet and the final entombment of Mound 72, it is not out of line to posit a void in leadership for the emerging Cahokian community^{52,53}. The lack of a unifying individual prompted a crisis for the communities at Cahokia. In the place of an individual or set of individuals, I believe the leaders of the local communities may

have created a social contract amongst themselves, in effect creating a single unified political organization out of the independent local communities (for a similar idea see Pauketat and Emerson 1997b:20). New institutions⁵⁴ may have been created in response to the accumulation of individual power by the prophet. Building Monks Mound ratified the contract by the communal participation in a project of great importance — the symbolic creation of the world. Thus, Monks Mound held an importance beyond demonstrating the ability to mobilize a large labor force. In addition to the ritualized labor that went into its construction, Monks Mound literally bonded the communities together (Richards 2004). Constructing Monks Mound may have been a large-scale ritual act in its own right. More broadly, it may be proper to suggest that in corporate societies, the construction of monumental architecture is as important as the use of the facilities (Knight et al. 2010, Renfrew 2001a, Vega-Centeno Sara-Lafosse 2007). If building Monks Mound was a ritual act, then it may have functioned like an adoption ceremony or the calumet. Hall (1987) suggests the calumet pipe ceremony observed in the early historic period is related to Middle Woodland mourning rituals, mound ceremonialism, and adoption. Building Monks Mound may have been a component of similar belief system where it was the final act integrating formally unrelated peoples (Diaz-Granados and Duncan 2000:237-240).

The idea of a relatively complex but decentralized leadership structure may sound out of place in relation to the standard Cahokian literature (see for example Emerson 1997b), but as noted by recent authors (J. Brown 2006, Welch 2006), standard interpretations are derived from a Muskogean analogy superimposed on an Western view of political economy which may be improper for Cahokia. Using an Osage analogy, it is

clear that Native American sociopolitical organization was more complex than currently theorized pyramid of power. If one strips away the specific details and examines the underlying structure of the House of Mystery, it could be seen as a council, or a confederation type of organizational model similar to the one posited for twelfth century Cahokia, ultimately creating something similar to the proposed organization of the earliest people at Cahokia albeit at a greatly increased scale. Given the limitations⁵⁵ on the House of Mystery in the Osage example, calling Cahokia a commonwealth or archaic state is improper. The House of Mystery integrated regional populations in ritual matters. Matters of economy or local decision-making were left to individuals or village structures. The confederacy arising at Cahokia during the late eleventh or early twelfth centuries likely was limited in similar ways.

Up-scaling would have been achieved by incorporating previously unaffiliated or loosely affiliated groups. Fusion would have entailed expanding the number of people involved in the decision making process and increasing the number of available positions as a way to balance power within the new created social group. Ranking of social units may have arisen as newer groups were added through time similar to how ranking may have arisen in ethnohistorically known Native American groups.

Cahokian Society (1100 A.D. – 1200 A.D.)

There are two keys for understanding twelfth century Cahokian society and its relation to Monks Mound. First, the act of building Monks Mound was a generative, foundational act in the creation of a relatively well-integrated regional polity. Second, Monks Mound served as the central place in a larger cosmological landscape that

integrated a diverse collection of peoples who formed the constituents of the polity. In the twelfth century it could be said that the people make the landscape and the landscape makes the people (Pauketat 2007).

Based on the chronology presented here, Monks Mound was built in the early twelfth century A.D. The mound (*sans* the first terrace — volume calculated at about 680,000 m³ or almost 90% of the mounds total volume) was conceived of and built as a single project over a short (sub-decadal) period. The scale⁵⁶ of the project required more than the local population at the Cahokia site. Given the importance of this undertaking and the overall goal, there should be little surprise that far-away peoples (J. Kelly 1991b) participated in construction (Bernardini 1999).

As noted above, the construction of Monks Mound was a foundational act. Knight (1989:422) indicates earthen mounds in the Mississippian world were considered earth islands, icons with cosmological implications, and, at a more general level, Monks Mound clearly was a LHDE. If we can expect earthen mounds are, as LHDE are, cosmologically imbued things that reference the earth and the underworld, then it is not out of line to suggest this notion may be encoded in the very stratigraphy of the mound where dark colored sediments sourced from the swampy area to the north are interspersed throughout the mound as a model of a multilayered underworld. Carrying this idea further, based on the centrality and scale of Monks Mound, it may have been the earth island that later Mississippian platform mounds across the Eastern Woodlands reference.

Based on this view, the building on the summit was located at the actual (and symbolic) interface of the upper and lower worlds, at the center of the universe. It follows then that the massive post encountered on the third terrace was a necessary element of

mound construction — the Tree of Life – connecting the Beneath World to the Above World. Brown (2010) makes a similar observation about posts found within the Craig Mound at Spiro. These posts were necessary elements required to connect differing realms.

Monks Mound by location, agreement, and production was the center of the twelfth century Cahokian world. Consequently, I hypothesize the function of the building was that of a council house or meeting place for the governing body (cf. Dalan et al. 2003, Reed 2009). By locating the building on top of Monks Mound, the decision-making structure would be reinforced by the special location, yet by being located metaphorically in this world, it would be recognized that these processes and outcomes were of a political nature. In fact, it may have been a necessity to place such a building atop Monks Mound. The role of the House of Mystery in the Osage decision-making process was to make decisions for establishing harmony or balance in this world. Placing a building at the juncture of the Above World and Below World would reify the idea that these decisions were designed to bring harmony to the two worlds. This location would help project the authority of this body because of the mound's intrinsic meaning as a place of emergence and common bond. At the same time, locating the building on top of a communal monument would remind leaders of their connection and critical responsibility to the whole. This explicit recognition of the pragmatic realities necessary for higher levels of social integration contrasts the hypothesized pattern of decision making. In earlier times, extra-local integration was tenuous and accomplished rarely and by a limited set of individuals, such as those centrally buried in Mound 72.

The second point is, I believe, the twelfth century built landscape appears to differ from the earlier landscape through a shift in layout. Monks Mound and the Woodhenges were superimposed on the earlier landscape and, by their relative placements, de-emphasize the previous focus on the cardinal points. During the 1100s, the East to West axis of the site is privileged over the early quadripartite layout. The new landscape highlights the tree of life located on Monks Mound and the entrance to the Path of Souls, located to the west in the center point of the Woodhenge structure. This geographic relationship is repeated throughout Eastern North American Indian mythology and is based on the location of the rising of the Milky Way (the Path of Souls) in the night sky (Lankford 2007a).

The twelfth century site layout may be a representation of the vertical and horizontal dimensionality of the Cahokian cosmology (Figure 73). A similar dimensionality can be seen in the historically documented Native American cosmology (see for example Hudson 1976, La Flesche 1995, Lankford 2007b). Fowler (1999) recognizes the concurrence between Native American conceptions of the world and the layout of Cahokia and he uses these data to argue for a centrally planned site — although it should be noted that he only recognizes the Cartesian dimensions and his interpretation conflates the vertical with the horizontal.

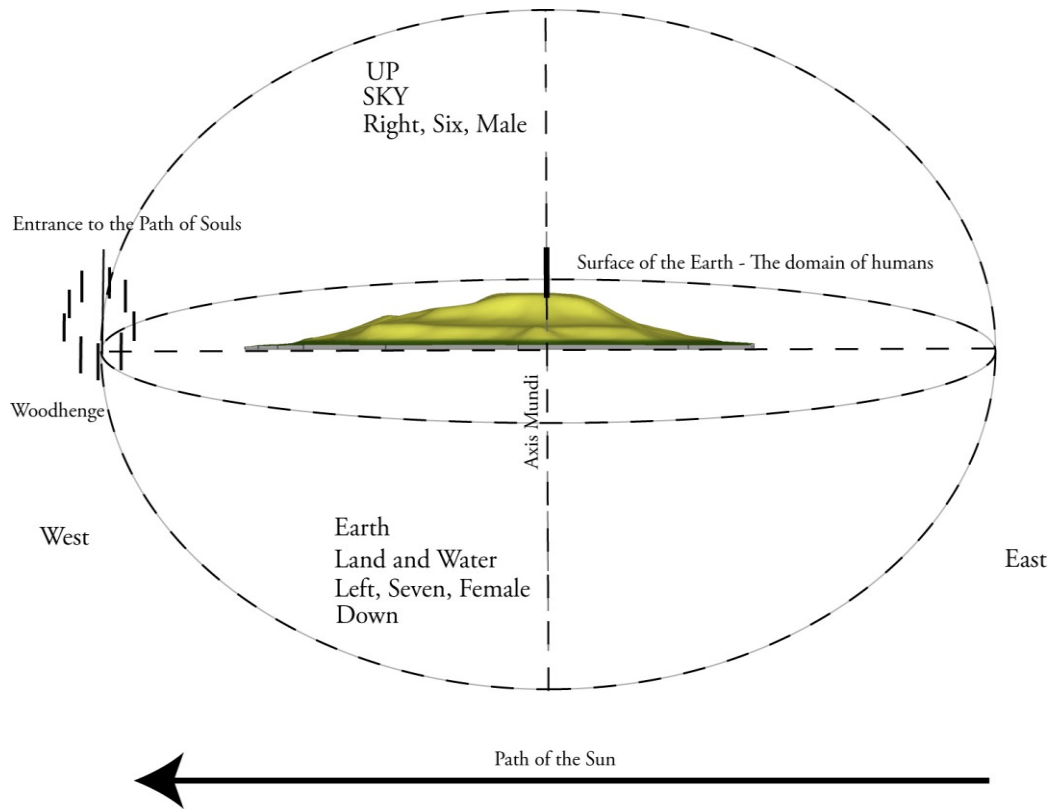


Figure 73. The Osage cosmology overlain on a view of Monks Mound from the south.

While I agree in principle with Fowler, certainly, a degree of planning was involved in the construction of the Cahokian landscape; however, I would argue this planning was likely drawn from a common agreement based on an accepted mythology rather than from a single administrative office (Carroll et al. 2004, Gosden and Lock 1998, Richards 1996, Wolf 1999). There is little in the way of data to suggest the existence of supraordinate social class (Milner 1998, Welch 2006), and where there is differentiation it appears in the realm of ritual governance rather than engineering or social planning (J. Brown 2006, J. Kelly 2006).

If, as Lankford (2007a) suggests, ideas about the Path of Souls has great antiquity in the Eastern Woodlands, then the relationship between Monks Mound and the

Woodhenges (the Tree of Life and the entrance to the Path of Souls) would be well known to the Cahokians. The argument forwarded here is that the site was built with both Cartesian and topographic considerations and these ideas correspond well to a three-dimensional Native American cosmology. By building in such relationships, the Cahokians were referencing a common mythological history as a means for integrating much of the Midcontinent (J. Kelly 2008a).

The twelfth century landscape highlights changes in organizing principles by emphasizing a shift in the underlying basis of organization. Through the early times at Cahokia, it is very probable that ritual and religion were used to reify the decision-making process but, in earlier time the ritual information was likely restricted to a few initiates. In the later period decision making may have been somewhat more diffused as ritual information was more publicly available. In particular, if we can suppose the Woodhenges did function as a calendar of sorts (Hall 1985, Wittry 1996), then the timing of yearly renewal ceremonies would be evident to anyone familiar with the Woodhenge layout whereas decision making, while still more democratic than in the earlier times, would be somewhat more private because deliberations would occur in within a special building atop Monks Mound⁵⁷.

Near 1150 A.D., the Cahokians added the first terrace. Although the data are somewhat ambiguous, it is plausible that the first iteration of the structure on the Southwest Corner was built at this time (Benchley 1975). This structure was rebuilt numerous times afterwards, with the last iteration built sometime later than the turn of the thirteenth century. The stratigraphy, number of constructions, and duration of use may suggest this structure was renewed on a yearly basis. No artifacts were found in

association with these floors, suggesting these buildings were used for special purposes (Benchley 1975:19) outside of the realm of day-to-day domestic living. There is also some indication these buildings were fenced off or separated from view by walls or screens. Few authors outside of Benchley have directly speculated as to why these buildings were built on the first terrace and who used them, but given the preponderance of specialized ritual statuses in Native American societies (see for example La Flesche 1995), it may be proper to suggest these buildings housed objects used in ritual and their keepers at ceremonial times. In any event, these features — the first terrace, the buildings, and mound — represent an accretionary aspect of an otherwise planned monument, highlighting the continually changing nature of the mound.

It should come as no surprise that major feasting deposits date to this time. Deposits from beneath Mound 51 may be a component of the construction ritual for Monks Mound (L. Kelly 2001). As Dietler (2001:78) notes feasting can create power differential by giving moral authority to the hosts. Guests become indebted to the host for labor. Dietler (2001:78-80) calls these kinds of situations “work feasts”. In these situations, feasting does not give the power to command but rather allows persuasive power to create a series of obligations after one becomes the recipient of hospitality. Work feasts obligate guests for the short term, although obligations can become quite extensive. Vega-Centeno Sara-Lafosse (2007:167) believes feasting was an integral component of building Vega-Centeno Cerro Lampay and may indicate that leaders who needed to use a feasting strategy were only vested with moderate amounts of power and do not correspond to chiefs or state leaders. Perhaps more importantly, Vega-Centeno

Sara-Lafosse believes feasting may be an integral component of organizing labor in acephalous societies or ones where leadership is not institutionalized.

Given the way construction commenced on Monks Mound and the obvious feasting remains beneath Mound 51, it can reasonably be asserted that the Mound 51 deposits may, in fact, be the remains of the feast associated with building the Monks Mound. Contrary to the Cerro Lampay data, however, the scale of the sub-Mound 51 deposits suggest a rather large number of people were involved and presumably, the number of people committed to working on Monks Mound would be commensurable. The data from Cerro Lampay indicate at least 10 feasting events were required to recruit enough labor to cover earlier buildings. At Cahokia, people were undertaking a very important ritual, which on its own may not have completely motivated the labor force. One very large party may also have been required (M. Dietler and Hayden 2001, Lorenz 2000).

Cahokian Society (1200 A.D. – 1400 A.D.)

Just as Cahokia's apogee (1100 A.D. – 1200 A.D.) is signaled by a single event — the creation of a sacred built landscape — so is the transition to the end. The final period begins with the capping of Monks Mound⁵⁸ and many other mounds at the site. These events ceremonially nullified the previous ritual contract. By closing the mound, it was no longer possible to use it in the previous manner, perhaps indicating social relations had changed. Although an event marks the beginning of the final period, this event was presaged by population movements, first evident in the middle 1100s with the abandonment of the upland sites in the Richland Complex (Alt 2006b). Where people

went is unknown, but this is part of a larger out-migration trend in the Greater Confluence region (J. Kelly 2008a, S. Williams 1990).

Benson and co-authors (2009) speculate the depopulation of the region and the ultimate collapse of the Cahokia polity was the result of later twelfth century droughts. Drought may be the ultimate cause, but from an anthropocentric view, the reorientation of the Cahokia polity may be related to stress and factionalism deriving from reduced crop productivity. These droughts were probably not enough to cause noticeable health problems in local populations; rather, social relations became more contentious because of smaller surpluses, or even deficit years.

One overt sign of stress may be seen in the construction of the palisade, which occurred just after the turn of the thirteenth century and may be coincidental with the capping of Monks Mound. At the same time, palisades were constructed at other sites across the American Bottom and throughout the Southeast (Hamlin 2004:313, Schroeder 2006). The beginning of the Late Period is also notable for the absence of Woodhenge construction. By the early 1200s, the western portion of the site was given over to a more residential occupation.

The time around the end of the twelfth and the beginning of the thirteenth centuries has been termed the “Moorehead Moment” by Brown (2001). Brown and others (J. Kelly et al. 2001) believe this was time when the Cahokia became more fully integrated within the Southeast. Alternatively, Pauketat (1997:49-50) suggests Cahokia transformed from a political capital to a sacred center. In the chronology as modeled here, neither argument is especially right or wrong. Certainly, there were out-migrations from Cahokia (Anderson 1994:80, Brain 1989, Goldstein and Richards 1991, King 2007,

Wells and Weinstein 2007), and the population did decline, but the key to understanding post-twelfth century Cahokia may be found in the meaning of Monks Mound, in particular and in relation to Native American cosmology.

Capping Monks Mound terminated its use as a platform mound, but Monks Mound's cosmological properties still existed. For the segments of Cahokian society who left the American Bottom, this was still the center of the world (J. Kelly 2008a). For all intents and purposes, the past Cahokian polity no longer existed; however, the sacred power of Monks Mound — which it was imbued with from its inception — did not leave. Monks Mound may have taken on idiosyncratic qualities such as being the place from which sacred fire must be re-kindled⁵⁹. Among the Natchez, the Great Sun suggested “the sacred fire needed to be carried away with violence as it was best that blood be shed over it” (the Great Sun of the Natchez as quoted by Du Pratz 1774:341). The Great Sun's words may explain the need for a constant watch and palisade around Monks Mound even though it was not the location of an individual's residence. The wall may have provided a measure of protection to people and a place that were under the constant threat of armed attack. In this case, the violence may have been a cultural prescription rather than a necessity.

Ideas developed at Cahokia likely spread to other parts of the Southeast but these ideas only took hold because they landed in fertile ground where existing people were pre-disposed to them⁶⁰. However, Cahokia likely remained an important sacred place for generations to come⁶¹. Because of this inherent sacredness, Cahokia would retain its pivotal position, but local peoples —those who did not leave after the Moorehead Moment—would be drawn into an increasingly Southeastern-looking world as the far-

flung peoples would return with new, or modified versions of old ideas. In this model, Mississippian Culture (defined as a system of beliefs partially mediated through a set of identifiable material styles) did not “arrive” at Cahokia until after the Moorehead Moment. Cultural practices before may be better termed Cahokian rather than Mississippian.

I see this model as a synthetic view derived from the propositions forwarded by Pauketat (1998b) and Kelly (1996b), Brown (2006), and other, but emphasizing the uniqueness of Monks Mound. The Mississippian cultural complex likely developed after Cahokia began to change, and in fact, Mississippian cultural traits may be the result of out-migrations from Cahokia. This is not a matter of Cahokians proselytizing the rest of non-Mississippian world. Rather, Cahokians would have brought ideas and practices that may have affected the ideas and practices of people where they settled⁶². In fact, out-migrations may have been entirely small-scale affairs with family or local lineages moving away from Cahokia in a piecemeal manner. After the Moorehead Moment, Cahokia changed in some ways but remained important. For example, Monks Mound retained an important sacred role, but its regional political position diminished (Lopinot and Pauketat 1997). The hypothesized change in role emphasizes the way LHDE can work in societies. In this case, Monks Mound may have served to connect people long after they moved out of the American Bottom.

As noted by Hamlin (2004), the later layout of Cahokia is exceptionally unusual because the palisade did not enclose the occupied areas at the site like walls at other Mississippian sites; rather it enclosed the durable landmarks of the previous generations. In fact, there is a considerable *ex-palisade* occupation including residences and a mound

center. Mississippian people lived at Cahokia until the late fourteenth century, but the scale and intensity of later occupations pales in comparison to the twelfth century. Ultimately, the site was abandoned, as much of the American Bottom was (Milner 1998:173, S. Williams 1990).

In summary, the social history of Cahokia may be better discussed in relation to solving the problem of integration at different scales. Restated simply, the story of Cahokia is the story of how societies where authority was spread through the community form larger groups without wholly transcending egalitarian norms. Here, I suggest the ancient Cahokians solved this problem by creating a ceremonial landscape, the building of which was inclusive and integrative. The Monks Mound-Woodhenge landscape was a conscious effort to integrate a vast number of social groups under the banner of a common system of beliefs.

With rising populations and increasing competition, institutions that integrated local populations broke down. During the late eleventh century, an experiment was tried with decision-making authority vested in a few individuals. However, on their death, there was a leadership crisis, which was the casual mechanism (a tipping point) for social change. Twelfth-century decision making was likely carried out through discourse and consensus building rather than through economic incentives, ideological manipulation, or coercion (cf. Emerson et al. 2008, Pauketat 1997, Pauketat and Emerson 1997a). Although this is difficult to see archaeologically, a search of Native American ethnography clearly demonstrates decisions affecting the entire group were arrived at by deliberation by many who often were arranged in councils or other deliberative bodies where admission was attained by merit or age rather than a class status. These institutions

cross-cut familial or kinship lines and allowed a high degree of flexibility in the political system. Flexibility allowed Cahokia as a political formation to include diverse groups of people and ultimately may be the reason why Cahokia was so long-lived in comparison to other Mississippian polities.

What do the recent excavated contexts have to say about Monks Mound? How does the construction of Monks Mound articulate with the construction of the Cahokia site? What does the history of construction at Cahokia say about the organizational strategies of ancient peoples in the American Bottom? How does this interpretation add to our understanding of societies worldwide? These are all questions that this dissertation has touched on.

Based on the data presented, I argue that Monks Mound was built relatively rapidly. Construction was so rapid that it appears as if the mound was conceived as a solitary project, planned to be a large and impressive construction from the beginning. The final height, over 30 meters above the surrounding floodplain, was the intended height. To be sure, the mound does have a history. The mound was constructed over much earlier remains. Likewise, later activities after its initial construction changed the appearance, and likely the meaning of the mound.

This construction history is useful for getting at the social processes that mobilized the labor for building the mound. Most would agree mound ceremonialism served to integrate diverse groups of people into a single socio-political entity. At the same time, it seems likely this organization not explicitly designed to aggrandize any one individual. This is not to say that everybody had similar status, Cahokia — as a political entity — almost surely had built-in power differentials, some people had more influence

in the decision-making process than other. Nevertheless, structural devices inhibited individual accumulation so that power was spread out to multiple individuals (Welch 2006) with the assent of many needed to undertake anything that would affect the socio-political whole.

The story of building Monks Mound is the story of building a society. In the model⁶³ I present, the initial stirrings of integration can be traced to a single influential individual. The death of this individual may have provided a trigger that led to the formation of the largest single polity in Ancient North America, if not the largest city in pre-Columbian North America⁶⁴. Contrary to materialist positions, integration was accomplished through the creation or more properly the re-creation of some aspects of a common set of belief about how the world works (J. Brown 2006). People built Monks Mound because of the social advantages afforded by the shared experience and an innate desire to be part of something larger than the individual (Holt 2009). Later, after the ceremonial termination of Monks Mound, it remained an important entity moving from monumental architecture to a monument.

This view contrasts with other views of monumental architecture at Cahokia (Emerson 1997a), or worldwide (Trigger 1990). Most interpretations privilege Monks Mounds as a tool of elite domination over a commoner population. Here, I argue the organization of the Cahokian decision-making apparatus may be more complex than is allowed by these kinds of analyses. Using an analogy to the ethnohistoric Dhegian Sioux speakers, I propose that decision making at the local scale was implemented by local leaders while large-scale decision making was done by priests or ritual specialists similar

to the Osage House of Mystery. Local leaders and local hierarchies may not have been the same people or based on the same criteria as large-scale hierarchies.

Although these ideas are somewhat unusual, they are not out of line with current trends in the Cahokian literature. For example, Brown (2006) suggests cosmology underpinned the activities occurring at Cahokia while Kelly (1996b) proposes the spatial layout of Cahokia may be governed by principals similar to those that governed the Osage hunting camp layout. This brings about how the Cahokia data are important in the larger realm of worldwide comparisons. Carniero (2010) recently suggested that all societies go through the same evolutionary stages on their way to becoming states. In this view, Cahokia was a chiefdom. Pauketat (2007) disagrees, but instead proposes that Cahokia was a state, presumably similar to a chiefdom but more evolved. In the reconstruction presented here, I argue that Cahokia does not comfortably fit into either category and may help advance our understanding of pre-state or non-state political formations. More kinds of categories are needed and cultural evolution should be seen as more than a unilinear phenomenon⁶⁵. The Cahokian polity was clearly a complex society, but complexity was not a consequence of vertical organization (Crumley 1995, 2001). Rather, multiple hierarchies likely operated at any time. Membership in any individual hierarchy likely depended on circumstance with some hierarchies determined genealogically while others were probably merit based.

Perhaps just as important as interacting with large-scale anthropological theory is the idea that this work should be meaningful and relevant to general audiences. The prevailing view of Cahokian society suggests inequality and social ranking was a pervasive and insidious aspect of Cahokia⁶⁶. At the same time, Cahokian society was a

very long-lived society, especially for a pre-modern society. Interpretations that privilege hierarchy and naturalized degrees of social inequality may suggest to those uninformed with anthropological theory that social ranking enables societies to prosper, such as Cahokia. Consequently, inequality is a side effect, or even causative, in social progress. In this way, social inequality is desired and necessary.

To paraphrase Marx, historical analysis should be aimed at changing people's minds⁶⁷. Current pictures portray Cahokia as an overwhelming force — a Leviathan in Pauketat's words (Pauketat 1994) — rife with institutionalized inequality based on genealogical relationships where ultimately a few dominated the many (Pauketat and Emerson 1997b)⁶⁸. This view, however, is a distinctly Western view of social organization and may be perpetuated by the desire to find inequality as the basis for all societies. Cahokia may be an example where diverse people were integrated into a single political entity using multiple hierarchies and multiple kinds of hierarchy. Integrating in this way enabled a large population to live in relative harmony for at least 100 years. At Cahokia, a common belief system facilitated integration. From my view, this is the preferred take home message.

References Cited

- Adler, Michael A. and Richard H. Wilshusen
1990 Large-Scale Integrative Facilities in Tribal Societies: Cross-Cultural and Southwestern US Examples. *World Archaeology* 22(2):133-146.
- Ahler, Steven R. and Peter J. DePuydt
1987 A Report on the 1931 Powell Mound Excavations, Madison County, Illinois. In *Illinois State Museum Reports of Investigations, No. 43*. Illinois State Museum, Springfield.
- Alt, Susan M.
2006a *Cultural Pluralism and Complexity: Analyzing a Cahokian Ritual Outpost*
Department of Anthropology, University of Illinois, Urbana-Champaign, Urbana.
2006b The Power of Diversity: The Roles of Migration and Hybridity in Culture Change. In *Leadership and Polity in Mississippian Society*, edited by B. M. Butler and P. D. Welch, pp. 289-308. Southern Illinois University Carbondale.
- Amborn, Hermann
2006 The Contemporary Significance of What Has Been. Three Approaches to Remembering the Past: Lineage, Gada, and Oral Tradition. *History in Africa* 33:53-84.
- Ambrose, Stanley H. and John Krigbaum
2003 Bone chemistry and bioarchaeology. *Journal of Anthropological Archaeology* 22(3):193-199.
- American Society for Testing and Materials
2003 *Standard Test for Particle-Size Analysis of Soils*. ASTM D422-63 (Reapproved 2002). ASTM International, West Conshohocken, Pennsylvania.
- Anderson, David G.
1994 *The Savannah River Chiefdoms: Political Change in the Late Prehistoric Southeast*. University of Alabama Press, Tuscaloosa.
1997 The Role of Cahokia in the Evolution of Southeastern Mississippian Society. In *Cahokia: Domination and Ideology in the Mississippian World*, edited by T. R. Pauketat and T. E. Emerson, pp. 248-268. University of Nebraska Press, Lincoln.
- Andrés-Abellán, Manuela

2005 Impacts of visitors on soil and vegetation of the recreational area "Nacimiento del Río Mundo" (Castilla-La Mancha, Spain). *Environ Monit Assess* 101(1-3):55-67.

Bandy, Mathew S.

2004 Fissioning, Scalar Stress, and Social Evolution in Early Village Societies. *American Anthropologist* 106(2):322-333.

Bareis, Charles J.

1975a Report of 1971 University of Illinois-Urbana Excavations at the Cahokia Site. In *Cahokia Archaeology: Field Reports*, edited by M. L. Fowler, pp. 9-11. Research Series. Illinois State Museum, Springfield.

1975b Report of 1972 University of Illinois-Urbana Excavations at the Cahokia Site. In *Cahokia Archaeology: Field Reports*, edited by M. L. Fowler, pp. 12-15. Research Series. Illinois State Museum, Springfield.

Bareis, Charles J. and Donald Lathrap

1962 University of Illinois Projects. In *First Annual Report: American Bottoms Archaeology, July 1, 1961-June 30, 1962*, edited by M. L. Fowler, pp. 3-9. Illinois Archaeological Survey, Urbana.

Bareis, Charles J. and J. W. Porter (editors)

1984 *American Bottom Archaeology*. University of Illinois Press, Urbana.

Bartram, William

1792 *Travels Through North & South Carolina, Georgia, East & West Florida, the Cherokee Country, the Extensive Territories of the Muscogulges, or Creek Confederacy, and the Country of the Chactaws; Containing an Account of the Soil and Natural Productions of those Regions, Together with Observations on the Manners of the Indians*. James & Johnson, Philadelphia.

1853 Observations on the Creek and Cherokee Indians. *Transactions of the American Ethnological Society* 3, part 1:11-58.

Baxter, Michael. J.

2003 *Statistics in Archaeology*. Oxford University Press, London.

Bayes, Thomas R.

1763 An Essay Towards Solving a Problem in the Doctrine of Chances. *Philosophical Transactions of the Royal Society* 53:370-418.

Bayliss, Alex and Christopher Bronk Ramsey

2004 Pragmatic Bayesian: A Decade of Integrating Radiocarbon Dates into

Chronological Models. In *Tools for Constructing Chronologies: Crossing Disciplinary Boundaries*, edited by C. E. Buck and A. R. Millard. Springer, London.

Bayliss, Alex, Christopher Bronk Ramsey, Johannes van der Plicht and Alasdair Whittle
2007a Bradshaw and Bayes: Towards a Timetable for the Neolithic. *Cambridge Archaeological Journal* 17(1):1-28.

Bayliss, Alex, Fachtna McAvoy and Alasdair Whittle
2007b The World Recreated: Redating Silbury Hill in its Monumental Landscape. *Antiquity* 81(311):26-53.

Beck, Robin A.
2003 Consolidation and Hierarchy: Chiefdom Variability in the Mississippian Southeast. *American Antiquity* 68(4):641-664.

2009 On Delusions. *Native South* 2:111-121.

Beck, Robin A., Douglas J. Bolender, James Brown and Timothy K. Earle
2007 Eventful Archaeology: The Place of Space in Structural Transformation. *Current Anthropology* 48(6):833-845.

Beekman, Christopher Stockard and William W. Baden (editors)
2004 *Nonlinear Models for Archaeology and Anthropology : Continuing the Revolution*. Ashgate, Burlington, VT.

Benchley, Elizabeth
1975 Summary Field Report of Excavations on the Southwest Corner of the First Terrace of Monks Mound. In *Cahokia Archaeology: Field Reports*, edited by M. L. Fowler, pp. 16-20. Research Series. Illinois State Museum, Springfield.

Bender, Margaret M, R. A. Bryson and David A. Baerreis
1966 University of Wisconsin Radiocarbon Dates II. *Radiocarbon* 8.

Bender, Margaret M, Reid A. Bryson and David A. Baerreis
1973 University of Wisconsin Radiocarbon Dates X. *Radiocarbon* 15(3):611-623.

Benson, Larry V., Timothy R. Pauketat and Edward R. Cook
2009 Cahokia's Boom and Bust in the Context of Climate Change. *American Antiquity* 74(3):467-484.

Bernardini, Wesley
1999 Reassessing the Scale of Social Action at Pueblo Bonito, Chaco Canyon,

New Mexico. *Kiva* 64(4):447-470.

Bethel, P. and I. Mate

1989 The Use of Soil Phosphate Analysis in Archaeology: A Critique. In *Scientific Analysis in Archaeology*, edited by J. Henderson, pp. 1-29. UCLA Institute of Archaeology, Los Angeles.

Bettis, E. Arthur, David W. Benn and Edwin R. Hajic

2008 Landscape evolution, alluvial architecture, environmental history, and the archaeological record of the Upper Mississippi River Valley. *Geomorphology* 101(1-2):362-377.

Binford, Lewis R.

1971 Mortuary Practices: Their Study and Their Potential. In *Approaches to the Social Dimensions of Mortuary Practices*, edited by J. Brown, pp. 6-29. vol. Memoir 25. Society for American Archaeology, Salt Lake City.

Birkeland, Peter W.

1999 *Soils and Geomorphology*. 3rd ed. Oxford University Press, New York.

Blanton, R. E., G. M. Feinman, S. A. Kowalewski and P. N. Peregrine

1996 A Dual-Processual Theory for the Evolution of Mesoamerican Civilization. *Current Anthropology* 37:1-14.

Blitz, John H.

1999 Mississippian Chiefdoms and the Fission-Fusion Process. *American Antiquity* 64:577-592.

2009 New Perspectives in Mississippian Archaeology. *Journal of Archaeological Research* 18(1):1-39.

Blitz, John H. and Patrick Livingood

2004 Sociopolitical Implications of Mississippian Mound Volume. *American Antiquity* 69(2):291-301.

Brackenridge, Henry Marie

1811 Unsigned article. In *The Missouri Gazette*. 9 January ed, St. Louis.

Brain, Jeffrey P.

1989 *Winterville: Late Prehistoric Culture Contact in the Lower Mississippi Valley*. Archaeological Report 23. Mississippi Department of Archives and History, Jackson.

Bronk Ramsey, Christopher

1995 Radiocarbon calibration and analysis of stratigraphy: The OxCal program. *Radiocarbon* 37(2):425-430.

2000 Comment on 'The Use of Bayesian Statistics for ¹⁴C Dates of Chronologically Ordered Samples: A Critical Analysis'. *Radiocarbon* 42:199-202.

2001 Development of the radiocarbon calibration program OxCal. *Radiocarbon* 43(2A):355-363.

2003 Punctuated Dynamic Equilibria: A Model for Chronological Analysis. In *Complex Systems and Archaeology*, edited by R. A. Bentley and H. D. G. Maschner, pp. 85-92. Foundations of Archaeological Inquiry. University of Utah Press, Salt Lake City.

2009 Bayesian Analysis of Radiocarbon Dates. *Radiocarbon* 51(1):337-360.

Brown, Ian W.

2003 Concluding Thoughts on Bottle Creek and its Position in the Mississippian World. In *Bottle Creek: A Pensacola Culture Site in South Alabama*, edited by I. W. Brown, pp. 205-226. University of Alabama Press, Tuscaloosa.

Brown, James

1971 The Dimensions of Status in the Burials at Spiro. In *Approaches to the Social Dimensions of Mortuary Practices*, edited by J. Brown. vol. Memoir 25. Society for American Antiquity, Salt Lake City.

1996 *The Spiro Ceremonial Center*. Memoirs of the Museum of Anthropology 29. two vols. University of Michigan, Ann Arbor.

1997 The Archaeology of Ancient Religion in the Eastern Woodlands *Annual Review of Anthropology* 26:465-485.

2001 The Invention of an Art Style as an Instrument of Elite Control Paper presented at the Southeastern Archaeological Conference, Nashville.

2006 Where's the Power in Mound Building? An Eastern Woodlands Perspective. In *Leadership and Polity in Mississippian Society*, edited by B. M. Butler and P. D. Welch, pp. 197-213. Occasional Paper 33. Center for Archaeological Investigations, Southern Illinois University Carbondale, Carbondale, Illinois.

2010 Cosmological Layouts of Secondary Burials as Political Instruments. In *Mississippian Mortuary Practices: Beyond Hierarchy and the Representationalist Perspective*, edited by L. P. Sullivan and R. C. Mainfort, Jr., pp. 30-54. University

Press of Florida, Gainesville.

- Buck, Caitlin E., William G. Cavanagh and Clifford D. Litton
1996 *Bayesian Approach to Interpreting Archaeological Data*. Statistics in Practice. Wiley, Chichester, England :.
- Buck, Caitlin E., Gary James and J.A. Christen
1999 BCal: An On-line Bayesian Radiocarbon Calibration Tool.
- Buck, Caitlin E., J.B. Kenworthy, C.D. Litton and A.F.M. Smith
1991 Combining Archaeological and Radiocarbon Information: A Bayesian Approach to Calibration. *Antiquity* 65:808-821.
- Buikstra, Jane E. and Douglas K. Charles
1999 Centering the Ancestors: Cemeteries, Mounds, and Sacred Landscapes of the Ancient North American Midcontinent. In *Archaeologies of Landscape: Contemporary Perspectives*, edited by W. Ashmore and A. B. Knapp, pp. 201-228. Blackwell Publishers, Oxford.
- Bushnell, D. I., Jr.
1904 *The Cahokia and Surrounding Mound Groups*. Papers, The Peabody Museum of American Archaeology and Ethnology. Vol. III (1). Harvard University, Cambridge.
- Butler, David R.
1995 *Zoogeomorphology : animals as geomorphic agents*. Cambridge University Press, Cambridge :.
- Byers, A. Martin
2006 *Cahokia: A World Renewal Cult Heterarchy*. University Press of Florida, Gainesville.
- Carneiro, Robert L.
1981 The Chiefdom: Precursor of the State. In *The Transition to Statehood in the New World*, edited by G. D. Jones and R. R. Kautz, pp. 37-79. Cambridge University Press, Cambridge.
- 2003 *Evolutionism in Cultural Anthropology: A Critical History*. Westview Press, Boulder.
- 2010 Pauketat's Chiefdoms and Other Delusions: A Challenge to Social Evolution. *Social Evolution and History* 9(1):135-165.
- Carr, Christopher and D. Troy Case (editors)

- 2005 *Gathering Hopewell: Society, Ritual, and Ritual Interaction*. Kluwer Academic/Plenum Publishers, New York.
- Carroll, Alex K., M. Nieves Zedeno and Richard W. Stoffle
2004 Landscape of the Ghost Dance: A Cartography of Numic Ritual. *Journal of Archaeological Method and Theory* 11(2):127-156.
- Chapman, Carl H.
1980 *The Archaeology of Missouri II*. University of Missouri Press, Columbia.
- Chappell, Sally Anderson
2002 *Cahokia, Mirror on the Cosmos*. University of Chicago Press, Chicago.
- Childe, V. Gordon
1950 The Urban Revolution. *The Town Planning Review* 21(1):3-17.
- Chmurny, William Wayne
1973 *The Ecology of the Middle Mississippian Occupation of the American Bottom*, University of Illinois.
- Clarke, David L.
1972 *Models in archaeology*. Methuen, London.
- Cobb, Charles R.
2003 Mississippian Chiefdoms: How Complex? *Annual Reviews of Anthropology* 32:63-84.
- Cobb, Charles R. and Patrick H. Garrow
1996 Woodstock Culture and the Question of Mississippian Emergence. *American Antiquity* 61(1):21-37.
- Cobb, Charles R. and Adam King
2005 Re-Inventing Mississippian Tradition at Etowah, Georgia. *Journal of Archaeological Method and Theory* 12(3):167-193.
- Coleman, Dennis
1974 Illinois State Geological Survey Radiocarbon Dates V. *Radiocarbon* 16(1):105-117.
- Collins, James M.
1990 *The archaeology of the Cahokia Mounds ICT-II. Site structure*. Illinois cultural resources study, no. 10. Illinois Historic Preservation Agency, Springfield.

- 1997 Cahokia Settlement and Social Structures as Viewed from the ICT-II In *Cahokia: Domination and Ideology in the Mississippian World*, edited by T. R. Pauketat and T. E. Emerson, pp. 123-140. University of Nebraska Press, Lincoln.
- Collins, James M. and Michael L. Chalfant
1993 A Second-Terrace Perspective on Monks Mound. *American Antiquity* 58:319-332.
- Collins, James M., Mikels Skele and Clyde Sweitzer
1993 Some Modern C-Transforms at Cahokia: A Conversation with Clyde Sweitzer. *Illinois Archaeology* 5(1 and 2):4-13.
- Crook, Alaga R.
1914 Cahokia or Monks Mound not of Artificial Origin. *Science* 40(1026):312.

1922 The Origins of the Cahokia Mounds. *Bulletin of the Illinois State Museum* (May).
- Crook, Alga R.
1915 Origins of Monks Mound. *Geological Society of America Bulletin* 26:74-75.
- Crowther, John
1997 Soil Phosphate Surveys: Critical Approaches to Sampling, Analysis and Interpretation. *Archaeological Prospection* 4:93-102.
- Crumley, Carole L.
1995 Heterarchy and the Analysis of Complex Societies. In *Heterarchy and the Analysis of Complex Societies*, edited by R. M. Ehrenreich, C. L. Crumley and J. E. Levy, pp. 1-17. American Anthropological Association, Arlington.

2001 Communication, Holism, and the Evolution of Sociopolitical Complexity. In *From Leaders to Rulers*, edited by J. Haas, pp. 19-36. Kluwer Press, New York.

2005 Remembering How to Organize: Heterarchy Across Disciplines. In *Nonlinear Models for Archaeology and Anthropology*, edited by W. W. Baden and C. S. Beekman. Ashgate Publishing Company, Burlington.
- Dalan, Rinita A.
1993 *Landscape Modificiation at the Cahokia Mounds Site: Geophysical Evidence for Cultural Change* Center for Ancient Studies, University of Minnesota, Minneapolis.

- 1997 The Construction of Mississippian Cahokia. In *Cahokia: Domination and Ideology in the Mississippian World*, edited by T. R. Pauketat and T. E. Emerson, pp. 89-102. University of Nebraska Press, Lincoln.
- Dalan, Rinita A. and Subir K. Banerjee
1996 Soil Magnetism, An Approach for Examining Archaeological Landscapes. *Geophysical Research Letters* 23(2):185-188.
- Dalan, Rinita A. and Bruce W. Bevan
2002 Geophysical Indicators of Culturally Emplaced Soils and Sediments. *Geoarchaeology* 18(8):779-810.
- Dalan, Rinita A., George R. Holley and Harold W. Watters Jr.
1993 *An Assessment of Moorehead's Investigations at Mound 56, Cahokia Mounds State Historic Site*. Southern Illinois University, Edwardsville.
- Dalan, Rinita A., George R. Holley, William I. Woods, Harold W. Watters, Jr. and John A. Koepke
2003 *Envisioning Cahokia: A Landscape Perspective*. Northern Illinois University Press, Dekalb, Illinois.
- Danzeglocke, Uwe, Olaf Joris and Bernhard Weninger
2009 CalPal-2007^{online}.
- DeBoer, William R.
1993 Like a Rolling Stone: The Chunkey Game and Political Organization in Eastern North America. *Southeastern Archaeology* 12(2):83-92.
- DeHass, Wills
1869 Archaeology of the Mississippi Valley. Paper presented at the American Association for the Advancement of Science, Chicago.
- Diaz-Granados, Carol and James R. Duncan
2000 *The Petroglyphs and Pictographs of Missouri*. University of Alabama Press, Tuscaloosa.
- Dietler, M. and Brian Hayden (editors)
2001 *Feasts: Archaeological and Ethnographic Perspectives on Food, Politics, and Power*. Smithsonian Institution Press, Washington, D.C.
- Dietler, Michael
2001 Theorizing the Feast. Rituals of Consumption, Comensal Politics, and Power in African Contexts. In *Feasts. Archaeologica land Ethnographic Perspectives on Food, Politics and Power*, edited by M. Dietler and B. Hayden,

pp. 65-114. Smithsonian Institution Press, Washington D.C.

Drennan, Robert D.

1996 *Statistics for Archaeologists : A Commonsense Approach*. Plenum Press, New York.

Earle, Timothy

1997 *How Chiefs Come to Power: The Political Economy in Prehistory*. Cambridge University Press, Cambridge.

2001 The Institutionalization of Chiefdoms: Why Landscapes are Built. In *From Leaders to Rulers: The Development of Political Centralization*, edited by J. Haas. Kluwer Academic, New York.

Edmunds, R. David

1985 *The Shawnee Prophet*. University of Nebraska Press, Lincoln, Neb.

Eidt, Robert C.

1977 Detection and Analysis of Anthrosols by Phosphate Analysis. *Science* (197):1327-1333.

Emerson, Thomas E.

1995 *Settlement, Symbolism, and Hegemony in the Cahokian Countryside*. Department of Anthropology, University of Wisconsin, Madison.

1997a *Cahokia and the Archaeology of Power*. University of Alabama Press, Tuscaloosa.

1997b Reflections from the Countryside on Cahokian Hegemony. In *Cahokia: Domination and Ideology in the Mississippian World*, edited by T. R. Pauketat and T. E. Emerson, pp. 167-189. University of Nebraska Press, Lincoln.

Emerson, Thomas E., Susan M. Alt and Timothy R. Pauketat

2008 Locating American Indian Religion at Cahokia and Beyond. In *Religion, Archaeology, and the Material World*, edited by L. Fogelin. 36 ed. Center for Archaeological Investigations Occasional Paper, K. Cummins, general editor. Southern Illinois University Carbondale, Carbondale, Ill.

Emerson, Thomas E. and Andrew C. Fortier

1983 Early Woodland Cultural Variation, Subsistence, and Settlement in the American Bottom. In *Early Woodland Archaeology*, edited by K. B. Farnsworth and T. E. Emerson, pp. 475-522. CAA Press, Kampsville, Ill.

Emerson, Thomas E., Radall E. Hughes, Mary R. Hynes and Sarah U. Wisseman

- 2002 Implications of Sourcing Cahokia-style Flint Clay figures in the American Bottom and the Upper Mississippi Valley. *Midcontinental Journal of Archaeology* 27(2):309-38.
- Emerson, Thomas E. and Timothy R. Pauketat
2002 Embodying Power and Resistance at Cahokia. In *The Dynamics of Power*, edited by M. Donovan, pp. 105-125. Occasional Paper 30. Southern Illinois University, Carbondale.
- Emerson, Thomas E., John A. Walthall, Andrew C. Fortier and Dale L. McElrath-Handell
2006 Advances in American Bottom Prehistory: Illinois Transportation Archaeology Two Decades after I-270. *Southeastern Archaeology* 25(2):155-169.
- Emerson, Thomas E. and William I. Woods
1993 Saving the Great Nobb: A Case Study in the Preservation of Cahokia's Monks Mound Through Passive Management. *Illinois Archaeology* 5(1 and 2):7.
- Erasmus, Charles
1965 Monument Building: Some Field Experiments. *Southwestern Journal of Anthropology* 21:277-301.
- Evans-Pritchard, E. E.
1935 The Nuer: Tribe and Clan (III). *Sudan Notes and Records* 18(1):37-87.
- Evans-Pritchard, Edward E.
1950 *The Nuer, a description of the modes of livelihood and political institutions of a Nilotic people*. Clarendon Press, Oxford.
- Evans-Pritchard, Edward E. and Meyer Fortes
1940 *African Political Systems*. Oxford University Press, London.
- Featherstonhaugh, George W.
1844 *Excursion Through the Slave States*. 2 vols. John Murray, London.
- Feinman, Gary and Jill Neitzel
1984 Too Many Types: An Overview of Sedentary Prestate Societies in the Americas. In *Advances in Archaeological Method and Theory*, edited by M. B. Schiffer, pp. 39-102. vol. 7. Academic Press, San Diego.
- Fischer, Fred W.
1972 *Recent Archaeological Investigations on the Fourth Elevations of Monks Mound*. Washington University in St. Louis.

- Fletcher, Alice C. and Francis La Flesche
1992 [1911] *The Omaha Tribe*. University of Nebraska Press, Lincoln.
- Fletcher, Mike and Gary R. Lock
2005 *Digging Numbers: Elementary Statistics for Archaeologists*. 2nd ed. ed. Oxford University Committee for Archaeology, Oxford.
- Fortier, Andrew C., Thomas E. Emerson and Dale L. McElrath
2006 Calibrating and Reassessing American Bottom Culture History. *Southeastern Archaeology* 25(2):170-211.
- Fortier, Andrew C. and Douglas K. Jackson
2000 The Formation of a Late Woodland Heartland in the American Bottom, Illinois, cal A.D. 600-900. In *Late Woodland Societies*, edited by T. E. Emerson, D. L. McElrath and A. C. Fortier, pp. 123-147. University of Nebraska Press, Lincoln.
- Fortier, Andrew C. and Dale L. McElrath
2002 Deconstructing the Emergent Mississippian Concept: The Case for the Terminal Late Woodland in the American Bottom. *Midcontinental Journal of Archaeology* 27(2):171-215.
- Fowler, Melvin L.
1963 Radiocarbon Assays. In *First Annual Report: American Bottoms Archaeology*, edited by M. L. Fowler. The Illinois Archaeological Survey, Urbana, Illinois.

1969 The Cahokia Site. In *Explorations into Cahokia*, edited by M. L. Fowler, pp. 1-31. vol. 7. University of Illinois, Urbana.

1973 Midwestern Prehistory, Cognitive Dissonance and Conspicuous Assumptions: An Essay. *The Missouri Archaeologist* 35(1-2).

1997 *The Cahokia Atlas: A Historical Atlas of Cahokia Archaeology*. Revised ed. Studies in Archaeology 2. University of Illinois at Urbana-Champaign, Urbana, Ill.

1999 *The Mound 72 area : dedicated and sacred space in early Cahokia*. Illinois State Museum Society, Springfield, Ill.
- Fried, Morton H.
1967 *The Evolution of Political Society: An Essay in Political Anthropology*. Random House, New York.

- Fritz, Gayle J.
 1992 "Newer," "Better" Maize and the Mississippian Emergence: A Critique of Prime Mover Explanations. In *Late Prehistoric Agriculture: Observations from the Midwest*, edited by W. I. Woods, pp. 19-43. Studies in Illinois Archaeology 8. Illinois Historic Preservation Agency, Springfield.
- 2000 Native Farming Systems and Ecosystems in the Mississippi Valley. In *Imperfect Balance: Landscape Transformations in the Prehistoric Americas*, edited by D. L. Lentz. Columbia University Press, New York.
- Fritz, Gayle J. and Neal H. Lopinot
 2002 Native Crops at Early Cahokia: Comparing Domestic and Ceremonial Contexts. *Illinois Archaeology* 15&16:90-111.
- Galaty, Michael L.
 1996 Labor, Population, and Social Complexity. *Chicago Anthropology Exchange* 22:33-49.
- Gee, G. W. and J.W. Bauder
 1986 Particle-size Analysis. In *Methods of Soil Analysis: Part 1, Physical and Mineralogical Methods*, edited by A. Klute, pp. 383-411. 2nd ed. Soil Science Society of America, Madison.
- Gelman, Andrew
 2005 *Bayesian data analysis*. 2nd ed. ed. Chapman & Hall/CRC, Boca Raton, Fla. ; London :.
- Gibson, Jon L. and Philip J. Carr
 2004 Big Mounds, Big Rings, Big Power. In *Signs of Power: The Rise of Complexity in the Southeast*, edited by J. L. Gibson and P. J. Carr, pp. 1-9. University of Alabama Press, Tuscaloosa, Alabama.
- Goldberg, Paul and Richard I. MacPhail
 2006 *Practical and Theoretical Geoarchaeology*. Blackwell, Malden, Massachusetts.
- Goldstein, Lynn G. and John D. Richards
 1991 Ancient Aztalan: The Cultural and Ecological Context of a Late Prehistoric Site in the Midwest. In *Cahokia and the Hinterlands*, edited by T. E. Emerson and R. B. Lewis, pp. 193-206. University of Illinois Press, Urbana.
- Gosden, Chris and Gary Lock
 1998 Prehistoric Histories. *World Archaeology* 30(1):2-12.

- Griffin, James B.
 1977 The University of Michigan Excavations at the Pulcher Site in 1970. *American Antiquity* 42(462-490).
- 1985 Changing Concepts of the Prehistoric Mississippian Cultures of the Eastern United States. In *Alabama and the Borderlands: From Prehistory to Statehood*, edited by R. R. Badger and L. A. Clayton, pp. 40-63. University of Alabama Press, University.
- Griffin, James B. and Albert C. Spaulding
 1951 The Central Mississippi Valley Archaeological Survey, Season 1950: A Preliminary Report. *Journal of the Illinois State Archaeological Society* 1(3):74-81.
- Grimley, David A., Andrew C. Phillips and Scott W. Lepley
 2007 *Surficial Geology of the Monks Mound Quadrangle, Madison and St. Clair Counties, Illinois*. Illinois State Geological Survey.
- Haag, William G.
 1976 *Field notes for 1976 excavations at Poverty Point*. Ms. on file, Poverty Point Station Archaeology Program, Poverty Point State Historic Site, Epps, LA.
- Hajic, Edwin R.
 2005 *Preliminary Stratigraphic Evaluation of the 2005 Slumps on Monks Mound*. Pathfinder CRM.
- Hall, Robert L.
 1975 Chronology and Phases at Cahokia. *Perspectives in Cahokia Archaeology, Illinois Archaeological Bulletin* 10:15-31.
- 1985 Medicine Wheels, Sun Circles, and the Magic of World Center Shrines. *Plains Anthropologist* 30(109):181-193.
- 1987 Calumet Ceremonialism, Mourning Ritual, and Mechanisms of Inter-tribal Trade. In *Mirror and Metaphor: Materials and Social Construction of Reality*, edited by D. W. Ingersoll and G. Bronitsky, pp. 31-42. Univeristy Press of America, Lanham, Md.
- 1991 Cahokia Identity and Interaction Models of Cahokia Mississippian. In *Cahokia and the Hinterlands*, edited by T. E. Emerson and R. B. Lewis, pp. 3-34. University of Illinois Press, Urbana.
- 1997 *An archaeology of the soul : North American Indian belief and ritual*. University of Illinois Press, Urbana.

Hally, David J.

1993 The Territorial Size of Mississippian Chiefdoms. In *Archaeology of Eastern North America: Papers in Honor of Stephen Williams*, edited by J. B. Stoltman, pp. 143-168. Archaeological Report 25. Mississippi Department of Archives and History, Jackson.

1996 Platform-Mound Construction and the Instability of Mississippian Chiefdoms. In *Political Structure and Change in the Prehistoric Southeastern United States*, edited by J. F. Scarry, pp. 92-127. University Press of Florida, Gainesville.

Hamlin, Jenna M.

1997 *One Person's Garbage: A Ceramic Analysis of a Midden and Fill Deposit on the First Terrace of Monks Mound, Cahokia*. Master's Thesis. Department of Anthropology, Washington University in St. Louis, St. Louis.

2004 *Sociopolitical Significance of Moorehead Phase Ceramic Assemblage Variation in the Cahokia area*. Ph. D. dissertation. Department of Anthropology, Washington University in St. Louis, St. Louis.

Harris, Edward C.

1989 *Principles of Archaeological Stratigraphy*. 2nd ed. Academic Press, San Diego.

Harris, Edward C. and Richard Reece

1979 An Aid for the Study of Artefacts from Stratified Sites. *Archaeologie en Bretagne* 20-21:27-34.

Haude, Rudiger and Thomas Wagner

1999 *Domination Institutions: Studies on the logic of symbolization and Logic of their theoretical denial*. Nomos, Baden-Baden.

Heckenberger, Michael

2005 *The Ecology of Power: Culture, Place, and Personhood in the Southern Amazon, A.D. 1000-2000*. Routledge, New York.

Heckenberger, Michael J., Afukaka Kuikuro, Urissapa Tabata Kuikuro, J. Christian Russell, Morgan Schmidt, Carlos Fausto and Bruna Franchetto

2003 Amazonia 1492: Pristine Forest or Cultural Parkland? *Science* 301(5640):5p.

Heiri, Oliver, André F. Lotter and Gerry Lemcke

2001 Loss on Ignition as a Method for Estimating Organic and Carbonate

Content in Sediments: Reproducibility and Comparability of Results. *Journal of Paleolimnology* 25:101-110.

Holley, George R.

1989 *The Archaeology of the Cahokia Mounds ICT-II. Ceramics*. Illinois Cultural Resources Study 11. Illinois Historic Preservation Agency, Springfield.

1990 Investigations at the Kunneman Tract, Cahokia Mounds Historic Site, Madison County, Illinois. Manuscript on file Southern Illinois University at Edwardsville, Unpublished report submitted to Illinois Historic Preservation Agency

Holley, George R., Rinita A. Dalan and Philip A. Smith

1993 Investigations in the Cahokia Site Grand Plaza. *American Antiquity* 58:306-319.

Holliday, Vance T. and William G. Gartner

2007 Methods of Soil P Analysis in Archaeology. *Journal of Archaeological Science* 34:301-333.

Holt, Julie Z.

1996 A. G. Church Site Subsistence Remains: the Procurement and Exchange of Plant and Animal Products during the Mississippian Emergence. *Illinois Archaeology* 8(1&2):146-188.

2009 Rethinking the Ramey State: Was Cahokia the Center of a Theater State? *American Antiquity* 74(2):231-254.

Hubert, Henri and Marcel Mauss

1964 *Sacrifice : Its Nature and Function*. University of Chicago Press, Chicago.

Hudson, Charles

1976 *The Southeastern Indians*. University of Tennessee Press, Knoxville.

Iseminger, William, Timothy R. Pauketat, Brad Koldehoff, Lucretia Kelly and Leonard Blake

1990 *The Archaeology of the Cahokia Palisade*. Illinois Cultural Resource Study 14. Illinois Historic Preservation Agency, Springfield.

Johannessen, Sissel

1993 Farmers of the Late Woodland. In *Foraging and Farming in the Eastern Woodlands*, edited by C. M. Scarry, pp. 57-77. University Press of Florida, Gainesville.

- Johnson, D. L., D. N. Johnson, D. W. Benn and E. A. Bettis III
 2008 Deciphering complex soil/site formation in sands. *Geomorphology*
 101(3):484-496.
- Johnson, Douglas H.
 1994 *The Nuer Prophets: A History of Prophecy from the Upper Nile in the Nineteenth and Twentieth Centuries*. Oxford Studies in Social and Cultural Anthropology. Oxford University Press, New York.
- Johnson, Gregory A.
 1982 Organization Structure and Scalar Stress. In *Theory and Explanation in Archaeology: The Southampton Conference*, edited by C. Renfrew and K. Cooke, pp. 389-421. Academic Press, New York.
- Kelly, John
 1980 *Formative Developments at Cahokia and the Adjacent American Bottom: A Merrell Tract Perspective*. Unpublished Ph.D. dissertation. Department of Anthropology, University of Wisconsin, Madison.
- 1982 *Formative Developments at Cahokia and the Adjacent American Bottom*. Archaeological Research Laboratory Western Illinois University, Macomb.
- 1990a The Emergence of Mississippian Culture in the American Bottom Region. In *The Mississippian Emergence*, edited by B. D. Smith, pp. 113-152. Smithsonian Institution Press, Washington, D. C.
- 1990b Emergent Mississippian in the Central Mississippi Valley. In *The Mississippian Emergence*, edited by B. D. Smith, pp. 113-152. Smithsonian Institution Press, Washington D.C.
- 1990c Range Site Community Patterns and the Mississippian Emergence. In *The Mississippian Emergence*, edited by B. D. Smith, pp. 67-112. Smithsonian Institution Press, Washington, D. C.
- 1991a Cahokia and Its Role as a Gateway Center in Interregional Exchange. In *Cahokia and the Hinterlands: Middle Mississippian Cultures of the Midwest*, edited by T. E. Emerson and R. B. Lewis, pp. 61-80. University of Illinois Press, Urbana.
- 1991b The Evidence for Prehistoric Exchange and its Implications for the Development of Cahokia. In *New Perspectives on Cahokia: Views from the Periphery*, edited by J. B. Stoltman, pp. 65-92. Monographs in World Archaeology 2. Prehistory Press, Madison, WI.

- 1992 The Impact of Maize on the Development of Nucleated Settlements: An American Bottom Example. In *Late Prehistoric Agriculture: Observations from the Midwest*, edited by W. I. Woods, pp. 167-197. Studies in Illinois Archaeology 8. Illinois Historic Preservation Agency, Springfield.
- 1993 The Pulcher Site: An Archaeological and Historical Overview. *Illinois Archaeology* 5:434-451.
- 1996a The Public Architecture on the Merrell Tract, Cahokia. Central Mississippi Valley Archaeological Research Institute, Columbia, IL. Manuscript on file, Cahokia Mounds Museum Society, Cahokia Mounds State Historic Site
- 1996b Redefining Cahokia: Principals and Elements of Community Organization. *Wisconsin Archaeologist* 77(3-4):97-119.
- 1997a *Dating the Sand Prairie Phase Residential Occupation of the Merrell Tract and Tract 15-B, Cahokia*. Cahokia Mounds Museum Society.
- 1997b *From the Ditch: The Anatomy of a Moorehead Phase House Complex along Kingshighway, St. Clair County, Illinois*. Illinois Archaeological Survey.
- 2002a Introduction. In *The Cahokia Mounds*, edited by J. Kelly. University of Alabama Press, Tuscaloosa.
- 2002b Woodland Period Archaeology in the American Bottom. In *The Woodland Southeast*, edited by D. G. Anderson and R. C. Mainfort, Jr., pp. 134-161. University of Alabama Press, Tuscaloosa.
- 2003 The Context of the Post Pit and Meaning of the Sacred Pole at the East St. Louis Mound Group. *The Wisconsin Archaeologist* 84(1&2):107-126.
- 2006 The Ritualization of Cahokia: The Structure and Organization of Early Cahokia Crafts. In *Leadership and Polity in Mississippian Society*, edited by B. M. Butler and P. D. Welch, pp. 236-263. vol. 33. Southern Illinois University Carbondale.
- 2008a Contemplating Cahokia's Collapse. In *Global Perspectives on the Collapse of Complex Systems*, edited by J. Railey and R. M. Reycraft. vol. Anthropological Papers No 8. Maxwell Museum of Anthropology.
- 2008b An Historical Perspective on the Big-Bang: Who Lit the Fuse? Paper presented at the Midwest Archaeological Conference, Milwaukee.

- 2010 Just in time: Dating Mound 34 at Cahokia. *Illinois Antiquity* 45(1):3-8.
- Kelly, John, James Brown, Jenna M. Hamlin, Lucretia Kelly, Laura Kozuch, Kathryn Parker and Julieann Van Nest
 2007 Mound 34: The Context for the Early Evidence of the Southeastern Ceremonial Complex at Cahokia. In *Southeastern Ceremonial Complex: Chronology, Content, Context*, edited by A. King, pp. 57-87. The University of Alabama Press, Tuscaloosa.
- Kelly, John, James Brown and Robin Machiran
 2003 Platforms of Power: The Dynamics of Mississippian Mound Construction at Cahokia and East St. Louis. Paper presented at the Society for American Archaeology, Milwaukee.
- Kelly, John, James Brown and Mary Beth D. Trubitt
 2001 The Moorehead Phase Revisited: The Historical Context of Cahokia's Second Climax. Paper presented at the Southeastern Archaeological Conference, Chattanooga.
- Kelly, Lucretia
 2000 *Faunal Provisioning of the Cahokia Site* Department of Anthropology, Washington University in St. Louis, St. Louis.
- 2001 A Case of Ritual Feasting at the Cahokia Site. In *Feasts: Archaeological and Ethnological Perspectives on Food, Politics, and Power*, edited by M. Dietler and B. Hayden, pp. 334-367. Smithsonian Institution Press, Washington
- Kidder, Tristram R.
 1998 The Rat That Ate Louisiana. In *Advances in Historical Ecology*, edited by W. L. Balée, pp. 141-168. Columbia University Press, New York.
- 2004a Plazas as Architecture: An Example from the Raffman Site, Northeast Louisiana. *American Antiquity* 69:514-532.
- 2004b Prehistory of the Lower Mississippi Valley After 800 B.C. In *Southeast*, edited by R. D. Fogelson, pp. 545-559. Handbook of North American Indians, Volume 14, W. Sturtevant, general editor. Smithsonian Institution Press, Washington, D.C.
- Kidder, Tristram R., Lee J. Arco, Anthony L. Ortmann, Timothy M. Schilling, Caroline Boeke, Rachel Bielitz and Katherine A. Adelsberger
 2009 *Poverty Point Mound A: Final Report of the 2005 and 2006 Field Seasons*. Louisiana Division of Archaeology and the Louisiana Archaeological Survey and Antiquities Commission.

King, Adam

2007 Mound C and the Southeastern Ceremonial Complex in the History of the Etowah Site. In *Southeastern Ceremonial Complex: Chronology, Content, Context*, edited by A. King, pp. 107-133. The University of Alabama Press, Tuscaloosa.

Knapp, A. Bernard and Wendy Ashmore

1999 Archaeological Landscapes: Constructed, Conceptualized, Ideational. In *Archaeologies of Landscape: Contemporary Perspectives*, edited by W. Ashmore and A. B. Knapp, pp. 1-30. Blackwell Publishers, Oxford.

Knight, Vernon J.

1989 Symbolism of Mississippian Mounds. In *Powhatan's Mantle: Indians in the Colonial Southeast*, edited by P. H. Wood, G. A. Waselkov and M. T. Hatley, pp. 279-291. University of Nebraska press, Lincoln and London.

1997 Some Developmental Parallels Between Cahokia and Moundville. In *Cahokia: Domination and Ideology in the Mississippian World*, edited by T. R. Pauketat and T. E. Emerson, pp. 229-247. University of Nebraska Press, Lincoln.

2001 Feasting and the Emergence of Platform Mound Ceremonialism in Eastern North America. In *Feasts: Archaeological and Ethnographic Perspectives on Food, Politics, and Power*, edited by M. Dietler and B. Hayden, pp. 311-333. Smithsonian Institution Press, Washington, D.C.

2006 Symbolism of Mississippian Mounds. In *Powhatan's Mantle: Indians in the Colonial Southeast*, edited by G. A. Waselkov, P. H. Wood and T. Hatley, pp. 421-435. University of Nebraska Press, Lincoln.

Knight, Vernon J., H. Edwin Jackson and Susan L. Scott

2010 *Mound Excavations at Moundville : Architecture, Elites, and Social Order*. University of Alabama Press, Tuscaloosa.

Kohler, Timothy A. and Sander van der Leeuw (editors)

2007 *The Model-based Archaeology of Socionatural Systems*. 1st ed. ed. School for Advanced Research Press, Santa Fe, N.M. .:

Koldehoff, Brad

1989 Cahokia's Immediate Hinterland: The Mississippian Occupation of Douglas Creek. *Illinois Archaeology* 1:39-68.

Kozlowski, T. T.

1999 Soil Compaction and Growth of Woody Plants. *Scandinavian Journal of*

Forest Research 14(6):596-619.

La Flesche, Francis

1995 *The Osage and the Invisible World : From the Works of Francis La Flesche*. University of Oklahoma Press, Norman.

Lankford, George E.

2007a The "Path of Souls": Some Death Imagery in the Southeastern Ceremonial Complex. In *Ancient Objects and Sacred Realms: Interpretations of Mississippian Iconography*, edited by F. K. Reilly and J. F. Garber. University of Texas Press, Austin.

2007b Some Cosmological Motifs of the Southeastern Ceremonial Complex. In *Ancient Objects and Sacred Realms*, edited by F. K. Reilly and J. F. Garber. University of Texas Press, Austin.

Le Page du Pratz, Antoine

1774 *The History of Louisiana*. T. Becket, London.

Lehmann, Laurent and Francois Rousset

2010 How life history and demography promote or inhibit the evolution of helping behaviours. *Philosophical Transactions of the Royal Society B: Biological Sciences* 365(1553):2599-2617.

Lewis, R. Barry and Charles Stout (editors)

1998 *Mississippian Towns and Sacred Spaces*. University of Alabama Press, Tuscaloosa.

Lewis, R. Barry, Charles Stout and Cameron B. Wesson

1998 The Design of Mississippian Towns. In *Mississippian Towns and Sacred Spaces*, edited by R. B. Lewis and C. Stout, pp. 1-21. University of Alabama Press, Tuscaloosa.

Lindauer, Owen and John H. Blitz

1997 Higher Ground: The Archaeology of North American Platform Mounds. *Journal of Archaeological Research* 5(3):169-207.

Liu, Chao Li, Kerry M. Riley and Dennis D. Coleman

1986 Illinois State Geological Survey Radiocarbon Dates VIII. *Radiocarbon* 28(1):78-109.

Livingood, Patrick

2008 Recent Discussions in Late Prehistoric Southern Archaeology. *Native South* 1:1-26.

- Lopinot, Neal H.
 1997 Cahokian Food Production Reconsidered. In *Cahokia: Domination and Ideology in the Mississippian World*, edited by T. R. Pauketat and T. E. Emerson, pp. 52-68. University of Nebraska Press, Lincoln.
- Lopinot, Neal H. and Gayle J. Fritz
 2008 *Plant Remains from the East Face of Monks Mound*. Missouri State University.
- Lopinot, Neal H. and Timothy R. Pauketat
 1997 Cahokian Population Dynamics. In *Cahokia: Domination and Ideology in the Mississippian World*, edited by T. R. Pauketat and T. E. Emerson, pp. 103-124. University of Nebraska Press, Lincoln, NE.
- Lorenz, Karl G.
 2000 The Natchez of Southwest Mississippi. In *Indians of the Greater Southeast: Historical Archaeology and Ethnohistory*, edited by B. G. McEwan, pp. 142-178. University Press of Florida, Gainesville.
- Lotz, Ted
 1971 Field Notes - South Ramp Excavations. Manuscript on file Washington University in St. Louis, notes on file, Department of Anthropology
- Lu, Xiangyang, Zhiyu Guo, Hongji Ma, Sixun Yuan and Xiaohong Wu
 2001 Data Analysis and Calibration of Radiocarbon Dating Results from the Cemetery of the Marquises of Jin. *Radiocarbon*. 43(1):55.
- Martignoni, Andrew J.
 2003 *Monks Mound: Retrospective and Prospective Geography*, Southern Illinois University of Edwardsville, Edwardsville.
- Marx, Karl and Friedrich Engels
 2001 *The German Ideology*. International Publishers, New York.
- Mauss, Marcel
 1990 *The Gift: The Form and Reason for Exchange in Archaic Societies*. Norton, New York.
- McAdams, William
 1882 Antiquities. In *History of Madison County, Illinois*, edited by W. McAdams, pp. 58-64. W. R. Brink and Co., Edwardsville.
- McDonald, Kenneth W. and Andrew Glen

2007 Modeling military trampling effects on glacial soils in the humid continental climate of southern New York. *Journal of Environmental Management* 84(4):377-383.

McElrath, Dale L. and Joyce A. Williams

1981 An Assessment of the Archaeological Phosphate Survey on Sites in the FAI-270 Right of Way. In *Archaeology in the American Bottom: Progress Report of the Illinois FAI-270 Archaeological Mitigation Project*, edited by C. J. Bareis and J. W. Porter, pp. 159-176. vol. 6. Department of Anthropology, University of Illinois at Urbana-Champaign, Urbana-Champaign.

McGimsey, Charles R. and Michael D. Wiant

1984 *Limited Archaeological Investigations at Monks Mound (11-MS-38): Some Perspectives on Its Stability, Structure, and Age*. Studies in Illinois Archaeology No. 1. Illinois Historical Preservation Agency, Springfield.

Meinkoth, Michael C., Robert J. Hoard, Robert L. Reeder and Joseph L. Harl

2000 Late Woodland Archaeology in Missouri. In *Late Woodland Societies*, edited by T. E. Emerson, D. L. McElrath and A. C. Fortier, pp. 179-185. University of Nebraska Press, Lincoln.

Merher, Mark W. and James M. Collins

1995 Household Archaeology at Cahokia and in its Hinterland. In *Mississippian Communities and Households*, edited by J. D. Rogers and B. D. Smith, pp. 32-57. University of Alabama Press, Tuscaloosa.

Mills, Barbara J.

2004 The Establishment and Defeat of Hierarchy: Inalienable Possessions and the History of Collective Prestige Structures in the Pueblo Southwest. *American Anthropologist* 106(2):238-251.

Milner, George R.

1984 Social and Temporal Implications of Variation Among American Bottom Mississippian Cemeteries. *American Antiquity* 49:468-488.

1996 Development and Dissolution of a Mississippian Society in the American Bottom, Illinois. In *Political Structure and Change in the Prehistoric Southeastern United States*, edited by J. F. Scarry, pp. 27-52. University Press of Florida, Gainesville.

1998 *The Cahokia Chiefdom: The Archaeology of a Mississippian Society*. University Press of Florida, Gainesville.

Mooney, James

- 1898 Myths of the Cherokee. *Washington, D.C.: Smithsonian Institution*:3-548.
- Moorehead, Warren K.
1929 The Cahokia Mounds. *University of Illinois Bulletin* 26(4).
- Morgan, David T.
2003 Proposed Construction Sequence of the Mound B Terrace. In *Bottle Creek Site: A Pensacola Culture Site in South Alabama*, edited by I. W. Brown. University of Alabama Press, Tuscaloosa.
- Muller, Jon
1997 *Mississippian Political Economy*. Plenum Publishing, New York.
- Nassaney, Micael S., Neal H. Lopinoit, Brian M. Butler and Richard W Jeffries
1983 *The 1982 Excavations at the Cahokia Interpretive Center Tract, St. Clair County, Illinois*. Southern Illinois University at Carbondale Center for Archaeological Investigations, Carbondale.
- Newell, H. Perry and Alex D. Krieger
1949 The George C. Davis Site, Cherokee County, Texas. *Memoirs of the Society for American Archaeology* 5.
- Norberg-Shulz, Christian
1971 *Existence, Space, and Architecture*. Praeger, New York.

1980 *Genus Loci: Towards a Phenomonology of Architecture*. Rizzoli, New York.
- O'Brien, Michael J. and W. Raymond Wood
1998 *The Prehistory of Missouri*. University of Missouri Press, Columbia.
- O'Brien, Patricia J.
1972 *A Formal Analysis of Cahokia Ceramics from the Powell Tract*. Monograph 3. Illinois Archaeological Survey, Urbana.

1991 Early State Economics: Cahokia, Capital of the Ramey State. *Political and Legal Anthropology* 8:143-176.
- Pauketat, Timothy R.
1993 *Temples for Cahokia Lords: Preston Holder's 1955-1956 Excavations of Kunnemann Mound*. Memoirs of the University of Michigan Museum of Anthropology. University of Michigan, Ann Arbor.

1994 *The Ascent of Chiefs*. University of Alabama Press, Tuscaloosa.

- 1996 The Place of Post -Circle Monuments in Cahokian Political History. *The Wisconsin Archaeologist* 77(3/4):73-83.
- 1997 Cahokian Political Economy. In *Cahokia: Domination and Ideology in the Mississippian World*, edited by T. R. Pauketat and T. E. Emerson, pp. 30-51. University of Nebraska Press, Lincoln.
- 1998a *The Archaeology of Downtown Cahokia: The Tract 15A and Dunham Tract Excavations*. Studies in Archaeology. University of Illinois at Urbana-Champaign, Urbana, Ill.
- 1998b Refiguring the Archaeology of Greater Cahokia. *Journal of Archaeological Research* 6(1):45-89.
- 2000 The Tragedy of the Commons. In *Agency in Archaeology*, edited by M.-A. Dobres and J. E. Robb, pp. 113-129. Routledge, New York.
- 2001 Practice and History in Archaeology: An Emerging Paradigm. *Anthropological Theory* 1:73-98.
- 2002 A Fourth-Generation Synthesis of Cahokia and Mississippianization. *Midcontinental Journal of Archaeology* 27(2):149-170.
- 2003a Materiality and the Immaterial in Historical-Processual Archaeology. In *Essential Tensions in Archaeological Method and Theory*, edited by T. L. Van Pool and C. S. Van Pool, pp. 41-54. The University of Utah Press, Salt Lake City.
- 2003b Resettled Farmers and the Making of a Mississippian Polity. *American Antiquity* 68:39-66.
- 2004 *Ancient Cahokia and the Mississippians*. Cambridge University Press, Cambridge.
- 2007 *Chiefdoms and Other Archaeological Delusions*. AltaMira Press, Plymouth.
- 2009 America's First Pastime. *Archaeology* 62(5):20-25.
- 2010 The Missing Persons in Mississippian Mortuaries. In *Mississippian Mortuary Practices: Beyond Hierarchy and the Representationalist Perspective*, edited by L. P. Sullivan and R. C. Mainfort, Jr., pp. 14-29. University Press of Florida, Gainesville.

- Pauketat, Timothy R. and Susan M. Alt
 2003 Mounds, Memory, and Contested Mississippian History. In *Archaeologies of Memory*, edited by R. M. Van Dyke and S. E. Alcock, pp. 151-179. Blackwell, Oxford.
- 2005 Agency in a Postmold? Physicality and the Archaeology of Culture-Making. *Journal of Archaeological Method & Theory* 12(3):213-236.
- Pauketat, Timothy R., Susan M. Alt, Jeffrey D. Krutcheon, Lucretia Kelly and Kathryn Parker
 2005 *Final Report of the Cahokia Extension Waterline and Grand Plaza Test Unit Projects*. University of Illinois, Urbana-Champaign.
- Pauketat, Timothy R. and Thomas E. Emerson
 1991 The Ideology of Authority and the Power of the Pot. *American Anthropologist* 93:919-941.
- 1997a Conclusion: Cahokia and the Four Winds. In *Cahokia: Domination and Ideology in the Mississippian World*, edited by T. R. Pauketat and T. E. Emerson, pp. 269-278. University of Nebraska Press, Lincoln.
- 1997b Introduction: Domination and Ideology in the Mississippian World. In *Cahokia: Domination and Ideology in the Mississippian World*, edited by T. R. Pauketat and T. E. Emerson, pp. 1-29. University of Nebraska Press, Lincoln.
- 2008 Star Performances and Cosmic Clutter. *Cambridge Archaeological Journal* 18(01):78-85.
- Pauketat, Timothy R., Lucretia Kelly, Gayle J. Fritz, Neal H. Lopinot, S. Elias and E. Hargrave
 2002 The Residues of Feasting and Public Ritual at Early Cahokia. *American Antiquity* 67:257-279.
- Pauketat, Timothy R. and Brad Koldehoff
 2002 Cahokian Ritual and the Ramey Field: New Insights from Old Collections. *Southeastern Archaeology* 21(1):79.
- Pauketat, Timothy R. and Neal H. Lopinot
 1997 Cahokian Population Dynamics. In *Domination and Ideology in the Mississippian World*, edited by T. R. Pauketat and T. E. Emerson, pp. 103-123. University of Nebraska Press, Lincoln.
- Payne, Claudine
 1994 *Mississippian Capitals: An Archaeological Investigation of Pre-*

Columbian Political Structure Department of Anthropology, University of Florida, Gainesville.

- Peet, Stepehn D.
1883 Ancient Village Architecture in America. *American Antiquarian* 5(1):39-68.
- Peet, Stephen D.
1891a The Cahokia Tablet. *The American Antiquarian* 13:58-59.

1891b The Great Cahokia Mound. *American Antiquarian* 13(1):3-31.
- Pietola, Liisa, Rainer Horn and Markku Yli-Halla
2005 Effects of trampling by cattle on the hydraulic and mechanical properties of soil. *Soil and Tillage Research* 82(1):99-108.
- Porter, James W.
1974 *Cahokia Archaeology as Viewed from the Mitchell Site: A Satellite Community at A.D. 1150-1200*. Ph.D. dissertation, Department of Anthropology, University of Wisconsin, Madison.
- Price, T. Douglas and Gary M. Feinman (editors)
1995 *Foundations of Social Inequality*. Plenum Press, New York.
- Putnam, Fredric Ward and J.J.R. Patrick
1880 *Twelfth Annual Report of the Peabody Museum, 1876-1879, Vol. 2*. Peabody Museum of American Archaeology and Ethnology and Harvard University.
- Rapp, George, Jr. and Christopher L. Hill
1998 *Geoarchaeology: The Earth Science Approach to Archaeological Interpretation*. Yale University Press, New Haven.
- Rappaport, Roy A.
1968 *Pigs for the Ancestors: Ritual in the Ecology of a New Guinea People*. Yale University Press, New Haven.
- Rau, Charles
1867 Indian Pottery. In *Annual Report of the Smithsonian Institution 1866*, pp. 346-355, Washington D.C.
- Reece, Richard
1994 Are Bayesian Statistics Useful to Archaeological Reasoning? *Antiquity* 68:848-850.

Reed, Nelson A.

1969 Monks and Other Mississippian Mounds. In *Explorations into Cahokia Archaeology*, edited by M. L. Fowler, pp. 43-48. vol. 7. University of Illinois, Urbana.

2009 Excavations on the Third Terrace and Front Ramp of Monks Mound, Cahokia: A Personal Narrative. *Illinois Archaeology* 21:1-89.

Reed, Nelson A., John W. Bennett and James W. Porter

1968 Solid Core Drilling of Monks Mound: Technique and Findings. *American Antiquity* 33(2):136-148.

Reilly, F. Kent and James Garber (editors)

2007 *Ancient Objects and Sacred Realms: Interpretations of Mississippian Iconography*. 1st ed. ed. University of Texas Press, Austin.

Renfrew, Colin

1973 Monuments, Mobilisation, and Social Organisation in Neolithic Wessex. In *Explanation of Culture Change: Models in Prehistory*, edited by C. Renfrew, pp. 539-558. Duckworth, London.

1974 Beyond a Subsistence Economy: The Evolution of Social Organization in Prehistoric Europe. In *Reconstructing Complex Societies: An Archaeological Colloquium*, edited by C. B. Moore, pp. 69-84. American Schools of Oriental Research, Cambridge.

2001a Commodification and Institution in Group-Oriented and Individualizing Societies. In *The Origin of Human Social Institutions*, edited by W. G. Runciman, pp. 93-117. Proceedings of the British Academy 110. Oxford University Press, Oxford.

2001b Production and Consumption in a Sacred Economy: The Material Correlates of High Devotional Expression at Chaco Canyon. *American Antiquity* 66(1):14-25.

Richards, Colin

1996 Monuments as Landscape: Creating the Centre of the World in Late Neolithic Orkney. *World Archaeology* 28(2):190-208.

2004 Labouring with Monuments: Constructing the Dolem at Carreg Samson, South-West Walse. In *The Neolithic of the Irish Sea: Materiality and Traditions of Practice*, edited by V. Cummings and C. Fowler, pp. 72-80. Oxbow Books, Oxford.

- Rissing, J.
1991 *Report on the geomorphology along the 5.8-mile extension of FAI-270 (255): FAI-270 Illinois Transportation Archeology Project, Archeological Mitigation Project, FAI-270 Illinois Transportation Archeology Project, Archeological Mitigation Project*. Illinois Transportation Archaeological Research Project.
- Robertson, Ian G.
1999 Spatial and multivariate analysis, random sampling error, and analytical noise: empirical Bayesian methods at Teotihuacan, Mexico. *American Antiquity* 64(1):137-52.
- Rolingson, Martha A.
1998 *Toltec Mounds and Plum Bayou Culture: Mound D Excavations*. Research Series 54. Arkansas Archeological Survey, Fayetteville.
- Rollings, Willard H.
1992 *The Osage: An Ethnohistorical Study of Hegemony on the Prairie-Plains*. University of Missouri Press, Columbia.
- Ros, M., C. Garcia, T. Hernandez, M. Andres and A. Barja
2004 Short-term effects of human trampling on vegetation and soil microbial activity. *Communications in Soil Science and Plant Analysis* 35(11-12):1591-1603.
- Rose, Mark
1998 Cahokia Surprise. *Archaeology* 51(3):25.
- Sahlins, Marshall D.
1958 *Social Stratification in Polynesia*. University of Washington Press, Seattle.
- Salzer, Robert J.
1975 Excavations at the Merrell Tract of the Cahokia Site: Summary Field Report, 1973. In *Cahokia Archaeology: Field Reports*, edited by M. L. Fowler, pp. 1-8. Research Series. Illinois State Museum, Springfield.
- Saucier, Roger T.
1994 *Geomorphology and Quaternary Geologic History of the Lower Mississippi Valley*. 2 vols. Mississippi River Commission, U.S. Army Corps of Engineers, Vicksburg.
- Saunders, Joe W., Rolfe D. Mandel, C. Garth Sampson, Charles M. Allen, E. Thurman Allen, Daniel A. Bush, James K. Feathers, Kristen J. Gremillion, C.T. Hallmark,

- H. Edwin Jackson, Jay K. Johnson, Reza Jones, Roger T. Saucier, Gary L. Stringer and Malcolm F. Vidrine
2005 Watson Brake, A Middle Archaic Mound Complex in Northeast Louisiana. *American Antiquity* 70:631-668.
- Saunders, Joe W., Rolfe D. Mandel, Roger T. Saucier, E. Thurman Allen, C.T. Hallmark, Jay K. Johnson, Edwin H. Jackson, Charles M. Allen, Gary L. Stringer, Douglas S. Frink, James K. Feathers, Stephen Williams, Kristen J. Gremillion, Malcolm F. Vidrine and Reza B. Jones
1997 A Mound Complex in Louisiana at 5400-5000 Years Before the Present. *Science* 277:1796-1799.
- Scarry, John F.
1996 The Nature of Mississippian Societies. In *Political Structure and Change in the Prehistoric Southeastern United States*, edited by J. F. Scarry, pp. 12-24. University Press of Florida, Gainesville.
- Schiffer, Michael B.
1987 *Formation Processes of the Archaeological Record*. University of New Mexico Press, Albuquerque.
- Schilling, Timothy
2008 Recent Research into Monks Mound. Paper presented at the 2008 Cahokia Conference, Cahokia Mounds State Historic Site.
- Schilling, Timothy and John Kelly
2009 *Report on the 2007 Monks Mound Stabilization Project*. Central Mississippi Valley Archaeological Institute.
- Schoeneberger, Philip J., Douglas A. Wysocki, Ellis C. Benham and William D. Broderick (editors)
2002 *Field Book for Describing and Sampling Soils, Version 2.0*. Natural Resources Conservation Service, Lincoln, NE.
- Schroeder, Sissel
2006 Walls as Symbols of Political, Economic, and Military Might. In *Leadership and Polity in Mississippian Society*, edited by B. M. Butler and P. D. Welch, pp. 115-141. Southern Illinois University Carbondale.
- Service, Elman R.
1975 *Origins of the State and Civilization: The Process of Cultural Evolution*. Norton, New York.
- Shanks, Michael and Christopher Tilley

- 1992 *Reconstructing Archaeology*. 2nd ed. Routledge, London.
- Sherrod, P. Clay and Martha Ann Rolingson
1987 *Surveyors of the Ancient Mississippi Valley: Modules and Alignments in Prehistoric Mound Sites*. Research Series 28. Arkansas Archeological Survey, Fayetteville.
- Simon, Mary L. and Kathryn E. Parker
2006 Prehistoric Plant Use in the American Bottom: New Thoughts and Interpretations. *Southeastern Archaeology* 25(2):212-257.
- Skele, Mikels
1988 *The Great Knob: Interpretations of Monks Mound*. Studies in Illinois Archaeology No. 4. Illinois Historic Preservation Agency, Springfield.
- Smith, Bruce D. (editor)
1990 *The Mississippian Emergence*. Smithsonian Institution Press, Washington, D.C.
- Smith, Harriet M.
1969 The Murdock Mound: Cahokia Site. In *Explorations into Cahokia Archaeology*, edited by M. L. Fowler, pp. 49-88. vol. 7. University of Illinois, Urbana, Ill.
- Soil Survey Division Staff
1993 *Soil Survey Manual*. Government Printing Office, Washington, D.C.
- Soil Survey Staff
1999 *Soil Taxonomy*. Natural Resource Conservation Service, U.S. Department of Agriculture, Washington, D.C.
- Southall, Aidan
1988 The Segmentary State in Africa and Asia. *Comparative Studies in Society and History* 30(52-82).
- Stanish, Charles
2004 The Evolution of Chiefdoms: An Economic Anthropological Model. In *Archaeological Perspectives on Political Economies*, edited by G. M. Feinman and L. M. Nicholas, pp. 7-24. University of Utah Press, Salt Lake City.
- Steier, Peter and Werner Rom
2000 The Use of Bayesian Statistics for 14C Dates of Chronologically Ordered Samples: A Critical Analysis. *Radiocarbon* 42:183-198.

- Steier, Peter, Werner Rom and Stephan Puchegger
2001 New Methods and Critical Aspects in Bayesian Mathematics for ^{14}C Calibration. *Radiocarbon* 43:373-380.
- Steponaitis, Vincas P.
1978 Location Theory and Complex Chiefdoms: A Mississippian Example. In *Mississippian Settlement Patterns*, edited by B. D. Smith, pp. 417-453. Academic Press, New York.

1986 Prehistoric Archaeology in the Southeastern United States, 1970-1985. *Annual Review of Anthropology* 15:363-404.

1991 Contrasting Patterns of Mississippian Development. In *Chiefdoms: Power, Economy, and Ideology*, edited by T. K. Earle, pp. 193-228. Cambridge University Press, Cambridge.
- Steward, Julian H.
1955 *Theory of Culture Change*. University of Illinois Press, Urbana.
- Stuiver, Minze, Paula J. Reimer and Ron Reimer
2004 CALIB Radiocarbon Calibration (version 4.4.2).
<http://radiocarbon.pa.qub.ac.uk/calib/>.
- Sullivan, Lynn P and Timothy R. Pauketat
2007 Cahokia's Mound 31: A Short-Term Construction at a Long-Term Site. *Southeastern Archaeology* 26(1):12-31.
- Swanton, John R.
1942 David I. Bushnell, Jr. *American Anthropologist* 44(1):104-110.

1952 *The Indian Tribes of North America*. Bulletin 145. Bureau of American Ethnology, Washington, D. C.

1998 *Indian Tribes of the Lower Mississippi Valley and Adjacent Gulf of Mexico*. Bureau of American Ethnology Bulletin 43. Smithsonian Institution, Washington D.C.
- Taylor, R. E.
1992 Radiocarbon Dating of Bone: To Collagen and Beyond. In *Radiocarbon Dating After Four Decades*, edited by R. E. Taylor, A. Long and R. S. Kra, pp. 375-402. Springer, Berlin.
- Taylor, Robert E.
1987 *Radiocarbon Dating: An Archaeological Perspective*. Academic Press,

Inc., Orlando.

Terry, Richard E., Perry J. Hardin, Stephen D. Houston, Sheldon D. Nelson, Mark W. Jackson, Jared Carr and J. Jacob Parnell

2006 Quantitative Phosphorus Measurement: A Field Test Procedure for Archaeological Site Analysis at Piedras Negras, Guatemala. *Geoarchaeology* 15(2):151-166.

Thomas, Cyrus

1894 Report on the Mound Explorations of the Bureau of Ethology. In *Twelfth Annual Report of the Bureau of Ethnology*, edited by J. W. Powell, pp. 3-730.

U.S. Government Printing Office, Washington, D. C.

1907 Cahokia or Monk's Mound. *American Anthropologist* 9(2):362-365.

Trigger, Bruce G.

1990 Monumental Architecture: A Thermodynamic Explanation of Symbolic Behavior. *World Archaeology* 22:119-132.

Trubitt, Mary Beth D.

2000 Mound Building and Prestige Goods Exchange: Changing Strategies in the Cahokia Chiefdom. *American Antiquity* 65:669-690.

Tuzin, Donald

2001 *Social Complexity in the Making: A Case Study Among the Arapsh in New Guinea*. Routledge, New York.

Van Nest, Julieann, Douglas K. Charles, Jane E. Buikstra and David L. Asch

2001 Sod Blocks in Illinois Hopewell Mounds. *American Antiquity* 66:633-650.

Vega-Centeno Sara-Lafosse, Rafael

2007 Construction, Labor Organization, and Feasting during the Late Archaic Period in the Central Andes. *Journal of Anthropological Archaeology* 26:150-171.

Vogel, Gregory

2002 *A Handbook of Soil Description for Archeologists*. Technical Paper 11. Arkansas Archeological Survey, Fayetteville.

Vogel, Gregory, Marvin Kay and Louis Vogelee

2005 A Mississippian Platform Mound at the Norman Site (34WG2), Eastern Oklahoma. *Southeastern Archaeology* 24(1):28-45.

Vogel, Joseph O.

1975 Trends in Cahokia Ceramics: Preliminary Study of Collections from Tracts 15A and 15B. In *Perspective in Cahokia Archaeology*, edited by M. L. Fowler, pp. 32-125. vol. 10. Illinois Archaeological Survey, Urbana.

Vokes, Richard

2007 Rethinking the Anthropology of Religious Change: New Perspectives on Revitalization and Conversion Movements 36(4):311 - 333.

Wagner, Gail E.

2000 Tobacco in Prehistoric Eastern North America. In *Tobacco Uses by Native North Americans*, edited by J. C. Winters, pp. 185-194. University of Oklahoma Press, Norman.

Walker, Winslow M.

1936 *The Troyville Mounds, Catahoula Parish, Louisiana*. Bulletin 113. Bureau of American Ethnology, Washington, D. C.

Wallace, Anthony F. C.

2003 Technology in Culture: The Meaning of Culture Fit. In *Revitalization and Mazeways: Essays on Culture Change*, edited by R. C. Grumet. vol. 1. University of Nebraska Press, Lincoln.

Walthall, John A. and Elizabeth D. Benchley

1987 *The River L'Abbe Mission : a French colonial church for the Cahokia Illini on Monks Mound*. Illinois Historic Preservation Agency, Springfield, Ill.

Walton, Clyde C. (editor)

1962 *John Francis Snyder: Selected Writings*. Illinois Historical Society, Springfield, Ill.

Watters Jr., Harold W., Rinita A. Dalan, George R. Holley and Jennifer E. Ringberg

1997 *Investigations at Mounds 59, 60, 94, and the West Borrow Pit Group, Cahokia Mounds State Historic Site*. Southern Illinois University at Edwardsville.

Weissner, Polly

2002 The Vines of Complexity: Egalitarian Structures and the Institutionalization of Inequality among the Enga. *Current Anthropology* 43:233-270.

Welch, Paul D.

1991 *Moundville's Economy*. University of Alabama Press, Tuscaloosa.

2006 Interpreting Anomalous Rural Mississippian Settlements: Leadership from Below. In *Leadership and Polity in Mississippian Society*, edited by B. M. Butler

and P. D. Welch, pp. 214-235. Southern Illinois University Carbondale.

Wells, Douglas C. and Richard A. Weinstein

2007 Extraregional Contact and Cultural Interaction at the Coles Creek-Plaquemine Transition: Recent Data from the Lake Providence Mounds, East Carroll Parish, Louisiana. In *Plaquemine Archaeology*, edited by M. A. Rees and P. C. Livingood, pp. 38-65. University of Alabama Press, Tuscaloosa.

Wesler, Kit W.

2006 Platforms As Chiefs: Comparing Mound Sequences in Western Kentucky. In *Leadership and Polity in Mississippian Society*, edited by B. M. Butler and P. D. Welch, pp. 142-155. Southern Illinois University Carbondale.

Wesson, Cameron B.

1998 Mississippian Sacred Landscapes: A View from Alabama. In *Mississippian Towns and Sacred Spaces*, edited by R. B. Lewis and C. Stout, pp. 93-122. University of Alabama Press, Tuscaloosa.

Whittle, Alasdair and Alex Bayliss

2007 The Times of Their Lives: from Chronological Precision to Kinds of History and Change. *Cambridge Archaeological Journal* 17(1):21-28.

Williams, Kenneth

1975 Preliminary Summation of Excavations at the East Lobes of Monks Mound. In *Cahokia Archaeology: Field Reports*, edited by M. L. Fowler, pp. 21-24. Research Series. Illinois State Museum, Springfield.

Williams, Stephen

1990 The Vacant Quarter and Other Late Events in the Lower Valley In *Towns and Temples Along the Mississippi* edited by D. H. Dye and C. A. Cox, pp. 170-180. University of Alabama Press Tuscaloosa.

Wilson, Gregory D., Marcoux Jon and Brad Koldehoff

2006 Square Pegs in Round Holes: Organizational Diversity Between Early Moundville and Cahokia. In *Leadership and Polity in Mississippian Society*, edited by B. M. Butler and P. D. Welch, pp. 43-72. Occasional Paper 33. Center for Archaeological Investigations, Southern Illinois University Carbondale, Carbondale, Illinois.

Wittry, Warren L.

1996 Discovering and Interpreting the Cahokia Woodhenges. *The Wisconsin Archaeologist* 77:26-35.

Wittry, Warren L. and Joseph O. Vogel

1962 Illinois State Museum Projects. In *First Annual Report: American Bottoms Archaeology, July 1, 1961-June 30, 1962*, edited by M. L. Fowler. Illinois Archaeological Survey, Urbana.

Wolf, Eric

1999 *Envisioning Power*. University of California Press, Los Angeles.

Woods, William I.

1977 The Quantitative Analysis of Soil Phosphate. *American Antiquity* 42:248-251.

1991 *Late Prehistoric Agriculture: Observations from the American Midwest*. Studies in Illinois Archaeology 8. Illinois Historic Preservation Agency, Springfield.

2001 Monks Mound: A View from the Top. Paper presented at the Society for American Archaeology, New Orleans, LA.

Woods, William I. and George R. Holley

1991 Upland Mississippian Settlement in the American Bottom Region. In *Cahokia and the Hinterlands*, edited by T. E. Emerson and R. B. Lewis, pp. 46-60. University of Illinois Press, Urbana.

Wright, Henry T.

1984 Prestate Political Formations. In *On the Evolution of Complex Societies: Essays in Honor of Harry Hoijer*, edited by T. Earle, pp. 41-78. Undena Publications, Malibu.

Appendix 1. Monks Mound Micromorphology Notes

4. 35: s) boundary b/w dark and light looks distinct, ltr part contains oxid larger grains, some oxid along bndry
m) drk and lt portions content similar, but larger more distinct grains in ltr portion, drkr portion smllr grains with more orgnx and less-defined grn bndries, all grns calc???

86: s) clearly peds entrained in above material, but uniform makeup throughout exc for color

m) peds entrained: borders kind of abrupt, but main diff clarity (fr orgnc cntnt/lack of) and lrg min grn presence; oxid prtn: borders more gradual, w/looks lk orgnx conc @ crtn places, makes look dstnct, same strxr/mkup, min, etc.; 1st ordr red in: mtrx disap w/oxd – zones of calc dissol?, amorph zones w/in oxd zones, red ndr 1st ordr red, blk in x-pol

105: s) oxd prtns look dstnct (mostly) (limonite?), lrg ones blur, but maybe fr slide manfxr; drk → lt: looks fairly discrete, but hrd to tell b/c of saw marks
m) red prtns: bndries v. dstnct, some min incl maybe same (in situ trans to limonite? Dissol calc mtrx?) hard to tell otherwise...pocket of oxd?; drk → lt: indstnguishable exc for more amrph/orgnx, bndries near invsble ndr 1st ordr rd & x-pol – a little clearer ndr lowr lt, maybe entrnd peds & A-B trans (paleo)

107B:s) vastly diff grn szs (diff mat.s dmped togeth?) w/mxng/dfrmtn in finer stuf (wet? Peds ntrnd?)

m) tongues of fn-crs (soft sed dfrmtn?) orgnx (? Oxd) cllcted around bndries, still v. dstnct, can't tell if diff min – maybe same soil src but def not ntrl bndries

114: s) looks lk a mess! Def ntrained peds &dfrmtn, v. rd band w/sqr inclsn

m) nclsn looks like calc rhomb, w/rd band some looks distinct, some not, but oxdtm fully replaces mtrx, ntrnd peds have discrete orgnc throughout, sm weird grns (qtz?) only in top prtn (may be evid for diff src)lots dfrmtn mostly, diff grn sz pockets

Appendix 2. Soil core descriptions

Core Number	Stratum	Horizon	Depth	Color	Texture	Upper Boundary	Lower Boundary	Redox	Organics	Comments
2008070801										
	1	A	21	10YR 3/2	SiCl	N/A	Diffuse	Absent	Many Roots	
	2	Bw	93	10YR 5/4	Si to FiSa	Diffuse	Clear	Fe	Few Roots	
	3	Ab	121	10YR 7/4 with 10 YR 3/2 mottling	Si	Clear	Abrupt		Roots	
	4	2Ab	194	10YR 2/1	SiCl	Abrupt	Diffuse	Fe	Roots	top boundary = submound surface (?)
	5	C1	264	Gley 5G1 4/1	Cl	Diffuse	N/A	Fe, Ca nodules		Channel fill?
2008071101										
	1	A	18	10 YR 3/2	SiL	N/A	Diffuse	Fe	Roots	
	2	Bw1	88	10 YR 4/2	Fsa-Si	Diffuse	Diffuse	Fe		Massive structure, slope wash
	3	Bw2	260	10 YR 2/1	SiCl	Diffuse	Clear	Fe	Roots	Massive structure, slope wash
	4	Ab1	280	10 yr 5/3 mottled w. 10 YR 4/1	SaL	Clear	Abrupt			Upper boundary is submound surface
	5	C	363	N41	Cl	Abrupt	N/A	Fe	Roots	Undistrubed sediments, gleyed - channel fill?

Core Number	Stratum	Horizon	Depth	Color	Texture	Upper Boundary	Lower Boundary	Redox	Organics	Comments
2008071102										
	1	A	21	10 YR 3/2	SiL	N/A	Clear	Fe	Roots	
	2	Bw1	145	10 YR 2/2	SiL	Clear	Clear	Fe	Roots	
	3	Bw2	231	10 YR 2/1	SiL	Clear	Abrupt	Fe	Roots	
	4	Ab	252	10 YR 2/1	Si to FiSa	Abrupt	Abrupt	Fe, limonite banding in top 1 cm	Roots	top boundary = submound surface, sample# 0711080201
	5	C1	295	10 YR 2/1 mottled w. 10 YR 3/3	Cl to Si	Abrupt	N/A	Fe		subsoil
2008071103										
	1	A	21	10 YR 3/2	SiL	N/A	Diffuse		Roots	
	2	Bw	49	10 YR 4/2 and 10 YR 5/3	SiL	Diffuse	Clear	Fe	Roots	
	3	Bw2	101	10 YR 3/3 mottled w. 10 YR 5/4 sand	SiCl	Clear	Clear			Massive structure, Slope wash
	4	Bw3	142	10 YR 3/3 mottled w. 10 YR 5/4 sand	SiSa	Clear	Clear			Massive structure, Slope wash

Core Number	Stratum	Horizon	Depth	Color	Texture	Upper Boundary	Lower Boundary	Redox	Organics	Comments
	5	Bw4	213	10 YR 3/2 w. 10 YR 5/3 and 10 YR 6/4 lensing	SiSa	Clear	Abrupt	Fe	Roots	Charcoal and calcium nodules at upper boundary
	6	Ab	215	10 YR 4/1	Si	Abrupt	Abrupt			Charcoal, bone
	7	C1	251	10 YR 6/4	Cl	Abrupt	N/A	Fe		undisturbed subsoil
2008071201										
	1	A	21	10 YR 2/2	SiCl	N/A	Clear		Roots	
	2	Bw1	240	10 YR 3/3	SiSa	Clear	Abrupt	Fe		Massive structure, Slope wash
	3	Bw2	252	10 YR 5/4	FSaSi	Abrupt	Abrupt	Fe		Massive structure, Slope wash
	4	Bw3	330	10 YR 3/2	Si	Abrupt	Abrupt	Fe		Charcoal in bottom of stratum
	5	2Ab	341	10 YR 5/4	SiSa	Abrupt	Clear	Fe		charcoal, lithics, bone - upper boundary is mound/submound interface
	6	2AB	370	10 YR 2/1	Lo	Clear	Abrupt			midden, calcite nodules
	7	2AB	406	10 YR 3/2	SiCl	Abrupt	Abrupt			buried soil?
	8	C1	417	10 YR 7/4	SiFSa	Abrupt	N/A			subsoil
2008071401										

Core Number	Stratum	Horizon	Depth	Color	Texture	Upper Boundary	Lower Boundary	Redox	Organics	Comments
	1	A	22	10 YR 5/3	Si	N/A	Clear		Roots	
	2	Bw1	165	10 YR 4/3 w. lighter lensing	SiL	Clear	Clear	Fe	Roots	
	3	Bw2	230	10 YR 3/2 w. 10 YR 5/3 lensing	SiCl	Clear	Abrupt	Fe	Roots	basket loading?
	4	Bw3	242	10 YR 3/1	SiCl	Abrupt	Abrupt		Roots	
	5	2Ab	253	10 YR 5/3, 10 YR 4/3, and 10 YR 3/3 mottling	SiCl	Abrupt	Abrupt	Fe		upper boundary is submound interface
	6	2Bw1	363	10 YR 5/2 with lighter and darker mottling	SiCl	Abrupt	Abrupt			Fill?, loosely packed, calcite nodules
	7	C1	395	10 YR 3/1	SiCl	Abrupt	Abrupt	Fe		Charcoal staining, water logged, lost portions of core
	8	C2	421	10 YR 6/4	SiSa	Abrupt	Abrupt	Fe		Water logged, lost portions of core
	9	C3	450	10 YR 5/3	Cl	Abrupt	N/A	Fe		Undisturbed
2008071402										

Core Number	Stratum	Horizon	Depth	Color	Texture	Upper Boundary	Lower Boundary	Redox	Organics	Comments
	1	A	28	10 YR 3/2	SiL	N/A	Diffuse			
	2	Bw1	188	Mottled 10 YR 2/1, 10 YR 3/2, 10 YR 3/3, 10 YR 5/4	SiCl	Diffuse	Clear	Fe		Basketloading
	3	Bw2	290	Mottled 10 YR 2/1, 10 YR 3/2, 10 YR 5/3	ClSi	Clear	Clear	Fe		Basketloading
	4	C1	290+	10 YR 2/2 and 10 YR 3/2	SiCl	Clear	N/A	Fe		subsoil, waterlogged, bottom of core lost
2008071403										
	1	A	47	10 YR 5/2 (Dry)	Si	N/A	Clear	Fe	Roots	
	2	Bw1	218	10 YR 3/2	Si to SiCl	Clear	Abrupt	Fe	Roots	Pottery, bone - possible wash from platform mound on 1st terrace
	3	C1	255	10 YR 6/3	Cl	Clear	N/A	Fe		Undisturbed sediments
2008071404										
	1	A	68	10 YR 2/1	Si to FSa	N/A	Diffuse		Roots	

Core Number	Stratum	Horizon	Depth	Color	Texture	Upper Boundary	Lower Boundary	Redox	Organics	Comments
	2	Bw1	180	10 YR 3/2	SiL	Diffuse	Abrupt	Fe	Roots	Pottery, bone, slope wash?
	3	Ab	188	10 YR 6/6 w. 10 YR 2/1 mottling	Sa	Abrupt	Abrupt	Fe		Sand Ridge, old ground surface
	4	C1	260	10 YR 5/1 wet	CiL	Abrupt	N/A	Fe		Undisturbed sediments
2008071501										
	1	A	36	10 YR 3/1	Si to Fsa	N/A	Diffuse		Roots	
	2	Bw1	109	10 YR 3/2	SiL	Diffuse	Diffuse		Roots	Massive structure, Slope Wash
	3	Bw2	169	10 YR 3/1	SiL	Diffuse	Abrupt	Fe	Roots	Massive structure, Slope Wash
	4	Bw3	177	10 YR 6/4 w. 10 YR 3/1 mottling	Sa	Abrupt	Clear			Massive structure, Slope Wash
	5	Ab	193	10 YR 4/2 (wet)	CiL	Clear	Clear			charcaol, interface w/ mound
	6	C1	212	10 YR 6/3	SiCl	Clear	Clear	Fe	Roots	Undisturbed sediments
	7	C2	310	10 YR 5/2	SiCl	Clear	N/A	Fe, Mn		Undisturbed sediments
2008071502										
	1	A	25	10 YR 3/2	SiL	N/A	Diffuse			

Core Number	Stratum	Horizon	Depth	Color	Texture	Upper Boundary	Lower Boundary	Redox	Organics	Comments
	2	Bw1	89	10 YR 2/1, 10 YR 3/2	SiC	Diffuse	Diffuse	Fe		Massive structure, Slope Wash
	3	Bw2	157	10 YR 2/1, 10 YR 3/2, 10 YR 3/3	SiL	Diffuse	Clear	Fe		Massive structure, Slope Wash
	4	Bw3	161	10 YR 6/4 w. 10 YR 2/1 mottling	Sa	Clear	Abrupt	Fe	Roots	Massive structure, Slope Wash
	5	Bw4	168	10 YR 3/1	Cl	Abrupt	Clear			Massive structure, Slope Wash
	6	Bw5	186	10 YR 3/2	SiL	Clear	Abrupt			Massive structure, Slope Wash
	7	Bw6	260	10 YR 4/3	Si	Abrupt	Diffuse	Fe		Massive structure, Slope Wash
	8	Bw7	291	10 YR 5/3 w. 10 YR 6/3 and 10 YR 2/1 lensing	SiCl	Diffuse	Abrupt	Fe		Massive structure, Slope Wash
	9	Ab1	322	10 YR 3/2	Cl	Abrupt	Abrupt			Interface w/ mound
	10	C1	334	10 YR 5/3	SiL	Abrupt	N/A			Undisturbed sediments
2008071503										
	1	A	26	10 YR 3/2 (Dry)	SiL	N/A	Diffuse		Roots	

Core Number	Stratum	Horizon	Depth	Color	Texture	Upper Boundary	Lower Boundary	Redox	Organics	Comments
	2	Bw1	111	10 YR 3/2 (Dry)	SiL to Fsa	Diffuse	Clear		Roots	
	3	Ab1	119	10 YR 6/4	Si	Clear	Abrupt	Fe		Surface?
	4	2Bw1	179	10 YR 5/3 w/ 10 YR 2/1 Mottling	Si-Fsa	Abrupt	Abrupt	Fe, Mn		Massive structure, slope wash
	5	2Bw2	189	10 YR 7/4	CSa	Abrupt	Abrupt			Massive structure, slope wash
	6	2Bw3	263	10 YR 6/6	Fsa-Si	Abrupt	Clear	Fe	Roots	Massive structure, slope wash
	7	C1	366	10 YR 5/2	SiCl	Clear	N/A	Fe		Undisturbed Sediments
2008071504										
	1	A	58	10 YR 3/1 (Dry)	Si	N/A	Diffuse		Roots	
	2	Bw1	141	10 YR 3/3 to 10 YR 4/3	SiL	Diffuse	Clear		Roots	Massive structure, slope wash
	3	Bw2	169	10 YR 4/3 mottled w. 10 YR 2/1	SiL	Clear	Abrupt	Fe		Massive structure, slope wash
	4	Bw3	211	10 YR 3/2 w. 10 YR 5/4 lenses	SiCl	Abrupt	Abrupt			Massive structure, slope wash
	5	Bw4	220	10 YR 6/5	Fsa	Abrupt	Abrupt			Massive structure, slope wash

Core Number	Stratum	Horizon	Depth	Color	Texture	Upper Boundary	Lower Boundary	Redox	Organics	Comments
	6	Bw5	226	10 YR 3/2	Cl	Abrupt	Abrupt			Massive structure, slope wash
	7	Bw6	239	10 YR 3/3	SiCl	Abrupt	Clear			Massive structure, slope wash
	8	Bw7	248	10 YR 3/2	SiCl	Clear	Abrupt			Massive structure, slope wash
	9	Ab	256	10 YR 6/4	Fsa	Abrupt	Abrupt			top is submound surface
	10	C4	330	10 YR 3/2 to 10 YR 2/1	Cl	Abrupt	N/A	Fe	Roots	Undisturbed sediments
2008071601										
	1	A	51	10 YR 3/2	SiL	N/A	Diffuse		Roots	
	2	Bw1	131	10 YR 4/3	SiL	Diffuse	Clear	Fe		Charcoal flecking at bottom
	3	Bw2	212	10 YR 5/4 w. 10 6/4 lensing	SiSa	Clear	Abrupt	Fe		laminated structure
	4	Ab	215	10 YR 2/1	Cl	Abrupt	Abrupt	Fe		upper boundary is submound surface
	5	C	298		SiSa	Abrupt	N/A			Undisturbed sediments
2008071602										
	1	A	34	10 YR 3/2	SiL	N/A	Diffuse		Roots	

Core Number	Stratum	Horizon	Depth	Color	Texture	Upper Boundary	Lower Boundary	Redox	Organics	Comments
	2	Bw1	154	10 YR 4/3	SiL	Diffuse	Clear	Fe	Roots	Massive structure, slope wash
	3	C1	284	10 YR 5/3 w. 10 YR 2/1 banding	SiL	Clear	N/A	Fe		Undisturbed sediments
2008071603										
	1	A	32	10 YR 6/4	Si	N/A	Abrupt		Roots	Pebbles at bottom of layer, modern loess repair
	2	Bw1	173	10 YR 3/1	Cl	Abrupt	Abrupt		Roots	Fill? Massive structure-possible slump
	3	Ab	181	10 YR 2/1	SiL	Abrupt	Abrupt		Roots	top is submound interface
	4	C	304	10 YR 6/4 w. yellow sand and black banding	ClSi	Abrupt	N/A	Fe		Undisturbed sediments
2008071604										
	1	A	6	10 YR 6/4	Si	N/A	Clear		Roots	
	2	Bw	311	10 YR 3/2	Cl to SiCl	Clear	Abrupt	Fe		Slump
	3	C	330	10 YR 5/4	Csa	Abrupt	N/A	Fe		Undisturbed sediments
2008071605										
	1	A	35	10 YR 3/2	Si	N/A	Diffuse		Roots	

Core Number	Stratum	Horizon	Depth	Color	Texture	Upper Boundary	Lower Boundary	Redox	Organics	Comments
	2	Bw1	106	10 YR 4/2	SiCl	Diffuse	Clear			Massive structure, slope wash
	3	Bw2	220	10 YR 5/2 and 10 YR 3/2	SiCl	Clear	Abrupt	Fe	Roots	Roots and old grass at boundary, Basketloading
	4	C	313	10 YR 3/1	SiSa	Abrupt	N/A	Fe		Undisturbed sediments, bottom of core lost
2008071701										
	1	A	20	10 YR 5/2 (dry)	Si	N/A	Diffuse		Roots	
	2	Bw1	85	10 YR 4/2	SiL	Diffuse	Clear		Roots	
	3	Bw2	142	10 YR 3/1, 10 YR 3/2, 10 YR 5/4	SiCl	Clear	Clear		Roots	Basketload, Slump?
	4	Bw3	186	10 YR 5/4, 10 YR 6/3, 10 YR 2/1	SiCl	Clear	Abrupt	Fe	Roots	Basketload, Slump?
	5	Ab	236	10 YR 6/3 w. 10 YR 2/2 mottling	SiCl	Abrupt	Clear	Fe		top boundary is old ground surface

Core Number	Stratum	Horizon	Depth	Color	Texture	Upper Boundary	Lower Boundary	Redox	Organics	Comments
	6	C1	416	10 YR 5/4 to 10 YR 6/4 w. 10 YR 2/2 bands of clay	SaCl	Clear	Abrupt	Fe,Mn		Water trapped between clay bands, Undisturbed sediment
	7	C2	470	10 YR 2/1	SiCl	Abrupt	N/A			Undisturbed sediment
2008071702										
	1	A	25	10 YR 7/4	SiL	N/A	Clear		Roots	loess repair slope wash , limestone @ bottom of layer
	2	Bw1	163	10 YR 4/3	Si	Clear	Clear			Slope wash, massive structure, soil development in top
	3	Bw2	277	10 YR 5/3 to 10 YR 6/3 mottled w. 10 YR 2/1	SiCl	Clear	Abrupt			Slope wash, massive structure
	4	Bw3	281	10 YR 5/3	Fsa	Abrupt	Abrupt	Fe		Slope wash
	5	Ab	287	10 YR 2/1	Cl	Abrupt	Clear			top is mound/submound interface (old ground surface)
	6	C	393	10 YR 3/2	Fsa to SiL	Clear	N/A	Fe		Water logged
2008071703										

Core Number	Stratum	Horizon	Depth	Color	Texture	Upper Boundary	Lower Boundary	Redox	Organics	Comments
	1	A	30	10 YR 2/2	Si	N/A	Diffuse		Roots	
	2	Bw1	116	10 YR 3/1	Si	Diffuse	Abrupt		Roots	Slope wash, massive structure
	3	Ab1	118	10 YR 2/1	Si	Abrupt	Abrupt			surface?
	4	2Bw1	119	10 YR 5/3	Fsa	Abrupt	Abrupt			Slope wash
	5	2Bw2	185	10 YR 4/2	Si	Abrupt	Clear	Fe		Slope wash
	6	2Bw3	249	10 YR 4/2 w. 10 YR 5/3 sand laminations	SiL	Abrupt	Clear	Fe	Roots	Slope Wash
	7	C	360	10 YR 3/1 w yellow-green sands	SiCl	Clear	N/A	Fe, Mn		Undisturbed Sediments
2008080201										
	1	A	60	10 YR 3/2	Si	N/A	Clear		Roots	
	2	Bw1	205	Mottled 10 YR 5/4 and 10 YR 2/2	Fsa-Si	Clear	Clear		Roots	Massive structure, slope wash
	3	Bw2	213	10 YR 4/3	ClSi	Clear	Abrupt	Fe		
	4	Bw3	216	10 YR 7/4	Csa	Abrupt	Abrupt			

Core Number	Stratum	Horizon	Depth	Color	Texture	Upper Boundary	Lower Boundary	Redox	Organics	Comments
	5	Bw4	222	10 YR 3/2	Si	Abrupt	Abrupt			Massive structure, slope wash
	6	Bw5	230	10 YR 5/3	Si	Abrupt	Abrupt			Massive structure, slope wash
	7	Bw6	237	10 YR 6/3	Si	Abrupt	Abrupt	Fe		laminated structure, initial slope wash?
	8	Ab	290	10 YR 3/2 w. 10 YR 5/4 lensing	ClSi	Abrupt	Diffuse			Charcoal flecking
	9	C	370	10 YR 6/3	SiCl	Diffuse	N/A			Undisturbed sediments
2008080202										
	1	A	46	10 YR 2/2	ClSi	N/A	Diffuse		Roots	
	2	Bw1	153	10 YR 4/3	Si	Diffuse	Abrupt		Roots	
	3	Bw2	222	10 YR 3/2, 10 YR 6/3, 10 YR 2/1	SiCl	Abrupt	Abrupt	Fe		Basketloading, Slump
	4	Ab	257	10 YR 2/2	SiCl	Abrupt	Diffuse			Trample zone, upper boundary is mound interface
	5	2Bw	281	Mottled 10 YR 3/2 and 10 YR 5/3	SiCl	Diffuse	Abrupt	Fe		Undisturbed sediments

Core Number	Stratum	Horizon	Depth	Color	Texture	Upper Boundary	Lower Boundary	Redox	Organics	Comments
	6	C1	359	10 YR 5/3	Si	Abrupt	Clear	Fe		Undisturbed sediments
	7	C2	376	10 YR 5/3	Cl	Clear	N/A			Undisturbed sediments
2008080203										
	1	A	32	10 YR 3/2	SiCl	N/A	Clear		Roots	
	2	Bw1	108	10 YR 5/3	Fsa-Si	Clear	Abrupt			Slope wash
	3	Bw2	112	10 YR 6/3 mottled w. 10 YR 3/2	Si	Abrupt	Abrupt	Fe		laminated bedding
	4	Ab1	117	10 YR 3/2 to 10 YR 2/2	SiCl	Abrupt	Abrupt	Fe		limonite on surface
	5	2Bw	119	10 YR 6/3	Si	Abrupt	Abrupt			laminated bedding
	6	2Ab1	136	10 YR 3/2 w 10 YR 6/3 mottling	SiCl	Abrupt	Clear			Upper boundary is interface
	7	2Ab2	174	10 YR 3/1	SiSa	Clear	Diffuse			probably part of Stratum 6
	8	C1	210	10 YR 5/3	SiCl	Diffuse	Clear			Undisturbed sediments
	9	C2	260	10 YR 4/1	Cl	Clear	Clear			Undisturbed sediments
	10	C3	275	10 YR 6/3	Si to Fsa	Clear	N/A			Undisturbed sediments

Endnotes

¹ This model is based on the idea that cooperation is brought about by discussion — verbal discourse — rather than overtly leveraging some form of power (sensu Earle 1997).

² Although the focus of this dissertation is ancient societies, as Winston Churchill once said, “We shape our buildings; thereafter they shape us.” Modern landscapes and the built environment are also encoded with similar ideas.

³ Egalitarian is a contentious word in anthropology with at least 5 different versions in use. Here egalitarian is used as defined by the Oxford English Dictionary where it means: of, relating to, or believing in the principle that all people are equal and deserve equal rights and opportunities. This definition stresses the fundamental nature of people as born with certain non-transgressable rights. I specifically use this term here to describe societies where inequality within statuses or social roles is not pre-ordained by birth.

⁴ Although most of the mound is made of earth, this is not explicitly true. Work in the past 15 years has demonstrated that some elements of the mound were built with limestone. However, limestone construction likely makes up a very small fraction of the overall construction material.

⁵ Dalan et al. 1993:152 indicate Oliver 1843:170 describes a mound on the fourth terrace. Oliver’s actual description is ambiguous. He states, “The large mound above alluded to has a platform running around the south side, at about half its height, and the cone which rises from this is flat on the top.” Whether Oliver is referring to a conical mound on the summit of the main body of the mound or not is equivocal. This quote may suggest: 1) There is a conical shaped mound with a flat top on the first terrace, 2) The main body of the mound is flat topped 3) There is a conical shaped mound with a flat top on the summit of the main body of the mound. It is unclear if Oliver climbed Monks Mound or viewed the mound from ground level. In a later passage, Oliver suggests there must be a great view of the surrounding landscape from a house on the summit of Monks Mound. Oliver’s comments suggest he did not climb to the summit of Monks Mound so his view was from the same perspective of Featherstonough and included the probability of misidentifying the irregular topography of the East Slope as indicating a mound on the summit

⁶ See Bailey 2006 for a tripartite division of the American Bottom.

⁷ As subsequent chapters detail, cultural materials related to earlier times have been found at Cahokia. For this reason, the 800 A.D. beginning time is somewhat arbitrary. On the other hand, the earliest time horizons at Cahokia are only known through relatively rare finds. The occupation (s) after 900 A.D. is much better documented.

⁸ Although based on the 1975 sequence from Cahokia, comparatively little of the data used to construct the FAI270 chronology came from excavated contexts at Cahokia.

⁹ The history of the name Emergent Mississippian is often traced to the 1984 FAI270 work; however, it can be traced to the earlier writings of Hall who first used the name in 1966 (see Kelly 2000 for a history of the name Emergent Mississippian).

¹⁰ Other authors have speculated on astronomical events as having an important impact on the development of Cahokia. Hall (1997) and Diaz-Granados (2000) argue for the appearance of a supernova in 1054 A.D. that created the Crab Nebula as important motifs in Cahokian styles. Kelly (1996b:111) points to the appearance of a comet in 1066 A.D. as a possible inspiration for the Mississippian forked eye motif.

¹¹ In early versions, he uses the term “commonwealth”. Commonwealth means: The whole body of people constituting a nation or state, the body politic; a state, an independent community, esp. viewed as a body in which the whole people have a voice or an interest. (OED). Ultimately, Pauketat suggests Cahokia was a political organization with power relations defined in part by class antagonism and coercion.

¹² Within the historical view there are numerous differences of opinions. This general outline of the historical view is based primarily on the writings of George Milner who is the most often cited proponent of the “minimalist” position where the paramount chiefdom of Cahokia differed little from other simple chiefdoms across the Southeast.

¹³ Both views do consider history and power but differentially emphasize the importance of one view or the other. The alternative presented here is that power, defined as influence over others, was less important in Cahokian society as power defined as the ability to achieve an end. Building Monks Mound was inherently powerful because it defined the Cahokians ability to achieve a goal. Building such an edifice defined a cosmological order and integrated previously disparate social group, which may have been one of the reasons for moundbuilding.

¹⁴ Knight’s discussion of platform mounds is the most direct discussion of the meaning of platform mounds in the Mississippian world. This work has much in common with ideas by Brown (2010), Hall (1997), and many others who emphasize the symbolic nature of culture over the more material approaches.

¹⁵ This notion may arise from conflating the renewal of buildings and the building of a mound.

¹⁶ Concretization is a term used by architectural theorists to describe how the built environment expresses abstract notions in physical forms. (Norberg-Shulz 1971,1980 as cited in Wesson 1998:94)

¹⁷ Connective structures may be real or imagined. In the case of Burji diaspora communities, many decorate their rooms with photographs of a sacred rock as a way of expressing their solidarity with other Burji and their Burji identity. Amborn (2006:81) suggests this is a case of a convergence of oral tradition and material culture.

¹⁸ At least as defined by differential access to the means of production. Power may have been acquired and expressed in relation to cosmology or belief rather than in terms of material goods.

¹⁹ Usually, a Natchezean analog is invoked to explain Cahokian social organization. The Natchezean analogies are derived from accounts of early explorers and settlers who were steeped in a Western European worldview. Lorenz believes this worldview may have biased the explorers and suggests the Natchezean societies differed from the explanations provided by the early historic accounts. For Cahokia, the Natchezean analogs may not be flawed but our understanding of how Natchezean society worked may be incorrect (Lorenz 2000). In any event, the ancestors of the Natchez of the sixteenth, seventeenth, and eighteenth century may have been influenced considerably by contact with Cahokia, but the nature and impact of the contact is an issue for another paper.

²⁰ This is the theoretical basis for understanding the subsequent historical model of Cahokian society (see Chapter VI). The notion presented here is that fundamentally Native American societies saw value in cooperation and designed their societies — through ritual and belief – to achieve cooperation. Why would cooperation be valued over individual completion? Lehmann and Rousset (2010) argue cooperation may confer an adaptive advantage that is self-perpetuating. In their view, the degree of cooperative behavior in a population is also dependent on demography and past behavior. In this way, the competitive models of Cahokian social behavior may be incorrect since these models tend to be drawn from historical interpretations of Western European economic behavior rather than Native American history.

²¹ The most convincing chiefdom type models do argue for degrees of heterarchy in the system, however the focus of discussion, and presumably ancient society, in these models ultimately focuses on the maintenance of a single or a very limited set of individuals dominating society. Heterarchical models do also contain elements of hierarchy but the ultimate goal is to understand how hierarchies come together to organize society rather than aggrandize a small component of the whole.

²² Byers (2006) invokes an African age-grade analogy to discuss the structure of Cahokian society but explains the structure as a function of an ecological outlook. Although Byers argument has much merit, the ethnography of North American Indians is replete with heterarchical social structures. In particular, the Mandan and Hidatsa in the early 19th century were organized according to age-grade statuses rather than genealogical hierarchies. In this case, I see no reason to forsake the more local analogy for a global one.

²³ As defined by O.E.D, meaning without formalized social classes.

²⁴ Limonite is a colloquial term in the American Bottom and has many different definitions depending on who is using it. Reed et al. (1968:141) discuss as:

In the Cahokia region, there exist sediments with high iron content, and in other mound and habitation excavations we have observed that these bands of limonite not only have formed on living surfaces, but that they outline vertical prehistoric excavations and, in a few instances, cut across both types of surfaces. Limonite can form through oxidation on an exposed surface, or it can be carried in solution, by water, down through the earth and deposited on the face of a soil change. It can form rapidly under proper conditions.

Subsequent discussions with Reed (personal communication, 2007) suggest that in the 1968 work, limonite was used to describe iron deposits that form on soil transitions as opposed to a specific form of iron.

²⁵ Pauketat 2001:85 does, however, suggest that construction of the Grand Plaza was executed in a very short time as a single integrated project. The work of Dalan et al. (2003) suggests the construction of the Grand Plaza required a commensurate amount of earth moving as did the construction of Monks Mound.

²⁶ To clarify, the idea of a single project is that the mound not used until it reached the final designed dimensions. These dimensions are very close to the modern dimensions of the mound. This idea is a fundamental break with previous researchers, who all argue for some form of gradualism.

²⁷ Based on the assumption that a blanket mantle style of construction was used, although this is a suspect assumption.

²⁸ The surface of a mound stage is defined here as a coherent stratum or collection of strata upon which human activity took place. These are recognizable by specific transformations associated with anthropogenic alterations of base soils. Transformations should be measurable by the chosen analyses.

²⁹ Clay strata overlying mound slopes have also been documented by Holder at the Kunneman Mound (Pauketat 1993:27).

³⁰ Building mounds by piling smaller piles of dirt or burying previous constructions seems to be a common method of construction at Cahokia. Mounds 10, 49, 72, and 86 were all built using a variation on this theme.

³¹ This does not mean that planning and final outcome were unplanned, rather that construction i.e., the actual piling of soil, did not require specialized knowledge of sedimentology.

³² Mound 10, the Kunneman Mound, also appears to have been built over a sloped surface.

³³ cf. Dalan 1997:93 who ascribes the Grand Plaza to the Spring Lake aged channel.

³⁴ See discussion in Steier and Rom and Bronk Ramsey on the efficacy and utility of using an uninformative prior probability.

³⁵ Radiocarbon dates from the Michigan lab are uncertain since at this early date there was no sense of how to properly determine standard error. Crane and Griffin indicate they simply calculated what they thought should be the proper standard error and then doubled it to be safe. In most instances Michigan dates are not used in this dissertation. Where they are, the dates should be held as place holders in the models rather than accurate assessments. In cases where the Michigan dates can be constrained by others, then the Michigan dates do provide a degree of surety since modeling allows for the narrowing of the standard error.

³⁶ The Nuer were cattle pastoralists and lived a much more mobile lifestyle as compared to the ancient Cahokians. Because of different economic systems, I argue that it would have been easier to organize the agricultural Cahokians because their lifestyle allowed more free time during certain seasons. Furthermore, Monks Mound was not the first large mound built in the American Bottom. It is assumed that by the time Monks Mound was built, the Cahokians would have had a very good knowledge of how to efficiently build mounds. The Nuer analog provides an example of how mounds can be built rapidly in the absence of an

agricultural lifestyle or pre-existing knowledge. By comparison, the impact of moundbuilding on Cahokians would have been less than the impact on the Nuer.

³⁷ Here plazas are explicitly defined as large-scale monumental architecture. The ICTHI project did investigate and create a fine-scale history of a courtyard group.

³⁸ For an alternative view on the age of Mound 51 see Pauketat 1993:143.

³⁹ This quote refers to the Buddhist parable. In this story, a king (*raja*) asked six blind men to describe an elephant. Each blind man touched a different part of the elephant and therefore had different interpretation of what an elephant is like. Each blind man was so convinced their interpretation was correct, they came to blows. None was able to look past their own opinion and see a synthetic view. Using this parable as a story about debates over the nature of life and the afterlife, Buddha said of scholars:

O how they cling and wrangle, some who claim
For preacher and monk the honored name!
For, quarreling, each to his view they cling.
Such folk see only one side of a thing.
Udana 68-69

Although the quote is particularly well suited to describing Monks Mound, this quote has been used by various authors to describe Cahokia.

⁴⁰ Although, I single out Pauketat's interpretation as in need of revision, I do agree that Cahokian society did change — at least in relation to the scale of society — at a very rapid pace through a series of events. Pauketat and Emerson correlate the appearance of a supernova at 1054 with the Big Bang and place the proximate cause of the Big Bang as a convergence of historically contingent practices that effectively reworked Cahokian society into something new by the end of eleventh century. The supernova may have been an activating element in these changes. In the chronology presented here, I see the Big Bang as having a history that can be understood by knowing the chronology of the landscape at Cahokia. In my view, the Big Bang may be better understood as the construction of Monks Mound since I see its construction as the culminating ritual in the creation of a new socio-political formation centered on Cahokia.

⁴¹ Collapse is used to describe what other researchers suggest happened. Kelly, Brown and others suggest what we see archaeologically is not a collapse rather a reorganization.

⁴² Complex is used in the sense provide by the Oxford English Dictionary. As defined by OED, complex means : Consisting of or comprehending various parts united or connected together; formed by combination of different elements; composite, compound. Said of things, ideas, etc.

⁴³ For example, Dalan and colleagues believe Helm's Ridge would have been draped with backswamp sediments, a proposition not borne out by other excavations see, for example, Salzer 1975:34 or Williams 1975.

⁴⁴ The age of Mound 48 is ambiguous, Ringberg (1996:99) cites personal communication with Woods that Mound 48 was built as a single event within the Lohman Phase, Stratigraphically she defines several units which are interpreted as peri-construction depositions. These strata underlie a massive silt episode, which is defined as colluvium. Perhaps a better way to look at this sequence would be to suggest the peri-construction deposits defined by Ringberg/Woods are actually pre-mound (a functional *TPQ*) and the colluvial deposits are the result of unconsolidated soil washing down from Mound 48 during the construction and immediate post-construction period since this would be the time when the mound would be most vulnerable to erosion, after the mound was built but before vegetation was established. If this is the case, then Mound 48 may date to the Lohman/Stirling transition or the final decades of the eleventh and beginning of the twelfth centuries or even later if materials in the colluvium indicate the time of construction. Interestingly enough, the proposed temporal relationship of Mound 48 and Monks Mound may suggest Mound 48 was a prototype for the later Monks Mound.

⁴⁵ Holley et al. (1993:317) allow for an alternate chronology for the construction of Monks Mound by indicating the sequence of proposed lateral borrowing and deep-pit borrowing has not been established. In this case, even if the soil for the initial stages of Monks Mound was excavated from the Grand Plaza, it could well have occurred after the excavation of the borrow pits. To my knowledge subsequent research has not clarified the point. In any event, the date on the borrow pits most proximate to Mound 48 and Mound 56 are less than useful for dating the construction of Monks Mound.

⁴⁶ Although most authors focus on the Grand Plaza and the arrangement of plazas around Monks Mound (see for example Kelly 1996), Cahokia may be defined as much as by the unusual number of plazas as by the great number of mounds. These plazas are located across the landscape and not just around Monks Mound. By my count there may be as many as a dozen plazas within the bounds of Greater Cahokia. Although there is probably a great temporal separation from the construction of the first to the use of the last, few settlements from any period in Eastern North America had more than one plaza and none, except for Cahokia, had more than four (Payne 1994).

⁴⁷ Woodhenges refer to the succession of structures on the western edge of the site.

⁴⁸ These authors are the most widely known of the numerous individuals who have expressed an evolutionary model of Cahokia. Even though all subscribe to some form of the standard evolutionary model, their explanations of process vastly differ.

⁴⁹ As noted by Kelly 1996, the notion of Monks Mound as a chiefly residence or a symbol of elite power is not universal. This idea is discussed later.

⁵⁰ Workers believe plaza areas were used more regularly for rituals during this time.

⁵¹ Although in this discussion, I reference a single historically known person. Native American prophets are occasionally found in pairs such as the Shawnee Prophet and his brother Tecumseh.

⁵² Materialist approaches dominate the Cahokian literature (see for example Brown 2006; Emerson 1997; Milner; or Pauketat 1994); however, a reading of Native American history demonstrates that, although a concern with the material conditions of life and its reproduction figures prominently, most institutional or organizational change arose through discourse and deliberation rather than through the manipulation of production. Organizations such as the Iroquois Confederacy, the Delaware Confederacy, the Cherokee Nation, or even the nascent organization when Bienville created a treaty with the Natchez and several other groups (unknown to Bienville) were all political organizations (each with a varying degree of institutionality) created through dialog and discussion.

⁵³ This general model of change caused by the failure of previous institutions can be seen in the writings of sociologist and social theorist Jurgen Habermas (2001) and in the work of anthropologist Anthony Wallace (1956)

⁵⁴ Here I use the word institution to mean a specific organization or establishment devoted to the promotion of a cause or program (OED). In this way I refer to a particular organization rather than a more sociological oriented view where institution is defined in terms of established structured patterns of behavior that are accepted parts of a culture, like the institution of marriage or governance.

⁵⁵ The House of Mystery had influence and power in ritual matters, however there is no suggestion that any form of the House of Mystery had coercive power or the ability to enforce decisions beyond ritual sanctioning. Any definition of state formation includes a modicum of coercive power.

⁵⁶ Depending on assumptions, 5000 people working for 40 days per year over the course of 5 years could have built the initial iteration of Monks Mound i.e., Monks Mound sans the first terrace (calculated from estimates provided by Lacquement 2009 and Muller 1997). This number, scaled to a ratio of 3:1 (3 people supporting 1 worker – although this logic assumes much about the division of labor that may not be relevant to ritual acts) suggests a regional population of about 20,000 people. Regional population estimates (of the American Bottom) suggest a population of between 15,000 and 50,000 people (Milner 1998:124). This estimate excludes the Missouri side of the river, the Uplands, and other far flung people likely associated with Cahokia –

such as the Evelyn Phase from the Illinois River Valley. Adding these populations in, it is possible to reduce the number of days worked or the number of years, or even change the amount of labor. The point is not to suggest an absolute number of people, rather to suggest with the degree of regional integration hypothesized, building Monks Mound in a very short time period as a single project was entirely possible. This project would require participation from much of the confluence region rather than just people from Cahokia proper. It may be somewhat ironic but it has taken 103 years to reach a similar conclusion as Cyrus Thomas reached in 1907 when he suggested 5000 people working for a total of 80 days could have built Monks Mound.

⁵⁷ Knowledge of celestial events required to build the Woodhenges would have had a deep history, however earlier methods of keeping time may have been much more exclusive than using a large structure such as Woodhenge.

⁵⁸ Although this is a non-trivial undertaking, it pales in comparison to building the mound.

⁵⁹ Part of this change may be seen in the large number of burials dating found in the central part of the site (Pauketat 1993:145) that date to this late period.

⁶⁰ For example at Lake Providence, Winterville, or Etowah local people were building mounds long before any Mississippian materials appear. It would not be difficult to believe that although Mississippian material culture references specific mythologies and ideas, local people already were familiar with them.

⁶¹ Mound sites likely remained sacred places long after the builders and their direct descendants were gone. Ian Brown discusses the trepidation of a Native American who was guiding Bienville to the Bottle Creek site in the Tensaw Delta of Alabama. Bienville removed a wooden carving from the temple mound at Bottle Creek which likely was abandoned well before Bienville's visit. Bienville's Indian guide had to be induced to bring the French there since the place was still considered sacred, perhaps even more than when Mississippians were living there.

⁶² In the model I present here, Mississippian Culture is a mixture of Cahokian and local influences. Although there are certain widespread ideas in Mississippian Culture none appear exclusive to Cahokia. Often Cahokian style material culture becomes significantly changed after appearing in a new location, e.g., Winterville, perhaps suggesting a creolization model of culture change in some places.

⁶³ This model is similar to Pauketat's Big Bang but differing in details and overall emphasis. Change was certainly rapid, but I do not believe that Cahokia after 1100 A.D. differed substantially in worldview or organization than Cahokians before 1050 A.D.

⁶⁴ The term city is contentious when applied to the Cahokia site, at its minimal definition a city is a place with a high population density. More expansive definitions require labor specialization, taxation, and public works among other things (Childe 1950). Given the hypothesized population density and history of construction at Cahokia, it is not unreasonable to call Cahokia a city by minimal definition during the twelfth century. At the same time, bureaucracy, taxation, and market economies are unlikely.

⁶⁵ This is an old idea that can be traced back to Julian Steward (1955) in archaeology, but based on Carniero's remarks some are committed to a unilinear view. Carniero believes the band-tribes-chiefdom-state typology effectively covers all of human social organization, but does allow for variation within the categories. I see this view as limiting and conflates variation for the sake of orderliness which may not exist outside of our desire to create simple explanations for complex phenomenon.

⁶⁶ For example, a display at Cahokia Mounds Museum presents Cahokian society as a pyramid with a single chief at the top and several levels of lesser chiefs between commoners at the bottom. Although archaeologists may disagree, an anecdote from my time at Cahokia is informative about public opinion. In the spring of 2010, I had the opportunity to speak with a writer from National Geographic who wanted to do a story about Cahokia. The working title of the story was *Pyramids on the Mississippi*, making a direct comparison of the Cahokian leaders to the Egyptian Pharaohs. By extension, the non-elite segment of Cahokian society was compared to Egyptian slaves. The first impression non-specialists have is that Cahokia was a top-down society dominated by aggrandizing elites. The data do not indicate this was the case.

⁶⁷ “The philosophers have only interpreted the world, in various ways; the point is to change it.”

⁶⁸ Pauketat’s view is the most widely known and, even though his recent writings present a more nuanced approach, Cahokia still stands to most as an example of a large, well integrated chiefdom. This view may actually blind researchers to what happened and why.