Plains Earthlodges: Ethnographic and Archaeological Perspectives. Edited by Donna C. Roper and Elizabeth P. Pauls. University of Alabama Press, Tuscaloosa. 2005. xviii + 227 pp., maps, photographs, drawings, bibliography, index. Cloth, ISBN 0817314458, $57.50. Paperback, ISBN 0817351639, $29.95.

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This stimulating book about Plains earthlodges will interest specialists in Plains anthropology as well as archaeologists in other areas whose interests include the social and symbolic meanings of architecture, the design and durability of structures made of earth and wood, and the lessons we can learn from replicating the forms of architecture whose remnants we find in the ground at archaeological sites. The nine chapters in this book (and the foreword by W. Raymond Wood, one of the leading voices in Plains archaeology for the past forty years) comprise the first scholarly publication concentrating on earthlodges. The contributors do not try to cover every site where earthlodges have been found, nor every topic that has been and can be considered through the study of earthlodges, but they do give the reader an interesting look at the rich archaeological and ethnographic record of earthlodges and the meanings they have had for Plains peoples in the past and present. Although the book does, of course, concentrate on the Plains, these chapters should interest readers in the Southeast, for several reasons. First, as is well known, there are examples of earthlodges in the Southeast, and many timber-frame and/or wattle-and-daub structures in the late prehistoric and protohistoric Southeast probably had earthen embankments, and, perhaps, significant amounts of earth in their roofs. Second, earthlodge villages of the Plains were sedentary settlements, supported by farming, not unlike Mississippian towns in the Southeast. Third, the kind of comparative approach—comparative in terms of spatial and temporal variation—taken here to one architectural form in the Plains is potentially applicable to the study of architecture or other forms of material culture in the Southeast. Fourth, and lastly, the chapters in this book explore the roles of earthlodges as "containers" of households, cultural activities, and material culture, and this theoretical perspective on architecture is applicable within the Southeast.

Plains earthlodges are timber-frame, earth-covered dwellings, found in northwestern Missouri, northeastern Kansas, eastern Nebraska, western Iowa, and the Dakotas. Early examples of earthlodges date to roughly A.D. 1000, they were present in native villages in the Missouri Valley that were visited and painted by George Catlin in the 1800s, they were present in native villages visited by Meriweather Lewis and George Clark in the early 1800s, and there are even photographs

of traditional earthlodges at Plains Indian settlements dating to the early nineteenth century. The durability of this architectural form notwithstanding, there is regional and temporal variation in earthlodges, including the general shift from rectangular to circular lodges at about A.D. 1400, and variation in shape and size as affected by household size and the availability of wood. Chapters in this book represent the first comprehensive and comparative treatment of an architectural form that has been identified at dozens, perhaps hundreds, of archaeological sites. Authors explore technical aspects of studying earthlodges—how they were built, how we can identify different construction stages, how we can examine earthlodges to estimate village population size and duration—as well as issues related to the social and symbolic meanings of earthlodges. The book emphasizes the material elements of earthlodges, but the rich ethnographic record and oral tradition about earthlodges are rich sources of clues about the symbolic dimensions of these structures as well.

The retrospective chapter by Michael Scullin recounts the project of replicating an earthlodge and garden in Minnesota in 1976. Scullin and colleagues were guided by written descriptions of Plains earthlodges and their knowledge of archaeological examples of them. Written descriptions of Plains settlements in the 1800s and early 1900s often do describe earthlodge design and village layout in varying degrees of detail, but they generally do not describe how much wood, bark, earth, and other materials were needed, how and when they were procured, how structures were actually built, or how often renovation and rebuilding was necessary. This chapter does not necessarily identify *how* earthlodges were built but does offer some valuable insight into how they *could have been* built. Not everything Scullin and colleagues learned in replicating an earthlodge is entirely new to Plains archaeologists, but experimental learning does bring new appreciation to what archaeologists know about structures from archaeological sites and documentary sources, and the following points are worth keeping in mind when studying the archaeology of architecture, whether in the Plains, or in the Southeast. First, it was more difficult to take bark off newly cut trees than trees or logs that had been dead and down for a year or longer. Second, it was a considerable challenge to get all the roof supports set at the same depth and height. Many hardwood groves where trees were cut for the earthlodge often included trees whose dimensions were very similar, meaning the prehistoric builders—needing posts of different sizes and different types of wood—may have needed large areas of woodland (architectural catchment zones?) to find enough raw material to build houses. It proved fortunate that it was not windy on the day the builders sheathed the wooden framework of the earthlodge with layers of willow branches and then grass. Logs placed outside the earthen covering were critical in stabilizing roofs, even though such posts are far less easy to identify archaeologically than wall posts and roof supports. Four inch-

es of earth proved enough (rather than the 10 to 12 inches noted in some published descriptions!) to cover the lodge effectively without overwhelming the roof support posts and rafters. The replica team also built a hearth, compartments, chairs, and other features inside their earthlodge, as well as an outdoor drying rack and garden, all of where were then enclosed by a log stockade. There would also be much to learn from replicating the kinds of structures archaeologists find in the Southeast (as some people have done), and also from burning them down to determine the relationship between firing conditions and the archaeological signatures of structures seen in the Southeast (as some people have done). This chapter demonstrates the value of experimenting with different architectural techniques and materials, which enriches our ability to interpret archaeological remnants of earthlodges and other kinds of post-in-ground structures built of earth and wood, and which better enables archaeologists to visualize and to interpret ancient architecture for the public.

Another paper about earthlodge replicas by Donna Roper concentrates not on building one, but, rather, on dismantling the Dancing Leaf Earth Lodge in southwestern Nebraska in 1998, and the opportunity to examine the status of different architectural elements 11 years after it was first built, in 1987. Roper develops a model of earthlodge longevity on the Plains by studying the condition of the log posts in the Dancing Leaf Earth Lodge. She first enumerates the structure members of an early twentieth century earthlodge depicted in an early twentieth century drawing. An estimated 30 tons of earth may have covered this structure. Including the wood and grass that would have been part of this earthlodge, it may have weighed 35 tons, in all. Roper notes that earthlodges would not only have needed to support the static loads of the architectural materials themselves, but they also would have been designed to sustain the dynamic loads of waterlogged roof material, precipitation, wind, earthquakes, ice, and the people and livestock who would periodically gather on top of earthlodges. Her comments on the varying strengths of different kinds of wood, and the differential resistance of those woods to moisture, are cogent reminders of the careful planning that probably went into building earthlodges, and Roper is absolutely correct that wood availability probably affected the size of earthlodges, and the periodicity of building, renovating, rebuilding, and abandoning them in different areas of the Plains. She describes in general the condition of the earthen covering, the layers of grass and branches between the roof and wood frame, and the problems introduced as posts settle and as they are replaced. Roper then recounts her painstaking approach to dismantling the Dancing Leaf Earth Lodge and recording the raw material, dimensions, placement, and condition of every post, beam, rafter, and leaner. Generally speaking, inner roof support posts, rafters, and beamds were in good shape, whereas the wall posts,

leaners, and entryway posts had suffered greatly from the effects of moisture in the ground. There is little firsthand indication in documentary sources of the longevity of Plains earthlodges, but there are estimates of 10 to 15 years in the scholarly literature, and this chapter by Roper does make it clear that major problems probably would have developed in at least some posts in an earthlodge during such an interval. Of course, some structural members could have been replaced before wholesale rebuilding or abandonment would have been necessary, but it seems likely that 10 to 15 years is a good estimate of a maximum life for an earthlodge, and Roper includes a helpful set of comments about the differential performance of different kinds of wood. These findings have major implications for the study of settlement history at Plains villages.

Structures are containers for social activity and interaction, but they also anchor people to specific points within the built environment, and Elizabeth Pauls considers the many layers of symbolic meaning attached to earthlodges in her chapter about the endurance of the earthlodge as an architectural form in the Missouri Valley for the past millennium. Archaeologists have noted broad temporal trends in the shape of earthlodges—lodges dating to the 1000s and 1100s are generally rectangular, whereas later lodges are often subrectangular or circular, although there were earthlodges in various shapes at some multiethnic villages dating to the 1700s and 1800s. Pauls and others see considerable conservatism in earthlodge architecture during the late prehistoric and postcontact periods—especially because this architectural form has endured two revolutions in Native American cultural history in the Plains, including the adoption of farming and sedentary villages lifeways in the early second millennium A.D., and encounters with Europeans beginning in the sixteenth and seventeenth centuries A.D. She acknowledges that performance characteristics and demands guided decisions about the raw materials and designs of earthlodges, but she explores the relationships between spaces within earthlodges and the broader cosmological meanings associated with them. Pauls describes earthlodges as primarily women's spaces that housed matrilineal and matrilocal groups, and that created venues for the practice of women's work. She relates the distinction between women's spaces (inside earthlodges) and men's spaces (outside and on the roof) within Plains villages to the differences in alternative pathways to power and prestige accessible to women and men in Plains societies, and this theme resonates with recent writing by archaeologists about gender and space in native settlements in the Southeast and Southwest. Plains peoples widely recognized another gender category, known as the *berdache*, and significant roles in building earthlodges may often have been performed by *berdache*. Ethnohistoric sources indicate that some women and male *berdache* had the responsibility and privilege of choosing the center posts for earthlodges, even if

men participated in actually setting posts in the ground and in other tasks. Pauls argues that center posts mediate between different cosmological realms—those realms associated with the sky, the earth, and the mortal world in between—and, therefore, only those with special power and knowledge were entitled to perform rituals related to procuring and placing such posts. Pauls specifically relates spaces within earthlodges—especially thresholds such as outer walls, for example, or the roof support posts connecting floor to roof—to gender roles and gender ideology. She is guided here by documentary sources in associating, for example, hearths and indoor workspaces with women, and in characterizing storage areas along the inner walls and leaners of earthlodges as spaces associated with men. She further argues that hearths were women's spaces in the *horizontal* plane, but men's spaces in the *vertical* plane, as smoke from hearths would emanate upward toward roofs of earthlodges, and, furthermore, hearths are analogous to the sun, which is traditionally envisaged as a male entity by many Plains peoples. By contrast, several Plains groups associate the earth with women, and, therefore, earthlodges may represent the earth itself, enclosing hearths and living spaces, and separating the domestic realm from the outside and from the male domain of the sky. Of course, whether any of this symbolism can be projected back into the past, and how appropriate it is as an interpretive framework for studying the archaeology of Plains earthlodges, are debatable points. Pauls nevertheless makes an interesting and compelling argument here that there must have been some kind of symbolism associated with earthlodges in the ancient and more recent past, and Pauls is perceptive in identifying earthlodge architecture as a source of cultural stability and conservatism.

Archaeological and documentary sources alike reflect the practices of trade, diplomacy, warfare, and other forms of interaction among different Plains groups after European contact, including interactions between mobile hunter-gatherers and sedentary village-farmers. Some Plains nomads could trace their precontact ancestry to more sedentary groups. Margot Liberty argues that medicine lodges built for annual sundance rituals by the Cheyenne and other groups are, in effect, streamlined earthlodges, and that Cheyenne, Arapahoe, and Oglala medicine lodges are outcomes of interaction during the eighteenth century between these groups and the more sedentary Mandan, Hidatsa, and Arikara villagers of the Dakotas.

After European contact, there were architectural specialists in Plains villages, and Donald Blakeslee examines archaeological evidence from Nebraska to consider whether there were architectural specialists during the Middle Ceramic period, from A.D. 1000 to 1400. Blakeslee has redrawn published maps of posthole patterns representing earthlodges from the Glen Elder, Medicine Creek, and Glenwood localities, associated with the Solomon River, Upper Republican, and Nebraska

phases, respectively. He then compares and contrasts the shape, size, and the placement of roof supports, wall posts, center posts, and entryways, looking for indications of consistency in the spacing and placement of architectural features. He finds, interestingly, that there is little patterning in archaeological evidence of earthlodges that would support the identification of architectural specialists in the Central Plains during the Middle Ceramic period. Blakeslee not only considers architectural drawings as sources of data in these comparisons, but in this chapter he also compiles extensive quantitative data on such variables as post spacing, ratios of floor space inside center posts to floor space between center posts and outer walls, and the overall size of earthlodges at the localities considered here. One interesting challenge in Central Plains archaeology is the identification of communities, given the spatially dispersed settlement pattern typical of the region. Even though Blakeslee concludes there is no clear evidence for architectural specialists during late prehistory in Nebraska, general similarities in the characteristics of pottery and corresponding similarities in earthlodges may make it possible to identify the communities to which the residents of archaeologically known earthlodges belonged.

Stephen Lensink outlines several methods for estimating the duration of occupation at earthlodge villages associated with the Middle Missouri tradition in Iowa from A.D. 1100 to 1250. The methods considered here include analyses of radiocarbon date dispersion, mean differences in radiocarbon dates, evidence of house rebuilding episodes, rates of midden accumulation, and counts of potsherds as proxy measures of household production, use, discard, and replacement. Given the imprecision associated with radiocarbon dates, analyses of radiocarbon date dispersion are not practical for the study of village occupations that are probably less than 100 years in length. For similar reasons, it is difficult to estimate the duration of occupation at sites or structures occupied for less than 150 years based on mean differences in radiocarbon dates. Documentary and archaeological evidence suggest that individual earthlodges probably would have had life spans of some 7 to 20 years, and Lensink concludes from his consideration of house rebuilding episodes at Middle Missouri sites that village occupations typically ranged from 15 to 60 years, comparable to estimates by another research for the duration of village occupations at Middle Missouri sites in South Dakota. With respect to midden accumulation, researchers have concluded from two different Middle Missouri sites that one collapsed earthlodge contributes 50 cm of midden to a site, and Lensink therefore proposes that duration of site occupation can be estimated by dividing the product of midden depth and house longevity (estimated at 15 years) by the midden accumulation rate of 50 cm per year. Another method derives dúration estimates from the study of pottery, first by focusing on the counts of rimsherds, then by con-

centrating on sherd weights. These methods involve several assumptions about how many pots each household makes and breaks per year, how many rimsherds are created when pots break, and the numbers of people who lived inside earthlodges. Of course, all of these variables are dependent on recorded or extrapolated values for the numbers of houses at sites, the floor areas of those houses, and the amounts of specific sites that were excavated. Interestingly, and not surprisingly, estimates derived from analyses of house rebuilding episodes and midden accumulation tend to yield longer estimates than analyses of the rate of ceramic discard. Meanwhile, reliance on only radiocarbon dates yields much longer estimates than other methods.

Although Lensink concentrates primarily on methods for determining the duration of site occupation, his chapter includes several interesting comments about earthlodge villages in Iowa and South Dakota dating from A.D. 1100 to 1250. First, earthlodges in Iowa are, on average, larger than those in South Dakota, although the size ranges do overlap, and Donald Blakeslee also notes this pattern in his chapter. Second, villages in the western part of the Middle Missouri region, in South Dakota, seem to have been home to higher populations than contemporary villages farther east. It may be the case that earthlodges at eastern Middle Missouri villages were larger than western counterparts because wood was more plentiful, but the social implications of differences in house size are not well known, nor are the implications of higher village populations in the western part than in the eastern part of the Middle Missouri region. Third, Lensink argues that there may have been greater diversity in villages involved in trade networks than in villages less involved in those exchange systems. Fourth, Lensink argues that cultural processes, including trade and exchange, were more significant determinants of the duration of site occupation than long-term or short-term climatic changes. All of these points are worth further consideration with data from other areas and other periods.

Jennifer Bales and Kenneth Kvamme consider the applicability of geophysical survey techniques to the study of earthlodges and villages by describing the results of magnetometer, soil resistivity, and ground-penetrating radar surveys at several well known sites in the Dakotas. These noninvasive techniques are helpful in identifying buried remnants of earthlodges, and the hearths and storage pits associated with them, and they also offer a means by which floors and other architectural elements can be identified at sites where earthlodges are visible as depressions on the ground surface. Bales and Kvamme consider the interpretive value of geophysical data at three different scales. First, they demonstrate how magnetometer and resistivity data can be analyzed to determine patterns of spacing,

alignment, density, and burning at earthlodge village sites. Second, they describe geophysical data relevant to the study of intrasite variation in structure shape, house size, and the alignments of doorways into earthlodges. Interestingly, some geophysical data can differentiate compacted floors from eroded roof deposits that formed at the edges of earthlodges, and these data can also be used to determine the depths of floors themselves. Lastly, and at the largest map scale considered here, geophysical data are also applicable to the study of the arrangement of space and architectural elements within individual earthlodges. Aside from its contributions to knowledge about earthlodges, this chapter gives a very nice summary of several different geophysical survey methods, and the kinds of archaeological deposits amenable to study by them.

Pauls and Roper conclude the book by outlining several topics that deserve further consideration through the study of Plains earthlodges. First and foremost, they note the need for further study of spatial and temporal variation in the designs and dimensions of earthlodges, and continuing efforts to learn how these structures were built, how and how often they were renovated and rebuilt, and how they were abandoned. Second, they advocate further study of relationships between earthlodges as architectural spaces and the symbolic and even sacred meanings attached to them. Third, they advocate the study of earthlodges as part of a broader set of interests in household life cycles and domestic lifeways, regional social networks, wealth, warfare, and other factors that shaped the geopolitical landscape and the built environment of the Plains during late prehistory. Earthlodges are, as Pauls and Roper note, comparable to architectural forms elsewhere—including aboriginal structures in the Southeast built of wood and earth—and the archaeology of Plains earthlodges can and should contribute to broader theoretical interests in architecture and the development of archaeological methods for studying the built environment at past settlements.

This book is a good read, both for those who want to read about the material aspects of Plains earthlodges, and for those who want to read about the symbolism of this widespread and long-lasting architectural form. It is accessible to readers who are not specialists in Plains archaeology, myself included, but these chapters also do lead interested readers to more specialized and technical papers, and more detailed treatments of specific sites and regions in other publications. It is well worth reading by any archaeologists interested in architecture in the Southeast, and elsewhere.

JOURNAL of ALABAMA ARCHAEOLOGY

VOLUME 53
NUMBER 1-2
JUNE-DEC. 2007

Published by

THE ALABAMA ARCHAEOLOGICAL SOCIETY

Eugene Futato, Editor
Office of Archaeological Research
13075 Mound State Parkway
Moundville, Alabama 35474