

**REINVENTING EQUALITY:
THE ARCHAEOLOGY OF KIRIKONGO, BURKINA FASO**

by

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To my parents, Kenneth and Mary Ann,
and to Daphne

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Chapter 1

Introduction

This work is a case study of an egalitarian revolution and the events that led to it. Over the course of the 1st and 2nd millennia AD, the inhabitants of the Iron Age village of Kirikongo, Burkina Faso (Figure 1.1) invented and reinvented their community and society in myriad ways.

In the next 15 chapters I present a holistic view of the emergence and development of a village, from the founding of a single homestead, to community growth and the rise of inequalities. It was at this point that the community rejected inequalities and the routes through which these could be achieved. However, this was no attempt to return to an idyllic egalitarian time; rather, it was post hierarchical, and the society that was created was consciously constructed with prior knowledge of how segments of a society gain political authority. In this regard the model presented here describes a type of event that likely occurred throughout the past and continues into the present when communities cease to accept inequality.

Today, Burkina Faso is home to a remarkable mosaic of peoples ranging from egalitarian societies with local autonomy to feudal states with extensive territories. These peoples inhabit diverse settlements, from dispersed extended family homesteads to clustered villages. To date, little is known about the trajectories that led to the current cultural heterogeneity. This study focuses on the development of Kirikongo, a single village in the Mouhoun Bend, located in the west of the nation. Kirikongo today is a cluster of mounds (tells) that represent a palimpsest of over a millennium and a half of sedentary life (ca. AD 100 to 1700). In order to understand the nature of the community at various points over its long occupation, my research involved survey, excavation and detailed material analyses to discern patterns and events. When temporally unraveled, it can be seen that the village settlement was at various points a singular compound, a dispersed village, a clustered village and a highly clustered village. The analysis of households within these settlements is used as a basis to explore community life in this ancient savanna village.

The time in which Kirikongo was occupied is known as the Iron Age. The Iron Age of the West African savanna was a period of unprecedented social and economic

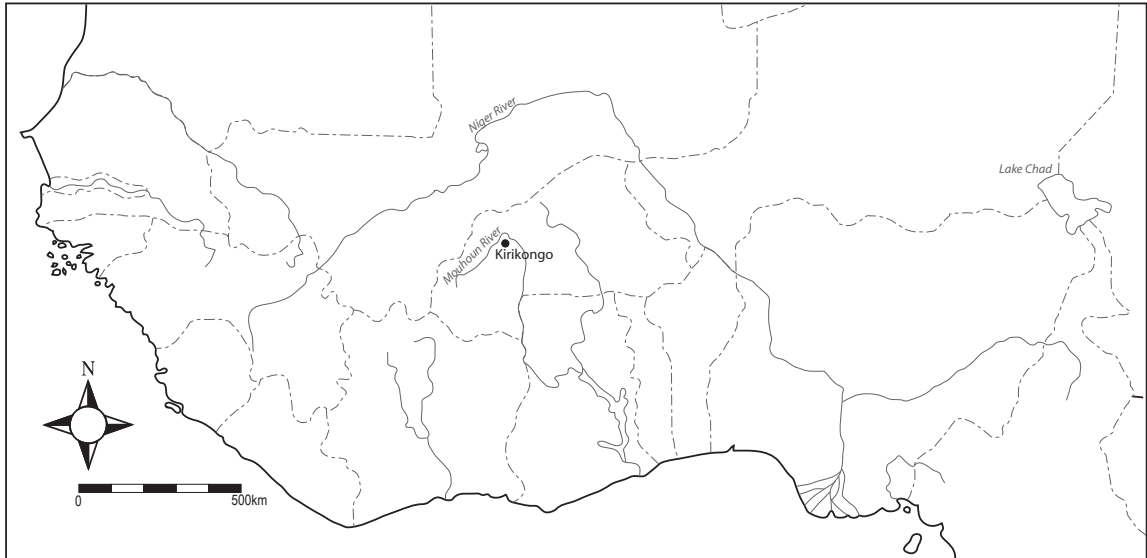


Figure 1.1: Kirikongo, Burkina Faso

transformations as sedentary farmers emerged throughout a region formerly inhabited by semi-sedentary societies with mixed economies (i.e., some cultivation). The origins and development of these early sedentary communities remain poorly understood, as the bulk of archaeological research has aimed to either chart the expansion in the use of domesticated resources, or characterize complex societies, including urban formations. Studies of village communities are rare. This is odd in a region where all ranges of society inhabit villages, from egalitarian peoples to kings. It is partly this confusion that led early anthropological work to regard many regional societies as acephalous.

This work addresses the social context for some of the most central issues in West African archaeology, including the nature of early sedentism, the economy that underlaid it, the emergence of craft specialization and the trajectory of complexity in the region, all through the lens of a single settlement that participated and witnessed this dynamic era. In order to facilitate the best and most detailed analysis of events in the village, I will focus solely on the first two phases (defined by architectural changes) of site occupation (AD 100 to ca. 1450), that are themselves divided into sub-phases (defined by ceramic change). The third phase (AD 1450- 1700) will be addressed in future presentations, as the topics diverge from those explored here.

Outline and Orientation to the Work

This study is divided into two parts. Part one (Chapters 2-7) introduces the site, the region, the research project and methodology, the excavations, and the ceramic sequence. The conclusion to the first half discusses Kirikongo and its affinities (through pottery) within the context of the West African Late Stone Age and Iron Age in order to understand its origins as well as the cultural context. It is argued that Kirikongo is the outcome of long-term social and economic processes in the savanna itself, with roots in the Kintampo complex or a Burkinabe contemporary. A Voltaic tradition is defined and this geographic and temporal context forms a foundation for discussing the evolution of the community in the second half.

Part two (Chapters 8-16) presents an argument for a dynamic series of events and societal change over the course of the first and second millennia AD. An analytical framework is first presented, in order to orient the reader with a series of general and regionally specific variables that need to be considered in interpreting the data (e.g. the relations of space, the nature of a Voltaic household). Then, using this framework, a series of targeted material patterns are explored. These include the nature of ceramic production, production and use of iron tools and stone tools, domestic animal use and hunting practices, farming, mortuary practices, and an analysis of domestic and ritual architecture. After this archaeological evidence, I present a holistic description of several different ethnic groups from the Voltaic region in order to provide a frame of reference for understanding social processes in the past. The penultimate chapter is an informed discussion of the evidence from Kirikongo drawing upon archaeological and ethnographic data. I conclude with a model for the evolution of a village in the Mouhoun Bend.

PART I

Chapter 2

Kirikongo: An Introduction to the Site, the Setting, and the Research Design

Kirikongo is a mound cluster, a group of mounds of varying sizes that can be considered a single settlement. Clustered settlements are found throughout West Africa during the Iron Age, and represent many variants on a scale of complexity, ranging from hamlets and villages to more urban settings (Holl and Koté 2000; Marchal 1978; McIntosh 1995; Togola 1996). Tells in West Africa are the end result of sedentism or long-term repeated occupation, and clustered tells likely represent a wide range of social formations. The social processes that created large urban clusters cannot be assumed to apply to small clusters, and vice-versa.

The site is fairly typical in form/size for the village manifestations particularly common throughout central, northern, and western Burkina Faso. The Mouhoun Bend region (Figure 2.1) contains a concentration of 19 similar sites (there are likely many more outside the actual bend), each ranging from 4 to 17 mounds, with individual mounds varying in size from 0.2 to 3.4 hectares (Holl 1997). Kirikongo was first identified during survey by Augustin Holl and Lassina Koté as part of the Mouhoun Bend Archaeological Project (MOBAP, 1997-2000) (Holl and Koté 2000).

I directed two seasons of fieldwork at Kirikongo, the first in 2004, and the second in 2005/2006. In this chapter, I describe the site and its local setting, and introduce the research project.

Kirikongo: The Site

Kirikongo is composed of thirteen small mounds ranging in size from 0.2 to 0.9 hectares each (see Table 2.1), with a total mound area of 5.6 hectares (see Figure 2.2). They vary in height above the current ground from 1.2 to 3.5 m. The mounds are distributed over a 37 hectare area measuring 700 m north-south by 530 m east-west. Beyond this core zone, activity areas are distributed outside the occupation zone of the village to a farthest extent of 250 m. The mounds can be divided into three distinct spatial

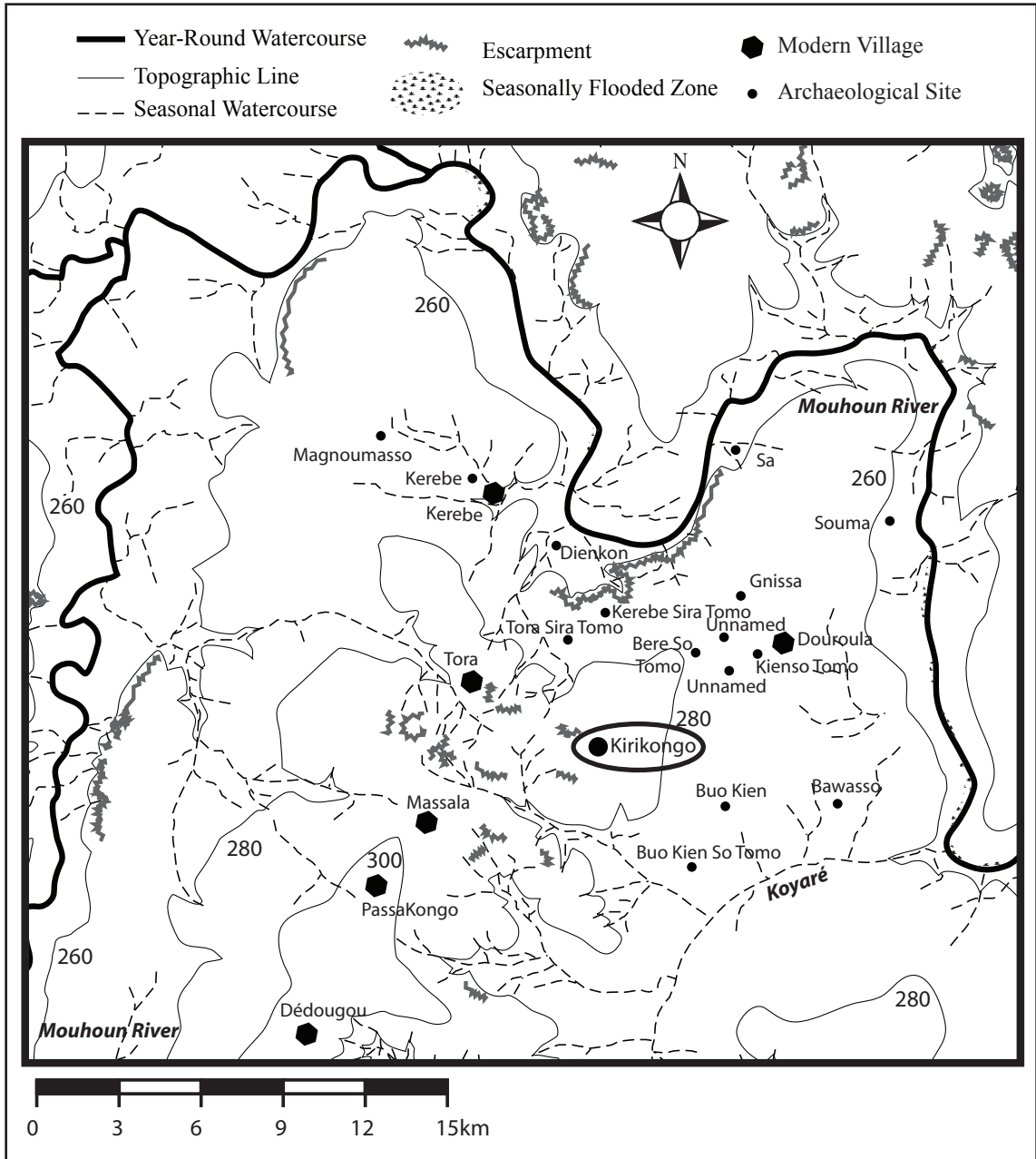


Figure 2.1: Regional Site Distribution in the Mouhoun Bend

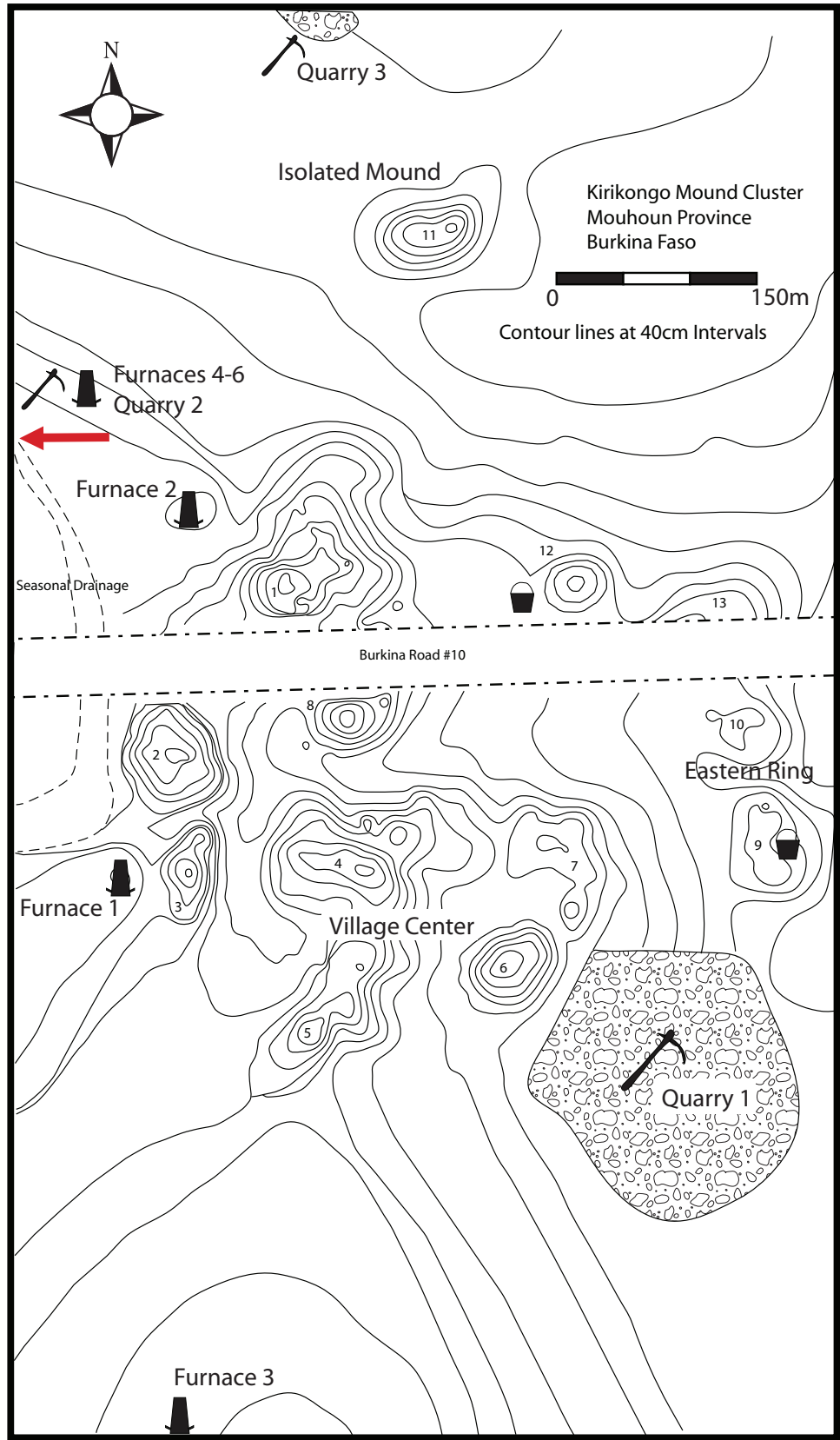


Figure 2.2: The Site of Kirikongo

Mound	Size (ha.)	Mound Group	Combined Size (ha.)
4	0.9	4 + 5	1.7
5	0.8	6 + 7	0.83
1	0.6	1 + 8	0.82
2	0.5	9 + 10	0.74
7	0.46	2 + 3	0.7
9	0.43		
6	0.37		
11	0.32		
10	0.31		
13	0.3		
8	0.22		
3	0.2		
12	0.2		

Table 2.1: The Relative Size of Mounds and Paired Mounds at Kirikongo

groups: a central (core) group of mounds all within 160 m of Mound 4; a ring of exterior mounds located ca. 300 m from Mound 4; and a lone mound located 485 m to the north of Mound 4.

The site is located at the edge of a rise in local topography. To the east and northeast the terrain descends gradually towards the Mouhoun River 10 km away. To the west, the rise continues towards Dédougou, although it is occasionally dissected by seasonal river valleys. The lateritic rise also extends to the south of the site, eventually descending towards the Koyaré drainage, a tributary of the Mouhoun River. Burkina Route #10 that runs through the site and follows the ridge east to Dédougou.

The Village Center

The core of the village is a group of eight mounds (1- 8). Mound 4 is set in the center of this group, with the summits of six of the mounds (Mounds 3-8) located within 160 m of its summit. Mound 1 is furthest away at 221 m. All mounds have a direct view of the summit of Mound 4 except Mound 1. A seasonal drainage is found to the west of the group, only nine meters west of Mound 2. It drains southwest, eventually emptying into the Koyaré drainage. There are two iron furnaces along the watercourse: Furnace 1 is located 27 m west of Mound 3, and Furnace 2 is found 50 m northwest of Mound 1. A poorly preserved furnace (Furnace 3) is located 265 m SSW of Mound 5, and a cluster of at least three furnaces (4, 5 and 6) located 300 m to the west of Mound 1. Two quarries,

used for building material and iron ore mining were identified. Quarry 1 is 22 m east of Mound 6; Quarry 2 is located 150 m west of Mound 1 on the other side of the drainage. Three mounds in the village core have been damaged by road construction (Mounds 1, 2, and 8).

Within this central group the mounds appear to be paired in north/south oriented couples: the edges of these pairs are separated by short distances. For example, Mounds 2 and 3 are only 9 m apart, Mounds 4 and 5 converge with a saddle, and Mounds 7 and 6 are 13 m apart. Mounds 8 and 1 may have been paired as well, but road construction has altered both mounds significantly and their spatial relationship will remain unknown.

The Eastern Ring

To the east of the central group are four mounds (9, 10, 12, 13) that are located off the edge of the high laterite ridge on a secondary ridge 1.5- 2 m lower in elevation. They are located between 265 to 331 m from the summit of Mound 4, and are 150 to 200 m from the summits of the peripheral mounds of the central cluster (e.g., Mounds 7 and 8). Mounds 10 and 13 may be part of a single original mound that was truncated by road construction. Mounds 9 and 10 were likely paired due to their close proximity.

In addition to mounds, there is a water cistern (round with a diameter of 5 m) 12 m west of Mound 12, in addition to a smaller well on Mound 9. Mound 9 is located 53 m north of Quarry 1.

The isolated northern mound

Mound 11 is a lone mound that lies 485 m north of the summit of Mound 4. It is equidistant from Mounds 1 and 12 at 291 m, respectively. Quarry 3 is 141 m north-northwest of the mound summit.

The relative size of mounds in the village

A comparison of mound sizes suggests a hierarchy both among individual mounds, as well as in the paired groups that were identified above. The two mounds that form the core of the central cluster (4 and 5) are the largest, at 0.9 and 0.8 hectares, respectively. The second tier is held by Mound 1 at 0.6 hectares. Three mounds comprise the next size group, measuring between 0.4 and 0.5 hectares (Mounds 2, 7 and 9). Four mounds measure between 0.3 and 0.4 hectares, (Mounds 6, 10, 11 and 13), and the smallest size class is marked by three mounds between 0.2 and 0.3 hectares (Mounds 3, 8 and 12).

In paired groups, an interesting pattern emerges-- with two clear size classes. The combined area of Mounds 4 and 5 at 1.7 hectares is over twice the size of the next

largest pair. Mounds 2 and 3 along the western edge of the site combine to an area of 0.7 hectares, Mounds 6 and 7 are 0.83 hectares, and in the eastern ring, Mounds 9 and 10 are 0.74 hectares, although these may have been larger before road construction. If we combine Mounds 1 and 8, whose relationship remains unclear, they total 0.82 hectares.

Interestingly, whether alone or paired with Mound 5, the central mound (Mound 4) is the largest cultural feature at Kirikongo. Below Mound 4, the rest of the mounds in the site fall within a fairly narrow size range, such that when they are paired with their closest neighbors they are all of relatively equal size. The one possible exception is Mound 1, which is the second largest mound in the central group, and may have been considerably larger in the past prior to modern development in the area.

Research Design

Fieldwork and analyses were designed to identify the nature of and organizational relationships between Kirikongo's spatial/social components. The framework guiding this research is a multiscale spatial analysis of what Chang (1968) defined as the "microcosm level" of settlement patterns, spanning from the activity area, to the mound, to the village community.

Settlements, or the "built environment" (Byrd 1994), are a class of material culture composed of an intricate web of objects and raw materials that are in use, have been discarded, or are retained for potential future use. All aspects of a site's location, physical characteristics, and culturally constructed features relate to the village community and provide information relevant to inferring past events and the nature of social groups. An important component of the research design for Kirikongo involved an anthropologically informed examination of the middle-range connections between space, activities and social organization in a West African village, drawing upon data from elsewhere in the world in order to create targeted models to test.

Time

An examination of the spatial structure of the ancient village requires a high chronological resolution to ensure that intra-village comparisons are made in as synchronic a manner as possible. Consequently, in addition to characterizing the nature of activities performed at the site in order to understand social relations, research methodologies were designed and enacted to ensure well-provenanced collection of relative and absolute chronological indicators. In particular, my field and laboratory research focused on identifying the classes of material culture particularly sensitive to diachronic variation at Kirikongo, as these can vary from region to region.

In exploring the relations between material culture and social process, it was recognized that social groups, despite inhabiting or continuing to inhabit the same area of the village, are dynamic entities, and may change considerably over time, with major implications for village reconstructions. While the practice of various activities in certain loci may remain constant over time at the site, variables involved in these activities may change, with significant social consequences. In addition, environmental factors, including changing resource distribution and stresses should be considered, in particular as the period of the site's habitation (the first and second millennia AD) saw vast and dramatic changes that may have influenced the settlement patterns found in the village.

Survey and Mapping

The first stage of research was concerned with identifying all the archaeologically visible features in the landscape within the site catchment. A systematic survey of the site and its catchment was conducted. The space within and immediately around (generally to 50 m around the exterior, but further when possible/necessary) was mapped using a transit to create a topographic plan. During this work, soil and geological (geomorphological) characteristics were also recorded. A second survey covered a space out to 250 m away from all exterior mounds, and mainly identified iron quarries and furnaces. Geomorphological characteristics within the space of this extended survey were also noted. To understand the local ecology and soils, a vegetation/botanical survey recorded the distribution of modern flora in the site catchment. Although later compared to the faunal and botanical samples recovered in the excavation units, this survey contributed to a local record of climate change and human induced transformations.

Surface collections

A systematic program of surface collections was implemented on all of the mounds and off-mound features (e.g., iron furnaces) found in the group and site catchment. These recovered data on the chronology of habitation and abandonment, as well as identified activity areas from surface remains. For each, ceramic vessel rims were collected in a 10 x 10 m area on the summit of the mounds. Body sherds were not collected, as it was determined after the preliminary season that decoration techniques were less time sensitive than vessel form. There is a great deal of potential information in the plow-zone of mounds that can be compared with the stratified materials from excavated units. Mounds at Kirikongo had little to no evidence for structures or features on the surface, with the exception of two highly disturbed large ashy deposits on Mounds 7 and 13. In addition, all mounds except Mound 3 are heavily cultivated by the inhabitants of the modern village of Kirikongo, leaving a deep plowzone of churned materials (~ 30cm).

Shovel Tests

A series of 11 shovel tests were excavated throughout the village in order to examine the space around mounds for evidence of activities (off-mound, extra-residential) and also to characterize the sedimentation and geomorphological processes relevant to the location of the village (Figure 2.3). The units were 50 x 50 cm in size and ranged in depth depending upon the diverse nature of the deposits. These shovel tests aimed to assess the basic assumption that cultural deposits are solely found in mounds. It seemed prudent to test these areas as many modern villages have a plaza area, where communal activities take place.

Road Cut Documentation

In order to identify general mound formation processes and stratigraphic habitation characteristics on mounds at the site, the profiles of the three mounds (Mound 1, 2, and 8) truncated by Burkina Route #10 were recorded. To have a precise view of the sections, these were cleaned (slightly and carefully, to avoid worsening the existing erosion). All features were drawn, and pottery samples were collected from secure contexts in various strata. This added additional stratigraphic information (e.g. flooring sequences and features) from non-excavated mounds to the information from those that were excavated. In addition, the sampling of these profiles was incorporated into decision-making for the placement of excavation units.

Excavation Strategies

Six test units were excavated: five mound units (Mounds 1, 3, 4, 9, and 11) and a single iron furnace (Iron Furnace 1) (Figure 2.3). Mounds were chosen for excavation based on a devised sampling strategy. Ideally, the project would test all the mounds in the settlement; however, in view of the time and money available, a program was employed that maintains a high-resolution view of the village over time while sampling a wide diversity of the mounds at the site.

Data from preliminary 2004 fieldwork (site mapping and the excavation of Mound 1, Unit A) provided a basis for an informed systematic sampling strategy to test organizational possibilities. Excavation units were placed to allow assessment of the formal variability of component parts of the site. To examine site formation over time, foundation and abandonment points of various areas at the complex were tested, including parts of the main cluster and the peripheral mounds. A wide variety of mounds of different sizes (area and height) were chosen, as it was possible that smaller mounds were simply activity areas. With these criteria, Kirikongo's mounds were divided into groups based on spatial location, depth of deposit, and surface area.

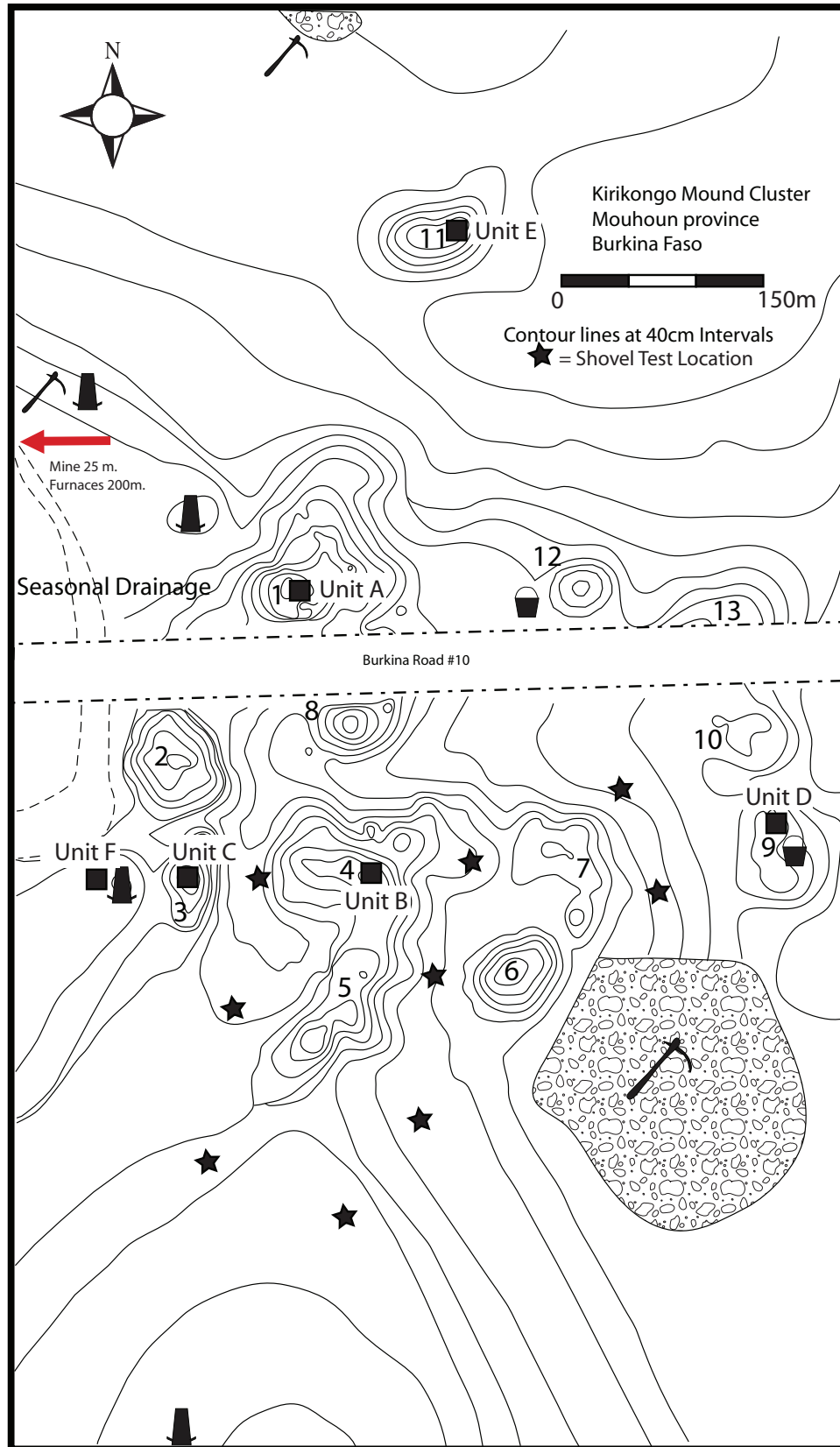


Figure 2.3: Excavation and Shovel Test Locations at Kirikongo

Several mounds were not considered for excavation units (in the sampling program) in 2006. For example, Mound 1 had already been tested in 2004, and Mounds 8, 12 and 13 were badly damaged by the road. These mounds were considered lower priority for the limited scale of a dissertation project, but will likely be tested in the future to examine the degree/quantity of intact deposits that remain.

The following four groups were used to divide the site into analytical categories from which one mound was to be chosen for excavation:

West: Mounds 2 and 3 form the western boundary of the site, and are located immediately to the east of the recorded drainage system. They represent deep deposits, at 3 and 3.25 m, respectively.

Center: Mounds 4 and 5 compose the largest cultural deposits at the site, in breadth and depth (3 and 3.5 m), and together form an “L” shaped ridge at the very center of the site

East: Mounds 6 and 7 form the eastern boundary of the main cluster, situated directly next to the quarry; their deposits are shallower at 2.8 and 2.1 m, respectively.

Exterior: Finally, Mounds 9, 10 and 11 lie outside the main cluster, situated directly next to the quarry or to the north of the village; their deposits are shallower still at 1.3, 1.5 and 2.5 m, respectively.

Unit A was excavated on Mound 1, Unit B on Mound 4, and Unit C on Mound 3. However, neither Mound 6 nor 7 was excavated because of evidence of extensive disturbance (Mound 6 has an hyena den at the top at least 2 m deep; Mound 7 has large ashy areas disturbed by both the action of livestock rolling in the ash to protect them from flies and gnats, and by small animal dens). Two units were excavated in the exterior group, one each on Mounds 9 (Unit D) and 11 (Unit E).

Excavation Recording

Excavation recording was designed to allow flexibility and extremely high resolution to stratigraphic and horizontal provenience. Units were excavated using a system that designated individual stratigraphic levels for every different deposit or feature encountered. The stratigraphic deposits were excavated in natural (or more appropriately cultural) levels; however, in thick deposits we systematically changed stratigraphic levels every 10 cm in order to maintain maximum vertical control. A new map was drawn either every 10 cm or when something new was encountered.

This strategy was employed to address the fact that activity areas can persist for long periods of time while building-up similar material signatures and compositions. The nature of this excavation recording system, while creating a high number of individual

stratigraphic levels, allows for high-resolution reconstructions. Deposits that are split stratigraphically in excavation can always be re-combined in analysis, whereas the opposite is not possible. This strategy resulted in a total of 608 stratigraphic levels being excavated over the two seasons. Detailed data was recorded on each stratigraphic unit, including Munsell soil color, and composition via Ahn tests; notes were also registered on the spatial, stratigraphic location, and content of each deposit. All classes of material data from each stratigraphic unit were bagged separately at the site.

All deposits were screened through a 3 mm mesh and flotation samples (2L) were collected systematically from all primary deposits, including larger (50-100%) samples from pits and hearths. Radiocarbon samples were collected systematically in each level; however, care was taken to avoid bioturbated deposits (termites are a common problem in West Africa).

Summary of the Research Program

Kirikongo was occupied for 1600 years during which a complicated archaeological site formed. Fieldwork focused on obtaining diverse data from numerous aspects of the site in order to explore social processes at all points in the sequence. The research design presented at the beginning of this chapter provided organizational direction for the field methodologies employed over two seasons of fieldwork. In general, all mounds in the group received some degree of data collection relevant to reconstructing the occupation of the site.

Five mounds were examined intensely through excavations that reached the sterile geologic base, providing a full sequence for their foundation, development, and abandonment. The tested mounds included the central and largest mound at the site (Mound 4), one located adjacent to the drainage on the western periphery of the main cluster (Mound 3), one situated on the eastern periphery of the village outside of the main cluster (Mound 9), one resting on the north side of the main cluster (Mound 1), and an isolated mound located to the north of the main cluster (Mound 11). In addition, evidence for iron-smelting was examined in Unit F. The mound units ranged in depth from 1.8 to 4 m, with four of five greater than 3 m in depth. They were excavated in small and precise contexts, with the average volume of a stratigraphic unit at 0.11 m³.

Three road cuts were recorded, including one from a mound that was also excavated (Mound 1), and two unexcavated mounds (Mounds 8 and 2) for which pottery was collected systematically from the already exposed profiles. This provided information for establishing these mounds contemporaneity with other parts of the village, through comparison with excavated deposits. These data also provide extensive

horizontal information that is not available from the excavated mounds and will allow analyses of the use of space and site formation processes.

Surface collections of pottery were made on all cultural features at the site. The relevance and utility of these will be tested independently through intra-unit comparison between plow-zone ceramics and stratified samples to determine if surface collections represent a good indicator of foundation, occupation, or abandonment points.

The eleven shovel tests examined evidence for off-mound activities at Kirikongo. They also provided information on the geological base of the site, augmenting data derived from the sterile basement layers found in the excavation units.

The intense mapping and survey component provided information on the location, size and height of mounds; the location of hydraulic systems; the presence of mines and quarries for construction and iron working; iron furnaces; and the geomorphological and environmental setting for the settlement.

The Physical Setting of the Site

The physical survey was performed in and around the site, and a series of shovel tests were placed within the site to clarify non-visible geomorphology around the mounds. These were combined with information derived from excavation units that exposed sterile basement rock. The survey data are described first below; data from shovel tests follows.

West of Kirikongo

The area directly to the west of the village core is part of the large lateritic rise that extends towards Dédougou. This ridge is dissected by many seasonal drainages, including a stream located west of Mound 2: it flows west-southwest away from the village. At the closest point to the mound, the stream bed forms a deep pond, after which it narrows and enters a naturally carved channel (the pond could be the result of mud brick production in the stream bed). The stream then cuts through the exposed lateritic duricrust creating a small valley 10-20 m across and 2-3 m deep as it flows from the site.

Quarry 3 and all the iron furnaces are set on the rise west of the site. The quarry was likely excavated there to exploit the ferruginous deposits found within the laterite, or to use the laterite in floor construction (see next chapter).

South of Kirikongo

The lateritic rise continues to the south of the site; however this section is not cut by drainages until several km away from Kirikongo. The rise is fairly flat and covered by a thin layer of topsoil upon which grasses grow today. The lack of hydrologic activity

is attested by pebbly deposits that are derived from slow decay of laterite duricrust, but without the soil formation or quick erosion from fluvial processes. Iron furnace 3 is located on this rise.

East of Kirikongo

The center of Kirikongo is perched on the edge of the rise, and the site gradually descends 1.5- 2 m towards the eastern ring of mounds that lie on a lower level of the slope (Mound 9, 10, 12 and 13). These mounds and Quarry 1 mark the edge of the laterite duricrust.

At least 5 m of laterite underlie the eastern side of the site as recorded from the exposed profile of the quarry. Directly east of Mound 9 the topography again descends another m to an extensive area with deep soils that today is heavily cultivated by the inhabitants of the modern village of Kirikongo.

North of Kirikongo

Like the terrain east of the site, the topography descends as one moves north from the central cluster toward Mound 11. Mounds 1 and Iron Furnace 2 are located on the laterite ridge as other parts of the central cluster, but directly north of Mound 1 is an exposed area of laterite duricrust about one meter lower. This is similar to the open area between Mounds 7 and 10 that is primarily composed of exposed lateritic outcrops and thin soils upon which grasses grow. The deep soils described on the eastern edge of Mound 9 continue northward towards Mound 11, where they are found to the north, and east, and potentially under the mound. Excavation data show that Mound 11 was not founded on a laterite base, but rather on heavy clay. Quarry 2 is located in a slightly raised area above the cultivated fields, although even it has 30 cm of soil above the bedrock.

Results of Survey

Within the site, the topography gently descends continuously from high points in the southwest and west of the village towards the east, eventually reaching an area of deep soils beyond Mound 9. Water to the west of the village flows west, and it can be inferred that water within the village would have flowed east towards the deep soils, following the slope of the underlying laterite base (Figure 2.4). Iron furnaces are found on high locations near the watercourse, with the exception of Furnace 3 (however, this southern area will be the target of future survey). Quarries seem to be distributed in the laterite basement along the edges of the village, suggesting that the site is located in an area with useful ferruginous deposits that are convenient for smelting and construction.

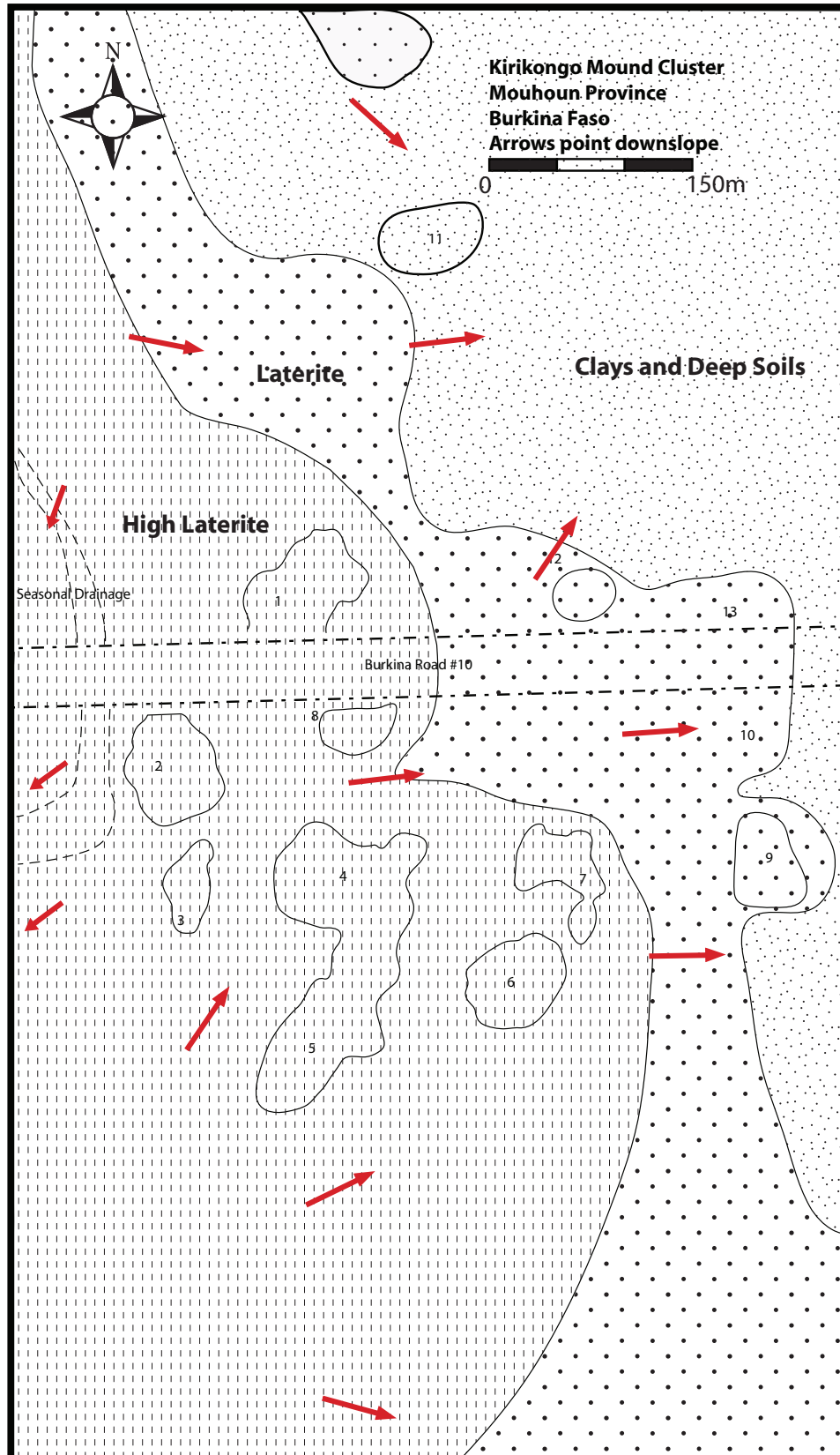


Figure 2.4: Geological Base and Slope of Kirkongo

The two identifiable water wells are located near the lower areas of the laterite rise along the edge where it drops off and is replaced by deep soils. This is an ideal location that is close to the water table but within dense laterite that could hold the walls of the pit without constant maintenance.

Shovel Tests Excavations and Intrasite Intensive Survey

To better understand site formation processes, the underlying geology, and intra-site hydrology, a series of shovel test pits (50 x 50 cm) were excavated in the center of the village, where site geology was more difficult to assess from surface features. The targeted areas were those without exposed geologic deposits, and were mainly located on three sides of Mounds 4 and 5, and then several to the east of Mound 7.

Specifically, two shovel tests were excavated in the low area between Mounds 3 and 4/5. They revealed laterite crust at 8 and 12 cm respectively. The deposits on top of the bedrock were light silt from slow-moving fluvial processes. To the south of mound 5 shovel test units exposed pebbly deposits derived from slow degradation of the laterite duricrust, suggesting very little erosive fluvial activity. These culturally sterile pebbly deposits reached laterite bedrock at depths of 31 and 36 cm. Three test pits were placed between mounds 4/5 and 6 in the center of the village. The deposits were composed of heavy dark clay with a high concentration of fragmented artifacts that were likely both derived from erosion of mounds. Sediments were thinnest in the shovel test unit directly east of Mound 5 at 15 cm, and became progressively deeper in the tests located between mounds, at 23 cm and lastly 38 cm. The nature of the silt and clay suggested little fluvial activity. The area serves as a trap for the erosion of cultural deposits as the site degrades. Below these, all tests reached laterite basement.

Two test pits were excavated in the area between Mounds 7 and 9. The first, north of Quarry 1 and east of Mound 7 exposed yellow clay and then laterite at 30 cm, suggesting little erosional activity in this location where clay collected in a small pocket. The second unit, set to the north of Mounds 7 exposed a laterite base at 23 cm, covered by pebbly degraded duricrust, also revealing little erosional activity.

The areas that were not tested with shovel test pits generally had exposed laterite on the surface. While the village was founded on the laterite ridge, there is some evidence for fluvial action within the site that will affect cultural reconstructions of the occupation. As already described, the site descends in elevation by several meters from west to east, and the erosional consequences of this gradient have affected the shape and preservation of cultural features at Kirikongo (Figure 2.5). Gullies created by seasonally flowing water were observed, most notably one in the narrow space between Mounds 2 and 3. This

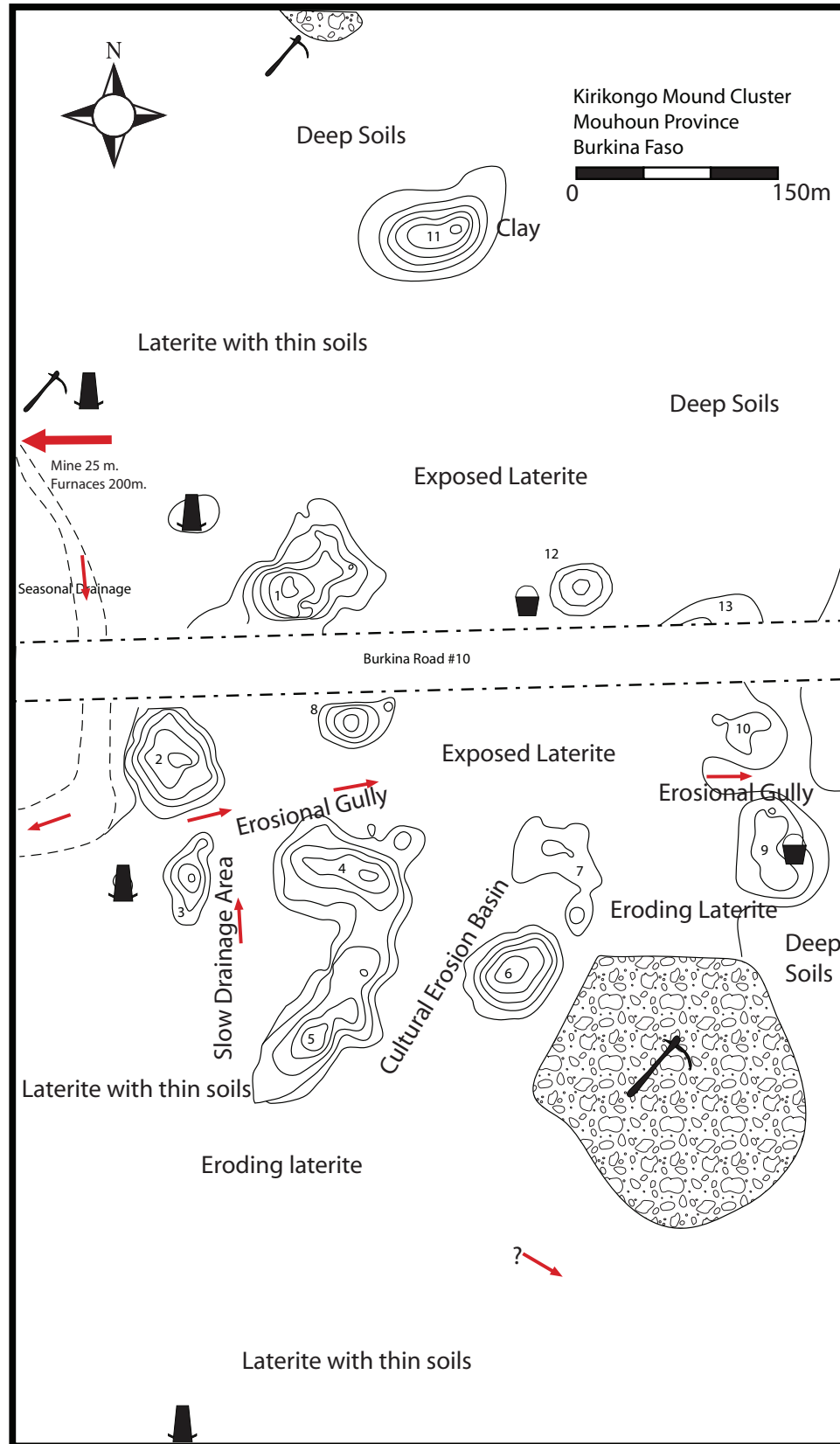


Figure 2.5: Post-Depositional Processes and Geomorphology of Kirikongo

same course continues through the gap between Mounds 4 and 8 until cutting between Mounds 9 and 10. Deposits at the bottom of these cuts contained water-rolled stones and pottery.

The erosional gullies indicate that the separation between mounds may have been less distinct in the past than today, with the modern gap between the paired mounds akin to that seen in the saddle between Mounds 4 and 5. The social significance of the archaeological signature of paired mounds will be discussed at length in later chapters. Lastly, data from excavations match well with the reconstructions based on survey and shovel tests, as Mounds 1, 3, 4 and 9 were all founded on laterite basement rock and Mound 11 was founded on a dense yellow clay deposit with few impurities.

Summary of the Site and its Depositional History

The founders of Kirikongo chose to settle along a seasonal drainage at the edge of a lateritic rise that descends gradually eastward towards the Mouhoun River 10 km away. The laterite base provided the villagers with both iron ore and building material, and they exploited the best locations for digging wells that minimized the depth to the water table. The location was also well-suited for agriculture, with deep soils adjacent to the north and east of the village. The grasses that are supported on the thin soils of the ridge top are suited for grazing the village livestock.

Within the village water drained from the high points southwest of Mounds 5 and 3, and also from the space between Mounds 2 and 3 through the gap between Mounds 4 and 8, and eventually to cut through Mounds 9 and 10. These modern fluvial processes may have created clean breaks between mounds that were spatially associated in the past.

With this background of the physical setting and cultural remains of Kirikongo, in Chapter 3, I expand the context further through a description of the regional and local natural environments.

Chapter 3

The Environmental Setting of Kirikongo

Kirikongo is located in the Mouhoun Bend, a region shaped by the long-term movements of the Mouhoun River, the largest permanent river in Burkina Faso. This area is in the dry savanna, and its ecology is influenced by the extreme seasonality of rainfall. While the geologic base creates soils that are generally nutrient poor, the Bend is a particularly favored area for rainfall, with a high average for its latitude and minimized extremes. During Kirikongo's occupation, climate change periodically increased or decreased the amount of forest cover in the proximity of the site. This chapter presents the environmental context (geologic, hydraulic, climatic, and vegetative) of Kirikongo and neighboring regions within the framework of the dynamic West African savanna.

The Geologic Setting for the Region

West Africa's basement is an old and stable shield known as the West African Craton (McIntosh 2005). The relief that is seen in the region is the result of tectonics that created uplift at the coasts (e.g., the Guinea Highlands) and downward movements in the interior (e.g., the Taoudenni Basin) (Grove 1985b). This process has been accompanied by erosion of highlands and intermittent sedimentation in basins and troughs. Weathering has created a series of soil-types and lateritic duricrusts that vary in depth and character from region to region (Sattran and Wenmenga 2002). The resulting landscape is an ancient, flat, highly eroded and weathered surface, with large rivers descending from coastal highlands or high plateaus into interior alluvial basins and emptying into the Atlantic Ocean.

Western Burkina Faso is underlain by two major African geologic formations and the Mouhoun Bend is located near the border between them (Figure 3.1). The first is the metamorphic and eruptive Precambrian (Birimian) basement, the central plateau, or "Mossi Plateau", that covers 75% of the country (Pigeonnière and Jomni 1998; Sattran and Wenmenga 2002). This is a flat granitic-gneissic basement with various granite intrusions at different elevations. Sedimentary deposits constitute the second main geologic unit covering Western Burkina Faso. Postdating the central plateau, the eastern

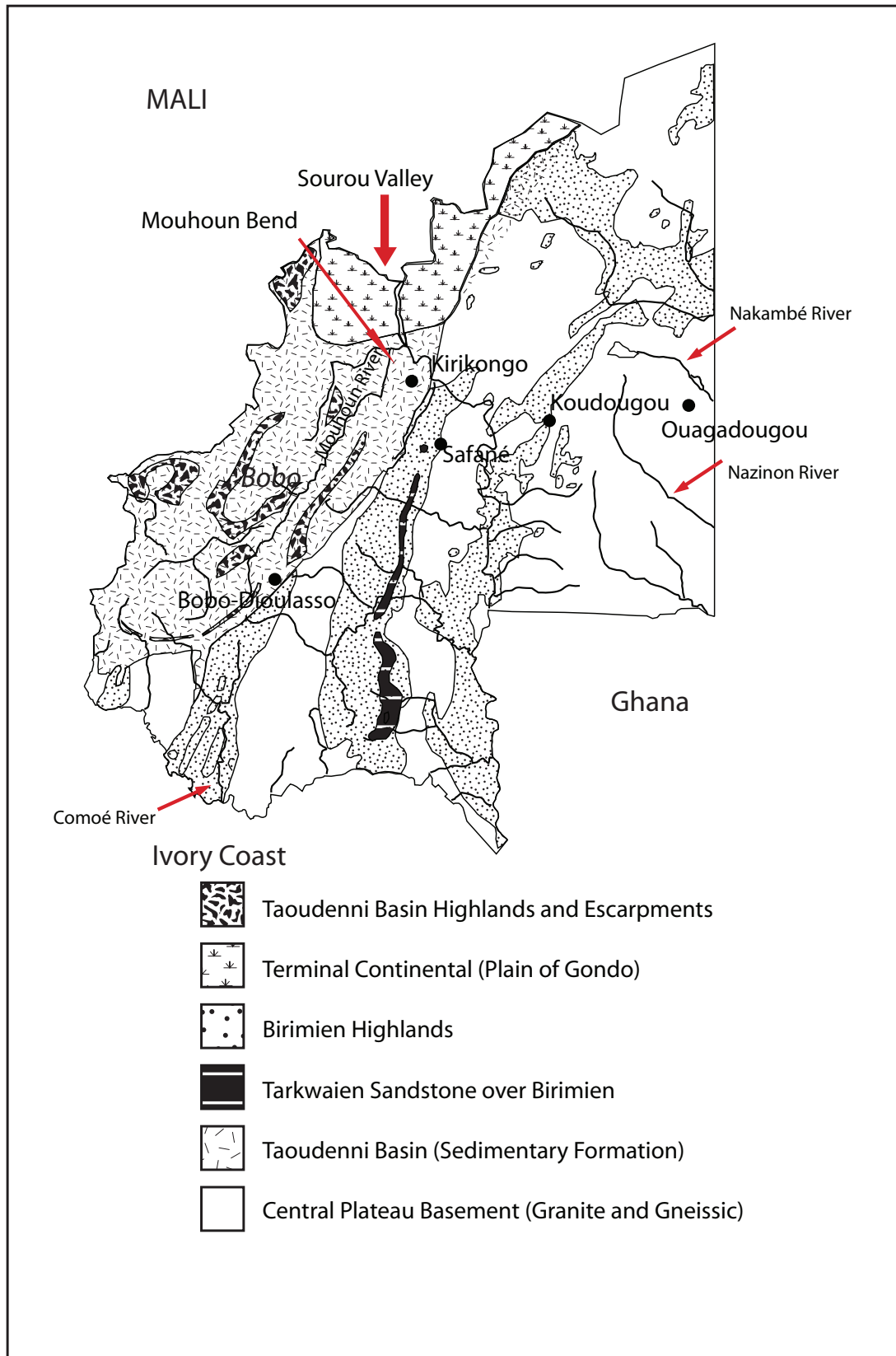


Figure 3.1: Geology and Geomorphology of Western Burkina Faso: Modified from Atlas du Burkina Faso (2001:11,13)

and north-eastern borders of the Taoudenni basin (which covers a large part of Mali and Mauritania) lie over the west and southwest of Burkina Faso, manifested in a sandstone formation that is up to 1500 m thick in places (Pigeonnière and Jomni 1998; Sattran and Wenmenga 2002). The border between the Birimien and other formations of the central plateau, and the Taoudenni Basin, extends roughly southwest from the Gondo plain in the north, to east of the Sourou valley around Tougan, to west of Safané in the Mouhoun Bend, and further southwards, passing closely east of Bobo-Dioulasso before curving westward into Mali.

Other geologic activity in Burkina Faso dates to the Late Tertiary (Post-Eocene), with the formation of the Gondo Plain in the northwest covering part of the Sourou valley, a catchment drainage of the Mouhoun River that is composed of clayey/sandy formations of the continental terminal (Grove 1985b; Pigeonnière and Jomni 1998; Sattran and Wenmenga 2002). More recently developed formations include the Pleistocene/Holocene Aeolian sand dunes that are found throughout the northern Sahel zone, most of which are inactive today (Sattran and Wenmenga 2002, see also Grove 1985a, b; Nichol 1999).

In general, the long-continued weathering of the upland surfaces and removal of soluble material and mobile parts has left behind heavy original rocks on a surface of iron-rich duricrusts (Grove 1985b; Pigeonnière and Jomni 1998; Sattran and Wenmenga 2002). The present detailing of this landscape has occurred over the past 2-3 million years, with fluvial and Aeolian networks growing, disappearing and changing (Grove 1985b).

Laterite Duricrusts

Laterite duricrusts are the most visible surface feature of the modern Burkinabe landscape. Dating from the Tertiary and the Quaternary, these formations are found throughout the country, although more frequently on Birimian rocks (Grove 1985b; Pigeonnière and Jomni 1998; Sattran and Wenmenga 2002). Lateritic formations are indurated residual deposits, identified as superficial incrustations resembling thin sheets of volcanic lava; these are a common feature in the tropics, and not limited to this region (Grove 1985b). Lateritic duricrusts can be slag-like, pisolithic, or vermicular in structure and are easily fractured by tree roots and marginal undercutting (Grove 1985b). They are high in iron content, form on many exposed surfaces, and range in thickness from 50 cm to 10 m (Pigeonnière and Jomni 1998). According to Sattran and Wenmenga (2002), duricrusts in Burkina Faso take two forms: ancient duricrusts interstratified with other

deposits that have eroded to create younger laterites on topographically lower sites; and, in actively forming duricrusts located on terraces and high points. Many prehistorically exploited iron deposits are found in lateritic duricrusts throughout Burkina Faso.

Rivers

Kirikongo is located along the the Mouhoun River, formerly known as the Black Volta, one of three major Voltaic rivers (Mouhoun, Nazinon, and Nakambé). With different sources throughout Burkina, these rivers eventually flow southwards and meet in central Ghana where their combined waters fill the now-dammed Volta Lake. The Nakambé and Nazinon drain a large part of the central plateau and southeast sedimentary series (e.g. the Pendjari) while the Mouhoun collects its flow from the sedimentary escarpments of western Burkina Faso (eastern Taoudenni Basin), with some contributions from the westernmost central plateau.

Biologically, the entire Volta drainage system belongs to the Sudanian fish fauna province that stretches across Africa south of the Sahara from the Atlantic to the Red Sea. This province has at various times has been connected to the Niger River belt (Niger, Senegal, Camoé, Gambia, Lake Chad, etc.), and thus has similar aquatic resources/species (Chisholm and Grove 1985; Lowe-McConnell 1985). With the leached and weathered landscape of Burkina Faso generally depleted of nutrients, the rivers are nutrient poor. The vast majority of the nutrient material that is found in the rivers is probably derived from rain (Chisholm and Grove 1985).

As with the hydrobiology of the Niger system, the Volta Basin's flow is based on seasonally abundant rains that fall on lateritic and strongly leached soils; this is, however, in a tropical climate with high evaporation rates that greatly reduce potential flow (Chisholm and Grove 1985; Sattran and Wenmenga 2002). The flow of the different Volta Rivers can vary dramatically from year to year, and it is not uncommon for the Nakambé and Nazinon to go dry in many places by the late dry-season (Chisholm and Grove 1985).

With the high levels of evaporation in West Africa, areas with less than 750 mm of annual rainfall contribute little to the river systems. Since the Nakambé and Nazinon's sources lie in higher latitudes than the Mouhoun, these rivers are more subject to arid spells, particularly in their upper reaches on the central plateau (Grove 1985b). The Mouhoun's sources lie in areas receiving greater than 1000 mm of annual precipitation. At a similar latitude with the sources of the Niger River; it rises and falls in relation to this hydraulic group, and has a more complex flood regime than the other Volta Rivers resulting in larger alluvial deposition (Chisholm and Grove 1985).

The Mouhoun River is born on the southeast corner of the plateau not far from

Orodara at an altitude of 550 m (Capron 1973). The source is clear and perennial. In its upper courses, the river moves through the high plateau, bounded by escarpments capped with duricrust, through gorges with softly sloped edges. At Samandeni, the river reaches the external borders of the principal sandstone plateau and enters an open lower plain, marking the beginning of several flat seasonally inundated alluvial valleys with hydromorphic soils (Capron 1973). From Lahirasso to Nouankui, the landscape is a succession of vast basins where the water expands and creates zones of inundation criss-crossed by little marigots oriented perpendicular to the river (Capron 1973). The flooded areas range between 5 and 12 km wide around the main channel.

At its northernmost point in the Mouhoun Bend, the river empties seasonally into the Sourou Valley, a catchment basin that primarily flows southward as a tributary of the Mouhoun. During the yearly floods, the Sourou flows with floodwaters and alluvium northward, distributing these over a 10 km-wide floodplain to around 70 km north of Koury in Mali (Forbes 1932).

The Mouhoun used to drain into the Niger River system through the Sourou valley until the Sahara extended and aeolian dunes formed in the plains of Gondo during the Quaternary, thereby blocking its former channel. According to Forbes (1932), in 1931, a sixth of the Volta total drainage flowed into the Sourou valley, and a third of this sixth returned after the flood lowered again. The rest is lost in evaporation.

It is also at this point that the Mouhoun receives from its left shore the Kossi tributary, a stream that drains the plateau around Solenzo. After Koury, the Mouhoun River flows through a little fissure set in the peneplain and changes direction in a bend oriented south-southwest/north-northeast; in this stretch it has no floodplain. The main channel thus continues eastward with two large oscillations, until making a sharp turn southwards east of Douroula to form the “Mouhoun Bend” and continues in this direction towards Ghana. Forbes (1932) suggests that the Mouhoun River at its bend will continue to carve into its bed, becoming more deeply inset in the future and limiting its future contribution to the Sourou Valley floodplain.

The Mouhoun Bend

The Bend is created by a dynamic hydraulic and geologic situation. Since it lies near the edge of the sandstone sedimentary plateau (Taoudenni basin) that extends from Banfora in the south, to the cliffs of Bandiagara in Mali, the lines of relief are oriented north/south, and subsequently so are the watercourses. However, as discussed above, the river has carved a deep channel into the landscape west of Dédougou and consequently is continuing to reduce its northern flow into the Sourou drainage and increasing the flow

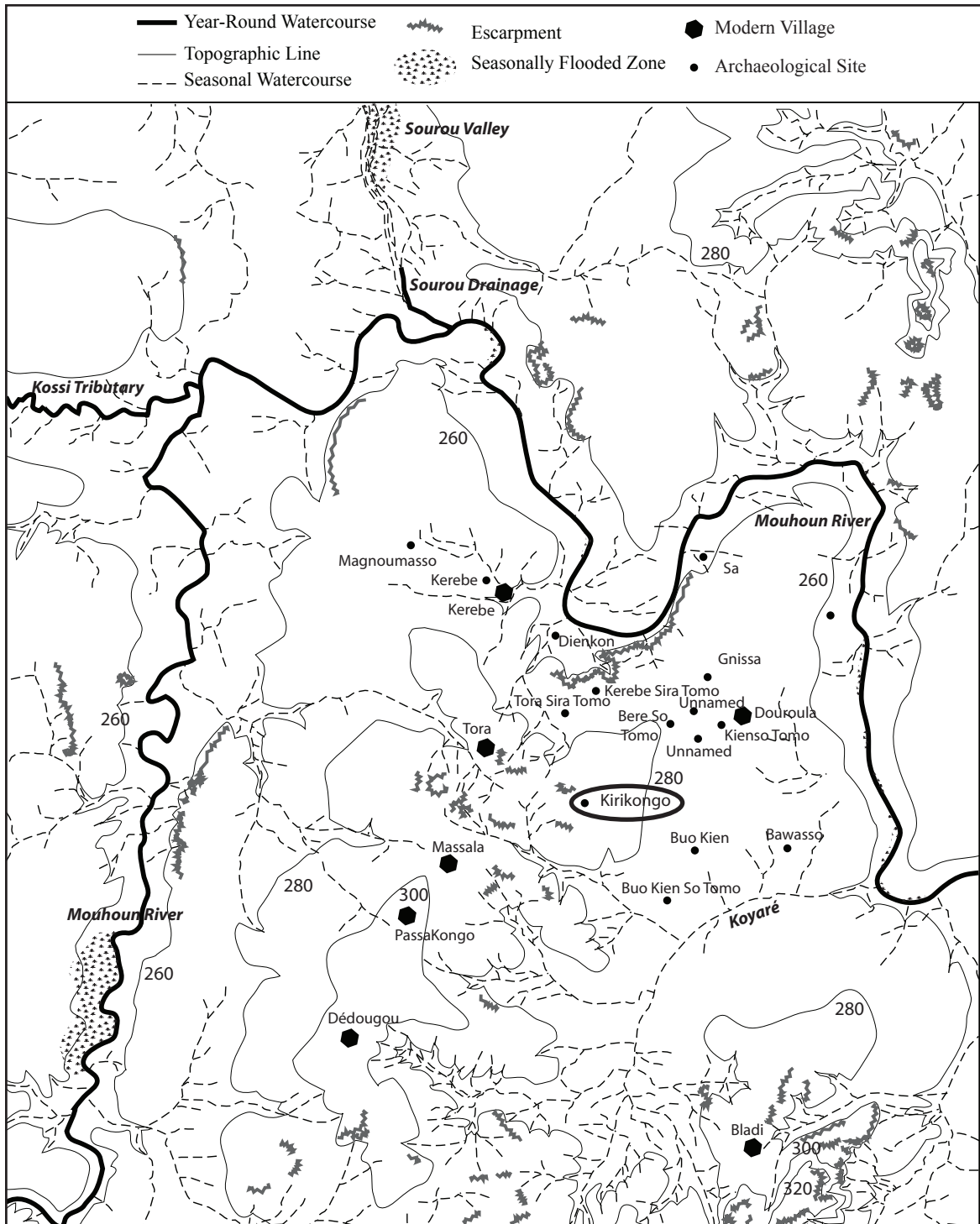


Figure 3.2: Geology and Hydrology of the Mouhoun Bend Region

entering the Birimien basement for its now southward course.

This geologic border area has a complex hydrologic system with many minor streams emptying into the Mouhoun (See Figure 3.2). With the north/south orientation of geographic features, many drainages on both the east and west banks of the river run parallel to the Mouhoun and never reach the stream until they strike the same conditions that create the bend or, in the interior, until they hit the Mouhoun itself at its Bend (Capron 1973). For example, the Kekeba flows for 40 km parallel to the river to its east despite being only 10 km away. Conversely, the Karouko and the Koyaré (to which Kirikongo's waters drain) to the north near the Bend, after having drained the west Birimien escarpments and the sandstones of the Mouhoun bend, flow NE until emptying into the Mouhoun after its bend (Capron 1973). The maximum flow of the Mouhoun at the Mouhoun Bend (as measured at Koury in 1931), was 120 cubic m per second at high flood (Forbes 1932).

The Mouhoun Bend is the northern part (starting at Dédougou) of the central Mouhoun basin to the interior of the river on the east bank. This region is still in the sandstone sedimentary formation, and is limited to the north and west by the river, to the east by the Birimien escarpments (the beginning of the central "Mossi" plateau), and to the southwest by the Kanroboué range, but it is opened to the south by the upper Tui basin (Capron 1973). The upper Birimien, located around 10 km to the east of Dédougou, is composed of volcanic rocks such as dolerites and basalts, thin bands of feldspars, metamorphic rocks, very iron-rich sandstones, schists with quartzites, and greenstones; further south, the lower Birimien is composed of clayey schists (Capron 1973; Coulibaly 2006; Sattran and Wenmenga 2002).

The soils in the bend are typically nutrient poor. In the uplands, such as near Dédougou or Kirikongo, the soils are characterized as poorly leached and leached ferruginous tropical soils (the degree of leaching depending upon terrain and rainfall amounts) overlying sandy-clayey or clayey-sandy matrices (Coulibaly 2006; Sattran and Wenmenga 2002). Soils develop on material-rich in kaolinitic clay and are characterized by their rich iron and manganese oxide and hydroxide content, which gives them the red or ochre color. Due to their age and long-term leaching, these soils are poor in calcium, potassium, phosphorus and magnesium (Sattran and Wenmenga 2002). The average depth is 2 m (Pigeonnière and Jomni 1998). Stratigraphically, there is a light gray surface horizon, poor in organic matter, and often sandy or deficient in chemical elements. Lower down is a leached paler horizon whose clays and soluble elements have been washed away. Lower still is a more clayey red horizon emerging with patches or nodules of iron (Atlas 1998). Where soil is deep, water retention is good. The soils in the Mouhoun basin

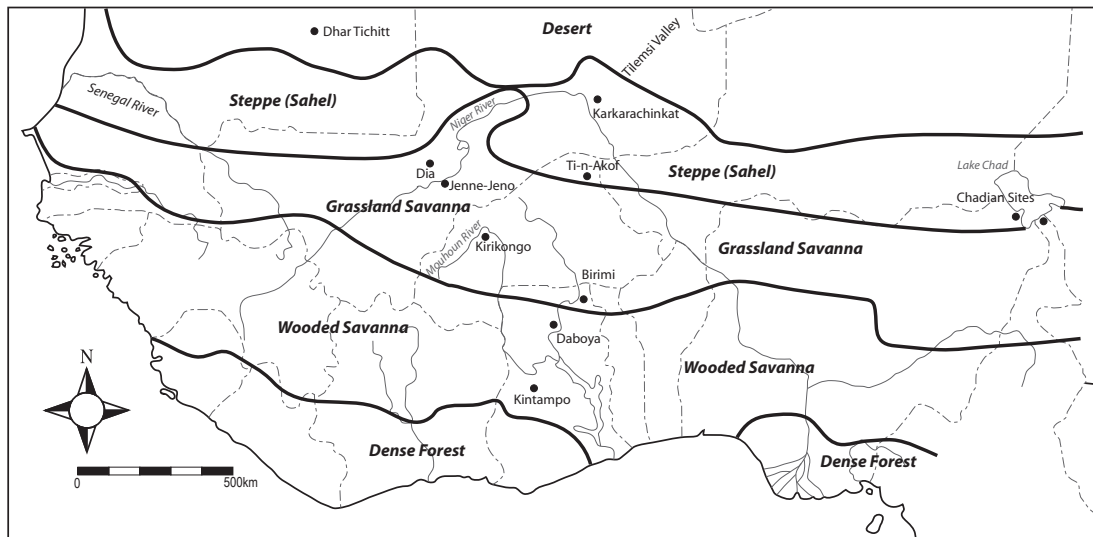


Figure 3.3: West African Ecological Zones

range from little evolved erosion of gravel material in the form of plateaus and mounds to hydromorphic minerals and pseudogley on a varied material in bands laid out along the axes of the drainages and depressed plains that are reasonably good for agriculture (Sattran and Wenmenga 2002).

Modern Climate and Ecology

The climate of West Africa is in the vast Sudanian region that stretches from Senegal to the Sudan. Ecological zones are distributed in east-west bands across this area, with the northern border (the Sahara desert) the driest and the southern border (the Atlantic Coast) the wettest (Pigeonnière and Jomni 1998; see Figure 3.3). The environment in West Africa can be broken up into several general zones: the desert, with less than 150 mm of annual rainfall; the sahel, with between 150 and 600 mm of annual rainfall; the northern savanna, with 600-900 mm of rainfall; the southern savanna, with 900-1200 mm of rainfall; the forest/savanna margin, with 1200-1400 mm of annual rainfall; and the forest, with 1400-2000 mm. Since the distribution of rainfall shows roughly a north/south gradient, the edges of each zone blend into one another, and the vegetation from any zone may be found in micro-environments elsewhere, as relicts of past climatic changes.

Rainfall in West Africa is derived from moist equatorial monsoon moving inland from the Atlantic and undercutting dry easterly air (Harmattan) that occupies the Sahara desert (Grove 1985a). The front between these air masses is called the Inter-Tropical Convergence Zone (ITCZ). It is located at the coast at 8° north latitude from November

to February, and moves to 20° north latitude in the Sahara by August (Chisholm and Grove 1985; Coulibaly 2006). This movement influences the distribution and intensity of precipitation, with rain concentrated during one season of the year, a longer dry season in the north, and increasing precipitation and a shorter dry season in the south. The result is regular latitudinal arrangements of climate and vegetation based on the rainfall regimes defined above. There is a great deal of interannual variability in rainfall amount and the timing of the movement of the airmasses (Grove 1985a; McIntosh 2005). Recent research by Nicholson shows that there are some poorly understood but clearly recognizable continent-wide patterns in the annual distributions of rainfall from year to year, such that there are certain types of dry years and wet years that may be predictable with future research (Nicholson 1986, 1994).

The beginning of the rainy season is a dramatic shift when the ITCZ advances north, and the first rains (the easterly waves) come as thunderstorms, sometimes with strong winds, as the two airmasses battle with one another (Capron 1973; Grove 1985a). Behind the ITCZ in areas in the savanna and southwards, there is a rainy season with less violent and persistent rains sometimes lasting for several hours over large areas, resulting in soaking or leaching of soils. However, for places that receive less than 400 mm, precipitation is mostly associated with the easterly waves of the ITCZ, and can be spotty, unpredictable, and violent, causing flash floods and quick erosion (Grove 1985a). In the extreme south of the savanna, where annual totals amount to over 1000 mm, monsoonal rains may last for a day or two, and the sky is often overcast, reducing evaporation.

Since the hydraulic systems are fed by rainwater, most West African rivers are at their lowest levels at the end of the dry season (about April). The larger rivers rise in June, and the headwaters release peak discharge around August. Maximum flood level in the lower reaches of the Mouhoun is around October, when accretion of water from throughout the drainage occurs (Grove 1985a). Conversely, headwaters respond to individual storms by rising and falling very rapidly. For the larger rivers the occurrence of multiple seasonal flood peaks and troughs is more apparent, as their drainage draws from multiple rainfall zones (Grove 1985a). Due to the above-discussed interannual variability in rains, precipitation peaks vary from year to year by several weeks. Evaporation losses are high and exponentially worse in dry years, as more evaporation occurs due to dryer air and increased sunlight. Since the large rivers (except the Nazinon and Nakembé) have their headwaters in the same latitudinal zones, they all respond similarly in individual years, such that climate events are shared over large areas of West Africa (Grove 1985a).

Temperature and Rainfall in the Mouhoun Bend

Topography, latitude, rainfall, sunlight, evaporation, temperature, wind, and, more recently, humans together create the vegetation regimes found throughout West Africa. Western Burkina and the Mouhoun Bend are in a tropical humid zone with a generally hot climate; however, there are intra-annual patterns in temperature. The following temperature and rainfall information is local for Kirikongo, derived from adjacent areas to the north and south of Dédougou (compiled by Jean Capron 1973); specific temperatures for Kirikongo likely follow the same patterns within a degree or two.

There are two temperature maxima a year, one in April/May (or March/April to the south near Boromo) and one in October/November, one each marking the end and beginning of the dry season. The average annual temperature is 28°. Between December and February, the zone is influenced by cool winds (see below), and the temperatures drop, particularly at night, with lows around 15° in San to the north, and 17° in Boromo to the south, and daily highs around 35° in Boromo and 32/33° in San. In March and April, it gets hotter, averaging 37° at San and 36° at Boromo, with average maxima topping-out at 40°. The hottest temperatures on record are around 45°; lows are also warm, around 26° in Boromo in April, and the same in April and May in San. Between May and October the rains bring a marked refreshment, and the average temperatures fall to 26° at Boromo, with minimums of 18° at San, and 22° at Boromo. In August, the maximums are the lowest of the year, 35° at San and 38° at Boromo, and the average everyday variations are 9° at San and 7.4° at Boromo. These months can be quite cloudy, with limited sunlight and lessened evaporation. Temperatures during the second annual maximum in October/November are slightly cooler than those at the end of the dry season, with average highs increasing to 37° in Boromo, and 36° at San. However, nighttime low temperatures begin to drop during this maximum.

The dry season (October/November-April) is dominated by the Harmattan or Saharan air mass, a high-pressure system (Saharan anti-cyclone) that causes heavy winds throughout the dry season, but particularly strong from February to March. From November to February the Harmattan is reinforced by a second much fresher wind, the Alizé Boreal, which blows in the night from the Sahara to the Atlantic NE/SW, with the combined winds reaching up to 70-120 km/h. In May, the opposite winds blow (the monsoon) up to 120km/h, but drop off after the ITCZ has passed (Coulibaly 2006).

The rainy season in this area is from May to September/October, with the ITCZ arriving and meeting the Harmattan (dry-season winds/air mass) resulting in violent thunderstorms. Precipitation ranges from 650 mm north of the Bend in the Gondo plain and the shores of the Bani, to over 1050 mm around Houndé to the south (Capron 1973).

However, the actual amounts are based on micro-environmental characteristics. For example, the valley of the Mouhoun (including the Mouhoun Bend) is privileged in rainfall, and Dédougou, despite being at high latitude, receives 975 mm a year, compared to Ouagadougou at 859. Interestingly, the Dédougou area is also privileged in inter-annual variation, such that regions to the south show lower minimal precipitations despite having a generally higher rainfall total [Houndé (1931-1960), 697/1422.1; Boromo (1933-1960), 539.3/1878.6], while Dédougou (1931-1960) is more predictable, ranging from 755.7 to 1519.4. In other words, bad years are not as bad as elsewhere in the savanna, which is known for extreme interannual variability. Data from between 1921 and 1930 suggests that rainfall at Dédougou was similar, averaging 951.5 mm (Manessy 1960). The date of the first rains varies greatly from year to year, and the first day of sowing therefore is based on the local resident's long-term knowledge of their region. The rainfall distribution within the rainy season also varies significantly, with July, August and September the heaviest months, but a dry spell can hit, as can a prolonged rainy season lasting into October. All of these data are from prior to 1960: current conditions are much drier, due to the numerous prolonged droughts seen in the latter half of the 20th century.

Vegetation

Vegetation zones roughly match rainfall regimes and totals; however floodplains, highlands, and microenvironments (interdunal areas, deep soils) can create more humid-zone vegetation in drier regions, and the inverse is true for poor soils in humid areas (Pigeonnière and Jomni 1998). The vegetation in general is in a common region stretching from Senegal in the west to the Sudan in the east. In the savanna zones (precipitation 600-1200 mm), which concern this research, the northern part of the zone blends into the sahelian domain and shares characteristics like stunted vegetation composed of acacias and thorn-bushes (Pigeonnière and Jomni 1998). The perennial grasses, including numerous *Andropogon* grasses, become more abundant and form continuous cover in this area (Pigeonnière and Jomni 1998). Further south, where rainfall ranges between 800 and 1000 mm, vegetation is generally denser and forms a highly heterogeneous mosaic of primary formations (open woodlands, savanna grasslands) and secondary damaged formations (wooded, bushy, or scrubby savanna) (Pigeonnière and Jomni 1998).

The Mouhoun Bend region is in the latter savanna, open woodlands with permanent vegetation adapted to long periods of heat and aridity. The very form and structure of plants permit them to fight against evaporation (Capron 1973). Generally following the rainfall isohyets, vegetation is sparser north of the river (Gondo, Sourou).

Along the Mouhoun there is dense vegetation mixed with some open spaces, and further southward there is increasingly dense forest/brush in areas with over 1000 mm of annual rainfall. The vegetation throughout is composed of permanent trees, and grasses that appear with the first rains and don't survive well into the dry season; these are very susceptible to brush fires. The number of trees relative to bushes and grasses increases towards the south.

The Mouhoun River at its Bend is mainly in a deep and narrow channel, with banks densely overgrown with a tangle of thorny brushwood, vines and occasional large trees (Forbes 1932). Around the Sourou catchment stream to the north of Koury, the floodplain is bordered by an open grassy plain with few trees due to the seasonal inundation (Forbes 1932). Similar conditions are found in the alluvial basins to the south of Koury. South of the river in the bend near Kirikongo, the savanna is polymorphic, often presenting multiple faces with lateritic undulations topped with high grasses as well as areas around dry streambeds containing large trees (Capron 1973). In the low humid areas along streams are little dense forest clumps separated by open space.

Trees that are commonly seen away from the river today are those used by humans or directly or indirectly result from human occupation. These include *Adansonia digitata*, *Khaya senegalensis*, *Butrospermum paradoxum*, *Parkia biglobosa*, *Lannea microcarpa*, *Pourpatia birrea*, *Bombax costatum*, *Tamarindus indica* and *Acacia albida*, as well as bushes such as *Sclerocarya birrea* (Capron 1973). There are also perennial grasses (*Andropogon sp.* and *Aristida sp.*) and fairly dense tree cover composed of *Mitragyna inermis*, *Syzigium guineense*, *Berlinia greniflora*, and *Anogeissus leiocarpus* (Coulibaly 2006). In addition to human influences, geology and hydrology greatly influence vegetation.

The Birimien zones to the east and south of the Bend (10km from Kirikongo) typically have a base of zizyphus and acacias; however, due to the high rainfall totals here they are not spiny types/varieties (Capron 1973). To the extreme south are the streams that cover the plateau with gallery forests of modest size, containing trees like *Elaeis guineensis* and *Raphia vinifera*.

As suggested above, (and relevant to first millennium AD occupation at Kirikongo-- see section on palaeoclimate) in the southern 1000-1500 mm zones, the grasses are less dense, and there is more bushy growth with species such as *Prosopis africana*, *Terminalia macroptera*, and *Cassia sieberiana* (Capron 1973). Research to the south in the area of Houndé suggests that most of the trees found today are dominated by many species of Combretaceae, such as *Anogeissus leiocarpus*, *Terminalia macroptera*, and *Terminalia laxiflora*. Sacred woods (culturally maintained natural vegetation),

thought to be a good indicator of prehistoric environments mainly contain *Anogeissus leiocarpus* and *Pterocarpus erinaceus* (Domboue 2002).

The human impact on the region's vegetation, in addition to the creation of open savannas in general, is reflected in anthropic formations like *Acacia albida* on the central plateau and western Burkina. This tree actually enriches the soil, and the pods are good for livestock; thus, one finds it where there are herds (Lingané 1995). The distribution of this tree has also been used as an indicator for finding abandoned prehistoric settlements.

The above-presented descriptions of the vegetation and soil characteristics are based upon observations that in some cases derive from the early 20th century. A large amount of additional anthropic change has occurred in the study area in recent history, which is part of a double-edged process of human-induced degradation combined with the increasing aridity of West Africa. As Coulibaly (2006:41) states, the area is changing rapidly due to the increasing population, dryness, and overexploitation of soils. As a result, people are farming on less optimal soils, and erosion is expanding. Animal traction has also contributed to the destruction of soils, while opening new farming opportunities. As early as the 1930's, Forbes (1932) expressed concern that the soils around Dédougou (and consequently Kirikongo) were fragile and infertile. He described soils poor in organic matter while high in iron and constantly exposed and weathered. The decomposition of the thin layer of humus is accelerated by the insufficiency of vegetal cover, and brush fires are often responsible. Today, many locals blame the degradation on overgrazing by Fulani herders throughout the Mouhoun Bend.

Climate Change

Since the end of the Pleistocene, climate change has had a great effect on West Africa, with multiple shifts in vegetation zones both northward and southward, changes in hydraulic systems, aeolian activity, etc., and most recently, human-induced effects on the landscape. Reconstructions of climate are based on proxy data, or the residues of past events that we can measure and then employ towards discerning the types of environmental processes they represent (see McIntosh 2005 and Fischer et al. 2004). For West Africa we have several classes of data: (1) studies of fluctuations of lake levels by sampling sediments. (2) pollen cores from various contexts. (3) human settlement patterns. (4) archaeological analyses of the remains of flora and fauna relevant to the exploitation of local environments. This section will mainly present the patterns based on the first two classes of data; the others will be more heavily utilized in chapters relevant to culture history and social process.

Based on studies from the Saharan highlands (Petit-Maire 1986), Lake

Bosumptwi in Ghana (Shanahan, et al. 2006; Talbot and Delibrias 1980), and Lake Chad (Brunk and Gronenborn 2004; Maley 1981), beginning around 10,000 years ago, multiple wet and dry spells occurred within a generally more humid environment than that found today, and environmental zones were often several hundreds of kilometers north of today's distribution.

The end of humid conditions during the Holocene was marked by a major dry spell from 4200 to 2300 BP, a period relevant to the environmental situation at the moment of Kirikongo's foundation. During this period, Lake Chad oscillated several times within a general pattern of descending lake levels (Brunk and Gronenborn 2004). The last wet spike during this oscillating period dated to 2800 BP. The climatic shift was dramatic in the southern Sahara; Munson suggests that at the beginning of this period, Dhar Tichitt had 200% of its modern rainfall, but by 3000-2600 BP it had fallen to just 125% (Munson 1981). The sediments of Ounjougou, Mali, similarly show that over the 2nd millenium BC there was a general desiccation of the landscape, progressing towards an environment similar to today's (Mayor, et al. 2005). In addition, an abrupt climatic break at 3500 BC has been identified in the Sahara, such that hydrological functioning of sahelian lakes demonstrates a drying trend between 1400 and 1000 BC (Mayor, et al. 2005). Aeolian processes also commenced again at this point among the dune fields of the Malian Gourma (Stokes, et al. 2004). Effects occurred slightly later further south in the forest, where data from Lake Bosumptwi shows a deep regression from 2500-2000 BP. (Shanahan, et al. 2006; Talbot and Delibrias 1980). The first millennium BC shows the first evidence for human impact on the environment; sites in northern Burkina Faso show an increasingly less diverse sahelian assemblage in pollen cores throughout the period (Andres, et al. 1996; Neumann, et al. 2000; Neumann and Vogelsang 1996).

Between 300 BC- AD 300 the increasing aridity slowed, and West Africa entered a stable dry period (McIntosh 2005; 1998). It is within this context that Kirikongo was established. Rainfall totals were probably slightly below present levels. A sharp shift towards increased precipitation dates to the first millenium AD, between AD 300 and 1100 (also known as the Humid Optimum), with rainfall totals 125%-150% of today's (McIntosh 2005). Lake Chad exhibited minor positive pulses, resulting in some over-flow and marsh development (Maley 1981). Lake Bosumptwi rose out of regression by around AD 200 (Shanahan, et al. 2006; Talbot and Delibrias 1980). Finally, evidence suggests that by AD 500, sahelian vegetation had advanced to 20 degrees north latitude (McIntosh 2005). At Saouga in northern Burkina Faso, conditions appear to have been wetter than today during the first millennium AD, as there is evidence for park savannas with *Butrospermum paradoxum*, *Sclerocarya birrea*, and *Adansonia digitata* (Kahlheber, et al.

2001). The Shea butter tree, in particular, is of strict Sudanian distribution, requiring at least 600 mm; today the area receives 400 mm and does not support the tree. The humid optimum is matched by evidence from nearby areas that suggests that the hydraulic systems of the Malian Gourma also began to run during the first millennium AD (Reichelt 1977).

However, beginning in AD 1100-1500 there is evidence for a new dry period. Lake Chad began to regress starting in the 12th century, and aeolian activity recommenced throughout the sahel (Maley 1981). At least four consecutive centuries of diminished rainfall caused a southward shift of ecological zones. German data from Oursi and Kissi in Northern Burkina Faso show that there was a retreat of savanna formations and the degradation of riparian banks along ponds beginning around AD 1100 (Ballouche 2001; Ballouche and Neumann 1995). Many Iron Age sedentary village sites located in northern Burkina Faso were abandoned at the beginning to the middle of the second millennium AD, perhaps related to the progression towards modern sahelian conditions (Neumann and Vogelsang 1996).

There is some evidence for a short return to wet conditions between AD 1500 and 1630 (McIntosh 2005), such that there was a northward advance of the tsetse belt by 200 km according to Brooks (1998). This was followed by another arid spell between AD 1630-1860. However, as Mayor et al. (2005) suggest, recent work in the Malian and Burkinabe Gourma add doubts to whether this climatic improvement occurred, as dune fields were reactivated in Mali (Ballouche 2001; Ballouche and Neumann 1995), and there is no evidence for improvement in Burkina at that point. Also, data from Lake Chad, while showing an improvement in the 17th century (Maley 1981), clearly shows a marked regression during the period of the 16th century.

The above-presented information helps contextualize Kirikongo within an area with dynamic and drastic environmental change. It was slightly dryer in the Bend when Kirikongo was founded. However, rainfall increased substantially as the village grew during the first millennium AD. Since then, and coinciding with the latter half of Kirikongo's sequence, the region has witnessed a continuing process of aridification. Later chapters will explore how Kirikongo's inhabitants dealt with these environmental transformations.

Disease

An additional environmental variable relevant for human occupation past and present in the Mouhoun Bend is disease. At the start of the 20th century the area of Dédougou, and particularly the vegetation zone around the river, was host to the tsetse

fly (*Glossina* sp.). This fly carries sleeping sickness (trypanosomiasis) both in its human and livestock forms such that river crossings had to be cleared of brush to minimize the risk of exposure (Forbes 1932). In addition, the Mouhoun near Dédougou is also home to river blindness (onchocerciasis), as black flies (*S. damnosum*) can breed in rocky areas around the river (Forbes 1932). River blindness can be a major deterrent to habitation in an area; one study by Rolland (1972) documented its effects on a newly established hamlet named St. Pierre in Burkina Faso that was several hundred meters from the breeding grounds for flies. After only 5 years of living in an infested area, 90% of the population showed some symptoms, and 30% exhibited severe symptoms (Rolland 1972; Walsh 1985).

Discussion

In summary, the location of the village of Kirikongo is in a border zone between two geologic formations with different characteristics that created the Mouhoun Bend. Kirikongo's local environment has changed several times since it was founded in the early first millennium AD, with the potential shift of ecological zones some hundreds of kilometers north or south. In addition, it is important to note that the community of Kirikongo likely contributed significantly to further degradation of the wooded savanna, as vegetation was cleared for farming, livestock grazing, firewood and iron-smelting. With increasing population densities throughout Burkina Faso and the neighboring savanna countries during the first millennium AD, the rate of human-induced change in vegetation and erosion should be considered exponential. The soils are relatively poor, but rainfall is both high for its latitude and tends to be more consistent, causing fewer disastrous harvests. The deposits in the vicinity of the site contain many of the raw materials it needed, including iron ore in the laterite, sandstone for grinding tools, clays for pottery, soils for farming, and aquatic environments for fishing. The environmental context provided by this chapter will allow us to better understand the general context for the site location that is explored in the next chapter.

Chapter 4 Stratigraphies and Depositional Episodes

The mounds at Kirikongo were created by a diverse array of cultural processes that resulted in complex stratigraphies. The deposits of each mound form an apparently continuous sequence and lack the sterile lenses of temporary site abandonment. Below I describe the sequence for four excavation units (the fifth, Unit D, postdates the period under study). Units were excavated using a recording system designating individual “stratigraphic levels” for each different deposit encountered (the excavation methodology is presented in detail in Chapter 2). In this chapter, based upon my analyses of the relationships between these stratigraphic levels, I combine them into culturally relevant depositional episodes, each marking an archaeologically visible “action” in the past of varying temporal duration. These divisions are analytical tools; depositional episodes ranged from those produced during a single finite action, while others were processes that lasted over several phases of occupation. These episodes provide a framework for organizing and interpreting material remains at each mound throughout the sequence.

Several features require definition before the presentation of individual mound sequences.

Yellow Floor: A yellow colored floor produced by laying clay with small amounts of laterite pebbles and pounding with occasional application of water until hard.

Red Floor: A red colored floor produced by crushing laterite, mixing it with small quantities of clay, then pounding, with occasional application of water, until hard. Such floors are much harder than yellow floors, forming a pavement-like surface.

Puddled Mud Architecture: An architectural technique in which layers of mud are piled to build a wall. Within the building sequence, at various points the wall stub is left to set and dry before continuing higher. There is no wattle component.

Mud Brick Architecture: The use of unfired, sun-dried, and mould-produced rectangular bricks between which is laid an earthen mortar. Bricks often contain a temper of laterite pebbles and small pieces of pottery. Structures are built by the laying of courses of brick.

Terraced Roofs: An architectural technique that creates a generally flat (slightly angled for drainage) roof made of mud, wood, and crushed stone that resembles those found in the pueblos of the American Southwest, and is common today throughout West Africa.

The roof is constructed by laying a series of large branches (ca. 8-10 cm diameter) from one wall to the next, with a varying amount of space between each (these branches stick out from the exterior of the wall). Then, a dense layer of smaller branches (ca. 2-3 cm) is laid across these large beams, and mud is used to seal this layer. The next step at Kirikongo is to apply a red floor (see above) on top of this structure, which creates a hard surface and protects the wood from rotting. Drains (primarily wooden) allow water to escape from the roof. Terraced roofs are strong enough to allow the construction of two-story architecture.

Unit A (Mound 1)

This unit was excavated during the preliminary season (2004) on Mound 1, the northern mound of the village center. It was chosen based upon its exposed profile from the road construction that truncated the site. This revealed a long and well-stratified deposit appropriate for constructing a cultural sequence. Unit A was a 3 x 3 m unit oriented north/south and placed on the mound summit. At 2 m of depth, the excavation was reduced to the east half of the unit (3 x 1.5 m). At 2.5 m, it was reduced again to the northern 1.5 x 2 m space of the half. Finally, at 3.1 m, the unit was further limited to a space measuring 1.25 x 1.5 m. Sterile laterite deposits were reached at 3.3 m, although an ash pit continued into basement rock, thereby extending the cultural deposit to 3.8 m in total depth. The total volume of the excavation unit was 21.82 m³, and the total number of stratigraphic levels was 181.

The 3.8 m sequence can be divided into 12 identifiable depositional episodes. The archaeological deposits consisted mainly of a variety of domestic debris, including architecture, activity areas, artifacts, and economic data (see Figures 4.1 - 4.11).

Episode 1 (3.3-2.8 m): An accumulation of yellow silt deposits (clay mixed with ash)














	Laterite Floor		Puddled mud melt/ Early mud brick		Orange burned earth
	Pebble Floor		Puddled mud melt		Ash
	Mud Brick		Collapse Debris		Loose Pit Fill
	Mudbrick melt		Topsoil	L	Laterite
	Loose earth		Ceramics	T	Termite
				S	Stone

Figure 4.1: Key to Kirikongo Profiles and Maps

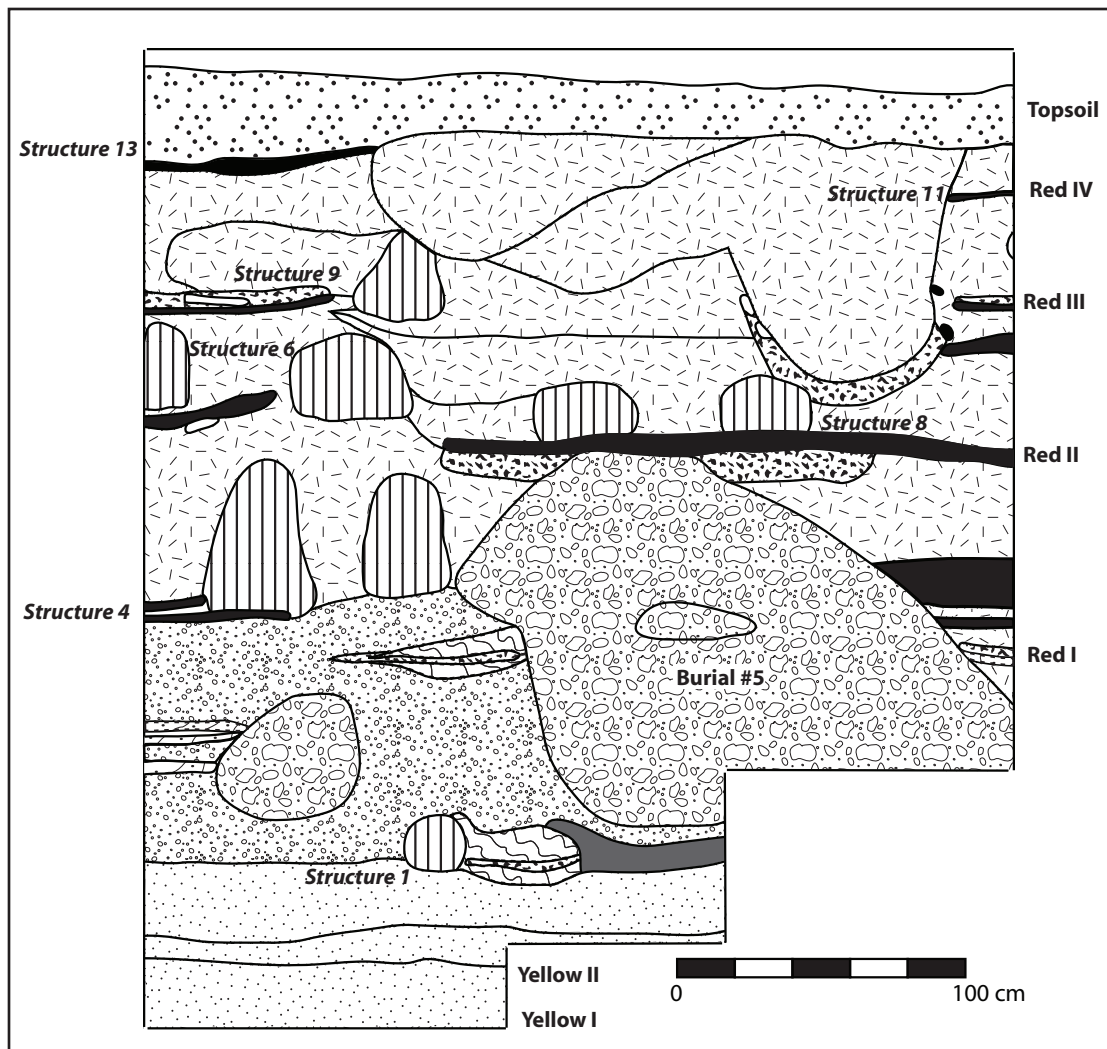


Figure 4.2: Unit A East Profile (Mound 1)

with no architectural evidence, but fairly dense cultural remains.

Episode 2: (2.8-2.7 m): The first direct architectural evidence (Structure 1) was uncovered in this level, and consisted of a yellow floor with a wall stump that was ca. 32 cm thick. The wall was likely constructed using a puddled mud technique.

Episode 3 (2.7- 3.8 m): After the abandonment of Structure 1, a trash pit one meter in diameter was dug through the yellow floor, extending through Episode 1, and continuing 50 cm into the laterite bedrock. The pit was filled with ash that contained occasional charred botanicals, animal bones, pottery, and iron implements.

Episode 4 (2- 2.7 m): Similar to Episode 1, this is an accumulation of yellow silt deposits

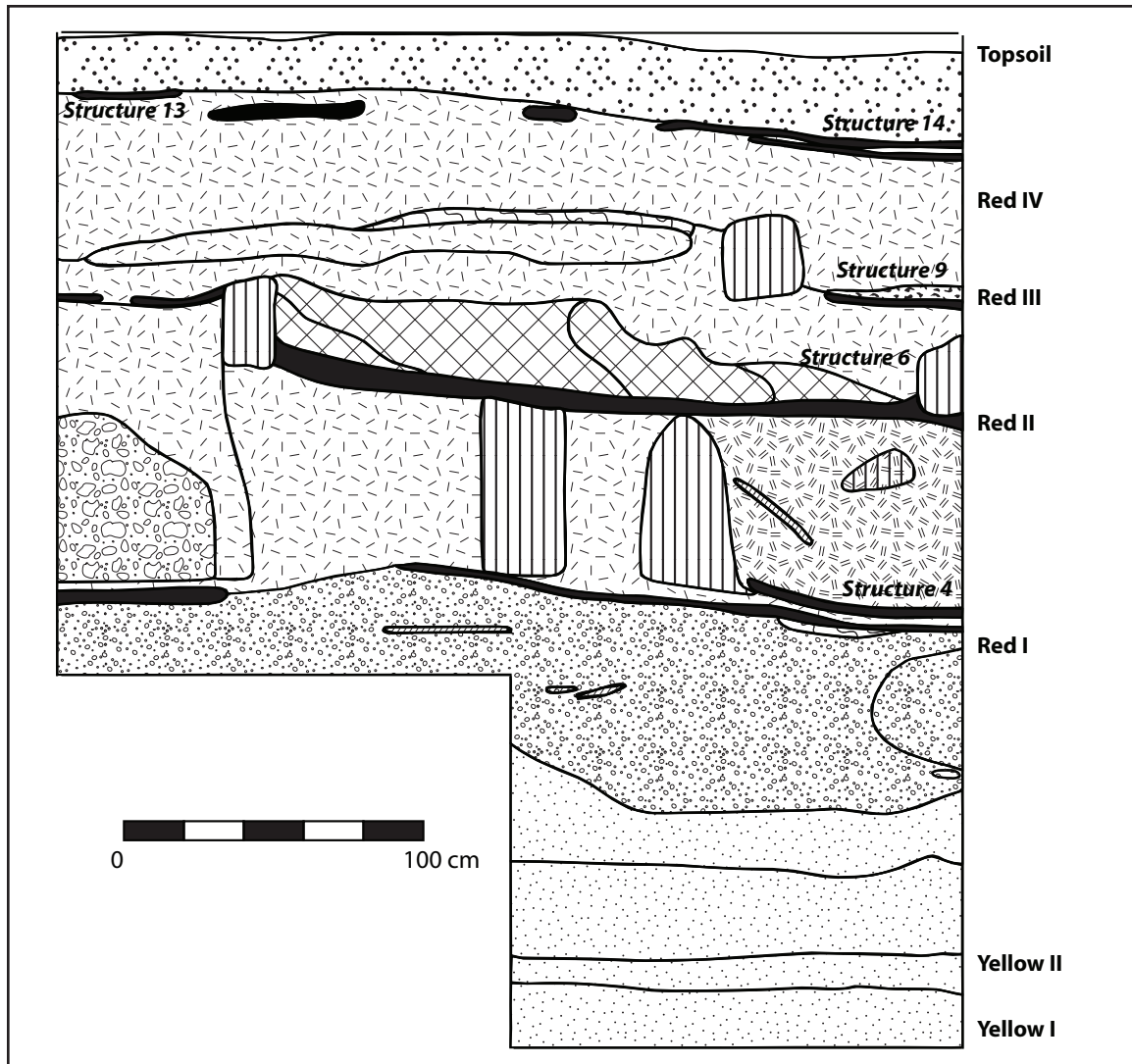


Figure 4.3: Unit A North Profile (Mound 1)

(clay mixed with ash) with dense cultural remains, but without evidence for architecture. In addition, two burials were interred in these deposits (Burial 1 (A160-2.4 m deep), and Burial 2 (A162- 2.5 m deep). However, only Burial 1 dates to this episode.

Episode 5 (1.9- 2 m): The first clear evidence of mud-brick architecture in Unit A was uncovered in this deposit. It constitutes a round hut (Structure 2) with a yellow floor in the center-south of the unit, estimated to be 2 m in diameter with walls 36 cm thick. Several meters to the north of Structure 2 was a basin hearth 45 cm in diameter and surrounded by burned earth, and to the northeast of Structure 2 were two round pits, the western one measuring 40 cm and the eastern one 50 cm. The latter was confirmed as a burial pit that led to Burial 2. In addition, directly under the wall of Structure 2 was another interment, Burial 3 (A154- 2 m deep).

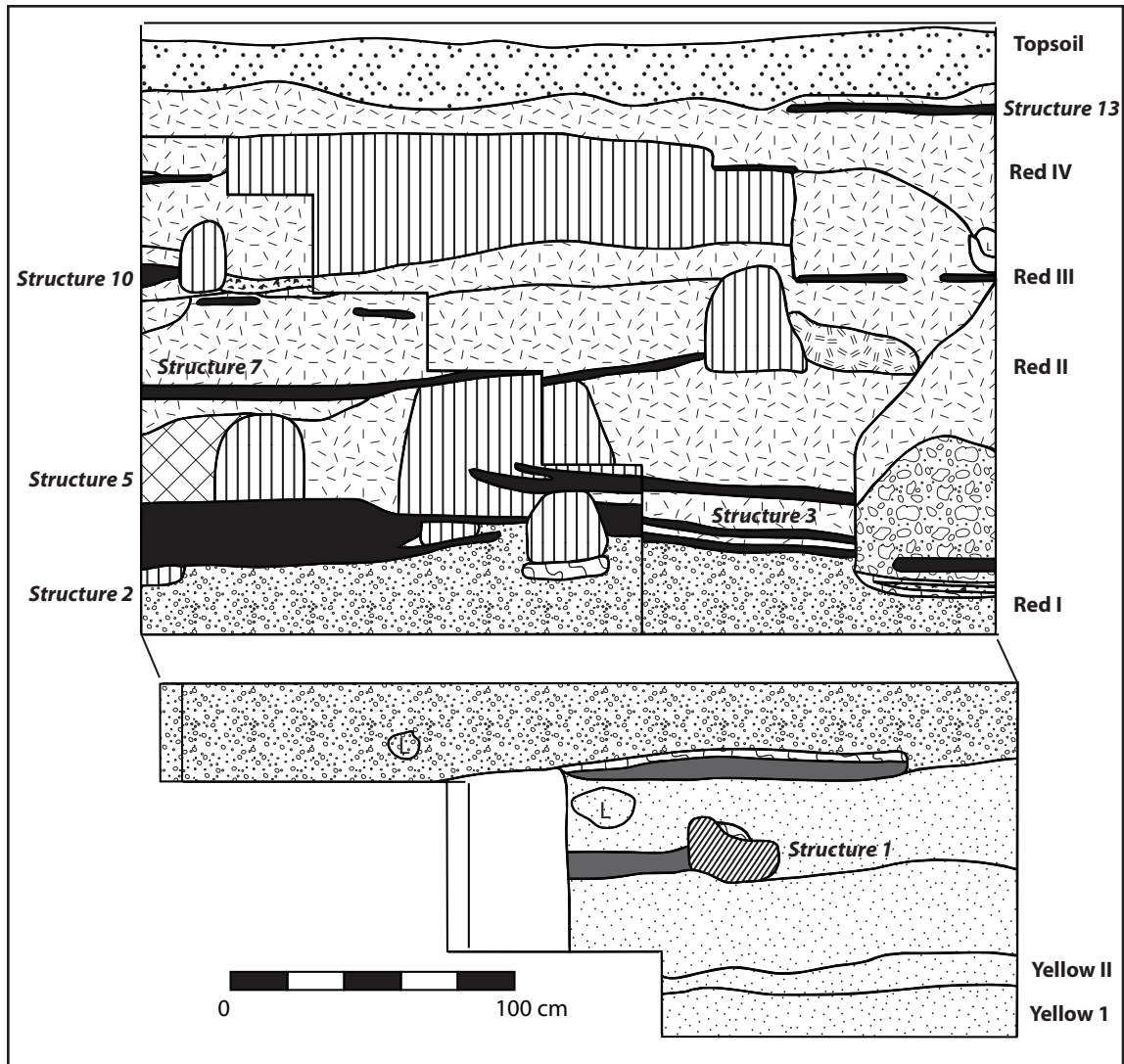


Figure 4.4: Unit A West Profile (Mound 1)

Episode 6 (1.7- 1.9 m): The first building stage of a two-part architectural sequence (with Episode 7). There is a mud brick structure (Structure 3) with a red floor in the northwest of the unit. It has an estimated diameter of 2.5 m, and its walls are 32 cm thick. There was a cache of two grinding stones along the eastern central wall of the structure. A second round mud brick structure (Structure 4) of unknown size was uncovered in the extreme northeast of the unit. Its wall was 30 cm thick. The exterior area seems to have been a paved courtyard. The courtyard was resurfaced frequently in comparison to the structures, resulting in a 20 cm thick surface in the southern profile.

Episode 7: (1.4- 1.7m): This is the second stage of the architectural sequence (with Episode 6). Structure 3 was in the same place, but had been re-floored and re-walled,

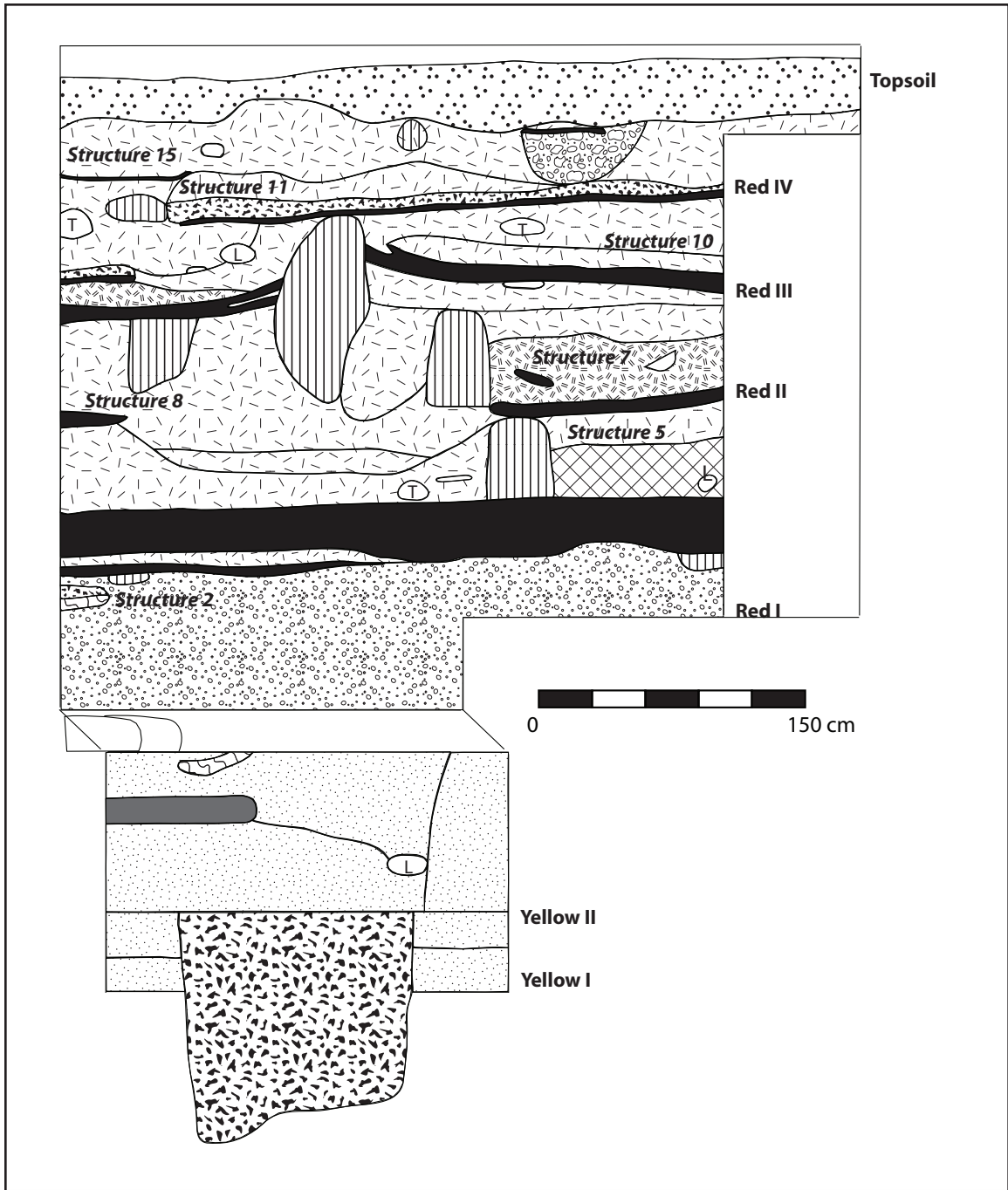


Figure 4.5: Unit A South Profile (Mound 1)

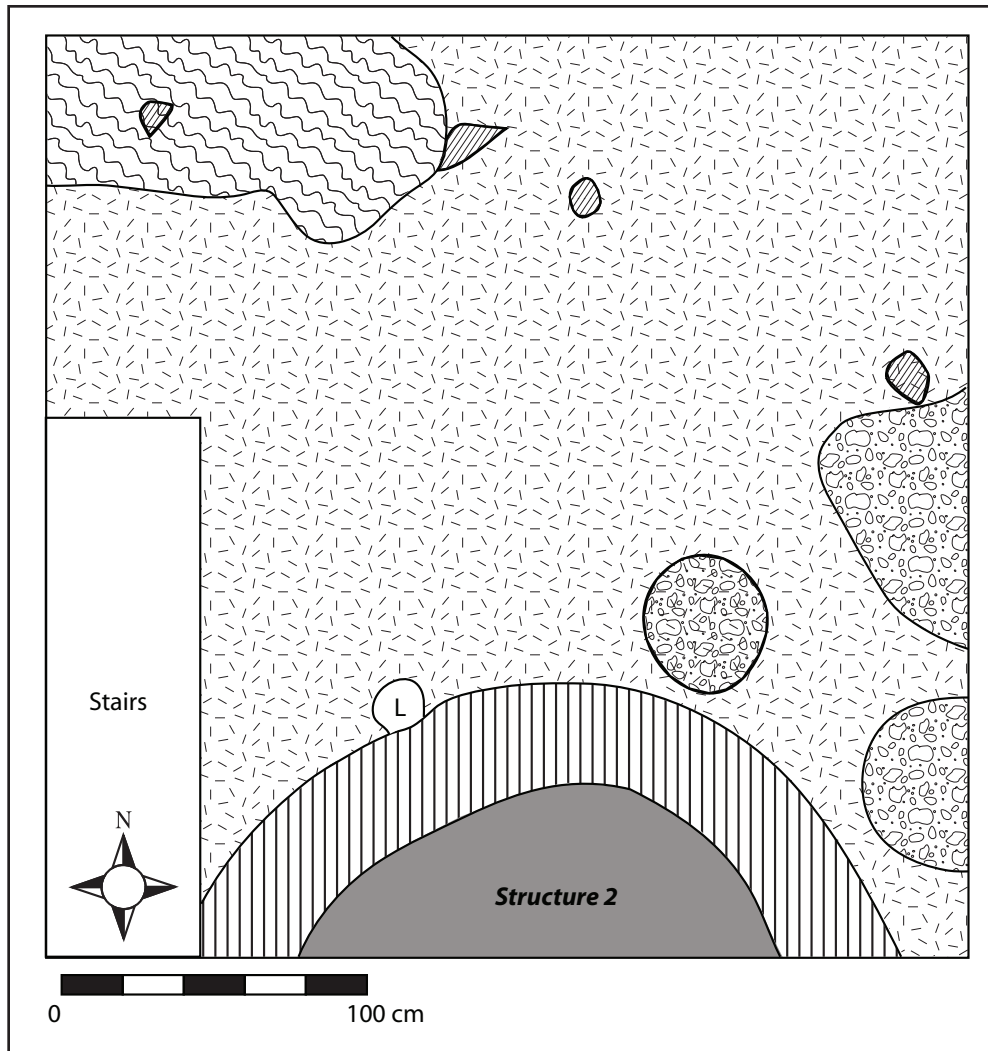


Figure 4.6: Unit A Episode 5, 2.0 meters (Mound 1)

resulting in a structure with an estimated 2.6 m diameter and 36 cm thick walls. On the interior against the western profile is a 40 cm diameter hollow in the floor where a round-bottomed pot may have been placed, and there is a large pot lid next to this feature. In the south center of the hut is a raised earthen bench, extending from 70 cm north of the southern wall to directly next to the hollow. Outside Structure 3, Structure 4 remained in the same place as during Episode 6, but there was now a new Structure 5 that measured 60 cm in diameter, with walls 24 cm thick, located south of Structure 3 in the courtyard. This may have been a domestic fowl coop, as there is no evidence for burning, and the interior deposits seem to be organically derived. Two burial pits were dug into these deposits after abandonment, one (Burial 4) through the center of Structure 3, and the other (Burial 5) in the courtyard after it had been filled with trash. The trash in the courtyard provided an excellent sample of pottery. After the abandonment, these buildings were filled by mud brick melt containing occasional trash lenses.

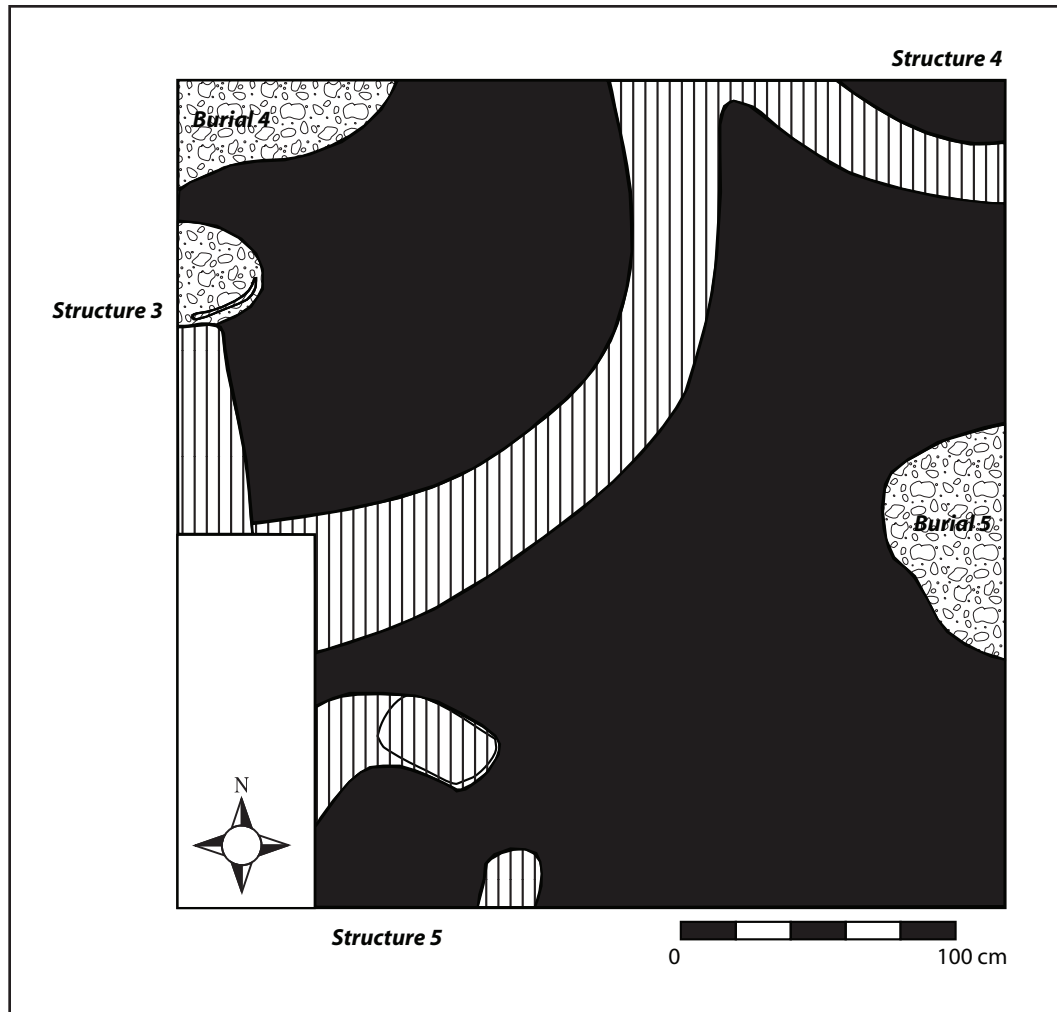


Figure 4.7: Unit A Episode 7, 1.7 meters (Mound 1)

Episode 8: (1.3-1.4 m): Resting on the architectural debris of Episode 7 in the southeast corner of the unit was a pottery concentration. This was composed of a series of diverse vessels (jars, bowls), and several laterite blocks.

Episode 9: (1.3-1 m): A particularly well-preserved architectural layer composed of three different mud brick structures and a small paved courtyard. Structure 6 in the north of the unit is a round hut 2 m in diameter with walls 20 cm thick; it also has a small simple open bowl set in a generally uneven floor surface. In the southwest of the unit (covering almost the entire western half) is a large round structure 2.5-2.6 m in diameter (Structure 7), with a wall 28 cm thick, a large storage jar (A96) set in the floor, and a mud brick bench that extended at least 70 cm from the southern wall. A southeastern structure of unknown size with walls 18 cm thick (Structure 8) was built over the Episode 8 area, with the

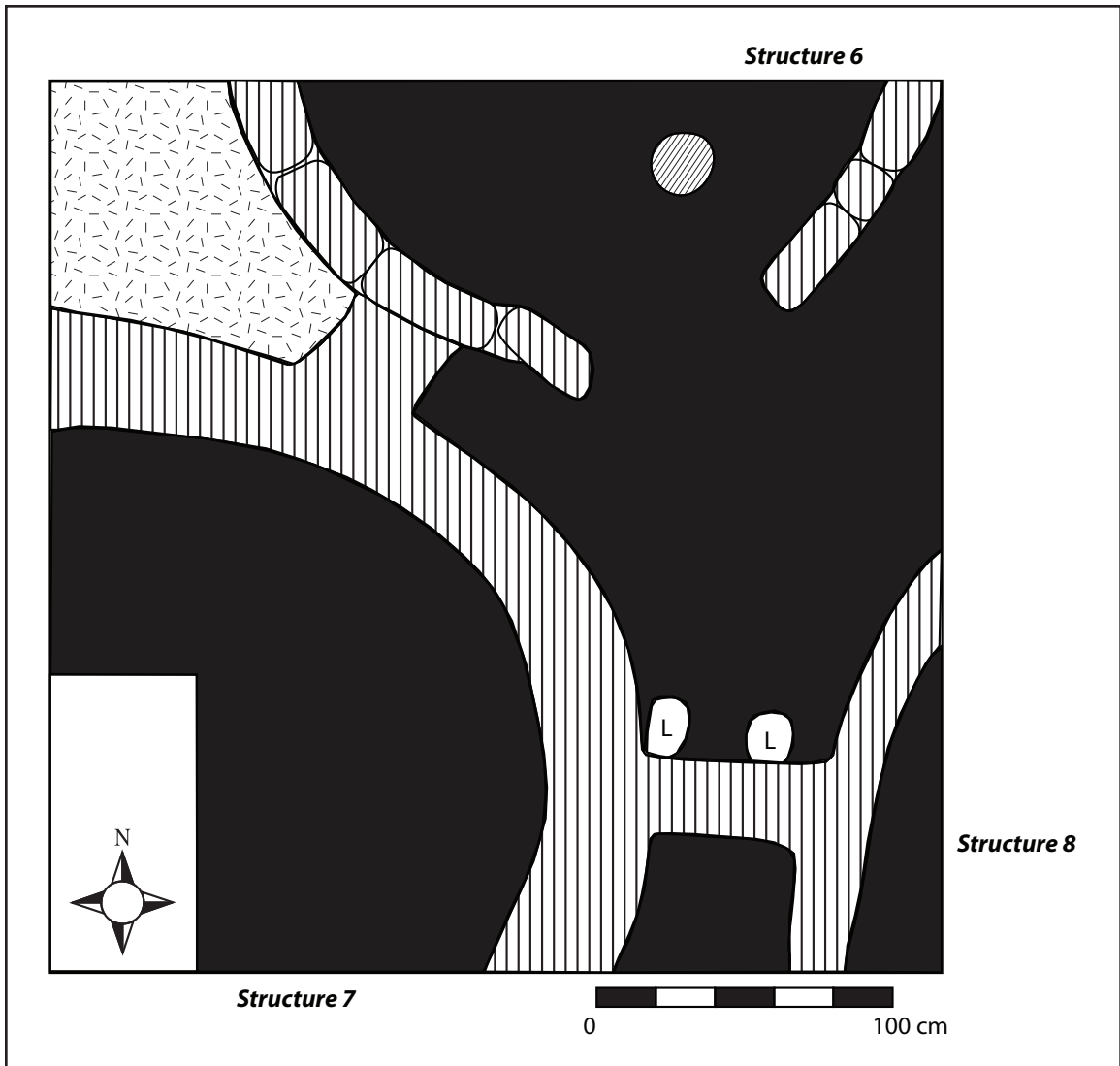


Figure 4.8: Unit A Episode 9, 1.3 meters (Mound 1)

laterite blocks partially covered by the new wall segment. There are two connecting walls between structures, one between Structures 6 and 7 (38 cm thick), and the other between Structures 7 and 8 (28 cm thick). The preserved architecture rests on a thick red flooring sequence, up to 10 cm in some places.

After the abandonment of these structures and courtyard, they were filled with trash and then leveled for the construction of Episode 10. The trash was mainly consumption debris, and the deposits in the paved courtyard area provided a large sample of animal bones. Structure 7, however, had different contents in the interior, the result of the collapse of a terraced roof (see definition above). This is composed of a mix of wall melt and pieces of roof fall (red laterite fragments). These collapsed on an in situ storage jar and a variety of other ceramic items, including small bowls.

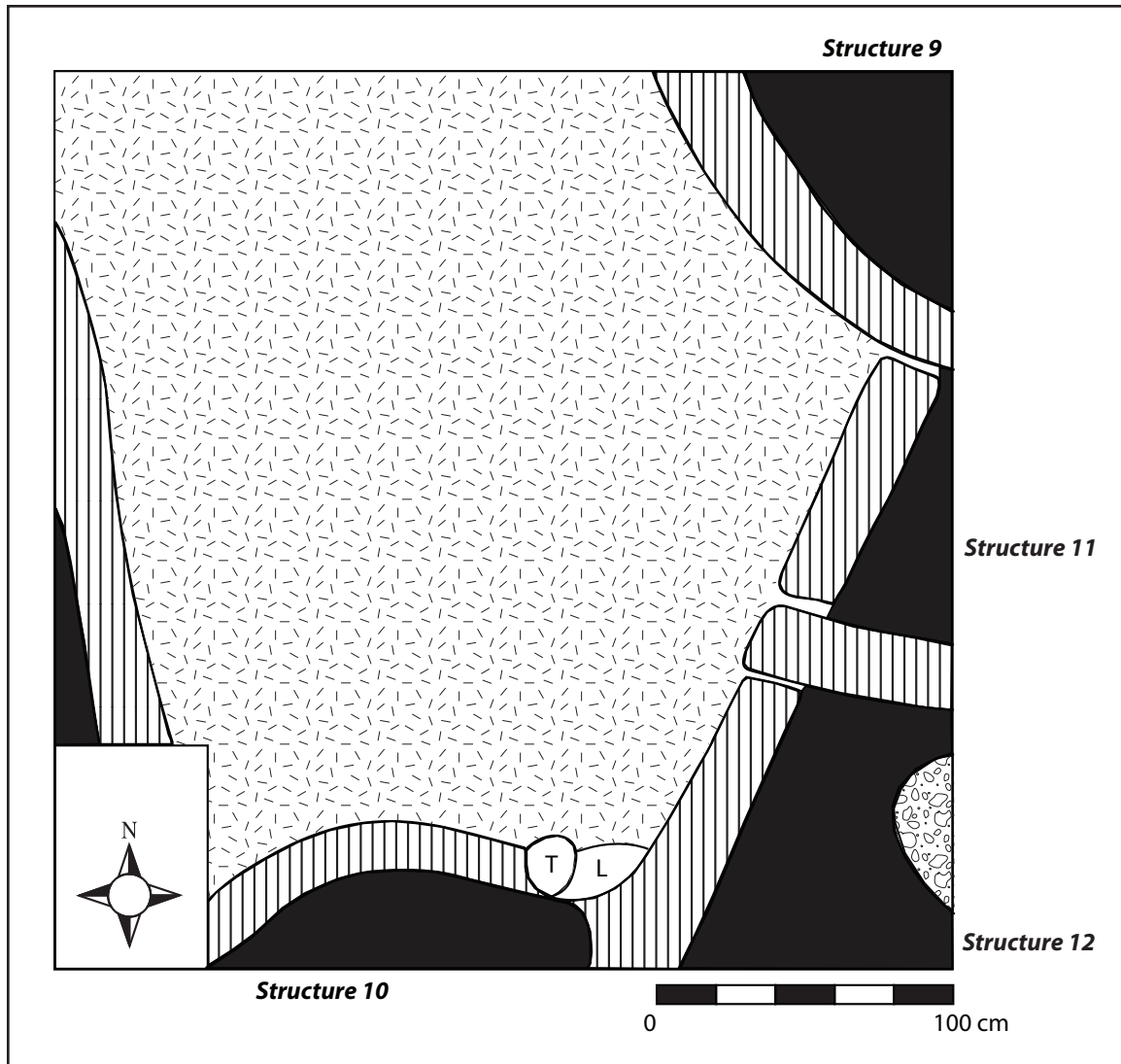


Figure 4.9: Unit A Episode 10, 1.0 meters (Mound 1)

Episode 10: (0.6- 1 m): An architectural level consisting of two structures connected by a long straight wall. It is unknown if these were part of the same compound. One circular hut (Structure 9) of unknown size but with walls 20 cm thick, was set in the extreme northeastern corner. The second structure (Structure 10), also of unknown size but with walls 18 cm thick, was centrally located along the southern profile with only a small section in the unit. This structure had a slight depression in the floor, potentially to rest a jar within. A straight wall (20 cm thick) connects these two structures and was oriented slightly diagonal of north/south, extending from the northeastern corner to the southern central wall. The space to the east of the wall was divided into two parts, north (Structure 11) and south (Structure 12), and was paved. Atop the floor was a layer of mud and disarticulated pavement fragments, evidence of a collapsed roof. This space was divided

into two roofed non-round rooms of some sort, enclosed with the terrace technique defined above.

The area to the west of this wall was unpaved. Trash was dense and mixed with ample deposits of ash, including a large deposit of ash and rubbish in the unpaved corner between the southern structure and the long wall. Lastly, a 20 cm thick wall ran along the western profile of the unit and seemed to enclose the unpaved space. The area to the west of this wall was paved.

After abandonment, the buildings and unpaved courtyard filled with trash and architectural decay before being leveled again for the constructions of Episode 11.

Episode 11: (0.4- 0.6m): An architectural level consisting of two round huts that shared a wall. One hut was found along the eastern central profile, and the other along the southern central profile, with the shared wall found in the extreme southeastern corner of the unit. The eastern hut (Structure 13), was round and 2 m in diameter, with walls 28 cm thick. The southern (Structure 14), was 2.5 m in diameter, with a wall 32 cm in thickness. The exterior courtyard that covered the rest of the unit was unpaved, and contained a horseshoe-shaped mud brick hearth (60 cm diameter) set against the eastern structure. The courtyard was filled with ash, bones and pottery, and likely these were derived from the use of the hearth. Along the western profile of the unit, the same wall found in Episode 10 (now greater than 42 cm thick) enclosed the compound. Following the abandonment of these structures, there was a deposition of trash and architectural collapse before a flat surface was created for the constructions of Episode 12.

Episode 12 (0.25-0.4m): Directly beneath the plow-zone were three potentially distinct floors with unknown dimensions. Structure 15 was in the northwest of the unit, Structure 16 was in the northeast of the unit, and Structure 17 was along the eastern profile. Structure 14 had several possible postholes, although due to the high disturbance of this level, these remain inconclusive. The southwestern corner of the unit appeared to be an open courtyard. In addition to mud brick decay, there was an infant burial (Burial 6) in the center of this space.

Episode 13: (0- 0.25m): The plow zone, with highly churned and decayed mud-brick deposits containing highly fragmented artifacts.

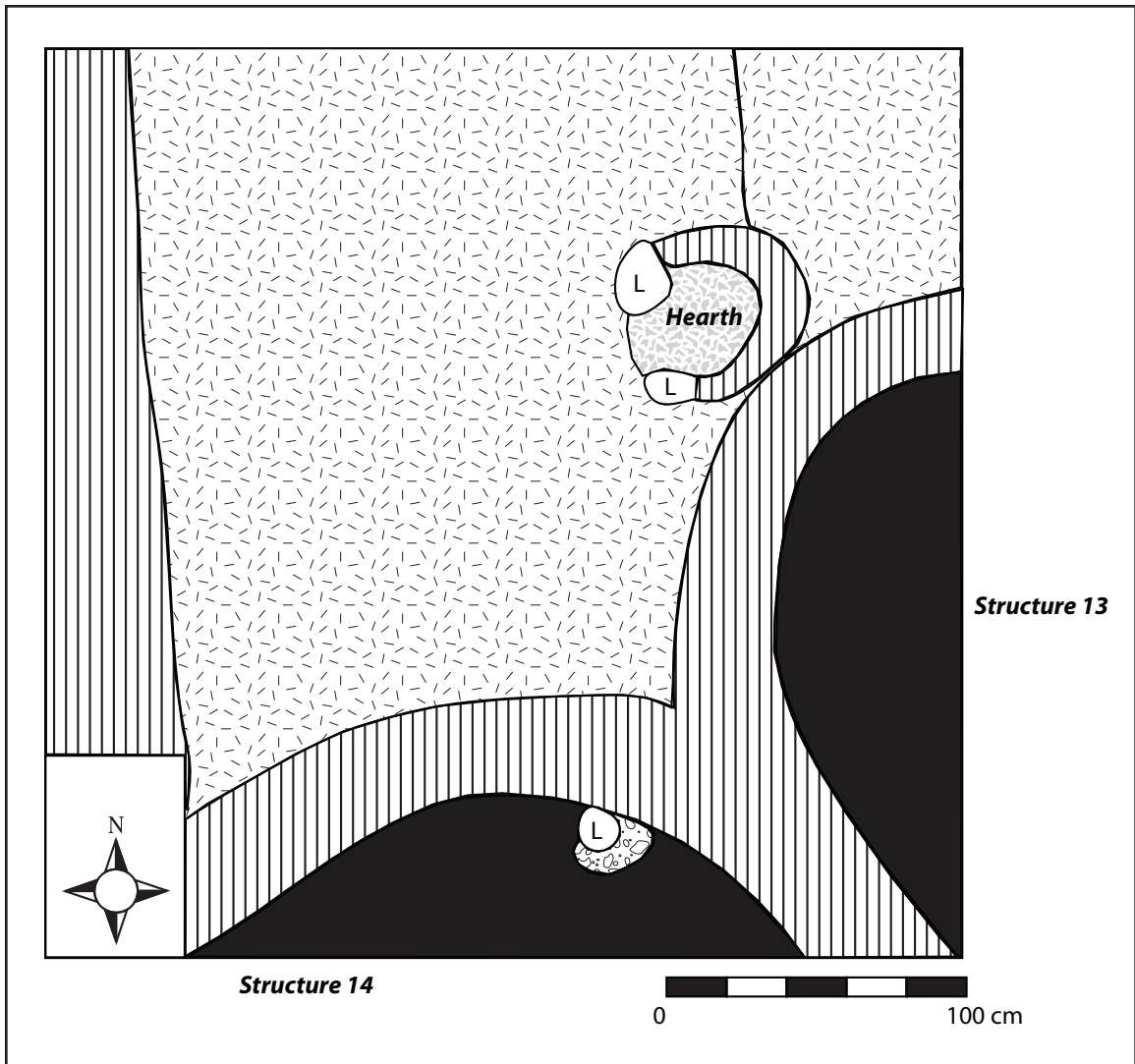


Figure 4.10: Unit A Episode 11, 0.60 meters (Mound 1)

Unit A Architectural Analyses and General Discussion

Two basic deposit types characterized the Unit A sequence. The first, found below 2 m in depth, consisted of a yellow-silt matrix (Munsell 7.5 YR 6/4) that was derived from the decay of puddled mud architecture. Two yellow floors were identified in this deposit. Architectural debris was mixed with ash lenses, and a discrete ash pit 1 m in diameter was dug into Structure 1 after its abandonment.

The second deposit was derived from the decay of mud bricks (10 YR 6/3). This is a more substantial form of decay, as the additives in mud brick (pottery, pebbles, etc.) make a more cohesive matrix, even after it is destroyed. These deposits built up over the course of a six part building sequence (7 identifiable construction episodes). They ranged in thickness from 10- 50 cm each, with architectural features standing between 10 and

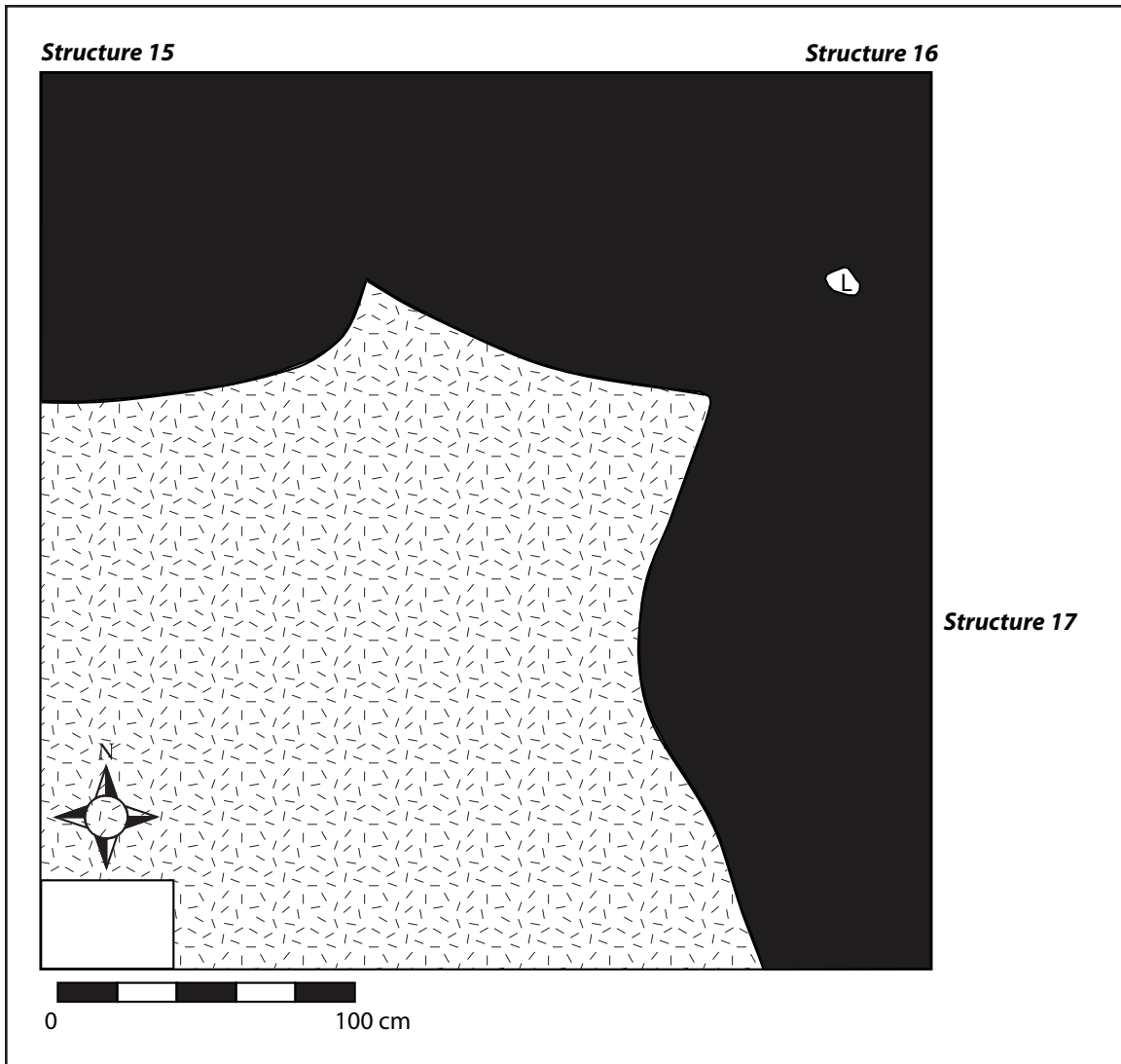


Figure 4.11: Unit A Episode 12, 0.40 meters (Mound 1)

30 cm. Each rested on a flooring sequence, with the earlier ones (Episodes 6, 7, 8 and 9) constructed on thicker floors than later examples.

The architecture of Unit A was well-preserved and identifiable, allowing for several observations. There were two sizes of huts, 2 m (n=3) and 2.5 m (n=3) in diameter. The 2.5 m diameter structures seem to have had a specific set of features in them, including a water jar and a mud brick bench at least 30-40 cm high, and one hut had a cache of manos placed in a small interior pit. The 2 m diameter huts had fewer features on the interior, with the sole exception of a simple open bowl that was inset in the floor of Structure 6.

Terraced architecture was marked by roof collapse resting atop floors. Structure 7 had a flat terraced roof that collapsed in on the hut before it had been filled with trash,

crushing the storage jar within the room. Not all structures were round, however, as demonstrated by Structures 11 and 12 in Episode 10. These had at least two straight walls each, and the roof collapsed on their interior floors after abandonment.

Outside of round and other roofed structures, spaces were both paved and unpaved. There is the possibility that all paved areas were actually roofed, as we did not find any hearths on paved surfaces; they all occurred in unpaved spaces. Trash was deposited over walls in unpaved areas, as well as in abandoned buildings. Smaller structures were placed in some courtyards, including a probable domestic fowl coop during Episode 7.

Unit B (Mound 4)

This unit was designed to explore the central mound in the village core. A 2 x 4 m trench was excavated at the summit of Mound 4 during the 2006 season. This unit was ended at 1 m depth owing to the exposure and subsequent maintenance of a layer of preserved architecture. An extension measuring 2 x 2 m was placed around the southwest corner of the unit; this uncovered another level of preserved architecture at 2 m depth. However, in order to highlight the entire sequence of the mound, a small 1.25 x 1.25 m probe was excavated in the southeast corner of the extension reaching bedrock at 4.1m, with several slight reductions in size leading to a final area of 1.125 x .80 m at bedrock. A second extension, measuring 2 x 2 m, was excavated to the west of the first extension, in order to further expose the architectural layer found at 2 m. The total volume of the excavation unit was 22.7 m³, and the total number of stratigraphic levels was 216 (Figure 4.12).

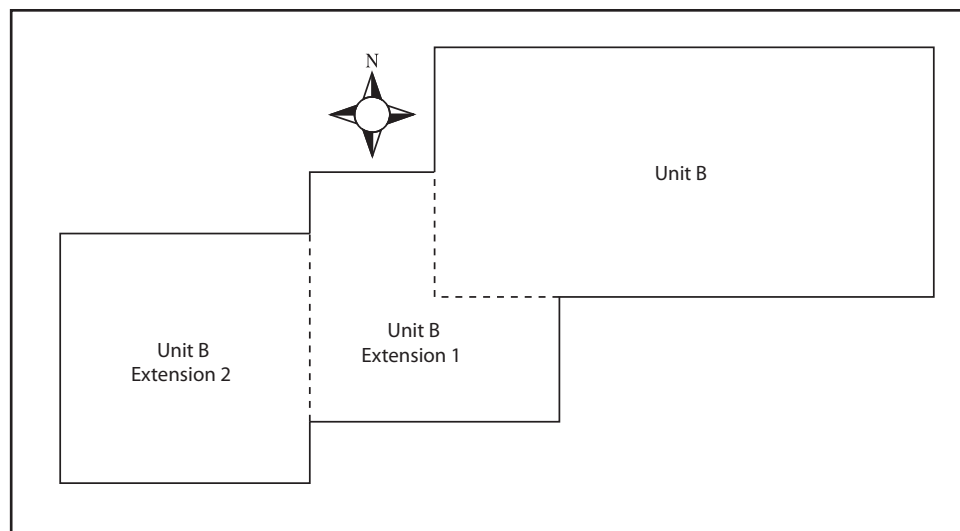


Figure 4.12: Unit B Overview Showing Location of Extensions (Mound 4)

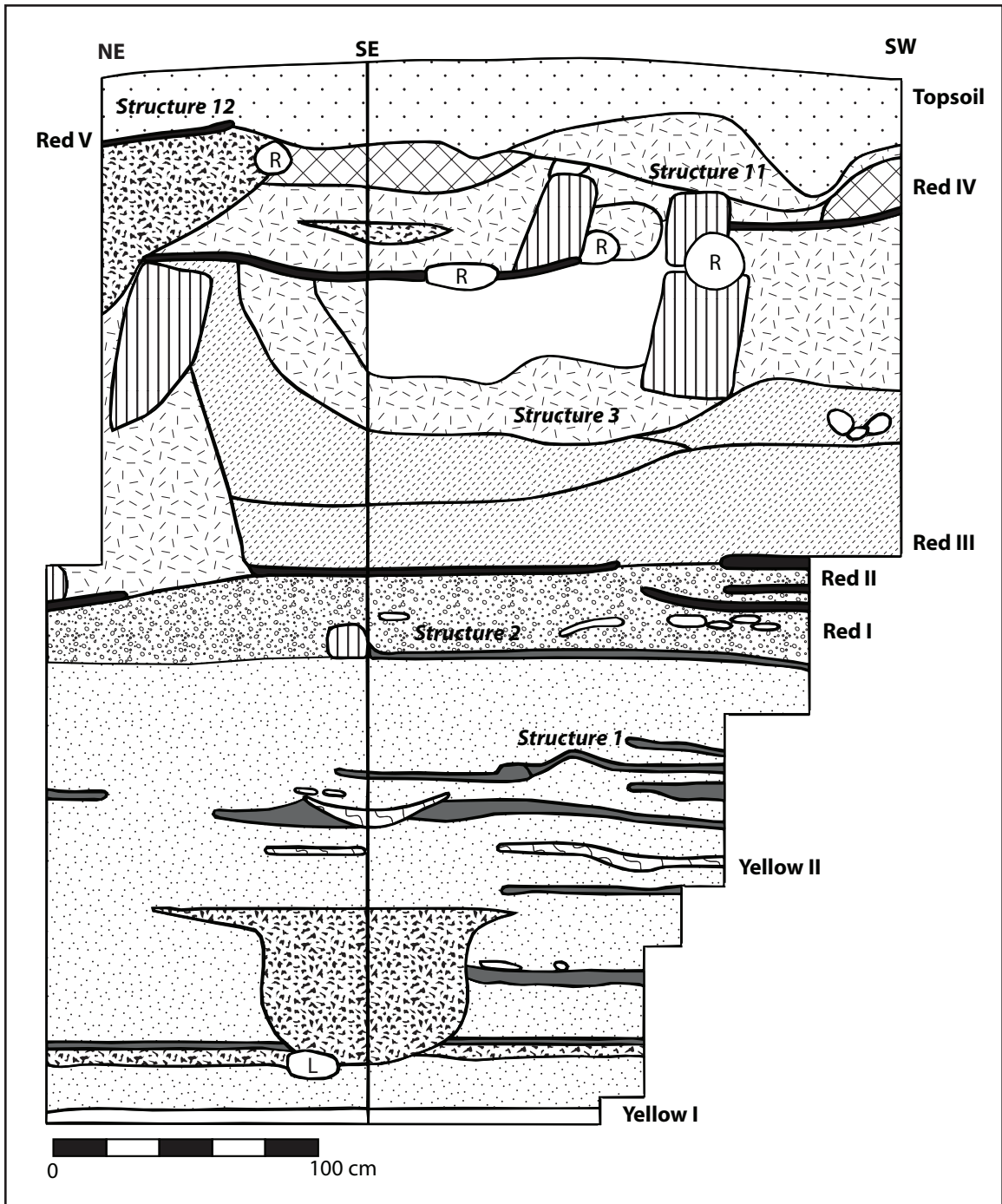


Figure 4.13: Unit B Extension 1 South and East Profiles (Mound 4)

The 4.1 m sequence can be divided into 12 identifiable depositional episodes. The archaeological deposits consisted mainly of a variety of domestic debris, including architecture, activity areas, artifacts, and refuse yielding economic data. The summary of depositional episodes combines the main unit and the two extensions, in order to provide a completely integrated picture of the sequence (see Figures 4.13-4.26).

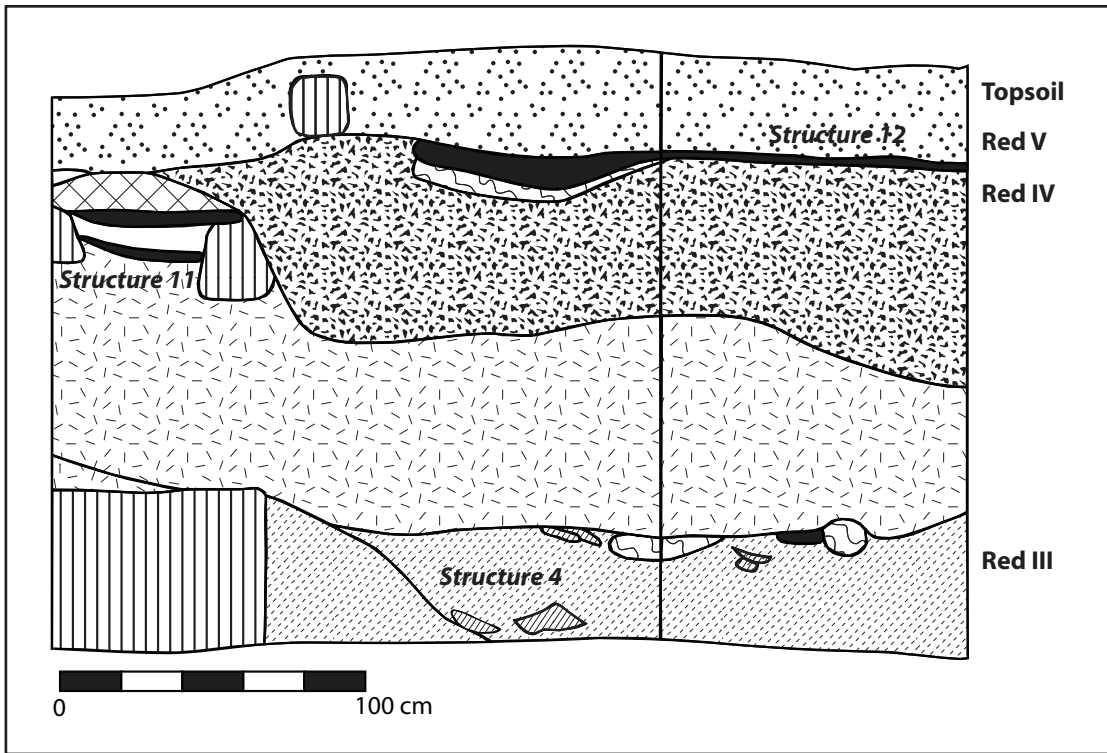


Figure 4.14: Unit B Extension 1 West Profile (Mound 4)

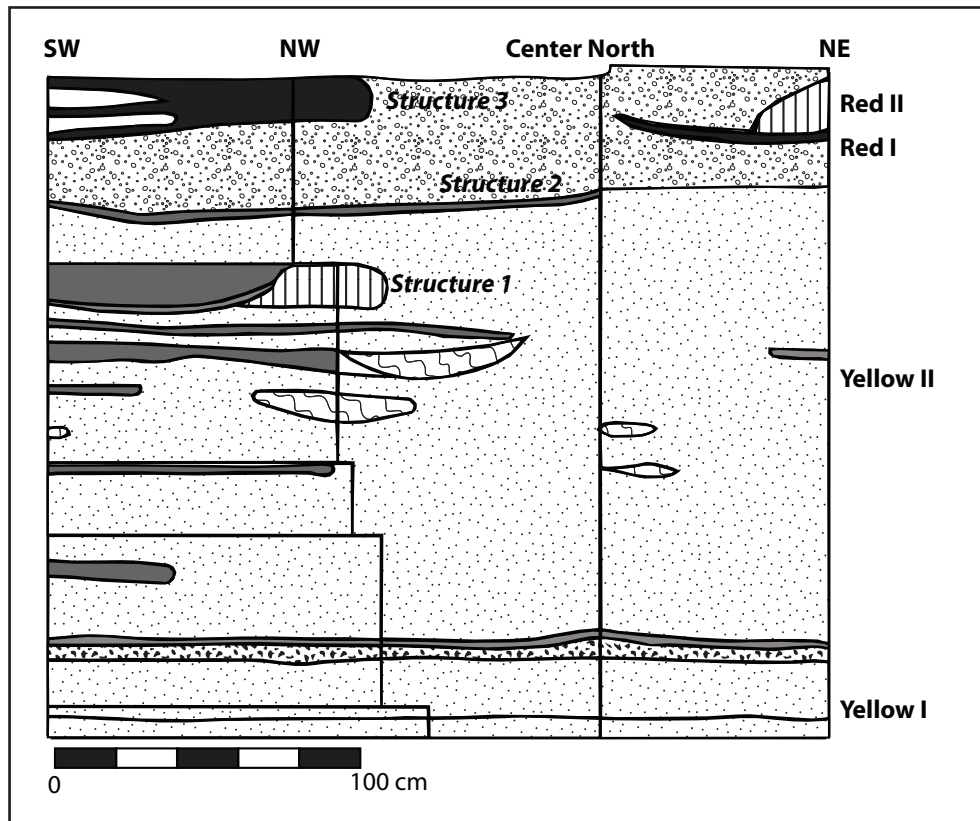


Figure 4.15: Unit B Extension 1 North and West Profiles Below Episode 7 (Mound 4)

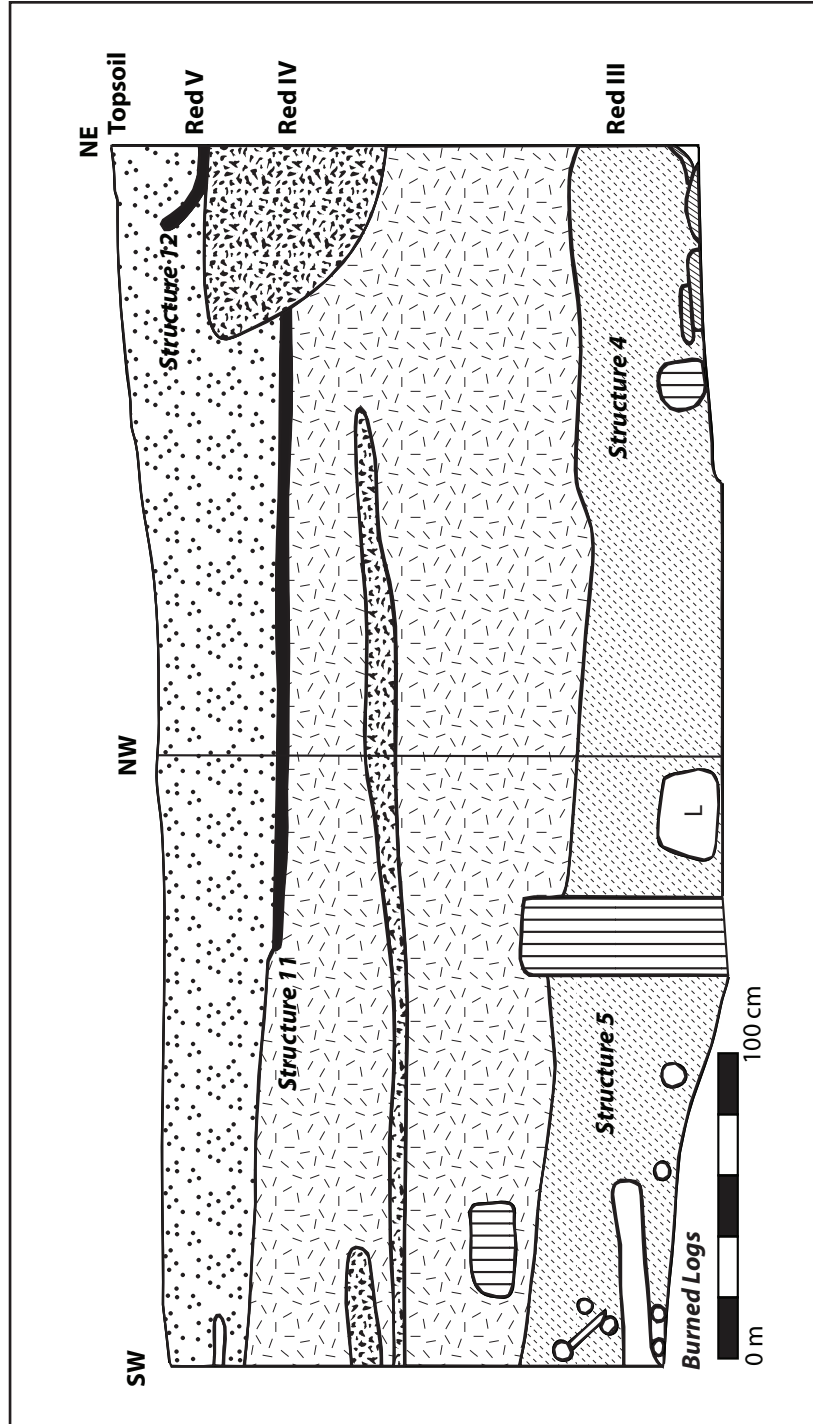


Figure 4.16: Unit B Extension 2 North and West Profiles (Mound 4)

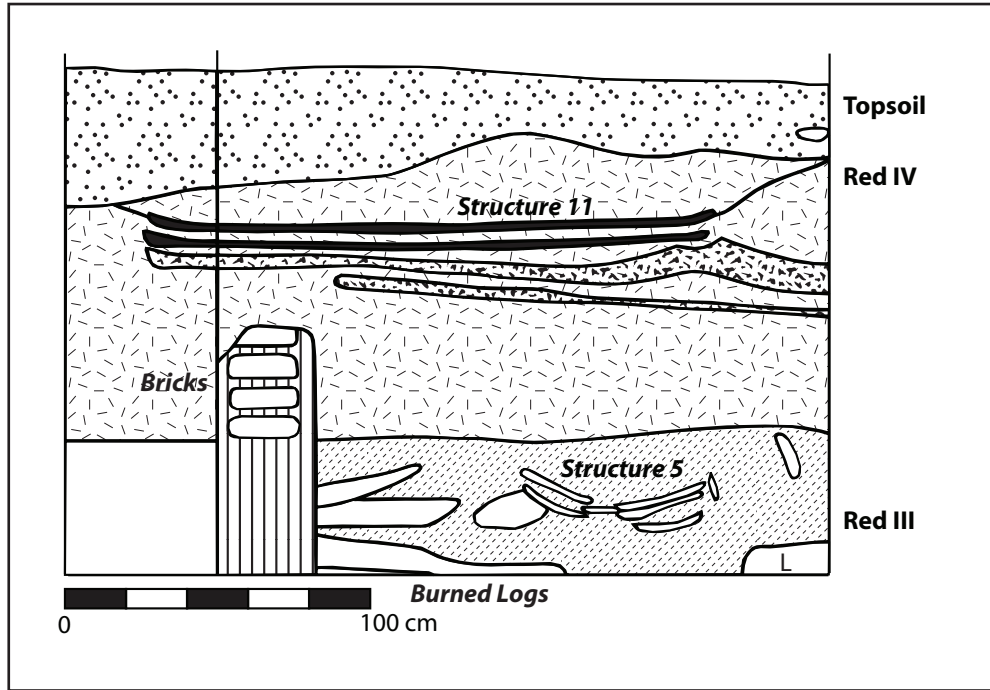


Figure 4.17: Unit B Extension 2 South Profile (Mound 4)

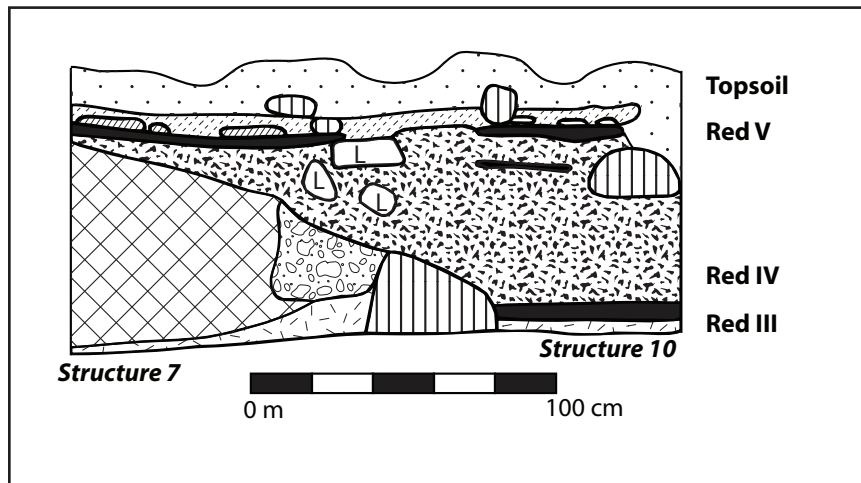


Figure 4.18: Unit B East Profile (Mound 4)

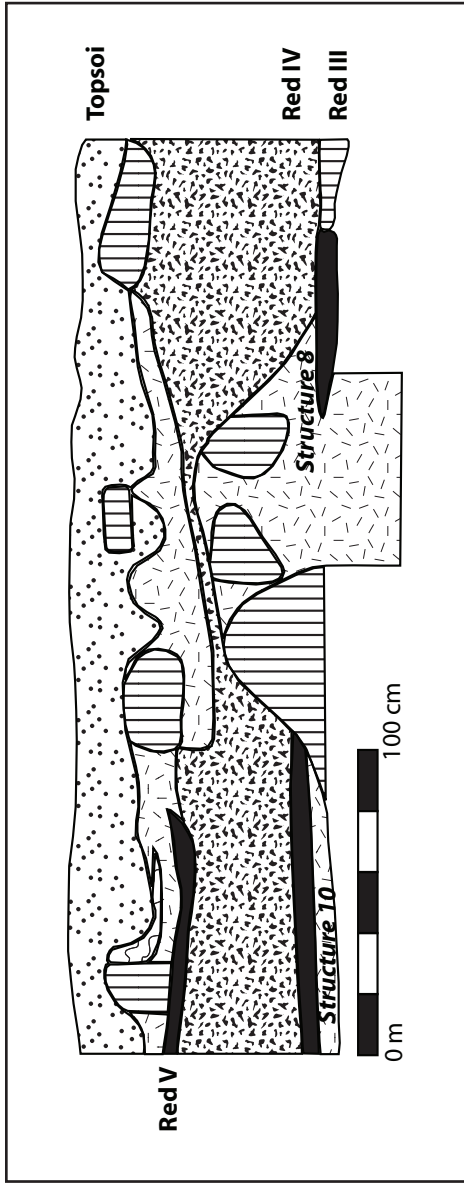


Figure 4.19: Unit B North Profile (Mound 4)

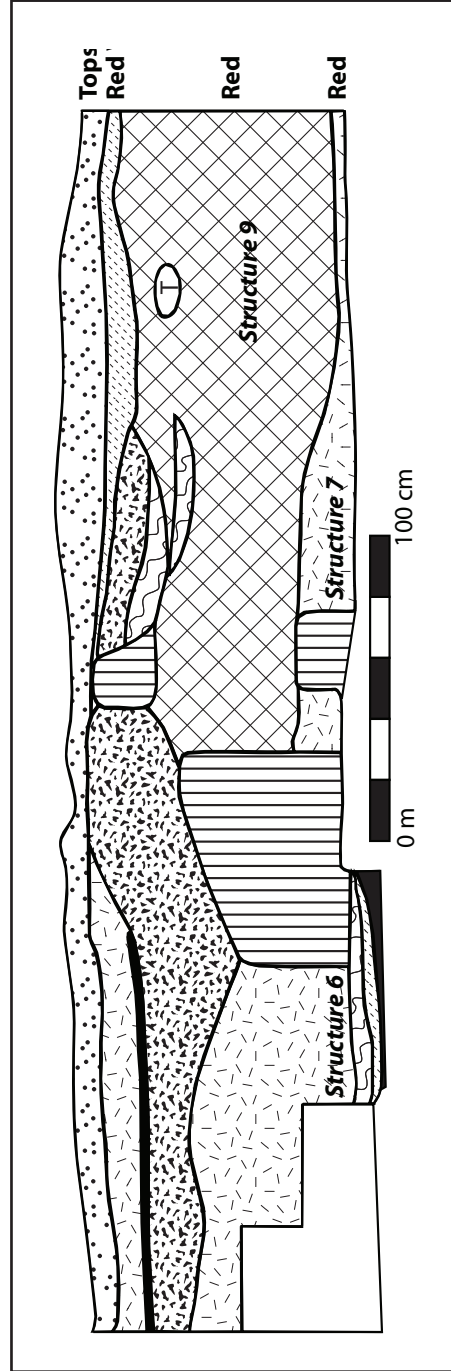


Figure 4.20: Unit B South Profile (Mound 4)

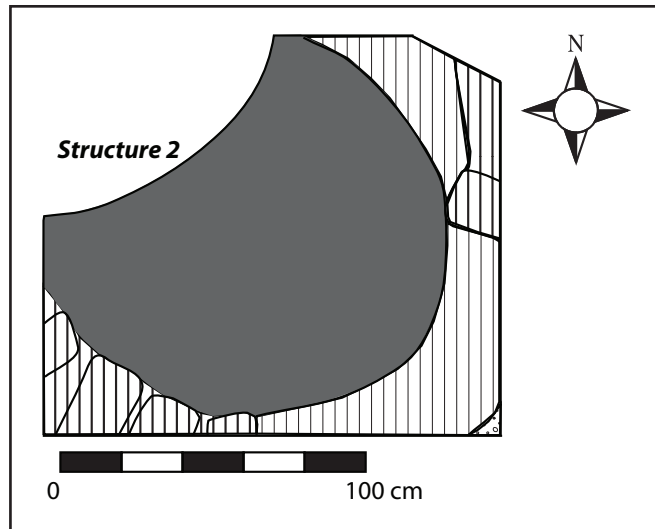


Figure 4.21: Unit B Extension 1 Episode 5, 2.35 meters (Mound 4)

Episode 1 (4.1-3.5 m): The earliest occupation level was an accumulation of yellow silt deposits, with multiple yellow floors interspersed with layers of ash and domestic debris. The first of these, at a depth of 3.9 m, contained a series of possible postholes, and a later surface at 3.5 m depth had a smashed jar flattened upon it.

Episode 2 (3.4-4 m): An inverted, bell shaped ash pit (40-45 cm diameter) was dug through the Episode 1 deposits. It contained iron implements, subsistence remains, and pottery.

Episode 3 (3.5- 2.95 m): This consisted of an accumulation of yellow silt deposits, similar to Episode 1. However, the five yellow floors had a higher pebble content and less clay, resulting in more durable surfaces. There was an inhumation (Burial 1) in the center of the unit at 3.3 m depth.

Episode 4 (2.35-2.95m): A puddled mud wall (Structure 1) with a yellow floor was uncovered at 2.7 m. The round structure had walls 28 cm thick and was 2 m in diameter. The deposits above this had a high concentration of slag.

Episode 5 (2.35-2.3m): The first mud brick building in this area (structure 2) was 1.25 m in diameter and had a yellow pebble floor and a wall that was 19.5 cm thick. The bricks are estimated to have been 16 x 30 cm in size.

Episode 6 (2.3-2m): This episode provided a series of 2-3 red floors that preceded the Episode 7 deposits. As part of a greater flooring sequence, their dimensions are unknown.

Episode 7 (1.1- 2m): This was an architectural level consisting of two round structures and a non-round room that had multiple stories. All these structures were burned, and as a result their walls are well preserved, still standing 50 to 60 cm above the floor. This episode provided a remarkable glimpse into village life, owing to the quantity of in situ material culture. These structures were originally discovered in the first extension, and the second extension was excavated to further expose these layers.

There is a small structure measuring 2 m in diameter (Structure 3) in the southeast of the first extension. Its mud-brick walls were 28-30 cm thick, and it had a door oriented towards the west. The second structure (Structure 4) was 2.5 m in diameter. This building had at least two doors, one leading to the west, and the second just west of Structure 3 in the south. To the exterior (southwest) of Structure 4, the two portal walls created another roofed space (Structure 5) that was bounded by walls on at least two sides. Structures 3 and 4 were filled with a variety of broken pots, mostly in large pieces that rested on the floor, where the roof beams had collapsed on them. In addition, a small cluster of sorghum grains was found in the center of Structure 4.

The burning revealed that Structure 4 had been constructed with square bricks (24 cm on a side) rather than the usual rectangular ones, and the walls were 33 cm thick. The remains of a terraced roof (roofs beams mixed with fragments of red floors) were found along the floor. Above the roof, the walls had collapsed inward, creating a thick deposit of mud brick debris.

Structure 5 contained a large unfired mud tripod granary that had been crushed by roof collapse. The granary had been set over a depression in the floor in order to protect the grain from termites and rodents. Above the roof beams in this room were fragments of flooring material, and then several broken pots that must have rested upon the roof. This suggests that Structure 5 was a two-story-tall building. After its initial collapse the walls fell in, resulting in a thick layer of mud brick melt like that found in Structure 4.

Episode 8 (1.1- 0.9 in main unit; 1.1- 0.8 in second extension; deposits for this period in the first extension were destroyed by Episode 10): The next architectural level encompassed deposits in the main unit for the first time, in addition to the two extensions. These features were less well preserved than those in Episode 7, and wall stubs stood only 20 cm high. A round hut (Structure 6) estimated at 2 m in diameter, with a wall 24 cm thick, was located in the northwest corner of the main unit. Structure 6 was burned like those in Episode 7, with a dense layer of terraced roof fragments left resting on the floor and at least one crushed pot.

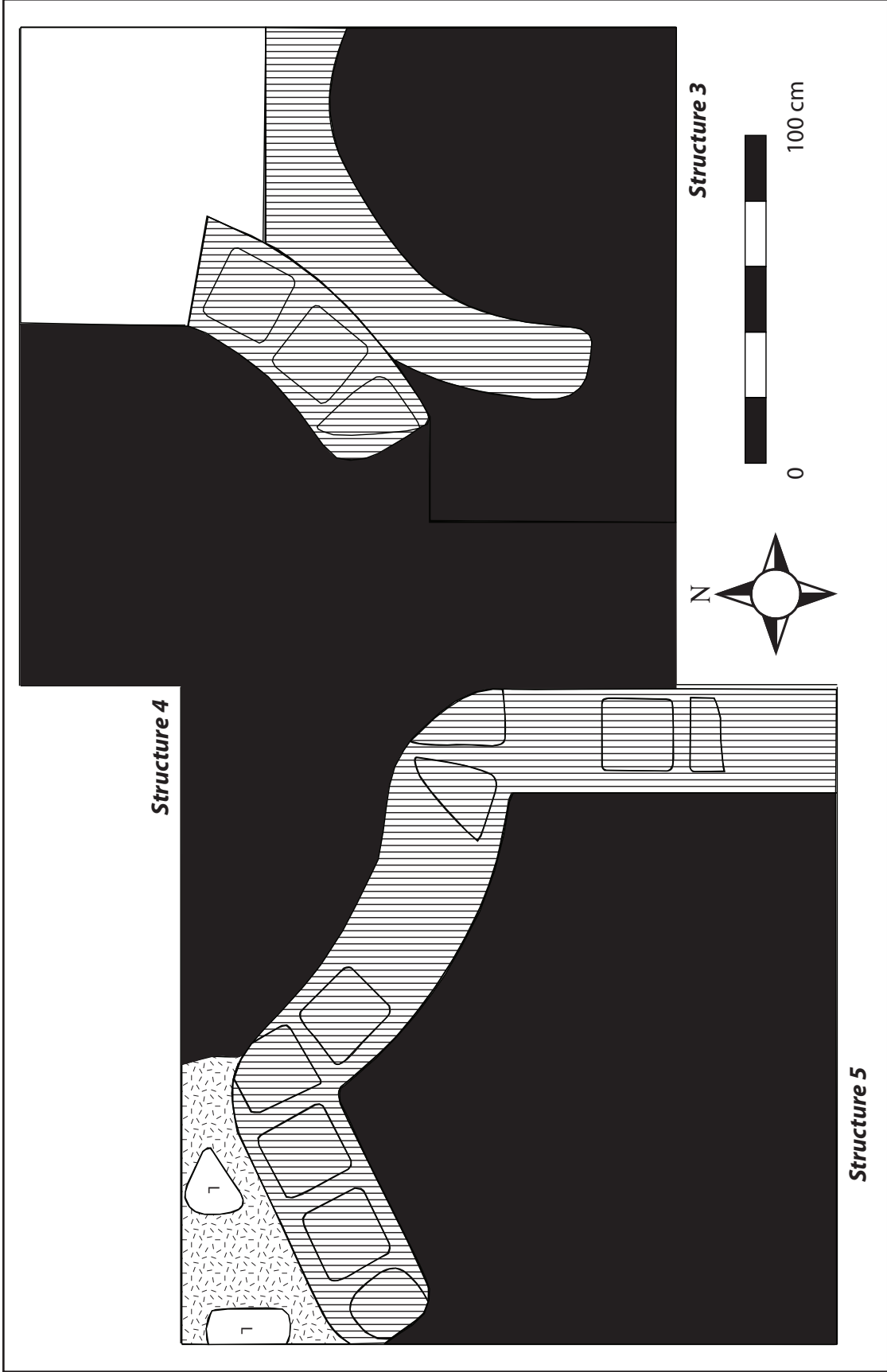


Figure 4.22: Unit B Extensions 1 and 2 Episode 7, 2.0 meters (Mound 4)

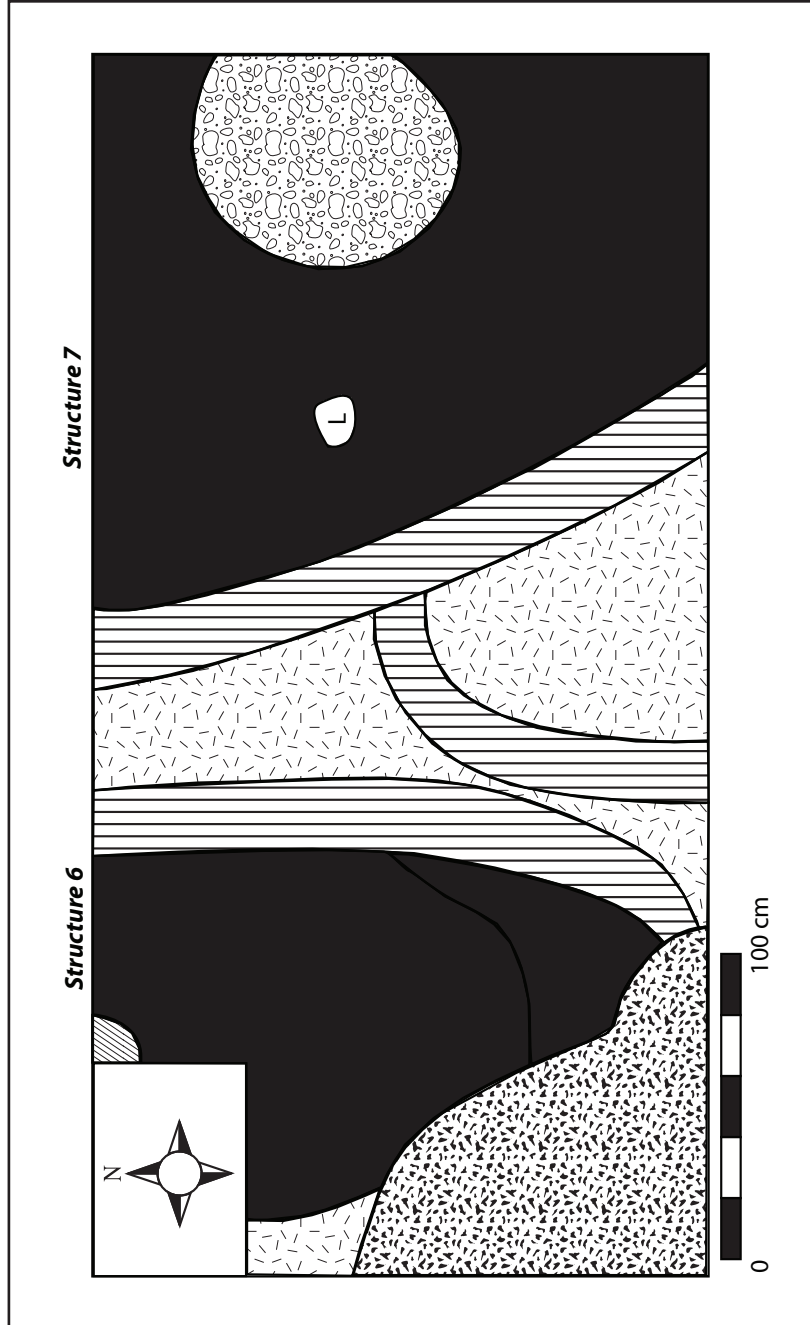


Figure 4.23: Unit B Episode 8, 1.1 meters (Mound 4)

Structure 6 was cut partially in half by a later ash pit (Episode 10 to be described below). To its southeast was a small retaining wall that enclosed a small space and connected to a courtyard wall. This straight wall enclosed the eastern third of the main unit running diagonally north/south and measuring 22 cm thick. On the other side of the wall was a paved courtyard (Structure 7) with some domestic debris (groundstone, pottery) on the surface. Also in Structure 7 was a burial pit (50 cm in diameter) along the eastern wall, dating to a later period. It is unknown whether Structure 7 was roofed, as the deposits resting on the floor were dug into several times for the burial and trash pits, destroying a clear view of the abandonment.

Part of the same depositional episode was a trash lens, 15-20 cm thick and located in the second extension. This trash layer rested upon the architectural collapse of Episode 7, and contained a diversity of domestic remains.

Episode 9 (0.9-0.6m in the main unit): Directly on top of Episode 8 in the main unit was another architectural level. Structure 8 was a round hut centered 1 m south of where Structure 5 had burned during Episode 8. It was the same size, 2.5 m in diameter with walls 28 cm thick. The eastern half of the unit contained two different round structures, a northern one (Structure 9) that was 2 m in diameter with walls 24 cm thick, and a southern one, Structure 10, that was 2 m in diameter with a wall 22 cm thick. Between the three structures was a storage pot on a paved surface. Following abandonment, these buildings were destroyed by the construction episodes of Episode 10 that involved digging and redeposition of deposits.

Episode 10 (0.4-0.6 m in the main unit, west pit extends down to 1.2 m; 0.5-0.6 m in second extension): This was a general level of architectural debris with some trash, but the primary features of the episode were two large ash pits filled with diverse domestic refuse. The western pit was 2 m in diameter and 80 cm deep, and narrowed continually until the bottom. It was dug through structures from Episodes 10, 9, 8, and 7, and covered almost the entirety of the first extension above Episode 7. The eastern pit was smaller, 1 m in diameter down only 20 cm deep. These pits yielded extensive botanical, faunal remains, and iron implements in addition to pottery.

In the second extension excavations revealed a round building (Structure 11), 2 m in diameter with a wall 28 cm thick. It was located along the southern half of the extension, extending into the profile. A paved exterior courtyard to the north covered the rest of the extension. The pavement was truncated in the northeastern corner by the western trash pit. The architectural feature dated to the same period, and the trash pits

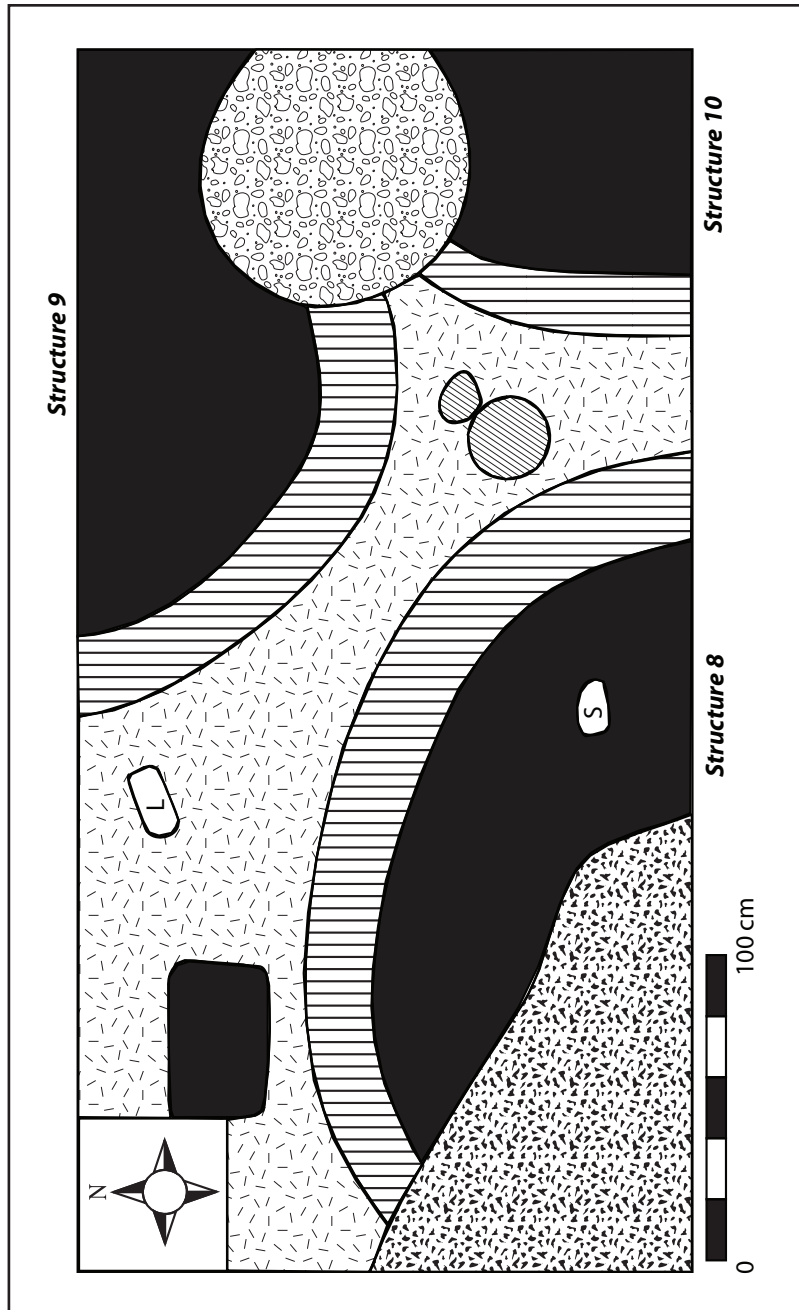


Figure 4.24: Unit B Episode 9, 0.90 meters (Mound 4)

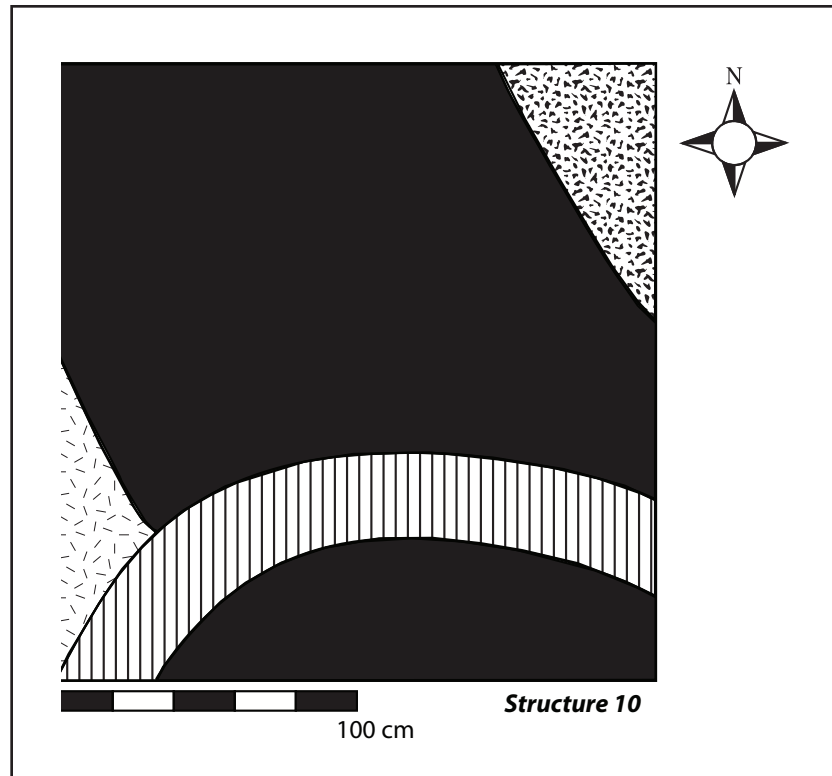


Figure 4.25: Unit B Episode 10, 0.60 meters (Mound 4)

were dug shortly following its abandonment. The two pits were each sealed immediately by the flooring sequence of Episode 11, with no intervening deposition.

Episode 11 (0.2-0.4 m): A structure of unknown shape with a red floor covered the western third of the main unit and parts of both the first and second extensions. A hearth with laterite blocks and intact pots was found in the main unit east of this floor, and a small fragment of another surface was found to the northeast of the hearth.

Episode 12: (0-0.20 m): This corresponded to the plow zone, with highly churned decayed mud-brick deposits containing highly fragmented artifacts.

Unit B Architectural Analyses and General Discussion

In general, two basic deposit types characterized the Unit B sequence. The first occurred below 2.35 m in depth and consisted of a yellow silt deposit derived from the decay of puddled mud architecture. There were eight to nine yellow floors in these levels. Several of the floors in the sequence were burned, and a few had small bowl-shaped hearths. A trash pit 40-45 cm in diameter and 60 cm deep was dug into these early deposits. There was also a smashed large jar on top of a floor.

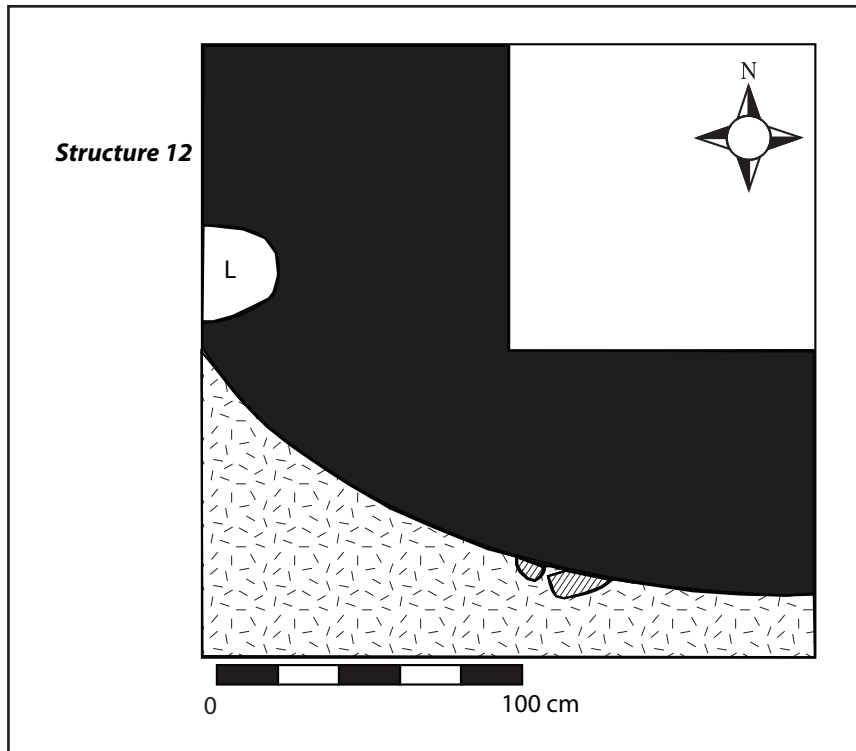


Figure 4.26: Unit B Extension 1 Episode 12 (Mound 4)

The second deposit was derived from the decay of mud bricks. These deposits were built up over a six part series of identifiable construction episodes. Episode 7 alone amounted to between 90 and 100 cm of deposition in the first and second extensions, due to the intense burning and quick collapse.

Unit B had generally well-preserved architectural remains that allow us to make several observations. There were two sizes of huts, a smaller one at 2 m (n=5), and a larger at 2.5 m (n=3); a single non-residential structure measured 1.25 m. While in general these huts did not contain additional architectural or material features, it was the case that two different sets of buildings burned down, revealing a diversity of in situ materials and evidence for architectural techniques.

Episode 7's buildings contained large amounts of pottery and were roofed employing a terrace technique. Structure 5, a non-round building, was two stories high, and several large pots were found on top of the floor fragments that lay upon the collapsed roof beams. Structure 3 was a unique, 2.5 m in diameter, non-residential round building with multiple doors constructed of square bricks. This structure also contained a large quantity of jars and pots of varying sizes upon which the roof fell after it was burned. The smaller adjacent Structure 4 contained fewer pots, but also had burned down.

In the next construction episode (Episode 8), Structure 7, a 2.5 m in diameter

round hut, was built almost directly over the collapsed remains of Structure 3. It also burned down, with roof fragments and burned beams resting on the floor and crushing at least one pot. The only hearth found in the Unit B deposits was in an unpaved area of courtyard. The evidence from Unit B matches that of Unit A suggesting that all paved spaces may have been roofed, meaning that almost the entire excavated area of Unit B starting with Episode 7 was interior space. This fact would explain the relatively small amount of trash found, as it would have been deposited outside the habitation areas.

Unit C (Mound 3)

This unit was excavated on Mound 3 in 2006 to explore the western boundary of the village next to the drainage. A 3 x 2 m unit was placed at the summit of Mound 3. At 1.5 m depth, the excavation was limited to a deep probe (.85 x 1.05 m) that reached sterile at 3 m depth (in a slightly smaller space measuring .80 x .825 m). The total volume of the excavated unit was 9.2 m³, and the total number of stratigraphic levels was 107.

The 2.9 m sequence can be divided into 10 identifiable depositional episodes. The archaeological deposits consisted mainly of a variety of mortuary features and domestic debris, including architecture, activity areas, artifacts, and other economic data (see Figures 4.27-4.32).

Episode 1 (2.9 m): An unexcavated inhumation (Burial 1) set into laterite bedrock extended into the west profile.

Episode 2 (2.9-2.1 m): An accumulation of yellow silt deposits with occasional pockets of trash and ash. There was no evidence of architecture.

Episode 3 (1.5-2.1 m): The bottom of this matrix provided the first evidence of architecture at Unit C, with a small round structure 50 cm in diameter (Structure 1) made of mud bricks that were 17 cm thick. Above this, there was an accumulation of yellow silt deposits with occasional pockets of ash and trash. In this layer there was at least one burial (Burial 2, unexcavated) at 1.6 m depth.

Episode 4 (1.5-1 m): In the western half of the unit there was a round mud brick structure (Structure 2) with a yellow floor 1.5 m in diameter. Structure 2 was fairly ephemeral in construction and also highly damaged due to later burial episodes that truncated it in several places. South of the structure there was a patch of burned earth. An unexcavated burial (3) was uncovered to the east of this structure at 1.6 m, and post dated the

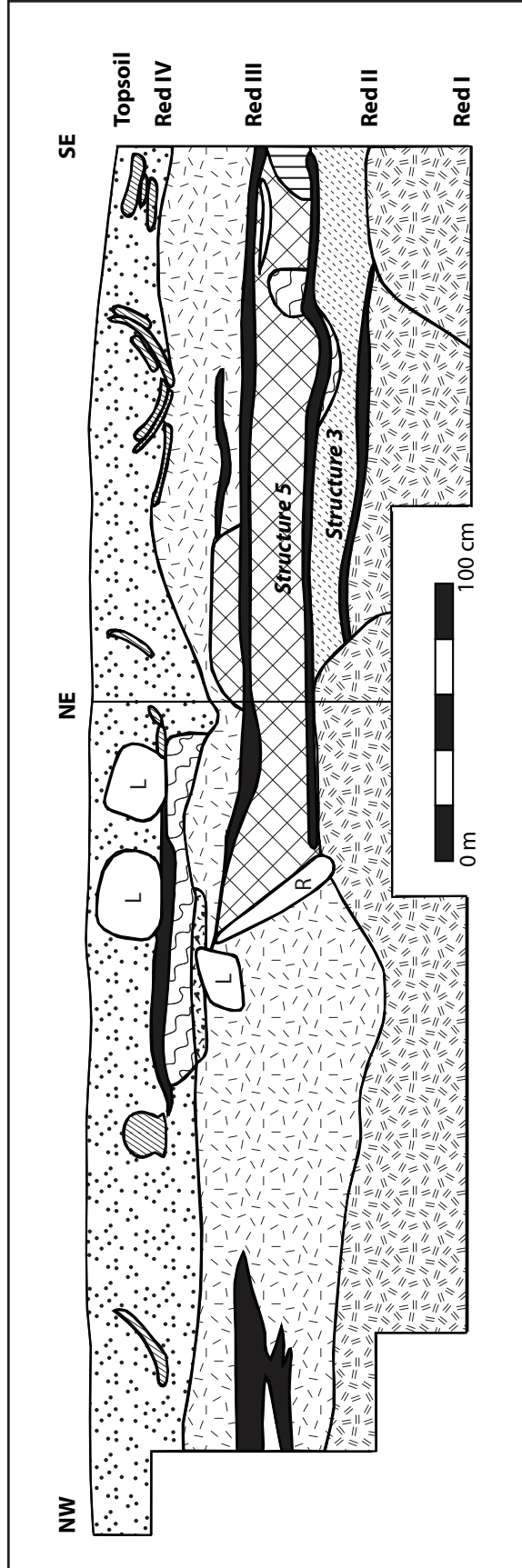


Figure 4.27: Unit C North and East Profiles (Mound 3)

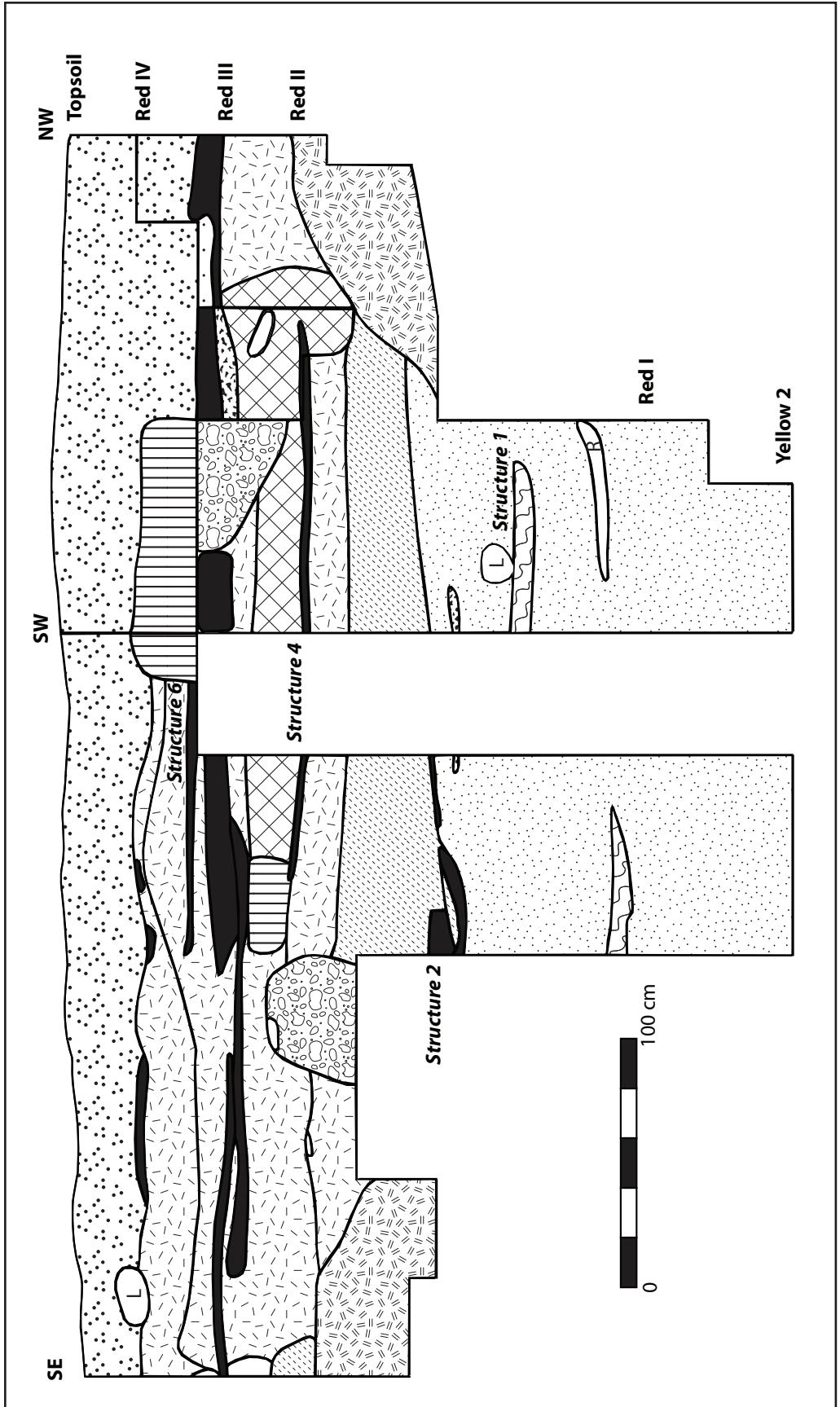


Figure 4.28: Unit C South and West Profiles (Mound 3)

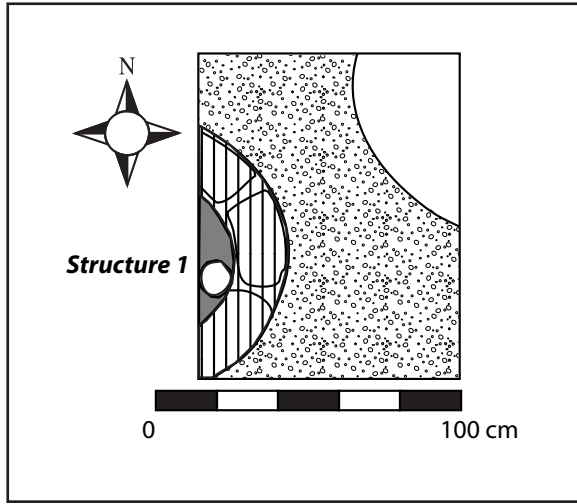


Figure 4.29: Unit C Episode 3, 2.1 meters (Mound 3)

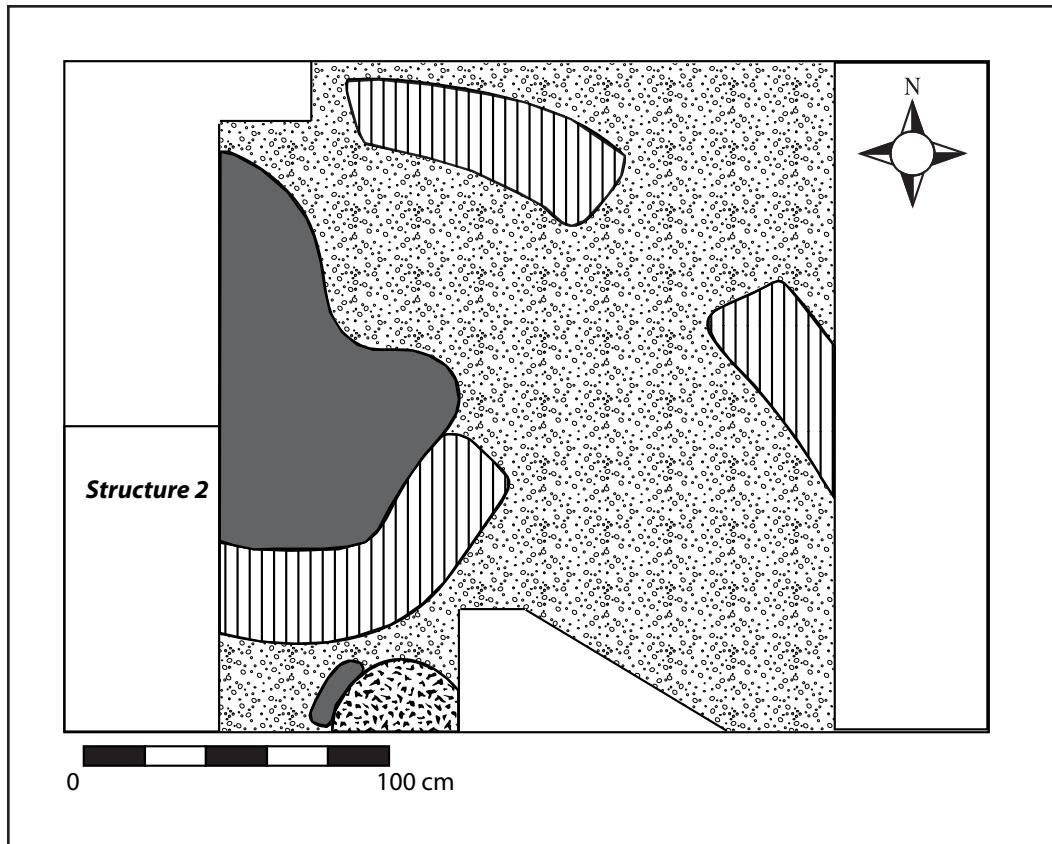


Figure 4.30: Unit C Episode 4, 1.5 meters (Mound 3)

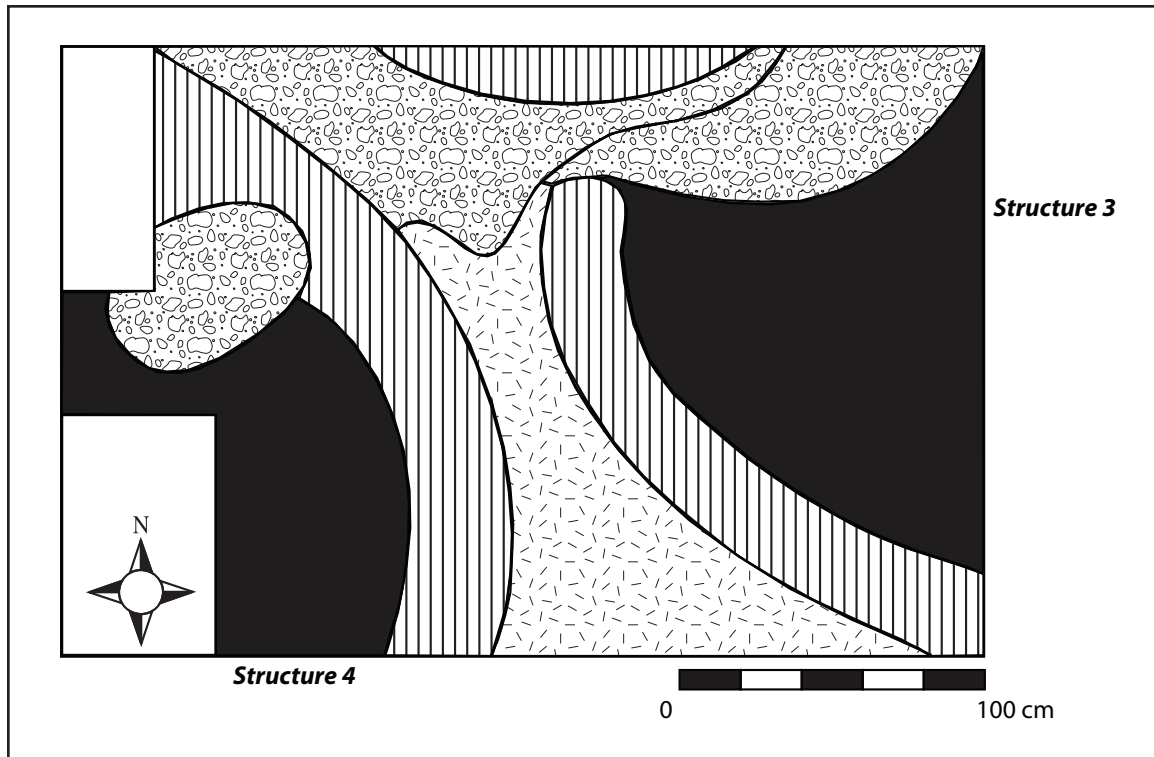


Figure 4.31: Unit C Episode 6, 1.0 meters (Mound 3)

construction. These deposits were covered by fill composed of mud brick melt.

Episode 5 (1.3- 0.75 in the eastern side of the structure): Following the deposition of fill over Episode 4, a 50 cm deep burial pit was excavated into the eastern half of the unit. Within this pit were at least 9 burials (Burials 4- 12), of which six were excavated and three (along the eastern wall) left in place. These were covered with a loose mud brick fill containing pottery and other trash. The fills used in Episodes 4 and Episode 5 were very different, with a distinct line between the deposits. It is not known whether the burials were all part of the same episode or whether they were individually interred over time.

Episode 6 (1.0 - 0.85 m): This was the first well-preserved architectural level with good evidence for occupation on the mound. Two round structures were identified. The eastern building (Structure 3) was 2 m in diameter with walls 26 cm thick; the western building (Structure 4) was also 2 m in diameter, but with a 30 cm thick wall. There were two burials that postdated this occupation, one in the space between the structures (Burial 13) and one placed in Structure 3 after its abandonment (Burial 14). The Episode 5 burial feature crept up in the north of the unit in this phase, as the underlying deposit was softer

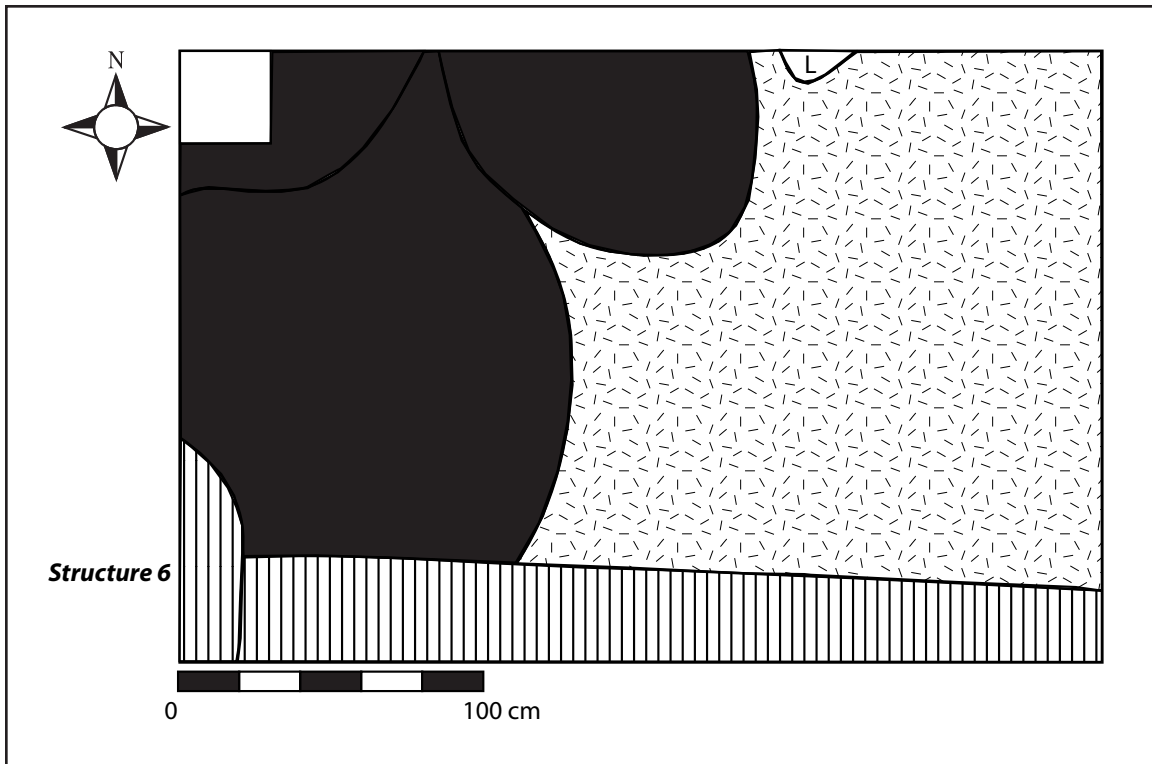


Figure 4.32: Unit C Episode 8, 0.60 meters (Mound 3)

than the heavy floors above.

On the floor of Structure 4 were the remains of a terraced roof, above which was a small amount of wall melt. Structure 3 was filled mainly with wall decay with some domestic debris.

Episode 7 (0.6- 0.85 m): This was a courtyard (Structure 5) in the eastern half of the unit enclosed by a wall, slightly off north/south and 26 cm thick. Inside the courtyard in the southeast there was a small hearth made of mud bricks (12 cm thick wall) on the paved court. There was a second wall directly to the west of the first courtyard wall; this may have been an exterior wall, as the space to the west of it was unpaved and filled with trash and architectural debris. Parts of this structure may have been roofed, as fragments of flooring material lay disarticulated in the abandonment layer that rested upon the floor.

Episode 8 (0.4- 0.6 m): A thick floor covered the entire unit. The individual structures were mostly indiscernible. A burned structure (Structure 6) in the extreme southwest of the unit could be an activity area (to be explored in the future). Along the south profile was a thick exterior compound wall, with a burned spot (possibly a hearth) located up against it in the center/south of the unit. Above these floors was a deposit of architectural decay.

Episode 9 (0.1-0.4 m): An activity area with 24 broken jars distributed around the unit right underneath the mound surface. There were a few patches of degraded floor in the northeast of the unit that may have extended all over this area in the past.

Episode 10 (0-0.1m): A thin layer of topsoil. It was particularly thin, as the large and dense concentration of jars right below the surface has precluded farmers from plowing or digging here. The surface of the mound was consequently quite hard compared to other mounds, with a cap of laterite pebbles.

Unit C Architectural Analyses and General Discussion

Three basic deposit types characterized the Unit C sequence. The first was found below 1.5 m in depth and consisted of a yellow/gray silt matrix likely derived from the decay of puddled mud or highly churned mud brick architecture. No floors were found in this deposit; however, a burial was interred within it. The only architecture was a single small (50 cm in diameter) mud brick structure of unknown function.

The second matrix was a level of several mortuary episodes with limited evidence for habitation. It was primarily composed of loose fill deposits with domestic debris. A burial was interred in the bottom of this matrix. Directly above, at 1.5 m depth, an ephemeral structure of unknown use was constructed. Other burials were interred in and around the structure after its abandonment. A fill composed of mud brick melt with some domestic debris was laid atop these burials and the abandoned structure. After this, a pit was dug into these deposits, and the depression was used for the burial of a number of individuals. A different fill of a slightly looser composition was used to close the pit.

The third deposit was derived from the decay of mud bricks, and was not primarily fill. These deposits built up over the course of a four-part building sequence that included huts and courtyards with domestic debris in context. The earliest occupational evidence, Episode 6, marked a shift at Mound 3 from a primarily mortuary feature to an occupation mound. It was composed of two adjacent huts, each 2 m in diameter. One of these huts (Structure 4) had evidence on the interior for a terraced roof, as did a courtyard in the next architectural series (Structure 5).

This sequence was slightly different from the ones in Units A and B. The bottom layers contained a set of burials intentionally covered by domestic debris. The type of debris used to cover burials at the site changed concomitant with architectural technology (e.g., early fills composed of puddled mud decay and later fills composed of mud brick decay). This is an interesting case of a cultural practice (burials covered with domestic debris) remaining the same while the materials (puddled mud/mud brick) used for it changed with cultural innovations.

Unit E (Mound 11)

In 2006 this unit was placed on Mound 11, the lone mound to the north of the main cluster. The isolated location of this mound required investigation, as it was deemed not sufficiently similar to Mounds 9, 10, and 13 to be the end-product of equivalent formation processes, or even to be from the same time period. A 2 x 2 m test unit was placed at the summit. It was reduced to a 1 x 2 m trench at 1m depth, and further reduced to 1 x 1.65 m at 1.3 m depth; then it was reduced to 1.3 x 1 m at 1.8 m depth, to 1 x 1 m at 2.1 m depth, and finally to .75 x 1 m at 2.85 m depth; sterile soil was reached at 3.15 m. The total volume of the excavated unit was 6.4264 m³, and the total number of stratigraphic levels was 64.

The 3.1 m sequence can be divided into 6 identifiable depositional episodes. The archaeological deposits consisted mainly of a variety of domestic debris, including architecture, activity areas, artifacts, and objects yielding economic data (see Figures 5.30-5.35).

Episode 1: (3.1-2 m): The earliest occupation level was an accumulation of yellow silt deposits with occasional pockets of trash and ash, founded on sterile yellow clay. Within this layer there was an intact tuyere in addition to a deposit of charred plant remains.

Episode 2: (1.8-2.0 m): A yellow floor marks the first identified architectural remains.

Episode 3 (1.05-1.8 m): The first building (Structure 1) was a round mud brick hut an estimated 1.8- 2 m in diameter with a wall that was 22cm thick. There was a possible paved floor outside the structure. Structure 1 was filled after abandonment with domestic debris containing ash and organic remains (80 cm deep in the north part of the hut; the south part held predominantly mud brick decay).

Episode 4 (0.9-1.05 m): The second level of domestic architecture, with a building (Structure 2) in the southeast of unknown size that was re-floored at least once. There was another structure in the northeast corner of the unit (Structure 3), 2 m in diameter with a wall 28 cm thick. On its floor was found a “tool kit” containing potsherds, a lump of hematite, and a large block of chert. To the west of both structures lay an unpaved courtyard. After abandonment, the structures and courtyard filled with architectural collapse and domestic debris.

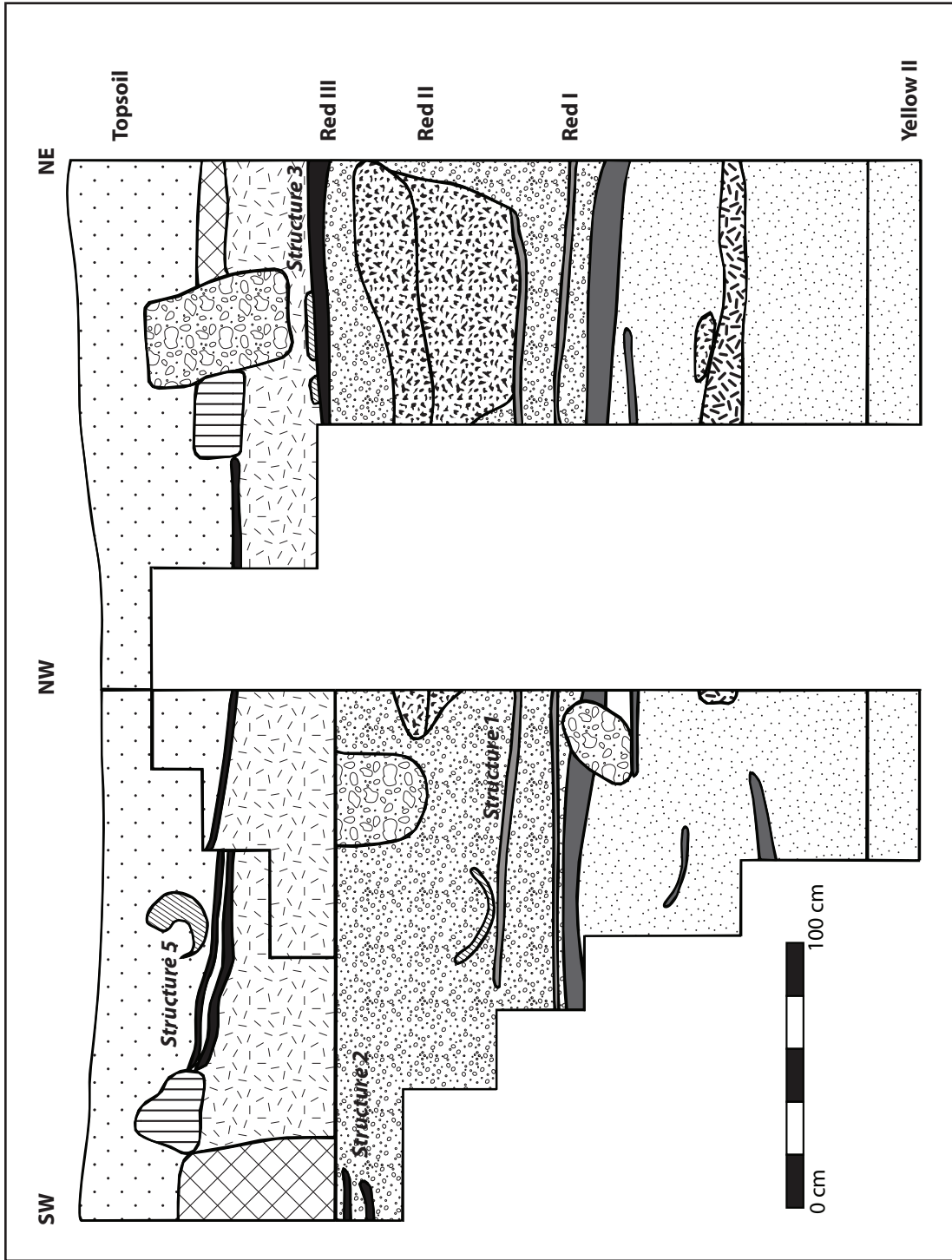


Figure 4.33: Unit E North and West Profiles (Mound 11)

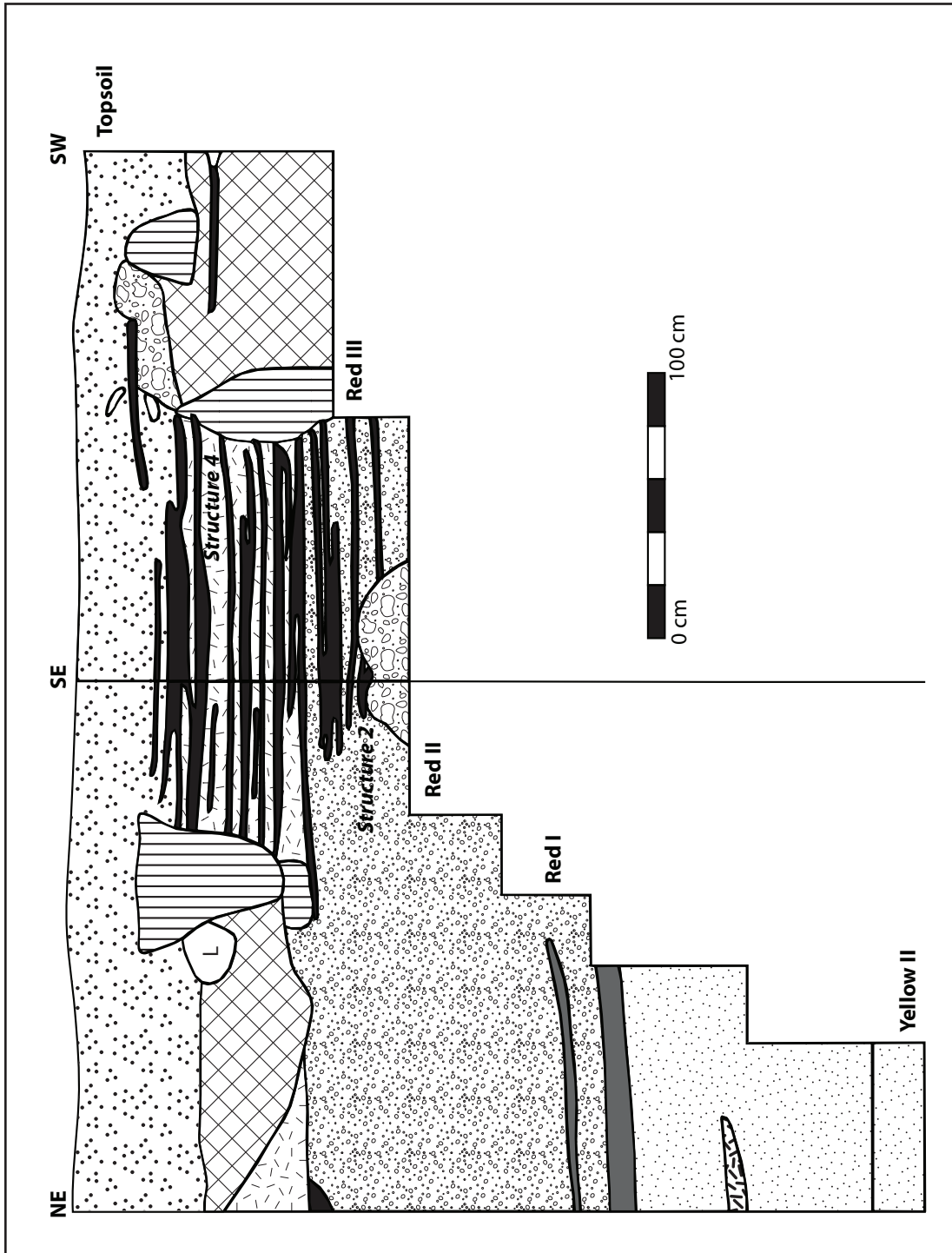


Figure 4.34: Unit E South and East Profiles (Mound 11)

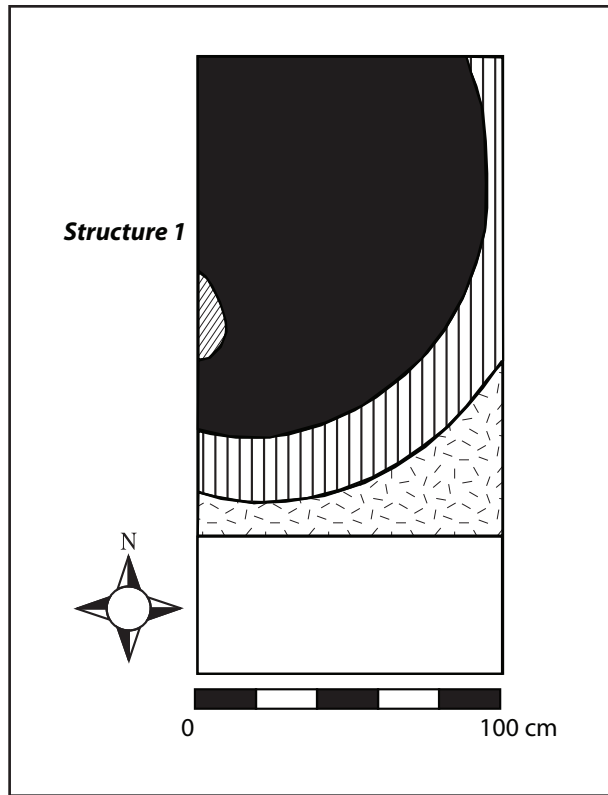


Figure 4.35: Unit E Episode 3, 1.8 meters (Mound 11)

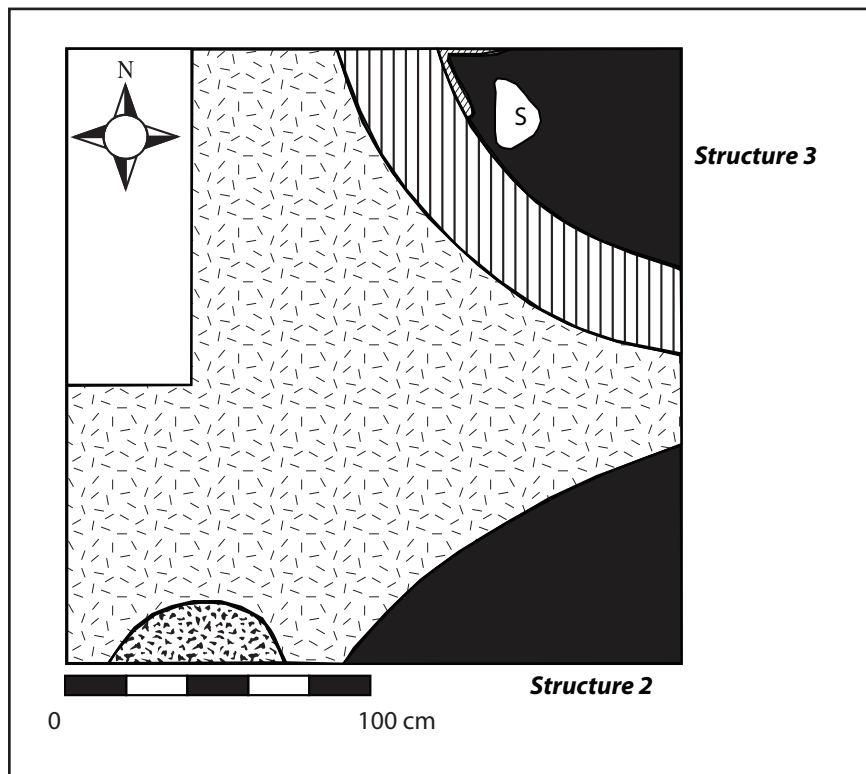


Figure 4.36: Unit E Episode 4, 1.0 meters (Mound 11)

Episode 5 (0.3-0.9 m): There was a round structure (4) in the southeastern corner, 108 cm in diameter with a wall 20 cm thick. Two blocks of laterite were found outside to the north. The structure was maintained through a series of at least seventeen re-flooring episodes measuring 60 cm in total thickness. The process of repeated re-flooring was different from that seen in other structures at Kirikongo, since between each floor there were 1-2 cm of ash. To the north of Structure 4 was a gravel surface that yielded two whole pots left upside down. To the west of the structure was a small trash deposit. Later on in the same episode, another small structure (Structure 5) was built; it was 1.15-1.2 m in diameter along the west profile, with a wall that is 28 cm thick. There was an upside down pot on its surface.

Episode 6 (0- 0.3 m): A thick layer of topsoil. This mound had been often plowed, and the topsoil layer was deep and very well churned.

Unit E Architectural Analyses and General Discussion

Two basic deposit types characterized the Unit E sequence. The first was found below 1.8 m depth, and consisted of a yellow-silt matrix derived from the decay of puddled mud architecture. At least four yellow floors were found in this deposit, as were burned surfaces with charred plant remains and, in one case, fairly intact iron-working debris. Small ash lenses yielded domestic trash. The second deposit was composed of mud brick decay from a four-part building sequence that included both residential and non-residential structures.

There were two size classes of round structures in Mound 11: one similar to other domestic structures in other parts of the site, and the second unique in several regards. The first examples (Structures 1 and 3) were both 2 m diameter huts with red or reddish floors. Structure 1 had typical residential remains, including a large ceramic basin that may have been used for washing. Structure 3 yielded a tool kit related to pottery production, and will be discussed further in Chapter 6.

The smaller round structures were 1-1.15 m in diameter with red floors (n=2). One of these (Structure 4) was re-floored at least seventeen times, a technique not commonly seen in domestic structures throughout the village. A second structure (Structure 5) of similar size was re-floored twice in the same manner. Reference to ethnographic data, coupled with personal observations in regional villages regarding features with these characteristics, suggests that they were pottery kilns. The use of these structures and the activities that occurred during Episode 5 in general will be discussed in Chapter 6.

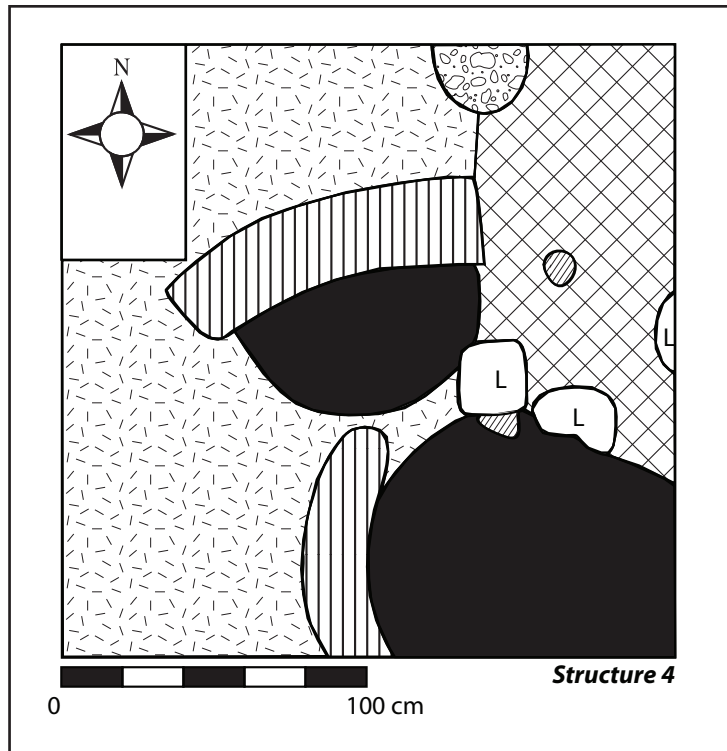


Figure 4.37: Unit E Episode 5 Lower Kiln, 0.80 meters (Mound 11)

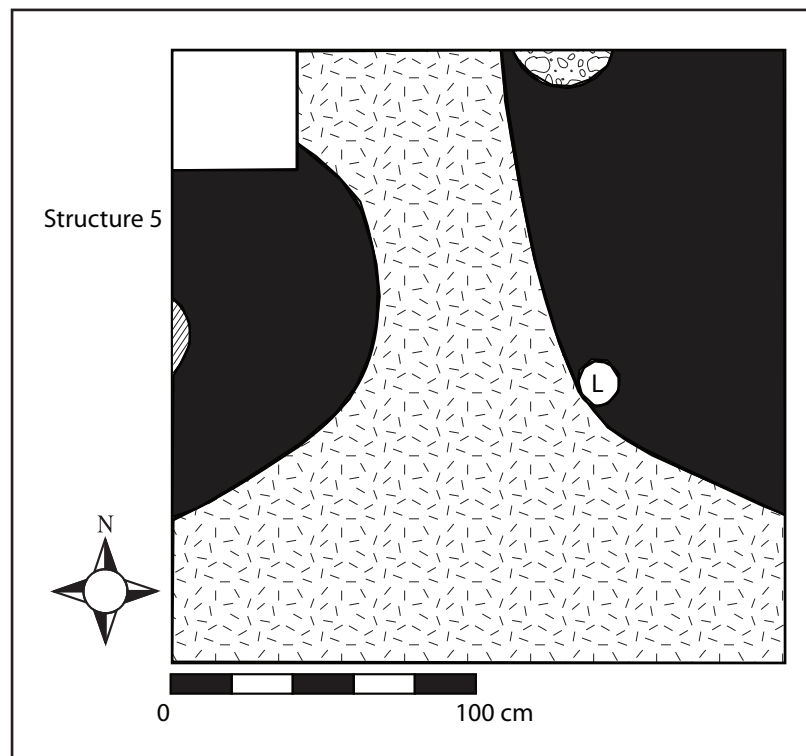


Figure 4.38: Unit E Episode 5 Upper Kiln, 0.30-0.40 meters (Mound 11)

Unit-F (Iron Furnace 1, West of Mound 3)

This unit was placed at the iron furnace located directly to the west of Mound 3. A 1 x 2 m trench was placed near the top of the 40 cm high mound of slag and pottery. This trench was further reduced, directly after cleaning the surface, to a 1 x 1m unit, as the densities of pottery, laterite, slag and other debris were high. Sterile soil was reached at 30 cm. The total volume of the excavation unit was .48 m³, and the total number of stratigraphic levels was 5.

Episode 1 (0-.3 m): There was a mixed (not in situ) concentration of pottery, smelting slag, furnace wall fragments, and laterite, all set on a bed of lateritic basement.

Discussion

The excavations at Kirikongo revealed deposits with well-preserved architecture and thick floors that sealed strata continually over time. There was little evidence of intrusion or disturbance throughout the site. All mounds were occupied for long periods of time, building up thick deposits in all locations. Activities were preserved both in primary contexts and also in the trash that was deposited throughout the levels, sometimes in large ash pits.

Deposits

The deposits can be roughly divided into two general types that coincide with periods of occupation. The first were the yellow-silt deposits found in the bottom layers of all mounds (Yellow Phase). The current evidence suggests that these were formed by the decay of puddled mud structures, with floors constructed of pebbles mixed with clay.

The second type of deposit was found in the upper layers of the explored mounds (Red Phase). This was grayish in color, with a high clay content and inclusions such as laterite pebbles and small pieces of pottery. These were derived from the decay of mud brick architecture. Structures during this phase had brilliant red-colored floors, constructed by mixing and then pounding crushed laterite and clay. The deposits also showed more buildup between flooring levels. This may be because the houses were used longer, or simply because the construction technique degraded less efficiently.

It is clear that all mounds were used primarily for habitation, save for the sequence at Mound C, which had extensive evidence for use as a cemetery in the early part of its history.

Architecture

There were four sizes of round structures found at Kirikongo:

- (1) Small round structures 50- 60 cm in diameter, one that I suggest could be a domestic fowl coops (Unit A), and another that has an ephemeral floor and very low walls (Unit C).
- (2) Small round structures 1 m in diameter that occur in Units B and E, one of which contains a unique flooring sequence; these were not accompanied by domestic debris.
- (3) The most common structures at the site were round huts 2 m in diameter. found in all deposits. These had few internal features; however, one had a bowl in set in the floor and another had artifacts on the surface.
- (4) The largest structures were round huts 2.5 m in diameter found only in the deposits of Units A and B. Several examples had a bench, water jars and the depressions for their installation, and one had a cache of manos within it.

In several places around the village, collapsed roofs were found on the 2 and 2.5 m diameter huts, suggesting that they had flat terraced roofs.

In addition to these categories, it is clear that round buildings were combined with non-round roofed spaces to create composite larger buildings. In Unit B we uncovered a particularly interesting architectural feature that had been destroyed in a fire, preserving sections intact to 50-60 cm in height. It was composed of a 2.5 m diameter round structure with two doors (hallways) extending from it to the south and west. This structure (only half excavated, allowing for the possibility that the other half may have doors going north and east) was built from special square bricks, and contained at least 25 pots in the excavated section, with a sprig of charred sorghum in the center of the room. It was roofed with a terrace technique that had collapsed on the pots. One 2 m diameter hut with a terraced roof and some broken pots in it had a door that opened onto the southern hallway. To the exterior of the large round structure, (in the room created by the western and southern hallways) was a large, raised, unfired mud granary. This granary was destroyed when the terraced roof collapsed during the fire. However, on top of the roof fall was evidence of a second level of architecture. There were several pots above, and these fell on top of the roof remains during the destruction. Units A and Unit C also contained evidence for non-round spaces that were roofed in this manner. Hearths were generally found on unpaved areas; thus activity areas and habitation areas may be distinguished by paving. There seemed to be some differences between the use of round structures and other non-round roofed areas. The round huts often contained some artifacts in them for personal use, while the other rooms had general domestic debris, and in one case a granary for more collective (likely familial) use.

This chapter has highlighted depositional episodes in excavated units and laid out some preliminary patterns and observations of architectural features. The next chapter will provide a temporal framework for comparing the depositional episodes between units.

Chapter 5

The Ceramic Chronology of the Site

This chapter introduces the chronological sequence of the site of Kirikongo. The data presented here enable the ordering of the depositional episodes described in the last chapter, towards the goal of delineating the growth of the community. The relative chronology at Kirikongo is based upon pottery, the most ubiquitous and time-sensitive class of objects found at the site.

Pottery production, as with any technological act, is a social process that is part of a general social system entailing symbolic, economic, political, and religious dimensions (Mauss 1954; Leroi-Gourhan 1943, 1945; Lemmonier 1992). Shared sets of understandings among members of a social group influence the development and performance of specific aspects and combinations of technological actions in an objects production (Leroi-Gourhan 1943, 1945; Lemmonier 1992). The standardization of the process may vary with the social or political characteristics of the producers, as can the degree of detail given to a particular variable.

The number of choices that potters can make in production are immense, and can range from the gestures used, when they are used and by whom, to the raw materials collected and prepared, and the types of tools employed (Leroi-Gourhan 1943, 1945). The aim of production is a functional object (although sometimes the production process itself is the point), however its final characteristics are shaped by temporal or spatially specific technological constraints. These include the availability of raw materials as well as local/regional environmental characteristics (e.g., distribution of seasons, geology, elevation). Social environmental features can sometimes be even more influential in determining an object's final form, as due to local trajectories and histories, societies often have a unique social representation (construct of what an ideal object is supposed to look like) that can have a bearing on the choices made in production, even to the point of compromising the technological efficiency (Lemmonier 1992). Archaeologists have a particularly informed view of the various influences involved in the production of a class of object, since we study the corpus of choices over long periods of time, in particular how an object changes in relation to other societal variables (e.g., environmental change, political transformations).

As mentioned in the introduction, ceramics have been produced in the savanna of West Africa for around 6,000 years. However, archaeological coverage is spotty, and prior to the late 1970's few sequences had been published extensively. Since then, the gaps are beginning to be filled both spatially and temporally [e.g. Kintampo (Stahl 1993; Watson 2005), Iron Age Daboya (Shinnie and Kense 1989), Inland Niger Delta (McIntosh 1995), Lake Chad (Holl 2002), The Gambia (Lawson 2003), the plains east of Bandiagara (Mayor et al. 2005), etc.], but many areas (and even countries) still have received no systematic ceramic analyses. My analysis is highly detailed in order to encourage comparison, a necessary point from which to define regional and interregional events in West Africa, within and between environmental, geographic, and socio-political boundaries.

Methods

Over 26,000 sherds were recovered from excavations totaling 60.2 m³: 8801 from Unit A, 9765 from Unit B, 4013 from Unit C, and 3861 from Unit E, with an overall density of 439 sherds per cubic m. This analysis is one of the first attempts to seriate a pottery assemblage in the Mouhoun Bend, and one of the few archaeological analyses from western Burkina to systematically analyze a pottery assemblage over time. Andah's work to the north (Rim, 1978) and south (Kawara and Sindou, 1980) were important early studies.

Pottery at Kirikongo was recorded in the following manner. First, all body sherds smaller than 2.6 cm were removed from samples, then weighed and counted. In general, sherds of this size were highly eroded and, with the well-attested use of small pottery as temper for mudbrick production, these were removed to avoid obscuring general patterns. A total of 13,054 sherds were removed. While not used in the ceramic analysis these were employed in studies of formation processes at Kirikongo.

This first step left 1719 rims and 11,667 body sherds for intensive analyses, and these were all recorded individually by attribute. For body sherds we recorded the following attributes: interior surface treatment, interior slip color, interior slip position, interior plastic decorations, interior decoration position, exterior surface treatment, exterior slip, exterior slip position, exterior plastic decoration, exterior decoration position, thickness, and state of preservation. For rim sherds and bases we recorded all of the above, but with the addition of rim angle, length of lip, interior diameter, exterior diameter, height, maximum diameter, paste color, firing conditions, and temper size and composition (Figure 5.1).

In addition, to aid in analysis all rims, bases, handles, and legs were drawn, as

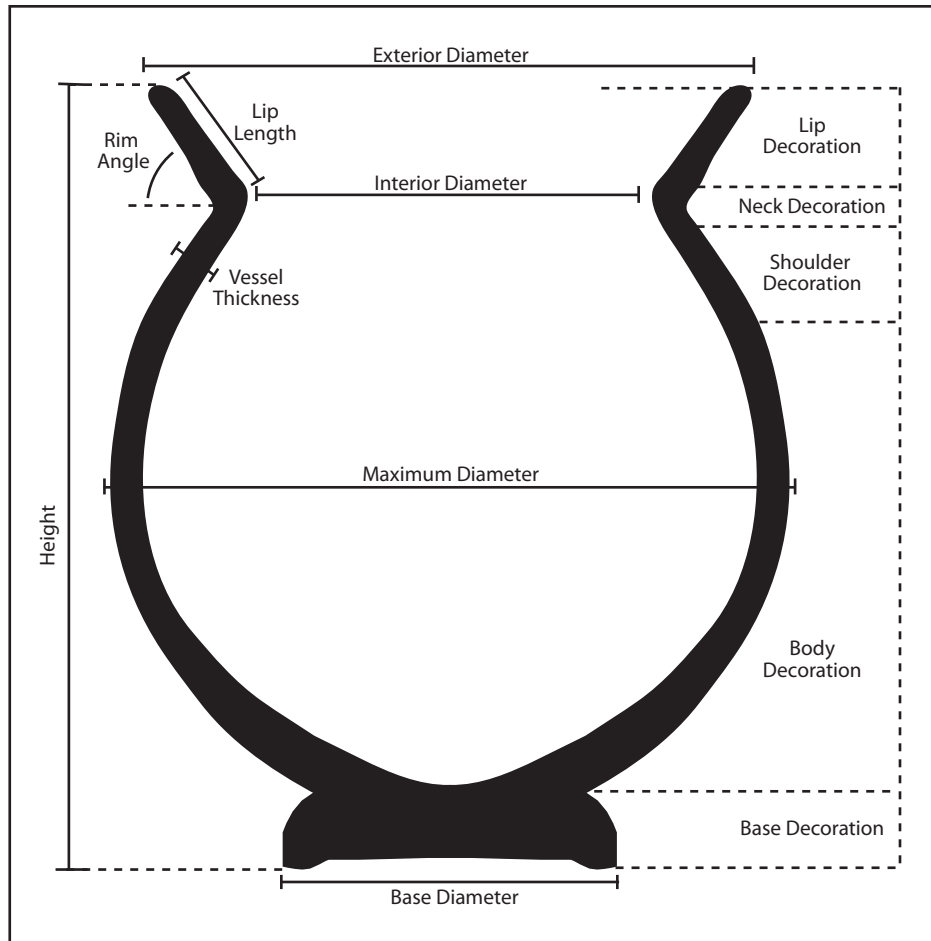


Figure 5.1: Measurement Locations and Decoration Zones

were body sherds with information relevant to technological or decorative techniques. The individual recording of the ceramic assemblage, while time consuming, was based in a framework that suggests that variations in objects are the result of socially performed actions that can be intentional or unintentional. Thus, it is difficult to say during the data recording period what actual aspects will be important during analysis.

The recording methodologies described above are the result of attempts to identify the series of production stages involved in an object's generation by viewing all stages of the general fabrication process. While not all stages are necessarily marked on each sherd, and use and post-deposition processes may erase some variables and create others, this is still a very useful method to discern a general system or dynamics in a system of production that may have meaningful social context. At the very least, temporal variability is itself meaningful.

Type Approaches

The pottery typology at Kirikongo is derived from a stratigraphic analysis. Rims, bases, and handles were first studied in the field, where initial notes on groupings were made, and further refined using drawings later. These studies identified a series of time-sensitive features, in vessel class, form, and decoration.

After extensive analyses of all variables, the form of jars was the most practical foundation for temporal divisions, as jars are the most common vessels in all stratigraphic levels, and their form changed fairly abruptly five times over the sequence here discussed. Other classes of vessel were less numerous and did not change as frequently: for example, one type of hemispherical bowl persists over two observable changes in jar form, another occurs throughout all five. Some decorations were introduced or dropped abruptly during the sequence, but more often changes in decoration technique were gradual and reflected only in shifting relative frequency.

In each jar-defined sub-phase there is an assemblage of vessel types, including jars, basins, bowls, lids, and handles. Types that occur in multiple sub-phases are described in each assemblage of which they are a component part, as specific features of the type, including decoration, may change slightly. This approach prevents the jar-defined periods from obscuring variability in the other vessel classes and provides a better framework for exploring the social context of vessels over time. A primary advantage of this approach is that types show combinations of variables that may provide at least preliminary insights into when a certain class of vessels was made “right”. While individual variables are easy to separate out by a researcher, the potters themselves may have seen certain combinations as intertwined.

The grouping of vessels into the types presented here does not obscure the attributes they contain as each sherd was individually recorded (see above for details) and these data are used to characterize the variability within each type. Intra-class variability will be a primary form of evidence employed in my discussion of pottery as a social production and indicator of socio-political processes (Chapter 9).

Two wares corresponding with the Yellow (puddled mud architecture) and Red (mud brick architecture) phases were identified in analyses. Ware is here employed to denote two visually dissimilar fabrics that are the result of technological practices in firing (see section on firing below). The five jar based sub-phases are thus labeled Yellow I and II, and Red I, II and III (two later sub-phases Red IV and V postdate the events discussed here).

General Characteristics of the Kirikongo Pottery Assemblage

Pottery at Kirikongo was systematically produced following a general operational sequence that was technologically consistent over the course of the five sub-phases described in this chapter. The characteristics for each stage in production are described below, although variations and specifics will be discussed throughout all presentations of the ceramic data.

The Procurement and Preparation of the Paste

The raw materials, or physical matter that constitute the basic building blocks of pottery, were likely local, as adequate clay sources are found even within the site (under Mound 11). Paste and temper were assessed along clean breaks with the aid of a small hand lens. The main temper used was grog (2-3 mm in diameter) obtained from crushing old pottery, usually combined with small amounts of sand and organics. This combination is dominant throughout the sequence, being found in 96% of the rims from Yellow I to 82% in Red III (see Table 5.1). Very rarely, laterite pebbles were added. The hematite used for red slips was also locally common.

Vessel Formation

Great variability in techniques can be found in this stage of production, and while generally conservative in most regards, the large part of temporally sensitive variability identified at Kirikongo is derived from vessel formation. Evidence based upon complete vessels from Red III suggest that by this time at least, pottery was first formed by the method of hollowing a lump (e.g., Mayor 2005: 41, Figure 8). Coils were added above the lump, the last of which was a coil for the rim. As will be seen below, variations in the lip shape (a time-consuming learned activity) was a primary form of evidence for identifying diachronic and synchronic diversity in Kirikongo's pottery.

Decorations

Decoration is here defined as all external treatment of the vessel (sometimes including parts that are functional to jar usage). I recorded the sequence and range of decorative techniques responsible for the final vessel appearance. Consistently over the occupation, most parts of most vessels received decoration (90% of body sherds), such that undecorated spaces were the exception. The extensive decoration was likely both for physical (e.g., gripping pots) and aesthetic functions.

My analyses determined that vessel decoration followed an ordered sequence, with the idealized decoration sequence (1) Twine impressions, (2) Carved Roulette impressions, (3) Channels/incisions/plastic attachments, or (4) Red Slip, (5) Polishing.

Temper	Yellow I		Yellow II		Red I		Red II		Red III		Totals	
Grog + organics	1	4.5%	1	2.9%	5	4.8%	3	3.9%	17	15.3%	27	7.8%
Grog + organics + sand	21	95.5%	33	97.1%	96	91.4%	69	90.8%	91	82.0%	310	89.1%
Grog + sand	0	0.0%	0	0.0%	1	1.0%	0	0.0%	1	0.9%	2	0.6%
Grog	0	0.0%	0	0.0%	0	0.0%	1	1.3%	0	0.0%	1	0.3%
Grog + organics + sand + white	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	0.9%	1	0.3%
Organics + sand	0	0.0%	0	0.0%	2	1.9%	0	0.0%	0	0.0%	2	0.6%
Organics + sand + white	0	0.0%	0	0.0%	1	1.0%	0	0.0%	0	0.0%	1	0.3%
Laterite	0	0.0%	0	0.0%	0	0.0%	1	1.3%	0	0.0%	1	0.3%
Laterite + grog + organics	0	0.0%	0	0.0%	0	0.0%	1	1.3%	1	0.9%	2	0.6%
Laterite + sand	0	0.0%	0	0.0%	0	0.0%	1	1.3%	0	0.0%	1	0.3%

Table 5.1: Temper Combinations by Period

This sequence was consistent over the entire span of pottery production at Kirikongo. If vessels lacked twine decoration, then the order followed the same sequence, starting at step 2. Evidence for the zonation of decoration techniques (where they occur on the vessel) will be presented in the discussion of each phase, as they are less consistent over the course of occupation.

The decorative techniques are presented in this section following the same sequence described above, starting with twine. Slight differences in similar decoration techniques were recorded; however, in many ways these represent the same social representation, or evolution in that representation. While the range of decorations described is wide (see summary in Table 5.2 and Figure 5.2), the range of techniques that were *commonly* used was just a small portion of these. The descriptions below therefore do not suggest any prominence in use.

Twine Decoration

If present, rolled (rouletted) twine impressions were the first decoration technique used on vessels at Kirikongo. The most popular twines were various twisted twines and knotted strip twines. Nineteen twine motifs were documented.

Unknown Twine: T1 (messy twine pattern): a twine decoration that was applied messily, with no discernable pattern, characterized by smearing and overlap. While identifying the specific twine responsible was difficult, it usually seems to have been produced using a twisted twine.

Twisted Twines: Rolled and Impressed: T2, T8, T10, T17 and T18: These are all twisted twine decorations that create rows of oval impressions. T2 is a twisted twine that was rolled over the vessel body at a 45 degree angle; identical to McIntosh's Twine 6 (1995; see also Mayor 2005:36, Figure 4). T8 is the same twisted twine but impressed, rather than rolled over the vessel. T10 is a loosely twisted version, such that the beads when rolled create a slightly "peanut shaped" impression rather than discrete ovals. T18 is a similar technique of a twisted twine, but the type of twist made resulted in a slightly different impression, most similar to Hurley's twine no. 23 (1979:24). T17 was the impressed version of T18.

Uniformly Twisted Combined Twine: T19: Created a raised square (checkerboard) pattern similar to Hurley's no. 37 (1979:29).

Accordion Pleated Twine Roulettes: T3, T7, T22, T23: These are all patterns produced by rolling an accordion-pleated twine roulette over the vessel. These create raised ovals or sometimes squares in rows. T3 is distinguished by identical rows of ovals in bands that create a raised checkerboard. T7 is the same, except the ovals in adjacent rows are offset.

Major Twine/Roulette	Twines Present	Details
Unknown Twine	T1	Applied with no discernable pattern
Twisted Twines	T2, T8, T10, T17, T18	T2- oval impressions rolled at a 45 degree angle. T8- impressed T2. T10- Loosely twisted rolled version, creating impressions with multiple beads. T18- Slightly different twist that when rolled creates half-ovals. T17- impressed T18.
Uniformly twisted combined twines	T19	When rolled creates a raised checkerboard pattern
Accordion Pleated twines	T3, T7, T22, T23	All create raised ovals/rectangles in rows when rolled over surface. T3- identical rows. T7- offset rows. T23- rectangular version. T22- T3 with alternate length rows.
Braided twines	T4 and T5	Cornstalk pattern when rolled. T5- Single "ear" on stalk. T4- Double "ear" on stalk.
Knotted Strip twines	T6, T9, T24	Several different impressions. T6- alternate knotted strip creates chevron-shaped impressed ovals, more highly inset than twisted twines. T24- is the same and deeply inset, but straight rows, not chevron. T9- is a different knotted twine that creates raised "H" shape parallel ovals in rows.
Twine with segments going in multiple directions	T14	Dispersed raised pattern resembling "confetti"
Toothed carved roulette	R2 and R4	Rows of raised lines with perpendicular teeth extending out. R2- single identical rows. R4- Interlocking rows.
Circular carved roulette	R1, R8, R9, R11, R14	Multiple derivations creating raised ovals/circles. R1- large ovals in closely spaced rows. R8- ovals with a raised line between rows. R9- perfect raised circles in rows. R11- larger ovals more widely spaced. R14- densely packed raised ovals.
Impressed square roulette	R5	impressed boxes in a regularly spaced continuous distribution.
Raised square roulette	R7 and R10	A raised box pattern. R7- raised rectangular boxes. R5- raised squares, the inverse of R5.
Raised star roulette	R13	Regularly spaced raised stars

Table 5.2: Pottery Decoration Techniques

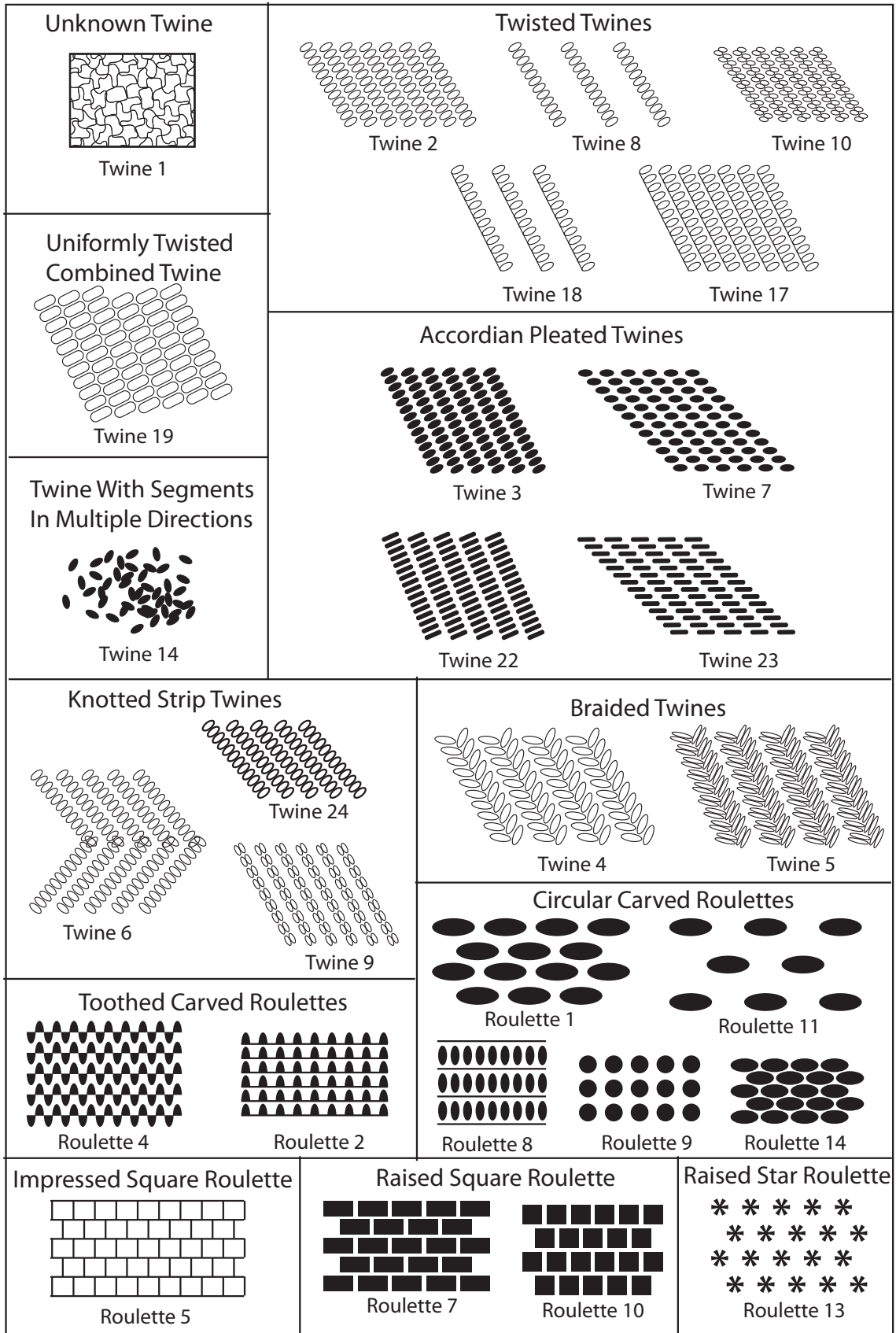


Figure 5.2: Decoration Techniques

T23 was originally thought to be a carved roulette, owing to the more squarish shape to the raised impressions, but is in fact a different type of accordion pleated roulette. T22 is the same twine as T3, except the rows alternate in length.

Braided Twine Roulettes: T4 and T5: These are braided twines rolled over the vessel surface. T5 creates a “cornstalk” pattern similar to ears shooting from a stalk (see Hurley 1979:87, #212). Twine 4 is a double knotted version, with two parallel ears extending from the stalk (see Mayor 2005:36, Figure 4).

Knotted Strip Roulettes: T6, T9 and T24: T6 is an alternate knotted strip roulette that creates a chevron twine pattern of deeply impressed ovals (identical to T2) when rolled over the vessel surface (see Mayor 2005:36, Figure 4 and Soper 1985). T24 is the same twine, except in straight rows, rather than chevron. Twine 9 is a knotted strip roulette that creates raised impressions of two parallel ovals, resembling the letter “H” (Soper 1985:38, Figure 5).

Cord with Segments Going in Multiple Directions: T14 is a dispersed raised pattern resembling “confetti” that coincides with Hurley’s no. 113 (1979:53). This is a “part of the first combination lost” (Hurley 1979:50) type; however, ours differs, as one strand does not intervene with the other.

Rare and Unknown Cords: T13 and T15: These are decorations found in extremely low frequency. T13 is a pattern of raised interlocking diamonds that was produced with an as yet unknown roulette (although similar to a Peigne fileté souple- see Soper 1985:43, Figure 9). Twine 15 is unknown.

Carved Roulettes

A series of carved (likely wooden) roulettes were also used in decoration of the ceramic assemblage, and sequentially follow the use of twine. Defined by Soper (1985:33) as “a rigid cylindrical roulette, usually made of wood, into which various patterns may be carved”, they produce “sharply defined bands of decoration.” Eleven carved roulettes were recorded.

Toothed Carved Roulette: R2 and R4: These are both types of decoration that have rows (raised lines) with teeth extending perpendicular to them. There is some variability in size throughout the assemblage. R2 had a single row, whereas R4 had two that interconnected, an interlocking pattern that looks like the closed mouth of a crocodile (see example of roulette in Frank 1998:43 Figure 38)

Circular Carved Roulette: R1, R8, R9, R11, and R14: These are derivations of a carved roulette (usually wooden) that created raised circular impressions (see Soper 1985:34, Figure 2 for an example of an identical roulette). R1 made large ovals in closely spaced

rows. R8 made raised lines with raised ovals in between. R9 made perfect raised circles in an even distribution. R11 created raised, evenly spaced ovals, both larger and more widely spaced than R1. R14 made densely packed raised ovals.

Impressed Square Roulette: R5: These are impressed boxes in a regularly spaced continuous distribution (see Soper 1985:34, Figure 2 for an identical roulette).

Raised Square Roulette: R7 and R10: These are derivations of a raised box pattern. The roulette therefore has a series of raised lines that form the opposite pattern of R5. R7 has raised rectangular boxes arranged in a checkerboard pattern. R10 is the inverse of R5, with regularly spaced raised boxes.

Raised Star Roulette: Roulette 13 was a rare roulette that created regularly spaced raised stars.

Other Plastic Techniques

In addition to these roulette techniques, a series of other plastic decorations were employed. Channels (CH), 1-2 mm wide, were the most common technique, found on a high percentage of vessels throughout the entire sequence. Incisions (I) that are much narrower than channels were occasionally identified, often as vertical decorations on the lip of a vessel. Impressed decorations using a comb implement (COI) with square-shaped teeth were common around the neck of small vessels. There are occasional examples of rocker-comb motifs (COR) where the comb was pivoted to create a continual zoned area of decoration. Other impressed shapes included a unique impressed triangle motif (IMT), and rare impressed circles (IMC). Fish spine roulettes (FS) were also identified, as were rare dragged twine (DT) decorations. Applied plastic ridges (PR) or buttons (PB) are found on some vessel classes, as are thumb-impressions (TH) and gouges (rough marks on vessel) (DG= diagonal gouges).

Red Slip

After all plastic decorations, a red slip (ranging from Munsell 10R 4/6-5/8- 2.5YR 4/6-5/8) was applied to almost all vessels, often completely over the interior of small vessels, and commonly to all vessels on their lip. Red slips were also commonly used as painted decorations for geometric designs during the Red II and Red III periods. Nearly all the surfaces upon which slip was applied, where plastic decorations did not occur, were burnished.

Firing of Vessel

Data on this stage can be indirect from the pottery itself, or direct from firing events. Firing cores were recorded based upon a system of oxidized/reduced/mixed, as

Color	Yellow I	Yellow II	Red I	Red II	Red III
Orange	55%	43%	11%	9%	11%
Gray	18%	3%	35%	46%	53%
Light Brown	13%	27%	42%	32%	19%
Brown	13%	0%	4%	6%	2%
Black	0%	27%	8%	4%	14%
Unknown	0%	0%	0%	0%	1%

Table 5.3: Paste Color by Period

well as color. The clearest observed pattern was vessel color, throughout the sequence. During Yellow I and II the most frequent color for jars was orange; after this point, gray colored sherds grew in frequency to 53% by Red III (see Table 5.3). This change in color was likely the result of changes in firing environment and higher temperatures, as clay sources were very similar throughout the region.

Most open-fired pottery in West Africa varies in color over the whole of the pot owing to the uncontrolled distribution of firing atmosphere and temperature; however, beginning in Red I, Kirikongo's pottery had only limited evidence for color differences, even on complete pots. There are ethnographic clues in the Mouhoun Bend that help to explain this shift to evenly distributed gray-colored pottery beginning in Red I. The Bwa, one of the major ethnic groups that inhabit the modern Mouhoun Bend, employ kilns to fire their pottery, unique in the central savanna (Frank 1998; Manessy 1960). These kilns are constructed of mud brick, and while not entirely enclosed (the top remains open, although covered with fuel), they produce pots fired at a higher temperature in a reduced atmosphere that are more grayish/tan in color. Kilns are re-floored every year and are used primarily in the dry season. Any pottery fired during the rainy season is still open-fired. A similar pattern at Kirikongo would explain why there are low frequencies of orange and other colors throughout the sequence even when the main assemblage is gray.

Structures that correlate well with ethnographic (and personal observations) of Bwa Kilns were found during excavations at Kirikongo. The best example is Structure 4 from Unit E (Red III). This small, non-residential mud brick structure was re-floored at least 17 times with several burned layers. A pattern not found in residential buildings. A second structure of similar size in Unit E (Structure 5) that had several re-flooring events was found to the northwest of Structure 4. The only other structure of similar size was Structure 2 in Unit B during Red I.

Two Phases with Five Sub-Phases

Five pottery-based periods are the topic of this dissertation. They are Yellow I and II, and Red I, II, and III. Two others, Red IV and V, post-date the processes analyzed here and will be the subject of later work. This section discusses pottery types only from stratified deposits. Unit F's pottery, derived from a mixed sub-surface feature will be discussed with the surface collections. The groups are based on a rigorous and detailed study of the depositional context of all pottery.

As described earlier, sherds from the Yellow Phase (I and II) are from deposits primarily pre-dating construction with mud bricks, and are consequently composed of a slow build-up of trash and limited structural degradation. From these contexts, pottery types were constructed using almost all rims, with the sole exception of highly eroded examples, as re-use of sherds appears to have been less frequent than in subsequent periods. The sherds from Red Phase deposits (Red I, II and III) with mud brick construction were analyzed with greater caution, and large in situ sherds were separated based upon stratigraphic position and degree of preservation. These levels contain certain degrees of "noise" due to the re-use of pottery in construction. However, these were easily separated, since layers of structural decay were stratigraphically distinct.

In the section below, I present five pottery assemblages, diachronically ordered, totaling 33 individual rim types, 6 base types, and 2 handle types. The types are presented holistically, combining traits from various production stages. These full patterns will aid in the later analysis of provenience, as well as synchronic and diachronic variability in production, use and discard.

Yellow I

[(11kg, n=333, 41 Rims, 185 Body, 107 small sherds) (see Figures 5.3 to 5.5 and Table 5.4)]

Type 1: Jars with Thickened Rims (n= 22, 57.9%)

Thickened rim vessels are jars in at least three rim diameter size classes. These are small at 12 cm, medium at 20-32 cm, and large at 42 cm (see Figure 5.2). Vessels range in thickness from 0.9-1.6 cm. There is a weak correlation between vessel thickness and rim diameter. This may be the result of either (1) unstandardized production or (2) that a wide range of specific vessel shapes were made with this rim type. Evidence for vessel shape is known from only one example, an inverted long convex cone with a rim diameter of 42 cm and a maximum diameter of 50 cm. Larger sherds from other vessels resemble this shape and it is likely that it is common in all size classes. No base sherds

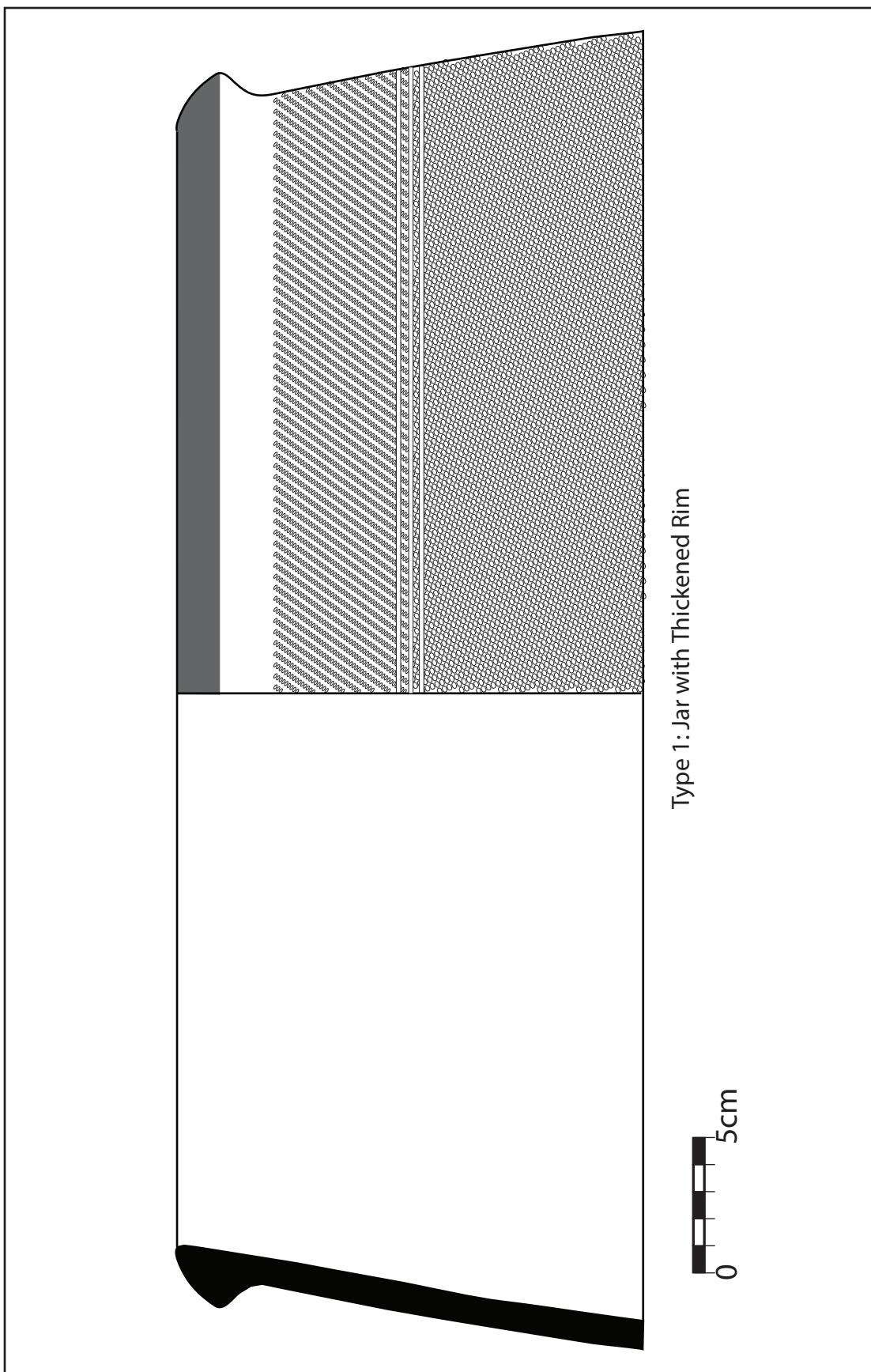


Figure 5.3: Yellow I Ceramic Assemblage: Type 1

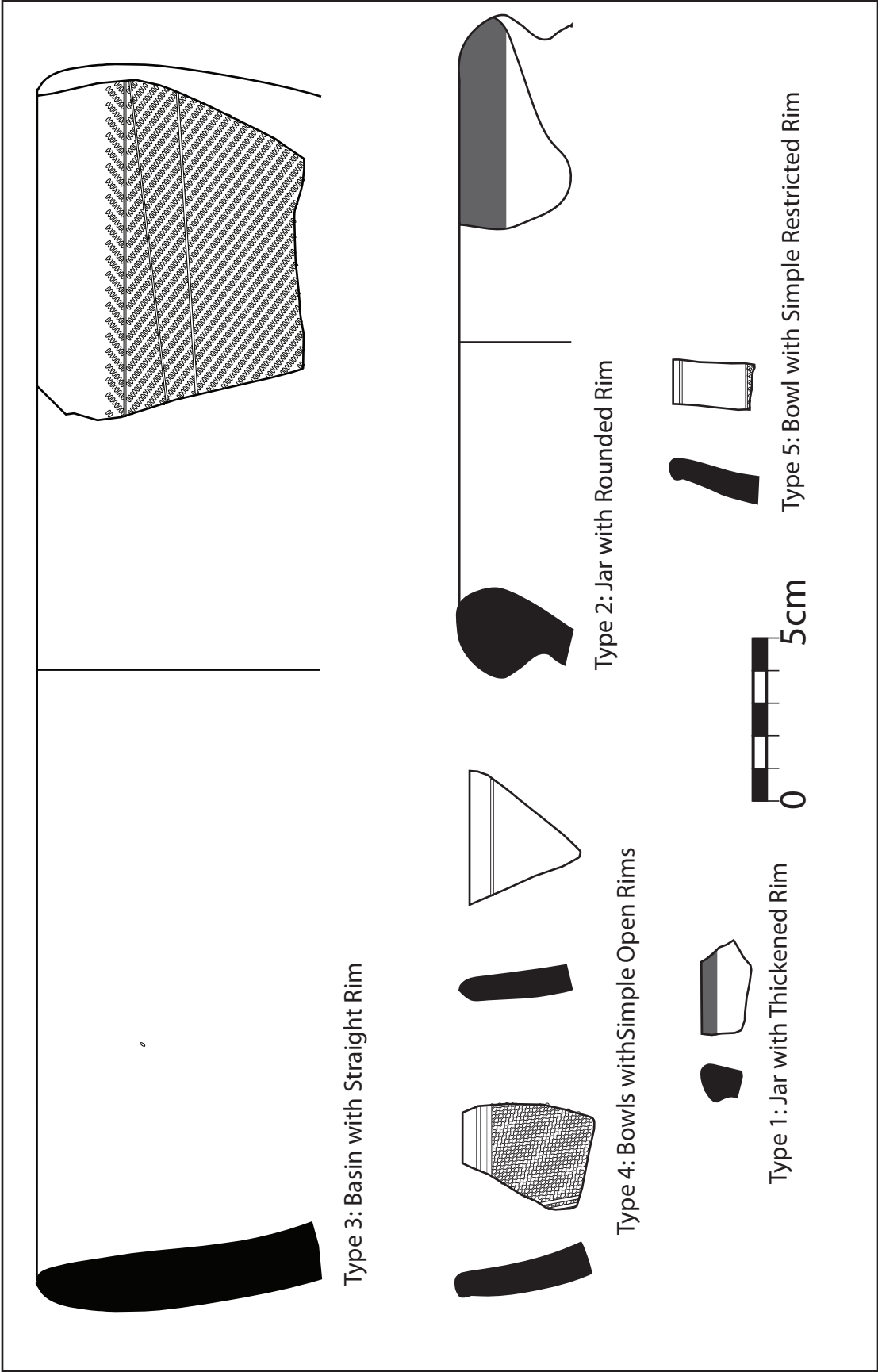


Figure 5.4: Yellow I Ceramic Assemblage: Types 1-5

	Type 1	Type 2	Type 3	Type 4	Type 5	Base Type 1
n	22	2	8	4	2	2
Vessel	Jar	jar	bowl	bowl	vessels	base
Restricted/Open	restricted	restricted	open	open	restricted	
Distinctive Rim/lip Shape	thickened eversion	rounded rim	straight lip	simple open	simple restricted	ring shaped base
Vessel shape	inverted long convex cone with spherical base (one more spherical)		hemispherical	hemispherical	spherical	
Plastic features						
Size Classes	3					
Diameter (cm)	12 (n=1); 20-32 (n=8); 42 (n=1)	21 (n=1)	32 (n=1); 38 (n=1)	14 (n=1)	17 (n=1)	7 (n=1) 9 (n=1)
Thickness (cm)	0.9-1.6	0.9-1.2	1.2-1.7	0.8-0.9	0.7-0.8	0.9
Surface treatment				highly polished (n=4)	highly polished (n=2)	highly polished (n=2)
Interior surface treatment				highly polished (n=4)	highly polished (n=2)	highly polished (n=2)
Lip Decoration						
Neck Decoration	diagonal gouges (n=9)	channel (n=1)	T2 (n=2); T6 (n=3); T19 (n=1)	channels (n=2)	channel (n=1)	
Shoulder Decoration	T24 (n=5)	T24 (n=1); T20 (n=1)	T24 (n=2); T6 (n=3); T19 (n=1)	T6 (n=1) T24 (n=1)		
Body decoration	T2 (n=5)	T24 (n=1); T20 (n=1)	T24 (n=2); T6 (n=3); T19 (n=1)	T6 (n=1) T24 (n=1)		
Base decoration	T19 (n=1)					T24 (n=1)
Zoned						
Body Channels	3		5			
Slip on Rim Top	All	All	All	1		
Interior Slip	lip and neck (n=4); complete (n=1)	lip and neck (n=1); complete (n=1)	lip and neck (n=3)	lip and neck (n=1)		complete (n=1)
Slip on Exterior	complete (n=1)		complete (n=1)	complete (n=1)		complete (n=1)

Table 5.4: Yellow I Assemblage

were recovered for large vessels, suggesting that it is likely they have round bases that were not significantly thicker than the body of the vessel.

In general, thickened rim vessels were decorated with a knotted strip roulette (T24) from below the lip to at least the maximum diameter. The only vessel for which we had sherds from the lower body had been decorated with a uniformly twisted combined twine (T19). A common feature found on the neck is diagonal or vertical gouges (quick incisions) under the lip. Several vessels have channels on the neck (either vertical or horizontal). All vessels have a red slip on the lip top, and one vessel was covered entirely

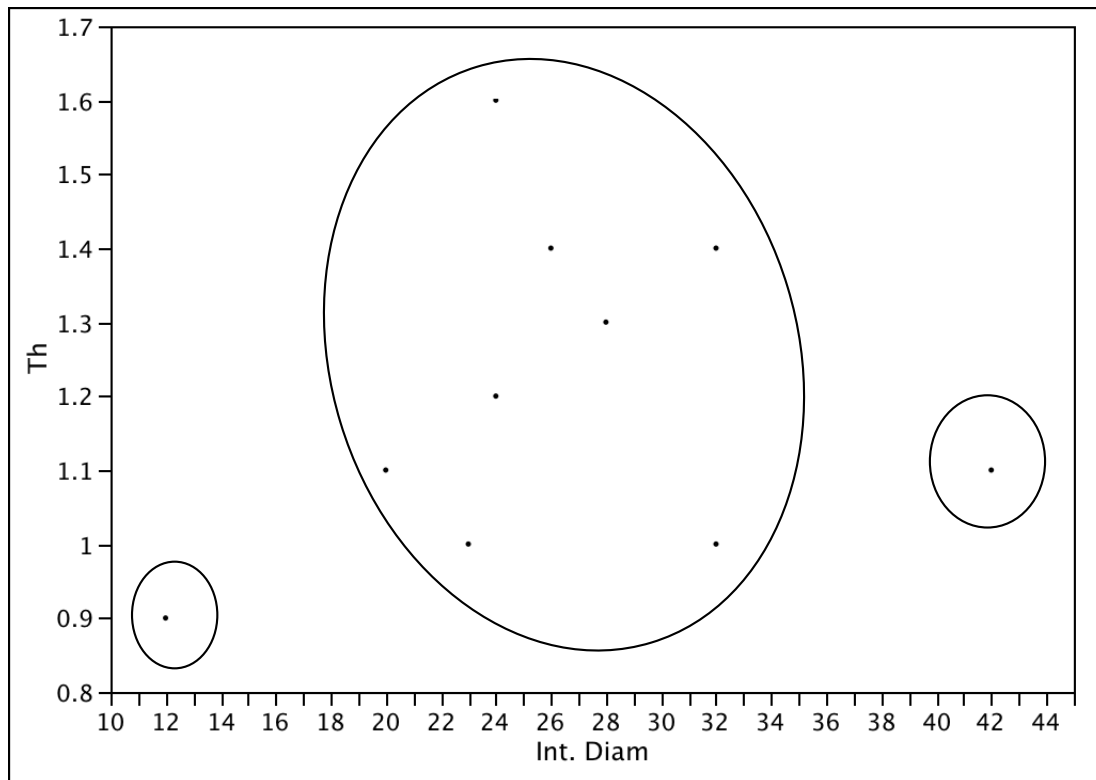


Figure 5.5: Yellow I Thickened Rim (Type 1) Vessel Size Classes

in red slip. On the interior most are polished, while a few have red slip from the lip to the neck, and one is completely slipped.

Type 2: Jars with Rounded Rims (n=2, 5.3%)

These are medium sized jars with a rim diameter of 21 cm (n=1), with relatively thin vessel bodies from 0.9-1.2 cm. Vessel shape is unknown, other than that they have a restricted rim.

One vessel was decorated with a knotted strip roulette (T24) and the other an unknown twine. One has a channel on the neck. Both have red slip on the lip, with slip extending in one case over the entire interior.

Type 3: Basins with Straight Rims (n=8, 21.1%)

Simple rim large bowls (32 and 38 cm diameter) that range in thickness from 1.2-1.7. They were decorated with a knotted strip roulette (T24), alternate knotted strip roulette (T6), and uniformly twisted combined twine (T19). On most bowls, twine impressions are accompanied by channels, both vertical and horizontal. Half of the bowls had slip on the lip, while one bowl was slipped over the entire exterior. On the interior,

three bowls had slip near the neck and were polished, while three others were simply polished.

Type 4: Bowls with Simple Open Rims (n=4, 10.5%)

These are small (14 cm), thin (between 0.8-0.9 cm) bowls. They may have had ring bases (see below). They are decorated with a range of techniques, including knotted strip roulette (T24), alternate knotted strip roulettes (T6), and occasional channels on the neck. The exteriors are highly polished and one is covered by red slip. On the interior three bowls are highly polished, one of which has a red slip near the lip.

Type 5: Bowls with Simple Restricted Rims (n=2, 5.3%)

Small to medium spherical vessels (17 cm), which are very thin, ranging from 0.7- 0.8 cm. They are polished on the exterior and interior, and one has a channel on the exterior.

Base Type 1: Ring Bases (n=2, 100%)

The only identified bases from this phase were two ring bases. They have thin walls, are entirely slipped, and one is covered by a knotted strip roulette (T24). They likely correspond to the small simple open bowls (Type 4).

Body sherds:

There are 197 sherds from Yellow I deposits. Of these, 168 (85%) are decorated, 20 (10%) are eroded, and 9 (5%) are undecorated but polished. In exterior impressed decorations, uniformly twisted combined twine (T19) account for 45 (27%), knotted strip roulette (T24) for 47 (28%), alternate knotted strip roulettes (T6) for 68 (40%), braided twine (T5) for 2 (1%), and an unknown twine for 6 (4%).

All channels co-occur with twine decorations, two with the knotted strip roulette (T24), eleven with alternate knotted strip roulette (T6), and three with uniformly twisted combined twine (T19). T19 itself co-occurs twice with T24. There were three peaks in general sherd thickness, one at 0.9 cm, one at 1.2 cm, and one at 1.6 cm. Channels were found on 9% of body sherds.

Summary of Period

The assemblage from Yellow Phase I is composed of a very limited range of vessel types. Large basins (Type 3) and thickened rim jars (Type 1) of many sizes predominate, with simple open (Type 4) and closed bowls (Type 5) together accounting for only 15% of rims. The thickened rim vessels seem to have been all decorated similarly, independent of their size. A second type of jar with rounded rims (Type 2) was

also produced. Knotted strip roulette (T24), uniformly twisted combined twines (T19), and alternate knotted strip roulettes (T6) are the most frequent decorations, applied to all vessel types. The bases of all medium and large size vessels are round, and the two ring bases likely correspond to one class of small vessels. Channels are common on vessels as is red slip. Small vessels are thinner and more highly polished.

Yellow II

[(25kg, n= 1289, 100 rims, 808 body, 381 small sherds) (see Figures 5.6 to 5.10 and Table 5.5)]

Type 1: Jars with Thickened Rims (n=36, 42.9%)

Vessels include jars from at least four rim diameter groups. These are small at 16 cm, medium at 19-26 cm, medium/large at 31-38 cm, and large at >40 cm (see Figure 5.4). They range in thickness from 0.7- 2.1 cm. There is a continuing weak correlation between vessel thickness and rim diameter. Evidence for vessel shape is limited, although a large number of vessels are similar in shape to those from Yellow I, suggesting that some of the jars marked by this rim type were likely inverted long convex cones with spherical bases.

Ten vessels were decorated with a knotted strip roulette (T24) from under the lip to at least the maximum diameter of the vessel body. Six vessels have alternate knotted strip roulette decoration (T6) on their surface. In addition, a common feature is diagonal or vertical gouges (quick incisions) on the vessel neck under the lip, and several have channels on the neck (either vertical or horizontal). All vessels had a red slip on the lip top. On the interior most were polished; however, a few had red slip extending several cm from the lip and four were completely covered by red slip.

Type 2: Jars with Rounded Rims (n=5, 6%)

These are the same rim type described in Yellow I. They are medium/large sized jars, ranging from 27 to 30 cm in rim diameter, with relatively thin vessel bodies from 0.8 to 1cm.

Rounded rim vessels during Yellow II are decorated differently than earlier Yellow I examples. Most are characterized by twine decorations on the actual lip of the vessel. They are decorated with an alternate knot strip roulette (T6) in two cases, or T6 in combination with a knotted strip roulette (T24) on three vessels. Only one vessel has channels. Most jars are entirely polished on the interior, although one jar has red slip on the lip that extends several cm into the vessel interior.

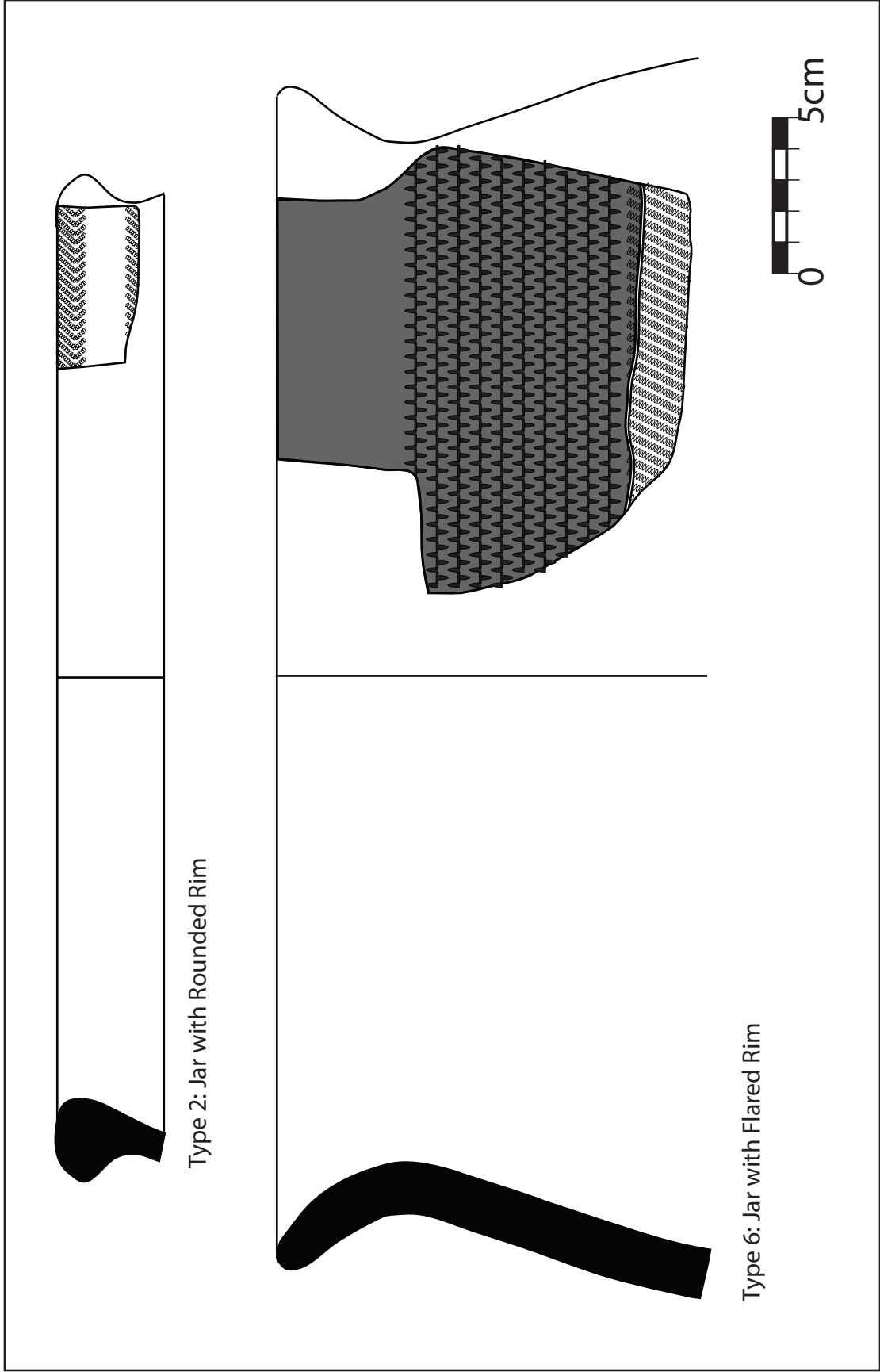


Figure 5.6: Yellow II Ceramic Assemblage: Types 2 and 6

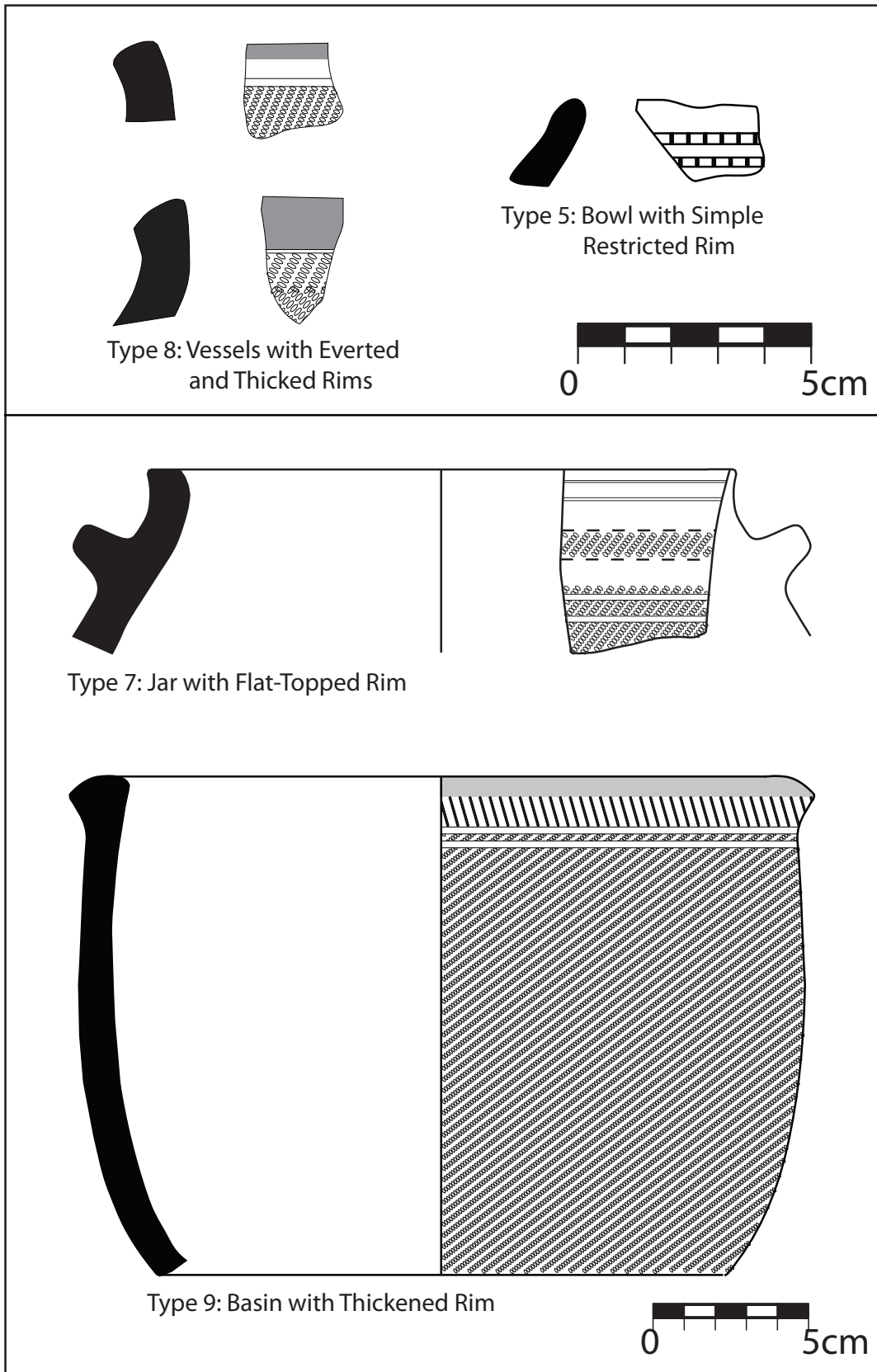


Figure 5.7: Yellow II Ceramic Assemblage: Types 5, 7, 8, and 9

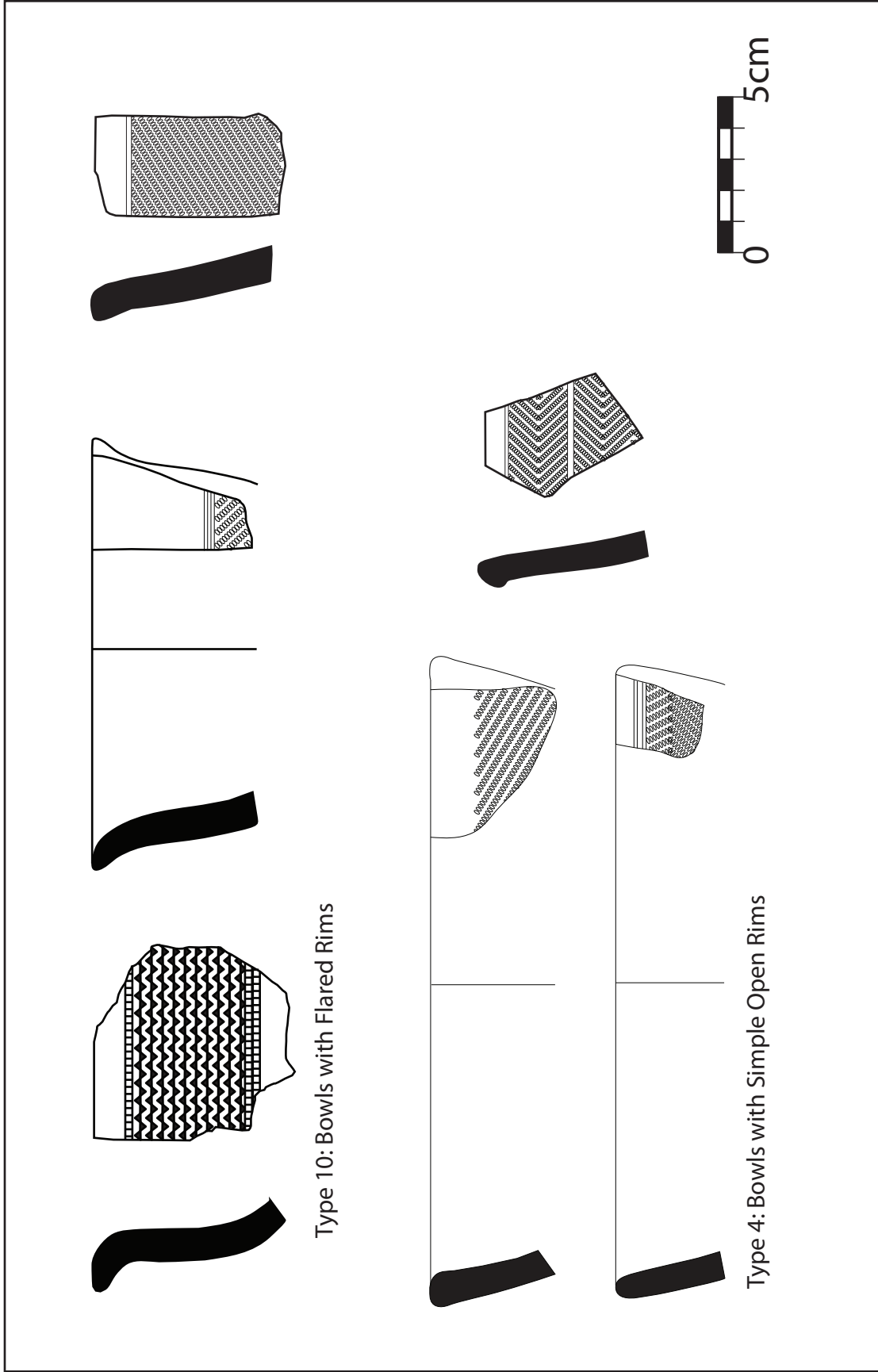


Figure 5.8: Yellow II Ceramic Assemblage: Types 4 and 10

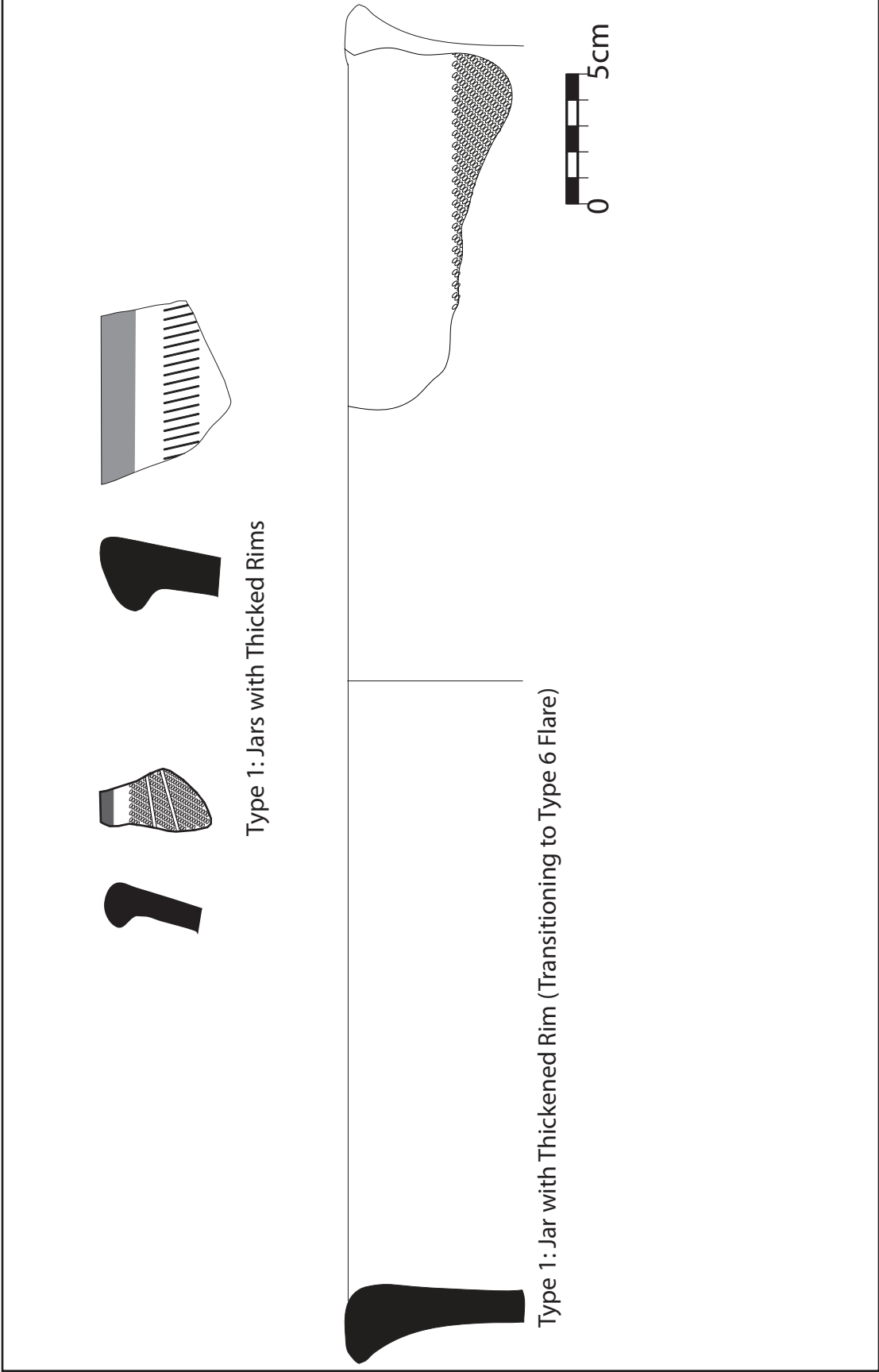


Figure 5.9: Yellow II Ceramic Assemblage: Type1

	Type 1	Type 2	Type 6	Type 7	Type 8	Type 5	Type 4	Type 9	Type 10	Type 11	Base Type 1
n	36	5	4	3	2	7	11	1	14	1	3
Vessel Restricted/Open	Jar restricted	Jar restricted	Jar restricted	Jar restricted	Jar restricted	bowl restricted	bowl open	bowl open	bowl open	potlid open	base ring
Distinctive Rim/lip Shape	restricted everted rim	rounded rim	elongated everted flares at angles greater than 40°	flat top	slightly everted but not thickened, squared lip	simple closed rim	simple open rim	thickened everted rim	simple open with short everted flare	simple open with rim angle of 195°	
Vessel shape	inverted long convex cone with spherical base (one more spherical)		inverted long convex cone with spherical base	inverted long convex cone with spherical base		spherical	hemispherical	hemispherical	hemispherical	shallow bowl	
Plastic features				ledge handles at neck for lifting							
Size Classes	4	1	2	2		2	1	1			
Diameter (cm)	16 (n=1); 19-26 (n=4); 31-38 (n=2); >40 (n=1)		20 (n=1); 30 (n=2)	17 (n=1); 34 (n=1)		13/14(n=3); 24 (n=1)	16 (n=1); 18 (n=3)	21	13 (n=1); 18 (n=1)		8-12
Thickness (cm)	0.7-2.1	0.8-1	1.0-1.5	0.9-1.5	1.0-1.1	0.7-1.1	0.8-1.2	1.2	0.9-1	1.2	0.4-1.3
Surface treatment			highly polished exteriors (n=3)			highly polished exteriors (n=4)	highly polished exteriors (n=11)		highly polished exteriors (n=10)		highly polished exteriors (n=2); eroded (n=1)
Interior surface treatment						highly polished interiors (n=7)	highly polished interiors (n=10)		highly polished interiors (n=14)		highly polished exteriors (n=2); eroded (n=1)
Lip Decoration		T6 (n=4)		lip channel (n=1)		vertical incisions (n=1)	vertical incisions (n=1)	Diagonal incisions (n=1)			
Neck Decoration	diagonal gouges (n=7)	T6 (n=5)		diagonal gouges (n=1); impressed comb (n=1)		channels around neck (n=3)	channels around neck (n=6)	T2 (n=1)		T2 (n=1)	
Shoulder Decoration	T2 (n=10); T6 (n=6)	T6 (n=5)	T2 (n=2); T6 (n=1); R4 (n=2)	T2 (n=3)	T2 (n=1); T6 (n=1)	T6 (n=6)	T2 (n=2); T6 (n=2); T19 (n=1)	T2 (n=1)	impressed comb (n=1)	T2 (n=1)	
Body decoration		T6 (n=5)	T2 (n=3); R4 (n=1)	T2 (n=3)	T2 (n=1); T6 (n=1)	T6 (n=6)	T2 (n=2); T6 (n=2); T19 (n=1)		T2 (n=2); T6 (n=3); R4 (n=1)		
Base decoration											T20 (n=1)
Zoned			neck R4 + body T2 (n=1)								
Body Channels	8	1	2	2	1		3		6		
Slip on Rim Top	36	1			1	3		1	1		
Interior Slip	lip and neck (n=7); complete (n=4)	lip and neck (n=1)	lip and neck (n=2)	lip and neck (n=1)	complete (n=1)	lip and neck (n=1); complete (n=2)	lip and neck (n=1); complete (n=2)		lip and neck (n=1) complete (n=3)		complete (n=1)
Slip on Exterior			neck (n=1); complete (n=1)	lip (n=1)	neck (n=1); complete (n=2)						

Table 5.5: Yellow II Assemblage

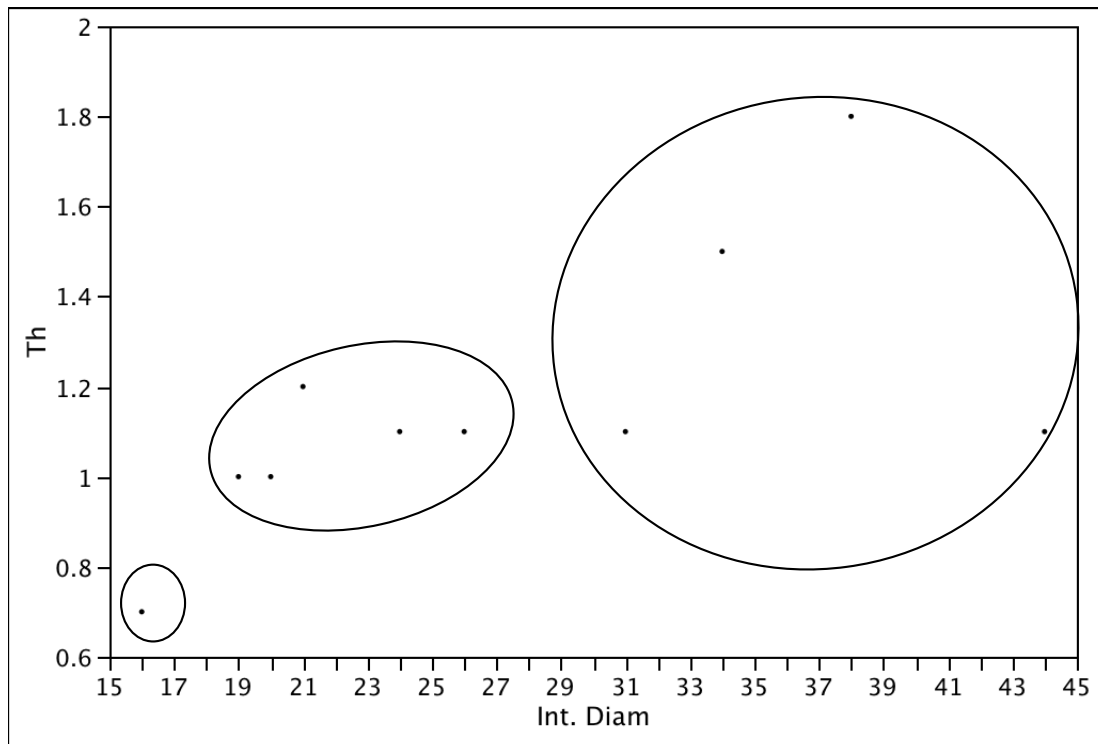


Figure 5.10: Yellow II Thickened Rim (Type 1) Vessel Size Classes

Type 6: Jars with Flared Rims (n= 4, 4.8%)

Elongated everted (flared) rims with angles greater than 40 degrees. They are found in a range of sizes, with the measurable examples at 20 and 30 cm, and thickness from 1.0 to 1.5 cm. These jars are similar in form to the thickened rim vessels, shaped as inverted long convex cones with a spherical base.

Three decoration techniques are found, including knotted strip roulette (T24), alternate knotted strip roulettes (T6), the addition of the toothed carved roulette (R4). R4 and T24 co-occur on one vessel, with the carved roulette on the neck and twine on the body. In addition, two vessels have channels.

One jar's exterior was completely covered by red slip and another has a simple band of slip at the neck. Likewise on the interior three vessels were polished, and two of these were completely slipped.

Type 7: Jars with Flat-Topped Rims (n=3, 3.6%)

A slightly everted rim that is flat on the top and has a ledge handle on the neck. The ledge handle is a small protuberance, roughly 3 cm long and 1 cm wide, used for lifting the vessel. Sizes range widely from 17- 34 cm, as does thickness from 0.9- 1.5 cm. There is limited evidence for vessel shape; however, they appear to be inverted long convex cones with a spherical base.

All three have a knotted strip roulette (T24) on the body, although one also has channels, another diagonal gouges and channels, and the last comb impressions. Two vessels have a red slip on the exterior lip. On the interior all are polished and one has slip around the rim area.

Type 8: Vessels with Everted and Thickened Rims (n=2, 2.4%)

A small pot with a slightly everted but not thickened rim. Size is unknown but thickness ranges from 1- 1.1 cm.

One vessel is decorated with a knotted strip roulette (T24), and the other with an alternate knotted strip roulette (T6) with channels. Red slip is on the lip of one vessel. The interior of one vessel is completely covered in red slip and the other is simply polished.

Type 5: Bowls with Simple Restricted Rims (n=7, 8.3%)

A diverse set of closed rim vessels with similar rim profiles that are spherical in form. There are two size classes, small at 13-14 cm, and medium at 24 cm. Thickness ranges from 0.7-1.1cm.

In decoration, three have channels around the neck; on the body, one has multiple incisions and two have an alternate knotted strip roulette (T6). Red slip was found on a few vessels, with two completely covered inside and out. Likewise, one had red slip around the lip inside and out. Four vessels were simply polished.

Type 4: Bowls with Simple Open Rims (n=11, 13.1%)

These are small (16-18 cm), thin (between 0.8-1.2 cm) bowls. They were decorated with a range of techniques, including knotted strip roulette (T24), alternate knotted strip roulette (T6), and uniformly twisted combined twine (T19). Channels co-occur with both bowls with T6. Three other bowls had channels, and one had incisions at the neck. The exteriors of all were highly polished, and one was completely slipped. On the interior, most were highly polished, one was completely covered in red slip, and another had slip on the lip and neck.

Type 9: Basin with Thickened Rim (n=1, 1.2%)

This large bowl was 21 cm in diameter with a thickness of 1.2 cm. It was decorated with diagonal gouges and channels at the neck; below these was a T24. The vessel had red slip on the lip, and the interior was eroded.

Type 10: Bowls with Flared Rims (n=14, 16.7%)

These are thin (0.9-1 cm), small vessels (two measurable examples are 13 and 18 cm in rim diameter). Two are decorated with a knotted strip roulette (T24), and three with alternate knotted strip roulette (T6); all of these have channels over them (one has a channel on the lip). One bowl has a toothed carved roulette (R4) bounded by rows of comb impressions. A final vessel has vertical channels on the body. All are polished on the interior, with three red slipped. One vessel has red slip on the lip, extending slightly into the interior.

Type 11: Pot Lid (n=1, 1.2%)

There was one fragment of a simple pot lid, 1.2 cm thick and of unknown size. It is distinguished by a rim angle of 195 degrees. Knotted strip roulette (T24) was applied on the exterior.

Base Type 1: Ring Bases (n=3, 100%)

This is a ring base identical to those seen in Yellow I. They range in diameter from 8 to 12 cm, and in thickness from 0.4 to 1.3 cm. One base that extended to the lower body has a twine decoration (T20). One vessel was slipped on the interior. They all have highly polished interiors and exteriors.

Body Sherds

There are 739 sherds from Yellow Phase II deposits. Of these, 621 (84%) are decorated, 71 (11%) are eroded, and 47 (6%) are undecorated but polished. In exterior decoration, uniformly twisted combined twines (T19) account for 106 (17%), knotted strip roulettes (T24) for 212 (34%), alternate knotted strip roulettes (T6) for 231 (37%), and all other twines for 7% (the latter includes T1, T3, T5, T10 and several unknown twines).

Carved roulettes (primarily R4) appear during this period, and are found on 2% of the decorated sherds. The remaining 2% of decorations comprise a diverse set of techniques (comb impressions, diagonal gouges, fish-spine roulettes, incisions, and impressed circles). All channels (60 out of 63) co-occur with other decorations, most often with T6 and T19. Zonation is not well-represented, as only a few sherds have co-occurrence of twines and roulettes. The general assemblage is thinner than 1A, and may be explained by the loss of the Type 3 basins (see below). Channels are found on 10% of body sherds.

Summary of Period

During Yellow II, the rim sample was both larger and more diverse, and some rim types are known only from one or two examples. The Yellow II assemblage is in many ways transitional between the rim types found in Yellow I and the flared rim vessels that dominate the following period, Red I. Thickened rim vessels (Type 1) are still the most common rim type, and in addition to restricted vessels representing a range of pots and jars, this rim type was also associated with at least one basin (Type 9), a vessel that may have replaced the large straight bowls (Type 3) that were common in the Yellow I assemblage. Rounded rim jars (Type 2) were still produced during this period, and constitute a small part of the greater jar/pot assemblage.

A major shift in the assemblage, and one that defines the period, is the addition of flared eversions (Type 6 and 10) in a wide diversity of sizes. Below the rim they are shaped similarly to the thickened rim vessels and likely represent an evolution of the rim type, for which several transitional examples were found. This new jar/pot class is decorated primarily with twine decorations, but wooden roulettes started to be employed in the decoration syntax. If one combines the thickened rim jars (Type 1) with the new flared jars (Type 6), they account for around 60% of the assemblage, the same total as thickened rims during Yellow I.

Another activity is attested by the addition of restricted, flat-topped vessels with handles (Type 7). They range widely in size, are twine decorated, and have embellishments around a ledge handle.

Small simple open bowls (Type 4) are more standardized in size, and restricted bowls (Type 5) are found in a range of sizes. Both classes of small vessels are highly polished and well-made and together account for 22% of the total assemblage. A similarly small number of ring bases (Base Type 1) was found during this period: it is still unknown which small vessel class they are associated with.

A number of new decoration techniques were employed/developed during Yellow II, from carved roulettes to comb impressions and new twines. Interestingly, the ratio of knotted strip roulette (T24) to alternate knotted strip roulettes (T6) shifts, with T6 becoming more popular during this period.

Red I
[(64kg, n= 3064, 269 Rims, 1614 Body, 1181 small sherds)
(see Figures 5.11 to 5.16, and Table 5.6)]

Type 12: Jars with Flared Decorated Rims (n=105, 51.2%)

A restricted opening vessel with a flared everted rim at an average rim angle of 33° (flares average 3.8 cm in length). Three size classes are present in the assemblage, all with the same vessel shape (see Figure 5.7). These are small (13-24 cm), medium (25-32 cm), and large (>40 cm). The thickness distribution only has one peak, ranging from 0.9 to 1.8 cm, but thickness is generally correlated with rim diameter. These vessels are inverted long convex cones with spherical bases.

The decoration of this class represents a departure from the Yellow phase thickened and flared jars. Mainly this was in the diversification of twine decorations. These extended from the bottom of the flare (lip) over the entire vessel body. For example, the most common decoration is T1 (poorly applied twine), which is present on 41% of decorated jars, whereas knotted strip roulette (T24) and alternate knotted strip roulette (T6) are found on only 8 and 5, respectively. Other new twine decorations are found as well, including accordion pleated twines (T3 and T7), an impressed twisted twine (T8), and a loosely twisted twine (T10). Carved roulette decorations also became more popular during Red I, with 10 vessels decorated with toothed carved R4 in addition to a raised square (R7) on several. Interestingly, channels are only found on four vessels; however, this may be due to the fragmentation pattern of the flared eversion which breaks easily at the vessel neck where the coil was attached.

Red slip was applied in distinctive ways, with most vessels (62, or 74%), having a band of slip 1.5 cm thick horizontally applied around the neck. Only 10 vessels lacked this band. Eight vessels had slip that extended over the entire rim (these were all late examples that are seen as transitional towards Red II), and four vessels had a red slip over their entire exterior surfaces. On the interior, almost all vessels had a red slip on the interior side of the flare, which extended several cm into the vessel neck. Below the slip, the vessels had smoothed surfaces.

Type 13: Small Jars with Thinned Flared Rims (n=10, 4.9%)

A small pot form, often highly decorated from the neck to the base, with thin flares that are undecorated on the underside, and lack the bands of slip found around the neck of Type 12. They are shaped as inverted convex cones with spherical bases. Vessels have an average rim angle of 35 degrees and flares averaging 1.3 cm in length. They range in size from 9.5-16 cm in rim diameter, and 0.7-0.9 cm in thickness.

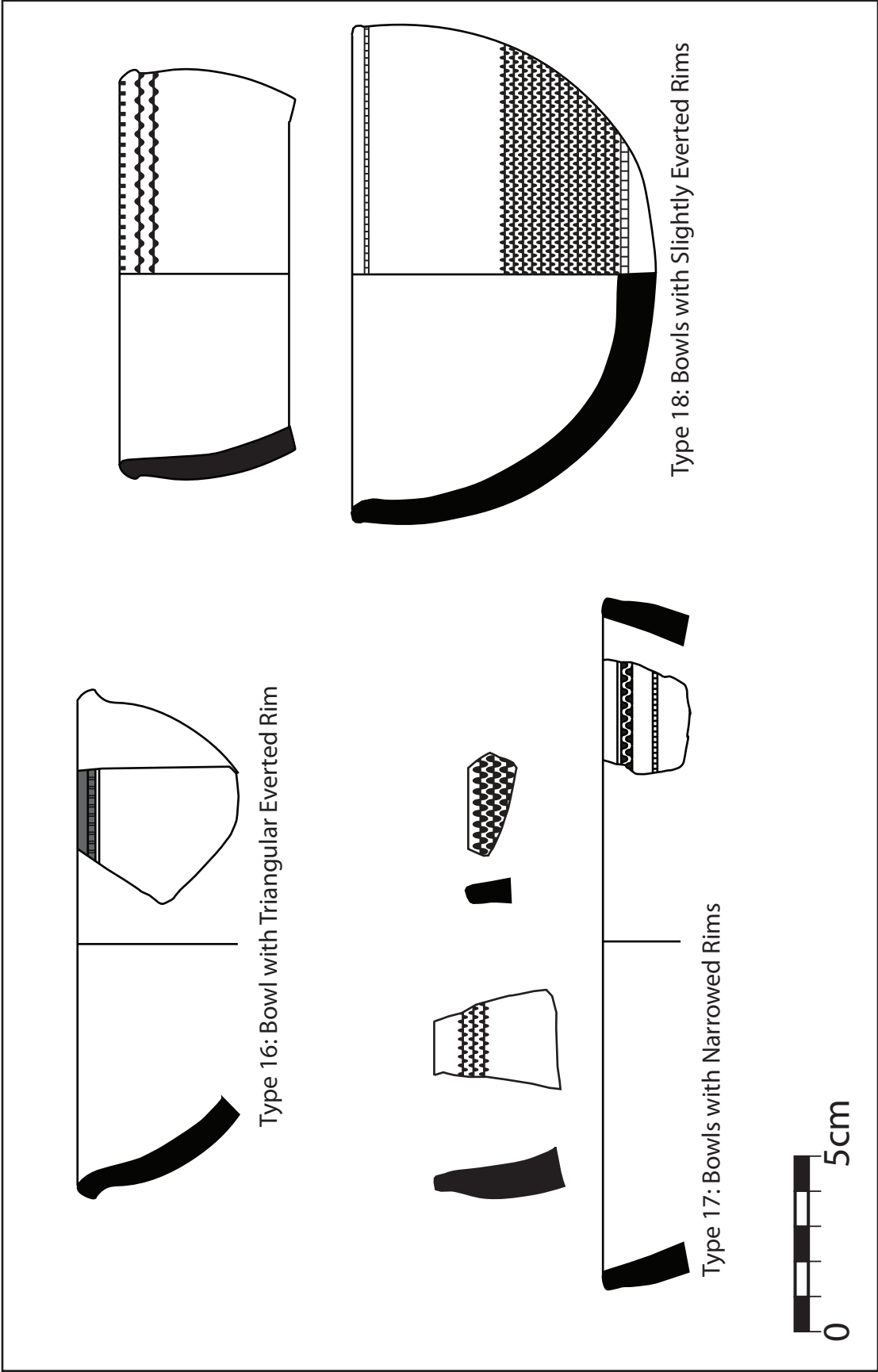


Figure 5.11: Red I Ceramic Assemblage: Types 16-18

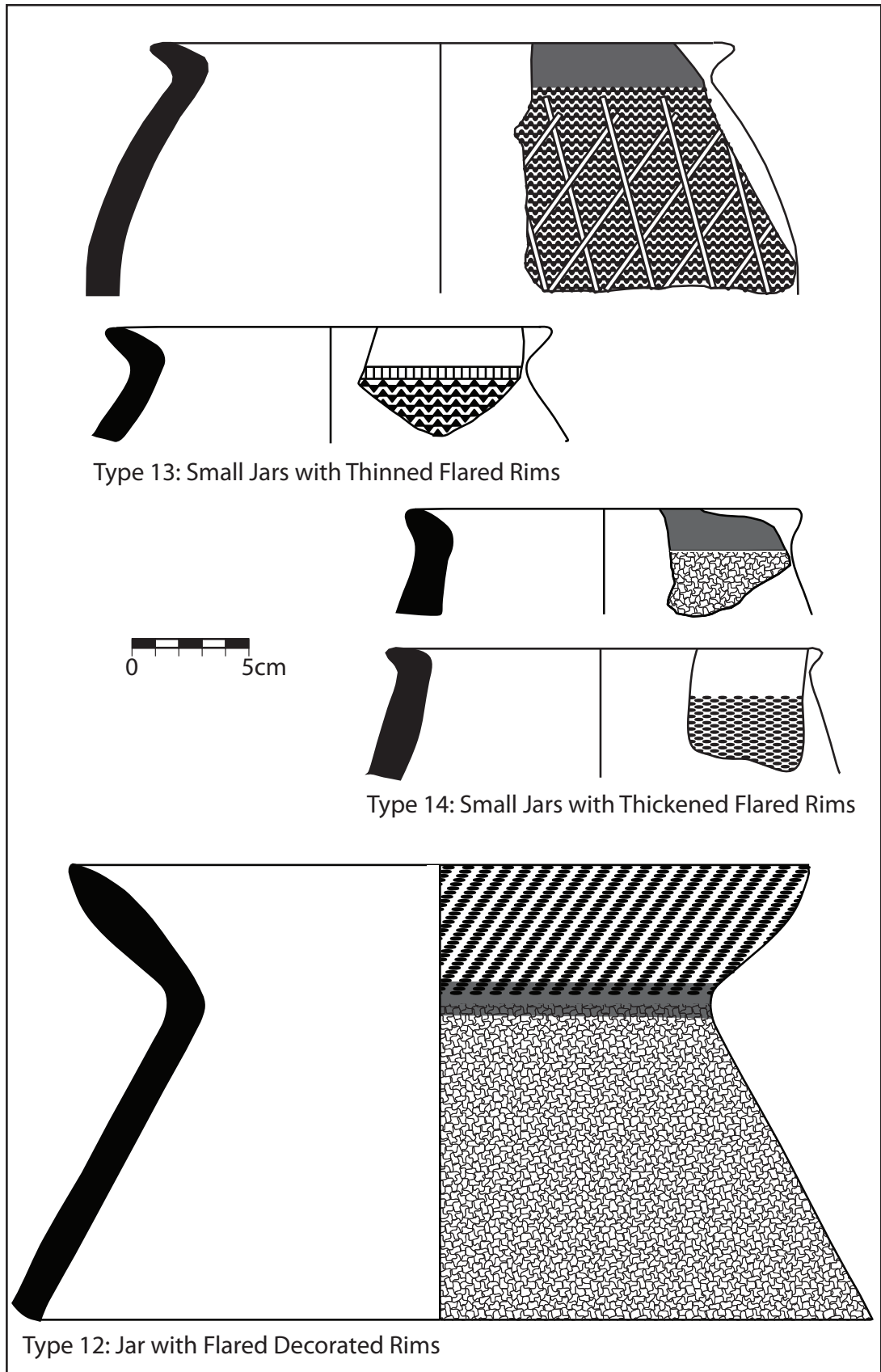
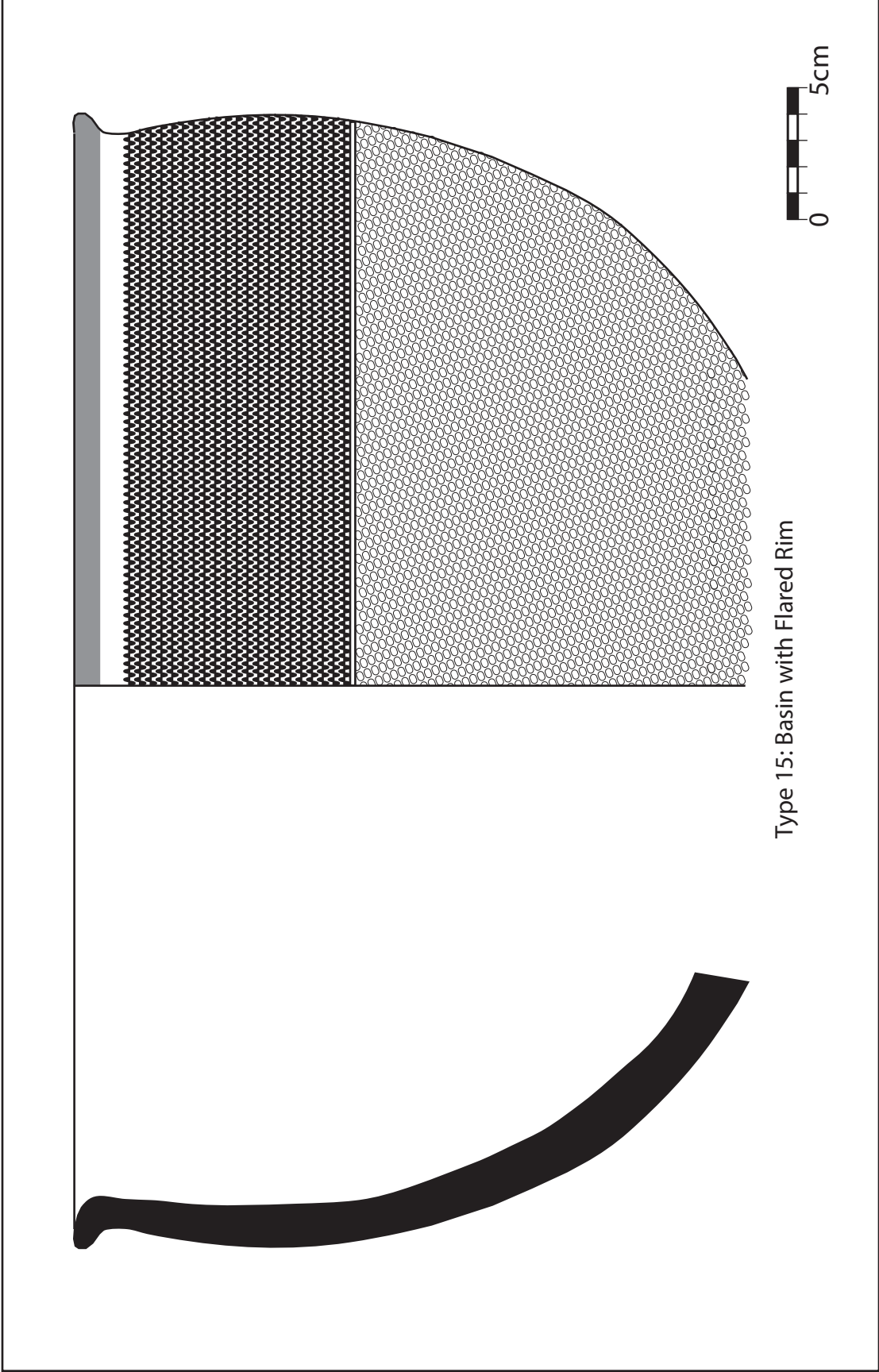


Figure 5.12: Red I Ceramic Assemblage: Types 12-14



Type 15: Basin with Flared Rim

Figure 5.13: Red I Ceramic Assemblage: Type 15

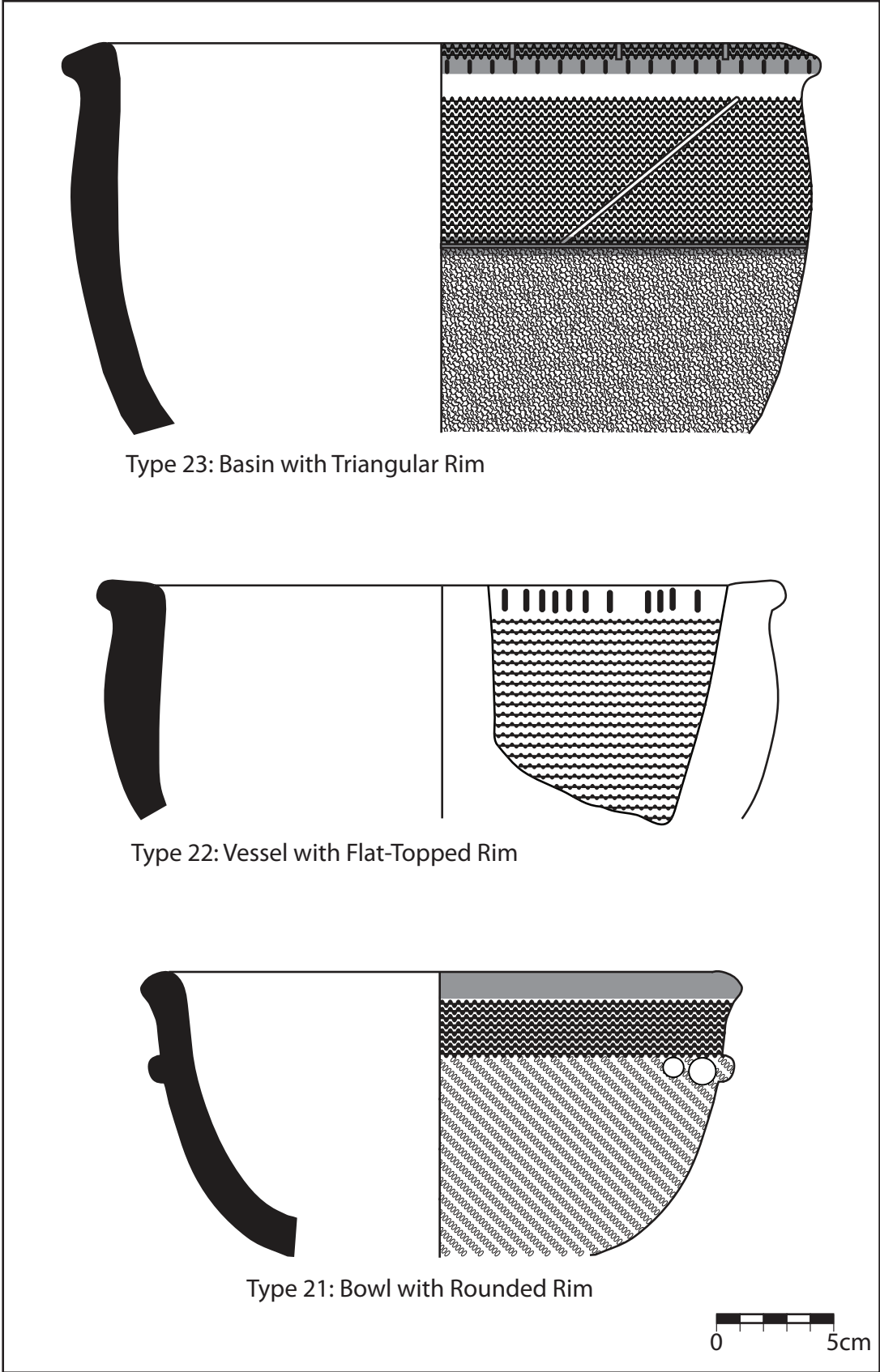


Figure 5.14: Red I Ceramic Assemblage: Types 21-23

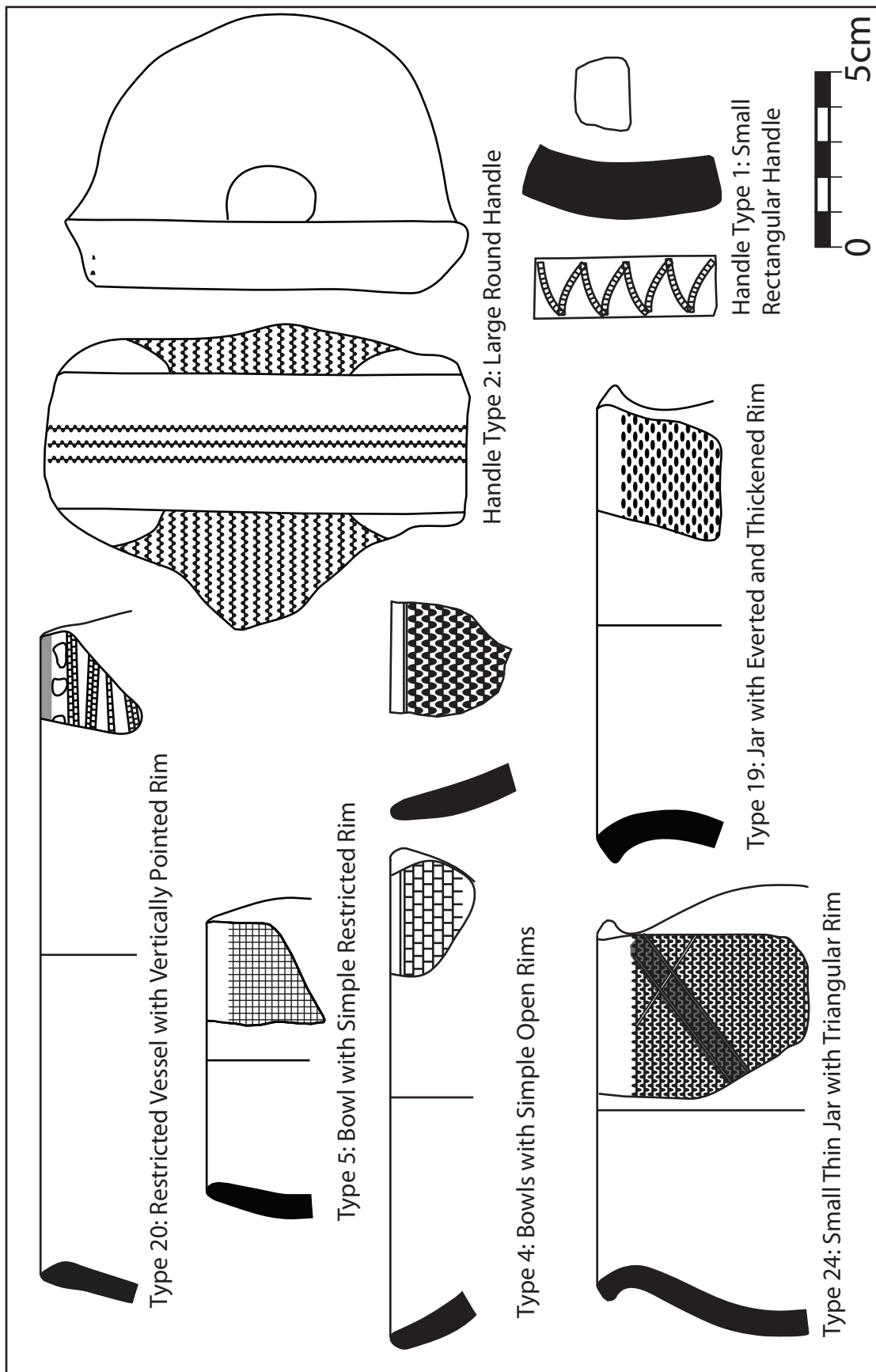


Figure 5.15: Red I Ceramic Assemblage: Types 4, 5, 19, 20, and 24 and Handle Types 1 and 2

	Type 12	Type 13	Type 14	Type 15	Type 16	Type 17	Type 18	Type 4	Type 5	Type 19	Type 20
n	105	10	8	1	16	10	16	7	5	8	3
Vessel	jar	jar	jar	basin	bowl	bowl	bowl	bowl	vessel	pot	pot
Restricted/Open	restricted	restricted	restricted	open	open	open	open	open	restricted	restricted	restricted
Distinctive Rim/lip Shape	elongated everted flares at angles around 33°	elongated everted flares at angles around 35°	elongated everted flares at angles around 56°	flared rim basin	simple open with a triangular shaped lip	simple open with a narrowed lip	simple open with a slightly everted rounded lip	simple open	simple restricted	short everted flares with a thickened lip	restricted rim with a pointy vertical lip
Vessel shape	inverted long convex cone with spherical base	inverted long convex cone with spherical base	inverted long convex cone with spherical base	hemispherical	hemispherical	hemispherical	hemispherical	hemispherical	spherical		
Plastic features					plastic ridge with vertical incisions (n=3) at neck			plastic button (n=1); plastic ridge with vertical incisions (n=2)	plastic ridge with vertical incisions (n=1)		
Size Classes	3	1	1		1	1	1	2	1	1	probably 2
Diameter (cm)	13-24 (n=25); 25-32 (n=8); >30 (n=2)	9.5-16	9-15		6-15	12-20	12-15	12-14 (n=2); 20-21 (n=2)	6.5-13	8-13	7-19
Thickness (cm)	0.9-1.8	0.7-0.9	1-2.2		0.7-0.9	0.7-1.1	0.7-1.1	0.7-1	0.7-0.9	0.7-1	0.7-1
Surface treatment	Decorated	Decorated (n=9); highly polished exterior (n=1)			highly polished exteriors (n=13)	highly polished exteriors (n=10)	highly polished exteriors (n=14)	highly polished exteriors (n=2); decorated (n=5)	highly polished exteriors (n=2)	highly polished exteriors (n=1)	highly polished exteriors (n=3)
Interior surface treatment	All Smoothed	highly polished interiors (n=10)	highly polished interiors (n=8)		highly polished interiors (n=15)	highly polished interiors (n=10)	highly polished interiors (n=15)	highly polished interiors (n=5)	highly polished exteriors (n=2)	highly polished interiors (n=8)	highly polished interiors (n=3)
Lip Decoration	T1 (n=30); T2 (n=6); T3 (n=7); T6 (n=5); T7 (n=4); T8 (n=2); T10 (n=1); R4 (n=6); R7 (n=5)				vertical incisions (n=1)		vertical incisions (n=1)				
Neck Decoration	T1 (n=34); T2 (n=8); T3 (n=9); T6 (n=5); T7 (n=4); T8 (n=2); T10 (n=2); R4 (n=10); R7 (n=5)	diagonal gouges (n=1)			comb impressions (n=9); channels (n=6)	channel (n=2); comb impression (n=2)	channels (n=8); comb impressions (n=5)	comb impressions (n=1); channels (n=5)	channels (n=1); comb impressions (n=2)	comb impressions (n=2)	comb impressions (n=1); Channels (2)
Shoulder Decoration	T1 (n=34); T2 (n=8); T3 (n=9); T6 (n=5); T7 (n=4); T8 (n=2); T10 (n=2); R4 (n=10); R7 (n=5)	R4 (n=8); T3 (n=1)	T1 (n=2); T3 (n=1); T7 (n=1); T10 (n=2); R4 (n=1)	R4	T2 (n=2); T20 (n=1)	R4 (n=9)	T2 (n=1); R4 (n=7)	R4 (n=3); R5 (n=2)	R5 (n=1)	R4 (n=4); T7 (n=1)	R4 (n=2)
Body decoration	T1 (n=34); T2 (n=8); T3 (n=9); T6 (n=5); T7 (n=4); T8 (n=2); T10 (n=2); R4 (n=10); R7 (n=5)	R4 (n=8); T3 (n=1)	T1 (n=2); T3 (n=1); T7 (n=1); T10 (n=2); R4 (n=1)	T19	T2 (n=2); T20 (n=1)	R4 (n=9)	T2 (n=1); R4 (n=7)	T2 (n=1); R4 (n=3); R5 (n=1)	R5 (n=1)	R4 (n=4); T7 (n=1)	R4 (n=2)
Lower body decoration				T19							
Body Channels	5	5	2								
Interior Slip	lip and neck (n=99)	lip and neck (n=6); complete (n=5)	lip and neck (n=2); complete (n=1)		lip and neck (n=1); complete (n=12)		complete (n=7)	complete (n=4)	complete (n=2)	complete (n=2); lip and neck (n=2)	complete (n=2)
Slip on Exterior	band at neck (n=62); complete (n=4); neck (n=8)	lip and neck (n=4)	neck (n=2); band around neck (n=1)		neck (n=9); complete (n=1)	complete (n=3)	neck (n=3); complete (n=1)	neck (n=1); complete (n=2); band (n=1)	neck (n=1); complete (n=1)	neck (n=1); complete (n=1)	neck (n=2)

Table 5.6: Red I Assemblage

	Type 21	Type 22	Type 23	Type 24	Handle Type 1	Handle Type 2	Base Type 2	Base Type 3	Base Type 4	Base Type 1	Base Type 5	Base Type 6
n	4	7	2	15	10	1	3	7	2	13	1	1
Vessel	bowl	Jar	bowl/basin	Jar	handle	handle	base	base	base	base	base	base
Restricted/Open	open	restricted	open	restricted	angular	round	pedestal base	flat round base	high Ring	ring base	legged base	large flat
Distinctive Rim/lip Shape	rounded rim	flat top restricted rim	triangular shaped thickened rim	delicate triangular shaped thickened rim	rectangular cross section, rounded corners							
Vessel shape	hemispherical	inverted long convex cone with spherical base	hemispherical	inverted long convex cone with spherical base								
Plastic features	plastic button (n=1)											
Size Classes	probably 2	2										
Diameter (cm)	16-34	11-15 (n=4); 22-26 (n=2)		8-14	10-15cm est.		8-10	4-9	7-10	5-12	leg was 2.8	
Thickness (cm)	0.9-2	0.9-1.3	1.5	0.4-0.9	2.3 x 1.5			0.6-1.1		0.5-0.9	0.9	1.3
Surface treatment		highly polished exteriors (n=1)		highly polished exteriors (n=14)			finger smoothed	highly polished (n=1)	highly polished (n=1); eroded (n=1)	highly polished (n=10); eroded (n=3)	highly polished (n=1)	
Interior surface treatment	highly polished interiors (n=3)			highly polished interiors (n=13); one is eroded			finger smoothed	highly polished (n=5); eroded (n=2)	highly polished (n=1); eroded (n=1)	highly polished (probably 10 as well)	highly polished (n=1)	
Lip Decoration		T1 (n=1); R4 (n=2); Vertical lip incisions (n=3); Thumb impressions (n=2)										
Neck Decoration		T1 (n=1); R4 (n=5)	R4 (n=1); T20 (n=1)	R4 (n=13)								
Shoulder Decoration	T2 (n=1); R4 (n=2); T1 (n=1)	T1 (n=1); R4 (n=5)	R4 (n=1); T20 (n=1)	R4 (n=13); comb impressions (n=1)	R4 (n=5); rocker comb (n=1); T3 (n=1); T10 (n=1); channel (n=1); Polished (n=1)							
Body decoration	T2 (n=2); R4 (n=1); T1 (n=1)	T1 (n=1); R4 (n=5)	R4 (n=1); T20 (n=1)	R4 (n=13); comb impressions (n=1)								
Lower body decoration								R4 (n=2)		R4 (n=3)		R4 (n=1)
Body Channels	1							thumb impressions (n=2); vertical incisions (n=1)		thumb impressions (n=4); vertical incisions (n=4)		
Interior Slip	complete (n=1); lip and neck (n=2)	lip and neck (n=2)	lip and neck (n=1)	lip and neck (n=9); complete (n=2)				complete (n=5)		complete (n=4)	complete (n=1)	
Slip on Exterior	neck (n=3)	neck (n=1); Body bands (n=1)		neck (n=7); band at neck (n=2); complete (n=1)							complete (n=1)	

Table 5.6 (continued): Red I Assemblage

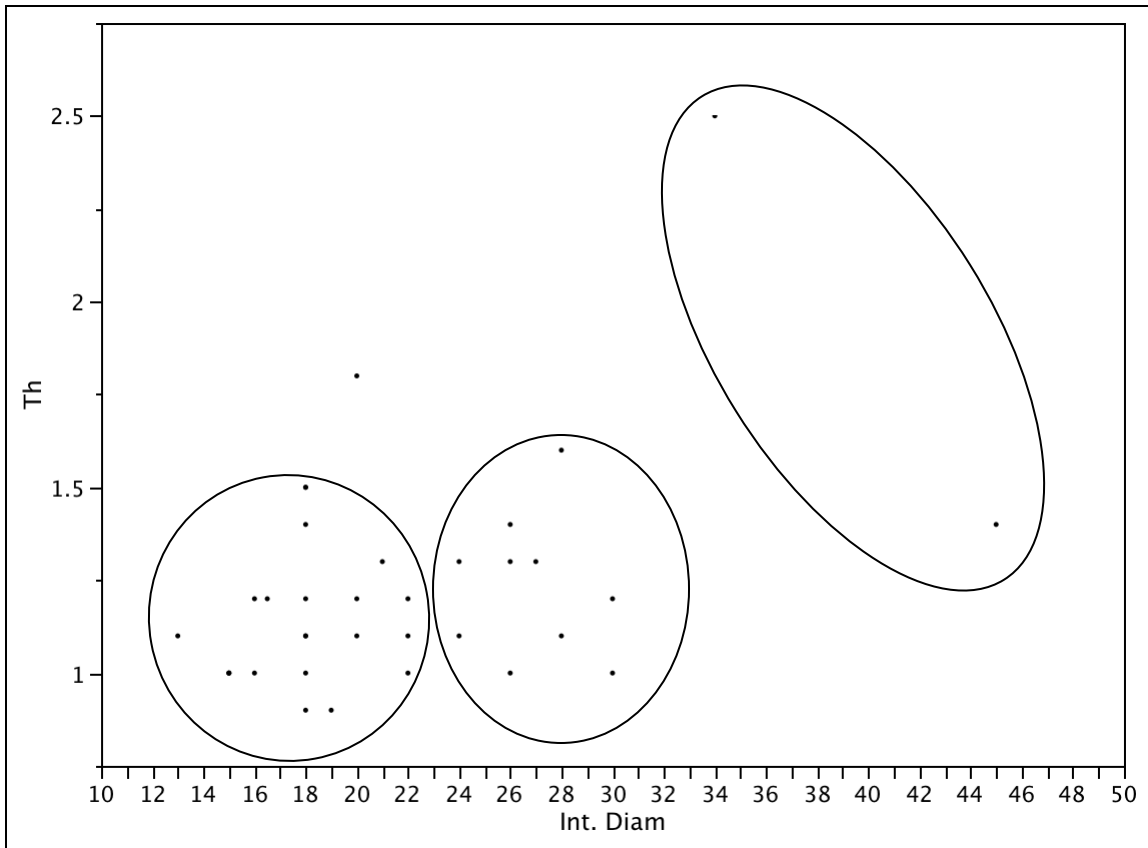


Figure 5.16: Red I Flared Rim (Type 12) Vessel Size Classes

Toothed carved roulette (R4) is the primary decorative technique employed in this group, with most vessels largely covered from the neck to the body. One jar had accordion pleated twine (T3), and one was simply polished. Diagonal gouges appear on the neck of one vessel from the early half of Red I. Five of the vessels with R4 had channels on the body, some in elaborate criss-cross patterns.

Red slip was quite variable, with four vessels having slip from the lip to the neck, and the rest were simply polished. On the interior, six vessels had slip on the interior lip to the neck, and five were completely slipped.

Type 14: Small Jars with Thickened Flared Rims (n=8, 3.9%)

This class is distinguished from the thin flares by its high rim angle, thickness of the flare, and vessel wall thickness. They are shaped similarly, as inverted convex cones with spherical bases; however, the rim angle averages 56 degrees and the eversion 1.6cm. They range in size from 9 to 15 cm, and in thickness from 1 to 2.2 cm.

A diversity of twine decorations characterizes this group, extending from the neck over the body. These include T1, accordion pleated twines (T3) and (T7), loosely twisted

twine (T10), and in one case a toothed carved roulette (R4) decoration. Only two vessels have channels.

Red slip was found on the lip to the neck of two jars, and one has a band around the neck. On the interior, two have slip on the inside of the flare to the neck, one is slipped completely, and the rest are polished.

Type 15: Basins with Flared Rims (n=2, 1%)

Simple open medium (18 cm diameter) to large bowls (32 cm diameter) with flared rims, similar to those from Type 12. However, they do not have decoration on the exterior lip. They are fairly thick at 1.2 and 1.6 cm respectively. In decoration, one has a toothed carved roulette (R4) and channels on the vessel shoulder to mid-body, below which is a uniformly twisted combined twine (T19). The other bowl has a knotted strip roulette (T24).

In slip, one vessel has none, and the other is covered from the interior lip over to the neck of the bowl.

Type 16: Bowls with Triangular Everted Rims (n=16, 7.8%)

Small simple open bowls with a distinctive slightly thickened lip that creates a triangular profile. They range in rim diameter size from 6-15 cm with most between 12 and 15 cm, and in thickness from 0.7-0.9 cm.

These bowls are primarily decorated on the neck, with either a single channel or a row of comb impressions. Only three vessels have a twine decoration. In the exterior spaces that are not decorated, all vessels are highly polished.

On the exterior, most bowls have red slip that extends from the lip to the neck. On the interior most bowls were completely slipped, and all non-eroded vessels were polished.

Type 17: Bowls with Narrowed Rims (n=10, 4.9%)

Small simple open bowls with a distinctive lip that is slightly narrowed and squared in relation to the vessel body. They range in rim diameter between 12 and 20 cm and in thickness from 0.7-1.1 cm.

This group was characterized by a very simple decorative scheme. Nine were decorated with a toothed carved roulette (R4) technique. This was applied either in a small space at the neck, or extending from the neck over the body. In addition, several vessels had either a channel or a single row of comb impressions at the neck (the one bowl without R4). On the exterior, in the spaces where the vessels are not decorated,

they were highly polished. On the interior, all bowls were polished and only three were completely slipped.

Type 18: Bowls with Slightly Everted Rims (N=16, 7.8%)

Small simple open bowls that have a distinctive slightly everted and rounded lip. They range in size from 12 to 15 cm and in thickness from 0.7 to 1.1 cm.

The decoration of this class of bowls is diverse; however, most vessels have either a single channel or a single row of comb impressions around the neck. Half are decorated on the body, with seven bowls with the toothed carved roulette (R4), and only one with the knotted strip roulette (T24).

On the exterior, where not decorated, bowls are highly polished. Red slips are uncommon on the exterior; only three vessels have red slip from the lip to the neck and one is completely slipped. On the interior, seven are completely slipped and eight are highly polished (one is eroded).

Type 19: Jars with Everted and Thickened Rims (n=8, 3.9%)

Small pots with a restricted opening and a distinctive slightly flared rim and a lip that is thickened and squared. They range in size from 8 to 13 cm and in thickness from 0.7 to 1.0 cm.

The decoration of this class of vessels is diverse. Four have toothed carved roulettes (R4); a single vessel is decorated with accordion pleated twine (T7); and one vessel is undecorated but highly polished. Similar to other small vessel classes, two have a single band of comb impressions around the neck. In spaces where there is no applied decoration, the vessels are highly polished.

Red slip is rare on the exteriors of this class, but covers one pot entirely and another from the rim to the neck. On the interior, two are entirely slipped, two have slip from the rim extending to the neck, and four are polished.

Type 20: Restricted Vessels with Vertically Pointed Rims (n=3, 1.5%)

Small vessels with a distinctive rim morphology, marked by a slightly closed (restricted) rim that extends vertically to a point at the lip. They range in rim diameter from 7 to 19 cm and in thickness from 0.7 to 1 cm.

The decoration of this class of vessel is similar to that seen for many other small vessel groups, with one vessel each having a single channel and a row of comb impressions at the neck. On the body, two vessels have toothed carved roulette (R4). Areas that were not covered in decoration are highly polished.

Red slip covers the exterior lip to the neck of two vessels. On the interior, two are entirely slipped and one is polished.

Type 4: Bowls with Simple Open Rims (n= 7, 3.4%)

A class of bowls characterized by its simple morphology and distinctive decorations that are unique to each vessel. There are two size classes in diameter, small (12-14 cm), and medium (20-21 cm). All are thin, ranging from 0.7 to 1 cm.

The decoration of each of these vessels is unique. However, all bowls have a channel, plastic ridge, or single row of comb impressions at the neck (one has plastic raised buttons as well). The primary decorations on the body are toothed carved roulette (R4) and impressed square carved roulette (R5); however, these co-occur once (R5 on shoulder, R4 on body), and on one bowl, a R4 is on the shoulder and a knotted strip roulette (T24) is on the body. Areas that were not covered in decoration are highly polished.

Slip patterns are unique as well. Two bowls are completely covered in red slip, one with slip from the lip to the neck, and the other with a band of slip at the neck. On the interior all are polished, four are completely slipped, and two are eroded.

Type 5: Bowls with Simple Restricted Rims (n=5, 2.4%)

Simple restricted rim vessels that range in size from 6.5 to 13 cm in rim diameter and in thickness from 0.7 to 0.9 cm.

Their decoration is diverse; however, all vessels have a channel, plastic ridge, or single row of comb impressions at the neck. Only one has decoration on the body, an impressed box (R5). In spaces where there are no plastic decorations, all vessels are highly polished.

One vessel has a red slip on the exterior extending from the lip to the neck, while one is completely covered. On the interior, two are completely slipped, and three are eroded.

Type 21: Bowls with Rounded Rims (n=4, 2%)

A medium/large group of bowls with rounded rims similar to those from the Yellow Phase. They range in rim diameter from 16 to 34 cm, and in thickness from 0.9 to 2 cm.

They are decorated with both twine decorations (T24, T1) and toothed carved roulettes (R4). A T24 (body) and R4 (shoulder) co-occur on one vessel. A plastic button occurs on the shoulder of one vessel. There was one channel on the body.

Red slip extends from the lip to the neck of three of the bowls. On the interior one

is entirely slipped, two have slip near the rim extending to the neck, and the last is simply polished.

Type 22: Vessels with Flat-Topped Rims (n=7, 2.9%)

Similar in form to the flat-rimmed restricted rim vessels described in the Yellow II assemblage, this type is characterized by decorations on top of the lip of the vessel. There are two size classes in rim diameter, small (11-15 cm), and medium (22-26 cm). Thickness shows a single distribution between 0.9 and 1.3 cm.

Decorations are concentrated on the top of the lip, where two vessels have toothed carved roulettes (R4), one has T1, three have vertical lip incisions, and two have thumb impressions. On the shoulder and body, R4 is found on most, whereas T1 is found on one.

Only one vessel has slip on the rim extending to the neck, while one has decorative bands of red slip on the body. On the interior, only two have slip on the rim to the neck; the rest have simply smoothed surfaces.

Type 23: Basins with Triangular Rims (n=2, 1%)

Large bowls 1.5 cm thick. Their size is unknown, as neither rim was large enough to record the diameter.

One was decorated with a toothed carved roulette (R4); the other with an unknown twine. The only slip ran from the lip top to the interior neck.

Type 24: Small Thin Jars with Triangular Rims (Red I, n=3, 7%; Red II, n=12, 9.2%)

A small pot with a distinctive triangular shaped eversion in profile. These are very thin, highly decorated, and generally well-made. They exhibit a small size range from 8 to 14 cm in rim diameter, and in thickness they are the thinnest class of vessel known from Kirikongo, ranging from 0.4 to 0.9 cm.

In decoration they were very consistent. Twelve vessels have a toothed carved roulette (R4) decoration from the neck to the body, one has comb impressions on the vessel body, and the last vessel is simply polished.

Red slip is found from the rim to the neck on six vessels; two have bands around the neck, while one is completely slipped. On the interior, eight vessels have slip from the rim top to the neck area, two are completely slipped, and three are entirely polished (one is eroded). All areas not decorated with roulettes are highly polished.

Handle Type 1: Small Rectangular Handles (n=10, 90.9%)

Ten angular handles with rectangular cross-sections were found in Red I deposits. Their average size was 2.3 cm x 1.5 cm in section, and though no complete ones were found, they are estimated to have been 10-15 cm in length. Since none were found

attached to vessels, these are assumed to have been used for potlids.

They are decorated with diverse techniques, on only one face. Most are decorated with a toothed carved roulette (R4), but accordeon pleated twine (T3), loosely twisted twine (T10), a lengthwise channel, and a rocker comb are found. None had red slip, although one handle that lacked plastic decoration is very highly polished.

Handle Type 2: Large Round Handles (n=1, 9.1%)

There is one example of this handle type, for a lid or large vessel. It was a round (4 x 3.7 cm) lug handle decorated with a toothed carved roulette (R4) on the exterior.

Base Type 1: Ring Bases (n=13, 48.1%)

The most common base form for this period is a ring base that is identical to those produced during Yellow I and II. They are for small (base diameter 5- 12 cm) thin (0.5- 0.9 cm) vessels, likely bowls. Most are highly polished on the interior and exterior. Many have either thumb impressions or vertical incisions on the base lip. Sherds with fragments of the lower body have a toothed carved roulette (R4) on the exterior. Four bases have slip on the interior.

Base Type 2: Pedestal Bases (n=3, 11.1%)

Pedestal bases for small vessels, with a base diameter of 8- 10 cm. They have simply smoothed surfaces.

Base Type 3: Flat Round Bases (n=7, 25.9%)

These are bases for small (base diameter 4-9 cm) and thin vessels (0.6-1.1 cm); likely from bowls. Several are decorated with either thumb impressions or vertical incisions on the lip of the base. A toothed carved roulette (R4) is found on vessels with fragments of the lower body. On the interior, most are completely slipped and polished. On the exterior, only one base is polished.

Base Type 4: High Ring Bases (n=2, 7.4%)

High ring bases for an unknown vessel with a base diameter between 7 and 10 cm. One was eroded, and the other was highly polished on the interior and exterior.

Base Type 5: Legged Bases (n=1, 3.7%)

A thin (0.9 cm) vessel with a legged base. The one recovered leg was 2.8 cm in diameter. The leg and vessel were completely slipped and highly polished on the exterior and interior.

Base Type 6: Flat Round Base for Large Vessel (n=1, 3.7%)

This was a flattened base for a large vessel. It was 1.3 cm thick and had a toothed carved roulette (R4) on the lower body. It likely correlates with a jar with flared rim (Type 12).

Body Sherds

There are 1673 body sherds in Red I deposits. Of these 1447 (86%) are decorated, 95 are eroded (6%), and 131 (8%) are undecorated but polished. Twine decorations constituted 90% of the decoration techniques, while carved roulettes accounted for 8%. The most popular twine is Twine 1, which appears on 572, or 40% of decorated vessels. Knotted strip roulette (T24), previously the most common, fell to 12%, or 167. Alternate knotted strip roulette (T6) fell to just 4%, or 57 sherds. Accordion pleated twine (T3) accounts for 4% of decorations, with 52 recorded, while loosely twisted twine (T10) accounts for 10% of the total decorations at 137. Unknown twines account for 296, or 20%, and all other twines together number only 25 sherds. T19, the uniformly twisted combined twine popular throughout the Yellow Phase, virtually disappears during this period, accounting for less than 1% with only 9 instances.

Toothed carved roulette (R4) is found on 100 vessels, or 7% of decorated sherds. All other roulettes are found on only 17 sherds, or around 1%.

Other decorations, like comb impressions, rocker comb, and plastic ridges, that normally occur near the rim, account for only 2%. Only two channels did not co-occur with a twine impression. Some 154 twine-decorated sherds have channels over them. The largest is T1, with 74 cases. T24 occurs with 27 cases, and the unknown twine with 28 cases. Channels are also found with wooden roulettes in 32 cases, of which 24 are with a R4. Almost all (14) of the comb impressions co-occur with channels. Zonation of decorations is not well represented. Channels are found on 13% of body sherds.

Red I Summary

During the Red I period, the ceramic assemblage changed dramatically. The primary decoration techniques of knotted strip roulette (T24) and alternate knotted strip roulette (T6) that had previously dominated the assemblages are less popular, and a new diverse set of twine decorations and carved roulettes dominate this period. Some of these were present in low quantities during Yellow II.

In addition to the shift in decoration techniques, this period is marked by greater diversity within a set of vessel classes generally similar to those of Yellow II. For example, a new type of flared rim vessel (Type 12) with clear roots in Yellow II becomes the most commonly produced vessel form. These have decorations on the underside

of the lip that extend down to the vessel body, as well as a band of red slip around the neck. Unlike earlier periods, smaller vessel types with a similar rim shape but different decoration could be easily separated (Types 13 and 14).

Three additional types of small pots (5-15 cm rim diameter) with non-flared rims were produced in small quantities. These included a triangular rim jar (Type 24), a jar with a thickened rim (Type 19 - distinguished from Yellow I and II thickened rims by the sharpness of the lip), and a restricted rim vessel (Type 20).

Small simple open bowls in a variety of rim forms were produced during this period, similar to the increasing diversity found in small pots. Simple open rims (Type 4) like those found in the Yellow I and II periods still occur in low frequencies. However, three new simple open bowl types dominate the assemblage, including those with triangular rims (Type 16), narrowed rims (Type 17), and slightly everted rims (Type 18). Small simple restricted vessels (Type 5) are still found in low frequency.

Larger bowl classes are more diverse during Red I, with rounded rims (similar in shape to those from the Yellow I and II periods) found (Type 21), as well as a class with triangular rims (Type 23). The flat-topped vessels lose their ledge handles during this period (Type 22).

In addition to this increased diversity in all rim classes, Red I has a concomitant increase in the number and diversity of small vessel bases, the most common of which was a ring base, identical in shape to those from the Yellow I and II periods (Base Type 1). The other new bases are pedestal (Base Type 2) and flattened circular bases (Base Type 3), both of which are likely associated with small bowls. A leg for a tripod base was also uncovered.

During Red I a new class of handle (Handle Type 1) was found throughout the site but were never found attached to any vessel. Due to their small size they may have been used for pot-lids that are as yet not identified in the assemblage.

The assemblage is basically diversified in vessel rim form during Red I (in comparison with Yellow I and II). However, this may not translate into functional variability, as it is not known that they were diversified in usage/function. For example, the various forms of small pot with flared rims are all around the same size, as is the new diversified group of bowls. In addition, the basic assemblage breakdown is similar to the previous periods, as flared rims (all types) account for around 60% of all rims, and small simple open bowls (all types) account for 23-24%. Consequently, this new assemblage diversity may not be related to functional diversification, and will be explored in detail in the next chapter.

Red II
[(65kg, n=3347, 278 Rims, 1698 Body, 1371 small sherds)
(see Figures 5.17 to 5.21, and Table 5.7)]

Type 25: Jars with Overhanging Rims (n= 69, 52.7%)

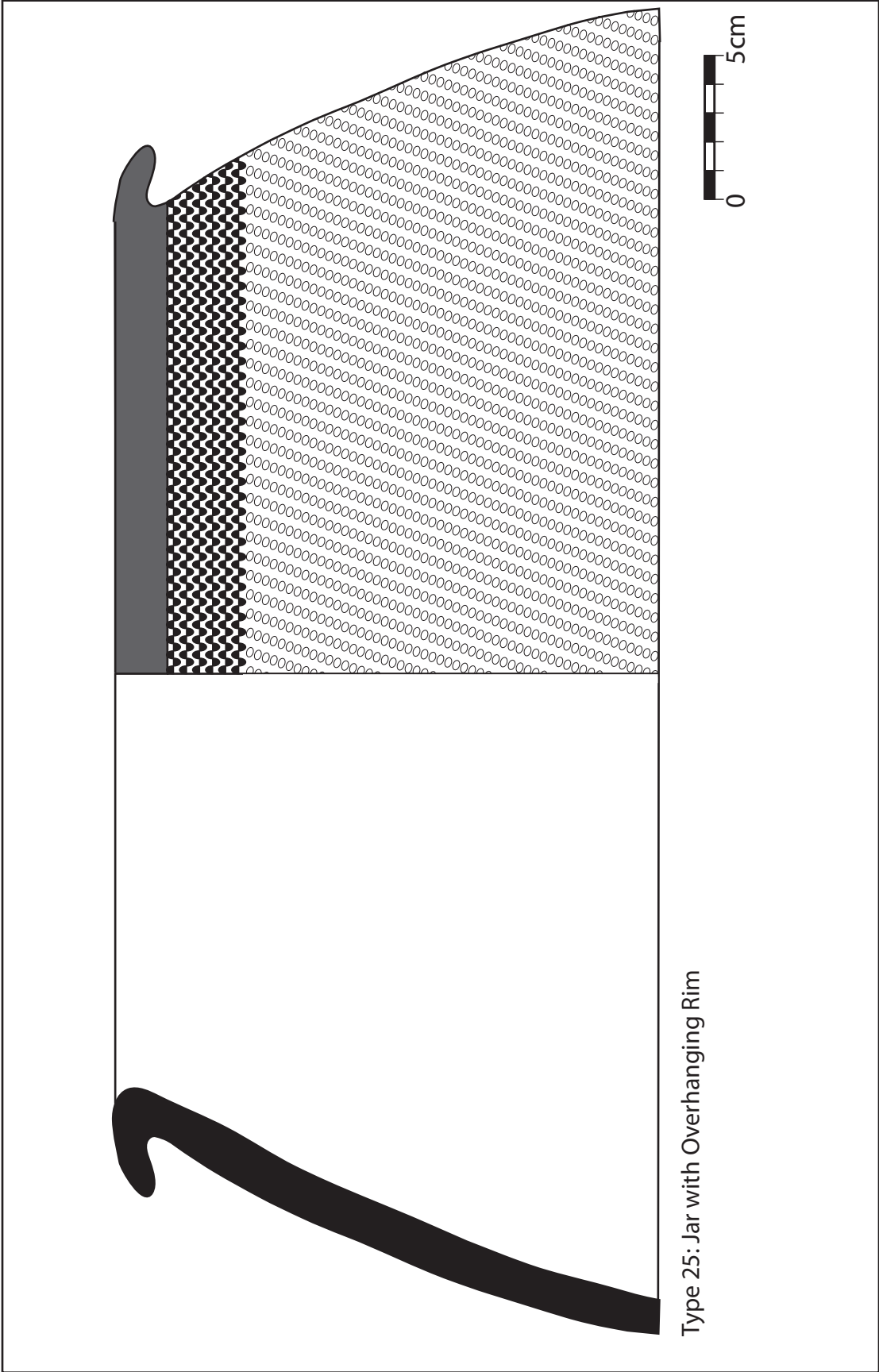
This jar class has a distinctive rim shape, with a restricted opening and long everted rims that overhang horizontally. They constitute an evolution of the flared Red I vessels (Type 12), whose rim angles fell gradually throughout the Red I phase. Decorations are no longer found under the lip, but begin at the neck. There are three size classes, with all but thirteen vessels attributable to the group (see Figure 5.10). The small vessels are 10 to 20 cm in diameter and 0.55 to 1.4 cm in thickness (eversion length ranges from 1 to 2.2 cm). Medium vessels range from 20 to 28 cm in rim diameter and in thickness from 0.8 to 1.5 cm (eversion length ranges from 2.2 to 3.7 cm). The large size class ranges in size from 30 to 42 cm, and in thickness from 1.2 to 2.2 cm (eversion length between 2.7 to 5 cm). Vessels resemble an inverted, long convex cone with a spherical base, similar to vessels from Red I.

The decoration of these jars is dominated by the toothed carved roulette (R4), applied in a 3 to 4 cm thick band around the neck and shoulders of 72% of the sample. Twine decorations are found below the R4 on the vessel body, and can occur with T1, twisted twine (T2), accordion pleated twine (T3), unknown twine (T20), and twisted twine (T18). Twine decorations are also found alone on vessels without the roulette, with T1 being the most common; T2, T3 and T20 are less frequently found. Channels were recorded on the bodies of twelve vessels, most often vertically or diagonally.

Red slip is found on six vessel bodies in diagonal (geometric) patterns serving as a type of paint. In addition, a red slip pattern where slip extends over the lip to the neck (meeting the roulette) is dominant in the assemblage, with 42 vessels (61%) having this application. Thirteen vessels (all early) have a band of slip around the neck in the style of Red I. Two vessels are completely slipped on the interior, and nine have rims that are not slipped but polished (three were eroded). On the interior, 53 vessels (77%) have a red slip on the top of the rim that extends several cm into the vessel, below which the surface is smoothed. Seven vessels are completely slipped on the interior, and three are polished but not slipped.

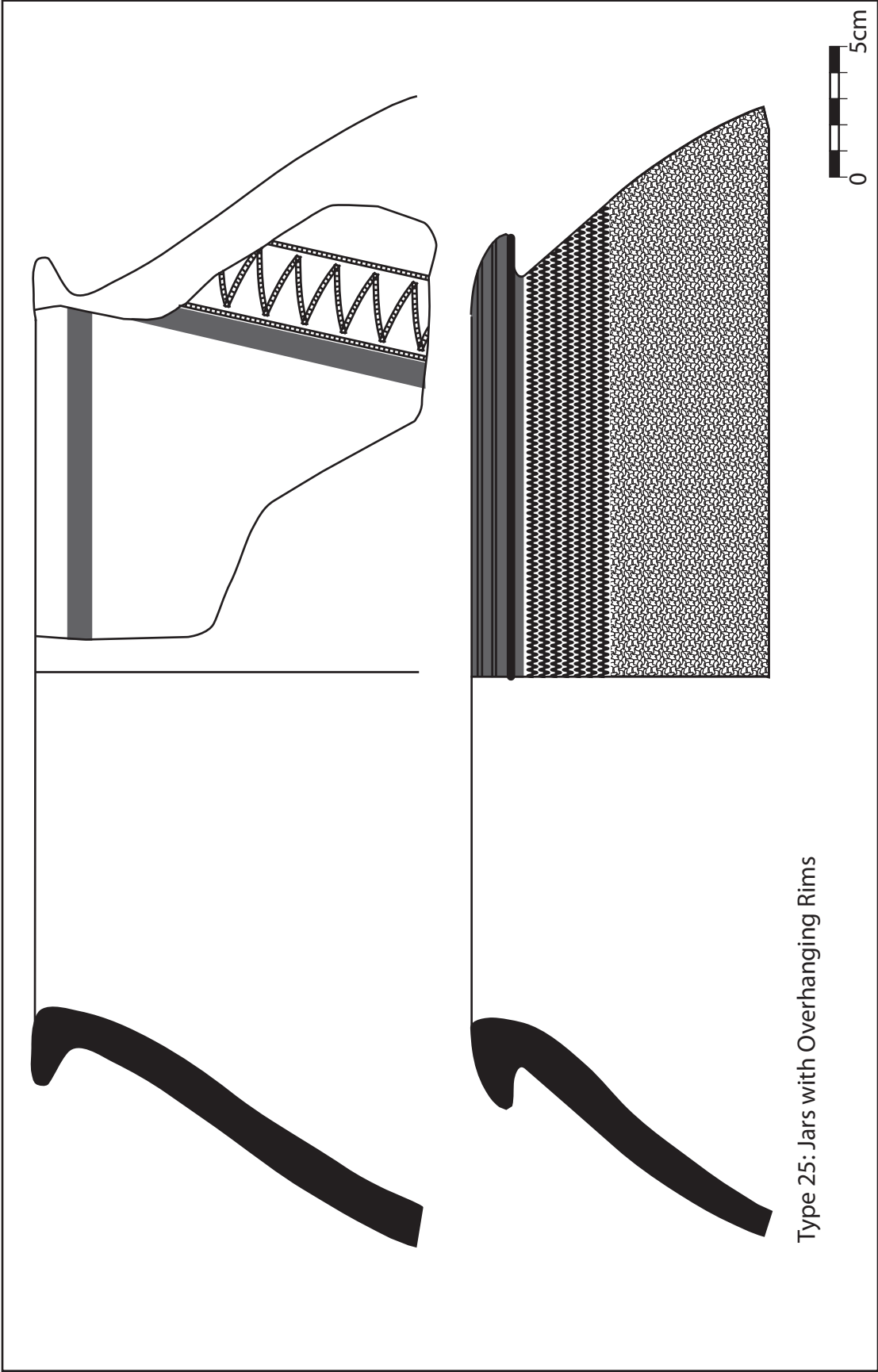
Type 26: Basins with Overhanging Rims (n=2, 1.5%)

These have the exact rim type as the type 26 jars above, but occur on unrestricted vessels that may be basins. They are thick at 1.4 cm, and have rim diameters between 28 and 32 cm.



Type 25: Jar with Overhanging Rim

Figure 5.17: Red II Ceramic Assemblage: Type 25



Type 25: Jars with Overhanging Rims

Figure 5.18: Red II Ceramic Assemblage: Type 25

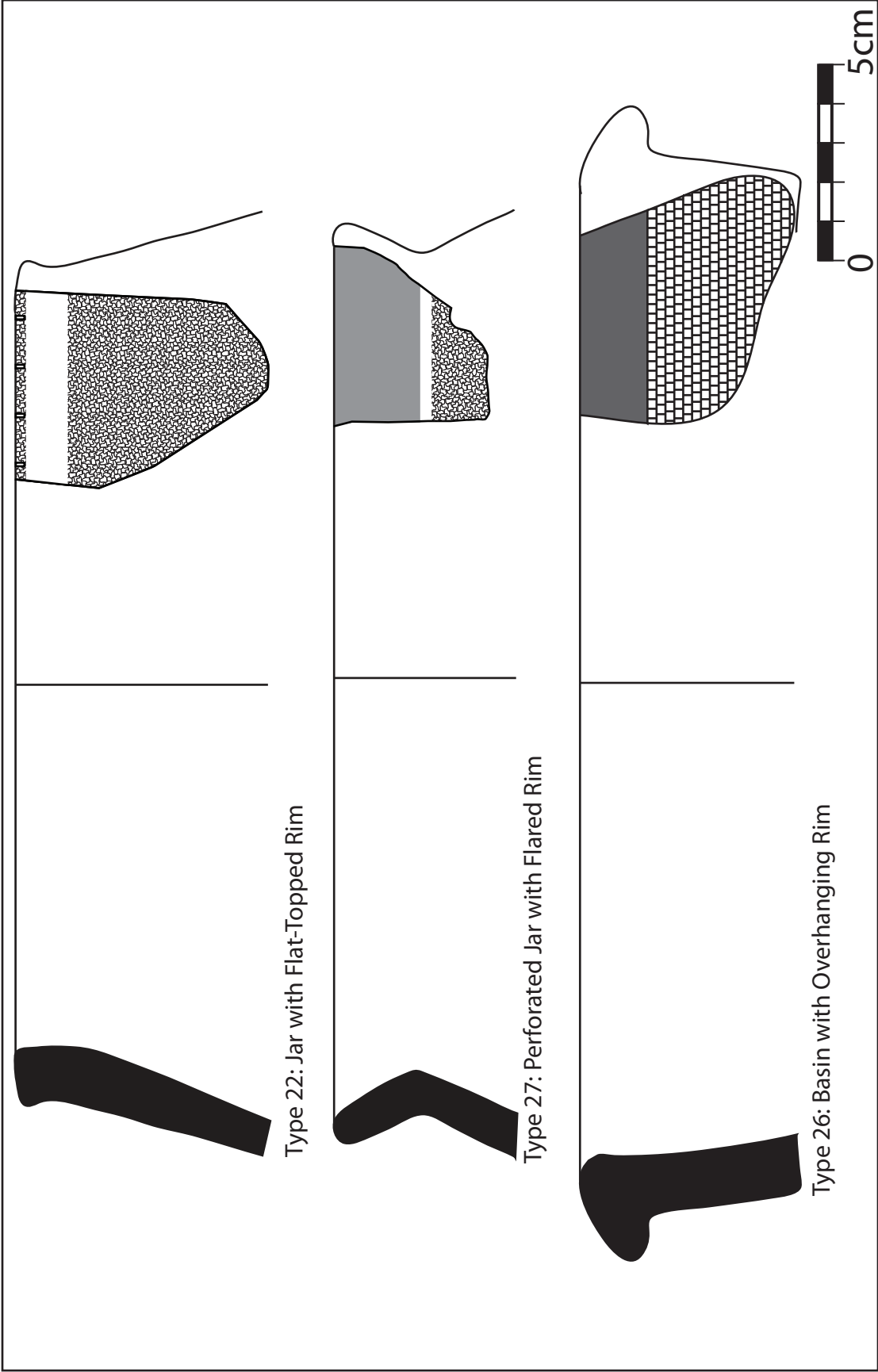


Figure 5.19: Red II Ceramic Assemblage: Types 22, 26, and 27

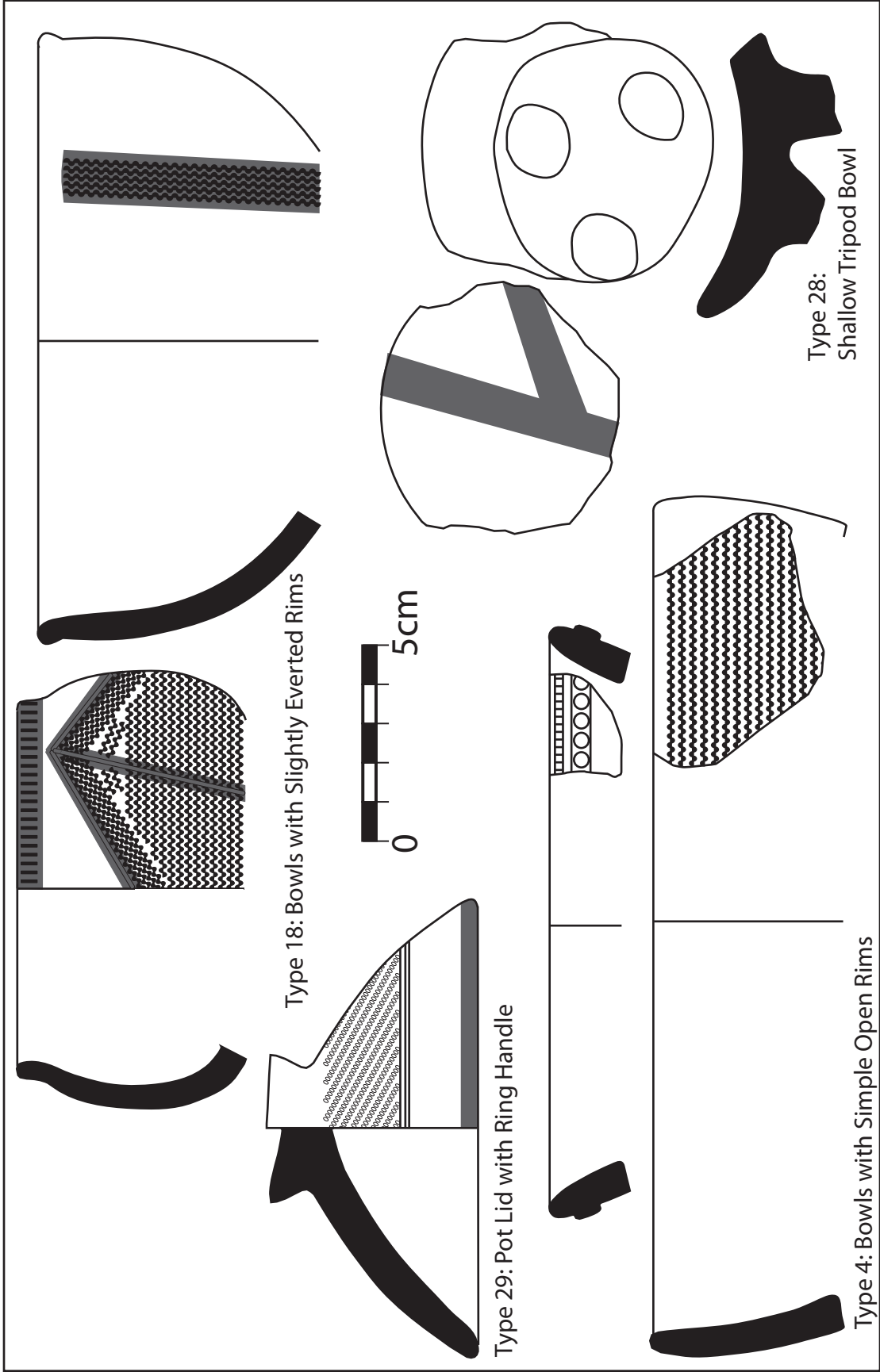


Figure 5.20: Red II Ceramic Assemblage: Types 4, 18, 28, and 29

	Type 25	Type 26	Type 27	Type 18	Type 4	Type 5	Type 22	Type 23	Type 28	Type 29	Base Type 5	Base Type 3	Base Type 1	Base Type 6
n	69													
Vessel Restricted/Open	jars restricted	bowl/basin open	strainer restricted	bowl open	bowl open	vessel restricted	Jar restricted	bowls open	shallow Bowl open	potlid bowl open	base legged vessel	base flat round base	base ring Base	base flattened large vessel
Distinctive Rim/lip Shape	long everted overhanging rims around O'	Long everted hemispherical rim around O'	Flared inverted long convex	simple open with a slightly everted rounded lip	simple open	simple restricted	flat top restricted rim	triangular eversions	oil-Lamp Tripod	simple open ring handle				
Vessel shape	Inverted long convex cone with spherical base	hemispherical	inverted long convex cone	hemispherical	spherical		Inverted long convex cone with spherical base	hemispherical		wide cone				
Plastic features														
Size Classes	3	1	1	1	1	1		maybe 2	1					
Diameter (cm)	10-20 (n=21); 20-28 (n=17); 30-42 (n=18)	28-32		8-18	14-16	22	12-21	16-30	12-13	6-12/4-4-4.5			5-10	
Thickness (cm)	0.55- 2.2	1.4		0.5- 1.1	0.6-0.8	0.5-0.6	0.9-1.1	1.2-1.5	legs 1-1.1 and 3 in length	0.9-1.1			0.7-0.8	1.5
Surface treatment				highly polished (n=25)	highly polished (n=6)	highly polished (n=2)				highly polished (n=3)			highly polished (n=1); eroded-several	
Interior surface treatment	highly polished interior (n=3)			highly polished (n=25)	highly polished (n=6)	highly polished (n=2)	highly polished (n=4)			highly polished (n=3)			highly polished (n=3)	
Lip Decoration				vertical lip incisions (n=6); thumb impressions (n=2)	vertical lip incisions (n=1)		R4 (n=3); T1 (n=1); vertical incisions (n=1); channels (n=1)							
Neck Decoration				channels (n=12); comb impressions (n=3)	channels (n=2); comb impressions (n=2)	channel (n=1)	R4 (n=3; T1 (n=1)	R4 (n=2); T20 (n=1); T7 (n=1)						
Shoulder Decoration	R4 (n=43); T1 (n=7); T2 (n=3); T3 (n=2); T20 (n=2)	R5 (n=1); T2 (n=1)		R4 (n=10)	R4 (n=1)	comb impressions (n=1)	R4 (n=3; T1 (n=1)	R4 (n=2); T20 (n=1); T7 (n=1)						
Body decoration	T1 (n=10); T2 (n=7); T3 (n=4); T20 (n=3); T18 (n=4)	T2 (n=1)		R4 (n=10)	T2 (n=1)	comb impressions (n=1)	R4 (n=3; T1 (n=1)	R4 (n=2); T20 (n=1); T7 (n=1)		R5 (n=1); T2 (n=1); T3 (n=1)				
Lower body decorations													T1 (n=1)	T1 (n=1)
Base decorations													vertical incisions (n=2); thumb impressions (n=2)	thumb impressions (n=1)
Zoned	yes			five vessels have zoned decorations	one									
Body Channels														
Slip on Rim Top				2 (diagonal)	one			1		2				
Interior Slip	lip and neck (n=53); complete (n=7)	lip and neck (n=2)		complete (n=20); lip and rim (n=1)	complete (n=2); lip and rim (n=2)	complete (n=2)	complete (n=1)	lip and rim (n=4)	bands (n=1); complete (n=1)	complete (n=3)	complete (n=1)		complete (n=3)	
Slip on Exterior	neck (n=42); complete (n=2); Band around neck (n=13)	neck (n=2)		neck (n=13); complete neck (n=1); bands on body (n=2- see diagonal channels)	complete (n=2); neck around decorative bands (n=1)	complete (n=2)	complete (n=2)	neck (n=3)		complete (n=1); neck (n=1)				

Table 5.7: Red II Assemblage

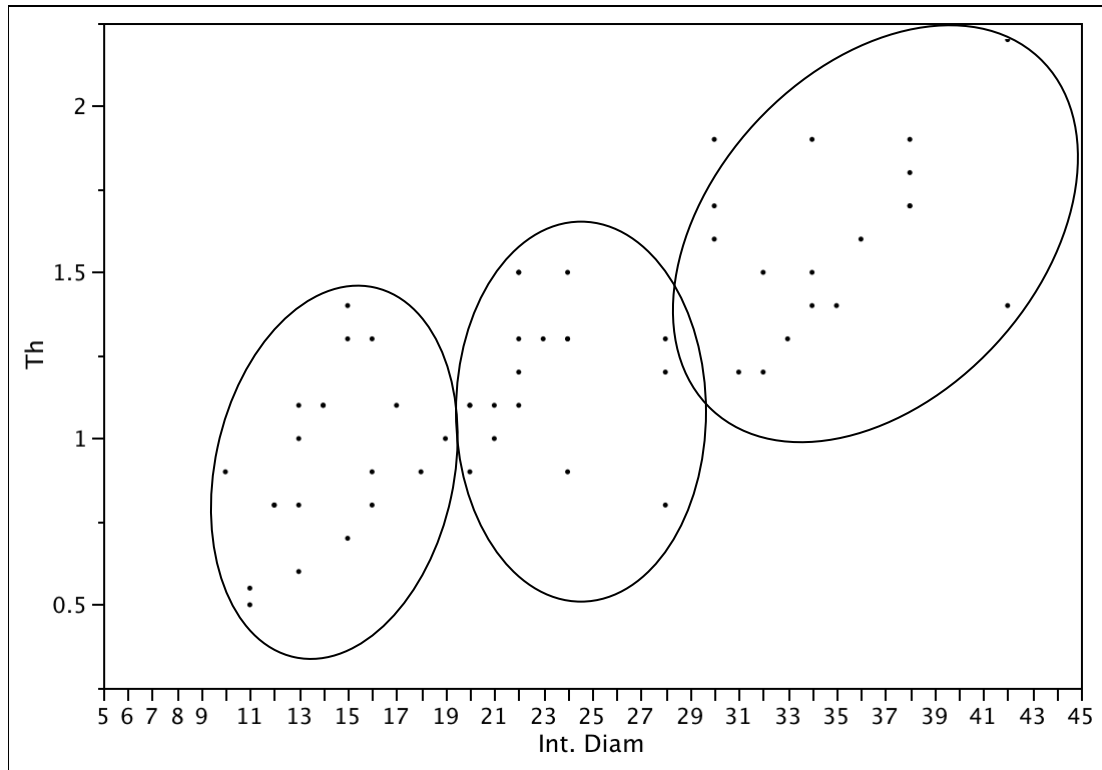


Figure 5.21: Red II Overhanging Rim (Type 25) Vessel Size Classes

In decoration, one has an impressed square roulette (R5), and the other a twisted twine (T2). In both cases this extends from the neck down to the shoulder. It is most likely that the roulette had twine below it, but the fragment does not extend to the body.

Red slip is found on both exteriors from the rim to the neck, and on the interior from the rim to several cm into the vessel, below which they are simply smoothed.

Type 18: Bowls with Slightly Everted Rims (n=25, 19.1%)

Small simple open bowls with a distinctive slightly everted and rounded lip. They are identical to the bowl type found during Red I, although they are more highly decorated in this period and were produced in a wider variety of sizes. They range in size from 8 to 18 cm and in thickness from 0.5 to 1.1 cm.

These bowls are characterized primarily by decorations on the lip and neck. Almost all have a channel or a single row of comb impressions around the neck, and/or vertical incisions or thumb impressions on the lip. On the body, ten vessels have a toothed carved roulette (R4). Several of these have complex decoration combinations, with R4 employed vertically or in specific zones. Three bowls have channels on the body that complement these motifs, and are diagonal or vertical in orientation. All areas on these bowls that were not covered in decoration were polished.

Red slip is used in a variety of ways on the exteriors of these bowls. Thirteen had red slip from the rim to the neck, three were slipped completely, one had a band around the neck, and two had decorative use of bands over channels on the bowl body. On the interior twenty bowls (80%) are completely slipped, one has slip near the rim, and three are polished (one is eroded).

Type 4: Bowls with Simple Open Rims (n=6, 4.6%)

Open bowls characterized by a simple morphology and distinctive decorations that are unique to each vessel. They range in size from 14 to 16 cm, and in thickness from 0.6 to 0.8cm.

In decoration, they are each unique, although they follow the same decoration syntax for small bowls (Type 18) described above. Bowls have a plastic ridge, a channel, or a row of comb impressions around the neck (except for one vessel that is simply polished). One of the plastic ridges has vertical incisions. One bowl is ornately decorated with a toothed carved roulette (R4), twisted twine (T2), a channel, and decorative bands of red slip. All areas not decorated are highly polished.

On the exterior, two bowls are completely slipped, and one has slip from the rim to the neck. On the interior, two are completely slipped, two have slip from the rim to the neck, and two are simply polished.

Type 5: Bowls with Simple Restricted Rims (n=2, 2.3%)

Simple restricted vessels that are very thin walls at 0.5 - 0.6 cm despite their size (22 cm rim diameter).

In decoration, one has comb impressions and a channel, and the other is polished. Both vessels are covered on the interior and exterior with a red slip, and highly polished.

Type 22: Jars with Flat-Topped Rims (n=4, 3.1%)

This vessel class is identical in form to that seen in Red I (inverted long convex cone), and is a restricted jar-like vessel characterized by decorations on top of the lip. Vessels range in size from 12 to 21 cm in diameter and in thickness from 0.9 to 1.1 cm.

From the lip extending to the body, three vessels have a toothed carved roulette (R4), and one has a T1. Also on the lip, one vessel has channels and another has vertical incisions. There was no evidence for slip on the exterior. However, one vessel was entirely slipped on the interior, and three were highly polished.

Type 23: Basins with Triangular Rims (n=4, 2.3%)

A large thick bowl with an everted rim that is triangular in profile. Thickness ranges from 1.2 to 1.5 cm and rim diameter from 16 to 30 cm.

The vessels are decorated with toothed carved roulette (R4), an unknown twine (T20), and an accordion pleated twine (T7). One vessel had a channel. Most have slip from the rim to the neck on the exterior, and on the interior all have slip from the rim to the interior of the neck.

Type 27: Perforated Jar with Flared Rim (n=1, 0.8%)

A flared rim vessel with 1cm diameter holes over the entire surface of the vessel, from the neck down. It is 1.1 cm thick and 22 cm in rim diameter. A T1 decoration covers the entire exterior surface, with occasional channels. It has slip from the rim to the neck on both the interior and exterior.

Type 28: Shallow Tripod Bowls (n=2, 1.5%)

Oil lamps are characterized by their tripod base and shallow bowl. They are between 12 and 13 cm in diameter with legs 1-1.1 cm in thickness and 3cm in length. One has bands of slip on the interior of the bowl. The other has an accordion pleated twine (T7) on the exterior of the lamp, and is completely slipped on the interior of the bowl.

Type 29: Pot Lids with Ring Handles (n=3, 2.3%)

Simple open bowls with ring handles on the top that were inverted for use as potlids. They range from 6 to 12 cm in diameter, and the handles from 4.4 to 4.5 cm in diameter. Thus, they were used for covering small bowls/pots (tô and sauce bowls most likely). They range in thickness from 0.9 to 1.1 cm.

Their exteriors are considerably decorated: a zone of impressed square roulette (R5) on one lid, a twisted twine (T2) and a channel on another, and an accordion pleated twine (T3) and channel on the last.

Two are completely covered by a red slip on the exterior, while one has a slip that extends from the rim to the neck. On the interior, all are completely slipped and polished.

Base Type 1: Ring Bases (n=5, 62.5%)

These are identical to those found from Yellow I to Red I. They come from small (5-10cm base diameter), thin vessels (0.7-0.8 cm), likely bowls. Most have either vertical incisions or thumb impressions on the base lip. One vessel has a T1 on the lower body. Three have slip on the interior, and all are highly polished. Only one is highly polished on the exterior.

Base Type 3: Flat Round Base (n=1, 12.5%)

This is the same type of base that was common during Red I. It was 9 cm in diameter and had thumb impressions on the exterior lip.

Base Type 5: Legged Base (n=1, 12.5%)

A single leg (2.8 cm diameter) for a tripod base that was completely slipped on the interior.

Base Type 6: Large Flat Base (n=1, 12.5%)

The large flat base of a large vessel was recovered. It was 1.5 cm thick, with thumb impressions on the base and a T1 on the lower body.

Body Sherds

There were 1718 body sherds in Red II deposits. Of these, 1520 (88%) were decorated, 105 were eroded (6%), and 93 (6%) were undecorated but polished. Twine decorations constituted 85% of the decoration techniques, while carved roulettes accounted for 15%. The most popular twine was T1, which appeared on 554, or 36% of decorated vessels. Twisted twine (T2) fell to 10%, or 155. Alternate knotted strip roulette (T6) continued to fall to just less than 1%, or 23 sherds. Accordion pleated twine (T3) accounted for 3% of decorations, with 49 recorded, while loosely twisted twine (T10) fell to 5% of the total decorations at 86. Unknown twines (T20) accounted for 362, or 24%, and all other identified twines together numbered only 38 sherds.

In carved roulettes, toothed carved roulette (R4) was found on 225 vessels, or 15% of decorated sherds. All other roulettes were found on only 16 sherds, or around 1%.

Other decorations, like comb impressions, rocker comb, and plastic ridges that normally occur near the rim accounted for only 1%. Some 238 decorated sherds had channels over them. The most frequent co-occurrences were T1, with 85 cases, and R4 in 68 cases. Zonation of decorations was not well represented. However it is clear that carved roulettes were applied on the neck of vessels, below which were twine decorations. Channels were found on 16% of body sherds.

Red II Summary

Much of the diversity that is found in Red I pottery disappears during Red II. However, once again there is a dominant rim type for most jars, the overhanging rim (Type 25). This rim type is found in three distinct size classes and decoration is highly standardized, with almost all jars and pots having a band (3-4 cm thick) of a carved roulette (usually R4) applied around the vessel neck and shoulder, below which is a twine roulette decoration on the body. The only other restricted vessel found in high frequency

is a small vessel with a triangular rim (Type 24) that is present at the very beginning of Red II, and its similarity to a rim type in Red I may suggest that this is class simply carries over and does not persist long into Red II. Similarly, the diversity of simple open bowls disappears with the slightly everted variant (Type 18) the primary one produced, and simple open (Type 4) and restricted vessels (Type 5) found in low frequency. Flat-top restricted vessels (Type 22) continue to be produced in Red II, as do basins with triangular shaped rims (Type 23) and overhanging rims identical to the main jar class (Type 26).

Several new vessel classes were made during Red II, including a flared restricted rim pot that has holes 1 cm in diameter over the entire surface from the shoulder to the base (Type 27- its function will be discussed later in the chapter). There are also small oil lamps with tripod bases. A new class of pot-lid is also found during Red II. They are simple open bowls (Type 29) with small ring bases (a knob for lifting) that are highly decorated, and for covering small vessels with rim diameters between 6 and 12 cm. The handles from Red I that were postulated to have been lid handles disappear during this period, replaced by this new class.

Ring bases again predominate (Base Type 1), while flat round bases (Base Type 3) are rare during Red II. A single vessel with legs was also uncovered. In decoration, the standardized use of R4 contributes to its increase to account for 15% of the total decorated sample. T1 remains the most popular twine decoration. The distribution of vessels at the assemblage level remains similar, as jars with the same rim form (Type 25) account for ~60% of the total, and small simple open bowls of both classes (Type 4 and 18) account for ~ 25%. All other vessels are found in low frequency.

Red III

**[(174kg, n=7588, 450 rims, 3050 body, 4088 small sherds)
(see Figures 5.22 to 5.25, and Table 5.8)]**

Type 30: Jars with Triangular Rims (n= 111, 63.4%)

A jar class with triangular-shaped rims in profile. They constitute an evolution of the horizontal eversion jars of Red II, whose rims shortened gradually throughout the Red II period. The decorative syntax is largely the same as Red II jars. There are four size classes, with all but 33 vessels attributable to a group (see Figure 5.12). The small class ranges from 8 to 11 cm in rim diameter and in thickness from 0.6 to 1.1 cm. The medium/small range from 12 to 19 cm in rim diameter and in thickness from 0.6 to 1.3 cm. The medium/large range from 20 to 26 cm in diameter, and in thickness from 0.7 to 1.7 cm. The large range from 30 to 40 cm, and in thickness from 1.1 to 2.3 cm. Vessel form is

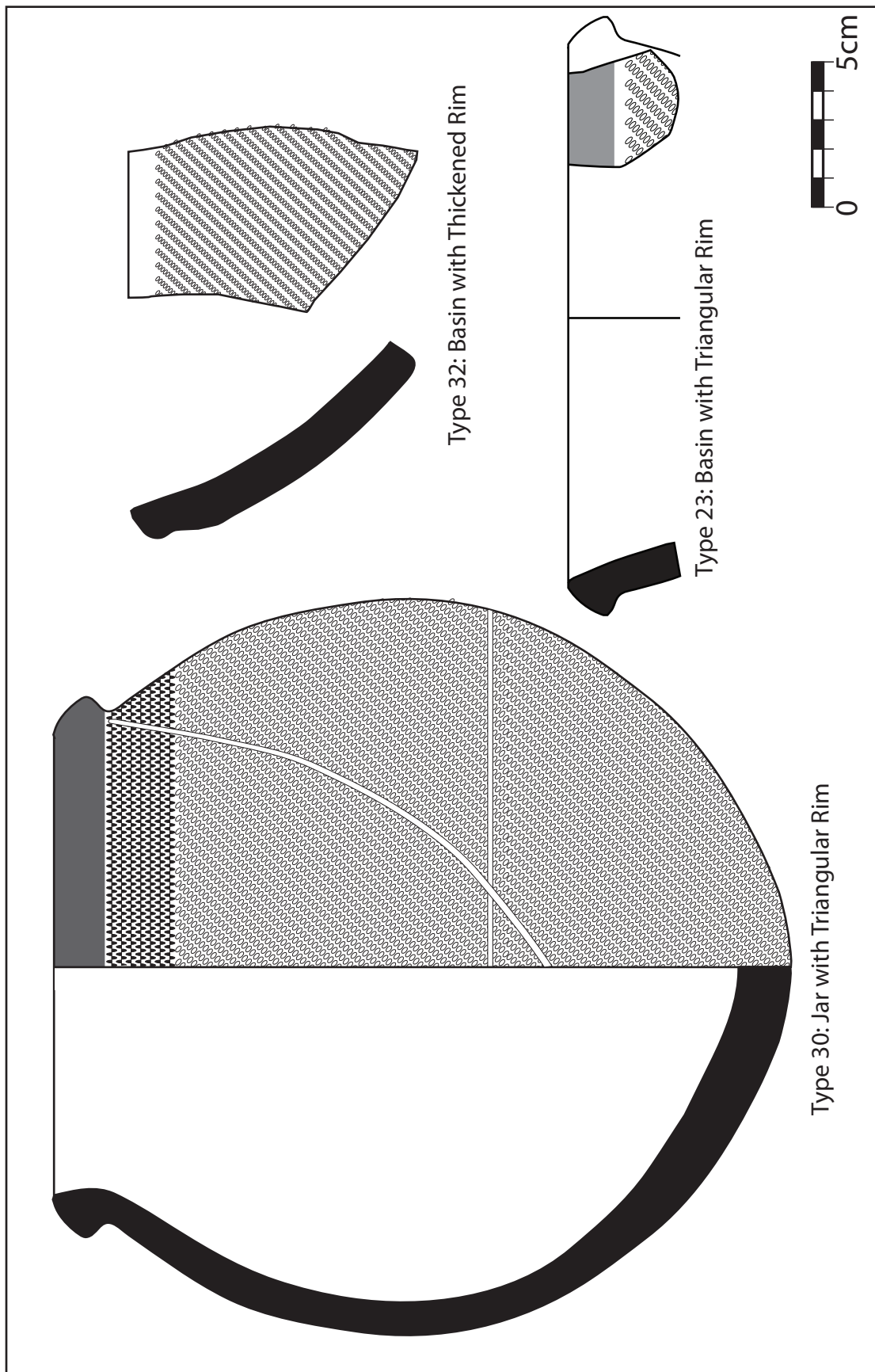


Figure 5.22: Red III Ceramic Assemblage: Types 23, 30, and 32

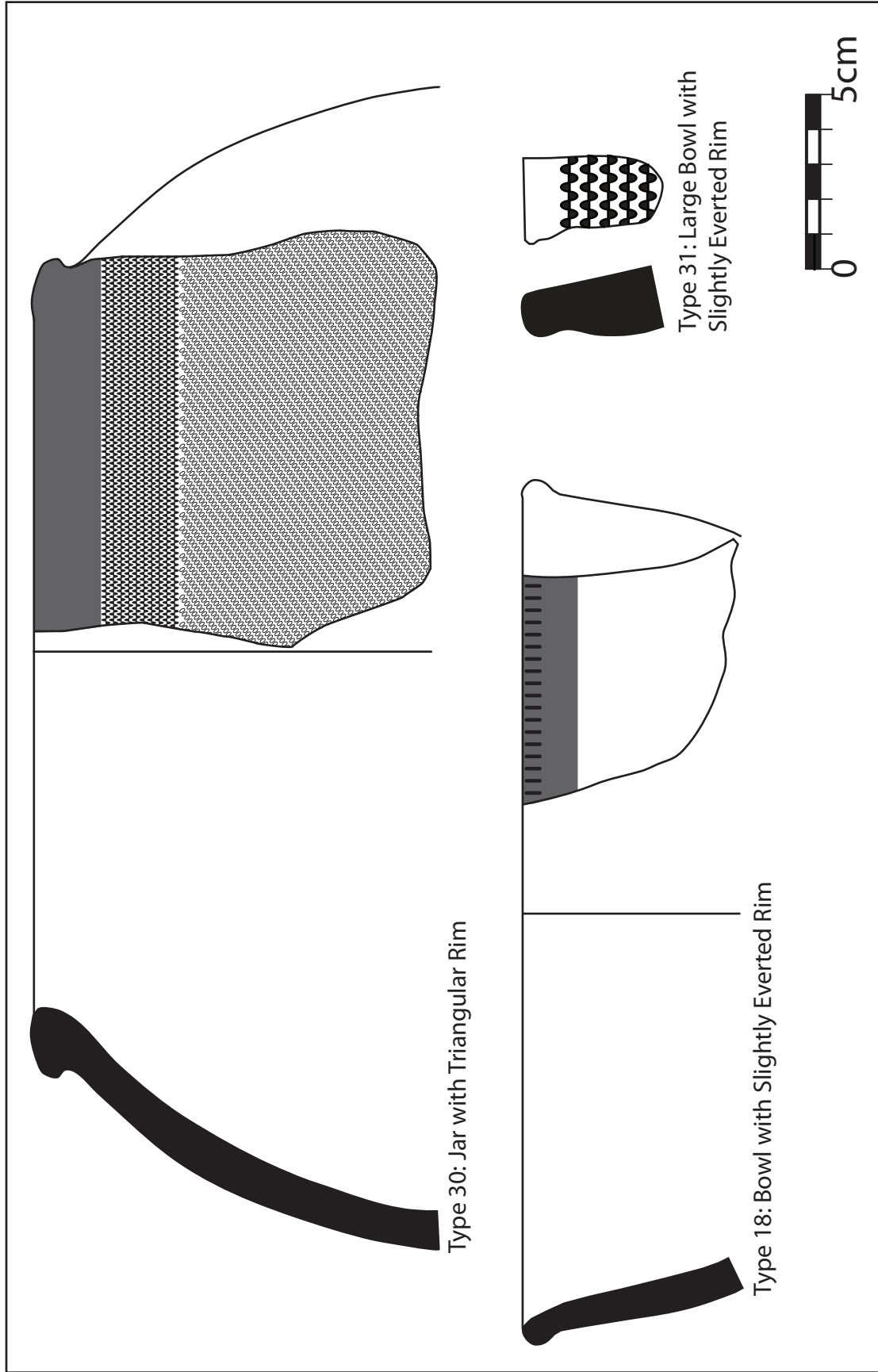


Figure 5.23: Red III Ceramic Assemblage: Types 18, 30, and 31

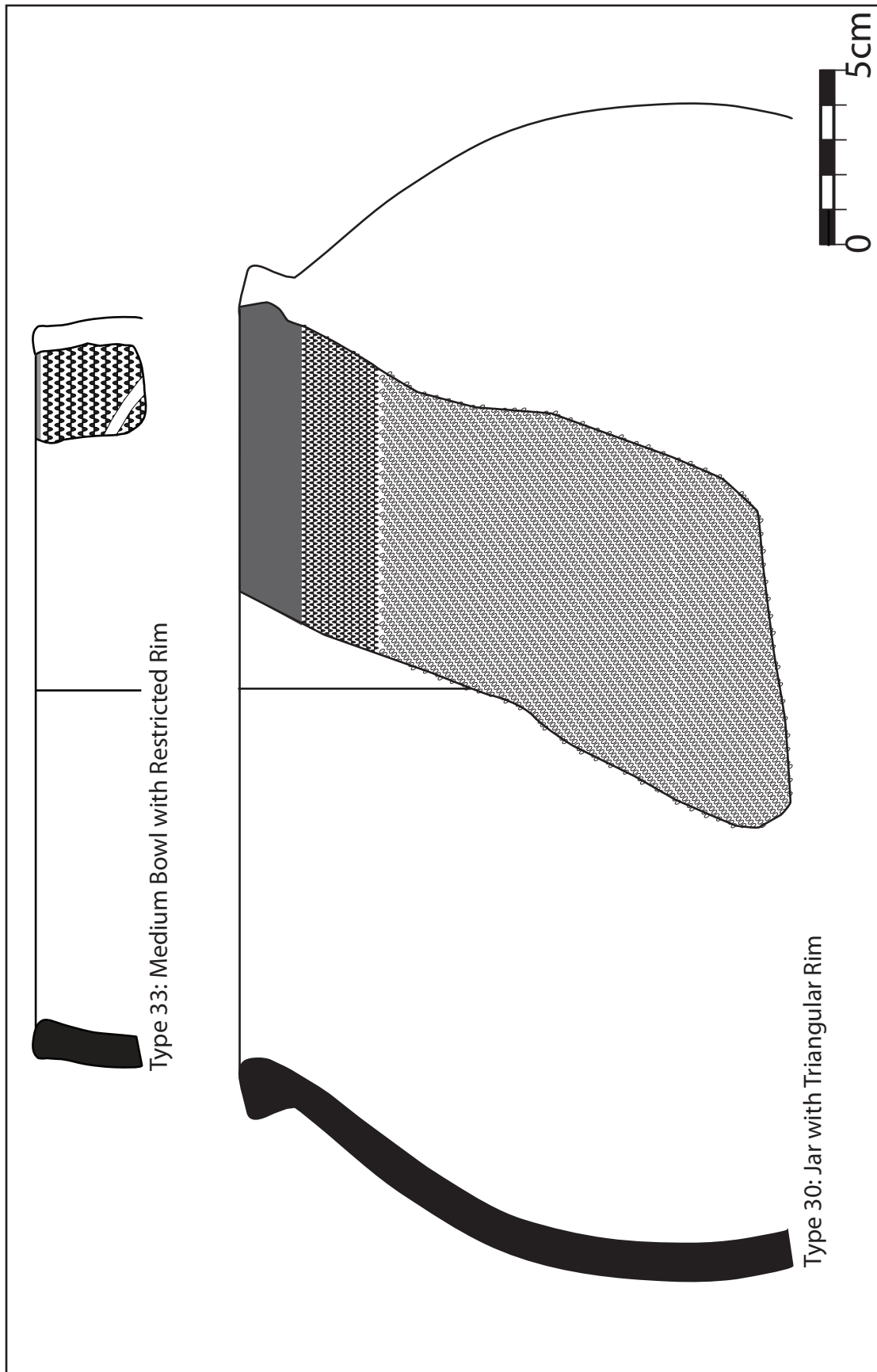


Figure 5.24: Red III Ceramic Assemblage: Types 30 and 33

	Type 30	Type 18	Type 4	Type 5	Type 23	Type 31	Type 32	Type 33	Base Type 3	Base Type 1	Base Type 6	Base Type 2	Base Type 5
n	111	45	9	2	4	2	1	1	17	10	8	1	1
Vessel	jars	bowl	bowl	vessel	bowl	bowl	bowl	vessel	base	base	base	base	base
Restricted/Open	restricted	open	open	restricted	open	open	open	restricted	flat round	ring base	large flat	pedistal base	legged vessel
Distinctive Rims/lip Shape	triangular everted rims	simple open, slightly everted rim	simple open	simple restricted	simple open with a triangular eversion	simple open, slightly everted rim	thickened triangular eversion	simple restricted					
Vessel shape	spherical/egg-shaped	hemispherical	hemispherical	spherical	hemispherical	hemispherical	hemispherical (possibly a lid?)	spherical					
Plastic features			plastic ridge with incisions (n=1)										
Size Classes	4 (n=33 not attributable)												
Diameter (cm)	8-11 (n=11); 12-19 (n=33); 20-26 (n=22); 30-40 (n=12)	9-26	12-17		14-30			20	5.5-8	4.5-8	16	10	leg diameter 2.3
Thickness (cm)	0.6-2.3	0.6-1.1	0.5-0.9	0.5	0.9-1.7	2-2.2	1.5	1	0.4-1.2	0.7-1.5	1.2-1.8	1.7	0.9
Surface treatment	highly polished (n=8)	highly polished (n=45)	highly polished (n=8)	highly polished (n=2)			highly polished (n=1)	highly polished (n=1)	highly polished (n=16); eroded (n=1)	highly polished (n=10)		highly polished	
Interior surface treatment	highly polished (n=14)	highly polished (n=43)	highly polished (n=8)	highly polished (n=1)				highly polished (n=1)	highly polished (n=16); eroded (n=1)	highly polished (n=7)		highly polished	
Lip Decoration	thumb impressions (n=1); vertical lip incisions (n=5)	vertical lip incisions (n=13); thumb (n=1); channel (n=1)	vertical lip incisions (n=3)										
Neck Decoration	impressed triangles (n=1); comb impressions (n=2)	vertical incisions (n=1); comb impressions (n=8); channels (n=18)	channel (n=1)										
Shoulder Decoration	R4 (n=54); R5 (n=1); T1 (n=2); T2 (n=9); T3 (n=2); T4 (n=1); T5 (n=2); T6 (n=1); T7 (n=1); T8 (n=1); T9 (n=1); T10 (n=1); T11 (n=1); T12 (n=1); T13 (n=1); T14 (n=1); T15 (n=1); T16 (n=1); T17 (n=1); T18 (n=1); T19 (n=1); T20 (n=1); T21 (n=1); T22 (n=1); T23 (n=1); T24 (n=1); T25 (n=1); T26 (n=1); T27 (n=1); T28 (n=1); T29 (n=1); T30 (n=1); T31 (n=1); T32 (n=1); T33 (n=1); T34 (n=1); T35 (n=1); T36 (n=1); T37 (n=1); T38 (n=1); T39 (n=1); T40 (n=1); T41 (n=1); T42 (n=1); T43 (n=1); T44 (n=1); T45 (n=1); T46 (n=1); T47 (n=1); T48 (n=1); T49 (n=1); T50 (n=1); T51 (n=1); T52 (n=1); T53 (n=1); T54 (n=1); T55 (n=1); T56 (n=1); T57 (n=1); T58 (n=1); T59 (n=1); T60 (n=1); T61 (n=1); T62 (n=1); T63 (n=1); T64 (n=1); T65 (n=1); T66 (n=1); T67 (n=1); T68 (n=1); T69 (n=1); T70 (n=1); T71 (n=1); T72 (n=1); T73 (n=1); T74 (n=1); T75 (n=1); T76 (n=1); T77 (n=1); T78 (n=1); T79 (n=1); T80 (n=1); T81 (n=1); T82 (n=1); T83 (n=1); T84 (n=1); T85 (n=1); T86 (n=1); T87 (n=1); T88 (n=1); T89 (n=1); T90 (n=1); T91 (n=1); T92 (n=1); T93 (n=1); T94 (n=1); T95 (n=1); T96 (n=1); T97 (n=1); T98 (n=1); T99 (n=1); T100 (n=1)	R4 (n=1)	R4 (n=1)	R4 (n=1); T20 (n=1); T3 (n=1); T2 (n=1)	R4 (exterior) (n=1); T18 (interior) (n=1)	R4 (exterior) (n=1); T20 (interior) (n=1)	T2 (n=1)	R4 (n=1)					
Body decoration	T1 (n=6); T2 (n=16); T3 (n=2); T4 (n=3); T5 (n=5); T6 (n=2); T7 (n=1); T8 (n=1); T9 (n=1); T10 (n=1); T11 (n=1); T12 (n=1); T13 (n=1); T14 (n=1); T15 (n=1); T16 (n=1); T17 (n=1); T18 (n=1); T19 (n=1); T20 (n=1); T21 (n=1); T22 (n=1); T23 (n=1); T24 (n=1); T25 (n=1); T26 (n=1); T27 (n=1); T28 (n=1); T29 (n=1); T30 (n=1); T31 (n=1); T32 (n=1); T33 (n=1); T34 (n=1); T35 (n=1); T36 (n=1); T37 (n=1); T38 (n=1); T39 (n=1); T40 (n=1); T41 (n=1); T42 (n=1); T43 (n=1); T44 (n=1); T45 (n=1); T46 (n=1); T47 (n=1); T48 (n=1); T49 (n=1); T50 (n=1); T51 (n=1); T52 (n=1); T53 (n=1); T54 (n=1); T55 (n=1); T56 (n=1); T57 (n=1); T58 (n=1); T59 (n=1); T60 (n=1); T61 (n=1); T62 (n=1); T63 (n=1); T64 (n=1); T65 (n=1); T66 (n=1); T67 (n=1); T68 (n=1); T69 (n=1); T70 (n=1); T71 (n=1); T72 (n=1); T73 (n=1); T74 (n=1); T75 (n=1); T76 (n=1); T77 (n=1); T78 (n=1); T79 (n=1); T80 (n=1); T81 (n=1); T82 (n=1); T83 (n=1); T84 (n=1); T85 (n=1); T86 (n=1); T87 (n=1); T88 (n=1); T89 (n=1); T90 (n=1); T91 (n=1); T92 (n=1); T93 (n=1); T94 (n=1); T95 (n=1); T96 (n=1); T97 (n=1); T98 (n=1); T99 (n=1); T100 (n=1)		R4 (n=1)		T2 (n=2); T20 (n=1); T3 (n=1)	R4 (exterior) (n=1); T20 (interior) (n=1)	T2 (n=1)	R4 (n=1)		T1 (n=1)			
Lower Body Decoration													
Base decoration													
Zoned													
Body Channels	37	5 (mainly fancy ones)			1								
Slip on Rim Top													
Interior Slip	lip and rim (n=65); complete (n=12)	complete (n=35); lip and rim (n=3)	complete (n=5)	complete (n=1)	lip and rim (n=2)	band of slip across (n=1)	(n=1) unknown zonation	complete (n=12)	complete (n=16); eroded (n=1)	complete (n=7)	complete (n=1); Band (n=1)	complete (n=1)	complete (n=1)
Slip on Exterior	neck (n=81); complete (n=4); neck bands (n=6); geometric pattern bands over channels (n=23)	neck (n=27); complete (n=4)	complete (n=4); neck (n=1)		neck (n=2)	band of slip across (n=1)		neck (n=1)	complete (n=4)	complete (n=2)		complete (n=1)	complete (n=1)

Table 5.8: Red III Assemblage

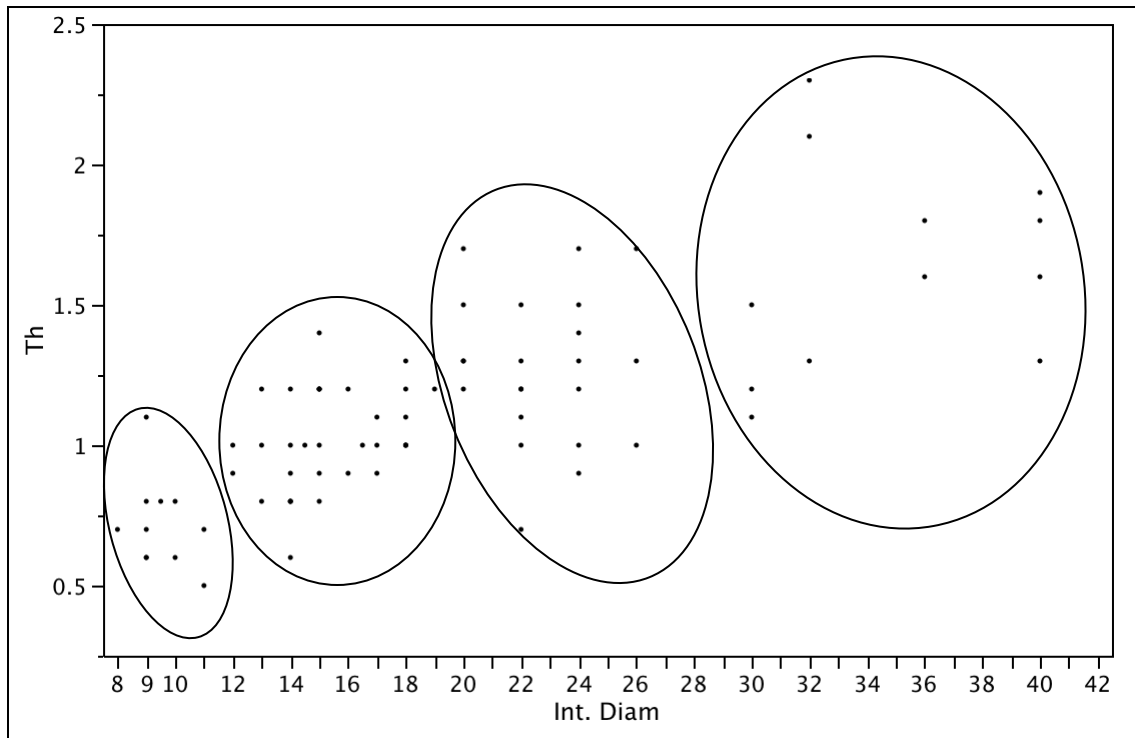


Figure 5.25: Red III Triangular Rim (Type 30) Vessel Size Classes

slightly different than Red II, with jars being more spherical (almost egg-like) in shape.

The decoration of these jars is dominated by the toothed-carved roulette (R4), which is applied in a 3-4 cm horizontal band around the neck and shoulder of 59% (n=54). Twine decorations are found below the R4 on the vessel body, and R4 is found with T1, twisted twine (T2), accordion pleated twine (T3), unknown twine (T20), twisted twine (T18), with T20, and vertical incisions on the lip. Impressed square roulette (R5) is also found on a few vessels, one with T1.

Twine decorations are also found alone on vessels without carved roulettes, with T1 found with thumb impressions. T2 the most common, and less frequently T3, T7, T9, T10, and T20. Vessels with twines infrequently co-occur with impressed triangles and vertical lip incisions. Several vessels have neither carved roulettes nor twine decorations, but have comb impressions, rocker comb, and vertical lip incisions. Overall channels are found on 37 vessels, often applied vertically or diagonally on the vessel body.

Red slip is used frequently as a decoration on the vessel bodies. Some 25 jars have bands and zones of slip painted on their vessel bodies, often painted over channels or in geometric shapes. Slip patterns are very standardized. Some 81 (85%) vessels have slip from the rim to the neck, four are completely slipped, six have bands around the neck, and eight are simply polished. On the interior, 65 (70%) have red slip from the rim to the neck, twelve are completely slipped, and 14 are polished (20 are eroded).

Type 18: Bowls with Slightly Everted Rims (n=45, 25.7%)

Small simple open bowls with a distinctive, slightly everted and rounded lip. They are identical to the Type 18 bowls found in Red I and II. They range in rim diameter from 9 to 26 cm and in thickness from 0.6 to 1.1 cm.

In decoration, the small bowls generally follow the syntax established at the beginning of the Red Phase. Almost all bowls have either a decoration on the lip (primarily vertical lip incisions, but sometimes a channel or thumb impressions), or have a single channel around the neck or a single row of comb impressions. Below the neck, decoration was primarily polished surfaces, but several bowls have plastic decorations, including most commonly toothed carved roulette (R4) and rocker comb, but also twines T1, T2, and T3. Nine bowls are simply polished on the exterior. In general, all bowls were highly polished on the interior, and on the exterior wherever there were not plastic decorations. Five bowls have channels on the body, oriented diagonally or vertically.

Red slip is found from the exterior rim to the neck of twenty-seven bowls. Four are completely slipped; on the interior, thirty-five (78%) are completely slipped, and three have slip from the rim to the neck. Red slip was used as a zoned decoration in geometric shapes on three bowls.

Type 4: Bowls with Simple Open Rims (n=9, 5.1%)

Open bowls characterized by a simple morphology and distinctive decorations that are unique to each vessel. They range in size from 12-17 cm and in thickness from 0.5-0.9 cm.

Most vessels have a decoration on the lip (vertical lip incisions, plastic ridge with incisions), or a channel or row of comb impressions on the neck. One vessel had a toothed carved roulette (R4) decoration below the neck.

Four are completely covered in red slip on the exterior, and one has slip from the rim to the neck. On the interior, five are completely slipped. Except for the one eroded vessel, all bowls are highly polished on both the interior and exterior.

Type 5: Bowls with Simple Restricted Rims (n=2, 1.1%)

This is the same medium sized, thin walled restricted vessel class found in Red I and II. The only recordable variable in this phase is a thickness of 0.5 cm.

In decoration, one is simply polished and the other has a channel. One is completely slipped on the exterior and the other is simply polished. On the interior, one is polished and the other eroded.

Type 23: Basins with Triangular Rims (n=4, 2.3%)

Thick bowls with triangular-shaped everted rims in profile. They measure 0.9- 1.7 cm in thickness and their rim diameter range from 14 to 30 cm.

They are decorated on the body with a toothed carved roulette (R4), twisted twine (T2), an unknown twine (T20), and an accordion pleated twine (T3). T2 (body) and T3 (shoulder) co-occur on one vessel. Two vessels have slip from the rim to the neck on the exterior, and on the interior, two have slip from the rim to the interior of the neck.

Type 31: Large Bowls with Slightly Everted Rims (n=2, 1.1%)

These medium/large simple open bowls have a distinctive rim shape with a slightly everted and rounded lip. They are thick, ranging from 2 to 2.2 cm. Rim diameter was not measurable.

One bowl has a toothed carved roulette (R4) on the exterior and a twisted twine (T18) on the interior, while the other was eroded. One vessel has a band of red slip on the exterior and its interior is decorated; the other is eroded on both sides.

Type 32: Basin with Thickened Rim (n=1, 0.6%)

This is a simple open vessel 1.5 cm thick, with a thickened triangular shaped lip. It is decorated with a twisted twine (T2) on the shoulder and body, and was highly polished on the exterior. The zonation of slip is unknown.

Type 33: Medium Bowl with Restricted Rim (n=1, 0.6%)

This is a medium simple restricted vessel with a rim diameter of 20 cm and a thickness of 1 cm. It is highly polished on the interior and exterior, and has a toothed carved roulette (R4) on the shoulder and body. It has slip on the exterior neck.

Base Type 1: Ring Bases (n=10, 27%)

These are the same type found from Yellow I to Red II. They are from small (base diameter 4.5-8 cm), thin (0.7- 1.5 cm) vessels. Half have vertical incisions or thumb impressions on the base lip. Two vessels had lower body fragments with a toothed carved roulette (R4), T1, and an unknown twine. Most are completely slipped on the interior, and a few on the exterior, but all are highly polished on the interior, and most on the exterior.

Base Type 2: Pedestal Base (n=1, 2.7%)

One pedestal base (probably intrusive) with a base diameter of 10cm, and a thickness of 1.7 cm. It was entirely slipped on the interior and exterior, as well as polished.

Base Type 3: Flat Round Bases (n=17, 45.9%)

A base for small (5.5-8 cm base diameter), thin (0.4-1.2 cm) bowls. Almost all have vertical incisions on the base lip, with several having comb impressions or thumb impressions. On the lower body, a variety of decorations are found, including most frequently a toothed carved roulette (R4), but also T1, T3, and unknown twines, rocker comb, and channels.

Most are completely slipped on the interior, and several are completely slipped on the exterior. All are highly polished both on the interior and exterior.

Base Type 5: Legged Base (n=1, 2.7%)

This is a base of a thin (0.9 cm) legged (2.3 cm diameter) vessel. It is completely slipped on the interior.

Base Type 6: Large Flat Bases (n=8, 21.6%)

Bases from larger vessels (pots and jars). They range in thickness from 1.2 to 1.8 cm, and the one measurable base diameter is 16 cm. Half have either vertical incisions or thumb impressions on the base edge, and a series of decorations (T1, T2, T20) were found on the vessel exterior, as was one channel. Interestingly, the interiors of several are also decorated with twines, one with T3, and another with T18. Red slip was on the interior of one, and another had a band.

Body Sherds

There are 3141 body sherds in Red III deposits. Of these 2813 (89%) are decorated, 181 are eroded (6%), and 147 (5%) are undecorated but polished. Twine decorations constitute 88% of the decoration techniques, while carved roulettes account for 11%. The most popular twine was T1, which appears on 756, or 27% of decorated vessels. Twisted twine (T2) increased to 15%, or 429. Accordion pleated twine (T3) accounts for 3% of decorations, with 109 recorded, while loosely twisted twine (T10) fell to 3% of the total decorations at 88. The new twisted twine (T18), a loose derivation of twisted T2, accounts for 9% of decorations at 253. Unknown twines (T20) account for 646, or 23%.

In carved roulettes, toothed carved roulette (R4) is found on 268 vessels, or 10% of decorated sherds. All other roulettes are found on only 42 sherds, or around 1%.

Other decorations, like comb impressions, rocker comb, and plastic ridges, that normally occur near the rim account for only 1%. Some 465 decorated sherds have channels over them. The most frequent co-occurrences are T1, with 97 cases, and R4 in 74 cases. Zonation of decorations is not well represented; however, it is clear that carved

roulettes are applied on the neck of vessels, below which are found twine decorations. Channels are found on 15% of body sherds.

Red III Summary

The Red III pottery assemblage is in many ways a continuation of that seen in Red II, potentially even more standardized in form and decoration. The assemblage is dominated by jars with triangular rims (Type 30). These vessels are made in four distinct size classes and are mainly characterized by the same zonation of decoration found in Red II, with a band of carved roulette decoration (R4) around the shoulder of the vessel, below which is a rouletted twine on the body. Towards the end of this period some vessels with this rim type lack the roulette decoration at the shoulder. These vessels are more spherical in shape than the inverted cones with round bases found in Red II, with large vessels resembling an egg, and small pots quite round. The only other vessels found in high frequency are simple open bowls (Type 18) with a slightly everted rim that are identical to those found in Red I and II. Low frequencies of simple open (Type 4) and closed bowls (Type 5) continue to be produced during Red III. Several basins with triangular/thickened rims (Type 23) are found as well.

Bases are fairly frequent during this period, with the most common, the flat round base (Base Type 3), similar to that seen in Red I. Ring bases (Base Type 1) are also common. Several bases for large vessels (Base Type 6) were found in situ. As seen in Red I and II, one vessel with a legged base was recovered.

Twisted twines rise in popularity during this period, roughly equaling the popularity of T1, and R4 remains common due to its use on the shoulders of the most common class of vessel. It is slightly less frequent than in Red II, but this is due to the shift away from its use at the end of the period. A highly visible decorative addition during Red III is the common use of painted geometric designs in red slip on vessels.

Interestingly, despite the large sample size during this period, the distribution of pottery types in the sample remained consistent with previous periods, with 63% of the total assemblage composed of triangular rimmed jars (Type 30), 31% composed of small simple open bowls (of both Types 18 and 4), and the remaining vessel types found in very low frequency.

The Function of the Assemblage and the Various Types of Vessels

Over the course of occupation the relative distribution of rim types within each sub-phase remains constant, despite differing degrees of variability within a vessel class at points in time.

This conservative structure of the assemblage is anchored by the fact that each period is fundamentally dominated by a single rim type that is found in a range of size classes. For example, around 60% of the Yellow I assemblage is composed of thickened rim vessels (Type 1) of various sizes. Yellow II has similar quantities of thickened and flared rim vessels (Types 1 and 6). Red I has flared rim vessels (Type 12). Red II has overhanging rim vessels (Type 25). Red III has triangular rim vessels (Type 30). It is likely that the predominance of these vessels indicates a functional importance to the activities for which ceramics were employed in the community.

Certain aspects of the function of these vessels can be deduced if one considers ethnographic observations of societies with both similar economies and ceramic assemblages. As discussed in later chapters, the evidence from Kirikongo shows that the villagers cultivated domestic grains (fonio, millet and sorghum), although not African rice. The infrequent evidence for charring on animal bones suggests that these were primarily stewed or boiled. The agricultural Bwa ethnic group that lives in the modern Mouhoun Bend, not far from Kirikongo, has a subsistence regime similar to that of Kirikongo (see below). In addition to economic similarities, they have one of the best-documented ceramic traditions in all of western Burkina, owing to the ethnographic research of Manessy (1960) in the Dédougou area. Their ceramic assemblage has consistent formal similarities to Kirikongo's, providing a basis for a variety of observations on assemblage function and daily use. The Bwa subsist on the staple dish of *tô*, a porridge made by boiling and stirring ground grains until they thicken into a solid form. *Tô* is dipped into stewed sauces, some with meat, and others with a vegetal base.

The modern Bwa assemblage contains three different sizes of cooking pot with the same rim type (a high flared rim), similar to that seen in each sub-phase at Kirikongo. The large size is used for cooking *tô*, as is the medium, and the smallest is used for preparing sauces. Vessels of these types can also be used to temporarily store small quantities of flour or grains in addition to cooking. It is this function of cooking which likely accounts for the ubiquity of this rim type in each period's assemblage, as cooking vessels are the most frequently broken and discarded category owing to thermal stress. The inhabitants of Kirikongo likely consumed *tô*, as the ceramic assemblage contained only a few steamers (vessels with holes in the bottom), and grinding stones were employed for producing flour for *tô*. Also, rice has yet to be found in the botanical samples. In addition to cooking, however, vessels in this class may have also been used as water pots, with smaller pots used for fetching water from wells and transporting to the residence (see Frank 1998; McIntosh 1995), and larger water storage pots found within households for daily use (several structures have large jars on the interior- see Chapter 4).

Small simple open bowls were the second most common vessel form found at Kirikongo in each period. Among the Bwa, small simple open bowls are used to serve tô to individuals, and due to their daily use are commonly broken. At Kirikongo, bowls were the most highly and uniquely decorated, likely because they are the most visible vessel class seen by guests, who may have included members of other households, neighborhoods, or even villages. Bwa potters today produce small to medium sized restricted rim vessels for use as sauce serving bowls to dip tô into during meals; unsurprisingly, these forms are found consistently in low quantities throughout the Kirikongo sequence. Potlids similar to those found during Red II are ethnographically described, as are large hemispherical basins (a constant feature throughout the sequence in low frequency) that are used for brewing beer and also as washing basins.

One class of vessel in the Kirikongo assemblage (Type 27), the restricted rim vessel with holes all over the body, was not recorded by Manessy; however, similar forms are found in the region today. These vessels are used today for straining the seeds of the locust tree (*Parkia biglabosa*) to produce a common sauce base (stew flavoring) found throughout western Burkina Faso today (Cremer 1924; Frank 1998). Two examples of this vessel were found, one in Red II, and another in Red III. Restricted rim, flat-top vessels (Type 7 and Type 22), may have been water storage vessels, or even water procurement vessels, as these were sometimes applied with handles and grips, as well as decorations on the top of the lip that could have been used for gripping. The one vessel type that does not have an easily attributed ethnographic parallel is the large straight-rimmed basins (Type 3) from the Yellow I assemblage. However, open vessels of basin form are ethnographically used for beer brewing (fermentation) and for holding water for personal hygiene.

The assemblage at Kirikongo was likely used for cooking and consuming tô and stewed sauces, storing and carrying grains and water, and brewing beer, as well as for more personal activities (e.g. washing). It should be stated that calabashes are often used for non-cooking and eating activities in modern West Africa. Additional uses for pottery types will be inferred from their depositional contexts during discussions of other classes of evidence throughout the remaining chapters.

Discussion

This chapter mainly served to present the pottery types upon which a relative sequence was constructed for Kirikongo. The assemblage for each period is distinctive and easily employed for ordering strata. The function of each period's assemblage over the course of occupation remains similar, despite increasing diversity in the rim shape

and decoration of various classes during some periods. In both number of classes and diversity within a class, there is an increasing diversity of rim types beginning in Yellow II and continuing through Red I. By Red II the assemblage becomes more standardized both in form and decoration.

Pottery manufacture was fairly conservative over the sequence, from initial paste preparation to vessel formation and the order within which potter's applied different decorations. While the operational sequence was similar over time, the actual materials and tools employed in decoration changed considerably, with specific techniques popular or unpopular at various points, and their location on the vessel changed frequently as well. Another area that was open to change was the firing of vessels. During the middle of the sequence the paste became denser and shifted in color from orange to gray, suggesting a higher firing temperature. I argue here, based upon local ethnographic and archaeological evidence, for the use of small mud brick kilns as part of a technological transformation that occurred during Red I and continued through Red III. This chapter has not yet looked at variation within the village at any point in time, which will be the subject of Chapter 8. Several production patterns that inform on the nature of the household at Kirikongo and their social implications will be advanced during that chapter.

Chapter 6
The Growth and Evolution of Kirikongo:
A Spatial and Temporal Setting for Community Formation

This chapter applies the ceramic-based temporal framework to both the depositional episodes from excavation units and the chronological information derived from surface collections in order to reconstruct the growth of the site. The results of radiocarbon dating will then be presented to estimate actual calendar years for each of the five periods.

The Assignment of Episodes to Defined Ceramic Periods

Unit A: This area of Mound 1 was inhabited from Yellow I to Red III: Episode 1 dates to Yellow I and Yellow II, Episodes 2-4 to Yellow II, Episodes 5-7 to Red I, Episodes 8 and 9 to Red II, and Episode 10 to Red III.

Unit B: This area of Mound 4 was inhabited from Yellow I to Red III: Episodes 1 and 2 date to Yellow I, Episode 3 spans Yellow I to Yellow II, Episode 4 from Yellow II to Red I, Episode 5 to Red I, Episode 6 from Red I to Red II, Episode 7 from Red II to Red III, Episodes 8 and 9 to Red III.

Unit C: This area of Mound 3 was used first as a cemetery (Yellow I to early Red II), and later as a habitation area (mid Red II to Red III): Episode 1 dates to Yellow I, Episode 2 to Yellow II, Episode 3 from Yellow II to Red I, Episodes 4 and 5 to Red I, Episode 6 to Red II, Episodes 7 and 8 to Red III.

Unit E: This area of Mound 11 was occupied from Yellow II and Red III: Episode 1 dates to Yellow II, Episode 2 to Red I, Episode 3 to Red I and Red II, Episode 4 to Red II and Red III, Episode 5 to Red III, and Episode 6 to Red III.

Surface Collections

Since only five mounds were excavated, surface collections coupled with exploration of the road cut profiles were a main source of data relevant to site chronology. A total of 94 rim sherds weighing 8.5 kg were collected during 20 surface collections; to these were added 11 rims weighing 5 kg collected from intact floor surfaces visible in the road cut of Mound 2.

Two surface collections were made on each mound that had not been excavated: one a systematic 10 x 10 m sample, and the second an opportunistic collection of all distinctive rims outside the systematic collection. Only a single systematic collection was made on mounds that had been excavated, as each unit involved removal of at least 20 cm of topsoil. The topsoil layers of excavated mounds contained rims from all periods for which that particular mound was inhabited. Collections were analyzed and rims were attributed to the ceramic types, and consequently to temporal periods (see Table 6.1).

The Growth of the Site

Through the combination of excavations and surface collections, it is possible to outline the growth of Kirikongo. Each period is presented in detail below.

Yellow I (Figure 6.1)

The earliest evidence for habitation at Kirikongo was found at Mound 4, where a thick deposit of domestic debris lay atop the geologic base. To its west, Iron Furnace 1 was active during this period, resulting in a large sample of pottery and industrial debris. Towards the end of Yellow I, Mound 1 was founded 221 m to the north (summit to summit; the relevance of this measure is provided below). Iron Furnace 2 was built in conjunction with Mound I. In summary, by the end of Yellow I there were two households in the village, each with its own iron furnace located next to the drainage.

Yellow II (Figures 6.2 and 6.3)

At the beginning of Yellow II, Mounds 1 and 4 were joined by Mound 11, established 291 meters northeast of Mound 1. The settling of Mound 11 followed the same spatial pattern as Mound 1; it was located several hundred meters to the north of the most recently-founded mound. By the middle of Yellow II, then, Mounds 4, 1 and 11 were arranged equidistant in a north/south line. While no iron furnace has yet been identified near Mound 11, excavation data suggests that at the very least, a forge was located at the mound. Also dating to the beginning of Yellow II is Mound 3, which contained several inhumations, and seems to have served as a cemetery rather than an inhabited area.

Mound	Surface Collection	Rim Distribution	Date Range
1	10	Type 2 (n=1) Type 25 (n=1)	Yellow to Red II
2	3 + Road Cut collections	Type 12 (n=1) Type 17 (n=1) Type 18 (n=1) Type 25 (n=1) Type 30 (n=8)	Red I to Red III
3	4	Type 30 (n=1)	Red III
4	20 + 14	Late rims (n=3) Type 2 (n=1) Type 30 (n=2)	Yellow to Red III to Later
5	2	Type 25 (n=1) Type 30 (n=4)	Red II to Red III
6	6	Type 1 (n=1) Type 2 (n=2) Type 12 (n=3) Type 25 (n=2) Type 30 (n=7)	Yellow II to Red III
7	8 + 9	Type (n=1) Type 6 (n=1) Type 25 (n=2) Type 30 (n=4) Late Rims (n=3)	Yellow II to Red III to Later
8	5	Type 25 (n=1) Type 30 (n=2)	Red II to Red III
9	15	Late Rims (n=3)	Postdates Red III
10	16 + 17	Late Rims (n=7)	Postdates Red III
11	1 + Random Collection	Type 2 (n=1) Type 18 (n=1) Type 25 (n=3) Type 30 (n=2) Type 34 (n=1); Handle Type 1 (n=1) Later Rims (n=2)	Yellow II to Red III to Later
12	11 + 12	Type 25 (n=1) Type 30 (n=3) Later Rims (n=1)	Red II to Red III
13	13	Late Rims (n=3)	Postdates Red III
Furnace 2	19	Type 1 (n=5) Type 2 (n=2)	Yellow I and Yellow II
Furnace 3	18	Type I (n=2) Type 4 (n=1) Type 6 (n=1) Handle Type 1 (n=1) Unknown (n=1)	Yellow II to Red I
Furnace 1	Topsoil	Type 1, Type 2 Type 3, Type 12	Yellow I to Red I

Table 6.1: Rim Types Recovered in Surface Collection

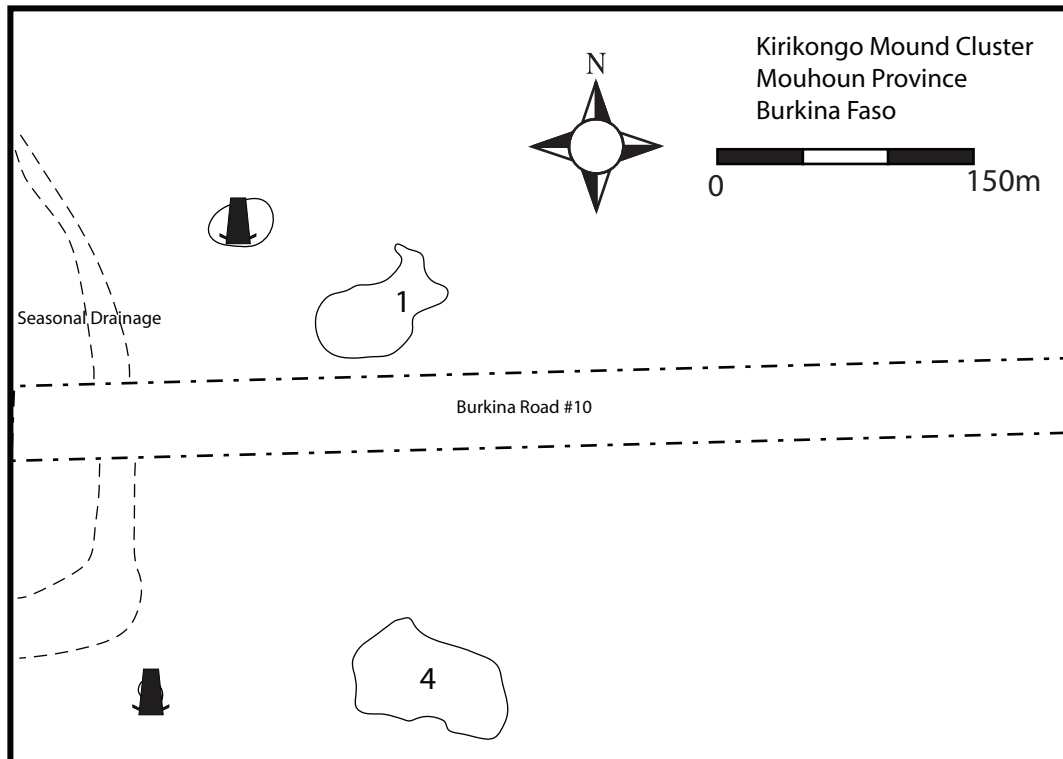


Figure 6.1: Spatial Extent of Kirikongo During Yellow I

Toward the end of Yellow II, Mounds 6 and 7 were established only 132 and 146 meters, respectively, to the east of the summit of Mound 4. Another iron furnace (Iron Furnace 3) was founded at this time, 300 m southwest of these mounds. It is unknown which mound the furnace was associated with. The establishment of Mounds 6 and 7 marks a departure from the earlier spatial pattern, both in proximity to Mound 4 and in deviation from the former north/south line.

Red I (Figure 6.4)

At the start of Red I, Mound 2 was settled in the west center of the village, north of Mound 3 and only 163 meters northwest of the summit of Mound 4. It seems to follow the same pattern of distance and location from Mound 4 as Mounds 6 and 7. It is during this transitional period (the end of Yellow II into Red I), that we see the beginning of a clustering pattern around Mound 4 that will later create the village center. Mound 2 was not associated with an iron furnace, and Iron Furnace 2 was abandoned by Red I.

Red II (Figure 6.5)

Several spatial patterns emerge during Red II that suggest dynamic transformations in the nature of the community. First, Mound 5 was founded directly to

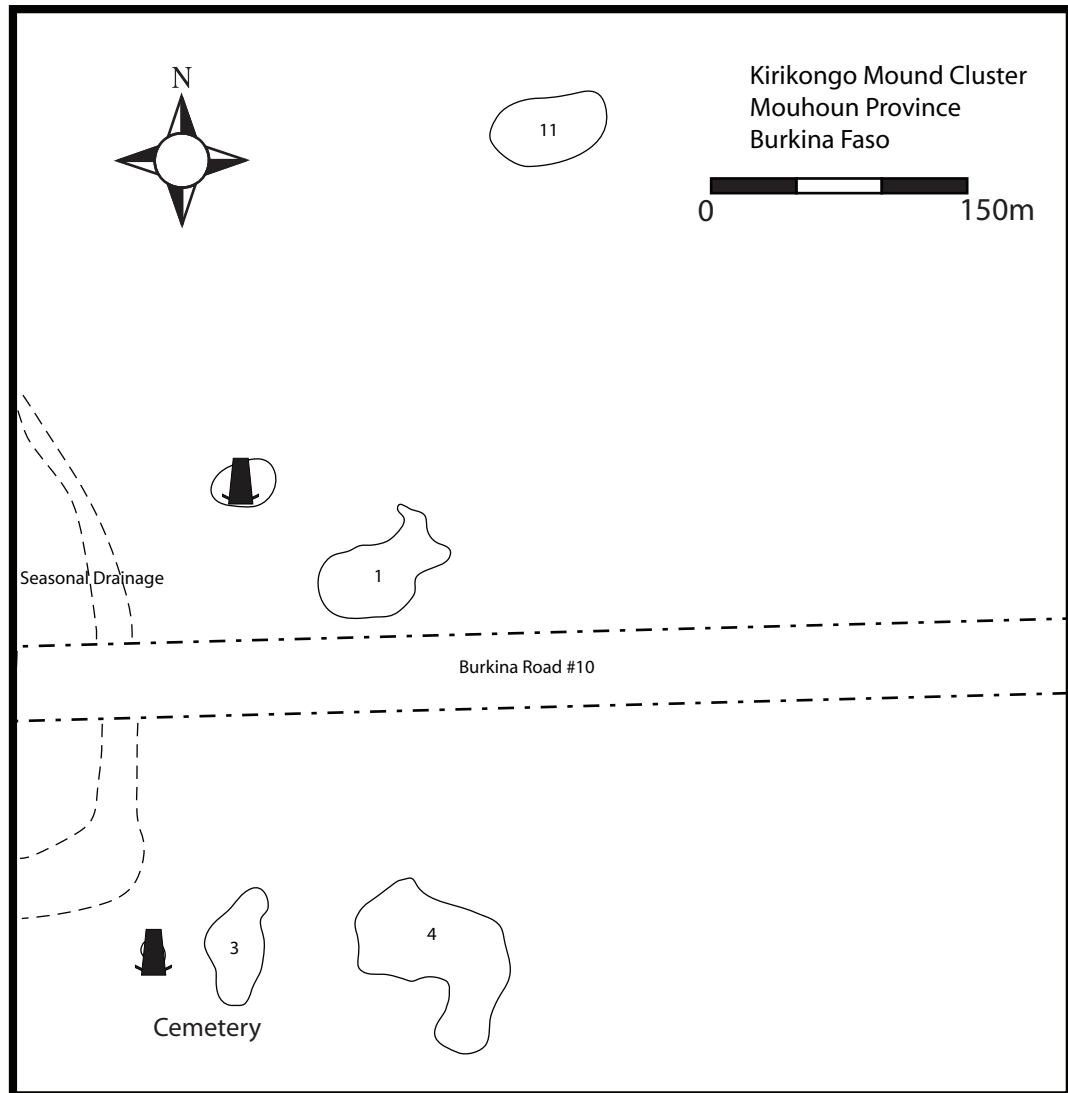


Figure 6.2: Spatial Extent of Kirikongo During Early Yellow II

the south of Mound 4, Mound 8 south of Mound 1, and Mound 12 alone to the east of Mound 1. In addition to these developments, for the first time Mound 3 can be considered an occupation mound during Red II. The founding of these mounds, each to the south of a pre-existing mound, created the paired mound groups described in Chapter 2. Each pair was oriented in a north/south line and likely were contiguous during their habitation. This interestingly parallels the emergence of the original north/south-oriented village during Yellow II. The establishment of new mounds to the south of three existing mounds to create neighbored pairs suggests a likelihood that each new mound was derived from its

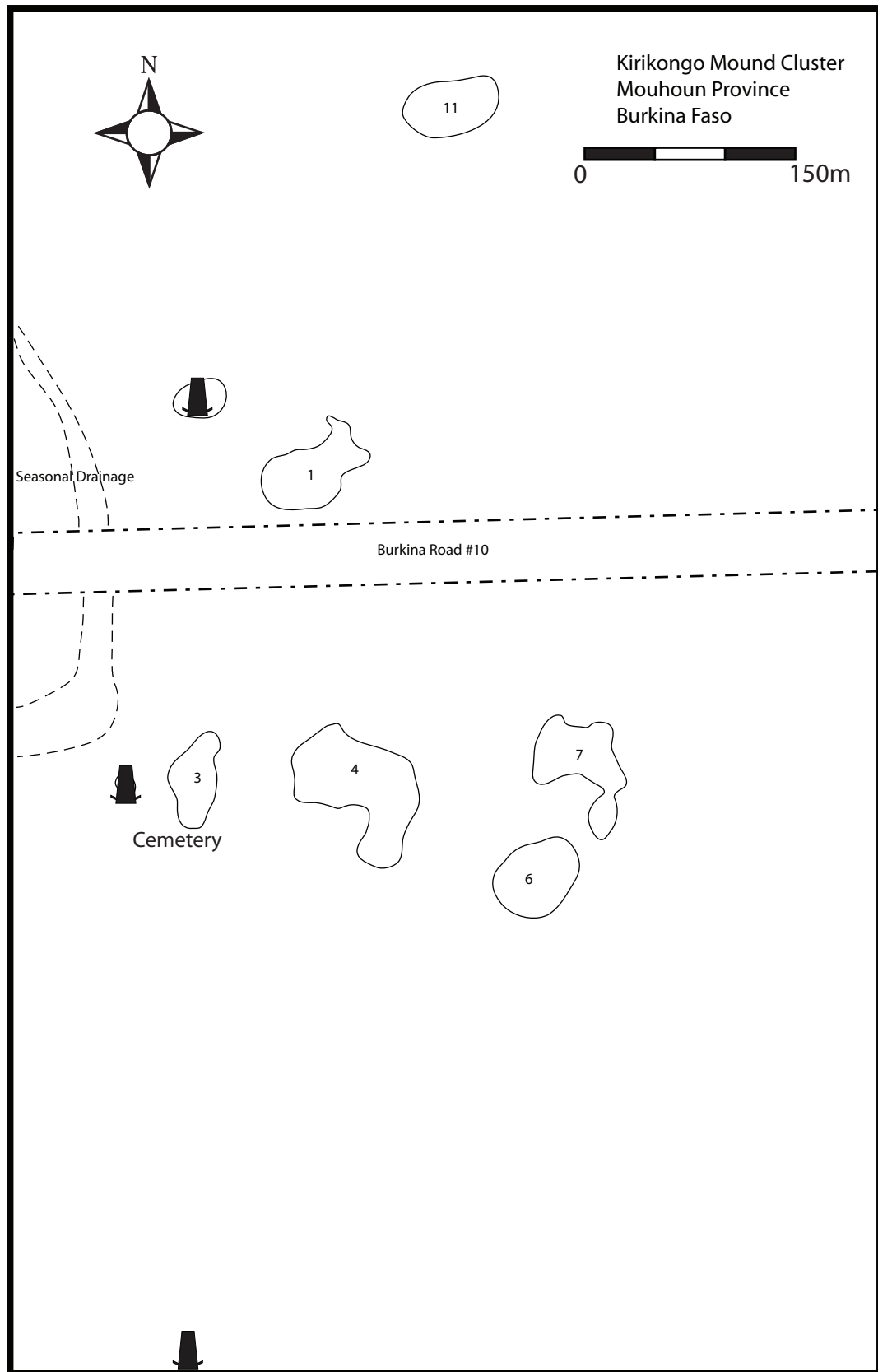


Figure 6.3: Spatial Extent of Kirikongo During Late Yellow II

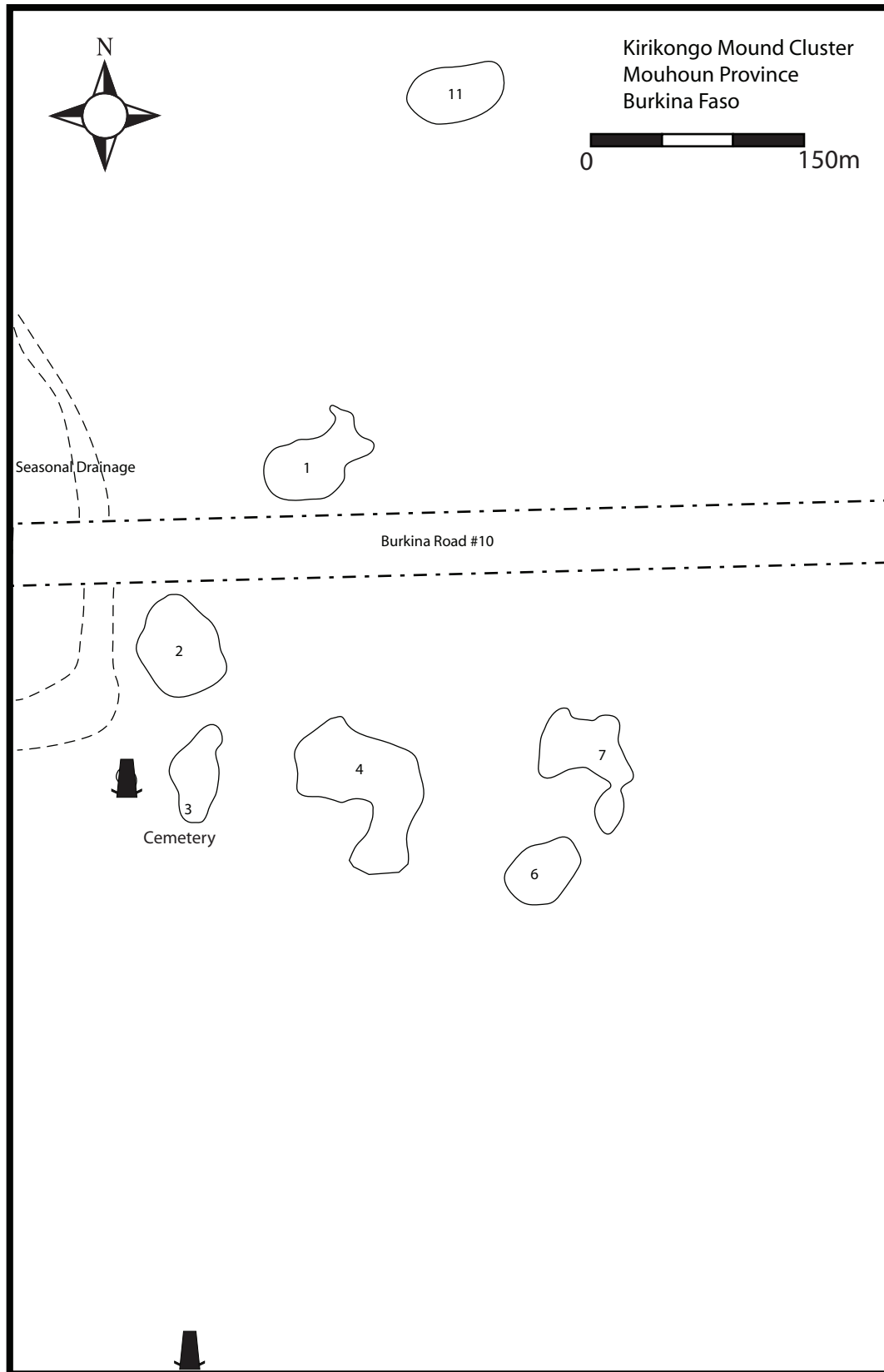


Figure 6.4: Spatial Extent of Kirikongo During Red I

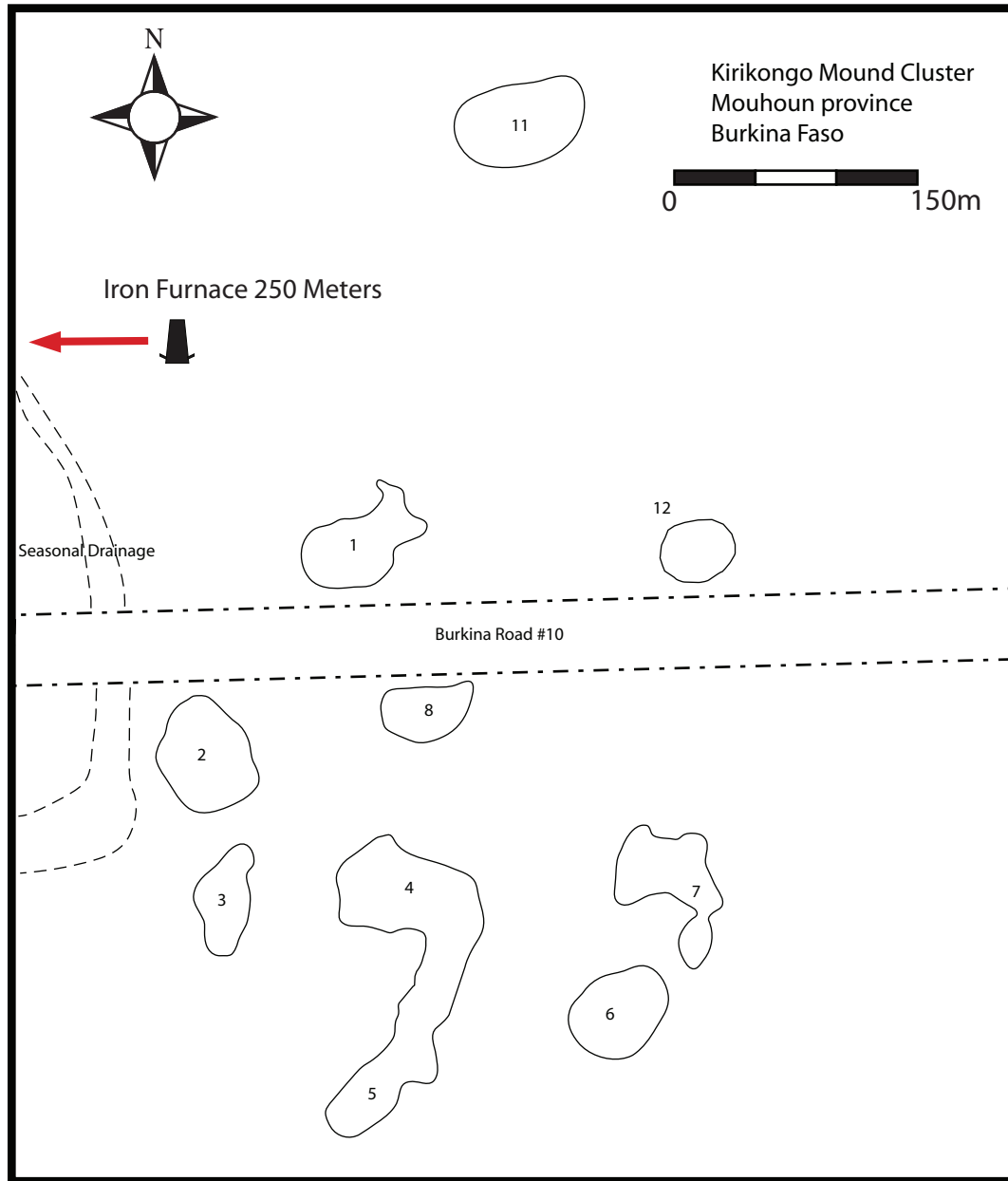


Figure 6.5: Spatial Extent of Kirikongo During Red II and III

northern neighbor, a fission process creating new social groups that remained close to their source. The social nature of this shift in settlement pattern will be explored in Part 2.

In a departure from the individual household production of iron in earlier periods, all the iron furnaces in the village core were abandoned during Red II, and a cluster of at least three furnaces were founded 250 m to the west of the site. These were associated with Red II pottery.

Red III (Figure 6.5)

During the Red III period, growth appears to have occurred within the newly formed paired mound neighborhoods, as mounds grew horizontally and merged together, rather than through spatial relocation. For example, the road cut of Mound 2 yielded in situ pottery which suggests that during Red I and Red II, the east side of Mound 2 was primarily inhabited, and that the western part of the mound grew during Red III. Spatially, these processes of growth created a denser circular village core, with only Mound 11 located outside this area.

The Use of Space on Mounds and Problems in Population Estimates

As stated above, to assess population estimates over time as the village grew, the locations of in situ ceramic vessels were recorded on the well-preserved 60 meter exposure of Mound II. These observations show that all deposits were vertically stratified; however, not all of the mound was occupied simultaneously. For example, in the eastern central section of the mound, floors I, II, III, and IV were sequentially ordered from Red I to Red III. But, if we look west on the same mound, areas that were lower in height had floors that dated to the Red III period. This suggests that it was only during Red III that the population inhabited the maximal area of Mound 2. It is therefore not possible to extend data from excavation units over the entire mound area at a given elevation to make population estimates for a specific time. Mounds thus grew both vertically and horizontally over time, with larger mounds likely having a core area (that appears to correlate with the summit), and lower areas that represent later developments or growth. This is similar to the mound formation process seen at many tells in the Near East (Flannery, personal communication 2007).

When this understanding is carried to other parts of the site that were explored by surface collections, it is clear that the areas with the thickest deposits within a mound likely represent the longest sequence for that social group. For example, in the paired Mound 4 and 5 cultural deposits, surface collections indicate that the center of Mound 4 has stratified deposits dating from Yellow I to the post-Red III period. The saddle area between Mounds 4 and 5 contains both Yellow and Red phase pottery, likely derived from the decay of Mound 4. However, Mound 5 contained only middle (Red II) and late (Red III) ceramics, and can be seen as horizontal growth of the greater cultural deposit. This information suggests that only by Red II did the inhabited area expand to cover the large part of 1.7 ha.

The social dimensions of this depositional process will be explored in later chapters, after the nature of deposits and their contents are considered.

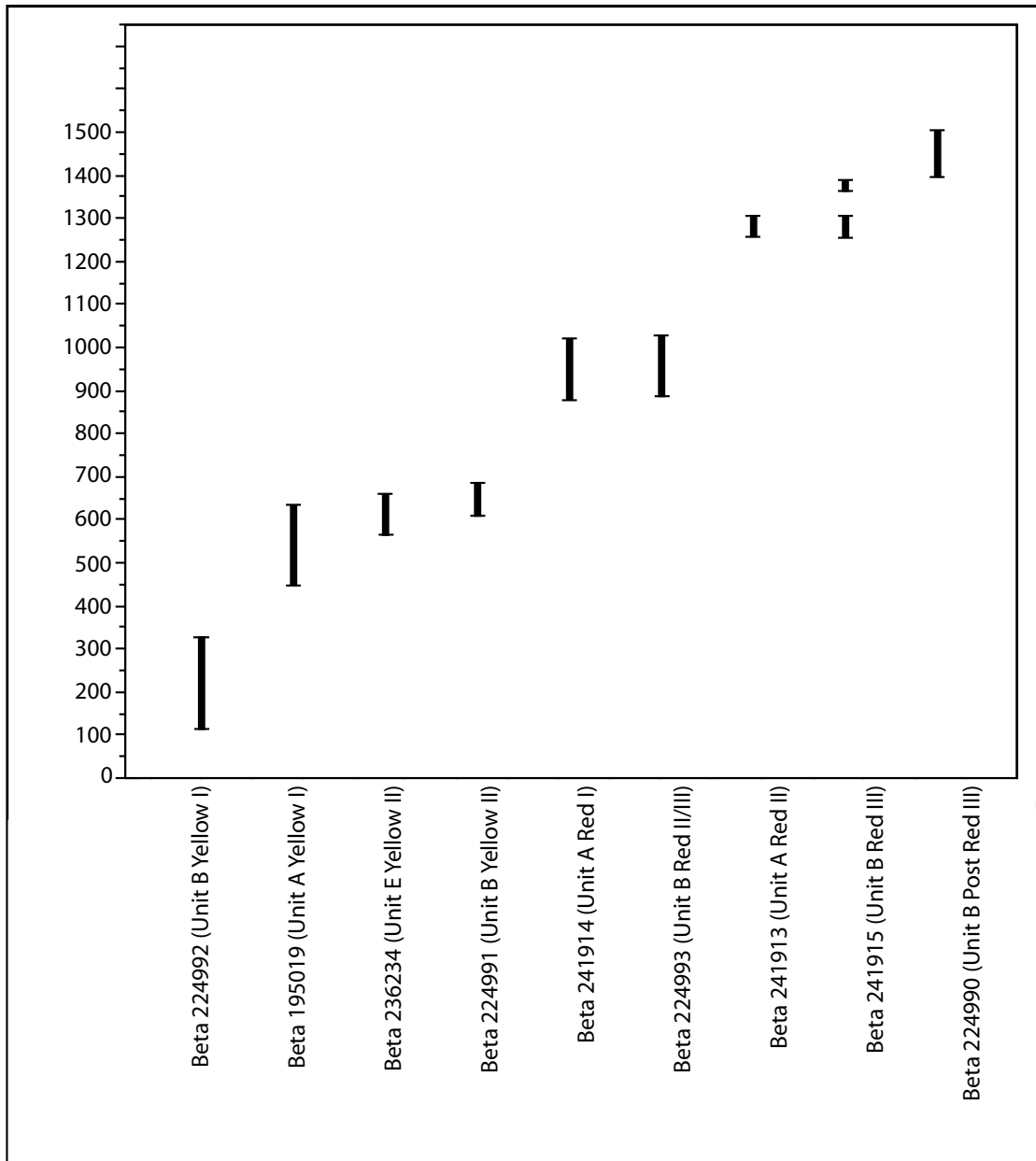


Figure 6.6: Calibrated Radiocarbon Dates from Kirikongo (Two Sigma Range)

Direct Dates

Eight radiocarbon samples were submitted to date the five periods to calendar years. All were analyzed with the AMS technique at Beta Analytic laboratories. The results matched well with the stratigraphic analyses of pottery, and produced a sequential series of calendar dates that allow good estimates for each period. Future samples will likely further refine the dating of these periods. All dates below are two-sigma calibrated estimates, unless otherwise specified (Figure 6.6).

Yellow I

Two AMS samples are available for this foundational period. Both were wood charcoal samples taken from secure contexts. The first sample (Beta 224991) was collected from Episode 2 at Mound B, an ash pit containing a variety of domestic debris. It produced an early first millennium date of AD 120-330. This is considered a mid-Yellow I date, as there are 60 cm of cultural deposits below the surface of the pit. The second sample (Beta 195019) was collected in ashy trash deposits within 10 cm of the Yellow II transition in Unit A, and is considered an end date for the period. The sample dated to the middle first millennium AD, between 450-640. Neither date is considered to address the ultimate foundation point of the village, but it is likely that Kirikongo was founded by the early first millennium AD, ca. AD 100.

Yellow II

Two charcoal samples were submitted from deposits associated with Yellow II pottery. The first (Beta 236234) was derived from the foundational events at Unit E (Mound 11), and yielded a late middle first millennium AD date of 560-660. The second (Beta 224992) is from the upper half of Yellow II deposits in Unit B (Mound 4), and dated to AD 610-680. Given the end date of Yellow I provided above, the early Yellow II date places the end of Yellow I and the beginning of Yellow II around AD 500, and the founding of Mound 11 at the earliest at AD 560. The second sample suggests that the later half of the Yellow II period dates to the 7th century AD.

Red I

One charcoal sample (Beta 241914) was submitted from Red II deposits. It was derived from the sealed courtyard trash deposits of Episode 7 in Mound A, and should be considered to date to the later part of the Red II period, owing to its stratigraphic position. This sample places this episode in the last century of the first millennium AD, at 880-1020. When compared with the above-presented dates from the Yellow II period (ending during the 7th century AD), this suggests that the beginning of Red I likely occurred during the 8th century AD and continued through to the end of the first millennium AD. Its conclusion is discussed below.

Red II

Two charcoal samples were submitted from Red II deposits. The first sample (Beta 241913) is from a secure sealed trash deposit found in the courtyard area of Episode 9 in Unit A. Based on the stratigraphic and pottery characteristics, these deposits date to the middle Red II period. The sample yielded a date with a small error of AD

1260-1310. This suggests that several centuries passed between the middle of Red I and the middle of Red II. The date of the transition between Red I and II is currently unknown.

A second sample (Beta 224993) from Red II/III deposits was problematic, providing a perfect example of the “old wood problem” in carbon dating. The sample was collected from a carbonized roof beam found along the floor of the architectural collapse of Structure 5 during Episode 7 at Mound 4 (Unit B) (see below for an unproblematic date for the end of Episode 7). The ceramics from Episode 7 suggest that the building was originally built during Red II and eventually burned during Red III. The roof beam sample yielded an early date of AD 890-1030 that matches poorly with the early second millennium AD date for Red II. This suggests that the roof beam was likely collected from an already dead tree, or perhaps a reused one from an earlier building, prior to its use in construction. The beam does not have secure context, and should be considered as questionable for use in the site chronology. There rests a possibility, however, that the structure was originally built around the turn of the millennium and Red II began at this point, but this is difficult to substantiate at present, and the actual date of the end of Red I and beginning of Red II remain unclear.

Red III

I submitted a more secure sample (Beta 241915) that is directly tied to the actual destruction episode at the end of Episode 7 during the middle of Red III. A small cluster of sorghum seeds was found along the floor of Structure 3, near a series of pots in the center of the room. A single grain was submitted, yielding a date that intersected the calibration curve twice, once at AD 1260-1310 and the second time between AD 1360-1390. The grain was likely contemporaneous with the destruction episode. According to this sample, the structures burned down at the earliest between AD 1260-1310.

The actual date of this episode can be further clarified if we take into account a radiocarbon sample submitted from the next temporal period (Red IV) that immediately post-dates Red III. This sample (Beta 224990), from a sealed ash pit during Episode 10 on Mound 4 (Unit B) dates between AD 1420-1500. Given that there is a great deal of depositional buildup, including two architectural sequences that still occur during Red III after Episode 7, it is likely that the earlier date of AD 1260-1310 should be considered for the Episode 7 destruction event. This also matches with a radiocarbon date (AD 1275 to 1292) associated with Red III pottery from the nearby site of Gniamankui (Coulibaly 2006). It is likely that the latter half of Red III lasted until the beginning of the 15th century, as it overlaps with the secure date from the middle of Red II, which probably dates to the middle of the 13th century AD.

Discussion of Direct Dates

Although it is difficult at this point to accurately highlight the exact calendar years of these five periods, the following estimated ranges are used in this study. They will likely be further refined in the future, and represent the limitation of using 8-9 samples for a 1400 year period. These are Yellow I (AD 100-500), Yellow II (AD 500-700), Red I (AD 700-1100), Red II (AD 1100- 1260/1300), Red III (1260/1300-1450).

Discussion

Kirikongo was founded during the early 1st millennium AD, and grew continually in a north/south lineal pattern until around the 8th century, when new mounds began to cluster around the village center and be settled closer to existing mounds. Starting at the beginning of the 2nd millennium AD, clustering in the village center intensified, with the creation of paired mound neighborhoods. These neighborhoods grew horizontally into the 15th century that marks the end of this sequence presented here. The next chapter concludes the first half of the dissertation with a discussion of the regional archaeological context of Kirikongo.

Chapter 7

A Voltaic Tradition with Roots in the Late Stone Age Savanna

This chapter concludes the first half of the dissertation by providing a theoretical and regional background for the study of an ancient village. I begin by providing a general model for early village life throughout the world, before addressing the current state of knowledge in West Africa.

General Models of Early Village Life

One of the most important transitions in human history was the emergence of sedentary farming communities. This shift is increasingly viewed as a complex event combining environmental factors, subsistence innovations and social processes that enabled larger groups of people to live together year-round. The result was the village community, the setting of dynamic cultural innovations that had many implications for subsequent socio-political developments and emerging complexity.

The development of early village life was enabled by experiments in food production and sedentism over the course of the late Pleistocene and Holocene (Childe 1956; Binford 1968). During these periods, hunter gatherers around the world adopted new economic strategies involving either (1) decreased mobility, enabled by intensive use of wild resources, sometimes leading to domestication, or (2) sedentary life, enabled after a certain point in the domestication process (e.g. the productive threshold of maize) (Bender 1978; Flannery 1986; Hayden 1995; Smith 2001). Secondary dispersal events, similar to various points in the primary domestication process, were heavily influenced by local environmental and cultural variables, resulting in societies throughout the planet with various degrees of sedentism and reliance upon domesticates, both plant and animal (e.g. Gebauer and Price 1992; Hastorf 1999; Smith 2001; Wills 1992; Zvelebil 1986). These can be seen on a continuum of increasing intensification in human-environment interactions (Smith 2001).

Whether based upon locally developed or adopted domesticated resources, trajectories of demographic growth and increasing social complexity are most often, though not exclusively, seen where sedentism and agriculture were combined, where

manipulatable resources provided opportunities for societal growth (both intra-community and extra-community) (e.g. Marcus and Flannery 1996; Kuijt 2000; Bandy 2006; for a counter-example see Prentiss and Kuijt 2004). In sedentary contexts, a wide variety of intensification options become available, as the infrastructure (storage, labor, and technology) and suite of cultural factors allow a wide range of agricultural practices due to logistical organization (see discussion in Varien 1999:3-43).

This new diversity of subsistence and mobility strategies was intricately intertwined with the creation of new social formations. The earliest sedentary communities in a region were in transition from systems based upon small populations and generalized reciprocity to more restricted and formalized group membership (Flannery 1972; Byrd 1994; Rosenberg and Redding 2000). As has been shown ethnographically, problems arise when forager camps reach larger sizes, due to a lack of integrative mechanisms (Lee 1979: 366-369). The transformations that enabled integration of early sedentary communities are thus at the root of social complexity. For example, the social organization of early village societies with egalitarian ethos in regions with low population densities were likely highly shaped by the possibility of fission, representing a series of integrative challenges (Flannery and Marcus 1996; see also Bandy 2004). The continuing growth of communities (and regions) following these initial developments likewise would lead to social transformations that altered ideological structures and archaeologically have been shown to spur exciting regional variations in integration mechanisms, and thus cultural practices (e.g. Adler 1990a, 1990b, 1996; Bandy 2004; Byrd 1994; 2000; Flannery 1972; Kuijt and Goring-Morris 2002; Lesure and Blake 2002; Marcus and Flannery 1996).

A village is thus a materialization of the practices and social institutions that allow people to live together rather than move to resolve social problems. Political and social institutions (e.g. kin groups, religious practices, age-sets) integrate individual domestic groups within a larger community. These structures necessarily change with demographic growth or greater diversity of resident social groups, as well as with events in the local and regional cultural and natural environments.

West Africa has contributed little to these dynamic discussions of initial sedentary life, nor to discussion of subsequent transformations within these communities as they grew. The potential contributions the region can make to understandings of early village life are many. In addition, within the region, the social and economic foundations for social complexity remain obscure due to this gap in knowledge, with current understandings based not on building up from developmental trajectories, but on attempts to project attributes of complexity into the deep past.

The Origins of Sedentism, Food Production and Village Life in West Africa

As early village life throughout the world is best understood through detailed understandings of long-term regional social processes, the study of developments in the savanna requires a contextualized view of the economic and social foundations that shaped its emergence. In this section I present two trajectories for the emergence of sedentism and food production in the region (culminating in the expansion of sedentary village life ca. 500 BC): one based on a long-term trajectory of events in the Sahara and sahel zone immediately to its south, and the other a description of the development of hunter-gatherer societies in the savanna and the savanna/forest margin (Figure 7.1). Following these, the relative importance of each to the social trajectory of early village life in the savanna and consequently at Kirikongo is assessed.

Early Saharan Food-Producers

The earliest food producers in West Africa were mid-Holocene pastoralists in the central Sahara in the 6th millennium BC, as evidenced by diverse habitation and activity sites and rock art stations (Holl 1998, 2004; Holl and Dueppen 1999; MacDonald and MacDonald 2000; Gifford-Gonzalez 2005). They were likely seasonally transhumant, exploiting the available resources of lake playas, grassy meadows and highland regions for several millennia. Their economies were based on cattle, sheep and goat herding, combined with the exploitation of wild grains. These herders later gave rise to the sedentary and semi-sedentary societies that emerged along the southern edges of the Sahara during the late Holocene, as aridity set in and triggered population movements towards the sahel, the steppic shores of the desert. Between ca. 2000 BC and AD 1, the sites of Dhar Tichitt, Dhar Walata, and Dhar Nema in Mauritania, with extensive dry-stone architecture (Amblard 2006; Holl 1985a, 1985b, 1986; Munson 1972; Person et al. 2004), attest to increasing social complexity (potentially a chiefdom-level organization). Their economies included the addition of domesticated millet to livestock husbandry, and cultivation may have been a key factor in decreasing mobility (Holl 1985a; Amblard 1996; Amblard and Pernes 1989; Munson 1976). Further east, the site of Karkarachinkat in the Tilemsi valley of eastern Mali likewise shows a transitional pastoral economy with the addition of wild and likely domesticated grains (millet) and increasing sedentism ca. 2000 BC (Smith 1974, 1975; Finucane et al. 2008).

With these early developments of food-production, increasing sedentism and social complexity, models for the origins of village life in the sahel and savanna to the south have naturally been linked to migrations, particularly as the environment continued became more arid during the last two millennia BC. This makes ecological sense, as the

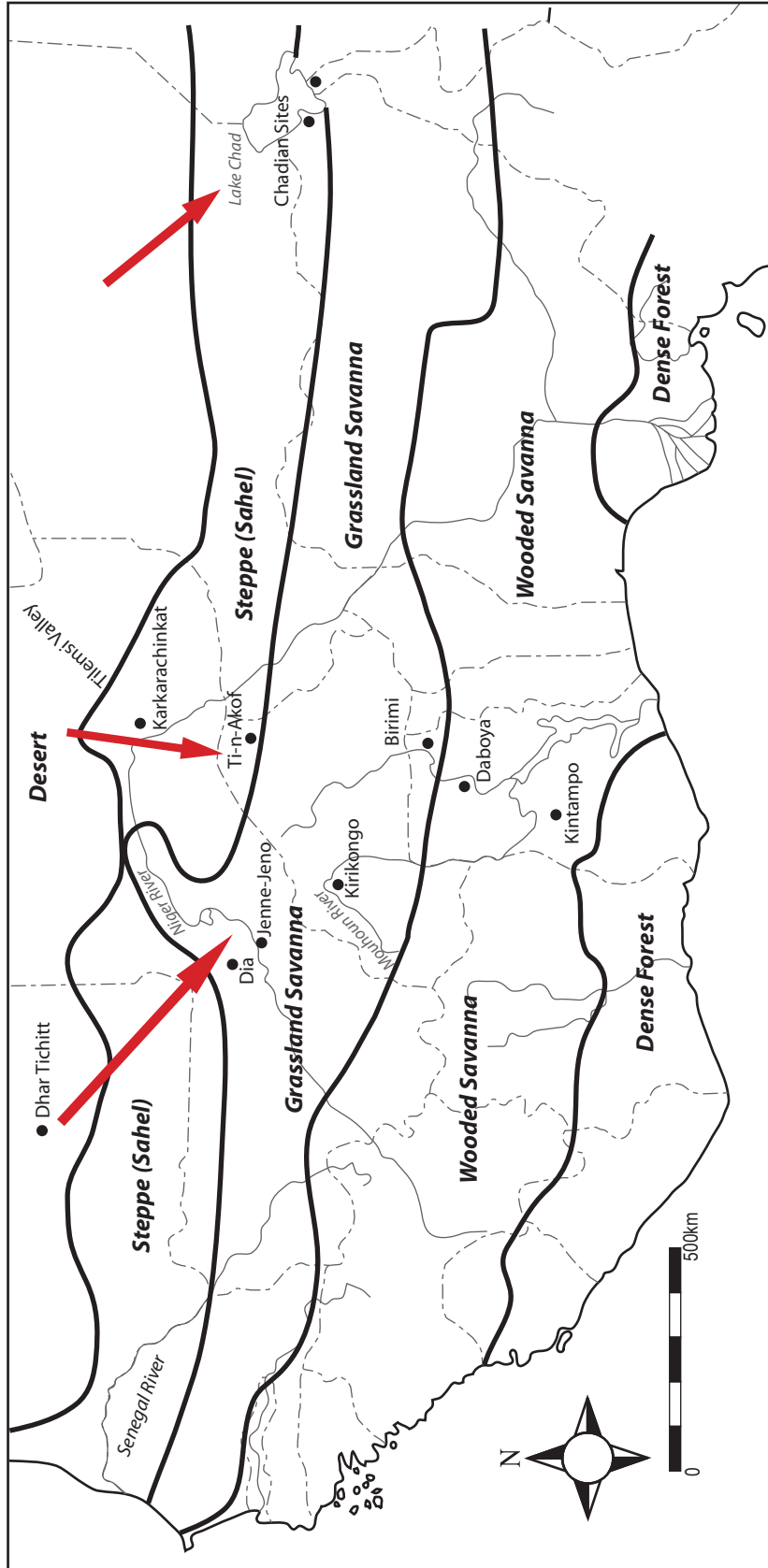


Figure 7.1: Selected Archaeological Sites in West Africa

sahel contains a series of environmental niches that mirror those found in the Holocene Sahara, with extensive river floodplains and seasonal lakes (the Senegal River, Inland Niger Delta (IND) and Niger Bend, and the Lake Chad Basin): some of these extend deeply into the savanna (e.g., IND). It is in these riparian environments that we view the highest number of food-producing societies from the late second millennium BC into the early Iron Age. Many used domestic grains and livestock, on a spectrum from fully sedentary to seasonally mobile [e.g., Dia (Bedaux et al. 2005), Jenne-Jenno (McIntosh 1995), including multiple sites in the Chadian Plain (Holl 2002; Connah 1981; Breunig 1995)].

Several convincing arguments have been made regarding the social implications of these processes. Holl (1985b) has argued that at Dhar Tichitt one can view the origins of the middle first millennium AD state of Ghana, and that these early social developments should be taken into account in modeling later social complexity. Likewise, MacDonald (1994, 1998) has argued that cultural complexity was achieved in the late Neolithic of the Sahara and sahel based upon cattle wealth, and likely spread into the savanna. R. McIntosh (1993, 1998) advanced a pulse model to account for population movements out of the southern Sahara, in which waves of migrants spread southward into the lake and river floodbasins as the desert dried out. In various works, MacDonald (1994) and S. McIntosh (1995) have convincingly charted the origins of IND food-producers in a slow movement of agro-pastoral societies from southern Mauritania into the IND by the early Iron Age (middle first millennium BC) (see also Bedaux et al. 2005). Those who settled in the IND developed complex societies with urban centers by the middle of the first millennium AD (McIntosh 1995). Population movements have also been observed on a smaller scale in recent work in the sahel of northern Burkina Faso, where millet cultivation is attested in the dunal depressions of this arid environment from 1000 BC onward (Breunig and Neumann 2002).

The chronology of events and the relatively quick pace of the emergence of complex societies along the Saharan margins and the floodplains suggest a continuity of social process in this area of West Africa. However, besides inferences regarding the adoption of domesticates (see below), there is little evidence to suggest that migrations extended into the savanna outside certain favorable and familiar ecological niches.

Late Stone Age (LSA) Hunter Gatherers in the Savanna

Archaeological data suggest that since at least 4000 BC, hunter-gatherer societies using pottery and microlithic tools inhabited the wooded and grassland savannas of West Africa. Currently, however, their subsistence and settlement patterns are poorly

understood (Stahl 1993; see also D'Andrea and Casey 2002). The majority of data derive from rockshelter sites, some with deep deposits that are considered to represent long-term repeated seasonal visits of fairly mobile groups. Reconstructions are based on the highly portable nature of materials found in these sites, including limited use of pottery, the presence of seasonally exploited resources (e.g. endocarps of oleaginous tree species, edible fruits, snails) (Smith 1975; Stahl 1993), and evidence for broad similarities in pottery decorations over large areas across West Africa (Shaw 1978). Open air sites are virtually unknown beyond simple stone-tool scatters.

There is currently little evidence for increasing sedentism during the early Ceramic LSA prior to the arrival of domesticates (see below). Casey (2005) suggests that the reason may be ecological, as human populations already had a toolkit for more intensive exploitation. She argues that the vast majority of savanna localities do not have the clustered wild vegetal resources to support a sedentary population, except potentially in the rich floodplain areas outside of the savanna ecosystem. Resources are fairly evenly distributed in the landscape and topography is undifferentiated (see Chapter 4). Knowledge of modern foraging systems suggests that the undifferentiated savanna ecosystem would have had low population densities and far-flung social networks during the LSA (Wai-Ogusu 1970). Following Wai-Ogusu's (1970) discussion of Deetz (1968), the lack of visibility for Late Stone Age sites in large parts of the savanna may be the result of small populations that never crossed a visibility threshold.

The first clear evidence for decreasing mobility and economic experimentation in the LSA is found after ca. 2000 BC (most dates cluster in the mid-to late second millennium BC). It occurs in an archaeological entity known as the Kintampo complex (Casey 2000), located primarily in the southern savanna and forest margin areas of central and northern Ghana (e.g. Davies 1960; Stahl 1993, Andanquah 1993; Shinnie and Kense 1989; Watson 2005). Recent research suggests that some Kintampo communities kept small livestock (and possibly cattle), and a few sites have cultivated domestic millet and cowpeas (Casey 2000; D'Andrea and Casey 2002; Stahl 1985, 1993; Flight 1976; Carter and Flight 1972; Logan 2003). Several Kintampo sites show evidence of decreased mobility, such as Birimi in northern Ghana, a small site with remains of wattle and daub huts and extensive evidence of millet cultivation (Casey 2000). At Daboya, the main characteristic of the Kintampo deposits is the ubiquitous burned daub (Shinnie and Kense 1989). Most sites, however, show some degree of mobility, with both rock shelters and open-air sites providing evidence for seasonal wild plant exploitation and hunting (Carter and Flight 1972; Rahtz and Flight 1974; Stahl 1985). Several rockshelter sites contain extensive deposits of the remains of oil palm processing, continuing a

practice found in earlier LSA contexts (D'Andrea et al. 2006; Stahl 1993; Watson 2005). The importance of cultivated resources in the economy has been highly debated, but at present, the Kintampo complex can be characterized as an extensive-mixed economy, where wild foods provided a significant part of the subsistence, with the addition of some domesticated resources, similar to a pattern found in early secondary adoption of domesticates in many other parts of the world (Smith 2001).

The Kintampo has also been the subject of discussion regarding potential yam domestication (e.g. Stahl 1993; Coursey 1976). Yams are a primary staple of many societies throughout the southern savanna today, but archaeologically they are much more difficult to detect (Neumann 2005). While domestic grains may have been important at some Kintampo sites, the economic foundations could have been built on tuber cultivation. Regardless of whether the Kintampo complex was based on adopted domesticates (millet, livestock) or the addition of these with a local yam domesticate, it is clear that it was a period of economic change and experimentation with sedentism. However, it was not a period that witnessed the creation of many stable village communities.

In the West African savanna there is no indication of sedentism within economies that are not to some degree reliant on adopted domesticates, either before or contemporary with Kintampo. However, our understandings are based upon a small number of sites with generally poor preservation, and particularly poor preservation of organic materials. In addition, while a great deal of research has focused on the Kintampo, comparable research has not been undertaken in the vast areas of the savanna found in the neighboring francophone countries such as Burkina Faso, Benin, Niger, Ivory Coast, and Togo. It cannot be assumed that the contemporary populations of these areas did not practice some degree of experimentation in food production and sedentism.

The Origins of Sedentary Life in the Savanna

The emergence of sedentary life in the savanna is thus based upon the use of storable domesticates, either identified (livestock and grain), or as yet unknown (e.g. yams). Recently it has been advanced that the origins of the Kintampo complex can be found in the southward migration of sahelian populations, similar to the pulse model described above for the floodplains (MacDonald 1998; Watson 2005). However, if the LSA populations that inhabited the savanna were characterized by low population densities and widely dispersed social networks, simple interactions between hunter-gatherers and sahelian food producers could have resulted in the rapid distribution of domesticated resources. In addition, there is the question of economic and social

trajectories. The Kintampo economy exhibits an uneven commitment to food production and sedentism characteristic of the mixed economies of previously hunter-gatherer societies that have received domesticates secondarily. In addition, to argue for migration implies that a derivative pastoralist society, potentially having evolved complex tribal or greater degrees of complexity, traversed several ecological zones -- including those that are detrimental to the health of the cattle upon which their value system was likely based (see MacDonald 1998) -- only to become hunter-gatherers with low level food production in the southern savanna. In fact, in the case studies where we have well-charted evidence for the movement of people into the Inland Niger Delta from Dhar Tichitt, the populations seemed to have largely reverted to pastoral economies (MacDonald 2004). While the connections between developmental trajectories along the edges of the Sahara and later in several floodplains is based on convincing evidence, the effect of these developments on the savanna needs to be established. As will be seen in later chapters, the organizational trajectories of savanna populations can be shown to have taken very different routes from those with origins in early social differentiation along the southern Sahara.

The Rise of Village Communities in the Savanna

An additional impediment to our understanding the origins of sedentary village life is a lack of evidence from the first millennium BC. This has been labeled the “silent millennium” (Breunig and Neumann 2002), with few dated archaeological sites. However, there are some clues of continuity from the Kintampo, with relevance to the emergence of sedentary farming communities. Several open-air sites in Ghana attest to continued habitation following the Kintampo period and into the first millennium AD (Davies 1980; Shinnie and Kense 1989). Stahl (1993:271) has suggested that the abandonment of rockshelter sites and the persistence of some open-air settlements implies a greater reliance upon domesticated resources during this period. She states that sites are located on the alluvial soils along the White Volta River in northern Ghana on better farming land than earlier Kintampo sites. The data I present from Kirikongo describes the social organization of early farmers that clearly have roots in these long-term cultural processes in the savanna. Evidence for events up the Mouhoun drainage at Kirikongo will place its origins in LSA economic and social processes.

The Spread of Farming Communities in the Iron Age

The first widespread archaeological support for fully sedentary societies in the savanna outside of the floodplains occurs rapidly and widely during the early Iron Age, beginning around the middle of the first millennium BC. Those societies were based on

food production, and stone tools were replaced by iron implements. For Burkina Faso, villages were found as early as the beginning of the first millennium AD, and throughout the country by the middle of the first millennium (Magnavita et al. 2002; Holl and Koté 2000; Langané 1995), with the exception of the southeast, where this shift may have occurred at the start of the second millennium AD (Frank et al. 2001). This rapid expansion of farming societies follows upon the earlier emergence of iron metallurgy in the region. Several dates for the production of metals have been obtained from the middle first millennium BC (Kiéthegea 1993a; Holl and Koté 2000; see discussions in Coulibaly 2006). In many parts of the savanna, sources for quality stone tools are limited, and iron may have influenced the ability to intensify the earlier experiments in food production. Despite the widespread distribution of farming societies throughout Burkina Faso, there is currently only limited evidence for their social organization and the development of different regional trajectories in social and political processes.

Kirikongo and its Neighbors: Defining a Voltaic Tradition

The pottery from Kirikongo provides an important line of evidence to understand the origins and affinity of the site in the wider context of West Africa over several millennia. In this section I define a new ceramic-based regional entity, designated the “Voltaic Tradition” that has roots in Late Stone Age Kintampo pottery and maintains a fairly cohesive set of formal characteristics into the beginning of the second millennium AD (see Figure 7.2 for the spatial extent). A distinction is drawn between the formal characteristics of Voltaic pottery and the contemporary pottery of neighboring, sometimes very close, regions. The implications of these affinities will be explored in great detail during discussions of social organization in later chapters.

The Origins of Kirikongo

The pottery of Yellow I and II are very similar to that from the LSA Kintampo complex, to the south in Ghana. Type 1 from Kirikongo resembles very closely the thickened rim forms described at various Kintampo sites (Davies 1980; Stahl 1985, 1993; Watson 2005). The use of obligate spatulate impressions at the neck of Kintampo vessels is identical to the diagonal gouges that occur on a significant portion of the Type 1 assemblage, as is the zoning of slip on the rim-top. Watson (2005) suggests that these are a late Kintampo development. Vessel shape below the neck also appears similar. In addition, Kirikongo’s heavily rolled rims (Type 2) are actually considered to be one of the typical identifying markers of Kintampo pottery (Stahl 1985: 129). Stahl attributes these to a later Kintampo development, and the identical form of rounded rim jars during

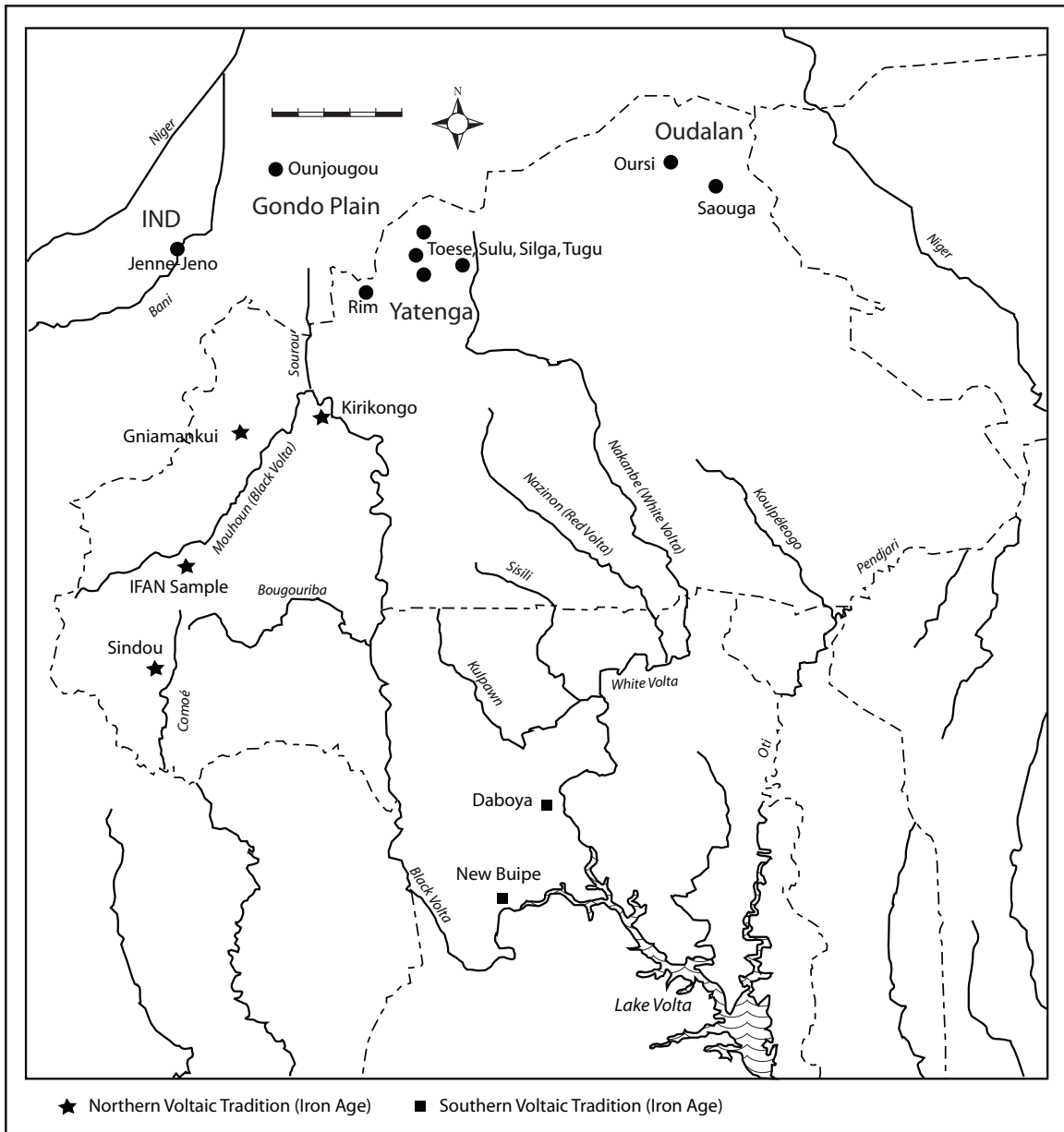


Figure 7.2: The Voltaic Tradition

Yellow Phase I and II at Kirikongo is an extension of this distinct rim type. Burnishing of small vessels is likewise found at both Kirikongo and Kintampo sites (Davies 1980; Stahl 1985; 1993). However, large straight-rimmed bowls (Type 3) are rare in Kintampo contexts, as Kintampo bowls and basins have inward curving lips. Interestingly, the Late Stone Age savanna site of Fanfannyégéné I, located several hundreds of kilometers away across the Niger in Mali, is characterized by an assemblage containing a high percentage of vessels with straight rims (Huysecom 1990). It is possible that the Burkinabe savanna had its own Kintampo populations, with some regional pottery characteristics owing to local developmental trajectories. To date, the LSA of central and southern Burkina Faso

is largely unknown, and Kintampo sites in Ghana extend all the way to the border with Burkina Faso. Kintampo sites are also known from Ivory Coast (Chenorkian 1983). It is unlikely that Kintampo or similar Late Stone Age societies were restricted to Ghana and the Ivory Coast, and these societies may well have extended up the Volta drainages into Burkina Faso.

The connection between Kirikongo's pottery and Kintampo sites is not limited to simply questions of origins. I was surprised to find that Kirikongo's ceramics have a number of close similarities to those from the site of Daboya, even throughout the first and second millennia AD (Shinnie and Kense 1989). Daboya is located along the White Volta river in Ghana and has been continuously occupied from the Kintampo period until today. Daboya's Tradition II Ware B1 vessels, associated with the earliest evidence of iron production (AD 200- 600), are almost identical in form (thickened rim), decoration (deeply impressed twisted twine roulette-- likely knotted strip roulette-- and diagonal/vertical gouges at the neck), and even the application of red slip, to Kirikongo's Type 1 from Yellow I and II (AD 100- 700).

Similarities between the two sequences continue after the early Iron Age. Following Tradition II Ware B1 come Tradition II Wares B2, B3, and B4, dated to between AD 600 and 1000. These are analogous to Kirikongo's Red I Type 12 (AD 700- 1100), the flared rims with decoration on the exterior lip. This pottery is known as Daboya Ware and is found in other sites such as New Buie in northern central Ghana along the Volta rivers (York 1973:102-107), although it must be mentioned that the samples of Daboya ware from Daboya are much more similar to that from Kirikongo. At both Daboya and Kirikongo, these vessels are characterized by a great diversity of vessel sizes and decoration techniques, and they even broke in similar ways at the vessel neck. The parallel evolution of these two ceramic sequences continues into the beginning of the second millennium AD, although the similarities at this point are mainly with vessel form, as the zonation of decoration begins to differentiate. For example, dated to between AD 700 – 1200, Daboya's Tradition IV Ware A1 is identical in form to the overhanging rims (Type 25) common between AD 1100 and 1260 at Kirikongo. Next, the trajectory of change from Red II rims to Red III triangular rims (Type 30) is encompassed in Tradition IV Ware A3 at Daboya. This is dated at Daboya to between AD 700 to 1200, and at Kirikongo to between AD 1260 and 1420. The dates for these ceramic changes are likely better approximated from the sequence at Kirikongo, as these were sequentially stratified in multiple excavation units throughout the site, whereas Daboya has a much more complicated depositional history.

The similarity of these sequences allows for several observations on regional ceramic patterning found in the Voltaic region. First, the form of the vessels changes comparably over a wide area with similar radiocarbon dates. Since change is continuous at Kirikongo, with transitional forms always present at the beginning and end of each period, it should be possible to use this chronological framework to date sites throughout this large region. Second, decoration is likely more localized than vessel form, and vessels at the two sites are more similar in the early Iron Age, after which they diverge (particularly in decoration). For example, during Yellow I and II, Kirikongo and Daboya share knotted strip roulette decorations, but by Red I and later, slip patterns and new decoration techniques (carved wooden roulettes) can easily be used to differentiate the sites (no wooden roulettes are known from Daboya). Third, while the form of jars and pots are similar over a wide area, it is unknown whether these patterns occur in small bowls and other ceramic implements.

The northern expression of this ceramic tradition may itself be defined by the *common* presence of carved wooden roulettes, particularly R4, starting in the Late Yellow II period and extending through Red III. My analyses of ceramics (housed at IFAN- Dakar) collected from an Iron Age site south of Kirikongo near Bobo-Dioulasso identified ceramics from Yellow II to Red III with similar forms and also the use of carved roulettes such as R4 (Dueppen in prep.). Work by Andah (1980) at the site of Sindou, an Iron Age agricultural village in southwestern Burkina Faso that dates to late Red III/Post Red III transition, likewise shows a R4 applied to the neck of vessels in a band like that commonly seen at Kirikongo. These data suggest that the pottery sequence at Kirikongo may be an example of a northern Voltaic Iron Age ceramic region that can be differentiated from the southern expression in Ghana by decoration techniques. This attribution should remain tentative until further archaeological work explores more extensively both Ghana and Burkina Faso.

Neighboring Societies During the Iron Age

The general lack of research in the savanna zone to the east and west of the Mouhoun Bend makes it difficult to define the full spatial extent of Voltaic pottery traditions. However, it is clear that the general formal similarities that characterize the complex do not extend much farther north than the Mouhoun Bend. The sahel of Burkina Faso has received a relatively large amount of Iron Age archaeological research compared to the center and south, and the ceramic evidence from northern Burkina Faso during the Late Stone Age and Iron Age show some major differences from Kirikongo and the Voltaic complex. For example, the site of Rim (Andah 1978) contains flared rim vessels

in the Late Stone age and Early Iron Age (Rim II and IIIa/ IIIb), with little evidence for thickened or rounded rims; and in small vessels there are many simple restricted bowls rather than the simple open and straight rimmed vessels common at Kirikongo. Andah's (1978) IIIb pottery that is contemporary with Red I has similarly flared lips, but decoration does not occur on the underside of the lip.

More recently Zakaria Ligané (1995) carried out fieldwork on the prehistoric sites of Yatenga province, focusing on the early second millennium AD. The site of Toese roughly corresponds to Kirikongo's Red II, whereas Silga dates to the end of Red III ca. 1300- 1450. These sites show some similarity in form to those recorded by Andah at Rim, with highly flared rims and slightly restricted small bowls (some are carinated); in addition, there is a diverse assemblage of pot-lids. In form, this assemblage is generally not very similar to that from Kirikongo, although the flat top-restricted vessel in figure 52j bears some resemblance to Types 7 and 22 at Kirikongo.

While form is very different, decoration of vessels from Yatenga sites share some techniques with those at Kirikongo. The zonation of decorative techniques is very similar, with one roulette decoration applied in horizontal bands on the vessel shoulder, and another type found on the body. Roulette 5 (R5) from Kirikongo is a popular decoration technique in Yatenga, and was employed on a variety of vessel classes. In fact, it is applied on the shoulder much as R4 was at Kirikongo during Red II and III. R4 was a minor decoration technique in Yatenga, found generally on the vessel shoulder. Channeling and comb impressions are also common to both Kirikongo and sites in Yatenga.

The data from Yatenga show that there may have been a wider exchange of decorative techniques between neighboring areas than transferring/sharing of vessel form. Vessel form may be more conservative in the region, and potentially a better indicator of genealogical (evolutionary) relatedness. Conversely, decoration is likely based on both relatedness and histories of interaction, as neighboring people clearly exchanged vessels and techniques, despite retaining their cultural heritages and borders.

German research in Oudalan province, to the east of Yatenga, appears to further reinforce the dual oppositional nature of form versus decoration, where vessel form is derived from affinity, whereas decoration is based upon interaction histories. The pottery sequence in this region dates from the Late Stone Age into the Iron Age (1000 BC- AD 1400), and holds many formal similarities to that seen at Yatenga, with a consistent production of flared rims throughout the entire sequence (Czerniewicz 2004). However, due to their different cultural origins (derived from different Late Stone Age roots), vessel form is distinctly different from Kirikongo. In addition, because of the lack of interaction

between the Mouhoun and Oudalan (Yatenga is directly between them), decoration in Oudalan included braided twines and other twine roulette techniques that were rarely if ever used at Kirikongo, and they lack carved wooden roulettes.

Directly to the north of the Mouhoun Bend, up the Sourou drainage, Swiss researchers have analyzed ceramics from the sites of Ounjougou dated from the 7th to the 13th centuries AD (Mayor et al. 2005). The assemblage is a specialized ritual set, and vessels include jars, cups, lids, plates and bowls. In vessel form, the assemblage has few similarities to that from the Red I to Red III periods with which they are contemporary. Interestingly, the decoration of the vessels is largely knotted strip roulettes (alternate and not). These decoration techniques were popular at Kirikongo during Yellow I and II, but were no longer very popular by the 8th century. Several of the Ounjougou small vessels are carinated, a vessel form not found at Kirikongo. Ounjougou's inhabitants thus produced an assemblage with some similarities to Rim and Yatenga, as well as the Inland Niger Delta (described below), and yet still some similarities to *earlier* Yellow Phase Kirikongo pottery.

Lastly, the Inland Niger Delta site of Jenne-Jeno (McIntosh 1995) shows very different ceramic traditions from Kirikongo, both in decoration and vessel form. From the early first millennium AD (Phases I/II), Jenne-Jeno's pottery bears no resemblance (even in the shape of simple rims), and there is no equivalent to Kirikongo's large straight rim bowls (Type 3) and thickened (Type 1) and rounded rims (Type 2). Later, Jenne-Jeno Phases 3 and 4 (Kirikongo Yellow II to Red III) assemblages bear even less resemblance with carinated forms and raised plastic adornments. Carved roulettes are rarely used throughout the Jenne-Jeno sequence, as plaited and twisted twine roulettes were the primary decoration techniques. The disparities in both form and decoration suggest potentially large social boundaries/histories between these two regions.

Implications and Conclusions

Kirikongo's pottery has many similarities to Kintampo pottery and later Ghanaian Iron Age pottery over the course of the entire first and early second millennium AD. Sites throughout western and southwestern Burkina show even stronger resemblance to the pottery from Kirikongo, as decoration techniques are similar. To the north (Oudalan and Yatenga) a very different formal tradition with flared vessels was produced during the first and second millennia AD, with roots in a northern LSA trajectory. However, within these areas, the closer societies are to the Mouhoun Bend, the more they share decorative characteristics. The Inland Niger Delta (Jenne-Jeno) ceramics are part of another very distinct tradition from that seen in the Bend, both in form and decoration. Sites on the

Gondo plateau (Ounjougou) contain elements of many traditions, but do not share formal characteristics with the pottery from Kirikongo.

It is currently unknown whether Kirikongo was founded by the movement of post-Kintampo societies up the Black Volta valley to the Mouhoun Bend during the first millennium BC, or conversely whether there was a local Kintampo-like society in western Burkina Faso that gave rise to farming villages like Kirikongo.

The implications of these ceramic distributions are many. First, it seems that there is a clear savanna evolutionary trajectory found in the Voltaic region, one that has borders near the Inland Niger Delta in the northwest, and Yatenga in Burkina Faso. The area included in the ceramic tradition is primarily part of what today is the Gur (Voltaic) linguistic/cultural group. As a starting point for the next section, I note that the Voltaic groups among themselves have a fair number of ideological, religious and organizational similarities, and Kirikongo can be seen as piece of a very poorly understood regional evolutionary trajectory. We currently have very little information from either Burkina or Ghana on the development of the range of societies living in this area.

In addition, the archaeological trajectories of the Voltaic region and neighboring sahelian zones are different, with trade and urbanism developing in the north, while further south in Burkina Faso and Ghana, most societies inhabit villages. In part two of this thesis I explore the nature of one such village, Kirikongo.

PART II

Chapter 8

Households and Space: Modeling a Village Community

In this Chapter I describe the analytical foundation for the rest of the work, primarily focusing on defining the social units in a village and criteria used in identifying their interactions and characteristics. The following discussions include fundamental information for the construction of arguments from archaeological data on households. Later in Part 2 these discussions, mostly from the general anthropological literature, will be combined with descriptions of how societies that live in the Voltaic region conceptualize space and community. The integration of general concepts and regional specifics will enable a detailed discussion of social process.

Space in a Village Community

One of the challenges of archaeological research is to connect cultural phenomena past and present to social process. Implicit is recognition of the relationship between space, chronology and social organization. Following Flannery (1972), the success of the village as a settlement type implies a strong organizational structure that allows for the nucleation of somehow related peoples into a single spatial unit. The structure of the village is maintained by supra-household institutions, including extended lineages and kin-groups, as well as community-wide institutions such as age-sets or sodalities that help organize political, economic, and religious activities (Byrd 1994; Flannery 1972, 1976, 2002; Marcus and Flannery 1996). Although community can be defined in a myriad of ways, in this work I follow two complementary characterizations, one that describes the dynamic social nature of a community, and the other that adds a more discrete spatial dimension. Yaeger and Canuto (2000:1) state that the community “is an ever emergent social institution that generates and is generated by supra-household interactions that are structured and synchronized by a set of places within a particular span of time”; while Varien (1999:19) suggests that “a community consists of many households that live close to one another, have regular face-to-face interaction, and share the use of local social and natural resources”. While wide regional variations may be found in the

nature, balance, and material manifestations of these complex interconnected structures, the strength allows people to develop and inhabit newly sedentary and ever larger social environments.

Intra-Site Social Dynamics and Settlement Systems

Past anthropological research on settlement systems has demonstrated that the social/physical distance between social groups is related to cultural understandings of what constitutes a social unit (Agorsah 1993; Byrd 1994; Chang 1968). This empirical finding suggests that both within and between individual sites, spatial data/architecture can be used as an indicator of interaction between social units (Byrd 1994). For example, individuals who reside within a household can be expected to interact more with one another than with members of a larger group to which they also belong, such as a lineage. It may also be inferred that at the community level decisions about the location of new habitations are, at least in part, a function of the residential unit's social relations with residents of pre-existing habitations (Agorsah 1993). In research on household spatial dynamics in the Volta Basin, Ghana, Agorsah (1993:9) documented that residential proximity contributed to a common set of desired goals that allowed multiple households to constitute a higher social unit. A further relevant distinction is that between domestic and corporate contexts (Byrd 1994). The latter is the spatial location where small social units (e.g., households) interact in ways conducive to community integration, such as through horizontal institutions, or economic and religious activities. With this framework it is possible to understand the settlement system or rules governing settlement structure by exploring the relationships between archaeological spatial patterns and the social groups that produced them (Flannery 1976; Parsons 1972).

Exploring Space through Activities

In order to understand the nature of resident social groups (or their interaction spheres) in a community, it is necessary to outline the types and spatial distribution of activity areas by describing their composition and contexts (Wilk and Netting 1984). A critical step for this project was to identify the probable function of buildings and other areas, to understand the structure and choices surrounding the layout, or "built space". Activities can be subdivided into three classes that were examined at various spatial levels (Netting 1982; Netting, et al. 1984).

- (1) Production: the procurement, processing, and transformation of matter/resources.
- (2) Distribution: the flow of goods and resources ending up with consumption.
- (3) Co-residence: the sharing of shelter and dwelling facilities.

Depending on how economic activities are organized, the basic social unit may be a specialized or generalized activity group. Household research suggests that the more diverse and generalized the tasks of the basic social group, the greater the tendency for larger fundamental groups. This results from the greater labor requirements of simultaneous economic operations (i.e., agriculture, craft production, animal husbandry), and the need to pool diverse resources in a single self-sufficient social unit (Netting et al. 1984). Conversely, when linear or specialized tasks are the primary economic activity performed by the basic social unit, labor tasks are less complex, and smaller household units will be more common. Thus, the types or range of activities that occur in a given space can inform us on basic social organizational features.

Two primary archaeologically visible social groups guided research at Kirikongo, the household and the village. In order to understand the village, one must first define and characterize what is a household. The degree of expected variability or homogeneity within features of these households were operationalized in the research design due to their comparability and clear spatial correlations. However, the aim of the project was to take the understandings derived from analysis of these groups in order to develop understandings of the broad variety of social groups that likely operated during the community's occupation. These other social groups will be addressed in subsequent chapters (i.e., neighborhoods, sodalities, religious groups, trading groups, village market participants, etc.). The preliminary groups are the following:

The Compound

The smallest social/spatial social unit that can be considered is an extended family compound/neighborhood containing multiple residential structures (huts) and ritual structures, as well as trash pits, hearths, storage features, and a shared courtyard and animal pens/coops. The household is defined by Wilk and Rathje (1982) as the smallest and densest *activity* group, articulated along three dimensions, the bio-social (demographic), material (architecture, activity area, possessions), and behavioral (activities performed), within a spatially circumscribed area (Holl 1993; Netting 1982). As the fundamental social unit of the village, the study of individual household compounds is the basis for assessing inter-household variations (Netting 1982; Kramer 1982; Reid and Whittlesey 1982).

In the Voltaic region today, while activities, political organization and independence of members differ from society to society, all egalitarian groups (of which there are many) live in extended family units that contain multiple generations and can normally reach a size of 120 people (and exceptionally 600); however, size is variable based upon histories and demographic success (Tauxier 1912, Labouret 1931, Capron 1973). These extended families are subdivided into nuclear polygamous families. This distinction is necessary because the children of one mother may or may not be related to children from another in inheritance, and in some case studies split up after the death of their collective father (Dacher 1997a).

The Village (a cluster of compounds)

The site consists of multiple mounds that may differ one from another, or may be exact replicas. Mounds may contain evidence for use as residential wards of craft specialists (LaViolette 2000) or of other social units; they may also contain evidence of public space. Non-mound space is also important to the village, as open places can act as plazas (common in clustered Voltaic villages).

In order to understand the community based upon activities within a mound cluster, it is necessary to identify integration and differentiation among the units that inhabit mounds, as well as any centralization of activities or leadership in any particular place. Integration is defined by Kowalewski et al. (1983:35) as "...the interdependence or interconnectedness between parts", and centralization, "as the relative amount of flow that is accounted for by a single node".

The spatial structure of a village itself is essential to understand, and it is unsurprising that one of the first theoretical papers on the phenomenon of the village in the West African savanna (Gallais 1962) divided types of societies into dispersed, semi-clustered (neighborhoods at a distance), or fully clustered, and described the social consequences of these variants.

Activities and Expectations

The social groups presented above can be distinguished by the kinds of activities performed that are likely to be recognized archaeologically. Discerning the nature of activities requires a detailed understanding of the general range of events and the stages in the production/consumption sequence that can be discerned within an activity (i.e., Leroi-Gourhan 1943, 1945; Lemmonier 1992). In addition to co-residence, the types of activities that are likely to be recognized either directly or indirectly include farming, craft-production (pottery, iron smelting and forging, bead-making, basketry, woodcarving,

weaving), cooking and food processing, storage, trading, herding, butchering, architectural maintenance and construction, fishing, hunting, defense, religious activities (ritual), and mortuary and burial practices.

In analyzing the relations between material patterns in classes of data at Kirikongo I view societies as systems, where all aspects of the system interrelate, such that the way one performs an activity can have a great bearing on how they do something else, even if they are entirely unrelated (Leroi-Gourhan 1943, 1945). This creates a framework for understanding variability even when it is seemingly arbitrary, or not efficient (Lemonnier 1992). It also provides a frame of reference for discerning individual or unique occurrences, including facilitating the identification of actors in the archaeological record who may have influenced the nature of change.

Throughout West Africa, ethnographic data suggest that the fundamental social organizational features of communities can be based in a variety of mechanisms of integration and disintegration (some mechanisms push and others pull at varying strengths). The study of an ancient community requires operationalizing the effects of these social integrative and potentially disintegrative mechanisms on archaeologically visible social groups.

Conclusion

Below I present the material patterns that elucidate social processes at Kirikongo. Each chapter builds up several lines of evidence for understanding the community. Discussions within chapters are limited to those that highlight the nature of the data. The full social dimensions are explored following an ethnographic survey of a set of Voltaic societies with different forms of political organization, and consequently different communal projects (ideologies). After observing how activities and material patterns relate in the region today, I combine archaeological patterns, regional ethnographic observations, and general anthropological theories, to describe the evolution of the community of Kirikongo. The conclusion to this thesis includes a set of implications for regional understandings, as well as for anthropological knowledge on early village life, social organization, the origins of rank, and egalitarian societies.

Chapter 9

The Origins and Development of Specialized Pottery Production

Pottery Production and Use

Traditional pottery production in the West African savanna was and continues to be organized and practiced in a diversity of ways. In western Burkina, this ranges from unspecialized production by talented individuals within generalized and independent households (e.g., the Lobi), to specialized production by endogamous potters married to iron-smiths (e.g., The Bwa or Bobo) (Labouret 1931, McNaughton 1988, LaViolette 2000, Holas 1957, Capron 1973). What is unknown, however, is when, how, and under what circumstances specialized production developed.

In this chapter I present evidence for the emergence of specialized production during the latter part of the Iron Age at Kirikongo. I argue that pottery was manufactured at the individual household level during the first millennium AD (Yellow I to Red I). However, starting in Red II, data suggest increased standardization in the village ceramic assemblage, coupled with direct evidence for pottery production in a single locus (Mound 11). This chapter presents two different arguments: (1) that individual households produced their own pottery within their own production traditions during Yellow I, II and Red I; and (2) that by Red II, these individual traditions were no longer continued, and were replaced by a single production tradition that provided ceramics to all households in the village.

Yellow I Pottery Production (Tables 9.1 and 9.2)

Deposits from Yellow I occur exclusively in Mounds 1 (Unit A) and 4 (Unit B), although Mound 4's are much more substantial. Both ceramic samples had the same range of vessel types, and in general were similarly decorated. The relative proportions of vessels differed slightly, as Unit B's assemblage had more jars with thickened rims (Type 1) relative to other vessel types. One discernable technological difference is that thickened rim vessels in Unit B became thinner over time. The pottery from Unit A falls within the late, thinner distribution. The pottery in each unit was mainly decorated with

Decorations	Unit A Mound 1		Unit B Mound 4	
	T24	14	25.0%	33
T5	2	3.6%	0	0.0%
T6	26	46.4%	42	37.2%
T13	0	0.0%	1	0.9%
T19	14	25.0%	31	27.4%
T20	0	0.0%	6	5.3%
Grand Total	56	33.1%	113	66.9%
Channels	7	12.5%	9	8.0%

Table 9.1: Yellow I Distribution of Decoration by Unit (Body Sherds)

Vessel Type	Unit A Mound 1		Unit A Decoration	Unit B Mound 4		Unit B Decoration	Total	
	Type 2: Jars with Rolled Rims	1		6.3%	T24		1	4.5%
Type 1: Jars with Thickened Rims	6	37.5%	T24 (n=3)	16	72.7%	T24 (n=2); T20 (n=2); T19 (n=1)	22	57.9%
Type 3: Basins with Straight Rims	6	37.5%	T6 (n=2); T24 (n=2)	2	9.1%	T6 (n=1); T19 (n=1)	8	21.1%
Type 4: Simple Open Bowls	2	12.5%	T6 (n=1)	2	9.1%	T24 (n=1)	4	10.5%
Type 5: Simple Closed Bowls	1	6.3%		1	4.5%		2	5.3%
Base Type 1: Ring bases	1	100.0%		1	100.0%			
Grand Total	16			22			40	

Table 9.2: Yellow I Distribution of Rim Types

twines, T24, T6 and T19. T6 is slightly more numerous in Unit A. Minor decorations were specific to each unit.

The relative homogeneity of the pottery during this period may be the result of the initial closeness (relatedness) of the two households. Temporal trends suggest an increasing diversity of vessel types and a decrease in vessel thickness.

Yellow II: The Development of Multiple Distinct Pottery Traditions (Tables 9.2 and 9.3)

During Yellow II a series of compounds were founded, resulting in new pottery production traditions and a concomitant increase in the number of vessel types. Yellow II can be characterized as a transitional pottery period, set between the jars with thickened rims (Type 1) of Yellow I and the jars with flared rims of Red I (Type 12). These transformations were quite apparent in the general assemblages as different compounds remained either conservative or innovative, the latter marked by creation of new vessel types.

Mound 1 (Unit A)

The assemblage from Unit A (Mound 1) retained the jars with thickened rims (Type 1) that were dominant in Yellow I, as well as jars with rounded rims (Type 2), simple open bowls (Type 4), and simple restricted vessels (Type 5). However, 20% of the assemblage was a new class of small bowls with flared rims (Type 10). These small and thin-walled vessels represented the beginning of a vessel class that continued into Red I, one that was decorated with the new carved roulette (R4). Type 10 pots were part of a new assemblage in which small vessels had flared rims and medium and large jars had thickened rims. Several other classes of small vessels were new in this period as well. Alternate knotted slip (T6) remained the most frequent decoration; knotted strip roulette (T24) and uniformly twisted combined twine (T19) formed the majority of the remaining decorations.

Mound 4 (Unit B)

The assemblage in Unit B (Mound 4) was much smaller, but significantly different. Jars with thickened rims were only found in the early layers, after which they were replaced by a medium and large jar class with flared rims (Type 6). These new vessels were similar to the thickened rim (Type 1) in shape below the neck, but were decorated with the new carved roulette technique (R4). Body sherd analyses also show the shift to flared vessels, as T19, commonly applied to the bases of thickened rim vessels, fell to less than 5% of the total assemblage decoration. Other new vessel classes

Decorations	Unit A Mound 1		Unit B Mound 4		Unit C Mound 3		Unit E Mound 11	
	T1	3	1.3%	3	4.4%	15	9.3%	0
T24	78	33.1%	26	38.2%	51	31.7%	58	34.9%
T3	0	0.0%	2	2.9%	0	0.0%	0	0.0%
T5	1	0.4%	0	0.0%	0	0.0%	0	0.0%
T6	89	37.7%	23	33.8%	56	34.8%	63	38.0%
T7	0	0.0%	1	1.5%	0	0.0%	0	0.0%
T10	4	1.7%	2	2.9%	0	0.0%	0	0.0%
T13	0	0.0%	2	2.9%	0	0.0%	0	0.0%
T19	57	24.2%	3	4.4%	14	8.7%	32	19.3%
T20	2	0.8%	2	2.9%	4	2.5%	8	4.8%
R15 (T22)	0	0.0%	0	0.0%	3	1.9%	0	0.0%
Twine Total	234	99.2%	64	94.1%	143	88.8%	161	97.0%
R4	0	0.0%	1	1.5%	6	3.7%	1	0.6%
R5	0	0.0%	1	1.5%	1	0.6%	1	0.6%
R7	0	0.0%	1	1.5%	0	0.0%	0	0.0%
R14	0	0.0%	1	1.5%	0	0.0%	0	0.0%
Carved Roulette Total	0	0.0%	4	5.9%	7	4.3%	2	1.2%
COI	0	0.0%	0	0.0%	5	3.1%	0	0.0%
DG	1	0.4%	0	0.0%	1	0.6%	0	0.0%
FS	0	0.0%	0	0.0%	1	0.6%	0	0.0%
IMC	0	0.0%	0	0.0%	1	0.6%	0	0.0%
MI	0	0.0%	0	0.0%	1	0.6%	1	0.6%
CH	1	0.4%	0	0.0%	2	1.2%	2	1.2%
Other Decoration Total	2	0.8%	0	0.0%	11	6.8%	3	1.8%
Grand Total	236	37.4%	68	10.8%	161	25.5%	166	26.3%
Co-Occur Channels	21	8.9%	8	11.8%	14	8.7%	22	13.3%

Table 9.3: Yellow II Distribution of Decoration by Unit (Body Sherds)

Vessel Type	Unit A Mound 1	Unit A Decoration	Unit B Mound 4	Unit B Decoration	Unit C Mound 3	Unit C Decoration	Unit E Mound 11	Unit E Decoration	Total	%
Type 2: Jars with Rolled Rims	4	7.3% T6 (n=4) T24 (n=3)	0	0.0%	1	8.3% T6 (n=1)	0	0.0%	5	6.0%
Type 1: Jars with Thickened Rims	23	43.6% T24 (n=7) T6 (n=5)	2	22.2% T24 (n=1) T6 (n=1)	6	50.0% T24 (n=2)	5	62.5% T24 (n=1)	36	44.1%
Type 7: Jars with Flat-Topped Rims	0	0.0%	1	11.1% T24	1	8.3% T24	1	12.5% T24	3	3.6%
Type 8: Vessels with Everted and Thickened Rims	2	3.6% T24 (n=1) T6 (n=1)	0	0.0%	0	0.0%	0	0.0%	2	2.4%
Type 5: Small Closed Bowls	4	7.3% T6 (n=1)	1	11.1% T6	0	0.0%	2	25.0% T6 (n=1)	7	8.3%
Type 4: Simple Open Bowls	7	16.4% T6 (n=2) T24 (n=1)	0	0.0%	4	25.0% T6 (n=1) T24 (n=1)	0	0.0%	11	14.3%
Type 9: Basin with Thickened Rim	1	0.0%	0	0.0%	1	8.3%	0	0.0%	1	1.2%
Type 11: Pot Lid	0	0.0%	1	11.1% T24	0	0.0%	0	0.0%	1	1.2%
Type 6: Jars with Flared Rims	0	0.0%	4	44.4% T24 (n=3) R4 (n=2)	0	0.0%	0	0.0%	4	16.7%
Type 10: Bowls with Flared Rims	14	25.9% T24 (n=2) T6 (n=3) R4 (n=1)	0	0.0%	0	0.0%	0	0.0%	14	2.4%
Base Type 1: Ring Bases	1	100.0%	2	100.0% T20 (n=1)						
Grand Total	55		9		12		8		84	

Table 9.4: Yellow II Distribution of Rim Types

included a jar with flat-topped rim and ledge handles (Type 7). T6 and T24 remained the dominant decoration techniques, to which were added a small number of new twine decorations and small quantities of carved roulettes.

Mound 3 (Unit C)

The assemblage from the cemetery of Mound 3 (Unit C) is derived from a fill deposit that has ceramic affinities to the pottery found in Mound 4. Half of the ceramic sample was jars with thickened rims (Type 1), with several examples of transitional forms changing into the flared rims (Type 6) that characterized the Mound 4 assemblage. The sample thus dates to early Yellow II when Type 6 was still evolving. These deposits also contained a flat-topped jars with a ledge handle (Type 7) similar to that from Mound 4. Also similar to Mound 4, the body sherd analyses show the replacement of thickened rims by new flared forms, as T19 composed only 10% of the decorations as part of a general assemblage dominated by T24 and T6. A small number of new twines (T1 the largest) and carved roulettes (mainly R4) were recorded in similar frequencies to Mound 4.

Mound 11 (Unit E)

The assemblage at Mound 11 resembled more closely that in Mound 1 (Unit A), with no transitional jar forms nor flared versions of large vessels. Jars with thickened rims (Type 1) remained the most common vessel type, but Mound 11's inhabitants may have been more conservative, lacking even the small flared bowls (Type 10) found in Unit A. However, they did produce Type 7, also found in Units B and C, and some vessels were decorated with new carved roulettes. Despite these, the twine decoration distribution was very conservative (mainly T6 and T24, and a high frequency of T19), lacking many of the new twines found in other units.

Summary

There were three active pottery production traditions during Yellow II that diverged in distinct ways. Units A and B differed in their relative retention of large vessels with thickened rims (Type 1). Unit A retained jars with thickened rims (Type 1) throughout Yellow II, although it added a class of small bowls with flared rims (Type 10) to replace some smaller vessels that formerly had thickened rims. Unit B replaced the majority of its jar assemblage with flared vessels (Type 6), and this transformation was clearly seen in the related assemblage from Unit C. A concomitant pattern in these assemblages was a large reduction in T19 that had formerly been tied (and still was in Unit A) with the lower body and base of thickened rim vessels (Type 1), and now extinct vessel types (Type 3: Yellow I Basins). In addition to differences in vessel distribution

between Units B/C and A, decoration techniques also diverged. For example, despite its large sample size in comparison to Units B and C, Unit A had only one carved roulette impression, while in both Units B and C they constituted around 5-6% of decorations.

Unit E provided an interesting view of a newly founded compound's pottery assemblage. The ceramic assemblage was very conservative compared to both Units B/C, and A, with thickened rims of all sizes, no development of flared rim vessels, and twine decorations that were composed of only the traditional twine techniques (T19, T2 and T6). However, it was clearly a Yellow II assemblage, owing to the presence of carved roulettes in very low frequencies, distinctive vessel types (Type 7) found only during the period, and direct radiocarbon dating. The conservative nature of the assemblage could result from the family that settled this location not having been used to making pottery, and therefore keeping it classic and simple. Alternatively, owing to their small initial size, they might not have had the time to improvise because of labor constraints. Further evidence for the production of pottery by each household was provided by Mounds A, B/C, and E which all had different carved roulette tools to produce R4; these tools created slightly different raised versions of the same motif.

In summary, Units B and C were parts of the same production tradition that diverged widely from and at Unit A (Mound 1), while Unit E constituted an additional, more conservative production tradition.

Red I Pottery Production (Tables 9.5 and 9.6)

The three pottery traditions identified in Yellow II continued to evolve during Red I. Each unit's assemblage diverged widely, as the village population and number of producers expanded. Vessels were decorated in diverse ways, and the inhabitants of different mounds had new tastes and preferences. These differences were mainly limited to the shape of the lip and decorative features, with the general technological nature of the assemblage roughly similar throughout the site. It can therefore be characterized as a general system with multiple production traditions.

Mound 1 (Unit A)

The large part of the Unit A (Mound 1) assemblage was composed of jars with flared decorated rims (Type 12) that were common to the entire village. However, similar to Yellow II, a class of small vessels with thinned flared rims was found only in Mound 1 (Type 13). These were clearly derivative of Yellow II's Type 10. Rounded-rim bowls (Type 2) were also restricted to Mound 1. Vessels with Flat-topped rims (Type 22) were primarily found on Mound 1.

Decorations	Unit A Mound 1		Unit B Mound 4		Unit C Mound 3		Unit E Mound 11	
	T1	175	24.1%	43	31.2%	244	60.1%	110
T24	98	13.5%	17	12.3%	25	6.2%	28	12.8%
T3	39	5.4%	2	1.4%	11	2.7%	0	0.0%
T4	0	0.0%	0	0.0%	0	0.0%	1	0.5%
T6	21	2.9%	8	5.8%	18	4.4%	10	4.6%
T7	12	1.7%	2	1.4%	4	1.0%	2	0.9%
T9	3	0.4%	0	0.0%	0	0.0%	1	0.5%
T10	55	7.6%	26	18.8%	46	11.3%	11	5.0%
T13	8	1.1%	1	0.7%	2	0.5%	2	0.9%
T14	5	0.7%	0	0.0%	0	0.0%	0	0.0%
T15	1	0.1%	0	0.0%	0	0.0%	0	0.0%
T18	0	0.0%	1	0.7%	0	0.0%	0	0.0%
T19	0	0.0%	1	0.7%	7	1.7%	1	0.5%
T20	214	29.5%	26	18.8%	26	6.4%	30	13.7%
R6 (Twine 23)	1	0.1%	0	0.0%	0	0.0%	0	0.0%
Twine Total	632	87.1%	127	92.0%	383	94.3%	196	89.5%
R4	74	10.2%	3	2.2%	10	2.5%	13	5.9%
R5	4	0.6%	3	2.2%	0	0.0%	0	0.0%
R7	2	0.3%	0	0.0%	0	0.0%	0	0.0%
R8	3	0.4%	1	0.7%	0	0.0%	1	0.5%
R9	0	0.0%	0	0.0%	0	0.0%	1	0.5%
Carved Roulette Total	83	11.4%	7	5.1%	10	2.5%	15	6.8%
COI	6	0.8%	1	0.7%	7	1.7%	4	1.8%
COR	0	0.0%	0	0.0%	1	0.2%	0	0.0%
PR	0	0.0%	0	0.0%	1	0.2%	0	0.0%
FS	1	0.1%	3	2.2%	1	0.2%	2	0.9%
IMC	0	0.0%	0	0.0%	1	0.2%	0	0.0%
CH	4	0.6%		0.0%	2	0.5%	2	0.9%
Other Total	11	1.5%	4	2.9%	13	3.2%	8	3.7%
Grand Total	726	48.8%	138	9.3%	406	27.3%	219	14.7%
Channels	99	13.6%	16	11.6%	54	13.3%	24	11.0%

Table 9.5: Red I Distribution of Decoration by Unit (Body Sherds)

Vessel Type	Unit A Mound 1		Unit A Decoration		Unit B Mound 4		Unit B Decoration		Unit C Mound 3		Unit C Decoration		Unit E Mound 11		Unit E Decoration		Totals		
Type 12: Jars with Flared Decorated Rims	46	49.5%	7R4; 5R7; 8T1; 2T2; 2T3; 2T6; 3T7; 1T8; 1T10; 3T20	39% of ID decorations Roulettes; 26% are T1	9	60.0%	1R9; 2T1; 1T2; 2T3; 1T6	14% roulettes	40	52.6%	3R4; 20T1; 3T2; 4T3; 2T6; 1T7; 1T10	9% roulettes; 59% Twine 1	10	45.5%	3T1; 2T2; 1T3; 1T8	105	51.2%		
Type 13: Jars with Thinned Flared Rims	10	10.8%	7R4; 1T2	87.5% roulettes	0	0.0%			0	0.0%			0	0.0%		10	4.9%		
Type 14: Jars with Thickened Flared Rims	0	0.0%			1	6.7%	1T10		6	7.9%	2T1; 1T3; 1T7; 1T10; 1R4	17% Roulettes	1	4.5%		8	3.9%		
Type 15: Basins with Flared Rims	1	1.1%	T19 (N=1); R4 (N=1)										1	4.5%		2	1.0%		
Type 21: Bowls with Rounded Rims	4	4.3%	1T1; 2T2; 2R4		0	0.0%			0	0.0%			0	0.0%		4	2.0%		
Type 22: Vessels with Flat-Topped Rims	6	6.5%	4R4; 2T1		0	0.0%			0	0.0%			1	4.5%	R4 + T1	7	2.9%		
Type 23: Basins with Triangular Rims	0	0.0%			0	0.0%			2	2.6%	1R4; 1T20		0	0.0%		2	1.0%		
Type 16: Bowls with Triangular Everted Rims	16	17.2%	2T2; 1T20		0	0.0%			0	0.0%			0	0.0%		16	7.8%		
Type 17: Bowls with Narrowed Rims rectangular	0	0.0%			0	0.0%			9	11.8%	9R4		1	4.5%		10	4.9%		
Type 18: Bowls with Slightly Everted Rims	3	3.2%	2R4		2	13.3%			5	6.6%	1R4		6	27.3%	4R4; 1T2	16	7.8%		
Type 20: Restricted Vessels with Vertical Rims	0	0.0%			0	0.0%			3	3.9%	2R4		0	0.0%		3	1.5%		
Type 19: Jars with Everted and Thickened Rims	0	0.0%			0	0.0%			7	9.2%	3R4; 1T7		1	4.5%	R4	8	3.9%		
Type 4: Simple Open Bowls	4	4.3%	2R4; 1R5		1	6.7%	R5 + R4		1	1.3%	R4		1	4.5%		7	3.4%		
Type 5: Simple Closed Bowls	3	3.2%	1R5		2	13.3%			0	0.0%			0	0.0%		5	2.4%		
Type 24: Small Jars with Triangular Rims	0	0.0%			0	0.0%			3	3.9%	2R4		0	0.0%		3	1.5%		
Handle Type 1: Handles	8	88.9%	5R4; 1T3; 1T10		1	100.0%			1	100.0%	Rocker Comb		0	0.0%		10	90.9%		
Handle Type 2: Big Handle	1	11.1%	R4		0	0.0%			0	0.0%			0	0.0%		1	9.1%		
Base Type 2: Pedestal bases	3	20%			0	0.0%			0	0.0%			0	0.0%		3	11.1%		
Base Type 3: Flat round bases	6	40%	2R4		0	0.0%			0	0.0%			1	33.3%		7	25.9%		
Base Type 4: High Ring Bases	1	6.7%			0	0.0%			1	12.5%			0	0.0%		2	7.4%		
Base Type 1: Ring Bases	3	20%	2R4		1	100.0%			7	87.5%	1R4		2	66.7%		13	48.1%		
Base Type 5: Legged Vessel	1	6.7%			0	0.0%			0	0.0%			0	0.0%		1	3.7%		
Base Type 6: Large Flattened Base	1	6.7%			0	0.0%			0	0.0%			0	0.0%		1	3.7%		
Grand Total	117				17				85				25			244			

Table 9.6: Red I Distribution of Rim Types

The small vessels produced by the potters at Mound 1 were slightly different from those found in other mounds. For example, the common simple open bowl type with triangular everted rims (Type 16) that accounted for 17% of the entire rim assemblage occurred only in Mound 1. Other vessel types were also found at other mounds, including bowls with slightly everted rims (Type 18), simple open bowls (Type 4), and simple restricted bowls (Type 5). T1 constituted 24% of the decorations in the assemblage, with T24, T3 and T10 also prominent. The most distinctive feature of decoration was the high proportion of carved roulettes, accounting for over 11% of the decorations in the body sherd sample. In addition, while flared rim forms were common throughout the village, 1/3 of those at Mound 1 were decorated with a carved roulette (R4), a much higher proportion than found elsewhere.

Mound 4 (Unit B)

The Red I sample from Mound 4 was the smallest at the site and mainly composed of jars with flared decorated rims (Type 12). In addition, it contained the bowls with slightly everted rims (Type 18), simple open bowls (Type 4), and simple restricted bowls (Type 5) found throughout the village. As in Yellow II, the sample maintained its similarity to pottery at Mound 3, with thickened flared rim vessels (Type 14) common to both. Also similar to Mound 3, the body sherd assemblage had a low proportion of carved roulettes. T1 was the most popular twine, and this small sample had a high proportion of T10. The high frequency of twines in relation to carved roulettes was found on the common flared everted vessels (Type 12), providing a contrast to those from Mound 1.

Mound 3 (Unit C)

The deposits in Mound 3 were primarily composed of fill placed on and around burials. The pottery in the fill was generally unmixed with Yellow Phase pottery, and the sample was of comparable size to that recovered from Mound 1. The assemblage also maintained its affinity to the pottery at Mound 4. Similar to other mounds, the sample was mainly composed of jars with flared decorated rims (Type 12); however, it shared the jars with thickened flared rims (Type 14) with Unit B. Several other small pot classes were unique to the mound; these included the small thin jars with triangular rims (Type 24), small jars with everted thickened rims (Type 19), and the restricted vertical rim vessels (Type 20).

Mound 3, like Mound 1, had a distinctive type of simple open bowl, with a narrowed lip (Type 17); this vessel constituted 12% of the entire rim assemblage. The small bowls with slightly everted rims (Type 18) were also present in low quantities (Type 18), as were the common simple open (Type 4) and closed (Type 5) bowls. The

body sherd assemblage was entirely dominated by T1 (60% of all decorations), with T10 the only other decoration found in high quantity. At Mound 4, carved roulettes were extremely rare in comparison with Unit A. For example, on the jars with flared decorated rims (Type 12), almost 60% of the decorations were T1, while only 9% were carved roulettes. When applied, R4 seems to have been used more scarcely in zones, while at Mound 1 it entirely covered the vessel exterior. The thickened flare class (Type 14) likewise showed a prevalence of twine decoration, and was quite distinct from the thinned flared jars (Type 13) of Mound 1 (primarily decorated with carved roulettes).

Mound 11 (Unit E)

The Mound 11 Red I assemblage was small, and seemed to share attributes with all other production traditions. Its assemblage was primarily composed of flared decorated rim jars (Type 12), and the sample lacked Type 13 and 14 vessels. It is possible that the conservative pottery tradition found during Yellow II continued, as the small flared jars of Mound 11 were not different from medium and large jars, a common feature at Mounds 1 and 4. Only one flared vessel without decoration on the underside of the lip was recovered, a basin with a R4 on the shoulder and a T19 on the body. This was the only use of T19 on a vessel during Red I, indicating an additional conservative element in the pottery assemblage. Some vessels that resembled those at other mounds were found in low frequency, including a single thickened flare (Type 14) like Unit B and C, and one flat-topped rim (Type 22) like Unit A.

The small bowl assemblage at Mound 11 was dominated by the bowls with slightly everted rims (Type 18), found throughout the site as a minor member of other mound assemblages. Like Unit C, the body sherd data was dominated by T1. However, it had more T24, and less T10 than Unit C, as well as more frequent use of carved roulettes. Interestingly, the flared rim vessels here were exclusively twine-decorated, while the small bowls were covered predominantly with carved roulette decorations.

Summary

There were three active pottery traditions during this phase, each with clear roots in Yellow II. All mounds shared a basic, technologically equivalent assemblage (mainly jars with flared rims and a single simple open bowl type); however, each compound decorated these in their own way and shaped the vessel lips differently. For example, all compounds had their own types of small simple open bowls with distinctive decorative treatments, but they were all likely used for the same purpose, as serving dishes (See Chapter 5). Unit A had some unique vessels with roots in Yellow II, including Type 2, Type 22, and Type 13.

The popular twines, T6 and T19 + T24 from Yellow I and II, were replaced by T1. T1 was particularly common in Units C and E, although its relative low frequency in Mound 4 may be related to small sample size. Other twines varied in frequency between units. Another stark distinction was seen in the high quantity of carved roulettes found in Mound 1. They constituted 10% of the overall decoration sample, and were applied on several vessel classes.

Red II Pottery Production (Tables 9.7 and 9.8)

During Red II, only one pottery production tradition was active in the village. The assemblage was characterized by increased standardization, both in the range of vessels present, as well as in their form, size, and decoration. New vessel types that appeared during this period were common to the whole village, and not just individual mounds. At the very beginning of the period, some vessel types were unique to each mound, but these disappeared by mid-Red II.

Mound 1 (Unit A)

This assemblage was the largest recovered from the Red II sub-phase. Jars with overhanging rims (Type 25) constituted the majority of the sample. In contrast to Red I, the primary bowl type found in Red II deposits (Type 18) was common throughout the village and replaced the diverse forms that characterized Red I. Simple open bowls (Type 4) and simple closed vessels (Type 5) continued to be produced in low frequency. Other vessels that continued from Red I included jars with flat-topped rims (Type 22) and basins with triangular rims (Type 23).

Several new and specialized ceramic elements were added during Red II, including pot-lids with ring handles (Type 29), small tripod oil lamps (Type 28), and a flared rim jar perforated with holes (Type 27). Basic decoration patterns were somewhat obscured by the large degree of noise in the assemblage, derived from the re-use of pottery in mud brick. For example, 37% of sherds with twine decoration could not be classified owing to erosion. If limited to rims, 76% of decorated vessels (Type 25) had a R4 on the vessel shoulder in horizontal band, below which was a twine decoration. T1 was still the most popular technique, with the next highest T2. The most obvious change during Red II was in carved roulettes, as R4 became the second most numerous identified decoration technique, constituting 17% of the entire decorated sample.

Mound 4 (Unit B)

This assemblage was very small. Of the 13 rims, almost all were jars with overhanging rims (Type 25) identical to those found in Unit A. Otherwise, simple open

Decorations	Unit A Mound 1		Unit B Mound 4		Unit C Mound 3		Unit E Mound 11	
T1	143	18.1%	10	45.5%	364	55.8%	38	55.9%
T2	114	14.5%	0	0.0%	28	4.3%	13	19.1%
T3	27	3.4%	1	4.5%	21	3.2%	1	1.5%
T5	4	0.5%	0	0.0%	0	0.0%	0	0.0%
T6	12	1.5%	2	9.1%	9	1.4%	0	0.0%
T7	8	1.0%	0	0.0%	5	0.8%	0	0.0%
T9	1	0.1%	0	0.0%	3	0.5%	0	0.0%
T10	30	3.8%	1	4.5%	50	7.7%	6	8.8%
T12	1	0.1%	0	0.0%	0	0.0%	0	0.0%
T13	10	1.3%	0	0.0%	0	0.0%	0	0.0%
T14	1	0.1%	0	0.0%	1	0.2%	0	0.0%
T18	0	0.0%	0	0.0%	3	0.5%	0	0.0%
T19	0	0.0%	0	0.0%	3	0.5%	0	0.0%
T20	288	36.5%	7	31.8%	59	9.1%	8	11.8%
T21	1	0.1%	0	0.0%	0	0.0%	0	0.0%
R6 (Twine 23)	2	0.3%	0	0.0%	0	0.0%	0	0.0%
Twine Total	642	81.5%	21	95.5%	546	83.7%	66	97.1%
R2	0	0.0%	0	0.0%	2	0.3%	0	0.0%
R4	131	16.6%	1	4.5%	91	14.0%	2	2.9%
R5	7	0.9%	0	0.0%	1	0.2%	0	0.0%
R7	1	0.1%	0	0.0%	0	0.0%	0	0.0%
R8	1	0.1%	0	0.0%	0	0.0%	0	0.0%
R14	1	0.1%	0	0.0%	0	0.0%	0	0.0%
Unknown R	1	0.1%	0	0.0%	0	0.0%	0	0.0%
Carved Roulette Total	142	18.0%	1	4.5%	94	14.4%	2	2.9%
COI	3	0.4%	0	0.0%	6	0.9%	0	0.0%
COR	1	0.1%	0	0.0%	0	0.0%	0	0.0%
PR	0	0.0%	0	0.0%	1	0.2%	0	0.0%
Channels		0.0%		0.0%	5	0.8%		0.0%
Other Decoration Total	4	0.5%	0	0.0%	12	1.8%	0	0.0%
Grand Total	788	51.5%	22	1.4%	652	42.6%	68	4.4%
Channels	108	13.7%	3	13.6%	121	18.6%	7	10.3%

Table 9.7: Red II Distribution of Decoration by Unit (Body Sherds)

Vessel Type	Unit A Mound 1	Unit A Decoration	Unit B Mound 4	Unit B Decoration	Unit C Mound 3	Unit C Decoration	Unit E Mound 11	Unit C Decoration	Total
Type 25: Jars with Overhanging Rims	31 49.2%	17R4; 4R4+T2; 1R4+T1; 3T1; 2T2; 1T3; 1T20	10 76.9%	1R4; 4R4+T18; 1R4+T1; 1R4+T3; 1T2; 1T3	26 54.2%	10R4; 1R4+T3; 1R4+T20; 1R4+T1; 4T1; 2T20	2 28.6%	1R4; 1T1	69 52.7%
Type 26: Basins with Overhanging Rims	2 3.2%	1R5; 1T3	0 0.0%		0 0.0%		0 0.0%		2 1.5%
Type 27: Perforated Jar with Flared Rim	1 1.6%	1T1	0 0.0%		0 0.0%		0 0.0%		1 0.8%
Type 18: Bowls with Slightly Everted Rims	14 22.2%	4R4; 1T20	0 0.0%		8 16.7%	4R4	3 42.9%	2R4	25 19.1%
Type 5: Simple Closed Bowls	3 4.8%		0 0.0%		0 0.0%		0 0.0%		3 2.3%
Type 4: Simple Open Bowls	4 6.3%	1R4; 1T2	1 7.7%		1 2.1%		0 0.0%		6 4.6%
Type 28: Oil Lamp	1 1.6%		1 7.7%	1T7			0 0.0%		2 1.5%
Type 29: Pot-Lid	2 3.2%	1T3; 1T2	0 0.0%		1 2.1%	R5	0 0.0%		3 2.3%
Type 24: Small Thin Jars with Triangular Rims	1 1.6%	R4	1 7.7%	COI	10 20.8%	12R4	0 0.0%		12 9.2%
Type 16: Bowls with Triangular Everted Rims	1 1.6%	1R4	0 0.0%		0 0.0%		0 0.0%		1 0.8%
Type 22: Vessels with Flat-Topped Rims	2 3.2%	1R4; 1T1	0 0.0%		1 2.1%		1 14.3%	1R4	4 3.1%
Type 23: Basins with Triangular Rims	1 1.6%	R4 + T20	0 0.0%		1 2.1%	T20	1 14.3%	1T7	3 2.3%
Base Type 3: Flat Round Base	1 50.0%		0 0.0%		0 0.0%		0 0.0%		1 12.5%
Base Type 1: Ring Base	1 50.0%		0 0.0%		4 66.7%	1T1	0 0.0%		5 62.5%
Base Type 5: Legged Vessel	0 0.0%		0 0.0%		1 16.7%		0 0.0%		1 12.5%
Base Type 6: Large Flattened Bases	0 0.0%		0 0.0%		1 16.7%		0 0.0%		1 12.5%
Grand Totals	65		13		54		7		139

Table 9.8: Red II Distribution of Rim Types

bowls (Type 4) and a single small thin jar with a triangular rim (Type 27) were recovered, as was a small oil-lamp (Type 28) identical in form to that from Unit A. The body sherd sample was too small (n=22) to be statistically meaningful.

Mound 3 (Unit C)

Red II deposits at Mound 3 could be divided into two parts: the cemetery deposit and the first habitation on this mound that marked the closing of the cemetery. The assemblage was large and compared well to Unit A. Unit C had jars with overhanging rims (Type 25) that were decorated in the same manner (68% of decorated vessels have a R4 on the shoulder). In addition, the same small bowl class (Type 18) was common. Pot-lids (Type 29) that were identical to those from Unit A were recovered, as were flat-topped rim vessels (Type 22) and basins with triangular rims (Type 23). A single vessel class found in Unit C did not occur in Mounds A and E. These were the small, ornately-made and decorated jars with triangular rims (Type 24); they were restricted in distribution to the mortuary layers from the beginning of Red II, and were a continuation of a type found in Red I.

T1 accounted for 75% of identified twines and 56% of the entire decorated assemblage. The high frequency of T1 was likely the result of the use of old cultural deposits to make mud brick. R4 was present in a similar frequency as in Unit A, and the re-use of sherds with this decoration is unlikely, since carved roulettes were only a minor component of the Red I assemblage.

Mound 11 (Unit E)

Mound 11 had a small assemblage that contained classes identical to those found on other mounds, including jars with overhanging rims (Type 25), bowls with slightly everted rims (Type 18), flat-topped vessels (Type 22) and basins with triangular rims (Type 23). The sample of decorated sherds was also very small, with Twine 1 the largest component. However, like Unit C, Twine 1's popularity during Red I may have compounded to account for its inflated values during Red II.

Summary

The three pottery traditions that had developed over the course of Yellow I and II reached maximal diversity during Red I and unified into a single tradition in Red II. This new assemblage combined new types and decorative schemes, based on formerly popular elements from all mound production traditions, to create a single cross-site assemblage. Type 25 jars accounted for most of the assemblage and these were similarly decorated in all units. The diverse small bowl types found in Red I disappeared, replaced by a bowl

(Type 18) that had formerly been the most popular on Mound 11. Simple closed (Type 5), and open bowls (Type 4) continued to be manufactured.

Other formerly restricted-distribution vessel classes including flat-topped vessels (Type 22) and basins with triangular rims (Type 23), were found in all mounds. Newly developed oil-lamps (type 28) and pot-lids (Type 29) were ubiquitous. Only Unit A and C's body sherd samples were comparable in size; each had almost identical decoration distributions. For example, R4 composed 17% of the Unit A assemblage, and 14% of the Unit C assemblage, respectively. The divergent totals in T1 and T2 were likely the result of the re-use of sherds as mud brick temper. Minor twines were also found in relatively similar frequencies. Both in assemblage breadth and in decoration, Red II pottery was more standardized and universal across the site.

Red III Pottery Production (Tables 9.9 and 9.10)

The standardized pottery production identified during Red II continued in Red III. The assemblages from different mounds were largely identical in distribution, regardless of the relative sample sizes.

Mound 1 (Unit A)

The small assemblage was mostly composed of jars with triangular rims (Type 30), including several basins with triangular rims (Type 23). The remainder was bowls with slightly everted rims (Type 18), identical in form to those from Red II. In decoration, almost all of the jars with triangular rims had an R4 in a horizontal band on the shoulder and twine decoration below on the body. Late bowls and jars tended to have less R4 and more twine. Twisted twines (T2 and T18) were the most popular twine decorations. Other twines were found in low frequencies. R4 was slightly less popular, limited to 11% of the assemblage decoration.

Mound 4 (Unit B)

This assemblage was very large, with much of it derived from in situ ceramic features. Interestingly, despite the larger sample size in relation to Mound 1, this sample was remarkably similar in the relative frequencies of vessel types. The assemblage was mainly composed (62%) of jars with triangular rims (Type 30), and 26% were bowls with slightly everted rims (Type 18). The remainder of the sample was composed of vessels in low quantities, including simple open small bowls (Type 4), simple restricted bowls (Type 5), a basin with a thickened rim (Type 32), and one large bowl with a slightly everted rim (Type 31). In decoration, Mound 4's sample was also similar to that from Mound 1, with an R4 on most (73%) jar (Type 30) shoulders, and twine on most bodies.

Decorations	Unit A Mound 1		Unit B Mound 4		Unit C Mound 3		Unit E Mound 11	
T1	95	19.2%	410	25.4%	90	29.4%	162	39.6%
T2	119	24.0%	241	14.9%	18	5.9%	51	12.5%
T3	10	2.0%	79	4.9%	5	1.6%	15	3.7%
T4	1	0.2%	0	0.0%	0	0.0%	1	0.2%
T5	3	0.6%	0	0.0%	0	0.0%	0	0.0%
T6	10	2.0%	32	2.0%	7	2.3%	16	3.9%
T7	7	1.4%	21	1.3%	1	0.3%	6	1.5%
T9	0	0.0%	7	0.4%	4	1.3%	1	0.2%
T10	13	2.6%	50	3.1%	8	2.6%	17	4.2%
T13	0	0.0%	8	0.5%	2	0.7%	1	0.2%
T17	0	0.0%	2	0.1%	0	0.0%	0	0.0%
T18	0	0.0%	199	12.3%	37	12.1%	17	4.2%
T19	0	0.0%	3	0.2%	1	0.3%	0	0.0%
T20	147	29.7%	357	22.1%	78	25.5%	64	15.6%
R6 (Twine 23)	1	0.2%	0	0.0%	0	0.0%	0	0.0%
Twine Totals	406	82.0%	1409	87.1%	251	82.0%	351	85.8%
R1	0	0.0%	1	0.1%	0	0.0%	0	0.0%
R2	7	1.4%	3	0.2%	2	0.7%	0	0.0%
R4	52	10.5%	132	8.2%	46	15.0%	38	9.3%
R5	4	0.8%	7	0.4%	0	0.0%	3	0.7%
R8	0	0.0%	4	0.2%	0	0.0%	0	0.0%
R9	2	0.4%	0	0.0%	0	0.0%	0	0.0%
R10	2	0.4%	0	0.0%	0	0.0%	0	0.0%
R11	0	0.0%	0	0.0%	0	0.0%	1	0.2%
R12	0	0.0%	2	0.1%	0	0.0%	0	0.0%
R13	0	0.0%	1	0.1%	0	0.0%	0	0.0%
R14	0	0.0%	1	0.1%	0	0.0%	0	0.0%
Carved Roulette Totals	67	13.5%	151	9.3%	48	15.7%	42	10.3%
COI	9	1.8%	22	1.4%	1	0.3%	9	2.2%
COR	3	0.6%	11	0.7%	1	0.3%	1	0.2%
PB	1	0.2%	0	0.0%	0	0.0%	0	0.0%
FS	1	0.2%	4	0.2%	0	0.0%	3	0.7%
IMT	1	0.2%	0	0.0%	0	0.0%	0	0.0%
VI	1	0.2%	4	0.2%	1	0.3%	0	0.0%
PRT	1	0.2%	0	0.0%	0	0.0%	0	0.0%
DT	0	0.0%	1	0.1%	0	0.0%	0	0.0%
Channel	5	1.0%	15	0.9%	4	1.3%	3	0.7%
Other Decoration Totals	17	3.4%	42	2.6%	3	1.0%	13	3.2%
Grand Total	495	17.5%	1617	57.2%	306	10.8%	409	14.5%
Channels	86	17.4%	255	15.8%	64	20.9%	61	14.9%

Table 9.9: Red III Distribution of Decoration by Unit (Body Sherds)

Vessel Type	Unit A Mound 1		Unit A Decoration		Unit B Mound 4		Unit B Decoration		Unit C Mound 3		Unit C Decoration		Unit E Mound 11		Unit E Decoration		Totals	
Type 30: Jars with Triangular Rims	16	61.5%	8R4; 3R4+T2; 1R5; 1T3	92.3% have a roulette	57	62.0%	15R4; 7R4+T18; 6R4+T2; 1R5+T1; 3T20; 1T10; 1T9; 2T2; 3T1; 1T7; 1R12	73% have roulette; 4% have twine	12	60.0%	5R4; 1R5; 3T20	66.6% have roulette	26	70.3%	5R4; 2R4+T20; 4R4+T1; 1R4+T2; 1R4+T18; 3T2; 2T20; 1T9; 1T7	65% have roulette	111	63.4%
Type 18: Bowls with Slightly Everted Rims	8	30.8%	2R4; 1T1; 1T3	25% have roulette; 25% have twine	24	26.1%	1T3; 1R4	4% have roulette; 4% have twine	5	25.0%			8	21.6%	2T2; 2R4	25% have roulette; 25% have twine	45	25.7%
Type 4: Simple Open Bowls	0	0.0%			6	6.5%	1R4		2	10.0%			1	2.7%			9	5.1%
Type 5: Simple Closed Bowls	0	0.0%			1	1.1%			1	5.0%			0	0.0%			2	1.1%
Type 32: Basin with Thickened Rim	0	0.0%			1	1.1%	1T2		0	0.0%			0	0.0%			1	0.6%
Type 33: Simple Closed Medium Bowl	0	0.0%			0	0.0%			0	0.0%			1	2.7%			1	0.6%
Type 23: Basins with Triangular Rims	2	7.7%	1T2; 1T3		2	2.2%	1T2 + R4; 1T20		0	0.0%			0	0.0%			4	2.3%
Type 31: Large Bowls with Slightly Everted Rims	0	0.0%			1	1.1%	1T18		0	0.0%			1	2.7%	1R4		2	1.1%
Base Type 3: Flat Round Bases	3	50.0%	2R4		9	42.9%	6R4; 1T3; 1T1		4	80.0%	1T1; 1T20		1	20.0%	1R4		17	45.9%
Base Type 1: Ring Bases	0				8	38.1%	1R4+T1; 1T20		0	0.0%			2	40.0%			10	27.0%
Base Type 2: Pedestal bases	0				1	4.8%			0	0.0%			0	0.0%			1	2.7%
Base Type 5: Legged Bases	0				0	0.0%			0	0.0%			1	20.0%			1	2.7%
Base Type 6: Large Flattened bases	3	50.0%	1T1; 1T2; 1T20		3	14.3%	1T2; 1T3; 1T18		1	20.0%	1T2		1	20.0%			8	21.6%
Grand Total	32				113				25				42				212	

Table 9.10: Red III Distribution of Rim Types

In the general sherd assemblage, like Unit A, T2 + T18 was slightly more frequent than T1, and other decorations were rare. R4 only accounted for 8%, similar to the frequency recorded in Mound 1.

Mound 3 (Unit C)

A small sample with a similar distribution of vessel types. The assemblage contained mostly jars with triangular rims (Type 30), while a quarter of the sample was small bowls with slightly everted rims (Type 18), and the rest were simple open (Type 4) and closed (Type 5) bowls. In decoration, while the amount of T2 + T18 grew from Red II, the total still did not surpass T1. As has been already discussed, this was likely the result of intrusive ceramics from lower levels. R4 accounted for around 15% of the recorded decorations.

Mound 11 (Unit E)

The Red III assemblage was larger and contained several in situ pots and large sherd fragments. The sample was mostly jars with triangular rims (Type 30), followed by small bowls with slightly everted rims (Type 18). Other vessels included simple open bowls (Type 4), a restricted medium bowl (Type 33), and a large bowl with a slightly everted rim (Type 31). The jars with triangular rims were mostly decorated with R4. In body sherd decoration, T1 remained dominant over T2 and T18. R4 constituted 9% of the total decorations, similar to the proportion at Mounds 1 and 4.

Summary

Many of the patterns that emerged during Red II continued in Red III. These include a generally simplified assemblage, dominated by a single rim form for most jars and another for small serving bowls. Other vessels were found in low frequencies. Pottery was similarly decorated throughout the site.

Discussion

Pottery production at Kirikongo changed dramatically over the course of the site's occupation. Between Yellow I and Red I, pottery was likely made at the household level. Yellow I pottery is fairly homogeneous, as it was produced by the village's founding compound (Mound 4) and a recently derived household (Mound 1). During Yellow II, with the establishment of multiple compounds throughout the site, three different pottery production traditions were identified within a general pottery production system common to all producers. This continued into Red I, when each compound had its own serving

bowls, small jars, and popular decoration techniques, despite mainly producing similarly shaped large vessels and a functionally equivalent assemblage. During Red II, the assemblage became less diverse. All compounds shared a standardized (decoration, form, size) set of vessels in comparable frequencies, and several specialized ceramic elements were added. Direct evidence for pottery production during Red II and Red III was recovered at Mound 11, where two kilns were identified in Red II/Red III deposits. It is likely that specialized pottery production was practiced at Kirikongo beginning in Red II.

The shift in pottery production from a generalized household activity to specialized production likely had significant consequences for the nature of households at Kirikongo. An exploration of patterns in other classes of material culture will enable inferences regarding social organization and community structure.

Chapter 10

From Individual to Specialist Production: Iron at Kirikongo

In this chapter I describe the organization of iron production at Kirikongo. An examination of material evidence for smelting and forging establishes that iron tools were originally produced by multiple households from Yellow I to Yellow II, solely by the inhabitants of Mound 4 during Red I, and finally by specialist iron-workers who lived on Mound 11 during Red II and Red III.

Spatial Patterns in Smelting

The most obvious evidence for iron production is the location of smelting installations throughout the village and its territory. Smelting furnaces are easily differentiated from smithing locales because of their heavy deposits of tap slag mixed with furnace wall fragments. These create slightly raised mounds 10-70 cm high and 5 to 12 meters across. Ethnographic and archaeological observations in the region suggest that furnace walls were constructed with mud and slag or laterite blocks creating structures sometimes several meters high. In this particular area of the Mouhoun Bend, studies suggest that the furnaces were subterranean in the late 19th century (Coulibaly 2006). While furnace wall pieces were recovered from a test excavation on Iron Furnace 1 west of Mound C, the actual furnace was not identified and its nature was not discovered.

Ceramic samples were collected from all six furnace locations, and several spatial patterns have been identified (see Table 6.1 for ceramic data; spatial patterns are presented in Figures 6.1-6.5). Furnace 1 was continuously used from Yellow I to Red I and based upon spatial proximity, chronology, and ceramic similarities was likely associated with Mound 4. Furnace 2 was temporally and spatially associated with the founding of Mound 1 (late Yellow I) and was actively used until the end of Yellow II. Furnaces 1 and 2 were active simultaneously in the two households during Yellow II.

The establishment of Mound 11 did not coincide with the establishment of a nearby iron furnace. It is possible that Mound 11 was supplied with blooms from either Mound 4 or 1. Towards the very end of Yellow II, Furnace 3 was established 400 meters south of Mound 4 and was only used until early Red I. The closest mound to Furnace

3 was Mound 4, and surface collection data indicate some similarities between their assemblages, but this association must remain tentative owing to small and eroded sherds.

Sometime between late Yellow II and early Red I, Furnace 2 was abandoned. In early Red I, Furnace 3 was likewise abandoned. Only a small number of Red I sherds were recovered from Furnace 1, and it may have been abandoned in early to mid Red I.

Of the three early furnaces, Furnace 1 and 2 are the most similar, with mounds ranging between 50 and 70 cm above the surrounding landscape and 15 to 20 meters in diameter. They are both set next to the seasonal drainage west of their respective mounds and were founded during Yellow I. Furnace 3 is different in many respects. Spatially it is set away from the drainage on the top of a flat laterite ridge, and it was only slightly mounded (10 cm) despite being of similar diameter. It is not clear whether the difference in mound height is related to technology, or simply the duration of use.

Ceramic evidence suggests that in Red II, iron smelting shifted away from the village across the seasonal drainage. During survey, a set of three iron furnaces (4, 5 and 6) were recorded 250 m west of Iron Furnace 2 on the other side of Quarry 3. The pottery on the surface, while not densely distributed, dated to Red II. Interestingly, these furnaces most closely resembled Furnace 3, in that they were not raised above the surface more than 10- 20cm. A tentative suggestion is that these may be subterranean furnaces while those founded in the Yellow Phase may have had a different technological nature. This will be a topic of future research. In summary, iron was smelted by two furnaces between Yellow I and the end of Yellow II, and during late Yellow II a new furnace was founded south of the site (Furnace 3) and used concurrently with Furnace 1 for a short while. Following their abandonment during Red II, smelting shifted to a cluster of furnaces west of the village.

Smithing

Yellow I and Yellow II: Independent Compound Production

Nineteen kilograms of slag were recovered from excavations at all units (Figure 10.1). The slag from excavations was very different in composition from that found at furnaces, as it was lighter, pisolithic, and occurred in fairly small nodules. In general, all occupied mounds during Yellow I and II contained high frequencies of slag, averaging 441 g/m³ during Yellow I and jumping to almost 2 kg/m³ during Yellow II. Both of these are the highest densities found for any periods during Kirikongo's sequence. As for individual mounds, Mounds 1 and 4 during Yellow I, and 1, 4 and 11 during Yellow II, appear to have been the locations of smithing. A blow-pipe (tuyere) was recovered at

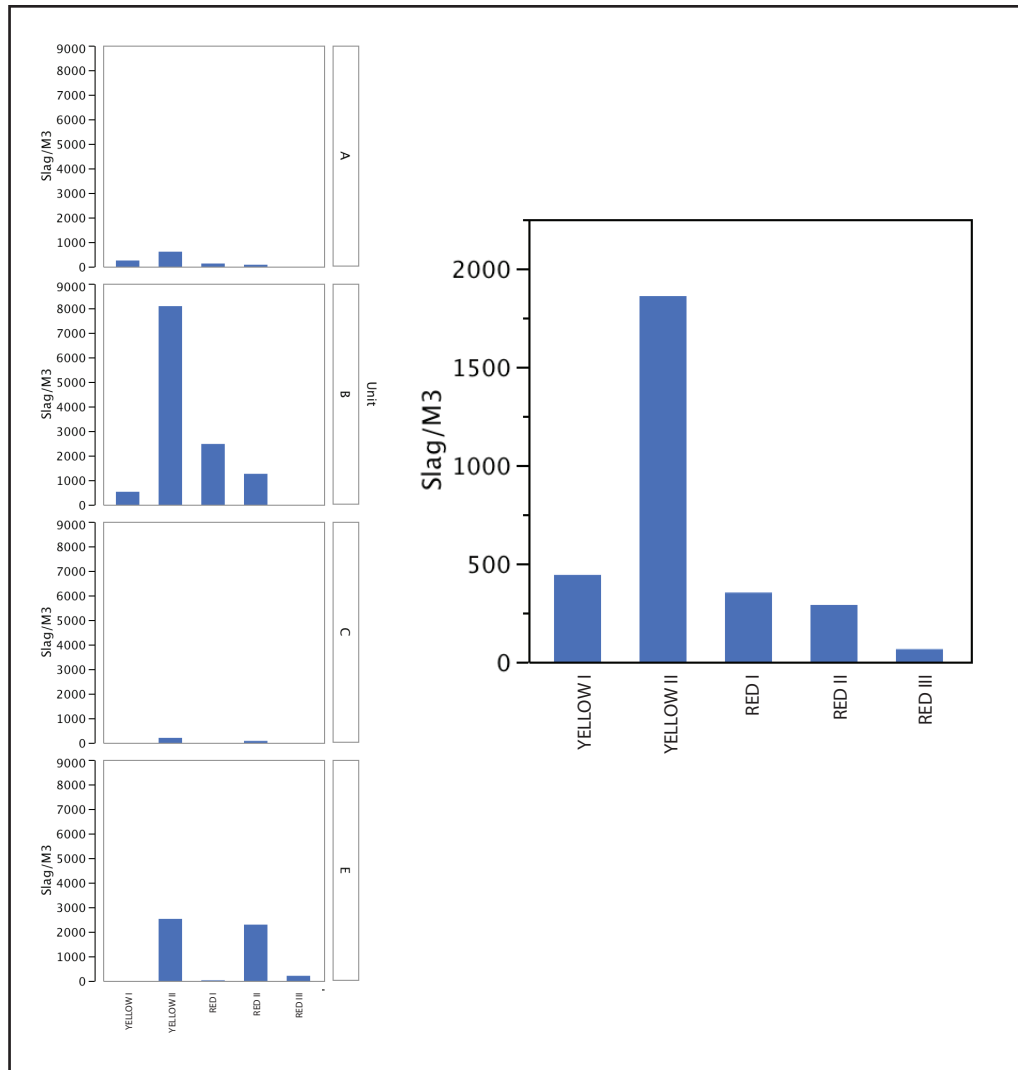


Figure 10.1: Spatial and Temporal Distribution of Slag at Kirikongo

Mound 11, in addition to a layer of slag. At Mound 4, a dense concentration of slag was discovered in what may have been a smithing workshop lasting from Yellow II to Red I. The Yellow II deposits at Mound 1 primarily contained domestic refuse. However, even in these deposits over 2500 g of slag were recovered.

The mortuary deposits at Mound 3 contained low quantities of slag during Yellow II, despite being composed of domestic fill from Mound 4. In summary, during Yellow I and II, Mounds 1 and 4 smelted and smithed iron, and these may have supplied iron blooms to Mound 11, where there is currently only evidence for smithing.

Red I into Early Red II: Centralized Iron Production at Mound 4

During Red I, slag densities fell to around 350 g/m³ for the village as a whole, with densities at Mounds 1 and 11 particularly low, at 127 and 24 g/m³, respectively.

However, the Mound 4 unit still yielded high densities of slag, at 2474 g/m³. This matches other evidence suggesting that two iron furnaces (1 and 3) were in operation in the vicinity of Mound 4 as late as Red I. Iron production may have been centered at Mound 4 during Red I, a shift from the previous pattern of independent household production during the Yellow phase. The slag deposits carried over into the very beginning of Red II at Mound 4, where 150 g were recovered from very small deposits (.12 m³).

Red II to Red III: Iron Specialists at Mound 11

During Red II, site-wide slag densities fell again to an average of 288 g/m³, and the highest density deposits shifted to Mound 11, where over one kilogram (2291 g/m³) was recovered. Slag densities fell to less than 100 g/m³ in Mounds 1 and 3 (Mound 3 was now a habitation area).

This shift coincided with the displacement of smelting furnaces to the northwest part of the village. It would appear that by Red II, iron smelting was taking place in a segregated location and smithed by the inhabitants of an isolated mound (11). By Red III, slag averaged only 63 g/m³ throughout the village, falling to less than 40 g/m³ in Mounds 1, 3 and 4. Mound 11 had the highest densities, at 207 g/m³, in a workshop area primarily used for pottery firing.

Conclusion

Slag patterns generally match with those seen in iron smelting installations, with smithing evidence found throughout the site early on, concentrated in Mound 4 during Red I, and shifting to Mound 11 during Red II. This coincided with the shift in smelting to the furnaces located to the west of the village. After the move, Mound 11 contained the highest frequencies of slag found throughout the village from this point on, despite having served mainly as a pottery production locale during these periods. The juxtaposition of pottery production with smithing at Mound 11 mirrors that seen today in the region among many ethnic groups, where the potters are the wives of iron-workers.

Iron Objects

A wide diversity of iron objects was recovered from excavations at Kirikongo. The majority of fragments were in poor condition and revealed little about their function; however, several were identifiable. A total of 75 pieces was recovered from excavations, weighing 365 grams (Table 10.1). While the total seems small for an agricultural village, recycling metals is a frequent practice today in West Africa, and it can be inferred that, with the value of metals, they were likely recycled in the past.

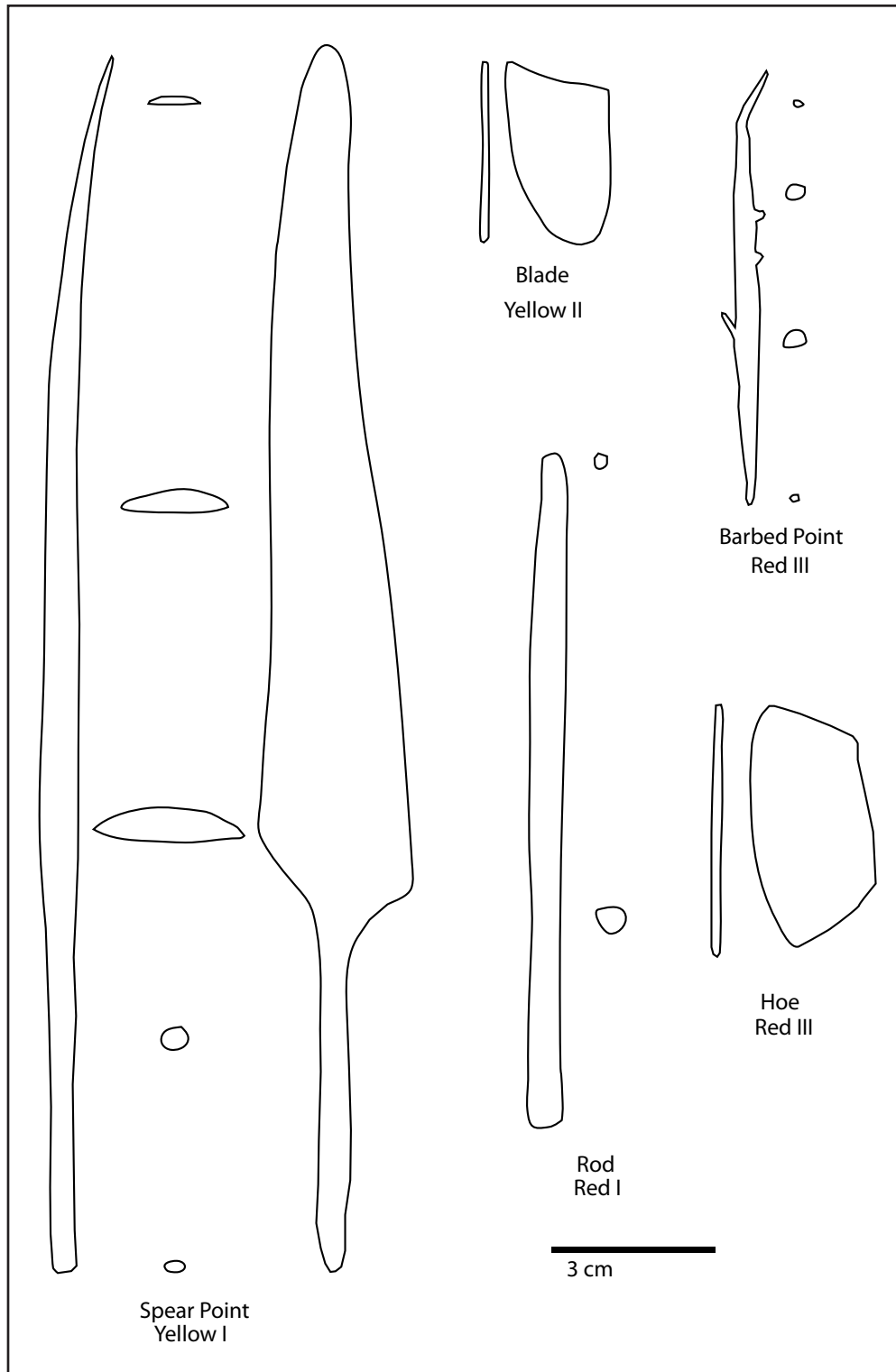


Figure 10.2: Iron Objects from Kirikongo

Unit	Period	Weight (g)	Length (cm)	Width (cm)	Diameter (cm)	Thickness (cm)	Description
A	Yellow I	4	6.8	0.35			Rod
A	Yellow I	4	4.4	1.74		0.29	Flat fragment of point
A	Yellow I	4	3.42	1.1		0.17	Flat knife fragment
A	Yellow I	4	2.97	1.36		0.4	Head of spear-point
A	Yellow II	2	2.71	0.41			Rod
A	Yellow II	2	3	0.42			Rod
A	Yellow II	2	3.68	0.43			Rod- possible barbs
A	Yellow II	5	6.8	0.41			Bent Rod
A	Yellow II	3	4.82	0.36			Rod
A	Yellow II	20	4.65	4.03	0.83	1.13	Crucible- moulded, 1/4 circle
A	Yellow II	2	2.32	0.62			Rod
A	Yellow II	4	3.45	1.42		0.3	Flat fragment (knife, hoe)
A	Red I	9	6.15	0.49		0.31	1/2 Iron Bracelet
A	Red I	12	3.32	0.99	1.42	0.53	Flat fragment (likely hoe)
A	Red I	1	2.56	0.46			Rod
A	Red I	2	4.56	0.33			Rod
A	Red I	1	2.88	0.41			Rod with barb
A	Red II	3	4.64	0.3			Rod
A	Red II	5	5.49	0.5		0.42	Rod
A	Red II	5	5.52	0.51		0.4	Rod
A	Red II	8	4.09	2.55		0.14	Semi-circle Flat fragment (probable hoe)
A	Red II	1	2.36	0.21			Rod
A	Red II	1	1.94	0.18			Rod
A	Red II	6	7.32	0.46			Rod
A	Red II	2	3.46	0.29			Rod
A	Red III	4	8.11	0.6	0.2	0.28	Rod with barbs
A	Red III	1	1.97	0.35			Rod
A	Red III	2	3.8	0.45			Bent Rod
A	Red III	1	1.86	0.3			Rod
B	Yellow I	3	26.8		4.7		Slightly hooked fragment of metal
B	Yellow I	54	212	27.3		5.2	Large iron spear point
B	Yellow II	1	25.7	5		1.5	Flat fragment of metal, rectangular, slightly curved
B	Yellow II	2	22.7	3.6		1.4	Torqued fragment of flat metal
B	Yellow II	2	3			4	Rod
B	Red III	3	39.7		4.5		Rod
B	Red III	1	32		4.4		Rod
B	Red III	9	31.7		2.9		Metal wire- expanding diameter (Likely a point).
B	Red III	2	3		3		Rod
B	Red III	4	44.7		4.4		Rod, flattened at one end.
B	Red III	8	36		4.8		Rod with amorphous lump at one end
B	Red III	3	44		4.9		Rod, possibly expanding towards one end.
B	Red III	4	48.7		5.2		Rod, possibly tapered
B	Red III	1	19.9		3.8		Semi-circular piece of metal (Ring)
B	Red III	9	17	17	1.1		Fragile loop of very thin wire with protuberance: earring
B	Red III	3	4		6		Rod
B	Red III	1	2.5		2		Bent Rod
B	Red III	1	2.3		3		Rod
B	Red III	1	2		4		Rod
B	Red III	3	73.6		4		Long pointed piece of metal (Likely a point)
B	Red III	2	52.9		3		Rod
B	Red III	4	39.6	6.6		7.2	Thick fragment with a slight kink in it
B	Red III	2	27		6		Bent piece of wire
B	Red III	50	49	36.5		29.6	Lump of iron- may be shaped- very corroded
C	Yellow II	1	24.3		2.9		Rod
C	Yellow II	1	18.4		5.6		Tear-drop shaped fragment (tapered wire?)
C	Red I	12	120		4		Long rod, tapers slightly
C	Red I	1	36.4		3.1		Rod
C	Red II	2	34.9		3.6		Rod
C	Red III	1	25.8		3.8		Thin rod
C	Red III	4	29.7	24.4		1.4	Triangular piece of metal- base of spear
E	Yellow II	1	22.2		2.9		Curved fragment - a ring
E	Red I	1	53.5		4.2		Slightly tapered rod
E	Red I	1	23.5		3.9		Rod
E	Red II	4	66		4		Rod
E	Red III	10	97	13.9		1.4	Shaft and base of tool. Tool is slightly scooped.
E	Red III	3	54.5		4.4		Tapered metal wire with slight bulb
E	Red III	2	25.5		4.1		Rod
E	Red III	2	37		3		Rod
E	Red III	1	39.9	3.4		1.4	Flat piece with thickened end
E	Red III	10	42.7			2.2	Broken flat piece- a hoe
E	Red III	7	34	2.7		1.9	Flat piece of metal- a hoe
E	Red III	1	19.6	5.4		3.3	Small pointed lump
E	Red III	4	19.9	3.3		2.7	Slight curved fragment
E	Red III	1	1.8			2.4	Earring-curved
E	Red III	2	3.8			4	Rod
F		1	29.2	5.4		2.3	Flat fragment- slight "y" at end
F		43	72.5	50		3	Flat fragment- roughly trapezoid- broken hoe
F		2	59		3.2		Piece of metal wire

Table 10.1: Iron Objects from Kirikongo

Quantitative analyses of the iron will not be presented, owing to small sample sizes. It is likely that iron was mainly lost through chance. Even today, it is rare to see a scrap of iron in an agricultural village, as these are recycled. In addition, analyses by weight are misleading, as several large fragments make up the majority of the iron recovered.

The majority of the collection (47 fragments= 63%) was composed of rods, likely the remainders of the hafting element for agricultural tools and spears. In general, tools had a slight tang, narrowing to a rod that was inserted into a wooden handle. If such an implement breaks, these pieces may remain in the wood. Kirikongo's sample is likely primarily composed of broken tools.

Yellow I

Excavations recovered several spear points and knives, including one intact spear point that was found in a trash pit from the middle of Yellow I (Unit B). This spear point was 21 cm long and had a tanged base that led to a rod for hafting deeply. Several other rod fragments were recovered.

Yellow II

In Yellow II the collection was primarily composed of rods (10), two of which were flattened and may have been for hafting a sickle. A fragment of a hoe, a piece of unworked iron, and a small ring (possible jewelry) were recovered.

Red I

During Red I the collection was mainly composed of rods (6). In addition, there was one fragment of a hoe blade, one barbed point, and a bracelet from late Red I.

Red II and Red III

Red II produced nine rod fragments and one hoe blade fragment. The collection from Red III was larger and more diverse, with twenty rod fragments, three hoe blade fragments, three points (1 barbed), the base of a spear point (including the tang), an unknown unworked lump, and jewelry (including two earrings and one ring). The last identifiable fragment was a spoon with a metal handle.

Summary

While temporal trends are difficult to assess given the small sample size, there may have been more blade fragments during the early sequence (Yellow I and II). The large part of the assemblage is likely biased towards broken agricultural tools, as spears are less commonly used and jewelry is rarely lost.

Discussion

Iron metallurgy at Kirikongo was a dynamic enterprise that changed from individual, to centralized, to specialized production. Slag densities and furnace location suggest that several individual households smelted and smithed their own metals during Yellow I and II. During Red I, all metallurgical activity shifted to Mound 4. It shifted again to Mound 11 during Red II.

Early smelting (Furnace 1 and 2) was practiced along the edge of the seasonal drainage. A shift occurred during early Red I, when Furnace 3 was founded several hundred meters south of the village. With the rise of specialist production, the next furnaces (4, 5 and 6) were set a similar distance away, across the seasonal drainage. It is clear that when metallurgical activities were restricted to a single social group, whether Mound 4 or later Mound 11, that smelting was performed at greater distances from the village. This is likely owing to the re-defining of iron-working as a restricted-knowledge activity.

The production of iron was a dynamic and constantly renegotiated process. Later chapters will explore the relationships between these patterns and community organization in greater detail.

Chapter 11

Stone Artifacts, Small Finds, and Non-Metal Jewelry

Ground stone

A variety of ground stone tools, minerals, and unworked stones was recovered from excavations, totalling 24 kg. This chapter makes the following points: (1) ground stone tools were common in all units where food processing was taking place, and were kept in huts as a woman's personal property; (2) between Red I and Red II there was a shift from private grinding of grains in individual huts to more public grinding in unpaved courtyard areas; (3) one can distinguish tool kits for pottery production, for pottery decoration, and for firing.

Function

In Chapter 5 I argued that Kirikongo's inhabitants likely made and consumed *tô*, a dish resembling *flan*, usually prepared from the flour of millets and sorghums, but sometimes from maize and fonio. Grinding stones are used to make the flour for this daily staple. The organization of ground stone production in western Burkina Faso today differs greatly from area to area. For example, in Bwa society, ground stone production is a transformative enterprise akin to iron smelting and is in the charge of the specialist smiths (Capron 1973). Conversely in Gourounsi society, ground stone can be made by any individual, providing extra income during the dry season (Tauxier 1912).

The use of grinding stones is also associated with women as an essential part of the food preparation tool kit. Like pottery, ground stone tools are a valuable component of a woman's tool assemblage and today are considered as part of a woman's wealth (Manessy 1960). Grinding location also differs throughout the region. In some areas, grinding is a more private activity in a woman's own hut. In others, grinding has a more social and communal role, with installations set in open courtyards. The location and context of grinding installations and stores of grinding stones are important to understanding household organization.

General Characteristics of Ground Stone

The stone sources for all grinding tools are likely local, since sandstone is available on a rise one kilometer north of the site, and often distributed in large chunks resting on the surface. Granite, on the other hand, is found 10 km east of Kirikongo in the Birrimian strata.

Of a total of 69 fragments of ground stone, 55 were sandstone, 10 granite, and 4 were made of unknown materials. Most (n=43) of these were identifiable to tool type, including manos, metates, spherical stones, a micro grinder, and a sharpening stone (Table 11.1).

Manos and other Grinding Stones

A total of 20 manos was recorded, and these were divided into three categories based upon cross section (Figure 11.1). All have rounded corners and edges, and almost all are elongated parallel to the shape of the cross-section. Shapes include rectangular, triangular, and quadrangular stones. A unique grinding stone with a rectangular cross-section and two concave depressions for gripping was also recovered.

Metates

Broken metate fragments were common in excavations (n=20). Fragments were derived from rectangular blocks of sandstone with a concavity on one side that marks the grinding surface. The recovered stones were all ground very deeply, and were clearly at the end of their use-life.

Unit A

Five manos and ten metate fragments were recovered from Unit A.

Yellow II

Three metate fragments were recovered from sequential trash lenses.

Red I

In Structure 2 (early Red I) there was a large metate fragment on the floor. Later in Red I, Structure 3 contained a grinding installation along with a cache of two manos. The activity area consisted of a mud bench that extended 70 cm from the southern wall. Directly to its north was a slight hollow that had some broken pottery within it. The depression served to securely hold a container (a pot or calabash) to catch flour as it was ground. Similar installations are found throughout Burkina Faso today.

A discarded mano was also found out of context in the courtyard debris dating to late Red I.

Unit	Phase	Material	Weight (g)	Length (cm)	Width (cm)	Height (cm)	Description
A	Yellow II	Sandstone	350	9	9	1.5	Metate Fragment
A	Yellow II	Granite	350	7	4.5	3.5	Metate Fragment
A	Yellow II	Sandstone	500	11	10	2	Metate Fragment
A	Red I	Sandstone	800	11	12	3 to 6	Metate
A	Red II	Sandstone	200	11.5	4.5	2	Metate Fragment
A	Red III	Sandstone	1500	18	20	1.5-2	Metate Fragment
A	Red III	Sandstone	350	8.5	4.5	3	Metate Fragment?
A	Red I	Granite	400	9	7	3	Mano Fragment
A	Red I	Sandstone	500	11	3.5	5	Mano Fragment
A	Red I	Unknown	600	10	6	6	Mano Fragment
A	Red II	Sandstone	300	7.5	3.5	3	Mano Fragment
A	Red III	Sanstone	300	9	4.5	1.5-3	Mano
A	Yellow I	Unknown	150	4	4	4	Sphere
A	Red I	Unknown	250	6.5	6	3.5	Sphere Fragment
A	Red II	Unknown	300	5	5.5	5	Sphere
A	Red I	Sandstone	40	3.5	3	2.5	Unworked
A	Red I	Sandstone	30	5	3	1	Unworked
A	Red II	Sandstone	25	4.5	3	1	Unworked
A	Red II	Sandstone	50	5	3	1.5	Unworked
A	Red II	Sandstone	50	5	3	1.5	Unworked
A	Red III	Sandstone	50	5	2.5	2	Unworked
A	Red III	Sandstone	40	4	2.5	2	Unworked
A	Red III	Sandstone	20	2.5	2.5	0.5	Unworked
B	Yellow II	Red Sandstone	1424	14	14	5	Metate Fragment
B	Red III	Pink Sandstone	153	5	5.5	2.2	Metate Fragment
B	Red III	Red Sandstone	571	9.3	7.4	4	Metate Fragment? Anvil-like with depression in the center of either side
B	Red III	White Sandstone	93	5	4.5	3	Metate Fragment
B	Red III	Gray Granite	1376	19	13	3	Metate? Not heavily ground
B	Red III	White Sandstone	220	9.2	5.5	2.4	Metate Fragment
B	Red III	White Sandstone	51	6	4.5	2.3	Metate Fragment
B	Yellow II	Red Sandstone	437	8	7	4.4	Mano
B	Yellow II	Red Sandstone	317	9	6.8	2.8	Mano
B	Red II	Pink Granite	185	4.5	6.5	4	Mano Fragment?
B	Red III	Pink Granite	117	5	4	3.5	Mano
B	Red III	Red Sandstone	900	13	7	5.5	Mano? Not heavily ground
B	Red I	White Sandstone	192	7.5	6.7	1.7	Sharpener, stone fragment with channel
B	Yellow I	Red Sandstone	274	7	5	4.8	Unworked
B	Yellow II	Ocher	59				Unworked
B	Yellow II	Gray Granite	1				Unworked
B	Red I	Red Sandstone	11				Unworked
B	Red I	Gray Granite with Quartz Inclusions	7				Unworked
B	Red I	Brown Flint	441				Unworked
B	Red III	Pink Sandstone	9				Unworked
B	Red III	Gray Granite	173	5	6	4	Unworked or roughly shaped
B	Red III	Quartz	3				Unworked
B	Red III	Red Sandstone	705	9.3	8	4.4	Unworked
B	Red III	White Sandstone	27				Unworked
B	Red III	Red Sandstone	25				Unworked
C	Red II	Pink Sandstone	514	13	10	1.8	Metate Fragment
C	Red II	White Sandstone	123	6	7	1.5	Metate Fragment?
C	Red II	Gray Granite	264	6	8	3	Metate Fragment
C	Red II	Red Sandstone	234	7.5	6	3	Metate Fragment?
C	Red I	Red Sandstone	147	4.5	5	3.5	Mano, triangular cross-section
C	Red I	Unknown	65	6	3	3	Mano? Triangular and made from black porous material with strange red content
C	Red I	Gray Granite	40	3	3	2.5	Mano Fragment?
C	Red II	Gray Granite	290	7.5	6.5	4	Mano, oval
C	Red I	Red Sandstone	58				Unworked
C	Red II	Red Sandstone	34				Unworked
C	Red II	Quartz	1				Unworked
C	Red II	White Sandstone	7				Unworked
C	Red III	Quartz	<1				Unworked
E	Red II	Red Sandstone	750	9	12	3.5	Metate Fragment? Anvil-like and not heavily ground
E	Red II	Quartz	3	2	1.5	0.6	Stone Tool with Striking Platform?
E	Red III	Ocher	128	6	5	2.5	Ocher lump with one grounddown side
E	Red III	Silex	>5000	24.5	31	5	Unworked
E	Red I	White Sandstone	19				Unworked
E	Red II	Red Sandstone	5				Unworked
E	Red III	Red Sandstone	21				Unworked
E	Red III	Quartz	1				Unworked
E	Red III	Red Sandstone	14				Unworked
E	Red III	Red Sandstone	9				Unworked
E	Red III	White Sandstone	39				Unworked
F		Red Sandstone	129	5	5	2.3	Metate Fragment?
F		Red Sandstone	293	10.5	8	3	Metate Fragment?
F		Red Sandstone	232	7.5	6.5	2	Metate Fragment?
F		Granite? Slag?	120	4	4	3.5	Sphere, small and irregular
F		Red Sandstone	121				Unworked
F		Red Sandstone	9				Unworked
F		Red Sandstone	25				Unworked
F		Granite	350				Unworked
F		Granite	200				Unworked
F		Red Sandstone	708	10	7	4.3	Unworked
F		Red Sandstone	34				Unworked
F		Red Sandstone	49				Unworked
F		Red Sandstone	64				Unworked

Table 11.1: Groundstone from Kirikongo

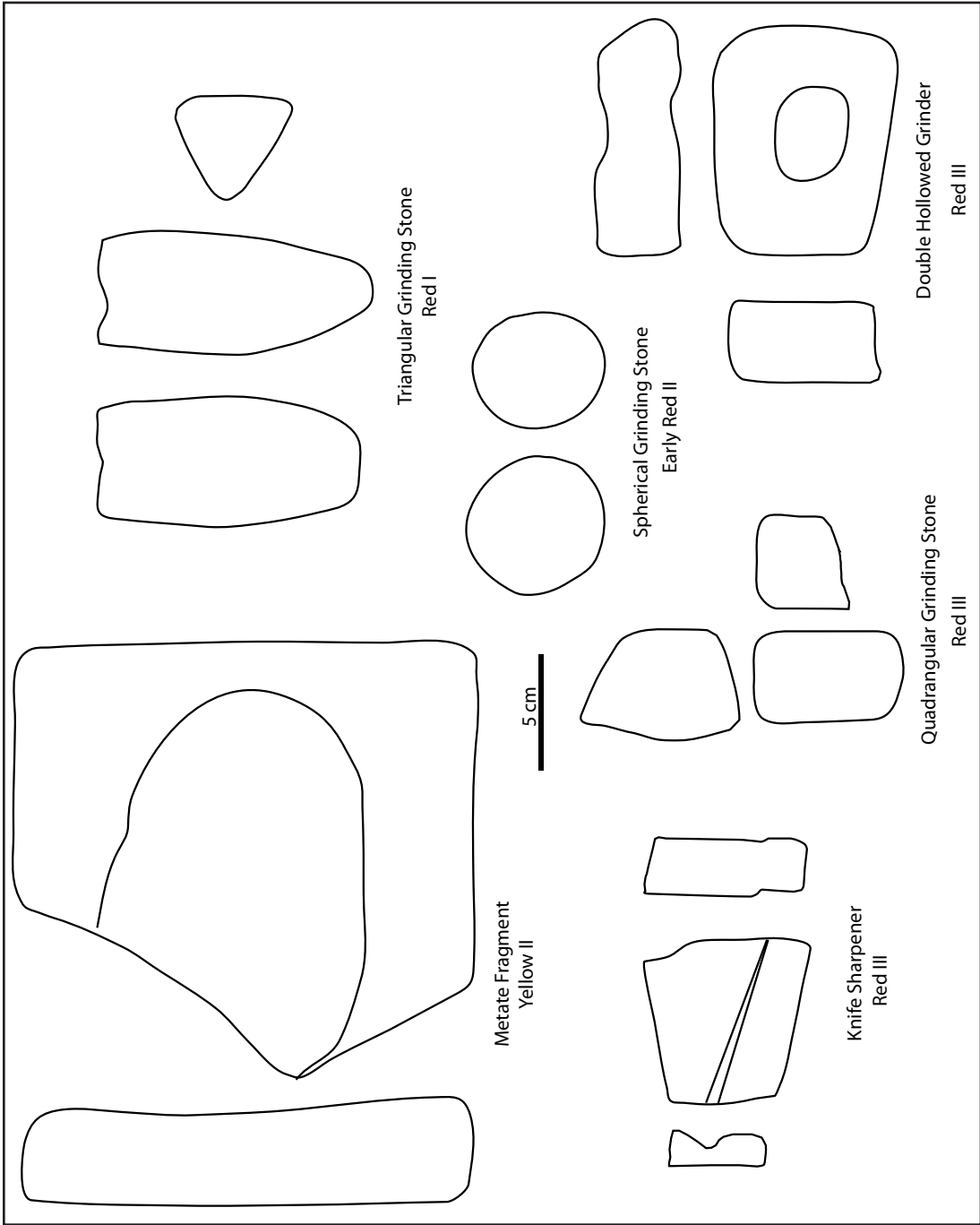


Figure 11.1: Groundstone from Kirikongo

Red II

A grinding tool kit (mano and metate fragment) was found in Structure 6, although without a grinding installation.

Red III

A grinding installation was identified, except in this case in an unpaved courtyard area. A mano and metate fragment were found in association with the base of a jar to catch the flour. Similar to modern cases, the sherd used to catch the flour had smoothed edges.

Unit B

Four manos, seven metate fragments, a sharpening stone (for metals), and a small unique grinding implement were recovered from Unit B.

Yellow II

Resting on sequential pounded clay floors were a mano, and a metate and mano.

Red III

A cluster of ground stone tools (one mano, two metate fragments) was identified in the space between Structures 3 and 4. In addition, 25 cm southeast of these in a small unpaved section of Structure 4 was a sandstone sharpening stone. The size and angle of the impression in the stone suggests that it was used for maintaining the edge of blades. These stone implements were part of a ritual sacrifice activity area, described later in Chapter 12.

In the same architectural level, in Structure 5, a mano was found on the roof collapse and was likely derived from the second floor terrace room.

In late Red III, during Episode 9, a grinding installation was discovered in an unpaved courtyard area to the northwest of a cluster of three huts. The feature was composed of a paved tabletop (oriented east/west) with two metate fragments and a depression to the east for placing a container to catch flour. In addition, Structures 8 and 9 each had a metate fragment on the interior.

Unit C

Four mano and four metate fragments were recovered from Unit C. However, only one comes from a contextualized occupation context.

Red I

Three manos were recovered in the burial fill.

Early Red II

Three metate fragments and one mano were recovered from the burial fill.

Red II

The only in-situ ground stone tool from the unit was a large metate fragment in the unpaved courtyard between Structures 3 and 4.

Unit E

Unit E contained a single metate fragment from Red II. However, it was out of context. All other pieces of ground stone were small unidentifiable fragments.

Discussion of Contexts of Grinding Stones

Most grinding stones were found in context, since owing to their weight they are less likely removed from settings, particularly when broken. Tools were found inside several huts: Unit A Structures 2, 3 and 6; Unit B Structures 8 and 9. It is likely that, similar to today, women kept their tools as personal property. In addition, the location of grinding changed, from grinding inside a hut (Unit A Structure III, Red I), to the grinding of grain in the courtyard (Unit A Red III, Unit B Red III, and Unit C mid Red II). This spatial reorganization of food processing may mark a shift from more private (independent) nuclear households within an extended family compound, to a more open and communal (less independent) extended family setting.

Pottery Production Toolkits

Two different types of tool kits for pottery production have been identified, one with flint and ochre (decoration and firing), and the other likely used in the actual formation of vessels (small round stones for shaping and polishing).

Flint and Hematite

Unit E, Red III

A pottery production toolkit was recovered on the floor of Structure 3, located near a pottery firing kiln (Structure 4). The feature included large potsherds, a six kg block of flint and a lump of hematite. Large sherds similar to those recovered are frequently used as a base in pottery formation. The flint was likely used as a fire-starter, and it is unsurprising to find this in a hut next to a kiln. Hematite is used to produce red slip, a main component of the decorative program in Kirikongo's pottery.

Unit B, Red I

A similar set of flint and hematite was found in the Yellow II/Red I workshop

area, which may have been the location of a kiln as well as an area of iron smithing. This toolkit was clearly associated with pyrotechnic activities.

Small Rounded Implements

A series of round stone/metal balls were found in Unit A's early phases (Yellow II, Red I and early Red II). These closely resemble the small tools used for pottery production when shaping vessels according to the concave bowl method. (see Bedaux, see also Roy). Round balls are also used to polish surfaces in many potting traditions in West Africa. They are made of an unknown material that is highly metallic (perhaps ground slag?). Future studies will focus on identifying the source of these tools.

These stones were only found in Unit A, between Yellow I and early Red II. As was mentioned in Chapter 5, it was suggested that by Red III, pottery was formed using a draw from a lump method. If these stones were indeed employed in forming pottery using the concave bowl method, then it may be that a technological transformation accompanied the emergence of specialized pottery production during Red II. A shift in forming technique could explain the shift in vessel shape starting in Red II. The early jars at Kirikongo were generally shaped as inverted long convex cones with spherical bases, while starting in Red II, jars and pots became more spherical or egg-shaped below the rim. These suggestions will remain tentative until we gather more evidence for vessel formation and its effects.

Small Finds and Non-Metal Jewelry

A diverse range of "small finds" (i.e., ornaments and figurines) was recovered from excavations at Kirikongo. These include cowrie shells, bone beads, stone beads, a possible figurine, and an unfired clay ball. The contexts of these finds suggest that ritual spaces contained a disproportionate amount of fine objects.

Cowrie Shells

Cowrie shells were used in a wide variety of contexts in West Africa, and are described both in early European and Arabic accounts. Most frequently they were known from the early colonial period in the late 19th century and early 20th centuries, when they were recorded as currency, jewelry, and ritual currency in different contexts and social uses throughout West Africa (Johnson 1970). Cowries are a marine gastropod from the Cypraeidae family, originally derived from the Indian Ocean, particularly the Maldives. Two species that were commonly used are: *C. moneta* and *C. annulus* (Lepetit 1989). They have been used at least since the late first/early second millennium AD. During excavations, 11 shells were recovered, all from Units B and C (Table 11.2).

Unit	Context	Phase	Length (mm)	Width (mm)	Height (mm)	Description
B	Episode 8	Red III	17.3	11	8.2	intact
B	Episode 7	Red III	19.5	14.8	7.3	missing back, slightly blackened
B	Episode 7	Red III	17.5	12.5	7.4	missing back
C	Burial Episode 3	Red II	15	10.9	5.9	missing back
C	Burial Episode 3	Red II	17.3	13.1	7.8	missing back
C	Burial Episode 3	Red II	12.6	9	4.8	missing back
C	Burial Episode 3	Red II	16.3	10.1	5.6	missing back
C	Burial Episode 3	Red II	17.4	12	6.4	missing back
C	Burial Episode 3	Red II	18	12.5	7.2	missing back
C	Burial Episode 3	Red II	16.1	11.5	7.3	missing back
C	Burial Episode 3	Red II	15.3	9.8	6.3	missing back

Table 11.2: Cowrie Shells from Kirikongo

Unit B

Three cowrie shells were recovered in Unit B, all from structures that had burned down. Two were found in the space between Structures 3 and 4, in a cluster that contained what I argue are sacrificed chicken remains. The third shell was found in Structure 6, a similar structure to Structure 4, located directly above the latter and also burned down.

Unit C

Eight cowrie shells were found in Unit C, all from the tomb with infant and small child burials, dated to early Red II. The cowries were found loose in the fill, and it is not certain if they were intentionally placed with specific burials, placed intentionally with the group of burials, or simply part of the fill. The last interpretation is unlikely, since we did not find cowries in any trash deposit, although they were recovered from structures that had burned down. Cowries were valuable items, particularly early in their appearance in West Africa (late 12th century AD/Early 13th), when they may still have been rare. It is therefore likely that they were deposited as part of a mortuary ritual.

In summary, cowries were found in ritual contexts dating to Red II and Red III. They do not occur before this, which generally matches known dates for their introduction into the region.

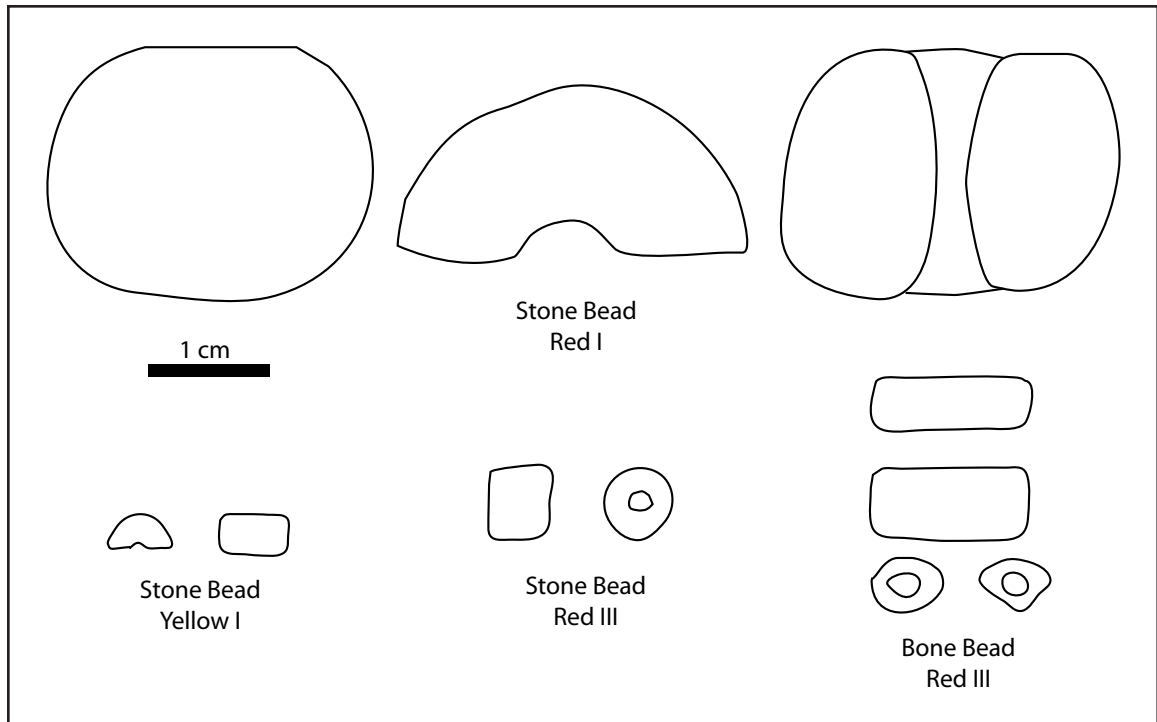


Figure 11.2: Stone and Bone Beads from Kirikongo

Stone Beads (Table 11.3, Figure 11.2)

Three stone beads were recovered, all dating prior to Red II. The earliest bead was a short cylinder of white stone, perhaps a milky quartz. It was found in the bottom cultural layer of Yellow I from Unit B, dating to the beginning of the first millenium AD. The other two beads were found in Unit C in strata composed of fill on top of burials. The first is an elongated (cylindrical) bead split lengthwise, and made of milky quartz. It was found in the burial pit of Burial C2, at most 5-8 cm above the foot. It is unknown if its inclusion was intentional. The last bead was found in the fill around the mortuary features and dated to the transition between Red I and Red II. It is made of sandstone, much larger than the others (28 mm diameter), and shaped as a slightly squashed sphere (donut shaped). This bead was clearly not found in association with a burial, and may have been simply in the fill.

Bone Beads (Table 11.3, Figure 11.2)

Three bone beads were recovered during excavations. Two were found together on the floor of Structure 9, dated to Red III. They were made from what appeared to be the metapodials of a dog-size canid (midshaft, 12.4 and 13.3 mm long, and 5.9 and 6 mm across, with cut marks across the shaft). They were smoothed and the cavity further hollowed. The last bead was smaller and made of a more porous bone fragment. It is

Unit	Context	Phase	Length (mm)	Width (mm)	Height (mm)	Diameter (mm)	Material	Description (mm)
B	Episode 1	Yellow I			3.2	5.8	white stone	1/2 small cylindrical bead, split vertically
B	Episode 9	Red III	12.4	5.9	5.1		bone	cylindrical with oval cross-section
B	Episode 9	Red III	13.3	6	4.6		bone	cylindrical with oval cross-section
B	Episode 10	Red III	5.9			5.6	bone	cylindrical, bone was sanded down to create the shape
C	Burial Episode 2	Red I	15.6	5.9	3.9		stone	possible cylindrical bead, split vertically
C	Burial Episode 3	Red II			19.3	28.2	sandstone	1/2 large oval bead, split vertically

Table 11.3: Beads from Kirikongo

cylindrical, 5.9 mm long and 5.6 mm in diameter. It was found in the trash deposits in the second extension during late Red III.

Unfired Clay Objects

A possible figurine of a bovid was found in the Yellow I trash pit from Unit B. The actual animal could not be distinguished. An unfired clay ball was found in the same location between Structures 3 and 4 in Unit B. Its function is unknown.

Discussion

Cowrie shells are one of the few trade items found in the Kirikongo assemblage. They are part of a greater regional long distance trade that occurred at this time between East and West Africa. Their ubiquity in prehistoric West Africa was such that their presence in western Burkina Faso does not necessarily imply that Kirikongo participated actively in super-regional trade networks: they could easily have been obtained locally through down-the-line exchange. Their context within Kirikongo provides an additional line of evidence to understand the mortuary features of Unit C, as well as the ritual contexts that burned down in Unit B during Red III. The stone beads were all made of locally available materials, and in the quantities present do not provide a great deal of information. Unfortunately, little more can be said about the burial with which one is associated (Burial C2), as it was left for future excavations. It is interesting, though, that the early inhabitants preferred stone jewelry, and the later people preferred bone beads. Iron jewelry also was likely common. A figurine of a bovid may not have been an unusual object in Yellow I, as the ideology of the society may have been more centered on livestock, as I suggest in my discussion of the fauna (Chapter 12).

Discussion

The ubiquitous ground stone in all domestic settings provides further evidence for the production and consumption of tô as a staple at Kirikongo. The organization of the grinding stage of food preparation appeared to change during the sequence, from grinding within the hut to grinding in a common courtyard. This shift may mark a transformation from more independent nuclear families to more communal views of property and task organization. Stones and minerals also were found in pottery tool kits of two types, one for decoration and fire-starting, and the other for the actual formation of pots. The latter may indicate a shift in pottery production techniques between the unspecialized production period (Yellow I to Red I) and the specialized production period (Red II to Red III).

In general, few small finds and jewelry were recovered at Kirikongo, but cowries provide important evidence for ritual areas at the site. The rare jewelry suggests that personal adornments may have been primarily composed of perishable materials.

Chapter 12

Herding, Farming, and Ritual Sacrifice: The Economy from Kirikongo

A wide range of domestic and wild animal species were utilized at Kirikongo. Two main periods with specific faunal spectra are contrasted below. The primary goal of this chapter is to suggest that the faunal analyses indicate a reorganization in the nature of domestic animal production and the methods and goals of hunting, within a general shift from a network, or more individualistic (by individualistic meaning household level), to a more corporate, or communal strategy. The chapter begins with a survey of identified animals, then shifts to a description and analysis of animal use at Kirikongo.

Methods of Identification

The analysis of the fauna presented here is on going and therefore focuses primarily on the general spectrum of identified mammalian and avian bones recovered. Analyses of other classes of animal (fish and freshwater molluscs) have only been completed for Unit A, and will be mainly discussed in later presentations. The recovered fauna from Kirikongo are derived from intact and well-stratified contexts, with almost all bones attributable to a specific trash deposit or lens. Bones were identified using comparative collections housed at the University of Michigan's Museum of Anthropology and Zoology, The Field Museum (Chicago), and the Smithsonian Institution (facilitated by the Archaeobiology program). In addition to my analyses of reference collections, a variety of published works were employed in tandem to distinguishing between similar species (e.g. Peters 1986a, 1986b; Van Neer 1989).

As mentioned earlier, all deposits were screened through a 3 mm mesh during excavation, and bagged separately. In the laboratory, all faunal remains were cleaned, which was particularly necessary due to extensive caking of thick and heavy clays on bones from the Yellow I and II deposits. Due to the generally excellent preservation, a large number of bones could be identified to genus or species, and by order those elements that could not be assigned further were assigned to a size class. In this work I follow the size class system that MacDonald (1995) defined at Jenne-Jenno. In general, the patterns from the size-class data match those found in the identified sample, providing a second line of evidence or a check on the patterns.

Quantification

Quantification of faunal remains has been the subject of a great deal of debate in archaeozoological methods research (see discussions in Marshall and Pilgram 1993; Redding 1992). The two primary techniques employed are NISP (Number of Identified Specimens) and MNI (Minimum Number of Individuals). MNI estimates have been shown to be problematic in a variety of ways, and in the case of tell sites this can be particularly true as there are generally small chances of interdependence. MNI are also very misleading in the West African context, as most communities live in extended family compounds with shared property, and domestic and wild animal carcasses are divided between members. Thus, in the trash deposits of a particular nuclear family one should expect only limited parts of any individual animal. An MNI count would drastically underestimate the number of animals consumed. This also means that any trash deposit is likely representative of what was being eaten at a given point by a compound.

Consequently, NISP are primarily used in this analysis, although MNI are included on tables for those who prefer them. For the NISP counts, all the separated fragments of a single element that possessed fresh breaks were counted as one fragment. Conversely, separated fragments without fresh breaks were counted as the number that could be identified taxonomically or associated individually.

Domestic Mammals at Kirikongo

The villagers at Kirikongo kept cattle, sheep, goats, dogs, and later ponies. As the majority of these species are ultimately derived from more temperate climates outside of Africa, the breeds kept at Kirikongo differ from their ancestors as they have become dwarfed through adaptation to the highly seasonal tropics with high humidity and prevalent diseases (including trypanosomiasis).

Dogs (Canis familiaris)

First identified in the Sahara during the 2nd millennium BC (Paris 1984, 1997). Current evidence for the earliest domestic dogs in sub-Saharan Africa comes from Jenne-Jeno during phase I/II (250 BC to AD 300, MacDonald and MacDonald 2000). By the 1st millennium AD, dogs are found at many sites throughout the savanna and sahel, including northern Burkina Faso (Linseele 2005). According to Epstein (1971), the dogs in West Africa are pariah dogs, a generalized type that is less attached to humans.

Canid remains were as frequent as sheep and goat bones at Kirikongo, with 30 identified fragments comprising both cranial and postcranial elements. MacDonald

and MacDonald's (2000) criteria for the separation of dogs from jackals were employed where possible, and all identified specimens were attributed to domestic dog. Unfortunately the criteria are limited to cranial characteristics, and I could not always differentiate postcranial elements. However, postcrania were found in some cases in association with cranial fragments and in general all canid remains appear to be from the same population. Since no jackals were identified, and specialized jackal hunting is unlikely, it is assumed that the unidentified canid bones are domestic dogs.

Cattle (Bos taurus)

The timing and nature of the emergence of cattle in the West African savanna is one of considerable debate. They are found on the edges of the Sahel by the second millennium BC as well as in the savanna by the mid second millennium BC in the Kintampo complex of Late Stone Age Ghana (Carter and Flight 1972, MacDonald and MacDonald 2000). The breeds that today inhabit the southern savanna regions of west Africa are small in size and resistant to the tsetse fly. Of the two modern dwarf breeds, the West African Dwarf is the smallest, and the N'Dama is slightly larger (Epstein 1971). MacDonald and MacDonald (2000) suggests that the small cattle found at Jenne-Jeno from 250 BC to AD 1400 are the smaller West African Dwarf Shorthorn, and he believes that Kintampo cattle and early Saharan cattle (e.g., Adrar Bous) could belong to this population's evolutionary trajectory, while the N'Dama may have roots in sahelian sites in the middle Senegal valley. However, the relationships between these archaeological size classes and modern breeds are largely unknown, and further complicated by the arrival of *Bos indicus* by the second millennium AD (Linseele 2005; MacDonald and MacDonald 2000). Despite the debates on breeds, it is indisputable that cattle have been kept in the savanna and neighboring regions since the mid to late second millennium BC.

Cattle at Kirikongo

Kirikongo's cattle are from a dwarf breed. They fall on the small side of the Jenne-Jenno cattle according to measurements (GLPE= 52.2 mm) on a 1st phalanx from Yellow II (another 1st phalanx from Yellow I is almost exactly the same size), and within the same range as the Kintampo cattle by comparison of measurements (GLPE= 30 mm) on a cattle 2nd phalanx. Other identified elements, while unmeasurable, appear to be from the same population. Teeth cannot be used in this regard, as the relationship between teeth and size is unknown with dwarfed domesticated animals.

Sheep (Ovis aries) and Goats (Capra hircus)

Sheep and goats are the most common livestock in the West African savanna.

Disease-resistant dwarf breeds predominate in the southern savanna and forest zones. Dwarf caprines are found as early as the 2nd millennium BC Kintampo complex in Ghana (Stahl 1993; Watson 2005) and were identified in Mali at Jenne-Jenno from 250 BC to AD 1400 (MacDonald and MacDonald 2000). In osteological measurements of dwarf caprines from archaeological sites, sheep are consistently slightly larger than goats.

Ovicaprines at Kirikongo

A total of 70 bones were attributable to sheep, goat, or sheep/goat. Measurements and morphological characteristics (horn cores) were compared with those taken from multiple sites, and all identified bones were from dwarf breeds.

Equids (Equus cf. caballus)

Equid remains have been only rarely identified in West African archaeological contexts. The earliest evidence is from the Middle Senegal Valley and the Mema region of Mali (both sahelian) during the first millennium AD (MacDonald and MacDonald 2000). They are found in floodplain and savanna/forest environments several hundred years later, with their presence at sites in Ghana, Nigeria and Mali during the early second millennium (ca. AD 1000-1400) (MacDonald and MacDonald 2000). The specimens in the Middle Senegal valley likely represent domestic donkeys, while those found in the central savanna (the Niger Bend) are considered to be from a small pony breed. While currently unknown archaeologically, linguistic evidence suggests that a small pony breed may have been present in the West African savanna potentially from the late first millennium BC (Blench 2000b).

Ponies at Kirikongo

The Equid remains found at Kirikongo consisted of a distal metacarpal as well as an incisor. Both appeared to be too large for donkeys and generally on the small side for horses. This information matches well with current evidence suggesting small ponies in the region at the latest during the 2nd millennium AD.

Wild Animals

A wide variety of wild animals was identified in the Yellow I to Mid Red II assemblage.

Antelopes

Maxwell's Duiker (Cephalophus maxwelli)

Maxwell's duiker is a very small (6-10kg) antelope that lives in rainforests

or highly forested savannas (Kingdon 2004:220). Maxwell's duiker's northernmost distribution is the southwest of Burkina Faso in regions with around 1200 mm of annual rainfall, and they are not found in the Mouhoun Bend today.

Red Flanked Duiker (*Cephalophus rufilatus*)

The red flanked duiker is slightly larger on average at 6-14kg and inhabits forest relicts and riverine thickets within the savanna, including woodland edges and clearings (Kingdon 2004:222). The red flanked duiker is primarily found today slightly to the south of the Mouhoun Bend, and prefers the savanna/forest transitions zones that are characterized by tall grasses and bushes, where they hide.

Bush Duiker (*Sylvicapra grimmia*)

The bush duiker (11- 25.5 kg) is found in a variety of habitats, but all within the savanna and savanna/forest zones throughout sub-saharan Africa. Bush duikers do not require water and can survive in areas with dense human populations (Kingdon 2004:220). They are particularly resistant to hunting since they can breed twice a year (Spinage 1986:178-179). Bush duikers are known to damage vegetable gardens in villages (Kingdon 1982:326).

Oribi (*Ourebia ourebi*)

A small antelope (12-22 kg) found in open grassland environments maintained by fires and/or grazing (Kingdon 2004:230). It is unknown if they are water-dependent (Estes 1991:58). Due to their attraction to grassland clearings, they occasionally cause damage to crops (Kingdon 1982:222).

Bushbuck (*Tragelaphus scriptus*)

A small to medium bovine (24-80 kg) found throughout sub-Saharan Africa. They are dependent on thick cover and confined to places close to water (Kingdon 2004:212). They eat predominantly shrubs, herbs and grasses, sometimes living in the beds of dry rivers during the dry season (Happold 1987:214-216). They are not territorial, but nocturnal and solitary.

Bohor Reedbuck (*Redunca redunca*)

These are medium (35-65 kg) antelopes that live in highly unstable large grasslands with extensive annual flooding, droughts and fires. They are exclusively grazers that feed after dark (Kingdon 2004:234).

Kob (*Kobus kob*)

The most common antelope of West Africa, kobs are a medium-sized (82-121 kg)

antelope found primarily in the savanna and savanna/forest on plains close to permanent water (Kingdon 2004:236) since they must drink daily (Spinage 1986:182). They are remarkably territorial and will stay in an area even after humans move in. Consequently kobs are easily trapped and hunted (Kingdon 1982:381).

Hartebeest (*Alcelaphus buselaphus*) or *Topi* (*Damaliscus lunatus*)

The bones of these two species are difficult to distinguish. Hartebeests (116-218 kg) are grazers found in all of Africa's savannas and plains (Kingdon 2004:248). Often they prefer the boundaries between plains and parkland, woodland, or scrub. They can obtain their water by drinking or by eating water-holding plants (Estes 1991:139). Hartebeest do poorly when made to compete with cattle, since they both compete for grasses (Kingdon 2004:248).

The Topi (75-160 kg) is found mainly in northern savanna and sahelian floodplains south of the Sahara (Kingdon 2004:246). Living in seasonally inundated grasslands, it follows the receding waters and grazes the recession grasses. Fairly large populations can be found on large plains (Estes 1991:142-143).

Roan Antelope (*Hippotragus equinus*)

The roan is a large horse-like antelope (223-300 kg) that is primarily a grazer of short and medium sized grasses (Kingdon 2004:252). They are one of the most common antelope species found in savannas throughout Africa; however they are most frequent in the wetter southern regions, since they need to drink daily (Spinage 1986:183). It is noted that they prefer habitats where there is little competition with other herbivores and few predators, including people (Kingdon 1997:436-437).

Suids

Common Warthog (*Phacochoerus africanus*)

While able to survive in open and dry landscapes, warthogs (45-150 kg) are most common on alluvial soils in lightly wooded country within the savanna (Kingdon 2004:204). They eat a wide range of plants but stay within walking distance of water. When necessary they can survive on succulents and water-conserving plants (Happold 1987:202).

Primates

Patas Monkey (*Cercopithecus patas*)

The most widespread monkey in Africa, Patas monkeys (7-25 kg) are found in the sahel, savanna, and forest margin grasslands and woodlands near watercourses and

riverine forests (Kingdon 2004:44). They eat a wide variety of foods but prefer acacia pods. Patas monkeys are well-known for raiding crops (Kingdon 1971:216,269).

Lagomorphs

Cape Hare (*Lepus capensis*) or *Scrub Hare* (*Lepus saxatilis*)

Common in the savanna, the cape hare (1-3.5 kg) prefers open grasslands, steppes and subdesert; whereas the scrub hare (1.5-4.5 kg) prefers scrubby grasslands. It is common in the southern savanna and forest areas, although its distribution extends north in micro-zones (Kingdon 2004:94). The scrub hare in particular is found in man-made habitats, including old farmlands, and they frequently damage young crops (Happold 1987:104-106, Kingdon 1974:351). Since the environment at Kirikongo during the first millennium AD was more humid than today, the remains are most likely scrub hare.

Large Rodents

Savannah Cane Rat (*Thryonomys swinderianus*)

These are large (4.5-8.8 kg) rodents found in waterlogged valleys in the moister parts of Africa (Kingdon 2004:120). They are commonly hunted and trapped, as their meat is considered particularly tasty (Angelici et al. 1999).

Giant Pouched Rat (*Cricetomys gambianus*)

These rats are smaller, at 1-1.4kg, but are also popular as a source of meat. They are found in a variety of environments south of the sahel (Kingdon 2004:130). Giant rats have been the subject of a domestication program in West Africa since the 1960s and their meat is traded widely (Blench 2000).

Small Rodents

A series of small rodent species were identified at Kirikongo. These included the gerbil (*Tatera sp.*), a multimammate rat (*Mastomys natalensis*), and a grass rat (*Arvicanthis niloticus*). These are all widespread species that are common around human settlements.

Mongoose

Gambian Mongoose (*Mungos gambianus*)

Found in the southern savannas of West Africa, the Gambian mongoose (1-2 kg) is a highly social animal that eats small invertebrates and vertebrates. They are water-dependant and like to forage in long grasses (Kingdon 2004:152).

Slender Mongoose (*Herpestes sanguinea*)

A widespread mongoose species (350-800 g) found in all forest, woodland,

savanna and swamp environments. They eat larvae, birds, frogs, reptiles, insects and rodents (Kingdon 2004:156).

Felids (Possible Domesticate)

Cats (*Felis sylvestris* cf. *catus*)

A multitude of wild cats live in West Africa. These include the wild progenitor of the domestic cat (Kingdon 2004:170). It was impossible to discern the status of the cat teeth recovered in excavations.

Wild and Domestic Birds

Against a background of dynamic wild and domestic mammal use at Kirikongo, the inhabitants of Kirikongo also hunted wild birds and kept domestic fowl.

Anseriformes: Large Ducks and Geese (Anatidae)

Spur-winged Goose (*Plectropterus gambensis*)

The spur-winged goose is the largest goose in the world, ranging up to 5.5 kg. It is a waterbird common to sub-Saharan wetlands and migrates within Africa (Fry et al. 1988:246). They rest in water for the middle part of the day and graze the rest of the time. Some are kept as domestic animals in Mali (Blench 2000).

Comb Duck (knob-billed duck) (*Sarkidiornis melanotos*)

This duck species is a waterbird distributed throughout the world's tropics. It grazes on vegetation in shallow water and also eats small fish, invertebrates, and seeds. They breed in freshwater lakes and swamps, and are consequently dispersing over large areas during the rainy season. They occasionally perch.

Galliforms

Chicken (*Gallus gallus*)

The earliest evidence of chickens in Africa comes from Egypt in the second millennium BC (MacDonald 1992). In sub-Saharan Africa, chickens are found at the trade center of Jenne-Jeno in Mali by the mid to late first millennium AD (MacDonald 1995). By the early second millennium AD, they are found throughout Mali and northern Burkina Faso (Linseele 2005). Chickens in the Lake Chad area date to the end of the first millennium AD. It is currently unknown whether chickens arrived from the east coast of Africa or via the trans-Saharan trade.

In general, African chickens are quite small when compared to European breeds. Their size has been attributed to the fact that they are free-range and not fed (MacDonald 2000). Chickens are deeply embedded in African cultural systems, mainly in sacrifice.

Chickens at Kirikongo

The earliest identified chicken bone from Kirikongo is associated with an AMS date of AD 560-660. It is likely the oldest chicken identified to date in West Africa. The earliest element identified at Jenne-jeno dates to Phase III (AD 500-850), however, the bone is from the latter part of phase (McIntosh 1995:123, and MacDonald 1995:309). Since there are two possible routes for the introduction of the chicken in West Africa, the appearance of a chicken at Kirikongo before Jenne-jeno may strengthen the linguistic data suggesting that chickens arrived via East Africa (Williamson 2000).

Helmeted Guineafowl (Numida meleagris)

The guinea fowl is considered an African domesticate. However, little is known of their domestication trajectory since they interbreed with wild guinea fowl, and consequently there is no indication of morphological change accompanying domestication. The earliest evidence for domestic guinea fowl is from Greece in the 5th century BC (MacDonald 1992), and it has not been identified in Africa before the 1st millennium AD in the Middle Senegal Valley (MacDonald and MacDonald 2000). However, even in this case it is uncertain whether they were domestic, despite large quantities of bone.

The wild guinea fowl is widely found in sub-saharan Africa. They prefer open country including forest edges and arid savannas. They require daily water and a roost. Important for archaeological samples, wild guinea fowl are attracted to cultivated fields (Urban 1986:8-10).

Francolins (Francolinus sp.)

Francolins are small galliform birds that live in open spaces with trees to roost in. They are considered endemic (highly sedentary), and generally live in a wide variety of vegetation types. They eat seeds and can be problematic during sowing and harvesting. They are regionally the most popular game bird today (Urban 1986:24).

Fish and Freshwater Shellfish

The analysis of fish bones is on going, and results are currently only available for Unit A. A total of 67 fish bones were recovered, of which 56 were identified to species. The following species were present.

Osteoglossiformes (Family Arapaimidae)

Heterotus niloticus

This fish has an auxiliary branchial breathing organ that allows it to live in

deoxygenated water (Welcomme and de Merona 1988:125). It is thus common in vegetated watercourses with muddy bottoms. It spawns on floodplains where it constructs nests (Daget 1954:60-62).

Siluriformes

(Clariid catfish- Clariidae)

There are two genera in the Mouhoun system that need to be considered, *Heterobrachus* and *Clarius*. Like *Heterotus*, Clariids have an accessory breathing organ and can take oxygen from the atmosphere (Teugels 2003): they can also withstand very high temperatures. Consequently, they dig burrows temporarily when there is limited water and/or air (Bruton 1979). Clariids spawn at the start of the floods in shallow marginal floodplain areas and are often found in residual pools when levels drop (Bruton 1979). The fish that stay in the floodplain are generally small.

Synodontis sp.

Synodontis catfish (over 30 species) are unspecialized feeders that occur in a wide variety of habitats. They spawn when the water rises, and enter the floodplains at that point, however they are mainly an open water species (Welcomme and de Merona 1988).

Perciformes

Nile Perch (Lates niloticus)

Nile perch are an open water species that lives in permanent, deep and well-oxygenated waters (Daget 1954:359). Unlike several species described above it is very sensitive to a lack of oxygen. While large fish are usually found in the channels, small fish generally live in shallow water and these are caught in marigots.

Tilapia (tribe Tilapiini)

Tilapia prefer shallow waters and can be caught in high quantities (Bruton and Bolt 1975). They are at their most vulnerable when going to spawn at the beginning of the floods. As a shallow water fish, they are resistant to low oxygen as well as high salinity (Phillipart and Ruwet 1982).

Freshwater Bilalves

Nile Oyster (Etheria elliptica)

These are found in permanent rivers and lakes, and collected when water levels are at their lowest. The specimens recovered from excavations at Kirikongo are likely from the Mouhoun River, and these are even today found and harvested yearly to be smoked and eaten. Large heaps are found along the shores of the river (Van Damme 1984:75).

Chambardia sp.

These are often confused with *Spathopsis*. However, for Kirikongo we should consider only *Chambardia*, as they prefer fluviatile environments, while the former prefer lakes (Van Damme 1984:62).

The Fauna from Kirikongo (Table 12.1)

Domestic Animals

The early period of faunal exploitation dates between Yellow I and early Red II. The mammalian faunal spectrum is predominantly composed of domestic animals (74%) including cattle, sheep, goats, and dogs. Dwarf sheep and goat bones constitute around half of the domestic assemblage, and dwarf cattle are well represented. Dogs were commonly consumed from the beginning of the sequence and constitute the majority of the total domestic assemblage in Yellow I and Red I. The relative proportions of the various domestic stock are what one would expect in mixed herding, with one cattle bone for three sheep/goat bones (16% and 47% of the assemblage, respectively). Dogs constitute 37% of the recovered domestic bones.

During the late period (mid Red II to Red III), domestic animals drop to 57% of the assemblage, although the relative frequencies of each animal change disproportionately. Cattle fell to 2% of the domestic fauna, and there was one cattle bone for every twenty-eight sheep/goat bones. Consequently, sheep and goat bones increase to 60% of the domestic fauna during this period. Dogs decrease slightly in frequency to 32%. During the late period, there appears to have been a shift from a mixed herding profile to one focused on small stock. In addition, the late period saw the introduction of the horse into the region, although it is not yet clear what role they played. If we compare temporal trends in relative frequencies, the patterns are much more revealing. Domestic animals dropped in frequency between the early and late periods, 4.5 bones/m³ to 2.35 bone/m³. Despite sheep and goats comprising 60% of the domestic fauna during the late period, their absolute frequencies fell almost in half, 2.1 bones/m³ to 1.2 bones/m³. Dogs fell to less than one half of their earlier frequency, 1.66 bones m³ to 0.75 bones m³. Matching the other data, the most drastic change was in cattle, which dropped from 0.72/bones m³ to 0.05/bones m³.

Wild Animals

The wild fauna from the early period are a limited set of animals that either live in areas after human occupation (kobs), are notorious for feeding on crops (small duikers, oribis, monkeys), or are small mammals frequently found in fields (cane rats, Gambian

	DOMESTICATES										BIRDS									
	Bos taurus	Capra hircus	Ovis aries	Ovis/Capra	Canis familiaris	Felis sp.	Equus caballus	Gallus gallus	Numida meleagris	Gallus/Numida	Francoline/Gallus	Sarkidornis melanotos	Francolinus sp.	Plectropterus gambensis	Small Carnivore	Large/Medium	Medium Small	Small	Very Small	
Yellow I NISP (MNI)	3 (1)			5 (5)	12 (5)	1 (1)				4 (1)			1 (1)				9			
Yellow II NISP (MNI)	7 (4)	4 (2)		15 (7)	9 (4)		3 (2)		6 (5)			7 (3)		1	4		9	2		
Red I NISP (MNI)					8 (5)				15 (7)					4	3		9			
Early Red II NISP (MNI)	3 (2)			6 (2)	1 (1)		2 (1)		8 (2)						1	1	3			
Middle/Late Red II NISP (MNI)					4 (2)		2 (1)		23 (6)	1 (1)	1 (1)			1	12	2	3			
Red III NISP (MNI)	1 (1)	10 (4)	4 (2)	12 (8)	11 (5)	1 (1)	9 (5)	1 (1)	53 (19)	6 (3)	1 (1)	3 (2)		5	18	8	22			
Early Total (18 m3)	13 (7)	6 (3)	3 (1)	29 (16)	30 (15)	1 (1)	5 (3)		33 (15)			10 (6)	1 (1)	7	8	1	30	2		
Late Total (20 m3)	1 (1)	10 (4)	4 (2)	14 (10)	15 (7)	1 (1)	11 (6)	1 (1)	76 (25)	7 (4)	2 (2)	3 (2)		6	30	10	25			
Grand Totals	14 (8)	16 (7)	11 (3)	43 (26)	45 (22)	2 (2)	16 (9)	1 (1)	109 (40)	7 (4)	2 (2)	13 (8)	1 (1)	13	38	11	55	2		

	WILD MAMMALS																						
	Alcelaphus buselaphus	Hippotragus equinus	Cephalophinae likely rufilatus	Cephalophus Maxwelli	Kobus kob	Tragelaphus scriptus	Ourebia ourebi	Sylvicapra grimmia	Sylvicapra/ourebia	Redunca redunca	Redunca/Tragelaphus	Phacochoerus africanus	Erythrocebus patas	Mungos gambianus	Undetermined small mongoose	Herpestes sanguinea	Fetal Bovid	Lepus capensis/saxatilis	Thryonomys swinderhanus	Cricetomys gambianus	Coracidura olivieri	Small Rodents	
Yellow I NISP (MNI)								1 (1)					1 (1)	1 (1)	1 (1)					1 (1)			9
Yellow II NISP (MNI)			1 (1)	3 (1)			1 (1)	3 (2)										1 (1)	3 (2)				8
Red I NISP (MNI)					1 (1)			1 (1)										5 (5)	1 (1)				11
Early Red II NISP (MNI)																1 (1)							4
Middle/Late Red II NISP (MNI)	3 (1)				2 (1)		1 (1)											1 (1)					3
Red III NISP (MNI)	3 (1)	3 (1)			1 (1)	1 (1)	7 (3)	2 (2)	3 (3)	1 (1)	1 (1)	2 (1)					5 (1)	1 (1)	1 (1)	4 (4)	1 (1)	1 (1)	>9
Early Total (18 m3)			1 (1)	3 (1)	1 (1)	1 (1)	1 (1)	2 (2)	3 (2)	1 (1)	1 (1)	2 (1)	1 (1)	1 (1)	1 (1)	1 (1)	6 (6)	4 (3)	1 (1)	1 (1)	1 (1)	1 (1)	32
Late Total (20 m3)	6 (2)	3 (1)			3 (2)	1 (1)	8 (4)	2 (2)	3 (3)	1 (1)	1 (1)	2 (1)					5 (1)	2 (2)	1 (1)	4 (4)	1 (1)	1 (1)	>12
Grand Totals	6 (2)	3 (1)	1 (1)	3 (1)	4 (3)	1 (1)	9 (5)	4 (4)	6 (5)	1 (1)	1 (1)	2 (1)	1 (1)	1 (1)	1 (1)	1 (1)	5 (1)	8 (8)	5 (4)	5 (5)	1 (1)	1 (1)	>44

Table 12.1: Fauna from Kirikongo

rats, hares). The wild faunal assemblage suggests that during the early period hunting mainly occurred in the village fields.

The wild animal assemblage expanded in breadth during the late period, suggesting changes in the organization of hunting. Wild animal bones increased from 1.4 bones/m³ to 1.75 bones/m³. During the late period, hunters caught hartebeest, roan antelopes, bushbucks, reedbucks, and warthogs, in addition to the same animals that were hunted during the early period. The newly hunted were larger species that avoid human settlements and fields, and represent a very different hunting strategy.

Birds (Domestic and Wild)

Compared to mammals only a few bird species were exploited at Kirikongo, and domestic chickens dominated the assemblage starting in Yellow II. While chickens, guinea fowl, and francolins are osteologically similar, MacDonald (1992) provides criteria for differentiating several elements based upon morphological traits. The results indicate that in the large galliform category, only one guinea fowl was positively identified (and not until Red III) while 15 chickens were present. This suggests that the vast majority of bones were from chickens. This also casts doubt on the potential presence of domestic guinea fowl at the site. In addition to broad similarities with guinea fowl, small chickens overlap in size with large francolins, and seven bones fell into this designation. These bones date to late Red II and Red III, and with the large size of the chicken population at this point, these most likely represent the small end of the chicken size spectrum.

While it is not clear whether chickens were present until Yellow II (the first positive identification), the number of chicken and likely chicken bones increased dramatically over time, from 2.1 bones/m³ during the early period to 4.7 bones/m³ in the late period.

The wild bird samples seem to reinforce the patterns seen in mammalian fauna. Most (75%) of the identified francolin bones date to the early period, and as these birds often feed on seeds in open spaces, they mirror the evidence for garden hunting presented above. A large goose common in fields was also recovered during the early period. In the late period hunting was likely more extensive, as knob-billed ducks live away from settlements in swamps and ponds.

Aquatic Resources

Although only the fish from Unit A have been analyzed to date, patterns generally match those seen from hunting. Low-level exploitation characterizes the majority of the sequence, spanning Yellow I to the end of Red II (1.3 bones/m³), while an expansion in

fishing occurred during Red III (14.1 bones/m³). Before Red III there are few fish bones, and those caught represent the exploitation of drying marigots, as indicated by lungfish and the generally small size of specimens. Fishing was probably small-scale and perhaps an independent opportunistic activity like hunting.

Around 2/3 of all fish remains recovered during excavation date to Red III, despite this sub-phase representing only 17% of the excavated deposits on Mound 1. While effectively the sample is still not large (and still mainly small fish), the spectrum is more diverse. The remains recovered suggest an expansion in marigot fishing.

Nile oysters are found in their highest relative densities between Yellow I and Red I on (2 g/m³), but drop in frequency by Red II and Red III (1.2 g/m³). This pattern coincides with increasing aridity during the early second millennium AD, and may simply represent a narrowing of habitats within which oysters were found near the site (Nile oysters require a perennial flowing environment, and do not live in seasonal marigots). During the first millennium AD rainfall was likely 20% higher than current levels, and it is possible that the Koyaré drainage may have flowed year round at this point. Oysters are harvested in the dry season when waters are low.

Spatial Analysis of the Distribution of Fauna

In order to understand village organization over time, it is necessary to explore faunal patterns at different mounds. This section presents the trajectories from Units A, B, C and E.

Unit A (Mound 1) (Table 12.2)

The Early Period (Yellow I to Red I)

During the early period, Unit A's fauna was primarily composed of domestic animals.

The most common animals were goats/sheep (NISP=15), dogs (NISP= 10), and cattle (NISP =7). However, cattle disappear after Yellow II. The chicken arrived during Yellow II, and throughout the remainder of the early period it is found in low numbers (NISP=10). Three wild mammal species were killed, a kob, a duiker, and two rabbits. Kobs are highly territorial and considered easy to kill, while duikers and rabbits are known to raid fields. Both francolins (NISP=4) and a goose were killed, and both of these are also often found in fields.

	DOMESTICATES						WILD MAMMALS						FISH AND MOLLUSCS								BIRDS										
	Bos taurus	Capra hircus	Ovis aries	Ovis/Capra	Canis familiaris	Equus caballus	Alcelaphus buselaphus	Cephalophinae (likely rufilatus)	Kobus kob	Ourebia ourebi	Redunca redunca	Fetal Bovid	Lepus capensis/saxatilis	Small Rodents	Small Carnivore	Large/Medium	Medium Small	Small	Barbus sp.	Clariidae	Heterotis niloticus	Lates niloticus	Synodontis sp.	Tilapia	Freshwater Mollusc	Gallus/Numida	Sarkidornis melanotos	Francoelinus sp.	Plectropterus gambensis		
Yellow I NISP (MNI)	3 (1)			2 (2)	1 (1)									2						1	1	1		2 (2.34g)					1 (1)		
Yellow II NISP (MNI)	4 (2)	2 (1)		6 (2)	5 (3)		1 (1)								2			2	3	3	2	2	1	8 (5.84g)	2 (2)	2 (2)	2 (1)	2 (1)			
Red I NISP (MNI)		2 (1)	3 (1)		4 (2)			1 (1)				2 (2)	4	1	2		1	1			2	2		10 (12.29g)	8 (2)	8 (2)	1 (1)	1 (1)	1 (1)		
Red II NISP (MNI)				1 (1)	4 (2)	2 (1)	3 (1)	2 (1)	1 (1)			1 (1)	3		12	1	2	2			1	4	1	3 (2.75g)	19 (4)	19 (4)	1 (1)				
Red III NISP (MNI)				5 (2)	4 (2)			6 (2)	1 (1)	5 (1)	1 (1)	3 (1)	3	1	10		4	4	1	10	16	16	1	3 (4.07g)	13 (8)	13 (8)	1 (1)	1 (1)	1 (1)		
Totals NISP (MNI)	7 (3)	4 (2)	3 (1)	14 (7)	18 (10)	2 (1)	3 (1)	3 (2)	7 (3)	1 (1)	5 (1)	4 (4)	10	4	24	1	9	1	14	2	25	3	10	26 (17.99g)	42 (16)	42 (16)	2 (2)	5 (4)	1 (1)		

Table 12.2: Unit A (Mound 1) Fauna from Kirikongo

The Late Period (Red II to Red III)

During the late period, Unit A's fauna was equally split between domestic animals (NISP=16) and wild mammals (NISP=16). These are derived from two sequential courtyard trash deposits. The domestic assemblage contained no cattle bones, and dogs (NISP=8) were found in higher frequency than sheep/goat (NISP=6). Two bones of a small pony were recovered as well during Red II. The wild mammal assemblage is very different in character, with hartebeest, kob, oribi, reedbuck, and rabbits. The hartebeest avoids human settlements, as it does not like competition from livestock, while the reedbuck is primarily found in floodplain environments. These animals suggest a more active hunting strategy.

Chickens increase dramatically in number (NISP= 32) during Red II and Red III, from 1 bone/m³ to 5.6 bones/m³. In addition to one francolin, two comb ducks that live primarily in swampy areas were caught, suggesting a more extensive regional exploitation.

Summary of Unit A

The early period fauna are composed primarily of domestic species, with only a restricted distribution of wild mammals, most of which are commonly found in fields. The late period has an even distribution of wild and domestic mammals, and in each category there are changes in the distribution of species. For example, cattle drop out of the assemblages before the end of the early period, and are not found in the late period at all, while the late period indicates the arrival of a small horse breed. Sheep/goat and dog frequencies are relatively similar in each period. The late period faunal assemblage contains a series of larger species that avoid human settlements, indicating more active hunting.

Avian remains generally match trends in the mammals, with early period wild birds that those commonly found feeding on fields, while the late period has species from distant floodplains. The most dramatic shift is the increase in chickens between Red I and Red II. In summary, the fauna from Unit A indicate a shift from a mainly domestic animal profile with some garden hunting to a mixed economy with small domestic mammals, numerous fowl, and more extensive hunting.

Unit B (Mound 4) (Table 12.3)

During the early period, Unit B's fauna was primarily composed of domestic animals.

The most common were goats/sheep (NISP=11) and dogs (NISP= 12). Dogs were particularly common in the Yellow I deposits. A chicken was positively identified in Yellow II, however there is a chance they were present towards the end of Yellow I, although fowl are found in relatively low frequency. Several wild mammal species were identified: a bush duiker, a bush duiker/oribi, a Patas monkey, several mongooses, and rabbits, cane rats, and giant rats. Similar to the Unit A data for this period, almost all these animals are known for raiding gardens and fields, particularly the Patas monkey and cane rats, who eat young millet. Only one francolin was found.

During the late period, Unit B's fauna was equally split between domestic (NISP=20) and wild mammals (NISP=21). The domestic assemblage contained no cattle bones, and sheep/goats (NISP=14) were found in higher frequency than dogs (NISP=5). The wild mammal assemblage represents all the ecological zones of the savanna, with hartebeest, roan antelope, bushbuck, kob, oribi, bush duiker, reedbuck, warthog, rabbits, cane rats, and giant rats. The new species are not commonly found near human settlements and represent a more extensive hunting program than the early period. Garden hunting likely continued since many of the species found in the early period continue into the late period.

Chickens increase in number (NISP= 49) during Red II and Red III to 5.6 bones/m³ (their frequency during the early period could range from 0.77 to 4.6 bones/m³ depending upon the attribution of galliform bones). Francolins were recovered as well.

The fauna from Red III can be divided into several depositional contexts that inform on the nature of domestic and wild animal use.

Animal Sacrifice

Episode 7 in Unit B is composed of three groundfloor rooms and one second-story room that burned down during Red III. During the destruction sequence, the roofs fell in sealing faunal remains against the floor. A cluster of chicken bones representing at least three birds and one sheep/goat bone were found in Structure 4 near an unpaved patch of earth and a knife sharpening stone. Additional goat, sheep/goat, and chicken bones were found along the floor of the other rooms as well. The architectural feature will be interpreted in later chapters as a ritual structure for the Kirikongo community, and it is unsurprising that the setting for sacrifices to the ancestors would contain the two most commonly sacrificed animals of today: sheep/goat and chickens.

A Collective Hunting Profile

An example of a hunting profile for Red III is found in a single trash lens from Episode 9.

This context was primarily composed of wild animal remains, with only a few goat (NISP=3) and dog bones (NISP=3), and 26 chicken bones. The wild species include roan antelope, hartebeest, kob, oribi, bush duikers, warthogs, reedbuck, cane rat, giant rats, as well as a francolin. The above animals prefer environments ranging from thick cover to open floodplains, most of which are found today at some distance from Kirikongo. The diversity of animals matches well with ethnographic accounts of collective hunting methods, that do not target specific animals, but target a specific set of diverse ecological zones and kill all the animals within the designated space. The faunal assemblage also indicates that domestic animals were always consumed in low frequency, even in trash deposits dominated by wild remains.

Summary of Unit B

The early period fauna are composed primarily of domestic species, with only a restricted distribution of wild mammals often found in fields and gardens. During the late period, domestic and wild mammals are found in even frequencies. Between the periods both domestic and wild animal densities per m³ drop (domestic: 9.3-2.3, wild: 4.3-2.4), however these numbers are misleading in Unit B, as the late period was characterized by several cubic meters of architectural collapse (60 cm thick in some places) and my figures should be considered an underestimate of their relative frequency. The wild animal assemblage is indicative of collective hunting, due to the diversity in size of animal and habitat.

The early and late period are characterized by avian assemblages containing primarily chickens. The frequency of chickens per m³ (5.6) is likely an underestimation for the same reason given above. Both chickens and goats appear to have been used in ritual contexts.

Unit C (Mound 3) (Table 12.4)

During the early period (Yellow II to early Red II) Mound 3 was a cemetery composed of stratified tombs covered with domestic fill derived from Mound 4. The deposits were laid sequentially and fill was temporally unmixed. At the start of the late period (mid Red II to Red III), the mound's use shifted to an occupation zone.

During the early period, Unit C's fauna was primarily composed of domestic animals. The most common animals were goats/sheep (NISP=9), cattle (NISP= 5), and dogs (NISP= 2). Chickens are found in relatively low frequencies until early Red II.

	Bos taurus	Ovis/Capra	Canis familiaris	Cephalophus Maxwellii	Sylvicapra grimmia	Sylvicapra Ourebia	Herpestes sanguinea	Lepus capensis/saxatilis	Thryonomys swinderianus	Small Rodents	Small Carnivore	Large	Large/Medium	Medium Small	Small	Gallus gallus	Gallus/Numida	Francoelinus sp.
Yellow II NISP (MNI)	2 (1)	2 (1)		3 (1)		2 (1)			1 (1)	3	1		3		6		1 (1)	3 (1)
Red I NISP (MNI)		1 (1)	1 (1)		1 (1)			2 (2)							4		3 (2)	1 (1)
Red II NISP (MNI)	3 (2)	6 (2)	1 (1)				1 (1)			4			1	1	4	2 (1)	8 (2)	
Red III NISP (MNI)										3							4 (1)	
Totals NISP (MNI)	5 (3)	9 (4)	2 (2)	3 (1)	1 (1)	2 (1)	1 (1)	2 (2)	1 (1)	10	1		4	1	14	2 (1)	16 (6)	4 (2)

Table 12.4: Unit C (Mound 3) Fauna from Kirikongo

Several wild mammal species were present: Maxwell's duiker, bush duiker, bush duiker/oribi, mongoose, rabbits, and cane rats. Many of these animals are known to raid gardens and fields, including cane rats that eat young millet. Several francolins were identified.

Very little trash from the late period was found. Consequently, the entire faunal sample is composed of chicken bones (NSIP=4).

Summary of Unit C

The fauna from Unit C, primarily derived from the early period, generally match the trends seen in Units A and B. There was a slightly higher frequency of wild relative to domestic animals than other units, but the composition was essentially the same and indicates garden hunting. The relative frequency of domestic animals is difficult to assess due to small sample size, but cattle are generally well represented, while dogs are found in lower frequencies than elsewhere.

Unit E (Mound 11) (Table 12.5)

During the early period, Unit E's fauna was a fairly small assemblage primarily composed of domestic mammals, including dogs (NISP=4), sheep/goat (NISP= 3), and cattle (NISP=1). The only wild animal identified was an oribi. Chickens are found in low numbers. The sample generally matches those from other mounds, with a highly domestic focus and a wild animal that feeds on gardens and fields.

Unlike other mounds, during the late period (Red II and Red III) the fauna is dominated by domestic species with only a single giant rat bone. The domestic assemblage contained sheep/goat (NISP=11), dogs (NISP=2), and the only cattle bone from the late period throughout the site. In addition, a small pony was identified. Chickens (NISP=4) were found in low frequencies for the period, at 1.3 per m³.

Summary of Unit E

The fauna assemblage from Unit E is unique, containing no wild fauna during the late period, when hunting is widely practiced elsewhere and often represents 50% of the mammal assemblage. In addition, it contains the only cattle bone dated to the late period. Also interesting is the low frequency of chicken bones.

Conversely, the early period matches well with the domestic economy/garden hunting pattern seen in other units.

	Bos taurus	Capra hircus	Ovis aries	Ovis/Capra	Canis familiaris	Equus caballus	Ourebia ourebi	Cricetomys gambianus	Small Rodents	Small Carnivore	Large/Medium	Medium Small	Small	Gallus gallus	Gallus/Numida
Yellow II NISP (MNI)	1 (1)	2 (1)		1 (1)	4 (1)		1 (1)		2		1		2	1 (1)	3 (2)
Red I NISP (MNI)					2 (1)				7	3	1		2		
Red II NISP (MNI)				1 (1)		1 (1)				1					2 (1)
Red III NISP (MNI)	1 (1)	1 (1)	4 (2)	2 (2)	1 (2)			1 (1)				2	1		2 (1)
Totals NISP (MNI)	2 (2)	3 (2)	4 (2)	4 (4)	8 (3)	1 (1)	1 (1)	1 (1)	9	4	2	2	5	1 (1)	7 (4)

Table 12.5: Unit E (Mound 11) Fauna from Kirikongo

Discussion

In this section I discuss the implications of the patterns presented above.

Dwarf Livestock and Herding

In the studied assemblages, all sheep, goats and cattle fall into the size range of dwarf breeds. A wide diversity of specific dwarf breeds are found through the west African savanna and forest belt (Epstein 1971). All are highly resistant to sleeping sickness and other diseases, and their small size is thought to help them disperse heat in the seasonally humid and hot environment. Dwarf breeds are sedentary village animals: they are not transhumant or mobile, and do poorly when asked to travel long distances. They are generally kept near the village, where their manure is used. Regarding cattle, most contemporary sedentary West African villagers do not use them for milk, and dwarf breeds generally yield little (Epstein 1971). In the Voltaic region today, cattle are primarily kept as a medium for exchange, whether in dowries, compensations (for injury, murder), or sacrifices, particularly in funerals (Tauxier 1912). Dwarf goats are primarily used in sacrifice and as a form of capital in the marketplace. Sacrifices are fairly frequent as they precede almost any petition to the spirits in the traditional religions of the region. The early period faunal spectrum was consistent with a mixed herding profile, with three sheep/goat for every cow. By the late period, cattle disappear from the record and sheep and goats decline in half. This pattern suggests radically different social practices, including a drop in bridewealth, compensation systems, or their use in funerals. Evidence suggests that goats were killed in sacrifice during Red III, so despite a drop in frequency ritual use was maintained. It is possible, however, that as wealth in cattle was rejected, the commercial role of small stock may have been reduced as well. In short, the early period indicates fairly typical herding practices for the region, whereas during the late period, the inhabitants may have used livestock primarily in ritual contexts.

Dogs

Domestic dogs today are used primarily as security (guard dogs) and for meat. They are also occasionally used in ritual sacrifice and as herd dogs. The popularity of their meat is widespread, and it is unsurprising that they were favored throughout the sequence at Kirikongo. Their frequency at Kirikongo declined during the late period. One possible explanation is that with the drop in herding, dogs lost one of their primary occupations and were consequently less important. Their primary uses during the late period were likely for security and ritual sacrifice.

Chickens

Chickens in many areas of West Africa including the modern Mouhoun Bend are kept in coops set in the courtyard, but are not fed and mainly left on their own. They are the primary animals used in ritual sacrifices (see Tauxier 1912), and consequently are the most frequently consumed. The chickens recovered from Kirikongo from Yellow II may have taken some time to insert themselves into the social and economic system, as they are found in low frequencies for six to seven hundred years before increasing in importance during Red II and Red III. Chickens are the only domestic animal (save for ponies) that increase in frequency during the late period. The same social transformations that caused a reduction in herding may have influenced an increase in fowl. Since chickens are killed primarily in sacrifices, the increase in chickens may suggest that the frequency of rituals grew between these periods, or that they replaced other animals (dogs and goats) as sacrificial animals as these declined in availability.

Hunting Patterns

Above, I make a distinction between the garden hunting of the early period, and late period hunting, which I suggest involves both garden hunting and collective hunting. Garden hunting is marked by a spectrum of species that generally feed on fields (duikers, rabbits, cane rats, monkeys, rabbit, and some birds), and other animals (giant rats, mongooses) that are likely caught while doing tasks. While the seasonal organization of these practices is likely not clear cut; it can be implied that the animals that feed on fields would likely have been killed during the rainy season (late May to Early October), when farmers would be out in the fields working and protecting the crops. In modern case studies, any segment of the community (women, children and men) could be responsible for garden hunting.

Collective hunting dates solely to Red II and Red III. These are territorially organized hunts, and tend to kill diverse assemblages of animals. They differ from garden hunting in that they are not opportunistic and include animals not found near settlements. In Units A and B in all trash deposits not in ritual contexts, diverse groups of wild animal bones occurred together. Never was there any specific targeted animal. In the early 20th century, collective hunts were organized by diverse social groups, although always larger than a single compound (Capron 1973, Labouret 1931). The data therefore show a shift from individual opportunistic hunting to collective organized hunting. Collective hunting is generally done after the burning of the brush in the dry season (March/April).

Between Yellow I and Red III there is no evidence for bows and arrows. However, spears and barbed points of various kinds were recovered from excavations. Today

collective hunts are primarily accomplished with poison arrows, and it must have been organized very differently in the past.

Environmental Reconstruction

Some of the animals found in the faunal spectrum yield information on the environmental context of Kirikongo during the first and second millennia AD. Several species indicate a wetter climate during the first millennium AD. For example, the red-flanked duiker's northern border today is found slightly south of the Mouhoun Bend and its presence would suggest at least a slightly wetter climate than present. Maxwell's duiker on the other hand lives far south of Kirikongo today, in regions that receive at least 1200 mm of rain. These two species were hunted during Yellow II, and are consistent with the current environmental data that suggest the mid 1st millennium AD may have had rainfall up to 20% higher than today.

Small animals also suggest a wetter climate in the first millennium AD. For example, the Gambian mongoose identified in late Yellow I deposits is generally found in the southern savanna. Cane rats are also most common in the southern savanna, as they live in waterlogged valleys in moist regions.

Increasing aridity in the 2nd millennium AD is primarily marked less by disappearance of species, but by increases and decreases in frequencies, as micro-environments, or refugia are found in all savannas. While the small duikers described above entirely drop out of the sequence, animals like the oribi, which were present in the 1st millennium, increase in frequency as they prefer grassland environments. Similarly, cane rats drop in frequency between the first millennium and the second millennium AD, as their range likely narrowed considerably. The Mouhoun Bend even at the start of the 20th century was ecologically diverse place, with a river valley, floodplains, deep channels, gallery forests, thick brush, open grassland, and seasonal marigots. Consequently, the presence of bushbuck and mongooses is not surprising, even in the second millennium AD.

Conclusion

From its foundation, the villagers at Kirikongo kept dwarf cattle, sheep, goats, and dogs. They also hunted animals in the fields and fished the marigots. Chickens arrived during Yellow II and increased in importance throughout the early period. Evidence suggests that during this period all mounds had roughly similar faunal assemblages.

A large shift occurred during mid Red II and into Red III, when villagers kept fewer sheep and goats and ceased to keep cattle. Dogs may have decreased in frequency

as a result of the disappearance of herding. Chickens become very common and were included in sacrifices. Wild animals increased as domestic animals decreased, and evidence indicates the emergence of collective hunting practices. Fishing may have increased slightly, while freshwater oyster collection decreased.

The most interesting patterns concern Unit E on Mound 11. The assemblage did not contain a single wild animal bone in the late period, when the other mounds contain large wild assemblages. This social group did not participate in collective hunting. There is evidence from Unit B (Mound 4) that chickens and goats were sacrificial animals by Red II/Red III, as both were found in a burned ritual structure.

The general shift from a domestic-focused strategy to one that exploits wild resources is the opposite of archaeozoological data from other Iron Age sites in Burkina Faso and Mali. In fact, the drop in cattle husbandry is counter-intuitive, as the climate was less humid in the second millennium, and thus a better general habitat for cattle. The social implications of these trends will be discussed in Chapters 15 and 16.

The Botanical Remains from Kirikongo

As described in Chapter 2, flotation samples were systematically collected during excavations at Kirikongo. The analyses, by Daphne Gallagher of the University of Michigan, are on going, and current understandings are mainly based upon the completed analyses of Unit A's sequence (Table 12.6). The results suggest that Kirikongo's inhabitants were farmers from the beginning of the site's occupation, originally cultivating pearl millet and fonio, and later sorghum. In addition, they likely used tree products for fats and condiments. The botanical analyses also show a growing and changing village agricultural territory, as weeds became more diverse over time as the village grew and the types and qualities of soils in various states of cultivation and fallow expanded. In the following section I discuss briefly the crops and their significance at Kirikongo.

Fonio (Digitaria cf. exilis)

Fonio is a small-seeded savanna grain grown in areas with between 250 and 1500 mm annual rainfall. Fonio is very important in the modern farming systems of Burkina Faso, as varieties can mature very quickly (6-8 weeks), providing sustenance for farmers during the growing season. It is very nutritious and prefers to grow on poor, sandy, and iron-rich soils that are often infertile for pearl millet and sorghum. In fact, fonio actually does poorly on heavy soils (NRC 1996). Archaeological evidence for the grain is rare,

		Yellow I/II	Red I	Red II	Red III
Domesticated Crop Plants	<i>Pennisetum glaucum</i>	x	x		
	<i>Digitaria cf. exilis</i>	x	x	x	x
Herbaceous and Woody Wild Plants (Likely Weeds)	<i>Borreria sp.</i>	x	x		x
	<i>Commelina sp.</i>	x			x
	<i>Eleusine indica</i>	x			x
	<i>Ficus sp.</i>	x			x
	<i>Gilnus sp.</i>		x	x	
	<i>Portulaca sp.</i>			x	x
	<i>Scleria sp.</i>	x			
	<i>Sida sp.</i>				x
	PANICEAE	x			
	AMARANTHACEAE				x
	PAPILIONACEAE				x
	POACEAE	x	x	x	x
	SOLANACEAE	x			
Tree Fruits	<i>Butrospermum paradoxum</i>	x	x	x	x
	<i>Sclerocarya birrea</i>			x	
	<i>Piliostigma sp.</i>				x
	Samples	16	13	13	4
	Total Liters	34.75	27.75	26	8.5
	Identifiable Seeds	309	34	60	97
	Seeds Identified	263	23	10	84

Table 12.6: Botanical Remains from Unit A (Mound1)

and owing to the slight morphological differences between wild and domestic *Digitaria sp.* grains, verifying domestic status can be difficult. The samples from Kirikongo are significant in understanding the prehistoric trajectories of its use.

Fonio is found in all layers of occupation at Mound 1, from Yellow I to Red III. In relation to the agricultural system at Kirikongo, fonio is a good candidate to be cultivated on the soils atop the laterite ridge (west and north of the site), as opposed to the deep soils to the east of the site. As mentioned above, it provides temporal variability in the harvest, and is an important part of regional farming system in large parts of the savanna. It is likely that it served these purposes at Kirikongo.

Pearl Millet (Pennisetum glaucum)

Pearl millet is the earliest domestic grain found in West Africa, recovered from 2nd millennium BC sites in the sahel (e.g. Amblard and Pernes 1989), and southern savanna (e.g. D'Andrea et al 2006). Pearl millet also grows in areas with between 250 and 1500 mm annual rainfall and is one of the principle crops of the savanna. It is particularly appreciated in t^o, and consequently plays a staple role in the farming societies of western Burkina Faso today. It grows on light, well-drained loams (although it is highly flexible) and is very nutritious (NRC 1996).

Pearl millet is found in the early layers of occupation at Mound 1 and reappears later in the sequence beyond the phases discussed in this work. It was likely the principle crop grown in subsistence.

Sorghum (Sorghum bicolor)

Sorghum is an extraordinarily diverse crop that has varieties adapted to grow in all circumstances. Consequently, it is a principle crop in the farming systems of western Burkina Faso. In general, sorghum requires greater rainfall than millet and fonio, and today is found primarily in the central and southern savanna (NRC 1996).

While sorghum was not identified in Unit A (Mound 1) analysis, a carbonized cluster of sorghum grains was found in Structure 4 during Episode 7. This structure contained numerous storage jars and may have been a ritual communal granary. The sorghum therefore likely represents part of the yearly gifts of grain for village communal uses. Since sorghum is the principle grain used to make beer in several societies of western Burkina (Capron 1973, Tauxier 1912), it is often considered sacred, and may have been one of the most frequently donated grains to the village repository. Beer is used in village parties, as well as a sacrificial offering to the spirits and ancestors.

Tree Fruits

While grains form the basis of subsistence, tree products provide essential culinary components.

Shea butter (Butrospermum paradoxum)

Shea nuts shells have been tentatively identified from Unit A, and also from samples still under analysis (a possible shea butter processing installation in Yellow II, Mound 11). Shea butter is an essential form of fat in the traditional cuisine of western Burkina Faso. It is likely that the use of shea butter was a critical component of early farming life. However, the historical trajectory of its development is largely unknown. It is today used for cooking and frying. In addition, for many societies, shea butter

processing is one way in which women can earn income.

Locust Bean (Parkia biglobosa)

The locust bean, used to make the condiment called soumbara, has not been identified in botanical samples. Soumbara is a sauce base and essential ingredient in the traditional cuisine of western Burkina Faso. However, the ceramics used in processing the beans were found from early Red II onwards.

Conclusion

Sedentary life in the West African savanna was enabled by a commitment to domesticated crops. Kirikongo was a community of sedentary farmers, and grains were both a central feature of their economy, but also likely a highly ritualized part of their social and religious lives. This role was highlighted by the context within which sorghum was found at Mound 4. More extensive results of plant use will be available after analyses are completed.

Chapter 13

Lineage Based Social Differentiation: Mortuary Practices at Kirikongo

Differential treatment at death was a fundamental feature of village life during the early sequence at Kirikongo. This chapter presents patterns in the burial of dead throughout the village over time.

Methods

The analysis of burials from Kirikongo is on going. The interpretations in this chapter are based primarily upon the location and context of the burials. Since the skeletons have not yet been analyzed, biological sex attributions are currently unavailable, and the age of individuals will be divided into three categories: infant/small child (under 3 years), juvenile (ca. 3-12 years), and adult (over 18 years). All human skeletal remains from the project are kept in the Mouhoun Bend's local museum of Douroula, and will be the subject of future research. Below, I present descriptions of all burial events from Kirikongo (Table 13.1), which will be followed by a discussion of mortuary practices over time.

Unit A

A total of five burials were uncovered, all spanning the period from Yellow II to Red I. They were buried in courtyards and abandoned buildings; none were found inside recently occupied buildings at the time of death. All burials were placed in prepared pits.

Burial A1- Yellow II (Adult- non architectural space): This inhumation was resting on its right side, oriented east-southeast. The head faced north. The arms were flexed and appear to have been positioned with the hands near the face; however, the cranium and hands were cut by a later burial pit, leaving the remaining parts fractured and in poor condition. The legs were flexed, with the knees perpendicular to the hip.

Burial A2- Yellow II (Adult- non architectural space): Stratigraphically, this inhumation was located 10 cm higher than Burial A1, with the skull only 20 cm south of the A1 pit. The individual was buried on the right side, oriented towards the north, with the face to

	Unit A			Unit B	Unit C		
	<i>Infant/ Small Child</i>	<i>Juvenile</i>	<i>Adult</i>	<i>Infant/ Small Child</i>	<i>Infant/ Small Child</i>	<i>Juvenile</i>	<i>Adult</i>
Yellow II			2	1			1
Red I	1	1	1				3
Early Red II					7		
Middle Red II					1	1	

Table 13.1: Estimated Age and Location of Burials at Kirikongo

the east. The legs were much more tightly flexed, with the knees up near the humerus. The arms were also highly flexed, with the hands likely near the face, although the phalanges and carpals were highly eroded. While the outline of this burial was clear, the preservation was much worse than that of Burial A1, with most bones lacking epiphyses. This skeleton was of a smaller individual than Burial A1.

Burial A3- Red I (Infant- non architectural space): This inhumation was of an infant oriented towards the south.

Burial A4- Red I (Adult- burial in abandoned courtyard): This inhumation was set on its left side oriented north-northwest, facing north. A pot sherd lay in front of the face. The arms were flexed, with the hands under the cranium. The position of the lower body is unknown.

Burial A5- Red I (Juvenile-burial in abandoned Structure 3): This inhumation was laid flat on its back, with the head likely to the southeast, and arms extended alongside the body. Only a small section entered the excavation unit.

Unit B

Only one burial was found during excavations at Mound 4. It was placed in a pit. Burial B1: (Infant- non architectural space): This inhumation was oriented southwest facing north. It was positioned on its left side with legs highly flexed, and arms flexed, with hands under the face.

Unit C

Current evidence suggests that from Yellow II to Early Red II, Mound 3 was primarily used as a cemetery. Three depositional episodes occurred, although the rate at which bodies were deposited is not known, as burial pits were generally shallow and covered with loose mixed fill. However, the following are described in chronological order.

Burial Episode 1

One burial was set in a pit dug into the laterite bedrock.

Burial C1- Yellow II (Adult- burial into bedrock, then covered by fill): This inhumation was oriented to the east, with the face looking north. The body was likely on its right side, but this is not certain. Only the top of the skull was in the excavation unit.

Burial Episode 2

Three burials, all of adults, were found higher up in the unit, between 10 and 40 cm below Structure 2. None of these were excavated, but uncovered parts were recorded and then re-covered.

Burial C2- Red I (Adult- burial into fill deposit, 20 cm east of Structure 1): This inhumation was known only from a foot that extended into the deep probe.

Burial C3- Red I (Adult- burial under Structure 2): An adult cranium. It may be associated with the Burial C2 feet.

Burial C4- Red I (Adult- burial below and right of Structure 2): This inhumation was oriented northwest and was set on its back, with arms and legs extended.

Burial Episode 3

The next set of burials is a cluster of infant and small children placed within a 20 cm layer of the mound, and primarily distributed over the eastern side of the unit. Six were excavated and four were left in the ground.

Burial C5- Early Red II (Small child- burial in the northeastern quadrant of the unit): This was the burial of a small child in very poor condition. It was oriented south-southeast and rested on its back, with arms along its side, and legs slightly flexed.

Burial C6- Early Red II (Small child- burial in the southeastern quadrant of the unit): This unexcavated burial was of a small child with a pot sherd in front of the face.

Burial C7- Early Red II (Small child- burial in the northeastern quadrant of the unit): This was the burial of a small child. The head was oriented north and set on its back with arms and legs extended. A pot sherd propped up the face.

Burial C8- Early Red II (Small child- burial in the southeastern quadrant 20 cm northwest of Burial C6): This was the burial of a small child that lay flat on its back. It was oriented northwest, and the head was propped up by pot sherds on both sides; however, the cranium had rolled over to face south. The arms were extended, with the left hand over the pelvis, and the legs were tightly flexed above the body (as if the burial had been in a sack).

Burial C9- Early Red II (Small child- burial in the north central quadrant along the wall): This was the burial of a small child. It was oriented to the northwest and set on its back, but was missing its right side. The head was propped up by a pot sherd, and its left arm was extended. The left leg was slightly flexed.

Burial C10- Early Red II (Small child- burial in the northeastern quadrant above Burial C7): This burial had an unknown orientation and was composed of cranial fragments and unfused arm elements (a humerus, ulna and radius).

Burial C11- Early Red II (Infant- burial in central quadrant of the unit): This burial was of an infant resting on its right side and oriented towards the southeast, with the face looking northeast. The infant's legs and arms were tightly flexed, with the arms in front of the body.

Occupation Period (Post-Cemetery) Burials

Two burials date to the occupation period starting in Mid Red II.

Burial C12- Mid Red II (juvenile- burial in Structure 4 after abandonment): This young juvenile rested on its right side, and was oriented west-southwest with its face to the south. The child's arms were flexed, with hands set in front of the face. The legs were slightly flexed. In front of the face there was a pot sherd, and on top of the head rested a sandstone fragment.

Burial C13- Mid Red II (infant- burial in the courtyard between Structures 3 and 4): The infant rested on its right side, oriented northwest, with the face towards the southwest. The arms and legs were tightly flexed.

Orientation of Burials

Although the sample size is small, there seems to be some variability in the orientation of burials according to age, if we lump the sub-phases (Figure 13.1). Five infant/small children burials from Burial Episode 3 were all oriented roughly north/south, three towards the south and two towards the north. In Unit A, the infant burial from early Red I, Burial A3, was likewise oriented towards the south. In addition, the infant burial from Yellow II was oriented south-southwest. Adults on the other hand, seem to have been buried in a wider range of orientations, with several in Mounds 3 and 1 buried roughly east/west, while others were roughly north/south. One juvenile from Mound 3, post-dating Burial Episode 3, was buried closer to east/west. It is possible that mortuary patterns changed after mid Red II.

Burial Ritual

Pottery Near the Face

Starting in Red I, a total of six burials had a single pot sherd propping up their heads in the burial pit. It is impossible to say whether this was for tilting the head a certain way, or if it marked a social status.

Cowrie Shells

The fill that was laid atop Burial Episode 3 contained eight cowrie shells. These are the first cowries found at Kirikongo, and are a significant addition to the deposits. The implications of these objects are discussed in more detail in Chapter 15.

False Huts

The cemetery at Mound 3 is a unique and interesting feature. Burial events at the mound followed a consistent interment process over time. First, a pit was dug and the body placed within it. Next, a fill composed of residential debris from Mound 4 was laid atop the tombs, producing small mounds. Lastly, a false hut was built atop one tomb (Yellow II), or multiple tombs (Red I). The size of the hut may have varied with the number of individuals in the tomb. For example, Structure 1 (50 cm diameter) was placed directly over the head of Burial C1, atop a mound that was ca. 90 cm high. Structure 2

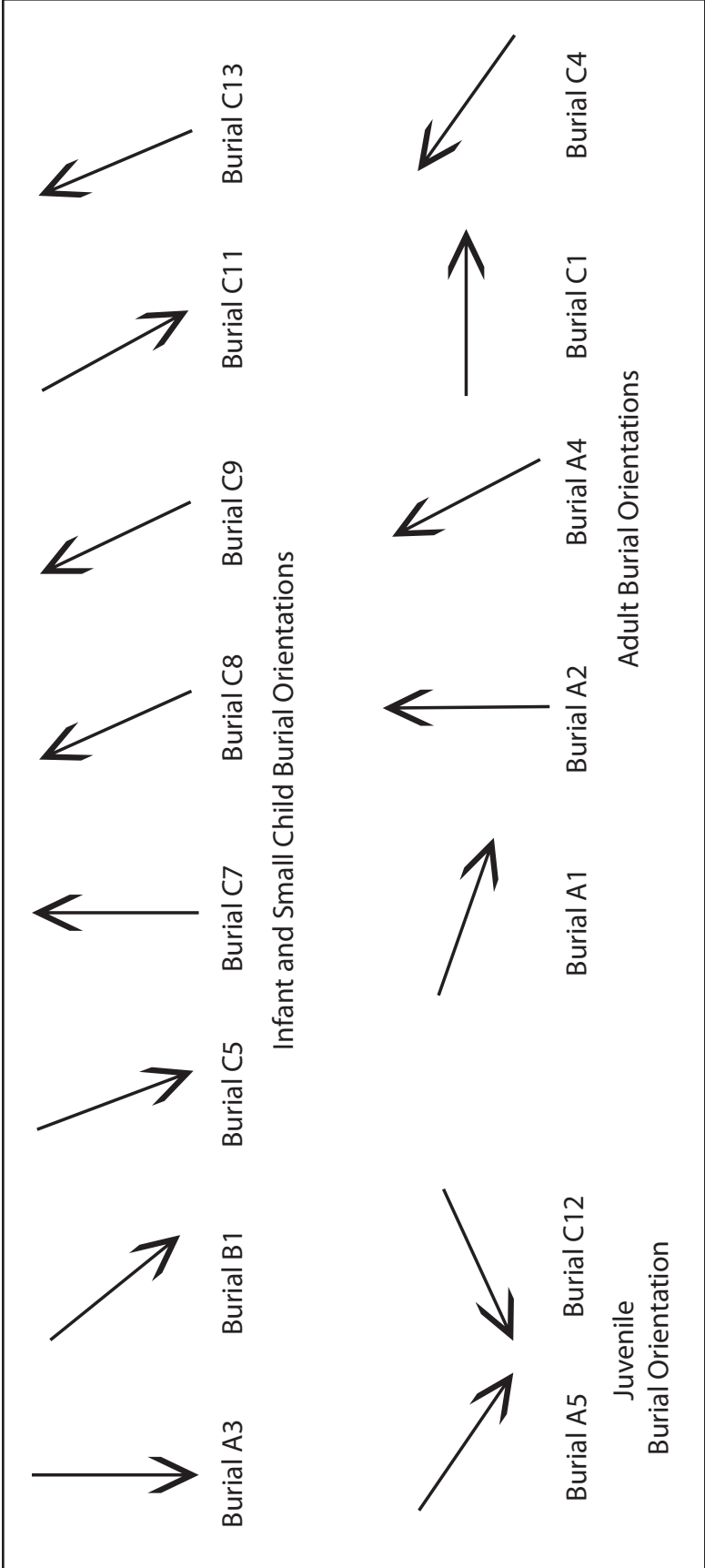


Figure 13.1: Orientation of Burials at Kirikongo

(150 cm diameter) was placed above multiple burials (Burials C2-4). This mound was only 10 to 20 cm above the actual burials. However, with the size of the excavation unit (less than a square meter) during Yellow II deposits, it is currently impossible to know if Burial C1 was actually a single individual's tomb, or was used for multiple burials. In addition, there was a possible false hut atop the Burial Episode 3 infant inhumations. This will be explored during future fieldwork.

The Gourounsi, an ethnic group that live directly east of the Mouhoun Bend today, seal tombs with false huts. These serve as a residence for the dead, as well as an altar for the petitions of the living to their ancestors (Tauxier 1912). At Kirikongo, these huts were not found above the burials at Mound 1. They seem to be restricted in distribution to the cemetery and to Mound 4's dead.

Discussion: Temporal Trends in Mortuary Practices

The location and character of burial practices change over time at Kirikongo. During Yellow II and Red I, Mound 4's residents buried their dead adults in a cemetery in Mound 3, while their infants were interred in Mound 4. The cemetery burials were covered with false huts that may have been used as ancestral shrines for the founding lineage of the site. Given their potential genealogical role, these burials likely also represent the village ancestors. The inhabitants of Mound 1, both infants and adults, were buried within residential areas (primarily abandoned courtyards), and were not given false huts. The restricted access to the cemetery and also to the use of the tomb monuments implies a certain degree of status/role differentiation during Yellow II to early Red II. For a short time during early Red II infants were buried in the cemetery, marking a break with the former mortuary program that had not treated the young as adults were treated. These burials were also interred with cowrie shells, a ritual and social valuable.

In addition to these patterns of social differentiation-- throughout the site and independent of the actual location of burial-- infants and small children appear to have been buried roughly north/south, while adults were interred in a diversity of ways. Today in Voltaic society, infants are often accorded very different burial treatment from adults, as they are uninitiated into the community. Research on mortuary practices at Kirikongo will be greatly augmented by future laboratory examinations of the interred individuals.

Finally, starting in mid-Red II, the mortuary practices at Kirikongo are poorly known. While two infant/small children burials were found in occupation levels at Unit C, not a single adult was recovered throughout the village at this point. The implications of this pattern will be discussed in Chapter 15.

Chapter 14

An Ethnographic Survey of Western Burkina Faso

This chapter provides crucial information for interpreting the material patterns presented over the last five chapters. Below, in a holistic survey of four distinct Voltaic societies, I explore topics relevant to understanding the following issues at Kirikongo: the social features of societies that live in clustered and dispersed villages; the organization of villages that practice specialized and generalized craft production; the social implications of cattle bride wealth and animal sacrifice; the role of hunting as a community activity; an exploration of the types of authority found in Voltaic societies; comparisons of cross-cutting village sodalities in different political settings; the relationship between village organization and regional integration/disintegration; and lastly an exploration of the origins of rank in Voltaic societies. The detailed cultural descriptions in this chapter are necessary for understanding Kirikongo's evolution, and will be drawn from frequently in the last two chapters.

Voltaic Civilization

The peoples of western Burkina Faso live in villages, most of which contain fewer than four to five hundred people, while particularly large settlements can house one to two thousand inhabitants. In spatial form, some are concentrated (neighborhoods and houses set in wards that are 10-15 meters apart), while others are more dispersed, (compounds with hundreds of meters between them). The actual form of a village differs based upon ethnic group and sometimes within an ethnic group due to historical circumstances.

Over the past 100 years, the region has been the subject of ethnographic research on societies that were formerly referred to as acephalous. The next section presents a series of case studies representing a diversity of village and household organizational forms. These include peoples who live in autonomous villages (the Bwa), others who have weak villages and strong regional kinship ties (the Lobi and the Gouin), and lastly, a group that likely lived in autonomous villages (although with a different household form), but in the 19th century developed into a chiefdom (the Gourounsi) (Figure 14.1).

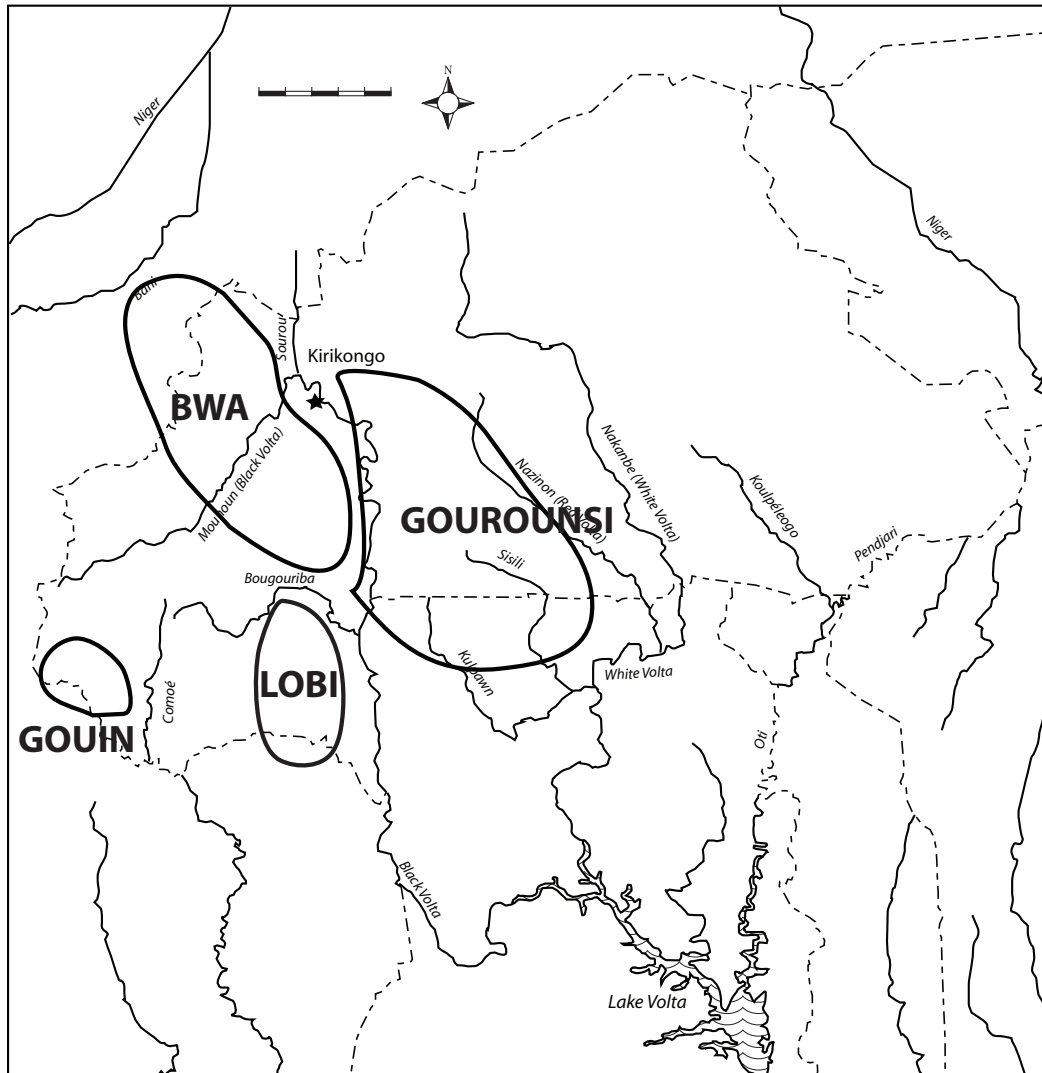


Figure 14.1: Selected Ethnic Groups of Western Burkina Faso

The Bwa

The Bwa live in Burkina Faso and Mali, from near Hounde in the south to Jenne in the north, comprising a population of 250,000 people in roughly 450 villages (Capron 1973). They are one of the principal ethnic groups of the Mouhoun Bend and are widely considered indigenous. Their neighbors to the north and west -the Bobo, Senoufo and Samo- live in similar village communities. There has been a century of documentation regarding the Bwa, whose autonomous villages and lack of combined political or social action have long interested French colonial officers, ethnologists, and visitors (Binger 1892, Capron 1962, 1973, Cheron 1916, Cremer 1924-1927, Delafosse 1912, Guebhard 1911, Hertrich 1996, Manessy 1960, Savonnet 1959, and Tauxier 1912). Various aspects

of Bwa society have been documented and analyzed, providing a rich comparative data set.

The Bwa are farmers who live in autonomous villages, and autonomy is maintained by an extremely complex societal organization and ideological system that ethnologists have titled a “communal project” (Capron 1973). Despite many years of influences from the nation-state and colonial governments, the internal cohesion of villages is intact, and there has been little urban migration and few religious conversions. The result has been the retention of their autonomous village life (Capron 1962).

The Village

The Bwa live in highly concentrated villages with narrow streets that weave between elongated residential wards composed of rectangular mud brick buildings with terraced roofs (Capron 1962; 1973, Savonnet 1959). The courtyards of the wards are open to the public, such that wells, granaries, and activity areas are visible. Most of the social life of the village is centered on a public plaza that is located near the village headman’s (*loso*) residence and the village ceremonial center (ancestor house). In this space women pound millet, process shea butter or beer, and interactions of all kinds are had between individuals and generations. It is not, however, a place of commerce, as most extra-household interactions have no economic component.

Many Bwa villages are formed by internal growth over time. Some early researchers thus referred to a village as a single-family bound by a familial hearth (Guébbard 1911). Capron’s research (1962: 135-136) suggests that this is mainly correct; as he found that traditional villages are primarily inhabited by members of a major patriline. However, Bwa villages also welcome immigrants, since any form of growth is looked upon kindly by the divinities. Thus, Capron recorded that 50-80% of the houses in a village were considered to be descendants of the founder.

Land Tenure (derived from Capron 1973: 274-283)

A Bwa village’s land is theoretically organized into three concentric circles starting at the settlement, although variable landscape features may influence the actual shape. The first two circles are considered the village territory, the third the bush territory. The first zone ranges in size from 10-100 meters wide and holds the permanent gardens that are fertilized by manure and constant work. The next zone has permanent fields with some bushes and useful trees. These are fertilized by the small stock during the dry-season. Beyond these is the bush territory, a zone of itinerant farming that is seasonally burned and far less organizationally structured.

The village territory is the priority of the oldest families, and they often keep their altars there, while bush territory is open to all. These lands are liberally given to new immigrants, but as with any unused land the *loso* must make a sacrifice to open the space to cultivation. After the initial sacrifice on new land, during each subsequent year a farmer has to give a small amount of millet from their bush field to be used in collective religious parties. In regions where wild animals are common people tend to cluster their bush fields for protection.

Socio- Professional Groups

The village community is divided into three endogamous socio-professional groups of unequal size (farmers 85%, ironworkers 7-8% and griots 7-8%). Smith/potters and griots are superficially seen as creating economic interdependence, however, they also play a role in communal solidarity as mediators in disputes and crises. Both griots and smith/potters do not farm, receiving grain and vegetables in exchange for their products and services.

Farmers

Agricultural tasks are primarily male activities (this is not always the case in the Voltaic region), and women only help with prescribed tasks when simultaneous labor is required. Capron (1973:206) believes that this avoidance is due to the fertility/fecundity aspect of the village's relationship with *nyumuni*. The crops grown depend on the local area, but include millets, sorghum, maize, rice, fonio, yams, tobacco and cotton. Farmers also herd, hunt, and fish.

Women are responsible for domestic tasks involving all stages of food preparation, including the collection and processing of necessary ingredients for sauces, often from trees and bushes. In the first few months of the rainy season they collect shea nuts for fat and process locust beans to make a seasoning base called soumbara. Women often produce a surplus of these products, and they constitute a large part of the Bwa economy, allowing women to buy salt, dried fish, peppers, condiments, sheep and goat meat. Everyday food preparation includes a variety of tasks: fetching water, pounding and grinding grains, making donuts, making sauces and *tô*, collecting wood fuel for the fire, etc. As mentioned above, women's labor is only rarely employed in agricultural tasks.

Iron Smiths and Potters

Bwa metallurgy is considered one of the great craft traditions of Burkina Faso (Kiethega 1993b), and their expertise in smelting and smithing iron from ore in the laterite substrata is and was much revered. They fabricate a diverse set of tools and

weapons, however their craft responsibilities include woodworking (e.g. mortars and pestles, stools) and shaping groundstone tools. Since they are associated with the earth in the smelting process (see below) smiths are charged with excavating graves and interring the dead. Specialist potters are the wives of smiths, and are renowned for their skills, including the unique use of kilns (Manessy 1960, Frank 1998). In addition, as wives they are also responsible for food preparation.

Since the earth holds a privileged place in Bwa religious thought, the role of the smith is imbued with several dimensions of societal importance. Capron suggests that in Bwa thought there is a fundamental opposition between the superficial manipulation of the earth by cultivators, and the profound techniques of digging involved in extracting iron, burying the dead, and digging wells. Smiths have a particular religious authority derived from working with minerals in the earth where they contact the divinities (Guebhard 1911). It is unsurprising that Bwa iron furnaces are in fact semi-subterranean structures, and hold a great deal of religious force (Coulibaly 2006).

Smiths play a role in the community as well, by maintaining social order as arbiters in disputes. They initiate conflict resolution and cannot be lied to, as they are thought to channel the will of the ancestors. The conciliatory presence of the smith is requested in all social quarrels.

Griots

Griots perform professional music relating the collective history and stories of the village. They, with their wives, specialize in the production, dying, and tailoring of fabrics.

The griot attends and participates in births, marriages, funerals, religious ceremonies, parties and collective work tasks. For example, griots even escort workers when returning from harvesting the fields. They broadcast news and contentious issues and individuals will consult them if they want something to be common knowledge, including gossip and grievances. Like the smith, a griot plays a role in conflict resolution. In private settings his words are manipulative and false in order to trick people into telling the truth. After a problem is resolved, he broadcasts the results.

Domestic and Wild Animal Use

The Bwa keep dwarf goats, sheep, some pigs, dogs, chickens, guinea fowl and ducks, all of which are primarily used for ritual sacrifice (Capron 1973; Tauxier 1912, Savonnet 1959, Manessy 1960). Small stock and fowl are generally left to feed themselves, and men are responsible for cleaning pens and coops. In describing the Bwa of the Dédougou area (near Kirikongo), Manessy (1960:94, translated by the author)

stated that the “principle occasions to eat meat were offered by sacrifices: a chicken, more rarely a sheep, a goat or a dog were bled to the ancestors or the protective powers of the house, the village, of the bush or the field”. The other instance beyond sacrifice to eat meat is when animals die of natural causes.

The contexts in which animals are sacrificed are innumerable: when new fields are opened, before hunting and fishing expeditions, during initiations, weddings, when an important decision needs to be made, etc (Tauxier 1912, Capron 1973, Manessy 1960). The soul of an animal appeases both ancestors and the spirits of nature as it feeds the sacrificer. Animals are thus a reservoir of souls to fulfill pacts with the *nyumuni* and *tû* (described later). Chickens are the most frequently sacrificed animals, likely due to their easy breeding, small size and low cost.

Since livestock are not used in bridewealth, the other main use of animals is for manure. The Bwa have been described as excellent cultivators, who intensively maintain their fields (Capron 1973, Manessy 1960, Savonnet 1959). They keep their animals close to the village during the rainy season and use the manure for the gardens. In the dry season they move the animals onto the permanent fields of the village territory, to restore fertility prior to the growing season (Capron 1973).

During the dry season, the meat of domestic animals is typically supplemented by wild game. Both collective and individual hunts are done in March after the January/February burning of the brush (Manessy 1960, Tauxier 1912). There are two types of individual hunting, bush hunting and garden hunting. Everyone (including women and children) takes part in hunting in the permanent fields and gardens, opportunistically killing rodents, squirrels, pheasants, wild guinea fowl, rabbits, and rats, when doing tasks. In addition, some individual bush hunting occurs throughout the year, but the contribution is small next to collective hunting (Manessy 1960).

Collective hunts are a community event, organized by ward, village, or by neighboring villages, and bring in a much larger quantity and diversity of game (Capron 1973, Cremer 1924, Manessy 1960). After planning a strategy, the men of the village advance in a line into the bush, with each person controlling the space in front of them (Manessy 1960:94). A dead animal belongs to the person who touches it first. Portions of a kill are given to the hunter's head of household (*duso*), and the meat is divided amongst everyone in the house and even amongst unlucky friends who didn't catch any game. Collective hunts are under the direction of a special headman (who can be anyone, but sometimes the *loso*), and hunts are preceded by sacrifices (Tauxier 1912, Manessy 1960).

The Bwa fish individually and collectively, but it is not considered a major enterprise (Manessy 1960). They do not exploit deep water, and they mainly fish

collectively in the dead arms of partially dried up streams. Strategies include fishing in shallow water with baskets, bailing out drying pools, and barricading marigots at the end of the rainy season to trap fish (Manessy 1960). Once a year the closest marigot is fished by the whole community under the leadership of the *loso* (who makes the necessary sacrifices), and he in turn is given particularly large fish (Tauxier 1912).

Marriage and Bridewealth

Amongst the Bwa, young men find their own wives and matrimonial compensation is limited to agricultural labor totaling 1-3 days that a young man does with his age set (*konu*) in the fields of his father in law (Tauxier 1912, Savonnet-Guyot 1986, Capron 1973). Beer and food are provided and the atmosphere is usually one of fun and excitement. In addition, he must give a few symbolic gifts (e.g. fowl). Savonnet-Guyot (1986) suggests that marriage therefore is a collectivist enterprise, and doesn't encourage the individualistic tendencies seen in societies where large amounts of livestock are needed. This point will be returned to later in reference to patterns from Kirikongo.

Murder Compensation

The Bwa belief in an everlasting community is exhibited by their practice of compensation for a murder within the community. In this case, the family of the murderer must give the family of the murdered a small girl. She must marry into the family and is expected to give birth to a reincarnation of the murdered person (Tauxier 1912). Murders outside the village are often a cause for war (Capron 1962, Tauxier 1912).

The Role of Women

As a result of the marriage system and virilocal residence, Bwa women are less tied into communal life. Since communities tend to be monolineal, women frequently leave their age set and move to an entirely new village. In addition, because of the very low bride service, access to marriage is easier and a woman passes very quickly from the residence of her parents to that of her spouse. As a consequence of these weak systemic ties, Bwa society is very permissive, and divorce is not highly condemned (Tauxier 1912, Capron 1973). For example, it was remarked that 80% of women over 30 years of age in the 1950s were on their third, fourth, or fifth husbands (Capron 1973:144, see also Gallais 1964). In fact, the freedoms exercised by women are also seen in cases of divorce: when she leaves her husband the older children go to him, but the younger ones stay with her even when she remarries (Tauxier 1912). Thus, the communal focus is so strong in the systemic aspects of male life that Bwa women exercise liberties unusual in the general region.

Commerce

Commerce plays a small role in Bwa life and they don't consume some of the most popular regional trade items, such as Kola nuts, that are coveted further north. The main items bought in the early 20th century were salt and cloth (Tauxier 1912). Goats and agricultural surplus are used as capital; women also sell surplus shea butter and sauce ingredients (Tauxier 1912, Capron 1973). On the whole, though, very little is consumed from outside the village.

Bwa Spirituality and the Sanctioning of Community Life (See Capron 1973:266-272)

The Bwa conceptualize two rights that sanction the community, one with nature and one with culture. The *nyumuni* right enables the establishment and maintenance of a community territory with the spirits of the untamed land (nature). Conversely, the *tû* right enables the establishment of a cultural authority in a human community, the ancestral cult. The village headman (the *loso*) always controls the *nyumuni* right and most often he also controls the *tû* right for which he is *tûso* (in some Bwa villages there are multiple families that control the *tû* right). A *loso* that controls both ritual spheres for the village is *lo-naleso*.

The first step in the foundation of a new community is to sacrifice to the *nyumuni* of the untamed land (bush), as represented by vegetation. This sacrifice is made at either an interesting feature of the landscape or an altar built from clay. At this spot, a chicken is killed and depending upon how it dies the sacrifice is said to be accepted or rejected by the *nyumuni*. This act creates the right of petition with nature, and begins an association between the fertility of the earth and the fecundity of mankind. The pact is created through the *loso*, and through him to the community, present and future.

The *loso* must then sacrifice regularly to *nyumuni* (at many altars, including the foundation altar) for good things to come (e.g. the harvest), as well as to keep away the dangerous aspects of nature (e.g. sickness, wild animals). The community's demographic success is the proof of the fulfilled contract, and either internal growth or the invitation of new groups into the community is encouraged (even in some cases from different ethnic groups).

While the *nyumuni* relationship is based in petitions with divinities in a wild territory, the *tû* is a concept of cultural authority. The cultural realm is that of human impact, such as the fields and garden, and the physical village. These are the ties that create authority within the village as well, as the *tûso* sacrifices to the ancestors for the cultural community during ritual occasions, events, and when making important decisions. Sacrifices are not made on altars but on the soil itself, and are often made in the

house of the ancestors (a ritual structure symbolizing the village community). Amongst the Burkinabe Bwa, the *tûso* right is usually held by the *lo-naleso*, while in some Bwa villages in Mali, there are multiple *tûsos* in a village.

The *loso* cannot refuse one from using land, as it is the universal right of *nyumuni*, but the right of *tû* allows the *tûso* to refuse land and even sacrifice against a problematic person. However, in cases where multiple *tûsos* are found, one family alone cannot refuse an immigrant: it must be done by the whole community.

Leadership is thus derived from two different realms, a natural (the petitioner with the spirits) and cultural (the petitioner with the ancestors). In the rest of this survey of Bwa society, I will use the term *loso* when referring to the political office of village headman, even though often he will be *lo-naleso*.

The House

The village is divided into extended agnatic family groups known as houses. They are the social equivalent of the compounds described later, with multiple generations of nuclear polygamous families under the direction of the eldest male. However, they live in wards within a clustered village, not in closed compounds with a shared courtyard (this will be an important distinction). Men enter the house through birth or adoption and women through marriage (Capron 1962). The population of a house varies from 20-120 people, with an optimal zone between 20-60 (Capron 1962). In cases where houses reach a dangerously small size, they sometimes combine to form one unit.

Houses are also the smallest economic unit in the village, a self-sufficient group that assures for itself the production and distribution of all consumed products. They cultivate collective fields with collective work groups, the harvests are stocked together in the house granary, and every two days grain is distributed to the women to prepare into food (Capron 1973). There is an interdiction against individual cultivation (Capron 1973, see also multiple discussions in Tauxier 1912). Each house has a headman known as a *duso* who is the oldest man of the oldest generation (Capron 1962, 1973). The *duso* manages the house, primarily by maintaining the altars and ritual complex. He petitions the ancestors through sacrifices made with the knife of sacrifice (a sacred object that is passed down). The *duso's* authority is checked by the presence of an internal bureaucracy that divides authority over various arenas of house functions. In fact, decision-making, production, distribution, and commercialization are responsibilities of several other bodies/offices. (The following descriptions are from Capron 1973:315-327)

The *dunikia* and *maaba*: In everyday decisions, the *duso* consults the elders of the house, or *dunikia*. In important decisions this is enlarged through addition of the house's officers in the council of the house, or *maaba*. The council meets in the chamber of the ancestors (*de nâsyadû*) where sacrifices are made by the *duso*. After consultation with the elders the chief petitions the ancestors for advice as well. The house council can remove a chief who disregards good advice.

The *faranyuso*: Chosen by the *duso* through consultation with the *maaba*, he directs and controls all the collective tasks of the men of the house, and regulates conflicts between them. Most important is agricultural labor, but he also directs hunting, fishing, construction and repairs of huts and granaries, the making of cords for baskets, and the placement and harvest of beehives.

The *duso* follows his advice in choosing fields, assessing their relative quality, and in decisions regarding when to let a field lie fallow. The *faranyuso* is usually considered the best worker of the house (the reason for which he was chosen), and must be young enough to work. He is relieved of his function when he becomes too old.

The head of the women: While not considered a formal office because she cannot sit at the *dunikia*, the eldest women in the house directs women's collective tasks, including sowing and harvests (the only two times women do agricultural labor), making shea butter and soumbara, spinning cotton, preparing food, and brewing beer.

The *naleso*: Also chosen by the *duso* through consultation with the *maaba*, he is the house accountant, and manages the collective goods. The *naleso* is the only one authorized to open the granaries (under the direction of the *duso*) and he hides the wealth of the house (cowries and money) in secret places. He keeps track of the buildings, animal pens, chicken coops, shea butter furnaces, bikes, and architecture: individual workers keep track of agricultural tools.

The *naleso* is the only person fully informed on the economic health of the house and what is needed for taxes, rituals, funerals, and marriages, and with these in mind he decides the volume that can be given to women for food preparation. He is often very unpopular since he is constantly auditing the members.

The *kâla*: This office is held by the eldest of the *dunikia*, and generally has minor responsibilities. He presides over the actual distribution of food and makes sure everyone gets his or her share, whether grain, fish or game. In addition, he is the intercessor between the house members and the *duso*.

Death and Burial

When a *duso* dies his younger brother succeeds him and takes control of the entire wealth of the household. The *duso* is buried in his actual hut, which then becomes the hut of the next *duso*. Other persons are buried before the door of the house and children are buried away in the fields. At death, several goats and chickens are sacrificed (Tauxier 1912).

The Political Village

The village political structure is generally modeled on the house. The *duso* of the ancestral lineage is the village headman, or *loso*. Consequently, the village *naleso* is called *du-naleso* and the village *kala* is the *du-kala*, with the usual roles within their house and some extended roles in relation to the community. The *loso* petitions the spirits and acts as the external head of the political entity and territory. The extent of his role is defined by the size and nature of the village, as well as its particular historical trajectory. In small villages the *loso* tends to have more authority because there are fewer eligible leaders. However, in large villages economic decisions are in the hands of individual houses and the *loso* is simply the personification of the territorial unit and the keeper of the collective village altars assisted by the village council of elders, or *lonikîâ*. The *loso* receives no taxes or labor for personal use, although labor is used for producing surplus for parties and religious festivals. The *lonikîâ* controls his succession, and there is a three-year trial for the presumptive chief, who can be removed if he acts poorly (Capron 1962:141).

The Do: Cosmology, Community, and Age Sets (The following section is derived from Capron 1962: 148-149)

The village *Do* is the religious system. *Do* is the “key” to faith and is the motor of social life, religious and profane. Religious rituals in the system are based upon mythic events and are expressed in the community, connecting daily life to the celestial creation.

The God in the Bwa universe is named Dobwenu. He created the universe, and he is the origin of all that was and will be. He is not an active deity intervening in the daily life of people, for he does not punish nor judge, and he has no altars and never receives sacrifices. *Do* is the son and brother of Dobwenu and is the intermediary between god and man. When he descended to earth he taught man to farm, smelt iron, and weave and he gave man the rules to communal life (e.g. the *Do*). The *Do* provides the organized communal acts that will ensure human success.

Mankind’s presence on earth constitutes the second face of creation and its material aspects. From his position in the bush, *Do* assures that the rains will come and

the equilibrium between man and nature maintained. However, if his rules are disobeyed, then the natural world will be angry and the village will be ruined. The *Do* is the “thing” of the Bwa, and all adults know what they must do to create a successful community. The *Do* priest (*donyaso*) is the brother of the *loso*, and he serves to organize all activities related to the societies of *Do* in consultation with the *Do* elders, or *dosasya* (see below).

The *Do* is a continual journey (process) throughout ones life. Baptism integrates a child into the community of the living and dead, and gives the right to be buried ritually. Initiation, however, brings the child into the community of the living. In preparation for initiation, a child and his age set are given lessons by the elders. These introduce the social and religious values of the community to the young. Part of the initiation event involves facing a masked person posing as a spirit. During this ritual battle the child learns that he is a man and the revelation liberates him from dependence on his parents and allows entry into a community. Masks are important symbols in the *Do*, usually accompanied by full body suits made of fibers and leaves.

Adults continue their religious education after initiation. The lessons are progressive and ordered, and the essence of *Do* (perfection) is never achieved. Even the leaders of the community seek further education. All age sets are in the service of *Do*, and for ceremonies that require masks, each age set provides a certain number. Each *Do* society crosscuts the village community through solidarity between houses and the alliances between generations. Advancement in the *Do* society is marked by a progression of agricultural hoes. The first is achieved at initiation, the second hoe is given when a boy becomes a strong man, and if he becomes a *duso*, he receives a third.

The age set proposes an alternative model of inter-personal relations that are egalitarian and based upon brotherhood, as opposed to the gerontocracy of the house. In addition, children of the smiths and of griots are also considered as brothers because they are part of the same age set. A large amount of labor at the communal level (community service) throughout ones life is done by age sets that are based in the *Do*, and the activities evolve depending upon what age set an individual belongs to.

Ritual Architecture

A Bwa village has a variety of ritual settings, mainly small altars and monuments to spirits, but the most important buildings are the *Do* house (Capron 1973:260-262) and the House of the Ancestors (Capron 1973:222-225). The house of *Do* is a village-level sanctuary and reunion hall for preparatory and initiation ceremonies; council and assembly meetings; and communal events for age sets (*konu*). The second important village structure is the ancestor house, the symbol of the community and of continuity.

The ancestor house is located near the residence of the chief in the center of the village. It is maintained by the *losu*, as priest of the ancestral altars. It is the meeting place for the village *lonikîâ* (and is sometimes known as the *ba lonikîâ tyaa*).

Regional Integration

The Bwa define themselves as the people that have *Do*. Despite living in very localized social settings, they do recognize a greater ethnic group that shares a belief/ideological system.

Social connections between independent villages are ordered by largely socio-religious relationships. The Bwa affirm kinship ties between people from families with the same name, as major patrilineages are often located in a restricted geographic area. Exact details of the nature and history of these kin relationships are not always known (Capron 1962: 153). They are, however, marked by food taboos common to the patriclan and during the dry season villagers who are traveling will often stay and eat with their patrilineal relations. The patriclan is not organic or institutional, but is symptomatic of the weak relationships found to the exterior to the village (Capron 1962:153).

Matrimonial alliances are a second extra-village relationship (Capron 1962: 153-154). These relations between lineages and households are important to the flow of marriage exchanges. Villages bound in a matrimonial alliance rarely fight, and sometimes ally in defense. Since bride service is composed of agricultural work done by an age set, young men from each village visit another frequently over a span of many years, thereby creating friendships. The exchange of marriage partners therefore makes a reciprocal and egalitarian relationship between villages.

Lastly the Bwa also form joking relationships that act as fictive kinship (Capron 1962:154-155). These are stable alliances between patriclans or more generally between two major patrilineages, and operationalized by two local houses that can be in the same village, or in neighboring villages. They are not limited to cultivators, as smiths/potters and griots can participate. Alliance members exchange insults and jokes within their respective age sets during interactions. Capron suggests that they act as a kind of safety valve by allowing individual spontaneity in a society with otherwise highly structured modes of interaction. Alliance members also get together to do work (agricultural, hunting, fishing), they rejoice (party) during births, marriages, and funerals, and they exchange gifts and information. Consequently, these relations can serve to stop wars between villages.

Despite politically independent communities, there is no isolation in the Bwamu.

Oppositions at the Regional Level

Warfare is the principle way villages affirm their autonomy and distinctive personality, and they usually occur between the same villages (Tauxier 1912, Capron 1962). Capron (1962: 156) believes that wars are necessary for maintaining the internal equilibrium of village communities. Battles are formulaic, quick, and usually end when someone is killed, primarily with an arrow. However, interventions are frequently made by a neutral party before anyone is hurt.

Conflicts between villages are generally the result of murder. While murder is usually committed due to vengeance, there is a Bwa tradition of ritual murder that is preceded by religious sacrifices, such that the village *Do* is thought to aid the murderer. Individuals gain prestige and are celebrated by the words of griots. In addition, the ritual murderer can join a select group of other prestigious village members (Capron 1962:156).

Summary of the Bwa

The Bwa are farmers who keep few livestock and inhabit concentrated villages. Spiritually, a Bwa village is a pact between the *losu* (the community by extension) and nature *nyumuni*, and the relationship is in constant maintenance through petition and sacrifice. The cultural (*tû*) village must itself be maintained through petitions and sacrifices to ancestors. The smallest social unit is the house. It is a self-sufficient economic group that has its own leadership structure, including a headman, councils, and officers. The houses are further interconnected by the *Do* society, an age grade system based in a religious philosophy that incorporates all inhabitants to a community. The key to communal life in a Bwa village is the *Do* path given to them by the divine, such that proper communal behavior can bring one closer to the divinities. The village leadership is modeled on the family, such that the *duso* of the founding house is the *loso*. The *loso* is the keeper of the major village altars and the external face of the community. Socio-professional specialist groups diversify the population and serve important roles beyond the economic, through arbitration, problem solving, and preservation of history and identity in the community. Beyond the village, relationships are not built on economic relations, they are formed through marriage, distant kinship, and fictive kinship structures that are all built to exercise neighborliness and provide a form of defensive advantage, but within these relations are perturbations that serve to assert village independence.

The Gourounsi

The Gourounsi are the eastern neighbors of the Bwa, and they provide an interesting contrast, in spatial organization (dispersed villages), economic practices

(non-specialist craft production, emphasis on livestock), and political structure (social ranking). The Bwa and Gourounsi share a small border today along the Mouhoun River east of Tcheriba, this likely extended much longer in the past before migrations over the last several hundred years.

Village Organization: Dispersed Compounds

The Gourounsi are a patrilineal society who live in large closed compounds (*kélé*) that are usually dispersed several hundreds of meters apart, although some villages are more clustered (Barral 1968, Duval 1985, Duperray 1984). *Kélé* are constructed with the *pisé* (puddled mud) technique and consist of round and oval structures that have pounded earthen floors, and are enclosed with terraced roofs (Barral 1968). Gardens and permanent fields surround the compounds (Barral 1968).

A *kélé* is home to an agnatic extended family (up to around 100 people) under the leadership of a headman (*kélé k'ébal*) (Barral 1968:22). Each nuclear family lives together, with a wife and her children working and residing in an interlinked set of three huts (Duperray 1984). Within the *kélé*, the nuclear family habitations face a common courtyard, and the *kélé k'ébal*'s residence is found directly opposite of the compound door (Barral 1968). The spatial organization of food preparation seems to vary from region to region, with women grinding grain in their huts in some areas (Tauxier 1912), and in the shared courtyard elsewhere (Duperray 1984). Cooking is done in the space in front of the individual households.

The *kélé* members work in collective fields for most of their subsistence. In addition, each nuclear family cultivates their own personal fields, and usually has a garden directly behind their residence (Tauxier 1912, Barral 1968). There are thus two sets of granaries in the *kélé*, those of the *kélé k'ébal* who provides the majority of yearly subsistence, and those for each nuclear family for the rest of the year (sometimes 4-5 months). This degree of personal ownership and independence is rare in the region (Tauxier 1912). There are other consequences of this organization, as property can also be accumulated away from the *kélé k'ébal*, although he has a right to the first of everything (i.e. he takes your first goat, you keep your second) (Tauxier 1912). Still, the *kélé k'ébal* receives the product of collective labor and assures the dowry (see below). While he is the head of the *kélé*, the *kélé k'ébal* is not expected to make decisions without the consent of the house council of elders.

Craft production in Gourounsi society is unrestricted, open to all members of the *kélé*, and generally practiced during the dry-season (Tauxier 1912). Since nuclear families can own personal property, most crafts represent extra income for the artisan. In

some cases, there is enough work that some craftspeople do not need to farm very often—primarily the case with iron production and the role of griot (Tauxier 1912). One task that is restricted to a certain family (not endogamous) is the digging of graves due to its religious significance (Tauxier 1912).

Herding, Hunting and Fishing

Herding is of great importance in Gourounsi society, and the large size of a compound is designed to house the herd in a vast interior space (Barral 1968). Cattle are a major component of the dowry that can be paid over a twenty-year period depending upon a family's wealth (Tauxier 1912, Duperray 1984). They are accompanied by gifts of domestic fowl and small stock. Cattle figure centrally in funerary sacrifices and all domestic animals are employed in many ritual sacrifices as well as judicial settings (Tauxier 1912, Barral 1968, Duperray 1984, Duval 1985). Gourounsi livestock are social capital that enable weddings and funerary parties, but they are also used in the political realm under the auspices of religion (see below).

Individual and collective hunting are both practiced in Gourounsi society, but they are categorically different. Individual hunting primarily refers to the killing of animals in protecting the fields. Duval (1985:119) describes every farmer as carrying weapons with him when he goes to the fields, resulting in the killing of monkeys and other small animals. Collective hunts, on the other hand, are organized by chiefdom, sometimes consisting of 10 villages (Tauxier 1912, see also Duperray 1984 and Duval 1985). Great hunters are revered in Gourounsi society, and often will have the horns of animals placed atop their tombs (Duperray 1984). Fishing is also a collective task involving many villages (Duperray 1984). In both collective hunting and fishing, the earth priest or village chief often acts as leader of the hunt and performs the necessary sacrifices (see below).

The Village Authority

Gourounsi villages have an earth priest (*tiatu*) and a village chief (*pio*), who generally co-exist peacefully (Duval 1985). The *tiatu* is the descendant of the first occupant of the soil and his origins can be either mythical or based upon a migration. At the founding of a village, the ancestor made an initial sacrifice in a sacred natural place (a unique feature in the landscape), and was taken under the protection of the local earth divinity (*tia*). This sacrifice and future sacrifices petition for fertility/fecundity, protection against evil and sickness, as well as to express thanks for rains or a good harvest (Duval 1985). The *tiatu* sacrifices when new buildings are erected and new fields are opened, and consequently receives a small amount of the harvest from these (Duval 1985, see also Tauxier 1912). He has authority over the territory, and a right to unclaimed goods

or resources that are found in it. It is important to note that his authority is limited to the village territory (Duval 1985).

The *pio*'s roles are religious and political, both of which are directed at maintaining the well being of the community (Duperray 1984, Duval 1985). He communicates directly with the *kwára*, the protective force of the village. The *kwára* materialization (a fetish, sometimes the horns of a bull) is kept in a special hut, and only the *pio* can enter without dying (Duperray 1984). The power of the *kwára* varies from village to village, and in some it is simply a secondary altar to those of the earth (*tia*), whereas in others it acts as the primary religious figure (Duperray 1984). The *pio* receives taxes from the village, most of which goes to rituals for the *kwára* requires the sacrifice of animals and other goods (Duval 1985, Duperray 1984, Tauxier 1912). Much of the surplus production of a village goes into this sacrificial system. In addition to this role, the *pio* is in charge of issues that involve the community (Duval 1985). In matters of great importance, he works with the village council to find a proper solution (Duval 1985). The *pio* is charged with keeping peace, but he is also responsible for conducting war (Duperray 1984).

The other positions in the village community are much less prestigious. In addition to the council, there is a mediator (*folonu*) who directs the chiefly succession, and the *voro*, a consultant for the *pio* who also acts as a slight check regarding the relative size of a sacrifice (Duperray 1984:42). The chief of the masks is the moral authority of the village, and manages the cult of the ancestors, funerals, and agricultural parties (Duperray 1984:42): he seems to function somewhat similarly to the Bwa *donyuso*.

Work at the village level is organized differently from the Bwa. Gourounsi initiation groups are less tightly integrated, and work groups beyond the concession are organized more ephemerally (Barral 1968). One type of group is composed of reciprocal friends that can be called upon, and a second is age sets that can be requested by a family head to clear new fields, weed a field, or deconstruct a concession (Barral 1968). These are, however, limited to one day of work.

Burial

Burials are often marked by miniature symbolic huts 10-50 cm high, with the ancestor of the house buried in a tomb on the interior of the compound, and others are buried to the exterior. The false huts act as altars to the ancestors, and are regularly sacrificed to in petition (Tauxier 1912).

Gourounsi Chiefdoms

While there were some independent Gourounsi villages in the 19th century, many were grouped under the authority of individuals known as “red hat chiefs” who wore special regalia and controlled between 3 and 20 villages each (Duval 1985:28, Duperray 1984:40). As an additional level of hierarchy, they received taxes from their chiefdom, and they were inherently expansionist (Duperray 1984, see also Tauxier 1912). Their power was based in the *kwárá*, and in the extreme example of the mid 20th century village of Bouyounou, society was divided into the dominators (*labwané*) and dominated (*ladia*), i.e. elites and commoners (Duval 1985). These chiefs were primarily Mossi, an ethnic group that borders the Gourounsi on the central plateau, and is organized as feudal states (Duperray 1984, Duval 1985). The modern political organization of the Gourounsi is likely derived from the migration of Mossi segments (one to two centuries ago) that assumed control throughout the land, and held power based upon the fear of destruction and enslavement that characterized the period. In general the 19th century saw a variety of conflicts in western Burkina, ranging from the Mossi expansion from the central plateau to raids by Fulani states from the north. With the frequency of conflict, the red hat chief’s role was likely very important to the perpetuation of the society.

Other Regional Relationships

Analyses of the Gourounsi infrequently speak of other forms of regional integration, tending to focus on the chiefdom organization. However, since bridewealth sometimes takes twenty years, strong relationships between families in different villages crosscut the chiefdoms (Duval 1985). Often these are structured by marriage alliances between villages/compounds in a region. Regional kinship relations resemble the Bwa, and do not generally play a large role in society.

Gourounsi Society

The Gourounsi live in large highly independent dispersed compounds composed of round puddle-mud buildings with terraced roofs. Nuclear families are likewise more independent, as they have a right to cultivate personal fields part of the time and can keep and accumulate personal property. Collective labor in a compound still provides the large part of yearly subsistence, and a heavy brideprice is insured by the *kélé k’ébal*. Large-scale hunting and fishing are organized by chiefdom.

Gourounsi villages have two leaders. The *tiatu* has ritual authority derived from the village founding ancestor who petitioned the spirits of the earth in establishing a territory and physical community. The *pío* is the political head whose authority is based in his relationship to the protective spirit, the *kwárá*. Consequently, he receives the village

(or multiple villages) surplus animals and gifts of grain to sacrifice to the preservation of all. Many *pio* in Gourounsi land are derived from the arrival of Mossi elites, likely during the 19th century. Gourounsi villages have several other offices of lesser importance, which were likely more central in the pre-chiefdom social organization. Particularly interesting is the marginalization of the chief of masks, or the person responsible for sacrifices to the ancestors, as well as the limitation of the authority of the earth priest. Both these offices resemble basic divisions in Bwa culture as well. Later in the discussion I will explore in more detail the origins of social ranking in a Gourounsi chiefdom.

The Gouin

The Gourounsi and Bwa are both patrilineal highly sedentary societies. In this section I describe the Gouin, who live in more ephemeral villages in the southwest of Burkina Faso. This community weakness is the result of a regional organization based upon kinship that pulls against village integration, resulting in communities with different dynamics from those already described.

In a Gouin village, individual compounds are dispersed, sometimes several hundred meters apart, and encircled with gardens. Gouin society is matrilineal and yet compounds are composed of an agnatic group. Inheritance reflects this kin organization, as non-mobile goods pass to agnates and movable goods (wealth and livestock) pass to the matriline. Bridewealth is exceptionally heavy for the region and families work very hard to obtain wives for their sons. Gouin social structure has two parts, descent (regional) and village life (local), that are key components in a society originating in northern Ghana that has been in slow expansion since the 17th century (Dacher 1997a:8)

The Household

The Gouin live in compounds (*ciinngu*) that are composed of agnates (Dacher 1997a:15). A father and his sons (with their nuclear polygamous families) are the production/consumption group. Each concession is independent and communicates with its own spirit/ancestor through the mediation of the father of the house. The father is considered as a moral, spiritual, and magical character. The size of a concession ranges from 10-200 people. When a father dies, the sons of different mothers separate, and the non-mobile goods including the house, rights to land, and ancestral altar, go to the oldest son. However, all mobile goods including livestock enter the matriline through the younger brother or maternal nephew. Thus, the agnatic household is a unit of production and consumption, while the matriline is the unit of accumulation (Dacher 1997a:15). Some villages also have quarters, but they are simply structured like villages, but lack an

earth shrine (Dacher 1997a:24-25). All members of the community are farmers, and craft production is unspecialized, with the sole exception of some smiths, although they are not endogamous (Dacher 1997a). These are, however, likely a recent development as the Gouin have been moving into areas that were very weakly inhabited by Senoufo groups, who have specialist smiths (similar to the Bwa) (see also Dacher 1997b).

Intra-Village Integration

Upon the death of a concession head who lacks a brother, the members of a concession disperse by mother. However, there is a social relationship that follows these groups and allows them to exercise common roots- the *bidanba* (Dacher 1997a:17-18). The *bidanba* are people who grew up together in a compound that dispersed upon the death of the headman, and they share the secret recipe for making poison (for arrows) and its antidote. They also function as a group during funerary ceremonies. In short, they group together in war and death. This association is important for binding a community, as Gouin initiation is a spiritual and religious instruction, not a political or civic enterprise, and age sets have much less structure.

The Village Authority

The Gouin headman has two different chiefly personas, first as the earth priest (*hienmanjigantienjo*), and then as the political headman (*nelenjigantienjo*). The founder of the village is the first *hienmanjigantienjo* and *nelenjigantienjo*, and has direct contact with the village spirit through the sacred altar. This is where the village founder sacrificed to the spirits and initially created a pact between the spirit community and the village community. In continuing sacrifices, the *hienmanjigantienjo* provides prosperity, peace, and goodness to the community. However, his descendents cannot directly communicate with the spirit, and they must communicate through their ancestor (Dacher 1997a:22).

When a village is founded, the territory is divided by the *hienmanjigantienjo* into individual lands for future quarters, and the role of *hienmanjigantienjo* over these lands can, but may not, be delegated to other leaders. They can then purify and open new habitations and fields themselves. They also purify the earth after certain interdictions are crossed (e.g. improper sexual acts, fights or murders, a death away from the bed, or working on the day of rest- Dacher 1997a:23-24).

The spirit world directly mirrors the human world, and spirits have their own headman who lives around the village sacred altar. Consequently, each compound has its spirits, each neighborhood its spirits, etc. Both at the level of the village and in smaller units (compounds), individuals must maintain these relationships (Dacher 1997a:19). The spirits thus create a dualistic connection with a community, as they both represent the

power of the earth, but also a social territory that is distinct from other villages.

A *nelenjigan̄tieno*, as the political headman, basically looks out for the well being of the community, including when to go to war. He asks for rain, peace and interestingly, he actually sacrifices for the spirits to protect against chiefs that abuse their power. As the *personification* of the village he must keep any disturbance at bay, including himself (Dacher 1997a:20). Consequently, there are some villages within which a *nelenjigan̄tieno* is not allowed to leave the village territory as bad things may happen. There is a great deal of variability in the *nelenjigan̄tieno*'s ability and reach of his spiritually based power. However, he is still a farmer, and he has no material advantage over others (Dacher 1997a:25). His other responsibilities include leading the village in war and deciding intra-village justice with the consultation of the council of elders. However, he has no actual power to *enforce* decisions other than his religious position.

Kinship and Regional Social Organization

Dacher divides Gouin regional organization into three different categories, the matrilineage (*huran̄ba*), the matriclan (*dun̄ngu*), and ritual alliances within the clan (*nyubin̄ba*) (Dacher 1997a:11). The *huran̄ba* is a group of kin that trace descent from a common ancestor. They are exogamous, and matrilineal inheritance makes them an economic unit. If the group is localized it can be recognized back many generations through a cult to the ancestors. At a corporate level, members are substitutable for one another in judicial and social actions. For example, a murder within the lineage is dealt with through sacrifice to purify their common ancestors, and lesser crimes are simply taken up by a council of the family. However, if the perpetrator is from outside the lineage, then the lineage must revenge the murder. The *huran̄ba* thus assures order by organic solidarity, and serves as a unit of accumulation and the transmission of riches (inheritance), but not of actual production (Dacher 1997a:11-12).

The Gouin have 6 dispersed *dun̄ngu* with a totemic avoidance (Dacher 1997a:13). However, they are not exogamous and function more as symbolic connections with roles at funerals and weddings; they also provide a place to stay for travelers when away from home. Within these matriclans is a third type of regional organization (*nyubin̄ba*), a ritual alliance of different lineages (Dacher 1997a:12). These are often made between lineages that have recently fissioned. In a sense these are basically an extension of a lineage, as they have mutual interdictions against murder and vengeance, are exogamous, and mutually perform sacrifices. One could add marriage alliances as a fourth regional relationship since the weight of the dowry forms strong relationships between communities.

Warfare

In the early 20th century, one of the primary regional integrative features that served to pull against ties to the local community was war. The events that ignited wars were usually the stealing of a woman, theft of property (e.g. livestock), and territorial incursions (e.g. the collection of game in someone else's territory). These were followed by the activation of war alliances based upon village organization and matrilineal kinship. Wars and feuds served to reaffirm the societies' cohesive kin units and break down some of the authority of village life. Inter-ethnic wars also occurred prior to the colonial era, as the Gouin moved into new lands (Dacher 1997a:21-22).

Gouin Society

The Gouin live in dispersed compounds composed of puddled mud structures (both round and rectangular) that are highly independent and generally have unspecialized craft production. Villages are based upon a cult of the earth with a spirit world that is a mirrored copy of the human community. The *nelejjigantieno* petitions the spirits on behalf of the village, and he generally has little authority over others, but his role is highly improvised and *nelejjigantieno* degrees of authority vary greatly from village to village. Dacher (1997a: 25-27) views the village organization as potentially unstable with no check on the potential power of the *nelejjigantieno*. However, due to the nature of kinship structures, villages have not established an interdependence of functions and powers, and potential authority would appear to be limited in this regard. The concept of the Gouin village community is thus very different from the Bwa, as the ritual organization is similarly sophisticated, but the civic sphere very weakly integrated.

The Lobi

The Lobi also inhabit southwestern Burkina Faso. The Lobi and the Gouin are very closely related, share many organizational features, and can even establish joking relationships with one another (Dacher 2005). Like the Gouin, the Lobi have been in a slow migration from Ghana since the 17th century (Labouret 1931). In this short section my intention is to explore some of the activities and organizational features of the Lobi that elaborate on those described for the Gouin, as the Lobi were observed in great detail at the very start of the colonial era when traditional economic systems and craft production were still universally practiced.

Compounds

The Lobi live in compounds made of puddled mud with rectangular buildings that are inhabited by agnates. A father and his sons (with their nuclear polygamous families)

are the production/consumption group. Compounds can have up to 600 members, but most contain no more than 175 (Labouret 1931:56). They do not fission by mother upon the death of a father like the Gouin. The enclosures are large in order to hold the livestock on the interior, however families with large herds construct stables outside. Grinding installations with multiple groundstone tools are set in open spaces (courtyards, vestibules), and rooms open onto the shared courtyard (Labouret 1931). Like the Gourounsi, the rooms of a nuclear family open one to another.

Herding, Hunting, and the Dowry

The Lobi highly value livestock, and they are used in dowries, compensations (bloodwealth, injuries), and as victims for sacrifices during funerals or ceremonies (Labouret 1931:130). Children care for the animals during the wet season, when they are kept close to the compound, however an adult is employed during the dry season when livestock must range further (Labouret 1931:133). The dowry can take many years to complete, and is divided into two identical sets: the first constitutes gifts for the in-laws, and the second is compensation for the wife. For example, if a young man gives 3 cattle, 10,000 cowries, and 4 years of work in the fields of his in-laws, then for their daughter he must also give a second set of the same (Labouret 1931:279).

Hunting is both collective and individual, however, hunting is only ever undertaken on the territory of the group or groups involved. Most frequently, a large number of villages get together to expand their collective territories, and hunts can involve as many as one thousand men. Collective hunts are organized by a chief of the hunt, who performs the necessary sacrifices and petitions for luck and good health. After the hunt, he has a right to the front left side of the large antelopes, but usually takes only a small portion (Labouret 1931:122-125).

Non-Specialized Craft Production

Lobi crafts are made within the compound, and there are no endogamous specialists. For example, Lobi potters are not in a special caste, are rarely the wives of smiths, and they are not endogamous (Labouret 1931:83-87). The actual organization of potting varies from house to house, with women in some houses only able to make one or two types of vessel, and exchanging for other vessel classes to fill their assemblage. Smiths are primarily farmers and not specialists, and Labouret (1931:69-70) states that this is because they don't have enough consignments to live from. The skills of the individual smiths vary, as was seen with potters, and some smiths only know how to make spears and knives while others specialize in hoes for agricultural labor. However, they are considered to have high status because the spirits with which they commune in

their work are very powerful, and no one may enter a workshop (Kiethega 1993b:45). As a result, Lobi smiths can do things that are forbidden to others (like orienting the door of their hut towards the east).

The Village

Lobi villages, like the Gouin, are composed of dispersed compounds on a common territory that is sanctified to the local spirits through the petitions of a village chief. The spirit pantheon is also similar, and spirits are conceived of living in a village that mirrors the human settlement. Individual households are united through neighborliness, relations with the spiritual world, and marriage alliances. Their villages have a much less structured community life, with fewer crosscutting tasks and religious groups. For example, the Lobi have the *Dyor*, an initiatory society that is the equivalent of the Bwa *Do* (Labouret 1931:414). However, unlike the Bwa, their initiation serves to consecrate individuals to the powerful protectors of the earth and fortifies them in a magico-religious sense. It has no civic or political nature, and consequently those who are not initiated are not considered of lesser status, or seen as children, as amongst the Bwa.

Mortuary Practices

Amongst the Lobi, headmen are buried in the courtyard of the concession, whereas others are buried outside the habitations (Labouret 1931:323).

Kinship and Regional Integration

The Lobi are matrilineal and compound residence is by agnatic group. Regional integration is provided by kinship, kin-based alliances, and matrimonial alliances (Labouret 1931). Clans denote individuals that share a name and descent and are exogamous and socially substitutable for one another (every individual is qualified to respond to a wound or murder of another clan member). Allied Clans likewise create groups that are socially substitutable. Matrimonial alliances are very strong, due to the heavy brideprice. Many of these alliances operated during frequent wars, and were considered very important. For example, when a clan member dies, an individual from the allied clan takes their symbolic quiver (a sign of their potency) and distributes arrows to the heirs (Labouret 1931:254).

Lobi Society

The Lobi live in dispersed compounds composed of puddled mud structures (mainly rectangular) that are highly independent and have unspecialized craft production. Their compound populations can get quite large as they do not fission each generation like the Gouin. The physical compound is itself expansive, with spaces for livestock

enclosures and collective grinding installations. The Lobi pay large dowries in cattle and other goods and services, and these create strong relationships between local families. The village is based in a cult of the earth with a mirrored spirit world similar to the Gouin. The Lobi initiation society (*Dyor*) provides a useful contrast to the Bwa *Do* society, as its main features are magico-religious and not civic, reflecting the weak integration of the Lobi village. Regional kinship and kin alliances are often activated by war, and in death. The strength of these institutions also pull against village integration, and consequently reduce the potential political power of community leaders.

Discussion

This section explores a diversity of topics that are essential to understanding the material patterns found at Kirikongo.

Clustered Houses vs. Dispersed Compounds

The Gouin, the Lobi, and the Gourounsi all traditionally live in villages of dispersed compounds, often several hundred meters apart. The compounds are closed structures composed of multiple puddled mud buildings, surrounded by garden plots. Socially, each unit is an extended agnatic family that is an independent and unspecialized production unit, including crafts. In comparison Bwa villages are clustered, with multi-house wards that open out into streets and plazas. Houses are the social equivalent to compounds (generally an extended agnatic family), although they are not enclosed. The village itself is surrounded by gardens and fields, as land tenure is centralized.

Socially, compounds in Gourounsi, Lobi, and Gouin territories are organized very differently. In the Gouin example, within a compound, brothers of the same mother combine as work groups; these are the same groups that either stay or leave upon the death of their father. The compound is still a single productive group, however, as members are all fed from their collective father's granaries. In a Gourounsi compound, the individual nuclear families are more autonomous, can farm personal fields, and control their own wealth, as long as they give their concession head the first of any class of article or animal. The Bwa house as an independent economic unit can only be divided into gender and age based groups, and there are few activities that are accomplished by a single nuclear family.

Livestock and Settlement Pattern

As early as 1912, Tauxier, in his survey of the cultures of western Burkina Faso noted that cattle-husbandry was correlated with weak local community integration, as it was found in societies with highly independent and dispersed compounds. This is likely

due to the spatial requirements of stock keeping, as well as the potential for disparities in wealth. In Gouin, Lobi, and Gourounsi villages, the large size and dispersion of compounds enables them to hold the livestock wealth of the family on the interior for protection from raiding and wild animals. Further evidence of the role of livestock in dispersed settlements is found in the modern Mouhoun Bend. In recent years several Bwa villages of the Bend have begun to herd cattle as a result of governmental encouragement, and consequently, villages have shifted from the traditional clustered settlement pattern to a dispersed village with wards set 100-200 meters apart (locals attributed this to cattle husbandry).

Livestock in Dowries, Social Transactions, and Sacrifice

Dowries are large in Gouin, Lobi, and Gourounsi societies, and are the responsibility of a compound head. They are primarily composed of cattle, but often augmented by gifts of various sorts, including fowl, small stock, and occasional bride service (work in the fields of the in-laws). In the surveyed societies, cattle keeping is always associated with bridewealth.

Livestock are also a social valuable. In cases of either kinship or alliance, when individuals of a particular social group are substitutable for one another, cattle can serve as compensation for a murder. For example, amongst the Lobi this is the case within a clan and between allied clans. In contrast, for the Bwa who don't keep cattle traditionally, the family of the murderer is required to provide a young girl to the family of the murdered person (this is the case for members within the same village community). It is through this girl, who is to be married in her new family that the dead person will be reborn. Cattle are also used in funerary ceremonies and feasts amongst the Gourounsi, Lobi and Gouin (see Goody 1962 for an excellent description of cattle use in funerary rituals by a Voltaic group).

Cattle, as a form of wealth are also tied into Gourounsi social ranking. This point will be returned to later, but it will suffice to say that the main materialization of authority is the right of Gourounsi chiefs to demand livestock (including cattle) for sacrifices, which they then consume. The Gourounsi are the only one of the surveyed societies that use livestock to assert permanent social differentiation.

In comparison to the other surveyed societies, the Bwa do not pay a dowry, nor do they use livestock in many social transactions. As a result, they keep few animals, and little energy is invested in their maintenance. Ideologically, the avoidance of cattle in Bwa society is a rejection of wealth differentials by limiting the very medium of wealth itself. Ironically, the Bwa territory is actually better land for cattle husbandry than that of

the Lobi or Gouin, as it is dryer and disease is less prevalent.

Domestic animals in all Voltaic societies are employed in sacrifices, including acts of petition and appreciation to the ancestors, divinities and spirits. Chickens are the most commonly sacrificed animals, however, goats and sheep, and more rarely dogs and cattle, are used as well.

Socio-Professional Specialization

The Gouin, Lobi, and Gourounsi all lack the endogamous craft specialists and griots that are found in Bwa society. In these societies there are multiple smiths, potters, tanners, groundstone shapers, griots, etc. throughout the village. In addition, activities are not coupled as they are in Bwa society. For example, smiths and potters are not husband and wife, smiths are not exclusively associated with digging (graves, wells). Crafts are mainly produced during the dry season in order to procure funds for various uses, private and by compound. Certain activities are imbued with ritual significance, particularly iron-metallurgy, but it can be dispersed in multiple compounds within the community.

Smiths in Bwa society produce iron objects, but also dig wells and burials, and make groundstone tools and wooden implements. They act in a secondary role as specialists in problem resolution where they channel the voice of the ancestors. They are feared and respected due to their relationship with the spirits of the earth. Griots serve as the Bwa free press, recording events and keeping the community history. They aid in problem resolution by helping to air problems and resolutions. Having a formalized information distribution specialist in a community helps to alleviate problems due to misunderstandings between members. They also specialize in making fabrics (leathers and cloth). The Bwa community-level economic interdependence (mutual dependence) creates organic solidarity, as well as non-hierarchical (non-centralized) differentiation in conflict resolution in the public sphere. These communal functions are consequently absent from the unspecialized communities of the Gouin, Lobi, and Gourounsi.

Hunting

Communal hunts are ritualized in the four surveyed cultures, however, the organization of the participants is a reflection of the organization of their respective political entities. For example, in Gourounsi society collective hunts are organized by chiefdom; in the Lobi and Gouin case they are done by clan or multiple allied villages; and Bwa communal hunts are primarily executed by village age sets within the context of the *Do*. In other words, communal hunts bring together the highest-level political action unit.

Individual hunting has two variants. The first is active hunting that is ritualized

and consequently requires sacrifices. The second is field hunting, intended more to protect crops than kill animals. Kills in this category are not ritualized and do not require sacrifices. For example, the Gourounsi always take their weapons to the fields with them. This is partly due to the dangerous cultural environment found in the 19th and early 20th century Gourounsi land, but also likely due to the dangers of wild animals (lions, hyenas, leopards) that are found in high density throughout the savanna. They kill any animals that threaten the farmers or the fields (e.g., monkeys are considered particularly dangerous to crops) (see Duperray 1984, and Barral 1968).

Authority in the Political Process

Bwa society has a number of institutionalized offices that serve as checks and balances in the political system, both within a house as well as in the community. The *loso* has limited power, and must consult with the *lunikiâ*, by whom he can be removed. Likewise within houses there is little wiggle room for bad behavior by a *duso* as the *naleso* is delegated authority over the wealth and goods of the house, the *faranyuso* directs labor, and the *kâla* oversees distribution of goods. In addition, the *duso* must consult and listen to the two councils, the *maaba* and the *dunikia*. The *loso* and the *dusos* are aided in conflict resolution and judicial proceedings by other religiously sanctioned authorities, the smiths and griots.

Village authority structures are also dualistic in Gouin society, with an earth priest (*hienmanjigantienjo*), whose authority may be split between compound heads, or combined with the authority of the political headman (*nelenjigantienjo*). *Nelenjigantienjo* can control a great deal of authority, as civic systems are weak and they often improvise the degree of authority in their office. This provides a contrast to the highly integrated Bwa system, where the *loso* and *duso* are checked by an internal bureaucracy of officers and civic actions are directed by the *Do*. There is a council of elders at both the compound and village levels that are consulted in decision-making.

Amongst the Gourounsi, the *pio* manages the village territory and external affairs. His authority is derived from a protective spirit, the *kwára*. Unlike the other societies surveyed, the Gourounsi chief's authority is materialized through his right to demand animals and other goods for sacrifices intended to maintain peace and well-being. There are several offices that may represent the original social organization of the society before the emergence of chiefs. The *tiatiu* is the descendant of the village founder, and essentially holds all the same authorities that would be considered *nyumuni* by the Bwa (but known as *tia* in Gourounsi contexts), and acts as the petitioner with the local spirits, although his political authority is quite reduced. In this sense he is *nyumuniso*, but cannot

be the *loso* of a Gourounsi community. The chief of the masks is a moral authority and petitioner to the ancestors who holds authority similar to the Bwa *tûso*, but his authority is also very limited.

Authority in a Gourounsi compound is materialized in space as the *kélé k'ébal's* huts are set directly opposite the compound door. However, nuclear families are very independent, and the *kélé k'ébal's* position is less controlling than the other surveyed groups, despite his control over the dowry. The *kélé k'ébal* is assisted by a council of elders.

Initiation, Religion, and Civic Duty

The civic nature of the Bwa initiation and age set organization is unique in the survey. The *Do* is a religious and civic society that results in a structured socialization for young and old alike, in crosscutting community tasks and activities. Initiation and religious education are not limited to the cultivators, as smith/potters and griots participate, nor is initiation only a male enterprise, as women have their own groups. The *Do* is also the cultural feature by which the Bwa identify their ethnicity. As Labouret (1912) described for the Lobi, the initiation society was not a political or civic enterprise, it mainly entailed socio-religious strengthening for individuals, and provides a stark contrast from the Bwa example. Amongst the Gourounsi, initiation societies are similarly more religious than civic, and collective tasks are less frequently organized according to them.

Regional Integration and Disintegration

In the surveyed societies, regional integration is related to the strength and organization of kinship relationships, and the strongest are found in matrilineal societies with agnatic residence: the Gouin and the Lobi. These both are spatially expansive societies tied into a village community that is not necessarily based upon descent, but mostly upon a pact with the local spirits. Community disintegration and regional integration is maintained through the matriline, the clan, and kin-based alliances, for which members are socially substitutable. These relations are further strengthened by warfare and feuds that call them into collective action. Regional integration is also maintained by inheritance through the matriline, separating the accumulation network from the production and consumption unit.

The Gourounsi and the Bwa are both patrilineal with agnatic residence. Unsurprisingly, they are less widely regionally integrated. Both Bwa and Gourounsi villages are often derived from long-term internal demographic growth, resulting in more localized traditions without tales of migration. Neighborliness and marriage

alliances form the only lasting bonds in the Bwa case, whereas Gourounsi political organization creates stronger regional relations, as does marriage that is accompanied by a dowry. Wealth is transferred through matrimonial alliances and ritual sacrifices in the Gourounsi case, not through kin ties, and these are mainly localized within the chiefdom. Conversely, the Bwa do not transfer wealth outside of a community. Warfare between Bwa villages asserts their independent status, as opposed to asserting a regional status in kinship, and consequently few battles extend beyond the immediate area of a community. The Gourounsi go to war by chiefdom, however events do not extend far beyond chiefdom borders. For the Bwa and Gourounsi, internal growth has created many localized traditions, such that collective action is rare to non-existent beyond the political borders of their polity, whether village or chiefdom.

Modeling Inequalities

In her analysis of Gouin social organization, Dacher (1997a) describes a diverse set of individual attempts by *nelenjigantienjo* to gain extra authority, providing interesting insights into the origins of rank in the region. Some *nelenjigantienjo* have inserted their own personal fetish into the village religious system that is considered the second, or even the most important altar in the village in comparison to the sacred foundational altar (symbol of the local spirit protector). In other examples, the ancestral family is imbued with a special invisible force derived from and sanctioned by the village spirit. These mysterious phenomena contrast with the common religious system that is based in a positive (helpful) spirit world that is neither political nor exerts influence over peoples lives. To augment authority then, a chief must create a separate fetish based in his agnatic line, that can be the source of authoritative power due to mysterious origins.

The Gourounsi chief's (*pio*) authority is also based in a fetish that is the village/polity protector, and is remarkably similar to the Gouin case. The *pio*'s authority is not based in the earth (*tia*) nor held by an earth priest (*tiatiu*), just as it was not based in the Gouin role of *hienmanjigantienjo*. Interestingly, the role of *tiatiu* is essential to Gourounsi villages, as it is based in the founding pact between the village ancestor and the spirits, but political authority is based in the *kwára*, a protective spirit with a material fetish that only the *pio* can access. His role as political head is quite similar to the Gouin *nelenjigantienjo*, and thus a politically based religious authority can be negative, demanding, and the source of inequalities.

The *kwára* is the source of community well being and must be given sacrifices to maintain order. Thus, the elites require the villagers to bring animals and other goods (i.e. social capital) that constitute the community surplus, to sacrifice for all. In extreme cases,

like the village of Bouyounou, the process of social ranking into elites and commoners led to disparities in diet breadth and quality.

In reference to modeling the origins of rank, it is clear that the social contract provided by the founding of a village with the local spirits is necessary to the community, even after ranking occurs. So, in the case of the Gouin and the Gourounsi, a potential elite must shift the nature of authority to another source over which they have sole power (a fetish) with no history of its potential power, it provides an easily usurpable source of authority. The implications of this analysis are explored later in reference to the data from Kirikongo.

Conclusion

Despite several overall similarities amongst Voltaic groups, clear differences emerge between egalitarian and ranked societies, locally integrated egalitarian and regionally integrated egalitarian peoples, patrilineal societies with agnatic residence and matrilineal societies with agnatic residence, and concentrated and dispersed villages. These differences echo throughout society in a variety of ways, affecting the organization of institutions and authority structures. In the next chapter these referential frameworks will be integrated with the data from archaeological fieldwork to explore the changing nature of political authority at Kirikongo.

Chapter 15

Archaeological Patterns and Social Process

This chapter explores the social and political significance of the archaeological data recovered from Kirikongo. The following temporal trends are examined: dispersed mounds to clustered mounds, generalized households to specialized households, closed compounds to open wards, bridewealth and animal sacrifice to bride service and animal sacrifice, garden hunting to collective hunting, the emergence of ritual architecture, restricted cemetery burial to a generalized mortuary program, and regional integration to local autonomy. The understandings derived from the following discussions are critical to the evolutionary model advanced in the final chapter. (A summary of the information in this chapter is available in Table 15:1)

Spatial Organization: From Independent Mounds to a Clustered Village

Changes in the spatial organization of Kirikongo suggest dramatic transformations in the community and land tenure system over time. During Yellow I to mid Yellow II, Mounds 1, 4 and 11 were dispersed (ca. 200 meters apart) in a north/south line following the edge of the laterite ridge. Their respective locations, above seasonal flooding, provided each with access to deep farming soils. In the ethnographic survey, when compounds were dispersed they were self-sufficient and independent entities in relation to a village. Concerning land tenure, the distribution of mounds adjacent to deep soils suggests a need to assert access to fertile land, and it is not clear if the inhabitants of Mound 4 controlled access to land until the period after Mound 11 was founded.

At the start of Yellow II a cemetery for Mound 4's dead (Mound 3) was founded near the village center and seasonal drainage. Since cemeteries sometimes mark corporate control over territory, the relationship between Mound 4 and Mounds 1 and 11 likely changed. At the end of Yellow II, Mound 4 began to exert a gravitational pull towards new social groups. Mounds 6/7 and later Mound 2 (early Red I) were founded at much shorter distances from Mound 4. These new mounds were no longer set next to fertile land. Rather, the spatial priority shifted to a newly emerged community center that likely decided and assured the distribution of land. This period may mark the beginning of a

Years AD	Ceramic Phase	Village Layout	Iron Working	Pottery Production	Domestic Architecture	Food Preparation	Domestic Fauna	Wild Fauna	Ritual Architecture	Mortuary Practice	Trade
100											
200											
300	Yellow I	Single Homestead	Single Production Location	Single Production Location	Round Huts Pisé Walls Yellow Floors		Bridewealth and Sacrifice	Garden and Field Hunting			
400							Sheep Goats Dogs Cattle	Oraibi Duiker Monkey Cane Rat Rabbit Mongoose Bird			
500							Chickens increase throughout				
600	Yellow II	Dispersed Compounds	Production at All Habitation Mounds							Mound 4 Buries Adults in Mound 3 Cemetery Marked by False Huts Buried in Mound 4	
700										Mound 1 Buries All Dead in Mound 1	
800											
900	Red I	Clustered Compounds	Specialized Production at Mound 4	Production at All Habitation Mounds	Round Huts Mudbrick Walls Paved Red Floors in Interior and Courtyard Contexts	Grinding in Huts					
1000											
1100											
1200	Red II						Sacrifice and Brideservice	Communal Hunting and Field/Garden Hunting	Ancestor House	Infants in Cemetery	Cowries in Cemetery
1300	Red III	Densely Clustered Compounds	Specialized Production at Mound 11	Specialized Production at Mound 11	As Above With Paved Terrace Roofs and Rectilinear Interior Compound Walls	Grinding in Unpaved Courtyards	Sheep Goats Dogs Cattle (one) Chickens (lots)	Roan Antelope Hartebeest Kob Reedbuck Bushbuck	Second Ancestor House	All Infants Buried in Residential Mounds No Cemetery Identified	Cowries in Ancestor House
1400											

Table 15.1: Temporal Distribution of Activities at Kirikongo

concentric circle land tenure system similar to that practiced by the Bwa today.

During Red II additional mounds were settled to the south of pre-existing mounds, creating a denser spatial pattern in the village core. The paired mounds might have been wards, the elongated blocks consisting of multiple adjacent extended families. By Red II, the density of the village center was set against an increasingly separate Mound 11, still located over 200 meters from the village core. The increased clustering suggests maintenance of the gravitational pull of the Mound 4 center, and an increasingly large group over which land tenure decisions had to be made.

In the end, Kirikongo's spatial organization had much in common with modern Bwa clustered villages that are spatially centered on the ancestral lineage. While Kirikongo lacked the plaza found in modern Bwa villages, all mounds in the village core were located around two plazas that lay to either side of Mound 4, and all except Mound 1 had a direct view of Mound 4. Kirikongo was not as concentrated a settlement as a modern Bwa village, the result of a history that began with a very dispersed settlement. In summary, the general development over time was from dispersed independent compounds that controlled access to fields to a clustered village with centralized control over space.

From Generalized Compounds to Specialized Wards

Early in the sequence during Yellow I and II, all mounds showed evidence for smithing and several smelting furnaces were in operation. Multiple potting traditions were also identified throughout the village. In the ethnographic case studies, non-specialist craft production took place in communities where compounds had a high degree of independence.

By late Yellow II through Red I, an important shift occurred in iron production. Slag levels dropped throughout the site and furnaces were abandoned, with the sole exception of Mound 4, where slag levels increased and Furnace 1 still operated, to be joined shortly after by Furnace 3 south of Mound 4. The social implications of Mound 4 co-opting metallurgy are profound, particularly as this was also the period in which new mounds begin to cluster around Mound 4. Despite these trends in metallurgy, during this period there were still multiple active potting traditions in the community. It seems that these two processes were unlinked (husband and wife) at this point, which is common in villages without *specialist* craft producers. However, even in societies where metallurgy is not specialized, like the Lobi, smiths are still highly respected.

Another transformation in iron production, now coupled with a shift in pottery production, dated to mid Red II. Slag was found again at Mound 11, and iron smelting

was removed to a group of at least three furnaces located 250 meters to the west of Mound 11. Specialized pottery production was attested by the disappearance of variability within the pottery assemblage (i.e. vessels could be placed into discrete size classes, and assemblages throughout the village were identical). Secondly, two pottery kilns dating from late Red II to Red III were found near a hut with a potting tool kit.

These craft specialists lived on an isolated mound away from the village core. In Bwa society, as well as in the neighboring Mande societies, smiths and potters are husbands and wives who are in constant communion with the earth and the divinities. They are both respected and feared. The uncoupling of metallurgy from the village headman's compound was part of a larger pattern of a weakening in power of Mound 4's inhabitants. It is likely that at this point the smiths began to serve as arbiters in the village community.

In summary, the production of metals and pottery production were dispersed during the early occupation (Yellow I and early Yellow II) into highly independent, self-sufficient compounds. By Late Yellow II to early Red II, iron production was co-opted by the founding lineage (Mound 4) and combined with the authority derived from their ancestral right of territorial control. During mid Red II, metallurgy and potting were transferred to a mound situated outside the village center. The result was specialist smiths and potters living on the edge of town, whose skills probably held the same religious significance as in modern Bwa and Mande societies.

Domestic Architecture and the Residential Use of Space

Architectural information from Yellow I and II is scarce, but it appears that villagers inhabited round puddled mud structures with pounded clay floors. During Red I small round huts were set around paved open courtyards, some of which held features including chicken coops. In Red II and III, some huts had terraced roofs, and by Red III there was evidence for sets of interlocking rooms, both round and rectangular, that were all roofed and had straight exterior walls. There were clear paved and unpaved areas, marking interior and exterior spaces. These structures resembled the elongated Bwa wards. In all periods, round huts ranged in size from 4 to 6.25 m², and probably held a single adult and children.

The most commonly identified items in huts were grinding equipment and pots. According to Manessy (1960, see also Laboret 1931), these items constitute the wealth of a woman, and she can derive considerable prestige from owning and maintaining nice pottery and groundstone tools.

An organizational shift in food processing was identified by the location of grinding. During Red I, Structure 3 at Mound 1 contained a bench that extended out from the southern wall, and to the north of the bench was a shallow depression filled with large broken sherds. Similar to modern grinding installations, a container was placed to catch the flour while grinding on a bench. In Gourounsi society women grind within their huts, and it is associated with their highly independent nuclear families with some private storage. Evidence from structures built after the middle of Red II suggest that grinding shifted location towards unpaved exterior courtyards. These more public grinding areas were found in Mounds 1, 3 and 4. An example from Red III at Mound 4 (Episode 8) was likely a raised table with a pavement tabletop, as I have observed in Bwa villages of the Mouhoun Bend today. The shift to a more open grinding arrangement marks a general societal shift towards a more open community, and perhaps a change in household organization from fairly independent nuclear families (e.g., the Gourounsi system) to a more centralized system (e.g., the Bwa system).

Domestic Animals: Sacrificial Offerings and Social Capital

Changes in the distributions of the domestic animals used at Kirikongo suggest dramatic social transformations over time. The villagers kept cattle, sheep, goats, and dogs from Yellow I to early Red II; chickens arrived by Yellow II. In relative frequencies, samples from mid Red II and III showed a significant reduction in cattle, a substantial drop in dogs, and a large increase in chickens. Goats and sheep were found in slightly lower frequencies during the late period.

Caprine and dog bones were the most common species in the early period. Large quantities of dog bones are unsurprising, as today they are considered the meat *par excellence* by many societies in the Voltaic region. In these cultures, dogs are used as security in addition to sacrificial offerings. Between the early and late period at Kirikongo dog quantities fell considerably. When viewed against the long-term trends within domestic animals, it is clear that chicken exploitation increased as dogs declined (and as caprines fell slightly as well). Given their prominence in ritual sacrifice today, the decrease in dogs and caprines could be due to a functional replacement by domestic fowl.

With the frequency of sacrifices, chickens may have made better economic sense, as they require less labor than livestock or dogs and are less expensive. The continued use of sheep and goats relative to dogs was likely due to secondary uses beyond sacrifice. For example, sheep and goats are also kept for their manure, and occasionally as money to buy salt or cloth at the market. Dogs however, are simply used for security. Dog meat may be one of the most appreciated, but due to the sacrificial use of animals and the

availability of a cheaper substitute, people ate fewer dogs over time. However, it doesn't appear that chickens were an instant hit at Kirikongo when they arrived by Yellow II. It took several hundred years to integrate this foreign animal into the ritual system. Since Kirikongo's inhabitants were rooted in Late Stone Age social and economic processes, goats, sheep, cattle, and dogs were socially integrated long before the first chicken appeared.

It is not likely that the drop in cattle was due to their replacement by chickens in sacrifice. Within the Voltaic region, where people today keep cattle, one of their primary uses is in dowries, and societies that lack dowries (both Voltaic and Mande, e.g. the Bwa, Bobo and Samo) do not keep cattle. It is likely that Kirikongo's early inhabitants were using cattle as documented ethnographically, in dowries, funerary sacrifices, or for storing wealth and supplying manure. Societies that do not keep cattle, like the Bwa, are strongly egalitarian and have general interdictions against the accumulation of wealth. By rejecting the very means of accumulation (cattle) and the reasons for accumulating wealth (dowries), Bwa society maintains its ideology. In addition to avoiding inequalities, the drop in cattle -- during Mid Red II almost certainly indicates a shift from bride wealth to bride service, agricultural work in the fields of the in-laws, with the help of your age set (possibly based in the *Do*) for one to two days. This is a transformation from a household model for the facilitation of marriage to a communal model, based in the collective labor of the age set. The pattern cannot be attributed to environmental change, as the region actually became more conducive to cattle husbandry during Red II.

Regional Integration, Local Autonomy, and Bridewealth

The operation of cattle bridewealth in long-term sedentary communities organized by unilineal kinship inevitably leads to inequalities over time, and these cannot be dealt with extensively the way mobile societies such as the Nuer deal with them. In the *Nuer Conquest*, Ray Kelly (1985) suggests that the very organization of unlimited Nuer bridewealth creates an insatiable need for cattle, and has spurred collective actions and widespread expansion at the expense of the Dinka. Nuer practices are unlikely to create large disparities in wealth or lead to ranked social segments due to the constant regional dispersion of cattle, but they do create regional relationships that result in collective actions. Evidence from Kirikongo lends support for Kelly's hypothesis, since the rejection of cattle at Kirikongo was part of a general rejection of rank and *region*. At Kirikongo, the desire for village independence and intra-communal equality required a switch to non-economic social transactions, as opposed to *unlimited* Nuer-style socio-economic transactions. As much as the Nuer are systemically expansionist, the inhabitants of Kirikongo were systemically local, as the Bwa are today.

Hunting: From Garden Hunting to Collective Hunting

Between Yellow I and early Red II, the inhabitants of Kirikongo hunted in their gardens and fields. They caught animals known to exploit crops, including monkeys, rats and small duikers. In Gourounsi society, field hunting is opportunistic and consequently not ritualized. It is unlikely given the size of animals and cursory hunting methods that game provided significant economic input into the economy of Kirikongo. In the survey of Voltaic societies, collective hunting was a universal practice, despite differences in organization. The reasons for such limited hunting during the early occupation at Kirikongo are unknown, and may have been based upon limitations of weaponry (e.g. lacking bows and arrows), or an unknown social variable.

Collective hunting is attested by multiple depositional contexts during Red II and III. Species distributions in the samples include animals that are not encountered near human settlements, and require active expeditions. In addition, they are found in trash lenses with multiple species of different sizes from different ecological zones, a collective hunting signature. Cremer (1924) recorded hunting stories from near Dédougou during the first years of the 20th century, and his informants suggested that kobs (likely both kobs and reedbucks), as well as hartebeest were important in collective hunting. Further south amongst the Lobi, Labouret (1931) accompanied villagers on a collective hunt and recorded the combined kills, which included kobs, waterbucks, roan antelopes, bushbucks, little duikers, and hartebeests.

Cross-culturally in the Voltaic region, collective hunting is ritualized and considered a strong symbol of social integration. For example, in Bwa society collective hunts follow a prescribed set of social patterns and ritual acts that are very similar to those described in the other three societies. There is a leader of the hunt who directs the actual event, and an elder who makes sacrifices to the forces of nature for both luck and success. As suggested earlier, the party by which a society hunts is closely related to their social organization. A shift to communal hunting at Kirikongo coincided with the emergence of economic specialization and a clustered village, suggesting that hunting may indicate the creation of cross-cutting religio-civic activity groups, as seen in the *Do*. However, this must remain a tentative suggestion until more data on social organization during Red II and Red III are recovered. At the very least, the shift in the hunting pattern suggests the emergence of structures or concepts of community in which a larger social group actively combine to hunt.

A final pattern in the faunal data concerns Mound 11. From Yellow II to Red I, the fauna spectrum was largely comparable to other mounds, and representative of garden hunting. After Red I, there was not a single wild animal bone (save for one rat) found in

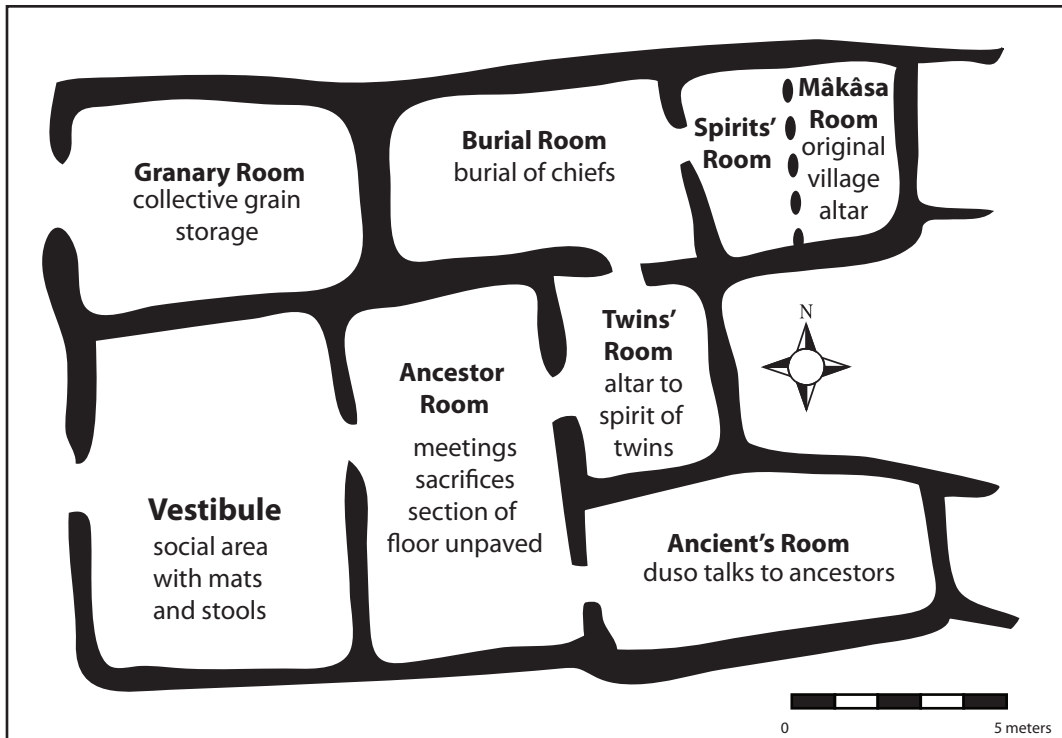
the deposits, despite a fairly large sample of domestic animal bones. This would imply that the inhabitants did not engage in either individual or collective hunts.

Ritual Architecture

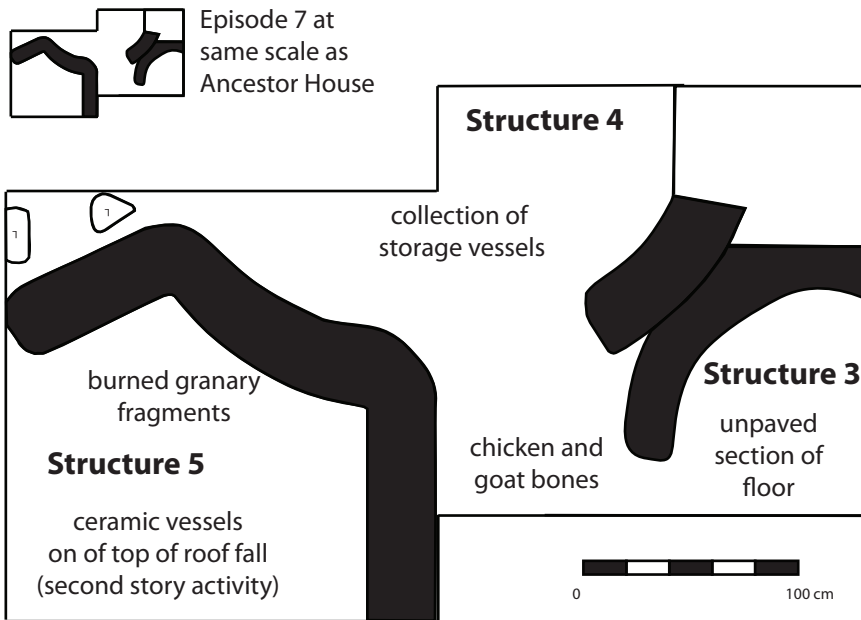
All buildings at Kirikongo were domestic structures with the sole exception of those from Episode 7 on Mound 4, dated to Red III. This set of three rooms shares many features with the Bwa ancestor house (Figure 15.1). Structure 3 was filled with a variety of pots (some containing sorghum) and a few bowls set in a room built with special square mud bricks and containing multiple doors. Capron (1973: 222-225) recorded a similar room (the granary room) in the ancestor house of the village of Toukoro that contains a series of amphoric mud granaries and hemispherical pots of different sizes, holding the grains and diverse food products derived from annual prestations by members of the community and destined for sacrifice on the community altars. The room's contents also serve as a reserve for feeding travelers and helping needy families. In addition to food, cowries and diverse material culture that represent the wealth of the community are placed in the room, and it is not surprising that two of the three cowries from non-mortuary contexts at Kirikongo were found in Structure 3.

Structure 4, the room directly to the south, contained a sacrificial feature composed of chicken and goat bones near a patch of unpaved floor, a knife sharpening stone and several pots. The ancestor house contains a room known as the ancestor room where the *dunikia* and *lonikîâ* meet to deliberate, first on the affairs of the family, second for those of the village community. More importantly regarding the material patterns, this room is where the *loso* make sacrifices to the ancestors, without an altar. The soil itself receives the blood of victims and different offerings (e.g. sacrificial meats, millet beer), and the unpaved space in Structure 4 matches this description. The room also usually contains a large jar that holds ceremonial holy water.

Structure 5 has no direct analogue in the ancestor house, containing only a large mud granary, and it is uncertain whether this space actually was part of the complex. However, a second story room did collapse into the structure. One of the only two-story buildings in a Bwa village is a terrace room in the ancestor house. The terrace is a setting for the celebration of diverse rituals. For example, during funerals fiber masks are put together there to honor the dead. It is also upon the terraces that they prepare the food and serve a communal meal during some religious ceremonies. The room is entered by a staircase (or ladder) from the adjacent ancestor room (see above), and it is possible that this was the case as well at Kirikongo.



Ancestor House at Toukoro. There is a terrace room on the second floor above the Ancestor House (redrawn from Capron 1973: 223)



Mound 4, Unit B, Episode 7 Detail

Figure 15.1: Comparison of Bwa Ancestor House and Mound 4 Episode 7 Structure

The rooms discovered at Kirikongo seem to match functions with three ethnographically described rooms in a Bwa ancestor house. The presence of a structure with similar functions to the ancestor house on the summit of the central mound in the site after Red II is a very important line of evidence for understanding Kirikongo's evolution. However, the most obvious aspect of the Episode 7 structures is that they burned down, not once, but twice, as a new ancestor house was built directly above it. Two destruction episodes for a single important ritual building are likely not the result of a coincidence. Warfare was fairly frequent in pre-colonial Bwa society, although primarily limited to short affairs and not entailing architectural destruction.

The Dead

Mortuary practices were dynamic over time at Kirikongo, revealing much about the nature of the community. No burials were identified in Yellow I deposits. However, starting in Yellow II, and continuing through Red I, adults from Mound 4 were interred in a cemetery area. Their tombs, sometimes collective, were covered with small mounds of earth atop which were placed false huts, while infants were simply buried within the mound. Conversely, both adults and children from Mound 1 were buried within their compound, in courtyards and abandoned buildings.

By early Red II the nature of burial in the cemetery changed. At least nine infant/small children burials were found together in the cemetery, placed in separate pits, and covered with a fill contained cowry shells. These constitute the earliest cowries recovered from Kirikongo. Following these burials, the cemetery was closed and covered over during mid Red II. At the same time adult burials disappeared altogether from mounds in the site, and children's burials were interred in courtyards and abandoned buildings in occupation mounds.

The ancestors play a large role in the lives of all Voltaic groups, who believe that communities are composed of both the living and dead. The emergence of a cemetery during Yellow II coincided with the transformation of the settlement from a single homestead to a village, and was likely an assertion of territorial authority by Mound 4, the founding lineage. There is no mortuary evidence, however, to suggest large status differences in the community before Red II. The false huts that were found in the cemetery were small structures not surrounded by architectural collapse, and were likely only 20-30 cm high when erected. These are similar to modern Gourounsi structures atop burials, sometimes collective, that serve to mark tombs and also provide a place to sacrifice to the ancestors. The cemetery probably represented a house of the dead for the ancestors of Mound 4, and likely for the village community as well.

The shift to the burial of infants and small children by Red II, with their own monuments and covered with fill containing cowry shells, was a dramatic departure from previous mortuary practices. In most Voltaic traditions, infants do not warrant full burial treatment, as they are not full members of the village community. This is why the Bwa see initiation as “awakening” into the community. Goody’s (1962) analysis of the LoWiili and LoDagaba societies in northern Ghana suggests that infants are often not even buried in the religiously powerful earth, as they are barely classified as persons. Instead they are laid on the ground away from the compound and covered with little earthen mounds, while adults are buried in pits within the compound or directly outside. In burying dead infants who are not initiated with the ancestors, Mound 4 was asserting a shift towards permanent social differentiation, with a birthright accorded infants to a position in the village pantheon.

Following these events the rejection of social ranking was marked by closing the cemetery. In many Voltaic societies, headmen are buried in the compound while other adults are buried near the compound door. It is possible that the post-Red II mortuary pattern resembles this program, since the majority of adults would be buried off the mound, but this suggestion must remain tentative. Regardless, the shift in mortuary patterns was village-wide, and the closing of the cemetery implies the weakening of the authority of Mound 4 at this point, mirroring several other lines of evidence. Lastly, the fact that small children/infants and adults were consistently buried together or differently from adults suggests the presence of a baptismal, or initiation process.

Trade and External Relations

The only evidence for trade at Kirikongo is cowry shells from Red II and Red III. These were used in the pre-colonial and early colonial period as a monetary unit in West Africa. Then and now they are also ritual items, and many societies embellish objects and clothing with cowries. The Voltaic societies discussed earlier contribute little to regional trading networks, and the main commodity that was traded for, at least at the beginning of the 20th century, was salt.

Outlining a community’s external relations in the absence of trade items is difficult. However, among the surveyed societies presented in Chapter 14, in the case of unranked societies increased communal integration is correlated with regional disintegration. It is clear that by mid Red II, Kirikongo was highly internally integrated, but it was also likely monolineal. This suggests that, at the very least, matrimonial alliances with other villages would be necessary, although not accompanied by an economic transaction (dowry).

Another indicator of regional disintegration is competition between villages to assert their independence. During Red III, the symbolic center of the village was attacked twice. It may be that immediately following the egalitarian revolution, the independence of communities was asserted more vigorously (see below). It is also equally possible that during Red I and early Red II, Kirikongo's elites controlled more than simply their village, and highly symbolic acts were used to assert independence in a region with recent memories of unequal relations.

Chapter 16

A Model for the Evolution of Kirikongo

Based upon the previous chapters, I now present a model for the emergence and development of Kirikongo over 1300 years. The sequence is divided into five temporally bounded varieties of community. Each period contributes critical insights into regional developmental processes as the settlement grew from a compound to a village, evolved into a ranked society, and returned to egalitarian village life following a societal revolution.

The Homestead Period (AD 100-500): Community as a Regional Phenomenon

The original settlement at Kirikongo (a single mound) was likely an extended family compound, owing to the requirements of a generalized economy and the constraints of the environmental setting on farming (Figure 16:1). Broad cross-cultural studies of family structure suggest that extended families help to cope with labor shortages in areas with abundant lands (Netting 1982; Netting et al. 1984). The inhabitants of Mound 4 were self-sufficient, performing a wide array of economic tasks, from cultivation, herding livestock (including cattle), smelting and smithing iron, potting, and likely many other activities. They lived in a region where the extreme seasonality of the rains and poor fertility of the soil create labor bottlenecks. Even today, the extended family compound is the smallest social group for modern non-specialized egalitarian Voltaic farmers.

As a small settlement, Kirikongo must have interacted with a wider community for social and demographic reasons. In the first half of this dissertation it was suggested that during the early first millennium AD there were similarities in ceramic styles and decoration techniques from northern Ghana to the Mouhoun Bend, following the Black Volta drainage. This extensive interaction zone would be consistent with a general homestead settlement pattern covering a wide area. Since Kirikongo remained a single kin community for over 400 years, it is likely that extra-community fissioning continually occurred to contribute to regional population growth. Fission can play an important social function in areas with low population densities, as it creates social distance between

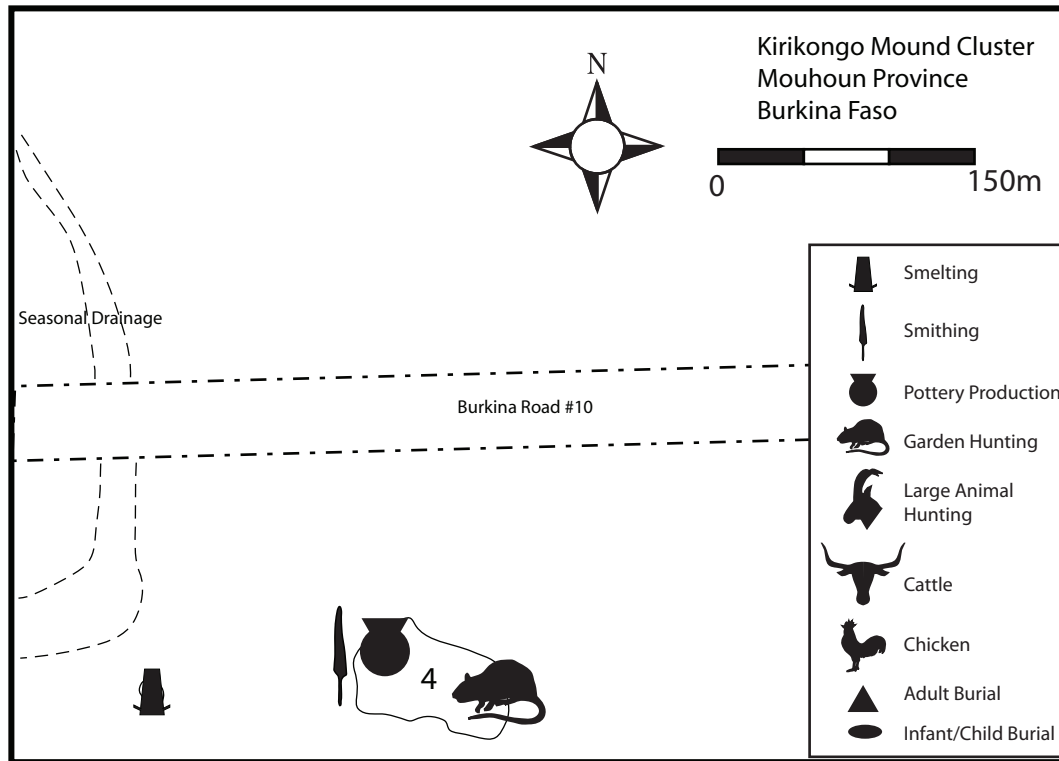


Figure 16.1: Spatial Distribution of Activities at Kirikongo During Early Yellow I

communities, and can shorten the time between which there are marriage interdictions.

The early compound at Kirikongo therefore presents a possible model for the small Kintampo and post-Kintampo sites found throughout the Voltaic region during the first millennia BC and AD.

The Transition to Village Life (ca. AD 500)

The second compound (Mound 1) was not founded until the middle of the first millennium AD (Figure 16:2). This marks the beginning of a multi-compound community, likely as a result of increasing local population densities. The characteristics of the settling of Mound 1 resemble the natural outgrowth of an as yet *unmodified* societal model based in fission processes that produce identical self-sufficient homesteads. Mound 1 settled at a distance (over 200 meters) from Mound 4, positioned itself with access to its own farming lands, set up an iron furnace, and produced its own pottery. This community (lasting for 1 to 2 generations) likely operated by an extension of kin ties, and because of these recent genealogical relations did not require new mechanisms of social integration. Similar situations have been recorded ethnographically in small communities where recent intra-community fission has occurred (Capron 1973).

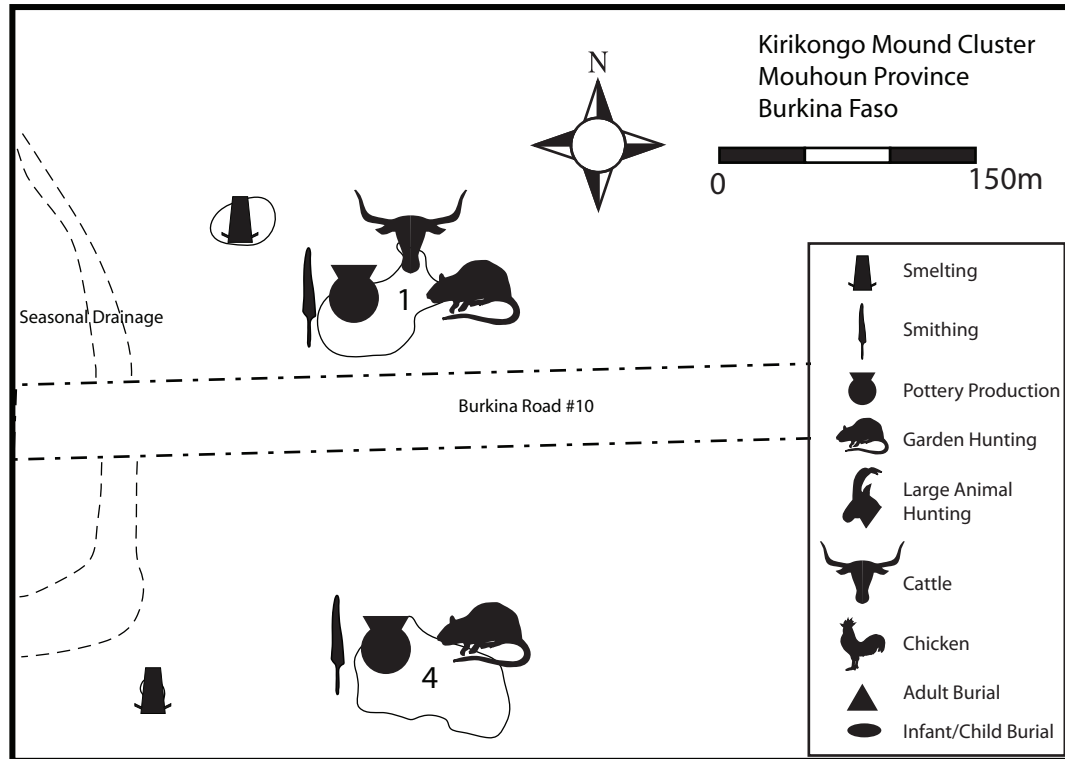


Figure 16.2: Spatial Distribution of Activities at Kirikongo During Late Yellow I

The Emergence of a Village Based on Common Descent (AD 500-700)

At the start of Yellow II, Mound 11 was founded ca. 200 meters north of Mound 1 (Figure 16:3). The community now had three compounds and was challenged to construct a society with authority structures beyond a single-family model. Archaeological data suggest the emergence of a village based upon common descent, with the inhabitants of Mound 4 extending corporate control over the territory as head of the village community.

Cemeteries often correlate with corporate lineal inheritance of restricted resources (e.g. Goldstein 1976). Yellow II witnessed the creation of a cemetery at Mound 3: a mounded burial monument for the inhabitants of Mound 4. False huts were set atop individual and group tombs and may have served as altars for petitioning the village ancestors. The burials of individuals from other mounds were restricted to their respective residential areas, and lacked false huts. This mortuary program was a materialization of Mound 4's authority over a village territory.

By this point, the well being of the *community* on its territory was likely only assured through Mound 4's intercession in sacrifice. A universal feature of Voltaic societies in founding a village is the establishment of ties between a leader of the community and the local spirits. During Yellow II we see the first evidence of an

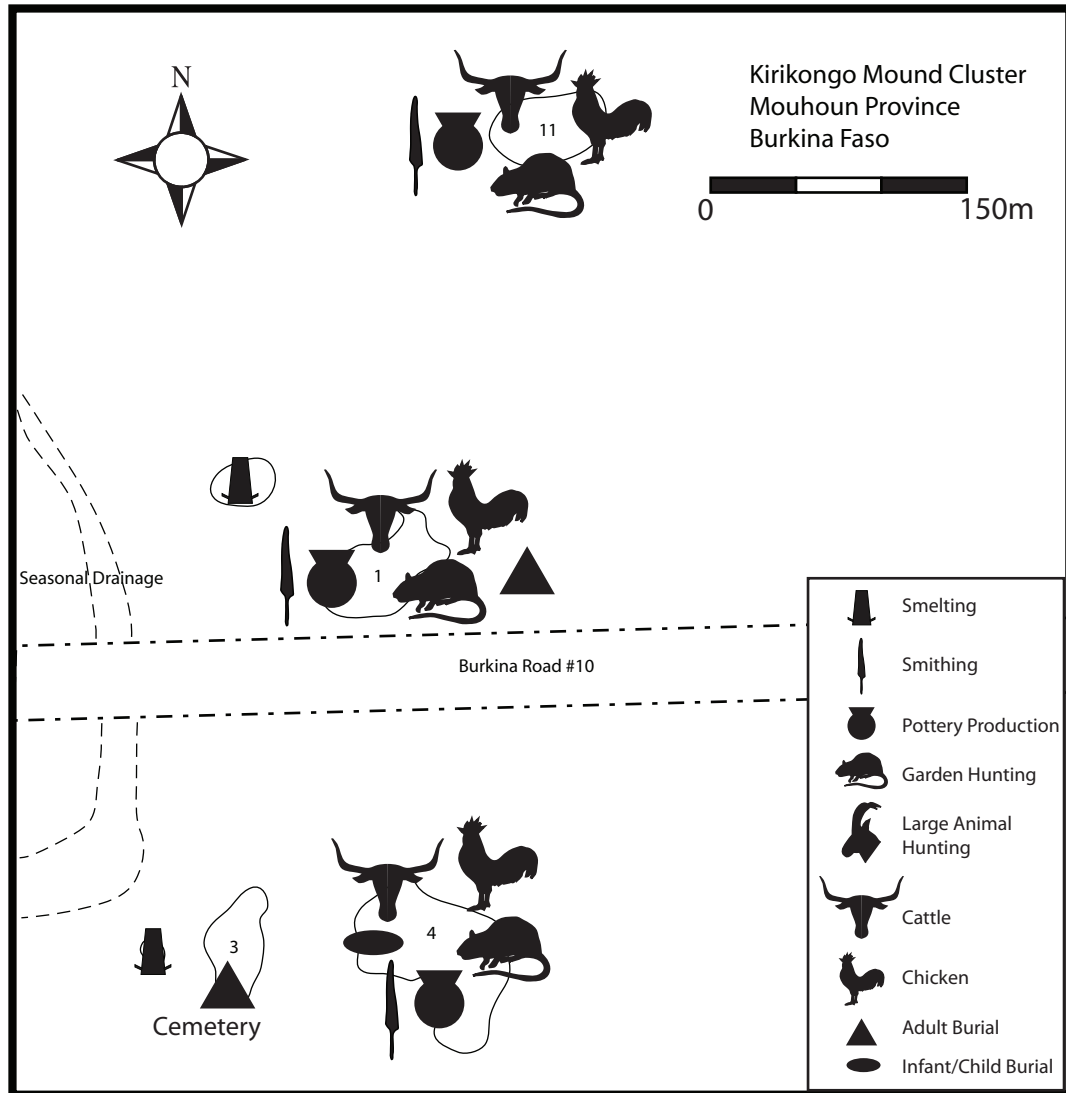


Figure 16.3: Spatial Distribution of Activities at Kirikongo During Yellow II

extension of this privilege over multiple compounds. While the households were still highly independent, they now lived in a formalized community of both cadet and senior social segments, based on common descent with a common ancestor.

Besides mortuary practice, intra-community differentiation was also expressed in the emergence of new potting traditions at the mounds. In addition, a small degree of economic integration was practiced for the first time. The third mound to be established, Mound 11, was similar in all respects to Mounds 1 and 4, but while smithing was attested, the mound had no associated furnace, and may have received iron blooms from others in the community.

The emergence of village life likely had consequences for the large-scale regional integrations seen during the homestead period. As local populations grew it is likely

that interaction spheres narrowed owing to increasing proximity of marriage partners. Increasing localization is seen in the pottery for the period, as decoration techniques (e.g., carved roulettes) began a trend of regional divergence. In the end, this period exhibited the first evidence for a shift away from redundant social and economic roles and the creation of a larger social group, a village.

The Emergence of Social Ranking from Centralized Authority (AD 700 to ca. 1100)

Shortly after the creation of a village community, the nature of the authority held by Mound 4 began to change (Figures 16:3 and 16:4). Toward the 8th century AD (end of Yellow II), Mound 4 began to exercise more control over the community and its territory, as shown by the clustering of new compounds around Mound 4. Along with the continued use of the cemetery, this shift in settlement pattern likely shows an extension, or activation of territorial control by Mound 4. The gravitational pull of Mound 4 also indicates greater authority over agriculture, since having fields around the compound and immediate access to deep soils was deemed less important.

By the beginning of Red I, the inhabitants of Mound 4 became the sole producers of iron tools (practicing smelting and smithing). A single corporate group now controlled the means to agricultural production, as well as a technique likely enshrouded with religious significance. In ethnographic case studies of the emergence of rank in Voltaic societies, increasing *political* power is always based in a fetish, i.e., a mysterious spiritual force controlled by an agnatic group that is separate from authority based in common descent. While it is unknown whether iron held the same spiritual significance at this point as it does today in both specialist and non-specialist spheres, it is clear that the co-opting of iron production by the ancestral lineage co-occurred with several other indicators of increasing authority. A suggestion of the increasing religious power of iron was indicated by the location of a new smelting installation (Iron Furnace 3) 400 meters south of Mound 4. Prior to this, all furnaces were founded in the village core.

A pattern of continually increasing social differentiation peaked at the start of Red II, when infants were accorded burial treatments that had been formerly reserved for adults in the cemetery. In summary, the inhabitants of Mound 4 used their relation to the village ancestor to first control territory (starting during Yellow II), then co-opted the religious power of iron in Red I, and later translated this into social ranking by at least Red II. Future research will assess whether there were economic consequences, such as the concentration of wealth (as marked by livestock) during Red I, as deposits from Red I and II were small at Mound 4. To date the only cattle bones for the period come from Mound 4.

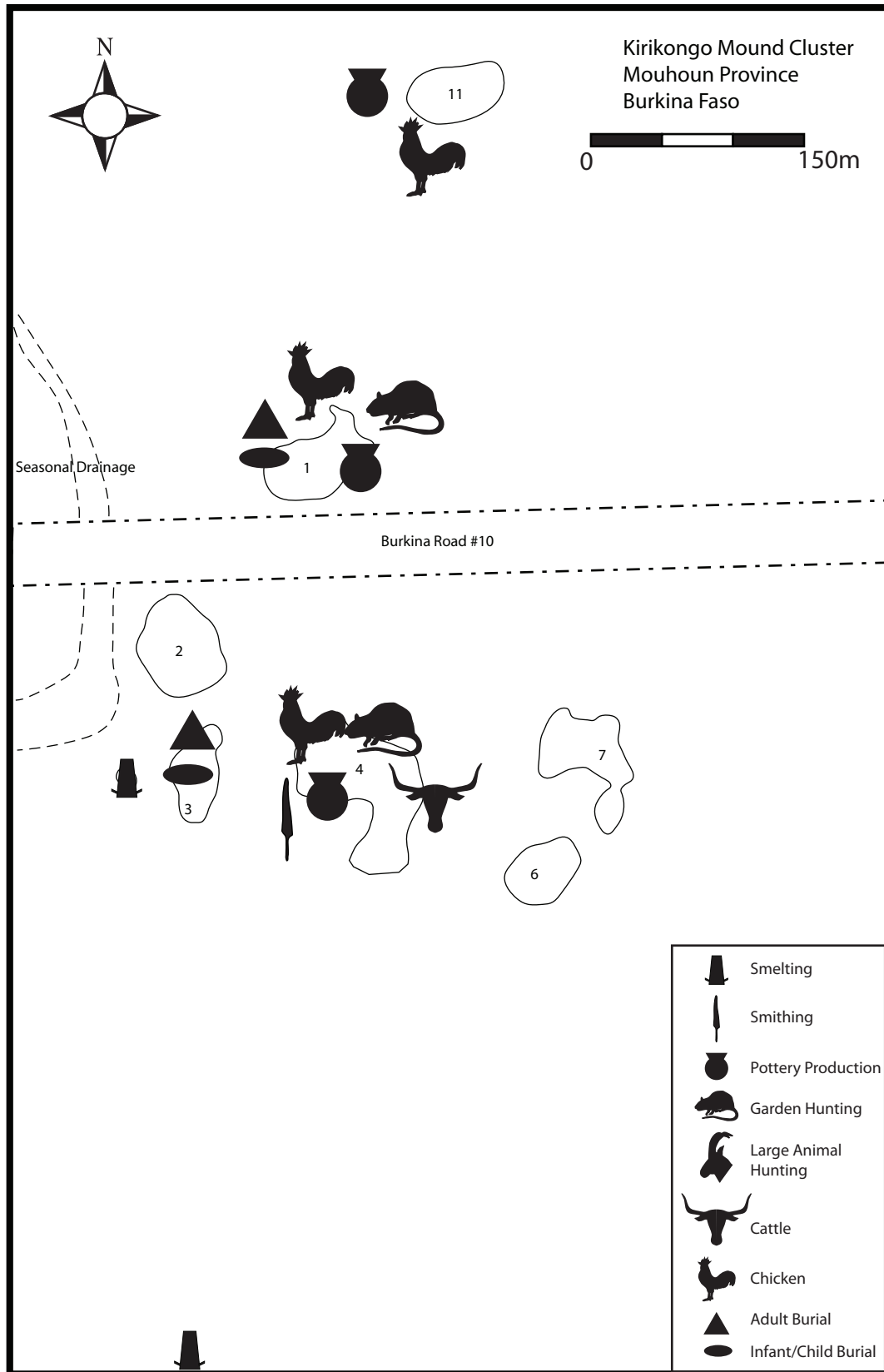


Figure 16.4: Spatial Distribution of Activities at Kirikongo During Red I

Outside iron production, mounds were still economically generalized at this point, and each produced very different pottery. Within compounds, data for grinding within huts suggests that nuclear families may have been independent.

The Re-Invention of Equality: A 12th Century Political Revolution (ca. AD 1100 to 1450)

Kirikongo's society was ranked at the start of Red II, but shortly afterwards a drastic and rapid egalitarian revolution quickly changed the very concept of the community. The rejection of hierarchical developments involved the invention of new political and social relationships, roles, and institutions, as well as the reinvention of traditional cultural features.

Iron working shifted from Mound 4 during mid Red II and appeared at Mound 11, located 200 meters north of the village center (Figure 16:5). Likewise, smelting was removed to an area 250 meters to the west of the site. Mound 11 also yielded direct evidence for pottery production, both from a tool kit and two kilns. Current evidence suggests that Mound 11 was the only group making pottery during these periods. Specialist smiths married to potter wives are common today in western Burkina Faso, and they hold a certain degree of non-political authority derived from the occult nature of iron and the use of fire in transformative acts. With the location of their residence and workshop on the edge of the village, and furnaces across the drainage away from habitation, it is likely that these religious connotations were present during Red II and Red III. This transformation also signifies the detachment of the religious and economic significance of iron from the ancestral lineage. What is particularly interesting is that the religious power of iron-working that is held by specialist smiths today may be a post-rank phenomenon, with the occult characteristics of iron based in a long-term social memory of political power and authority continuing even after detachment from the political realm.

During mid Red II, the social differentiation seen in earlier mortuary practices was rejected, and the cemetery area was floored over to become a habitation mound. Young, presumably uninitiated individuals were buried within mounds while adults were likely buried off-mound. There was no evidence for differentiation in community-wide mortuary practices during this period.

The independent mounds that had characterized habitation between Yellow II and Red I were replaced by elongated blocks of habitation (paired mounds). Within these groups, by Red III there is evidence that domestic architecture was organized into composite structures, with rectangular rooms connecting circular huts in blocks roofed

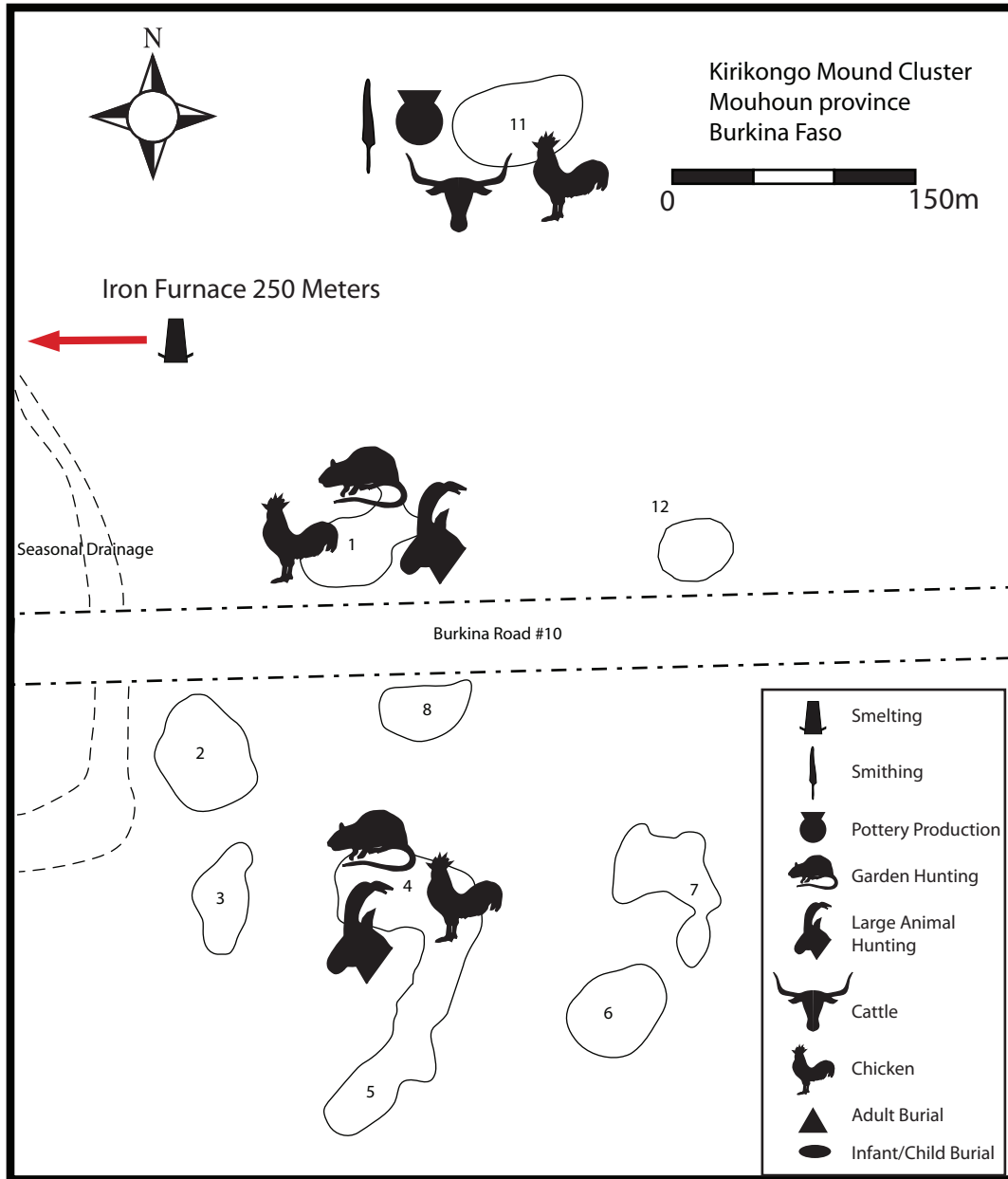


Figure 16.5: Spatial Distribution of Activities at Kirikongo During Red II and Red III

with paved terraces. Grinding took place in unpaved exterior settings, suggesting a shift to more public food preparation. The continued clustering of the village core with concomitant increases in the exposure of activities outside architectural enclosures suggests a built environment more focused on extra-household social interactions.

This period also witnessed the rejection of the material symbols of inequality, livestock. Despite a drier environment more suitable for animal husbandry, cattle almost disappeared during mid Red II to Red III, as only one bone was recovered. Today cattle serve as social capital in many Voltaic societies, enabling marriages and funerary

celebrations, and representing wealth. In addition to selecting against the accumulation of wealth, the rejection of cattle bridewealth reflects the emergence of matrimonial compensation in agricultural labor. In described accounts of bride service this is performed by the age set of the prospective groom, representing a cross-section of the community. It is possible that during mid Red II and Red III an age-set or some other communally structured bride service was practiced. The parallel emergence of communal hunting also indicates the development of concepts of community in which larger social groups combine beyond the household. While it is difficult to say precisely how these were organized, these roles are today played by crosscutting civico-religious institutions such as the *Do* society.

During late Red II through Red III, a ritual building was built atop Mound 4. This multi-story structure was very similar to the Bwa ancestor house. Today, this building with multiple rooms is maintained by the village headman, and is the location for sacrifices to the village ancestors and the meeting place of the village council. Excavations uncovered the granary room that may have held the collective donations of the villagers for communal feasts and hosting visitors, as well as the chamber where the village council met and the chief sacrificed to the ancestors. It is possible that by Red III the village headman's dwelling was at this location in Mound 4, and there was a council of the village and organized feasting. This structure burned down twice during Red III. However, modern village warfare in the region does not involve targeted architectural destruction. There remains the possibility that early Red I was a period of social ranking within the general region, and that following the egalitarian revolution, villages were asserting their independence by more extreme forms of war.

In conclusion, during the middle of Red II the community of Kirikongo was fundamentally altered. Earlier inequalities had been based on the occult power of iron, combined with the territorial authority derived from descent: during this period iron was detached from politics and shifted to specialized production in a distant ward. Likewise, Mound 4 maintained its role as the symbolic center of the village, which is consistent with a model for ranking that draws a large distinction between ancestral descent with its communal legitimization from the spirits, and a fetish (like iron) that can be used for social differentiation. The ritual structure on Mound 4 likely materialized the re-invention of an egalitarian community that was founded on common descent, rather than divided into two unequal social ranks based on occult power. The division of society into craft specialists and farmers forged an interdependent village community (organic solidarity), while increased clustering and architectural changes imply a built environment designed for more social interaction.

Lastly, bride service and communal hunting mark the formation of community-level task groups, sodalities that served to further integrate individuals from multiple families. The resulting social formation was a highly integrated and diversified community with an egalitarian ideology.

Conclusion

This case study offers a detailed description of a rejection of social ranking, a rare look at an event that may have been frequent in the past, due to the dynamic nature of human societies.

The socio-political revolution at Kirikongo was a societal (community) revolution as opposed to the more agent-based changes that are so frequent in the emergence of hierarchical systems. These have been frequent in recent political revolutions that have attempted to limit inequalities and create representational governments (e.g., the American revolution), but they have rarely been described in the deep past, particularly for non-literate cultures.

In addition, Kirikongo provides a regional model for the origins of rank, where the authority based in descent from a village ancestor is unmanipulatable, requiring potential elites to employ a type of power (a fetish) that is not foundational to the communal ideology. Lastly, Kirikongo contributes a case study of the evolution of a single-kin community to a village based in common descent, with the descendants of the village ancestor exerting territorial control. Early villages were then divided into senior and cadet social segments.

In conclusion, over a thirteen hundred year period the inhabitants of Kirikongo invented and re-invented their society. In the end, with memories of inequality, they developed a sophisticated political formation where checks and balances crosscut all levels of authority.

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