Two Thousand Years in Dendi, Northern Benin

Journal of African Archaeology Monograph Series

VOLUME 13

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Two Thousand Years in Dendi, Northern Benin

Archaeology, History and Memory

Edited by

Anne Haour

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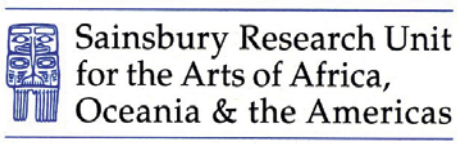

Cover illustration: The Niger River near Tin Tin Kanza. Photo by Nicolas Nikis, January 2013.

Library of Congress Cataloging-in-Publication Data

Names: Haour, Anne, editor, author.
Title: Two thousand years in Dendi, northern Benin : archaeology, history and memory / [edited] by Anne Haour.
Description: Leiden ; Boston : Brill, 2019. | Series: Journal of African archaeology monograph series ; v. 13 | Includes bibliographical references.
Identifiers: LCCN 2018034759 (print) | LCCN 2018035424 (ebook) | ISBN 9789004376694 (Ebook) | ISBN 9789004355842 (hardback : alk. paper)
Subjects: LCSH: Benin—Antiquities. | Niger River Valley—Antiquities. | Excavations (Archaeology)—Benin. | Excavations (Archaeology)—Niger River Valley.
Classification: LCC DT541.3 (ebook) | LCC DT541.3 .T96 2018 (print) | DDC 966.8301–dc23
LC record available at https://lccn.loc.gov/2018034759

Typeface for the Latin, Greek, and Cyrillic scripts: "Brill". See and download: brill.com/brill-typeface.

ISSN 2468-8266
ISBN 978-90-04-35584-2 (hardback)
ISBN 978-90-04-37669-4 (e-book)

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Acknowledgments

A project such as this would not be possible without the assistance, support and encouragement of a number of people and institutions.

We thank, first, the funders of the project. The European Research Council made the award of an Independent Starter Grant (StG-263747) to Anne Haour, making the project possible. We write this section, with bewilderment, a week after the news that UK voters had decided to leave the European Union. The Sainsbury Research Unit supplemented this ERC award, allowing for a considerable expansion of the initially planned team and goals; for this, and for the strong vision of research independence of the Director, Steven Hooper, we are grateful. The National Radiocarbon Facility funded 33 radiocarbon dates which were crucial in better understanding the chronology of the important architectural feature we uncovered at Birnin Lafiya, and the sequence of settlement preceding the villages of today.

In Benin, we thank particularly Professor Sylvain Anignikin and Dr Anselme Guézo (Department of History and Archaeology) for their support in the initial stages of setting up the project. The Dean of the Faculty of Literature, Arts and Humanities, Professor Flavien Gbeto, delivered the necessary permits to his staff and partners. The Direction du Patrimoine Culturel (DPC), through its Directors Richard Sogan and Jules Agani, delivered research permits and temporary export permits; we thank the DPC staff, and particularly Mr Calixte Biah for his assistance in the field. The Curator of the Parakou Museum, Mr Lafia Léon Doko, stored our artefacts (where they are available for further study) and the museum guide Mme Mamatou Adou facilitated this and always gave us a warm welcome.

Mr Denis Ali Yerima, Préfet of the Département du Borgou et de l'Alibori, Mr Issiaka Bako, Mayor of Malanville, and Dr Maman Bello, Mayor of Karimama, provided logistical and communication support. We thank the Chefs d'Arrondissement, in particular Mr Moukaïla Saley (CA Birni Lafia) for his warm support and logistical assistance (including the provision of a field base); the Chefs de Quartier; and the Councillors of the various villages in which we worked. Among these the Délégués Soumaïla Talibi and Ounténi Bouado merit particular thanks. The Brigades de Gendarmerie in Karimama, Malanville, Guene and Kandi and the Commissariat de Police in Malanville kept an eye out for us during our stays in Dendi.

At Birni Lafia the Director of the primary school Ibrahim Yacoubou, and in Pekinga the school director, both followed our work with enthusiasm and allowed us to report its findings to the schoolchildren in their care. The drivers, in particular Valère Nicoué and Youssouf Talba, and the catering team, Mme Azara Anasi and her assistant Karima Alassane, made everything possible in their quiet way.

In the field, the workmen who assisted with excavation, survey and finds washing, at Birni Lafia and elsewhere, are to be warmly thanked; in particular Nasamu Idi, Hassan Massaoudou, Talatou Mamadou, and foreman and camp manager Daouda Amidou. Amongst the informants and research assistants, too numerous to mention but whose investment and generosity contributed hugely to our results, we want to acknowledge in particular Yempabou Madougou in Kofounou and Doulla Sindy (formerly of IRSH-Niamey); the latter has worked with Olivier Gosselain for many years.

Colleagues who participated in the fieldwork and provided a range of valuable insights are Oumarou Banni Guene (Université Abomey-Calavi), Obarè Bagodo (Université Abomey-Calavi), Paulo de Moraes Farias (University of Birmingham), Boubé Gado (Institut de Recherches en Sciences Humaines, Niamey), Oumarou Idé (Institut de Recherches en Sciences Humaines, Niamey), and Anselme Guézo (Université Abomey-Calavi).

Throughout our fieldwork, we involved a total of 41 students from the UK, Belgium, Niger, Togo, Nigeria, and of course Benin. Some are included as co-authors on the present volume, in recognition of their contribution – others who could not be, for a range of reasons, are hereby acknowledged: particularly Boubé Adamou, Agathe Choukpin, Mossi Wahabou, and Abass Diallo. In the UK, a number of Sainsbury Research Unit students were involved in post-excavation finds processing, especially Héloïse Meziani [also subsequently at RMCA], Jenny Reddish, and Henriette Rødland.

The project has supported several MA and PhD theses: Lucie Smolderen (Université libre de Bruxelles); Barpougouni Mardjoua (Université Abomey-Calavi); Héloïse Meziani (University of East Anglia); Louis Champion (Université Paul-Valery Montpellier 3, University College London); Nadia Khalaf (University of East Anglia); Djimet Guémona (Université Jean Jaurès Toulouse); Jean-François Pinet (Université libre de Bruxelles/La Cambre) and Julien Jourand (Université libre de Bruxelles).

Post-excavation work involved a great number of individuals who, again, are credited within the volume where appropriate. To these we should add Anja Stoll (CReA-Patrimoine, Université libre de Bruxelles), Andy

Boyce, and Andi Sapey (Andi Sapey Photography) for photography and illustration; Stefka Bargazova (Sainsbury Centre for Visual Arts), Jonathan Clark and Debbie Harris (Norfolk Museums) and Karen Reid, Paul Malcolm and Jan Rout (Norfolk and Norwich University Hospital) for work on the finds. At the SCVA, Amanda Geitner, Paul Kuzemczak and David Rees helped us think through the wider story that our finds could tell.

During the preparation of this volume, many colleagues contributed data, support, advice and kindly reread early drafts. We are grateful in particular to Jeremy Bartholomew, Tamara Barylski, Dominique Bosquet, Fran Cole, Els Cornelissen, Chloë Duckworth, Nick Gestrich, Imogen Gunn, Tim Insoll, Kevin MacDonald, John Mack, Kat Manning, Anne Mayor and Susan McIntosh. Lynne Crossland, Lisa Farrington and Florence Reynolds provided invaluable editorial and practical help. Thank you to Sonja Magnavita, Franca de Kort, Pieter te Velde and Pierke Bosschieter for all their help during the production process.

We dedicate this volume to Professor Boubé Gado who first paved the way to an archaeological study of this middle stretch of the River Niger.

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PART 1

FIGURE 1.1 Where it all started. The team headquarters in Karimama, 2011

CHAPTER 1

Introduction

Anne Haour

1 The Context of the Project

The northernmost part of the Republic of Benin, known as Dendi, was a virtual archaeological *terra incognita* up to 2011. This will seem surprising, given the interest that the River Niger basin has generated among archaeologists for over a century, and given the early indications of the archaeological importance of Dendi; but opening the well-known volume *Vallées du Niger* (1993), for instance, will suffice to demonstrate how little coverage existed of the Benin segment. This book begins to fill this gap, presenting as it does the main results of a five-year project devoted to the archaeology and ethnography of Dendi.

The *Crossroads of Empires* research project, funded by the European Research Council (ERC; Independent Starter Grant 263747 to Anne Haour), began in January 2011 and ended in December 2015. Five field seasons, of between two and seven weeks' duration, were completed. The research was fully collaborative, integrating four European (University of East Anglia, Royal Museum for Central Africa, University of Stirling and Université libre de Bruxelles) and two African (Université Abomey Calavi in Cotonou, Institut de Recherches en Sciences Humaines of the Université Abdou Moumouni in Niamey) institutions. Crucial backing was given by the Direction du Patrimoine Culturel, Benin. The basic goal of the research was to place a neglected area on the archaeological record, although the wider aim was to examine the impact of political entities and of political influences on the material record, using both archaeological and ethnohistorical timeframes. How were political entities structured in Dendi, and how did they mark the landscape and influence the movement of peoples, ideas, technical knowledge and things?

Dendi seemed an ideal location in which to confront historical evidence and archaeological data, because this region is known to have lain at the intersection of several polities: Kebbi, Songhai, and Gourmantche, with influences from Nupe, Mali and Kanem-Borno. Anecdotal reports also showed that Dendi was rich in archaeological remains, many of which were attributed by local peoples to the vast population movements which accompanied the creation and shifting of political boundaries and processes of cultural-religious change. Because Dendi sits in a key area of migrations and cross-influences, it presented the ideal "laboratory" for exploring the materialisation of contacts and boundaries, through a mapping of craft specialisation and the distribution of material culture. Enquiries would assess how this material can show group membership, status differentiation and population movements, and in particular would focus on the role of craft specialists.

The specific research objectives of the project, then, were to carry out archaeological survey and test pitting along the 110 km-long stretch of the river which marks the border between Benin and Niger; but also, no less importantly, to carry out interviews with contemporary populations, generating data on past migrations, political structures, and craft production. Here, the argument was of course not that some sort of linear relationship existed, so that the data from the present could be transposed into the past. Rather, it was felt that knowledge on present ways of negotiating political belonging, making and doing, were crucial parts of understanding how political belonging was negotiated in the past, and how things were made and done. One early, surprising, finding of the project is that the sites first investigated by our team dated not to the second millennium, as had been assumed, but to several centuries earlier. Part of the challenge of this book has been to create a meaningful conversation between archaeology and ethnography when such a chronological gap exists. Closing that gap became a focus of the penultimate field season; with, as will be seen, some success.

The team originally devised for the project issued out of long-term collaborations and conversations, and a shared feeling that a concern with the political dimension of material culture in West Africa was long overdue (for one statement of this, see Haour & Manning eds, 2011, in a special issue of *Azania*). Beyond members of the partner institutions listed above, the team encompassed vital expertise from many individuals, as is reflected in the contributions to this volume. Complementary funding from the Sainsbury Research Unit for the Arts of Africa, Oceania and the Americas (SRU) at the University of East Anglia allowed the team to increase further and, in particular, enabled the vital inclusion of archaeometallurgical, archaeobotanical and architectural expertise, as well as the funding of a PhD scholarship. Throughout the project,

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student training was given high importance with up to 20 undergraduate and postgraduate students participating in field seasons; eleven have gone on to write Masters or doctoral theses issuing from the project. Local informants and excavators were a fundamental part of the work, and between 10 and 40 labourers were employed each year. Without them, the work reported here could not have taken place. We were accommodated in local administrative buildings (Figure 1.1). The substantial post-excavation costs were met through the two core sources of funding of the ERC and SRU, but also thanks to contributions by the partner institutions and grants from the radiocarbon facility administered by the Natural Environment Research Council (NERC) and which provided 33 radiocarbon dates.[1]

Project findings have been disseminated through a vast range of conferences and workshops, in Aarhus, Abidjan, Accra, Austin, Bangor, Bern, Birmingham, Brussels, Cambridge, Cotonou, Geneva, Heidelberg, Johannesburg, Leicester, Lomé, London, Marseille, Montréal, New York, Newcastle, Norwich, Orlando, Paris, Salt Lake City, San Francisco, Toronto, Tucson, and Wageningen among others. They have thus far been published in a range of papers (Haour et al. 2011, 2016; Haour 2013; Khalaf & Haour 2013; Champion & Haour 2013; Robion-Brunner et al. 2015; Gosselain 2016a), and future papers are yet to come; but the present volume aims to give a comprehensive overview of the work accomplished by the team.

2 The Structure of the Book

The book arose from the collaboration of a vast number of individuals, and one challenge has been to pull it into a coherent shape. We have wanted to avoid breaking down the book into overly strict classifications, based, for example, along lines of chronology or disciplinary background, but it has also been necessary to impose order onto a vast domain of information by using some structuring principles.

Part 1 sets the baseline of what was known about Dendi before our work commenced. We discuss in turn the historical narratives (Chapter 2), the palaeoenvironmental data (Chapter 3), and the archaeology of the immediate region (Chapter 4). We conclude by outlining the methodology (Chapter 5) which we considered would be most helpful to build on existing foundations to write a fuller history of the Dendi past.

Part 2 sets the wider backdrop to the landscape, outlining both its natural characteristics (Chapter 6) and the distribution and nature of archaeological remains as identified through survey (Chapter 7).

Part 3 turns to a consideration of the communities of Dendi today, and most especially their crafts (Chapter 8). We sought to explore histories of past migrations and settlement sequences, exploring what could be learnt about the sites of Dendi, both present and modern. Here, we deployed architectural insights into the evolution of the built fabric (Chapter 9). Many craft traditions were dying or had died out and could only be approached through interviewing former practitioners; with this in mind, we outline the knowledge relating to spinning and weaving (Chapter 10).

Part 4 outlines the archaeological data recovered. Chapter 11 summarises the key considerations which drove our methodology when we encountered this archaeological *terra incognita*. Contrasting with the regional outlook we have deployed so far, Chapter 12 takes a spatially focused view, introducing the large mound site of Birnin Lafiya which formed a major focus of our research over four years. We introduce the site's topography, appearance, vegetation, surface remains, and our excavation strategy. Chapters 13 to 15 take a regional view, but necessarily rely heavily on Birnin Lafiya, which is our best-documented site; they present the results of the geophysical prospection, the survey of potsherd pavements, and the excavation of architectural features. We then open up the broader frame again, to discuss the regional stratigraphic sequence (Chapter 16).

Turing to the artefacts and ecofacts, we successively discuss the pottery (Chapter 17), the evidence for ironworking traditions (Chapter 18), the metal objects and slag (Chapter 19), the beads and pendants (Chapter 20), the cowries (Chapter 21), the modelled clay objects (figurines, pipe fragments or unusual pottery) (Chapter 22), the archaeobotanical and anthracological remains (Chapters 23 and 24), and finally the faunal and human remains (Chapters 25 and 26).

To conclude, Part 5 situates our work within the scholarship of the region to examine what it contributes to the knowledge of the archaeology (Chapter 27) and of the craft and political history (Chapter 28) of West Africa.

Maps, a list of radiocarbon dates, descriptions of the excavated units and the finds within them (including the pottery data), and a gazetteer of sites identified during survey, can be found in Part 6, the Catalogue.

A final note concerns names. Our transcriptions of local place and person's names are a best effort, but should be treated with caution. Throughout the region, several

1 2013/02/09, to Anne Haour and Sam Nixon, 12 dates, 19 December 2013. 2014/01/07, to Anne Haour and Alexandre Livingstone Smith, 21 dates, 2 July 2014.

possible transcriptions may be used; most are French renditions of Zarma, Fulani, Gourmantche or Hausa names (among others). Contributors to this multidisciplinary volume follow the conventions in use in their respective fields for identifying various West African geographical, political and ethnic entities. For many non-English words and names, different forms are in use even within the specialist literature. Some groups are referred to by multiple ethnonyms, or multiple forms of the same ethnonym, which may vary across regions. This is the case for example for the Gourmantche/Gulmanceba. These considerations account for differences in terminology, orthography, and transcription across chapters in this volume, which we have not attempted to homogenise as long as confusion over meaning did not arise. One exception is the case of Birni Lafia where a decision was made to use the spelling "Birnin Lafiya" for the archaeological site known locally as *tombo* (a generic name which designates past settlement places) and Birni Lafia for the modern village a few hundred metres to its northeast.

CHAPTER 2

Crossing Archaeology and Oral Tradition: Approaching Dendi History from Sites of Memory

Olivier Gosselain and Lucie Smolderen

> En définissant une certaine autochtonie, un ordre social et politique ne livre pas le résultat d'une investigation historique et ne rend pas compte d'un fait indépendant des perspectives prises sur lui, il situe un référent symbolique nécessaire à la place qui lui paraît la meilleure, du point de vue de sa vision du monde.
>
> IZARD 1985: 27

1 Introduction

The history of Dendi written through the prevailing orthodoxy might be quickly summarised: a faraway province of Mali, the southern province of Songhai, and a place of resistance against Moroccan invaders. Yet such a history is so well published but so little demonstrated. For example, it is still not clear whether the region currently known as "Dendi" corresponds to the "Dendi" evoked in the *Tārīkh as-Sūdān*, and there are actually reasons to believe it might have been situated further north (Moraes Farias 2013). As for the information provided by the *Tārīkh al-fattāsh*, it probably refers to a situation prevailing at the end of the eighteenth century (Levtzion 1971; Nobili & Mathee 2015), well after the dislocation of the Songhai Empire. Since the beginning of the twentieth century, local oral traditions have been increasingly incorporated in historical narratives. This culminated in the 1980s and 1990s, with a series of historical studies devoted specifically to Béninois Dendi (Ayouba 1991; Bako-Arifari 1989; Bello n.d.; Bio Bigou 1987). Although these works have considerably improved our understanding of the area and remain an essential introduction to its history, their overall focus on settlement processes and political elite led them to reify narratives that have probably more to do with modern-day power, economical and religious relationships than actual historical processes. The division between "autochthones" and "conquerors" that constantly crops up in these works is a good case in point, as such division mainly reflects current concerns about land access and political legitimacy, and should thus be approached as such (see also Bako-Arifari & Le Meur 2003; Izard 1985).

Keeping in mind that the focus of this book is the long-term history of Béninois Dendi, but wanting to avoid the pitfalls of an approach that consists mainly in listing a succession of population strata (besides the works cited above, see also Perron 1924; Séré de Rivières 1965; Walther 2006), it will look at Dendi "from the soil up", by focusing on a group of sites which are of significance to historically-minded people in Dendi. These sites differ from those usually evoked in oral testimonies, inasmuch as they do not relate to a single village community,[1] but to a network of communities, in a radius of tens (or even hundreds) of kilometres. They may thus be considered as "regional sites of memory". Four of them will be considered here: Katanga, Nooru Bangu (the cowrie pond), Turuwe (also spelled Torouwey) and Mulabon (See Figure 2.1). The first two were mentioned in about twenty villages within a triangle demarcated by Dangazuri, Kambouwo Tounga and Kandi; the last two seem to have a more restricted notoriety.

Multiple correspondences in the narrative structures of the traditions associated with these places suggest that we are in the presence of myths, which would explain their higher profile within the study area. But, as often happens, the stories are interspersed with economic or technical details, with evocations of political processes or with links with relatively controllable historical facts. We are therefore faced with hybrid aggregates which may indeed have a legendary element but which also justify a historical analysis. The idea is to consider the four sites successively and try to assess their historical relevance. It will be evident that if such an approach sometimes forces us to consider questions of autochthony, peopling processes

1 Examples include the sites that have been subjected to an archaeological test by our colleagues: Boyeri/Bwayeri (BOY) for the villages of Kompanti (PTI), Loumbou Loumbou (TTO) and Banikani, or Kwara zeno (KAZ) for the village of Bogo Bogo (GOG). Turuwe/Torouwey was also test pitted (as TRO) (see Map 6 for location of all sites, and the Catalogue (Part 6) for descriptions of each archaeological unit and associated finds).

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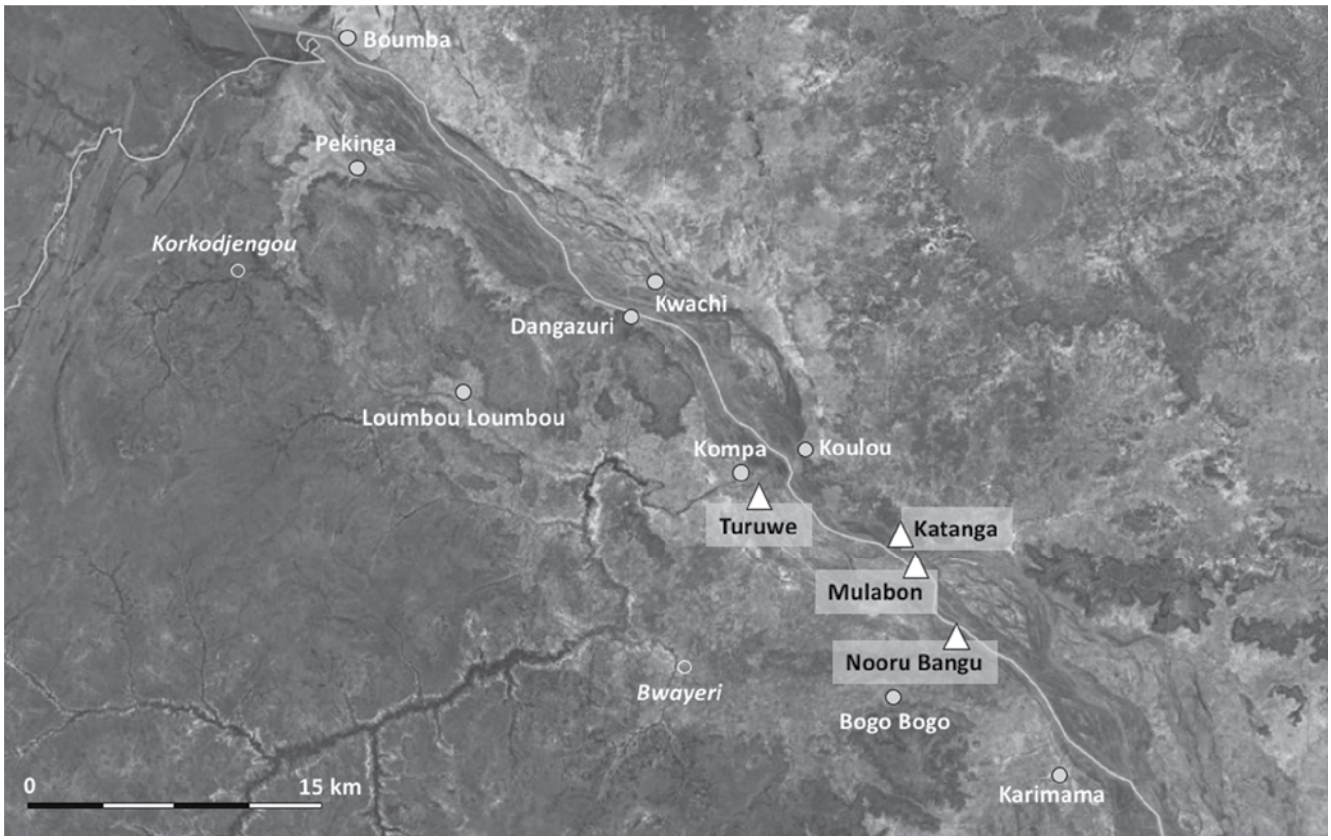

FIGURE 2.1 Location of the sites of memory discussed in this chapter (triangles), present-day villages (filled circles), and abandoned settlements (empty circles)

and power relations, or to focus on specific populations or social identities, it does so in a way that avoids reducing history to a succession of population strata and allows issues to be explored that have not been central in previous historical studies. It also contributes to reducing the gap between archaeological, historical and ethnographical data.

2 Sites in the Oral Traditions of Béninois Dendi

2.1 *Katanga*

The name Katanga was mentioned in eighteen villages located on or near the river,[2] but seems unknown south of Guene. The majority of our informants place Katanga on the left bank of the river in the present-day Republic of Niger, and many evoke an area between Koulou and Ouna.[3] The old village was established "at the foot of a hill",[4] which corresponds to the topography of the area, marked by the presence of several escarpments that stretch from west to east. Some informants however place Katanga on the right bank of the river, "next to Kompa"[5] (possible confusion with Turuwe), on the island of Lete[6] (possible confusion with Mulabon) or in Nigeria.[7] In the latter case, it is likely that our informants were making a reference to Oyo, which the Hausa designated as Katanga (Crowther 1852: i) or Katunga (Clapperton 1839); one of these informants also specified that Katanga is "in Yoruba".[8] We will see later that such an association is not accidental and that it has an impact on the historiography of the site.

2 Kwara Tegui Seydou Kwara, Banikani, Dangazuri, Kompa, Koulou, Bogo Bogo, Garbey Kwara, Gourouberi, Karimama, Birni Lafia, Tomboutou, Molla, Kwara Tegui Sambo Kwara, Kantoro, Torozougou, Malanville, Bodjekali and Kofounou.

3 Kompa, 30 and 31/01/12, 30/01/13; Bogo Bogo 01/02/12, 31/01/13; Gourouberi, 25/01/13; Karimama, 26/01/13; Birni Lafia, 03/02/13; Tomboutou, 09/02/14; Kwara Tegui Sambo Kwara, 31/01/14; Kofounou 23/01/13; Dangazuri, 30/01/13; Bodjekali, 11/02/14.

4 Bogo Bogo, 29/01/14.

5 Kwara Tegui Sambo Kwara, 12/02/12.

6 Torozougou, 05/02/13.

7 Garou Tegui, 08/02/13; Kambouwo Tounga, 09/02/13. The story of the foundation of Garou collected by Bio Bigou (1987: 214) also evokes a Katanga situated in Nigeria.

8 Garou Tegui, 08/02/13.

If Katanga is often described as an abandoned village, it appears on the map of the *Mission Tilho* (1910) – on the left bank, between Koulou and Ouna – but Landeroin (1909: 505) defines it as a "*petit village presque abandonné*". It still exists nowadays numbering 202 inhabitants, mostly Zarma, in 1986 (Bio Bigou 1987: 782) and figuring on the maps of Walther (2006), who unfortunately gave no description. Even if this may be a small settlement, with no relation to the "large village" or "city" evoked by our informants, we must keep in mind that the existence throughout the twentieth century of a place named Katanga on the left bank of the river may have affected the location assigned to the historic Katanga. In fact, the idea that the site was located elsewhere and that informants simply exploit their contemporary geographical knowledge to attribute its ancient location cannot be dismissed.

Most accounts present Katanga as a village initially inhabited by Yoruba,[9] who were rich, engaged in trade and owning Nooru Bangu, the "cowrie pond".[10] Their king had a golden throne.[11] These Yoruba left Katanga either after being attacked,[12] or because they feared the insecurity prevailing at that time on the left bank of the river.[13] According to some, they took refuge in Saki, Nigeria, near the border with Benin,[14] while according to others, they left to found Oyo.[15] Bio Bigou (1987: 185–6) and Walther (2006: 94) also name the Yoruba as the "original inhabitants" of Katanga. According to the first author, they were traders from Oyo, who were driven away by the Kebbi Hausa (Kebbawa) and the Songhai. According to the second, the Yoruba came from Abeokuta and Ibadan and traded in gold and livestock and their departure was caused by Askia Mohammed. Some traditions collected on the right bank of the river also evoke a later arrival of the Yoruba in Katanga, or their continuous presence in the region.[16]

If there is a near-consensus on the former presence of Yoruba at Katanga, there is much more debate regarding the identity of those who dislodged and/or replaced them. Among the Mulanche/Kumate[17] who claim a Zarma identity and generally say that they descend from Mali Bero,[18] many are those who claim to have defeated the Yoruba and claim Katanga as their first settlement site in the Dendi.[19] Warriors, hunters and farmers from "Mali",[20] from Timbuktu,[21] from Gao,[22] "from Niger",[23] from the Dosso region,[24] or from Kirtachi,[25] they are said to have migrated south in search of better living conditions or to seize the wealth of Katanga.

Once settled in Katanga, these conquerors were joined by other Mulanche/Kumate from the north.[26] Some were fishermen, either because they had learned it through contact with the Sorko already present on the site,[27] or because they belonged to a group of Kumate fishermen who had descended the river from Gao,[28] perhaps after the Moroccan conquest.[29] The main craft of the Mulanche/Kumate was indigo dyeing, a technique which they had

9 Dangazuri, 30/01/13; Kompa, 30–31/01/13; Bogo Bogo 01/02/12 and 31/01/13; Gourouberi, 25/01/13 and 02/03/15; Karimama, 26/01/13; Kofounou 23/01/13; Birni Lafia, 12/02/15; Kwara Tegui Sambo Kwara, 12/02/12 and 31/01/14.

10 Bogo Bogo 01/02/12 and 29/01/14; Kwara Tegui Sambo Kwara 12/02/12.

11 Bogo Bogo 31/01/13.

12 Kompa, 30/01/13; Bogo Bogo 31/01/13 and 29/01/14; Gourouberi, 02/03/15; Kofounou 23/01/13; Kwara Tegui Sambo Kwara 12/02/12 and 31/01/14.

13 Dangazuri, 30/01/13; Gourouberi, 25/01/13; Birni Lafia, 12/02/15.

14 Gourouberi, 02/03/15.

15 Kompa, 30/01/1313; Bogo Bogo 31/01/13. ("by Ilorin").

16 Birni Lafia, 03/02/13; 24/01/14; Torozougou, 05/02/13; Karimama, 26/01/13. The continued presence of the Yoruba after the fall of Katanga is also mentioned by Bio Bigou (1987: 186), who collected traditions stating their installation in various villages of the right bank (including Bogo Bogo) then a migration eastwards where they founded Lolo, in Nigeria.

17 "Mulanche" literally means "people from Mali", while "Kumate" is a patronym or clan name manifestly derived from the patronym "Konate", of Soninke origin (see Brégand 1998a). Both names designate the same population segment, yet the first is especially used along the river, west of Guene, while the second is more common to the east and south of Guene. Only in the vicinity of Bogo Bogo are both names used interchangeably.

18 Considered as the founder of Zarma aristocracy, this mythical hero would have led his people from Mali or "Melle" to the Zarmaganda, in present-day Niger (Bornand 2011; Olivier de Sardan 1982).

19 Bako-Arifari (1989: 63–4) echoes a similar tradition: "[*c*]*'est par la force que les Kumatè s'installèrent à Katanga au détriment des 'Yoruba'*".

20 Bogo Bogo, 29/01/14; Kwara Tegui Sambo Kwara 12/02/12 and 31/01/14; Goungoun, 24/02/15.

21 Torozougou, 05/02/13.

22 Tomboutou, 09/02/14.

23 Dangazuri, 30/01/13.

24 Bogo Bogo 01/02/12.

25 Bogo Bogo 31/01/13.

26 Bogo Bogo, 29/01/14.

27 Bogo Bogo, 30/01/14. Bio Bigou (1987: 230) reports that the founder of Tara (on the left bank of the river) is a sorko fisherman who first settled in Katanga. Unfortunately, he does not state whether other segments of the population were present before or afterwards.

28 Birni Lafia, 03/02/13.

29 Birni Lafia, 01/02/13: *"Les Kumate vivaient à Gao, où leur seule activité était la pêche. En ce temps-là, c'étaient les Bambara qui avaient le pouvoir et prélevaient l'impôt. Puis ce furent les Songhai Mamar Hamey qui prirent le contrôle de la ville, après s'être rebellés contre les Bambara. Les Songhai et les Kumate parlaient la même langue, mais ils n'avaient pas les mêmes activités. Ils fuirent*

brought with them from Mali.[30] This ensured a substantial economic contribution, but the wealth and power of the Mulanche/Kumate nevertheless resulted mainly from the exploitation of the "cowrie pond", the secret of which they had stolen from the Yoruba.[31]

It was also at Katanga that the Mulanche/Kumate forged or strengthened alliances with other groups such as the Sorko,[32] the Tyenga,[33] the Sirifi,[34] and the Traore,[35] with whom they developed complementary relationships.

The context in which the Mulanche/Kumate abandoned Katanga is not clear. Some think they were driven out by the Songhai who also sought to control Nooru Bangu.[36] Others, more numerous, evoke a population increase that would have led the inhabitants of Katanga to cross the river to settle on the island of Lete and at Turuwe, the starting points of their migrations on the right bank. Such a process leads Bako-Arifari (1989: 63) to state that « *en dehors des villages créés par les autochtones* [Tyenga et Goulmanceba] du Dendi [...] *les immigrants Kumatè furent les véritables bâtisseurs du Dendi. Ce furent eux qui fondèrent la plupart des villages actuels du Dendi.* »

But the Mulanche/Kumate are not the only ones to be considered as the conquerors of the Yoruba of Katanga. Songhai informants believe that Fulani attacked and massacred them in revenge for the kidnapping of one of their daughters in a previous war.[37] The Mulanche/Kumate would have settled in Katanga long after its abandonment.[38] We also collected testimonies that present Sorko fishermen as the original occupants of Katanga.[39] Finally, at Molla,[40] a Tyenga informant believed that it was a Tyenga clan that was originally installed in Katanga and subsequently dislodged by the Songhai who wanted to convert them to Islam by force.[41] This tradition echoes those Walther (2006: 94, 414–415) collected on the Niger bank of the river. Ayouba (1992) meanwhile evokes two traditions concerning the Tyenga. In the first, a south-north Tyenga migration would have led them to Katanga after crossing the river "by the end of the 16th century", but Tyenga would then have been dislodged "by militarily powerful nations" (Ayouba 1992: 39). In the second, the Tyenga of Borgou would have been pushed back to Katanga by "the kings of Nikki with the support of the Yoruba of Oyo" who sought to seize their lands (Ayouba 1992: 54).

2.2 *Nooru Bangu*

The name of Nooru Bangu was mentioned in twenty-four villages located on both sides of Malanville and along the national road connecting this town to Kandi.[42] It refers to a pond in the vast floodplain which extends on the right bank of the river, between the villages of Tin Tin and Banikani. Enquiries made in 2017 enabled it to be located to the south of the ancient village of Boumi Tounga.[43] A Kumate informant from Tui[44] evokes an alignment of several "deep places," known by fishermen alone. During the interview, he also associated this pond to a large village which was the main slave market in the region.

"A l'époque, rien de ce qu'on vend aujourd'hui n'existait. [...] Tout ce qui se vendait là, ce n'est que le cheval et les esclaves ou les enfants capturés. Lorsqu'on capturait tout

la ville de Gao à l'arrivée de l'armée marocaine et partirent vers le sud."

30 Kwara Tegui Sambo Kwara 12/02/12; Torozougou, 05/02/13. In villages founded or inhabited by Mulanche/Kumate, indigo dyeing is systematically viewed as their original craft speciality. This is the case in Bogo Bogo, Kwara Tegui Sambo Kwara, Kantoro, Tondi Banda, Torozougou, Issene and Guene. In Kwara Tegui Sambo Kwara, the fourth chief in the founders' line was called Sini Kusukoy, "chief of the indigo [dyeing] pits", a title that remained in the hands of Kumate dyers. Evoking the former site of the village – Tombofo –, which would have been abandoned in the nineteenth century, Bako-Arifari (1989: 57) writes that one still finds "*des puits de teinturerie et des tessons de poterie, vestiges* [des] *activités principales"* of the Mulanche/Kumate.

31 Bogo Bogo 01/02/12 and 31/01/13.

32 Generic name of the fishermen, who claim a Malian origin and consider themselves as Songhai.

33 A Mande-speaking population whose main villages are situated to the east of the study area, but which is generally considered as "autochtonous" in the Béninois Dendi. Around Birnin Lafiya, many Tyenga bear a Kumate patronym.

34 In the Dendi area, Sirifi claim an Arabic origin, or claim to descend from the Moroccans who invaded Gao or from Mali Bero. They are often associated with Quranic teaching.

35 As Kumate, Traore is a patronym or clan name of Soninke origin.

36 Kwara Tegui Sambo Kwara, 31/01/14.

37 Kompa, 30/01/13.

38 An informant in Garbey Kwara (25/01/14) said that the creation of Katanga postdates the settling of Mulanche/Kumate on the right bank following the destruction of their port of Turuwe by the Songhai of Kompa.

39 Bogo Bogo, 30/01/14; Birni Lafia, 03/02/13.

40 08/02/14.

41 This echoes the Kisra legend with is a part of the Tyenga oral repertoire and that of many other neighbouring populations (Adekunle 1993, 2004; Lüppke and Storch 2013; Moraes Farias 1992; Stewart 1980).

42 Boumba, Kwara Tegui Seydou Kwara, Banikani, Bogo Bogo, Toura, Boumi Tounga, Tin Tin, Koulou, Gourouberi, Bello Tounga, Karimama, Birni Lafia, Molla, Tomboutou, Kwara Tegui Sambo Kwara, Kantoro, Torozougou, Kambouwo Tounga, Boïfo, Guene, Malanville, Goungoun, Tui, Kandi.

43 12° 7'51.92"N; 3° 8'3.95"E. The ancient village of Boumi Tounga was settled on a low mound along the pond. It was evacuated after the floods of 2011.

44 25/02/15.

ça, on venait le vendre là. […] Lorsque les wasangari capturaient un esclave, c'est [*aux Kumate de Nooru Bangu*] qu'ils venaient le vendre. Un wasangari qui vole un cheval, c'est à eux qu'il le vendait. Et c'est pourquoi les grands-parents se sont installés à Nooru Bangu".[45]

Yet, with few exceptions,[46] the existence of a village and especially a slave market in Nooru Bangu was either unknown or refuted by our informants, even if many acknowledged the fact that the Béninois Dendi area was a transit zone for Nigérien slaves bound for Hausa or Borgou regions. The high-profile place of Nooru Bangu – "the cowrie pond" or "the money pond" – is due to the fact that it is widely held to have made the wealth of the Mulanche/Kumate[47] (after that of the Yoruba), thanks to a sacrifice that allowed them to collect cowries. In fact, most of the stories collected only mentioned this one aspect.[48] This explains why griots publicly praise Mulanche/Kumate by naming them *Nooru Bangu hamey*[49] or *Nooru Bangukoyïse*.[50]

Traditions mainly report a double sacrifice – human and animal – which observed the following procedure: a particularly beautiful young girl was carefully dressed and brought to the pond in the company of a black ox. The latter was slain and its skin laid out in the water. The girl was brought back to the village and the next day (or a few days later) the skin, full of cowries, was removed from the pond. The girl died during the following days.

Some versions of the story included additional details. For example, the sacrifice took place after the harvest, during the season *heemar*,[51] and it occurred at a place called *nooru gangaani*.[52] The practice continued after the arrival of Sirifi/Traore Muslims and their union with the Mulanche/Kumate.[53] The Mulanche leader supervised the whole ceremony[54] involving representatives of villages where the Mulanche/Kumate diaspora was established.[55] The girl was also required to be Kumate,[56] and had to be the only daughter[57] or a daughter[58] or a niece[59] of the chief. As for the cowries' collection, some thought that it corresponded to an isolated event, while others presented it as an annual activity.

"Ce sacrifice n'a eu lieu qu'une seule fois, mais il a permis la richesse des Kumate. L'argent retiré de la mare ne finissait jamais. Il se remplaçait de lui-même. Ce sont les blancs qui ont mis fin à cette richesse en introduisant leur propre monnaie".[60]

"Pendant le mois suivant [le sacrifice], tous les matins on trouvait un tas de cauris sur la peau. Une partie de l'argent était distribuée aux chefs de la région et le reste conservé dans une poterie. Cette réserve durait toute l'année et permettait d'acheter des denrées comme les pagnes ou le savon[61] aux commerçants dont les caravanes fréquentaient la région".[62]

A surprising aspect is the occurrence of technical details in several accounts. From time to time, one has the impression of being confronted with the description of a manufacturing process described as a *chaîne opératoire*. Here is a description given to us at Boumi Tounga.[63]

"On amenait […] un bœuf noir, qu'on égorgeait et dépeçait pour placer la peau dans l'eau, bien étirée et les poils tournés vers le bas. Lorsque les gens étaient ressortis de la mare, ils dansaient et chantaient. Puis ils retournaient dans l'eau et tâtaient la peau qui était couverte de cauris. Elle était si lourde qu'il n'était pas possible de la porter: on la traînait jusque sur la rive où on l'étendait au soleil

45 Tui, 25/02/15; translated from the baatonu by Barpougouni Mardjoua.

46 An informant from Kambouwo Tounga (09/02/13) names the place "Nooru Kware Bangu", which evokes the presence of a village (*kwara* in dendi). In Tomboutou (09/02/14), some also evoke a village build by the Kumate at Nooru Bangu.

47 Strangely enough, Bio Bigou (1987: 198) and Bako-Arifari (1989:106) collected testimonies in Karimama, Kandi and Gaya according to which Nooru Bangu belonged to Karimama. It seems that such a view was held by a handful of informants now deceased. During our 5 field seasons, we never collected similar information.

48 Bogo Bogo 31/01/13 and 01/02/14; Boumi Tounga, 15/02/15; Gourouberi, 02/03/15; Birni Lafia, 24/01/14; Tomboutou, 09/02/14; Molla, 08/02/14; Torozougou, 05/02/13; Kambouwo Tounga, 09/02/13.

49 "People of Nooru Bangu" (Goungoun, 24/02/15).

50 "Owners of Nooru Bangu" (Birni Lafia, 24/01/14).

51 Bogo Bogo, 01/02/14. Among Zarma and Songhai, *heemar* is the "semi cold" season (from October to December) during which sacrifices are made to the bush spirits (Rouch 1975: 60).

52 Birni Lafia, 24/01/14.

53 Torozougou, 05/02/13.

54 Bogo Bogo, 01/02/14; Tui, 25/02/15.

55 Bogo Bogo, 01/02/14; Boumi Tounga, 15/02/15; Molla, 08/02/14; Tui 25/02/15.

56 Bogo Bogo, 01/02/14.

57 Boumi Tounga, 15/02/15; Gourouberi, 02/03/15.

58 Tomboutou, 09/02/14.

59 The daughter of one of the chief's sister (Torozougou, 05/02/13).

60 Tomboutou, 09/02/14.

61 Such commodities became available from the colonial period onward. The reference to them underlines the fact that the "money" extracted from Nooru Bangu enabled the purchase of goods that circulated in the monetary sphere.

62 Birni Lafia, 24/01/14.

63 15/02/15.

pour que la chaleur force les animaux qui s'y accrochaient à lâcher prise. On les étalait au soleil et on remettait la peau dans l'eau pour une nouvelle prise. Tout cela pendant trois mois. Les animaux qui étaient attachés à la peau s'appellent *kodom*. On n'en trouve plus dans la mare aujourd'hui. Ils possèdent une coquille et c'est dans leur ventre qu'on trouve le cauri. Pour les extraire, les femmes pilent les animaux séchés dans un mortier. Puis on met les cauris dans une natte que l'on coud".

Precisely the same description was made by informants in Gourouberi[64] and Tin Tin,[65] the former adding that it was the accumulation of winnowed powdered cowries which formed the hill of Tin Tin. Other reports also stress the animal nature of cowries "They are living beings";[66] they have an animal "in the shell",[67] "inside",[68] "within".[69]

A singularly different version was collected in Tui.[70] This emanated from the Kumate chief of the village, who presented himself as the "king of Kumate" of the region and claimed to be descended from former chiefs of Nooru Bangu. According to him, one could indeed sacrifice oxen to obtain cowries, but, for one, these oxen were not black but white or bicolour and, the sacrifice of an ox was not the most effective way. The main way to get cowries was indeed to sacrifice a slave:

"seul le corps humain permettait de trouver une importante masse de cauris. Parce qu'on utilisait aussi la peau du bœuf, mais ça ne marchait pas bien. […] Les Kumate de Nooru Bangu allaient aussi à la guerre pour trouver l'esclave. Dès qu'on en trouve, on le tue et on attache la corde au poignet de la main. C'est après cela qu'on mettait le corps dans l'eau. Le lendemain, on tirait le corps et on trouvait beaucoup de cauris dessus. C'est ce qu'on m'a dit et c'est ce qu'on m'a laissé".[71]

This informant was also the only Kumate who did not mention the existence of Katanga and presented Nooru Bangu as a "complex" including a village, a market for slaves (and horses) and a sacrificial zone consisting of multiple locations. Moreover, he claimed never to have heard of a presence of Yoruba in the river region.

That cowries were formerly caught with the corpse of a slave is not corroborated – and even sometimes vehemently denied – by Mulanche/Kumate informants along the River.[72] It is only in Kandi that the local chief of Kumate admitted having heard about such a practice, adding that people do not want to evoke it nowadays.[73] In Guene, an informant asserted that people initially used the corpse of the sacrificed girl for getting cowries but discovered later that an ox hide might do as well,[74] while another informant explained that cowries could only be obtained with the blood of a man whose throat was cut over a hole along the pond.[75]

All oral testimonies agree on the fact that collecting cowries at Nooru Bangu required a human sacrifice, but there are two diverging versions regarding the role and identity of the victim: one evoking a Kumate girl whose life was offered to the spirit[s] of the pond; the other a man/slave whose body or blood served as fishing bait.

The end of Nooru Bangu was rarely seen as the result of a violent event.[76] Without being very explicit, some informants emphasised the "pagan" character of the ancient ceremonies conducted at Nooru Bangu and suggested that they are incompatible with contemporary Islam. Others pointed to the complete disappearance of cowries or of the animals within them.[77] The introduction of new currencies after colonisation could also have contributed to the abandonment of Nooru Bangu.[78]

One could easily reduce the legend of Nooru Bangu to its function as an identity resource for the Mulanche/Kumate. This is indeed the role it seems to play today in the public praises of griots, and in the references made to it by many of our informants – whether or not they consider themselves as Kumate. The underlying reasons for such a resource are not too difficult to grasp. In a con-

64 02/03/15. There was only one difference: the animals were pounded on the ground with a stick rather than in a mortar.
65 Tin Tin, 08/03/17.
66 Bogo Bogo 31/01/13; Goungoun, 24/02/15.
67 Kwara Tegui Sambo Kwara, 31/01/14.
68 Torozougou, 05/02/13.
69 Gourouberi, 25/01/13.
70 Tui, 25/02/15. A similar narrative was collected at Goungoun (24/02/15), but the person heard it from the same informant as the one we questioned at Tui.
71 Tui, 25/02/15; translated from baatonu by Barpougouni Mardjoua.
72 This question was systematically discussed during field enquiries in 2017. In Kantoro [22/02/17], an old informant explained that griots frequently say that Kumate used to "cut a man to fish cowries", but consider such a claim to be a mere provocation.
73 Kandi, 10/03/17.
74 Guene, 21/02/17.
75 Guene, 22/02/17.
76 In Kwara Tegui Sambo Kwara (12/02/12), some explained that the Kumate "*ont quitté cette localité car les blancs leur faisaient la guerre*."
77 Boumi Tounga, 15/02/15; Tui, 25/02/15: "*L'argent là, il n'y a plus cela là-bas.* […] *Même aujourd'hui, si vous mettez la peau du bœuf, vous ne trouverez rien. Ce n'est plus la même chose que par le passé: il n'y a plus rien dans l'eau.*" (Translated from Baatonu by Barpougouni Mardjoua).
78 Tomboutou, 09/02/14; Bogo Bogo, 26/02/17.

text where social distinctions and political relations are built on a binary opposition between "autochthones" (Tyenga and Gulmanceba) and "conquerors" (Songhai, Baatombu), the status of Mulanche/Kumate is potentially problematic as they belong to neither category. By portraying them as holders of sacrificial powers that enable them to conciliate the spirits of the cowrie pond and exploit its riches, but *also* as warriors[79] who drove away the Yoruba, the Nooru Bangu legend places them in a kind of "in-between" that legitimates both their status as owner of the land and political leader. It is a fact that none of the localities supposedly founded by Mulanche/Kumate appear to have experienced this form of dual power between autochthones and conquerors, which is observed in many other villages in the region. Perhaps other identity factors may have been mobilised in the past – for example, controlling trade and indigo dyeing, as we shall see – but the legend of Nooru Bangu today plays its role perfectly as an ideological support to the social and political functioning of the Mulanche/Kumate villages and to relations with other communities.

Stopping at this anthropological reading of the legend would however deprive us of the historical elements it may contain, or, in any case, of the connections it allows us to establish with other contexts. Let's begin with the simplest – but most confusing a priori: the very nature of this "wealth" obtained at Nooru Bangu. In Dendi, the word "*nooru*" means "money, currency" and is used today to designate the CFA. Since cowries were the main pre-colonial currency and the operation of Nooru Bangu is associated with the pre-colonial period, it is understandable that all our interlocutors believe that it was cowries that the Mulanche/Kumate withdrew from the pond. Their descriptions also leave little doubt about the fact that it might be shells and one is almost tempted to take the evidence at face value, were it not for a major problem: cowries (*Cypraea moneta*) are not freshwater gastropods and did not even come from the Atlantic coast of West Africa, but from the Indo-Pacific basin. In other words, it is impossible that living cowries were caught in Nooru Bangu. Obviously, one cannot discount the possibility that a large cache of cowries was discovered there, giving rise to the legend; but then how do we explain all the other elements it contains, starting with references to a recurring event and the capture of live animals?

One hypothesis tested in field surveys is that another species of shellfish may have been extracted from the pond, which would have constituted a substitute currency comparable to the "marginelloïdes" referred to by Mauny (1957). As a reminder, thousands of shells from the Atlantic were found in and around Timbuktu, Djenne, Tichit, Ouadane and Arguin, which Mauny interprets as alternative currencies used temporarily between the sixteenth and nineteenth centuries. According to Hogendorn & Johnson (1986: 130–1), the monetary use of Marginella could have emerged following the seizure of a huge cargo of cowries in 1787 and to cowrie supply problems consecutive to the European revolutionary wars of the late eighteenth century. Of course, Marginella are seashells, like *Cypraea moneta*. But could it not be that the "*kodom*" mentioned by one of our informants (above) might be a freshwater version of the "*koroni*" referred to in Timbuktu in the early twentieth century (Mauny 1957: 667)? To date this hypothesis could not be verified. Shellfish that were shown to us[80] were bivalves and univalves[81] so common that it would be difficult to imagine a monetary use. Besides, we were told that they are consumers of plant debris and not of flesh. The fact that their own flesh is not consumed (the shells are occasionally used as tools or utensils) seems to exclude their intensive exploitation. We are thus even more at a loss to interpret the detailed processing operations that several informants described to us. If it is neither shells nor cowries that were exploited at Nooru Bangu, what could it be? What are these valuable "things" that were found inside these "living beings" and which clung to the skin of an ox? We confess our complete bewilderment in this regard. In the register of a functional interpretation of the legend, the only trail that seems possible at this stage is that a valuable material was exploited in the environs of the pond, the extraction of which implied the rejection of a large amount of waste. Unfortunately none of the available elements allows us to go further.

The extension of the use of cowries beyond the monetary sphere (Green 2016, Guyer 2004; Ogundiran 2002) actually presents a huge difficulty in the interpretation of the legend of Nooru Bangu. Green (2016: 20) points out that cowries had a dual economic and ritual function in the "pre-Islamic societies" of West Africa, but that their monetary use became dominant in the seventeenth–eighteenth centuries, due to the Atlantic slave trade

79 While our Tui informant did not associate Nooru Bangu to the Yoruba and did not consider that the Mulanche/Kumate took control of the pond by force, he nevertheless underlines their military power, depicting them as slave hunters or mercenaries who notably helped the chief of Dosso to get rid of his enemies (Tui 25/02/15).

80 The principal interview was carried out in Dangazuri (28/01/14), close to Nooru Bangu.

81 In dendi cine, the bivalves are called "*giana*" and"*djingam*", and the univalve "*alkoto*".

and the increase in commercial connections. Citing Ogundiran (2002), he however recognises that their ritual value did not disappear and that it could even have increased here and there during the same period. It is difficult in these conditions to envisage a single model of historical evolution, which would mean, for example, that the insistence of our interlocutors as to the monetary function of cowries would situate the Nooru Bangu legend in the context of the commercial exchanges of the seventeenth–eighteenth centuries.

2.3 *Turuwe/Torouwey*

The name of Turuwe was mentioned in five villages between Kompa and Birni Lafia.[82] Its existence and history, which are linked to that of Kompa and Katanga, remain almost unknown outside this area.[83]

The traditions collected about Turuwe evoke an ancient village on the right bank, located south of Kompa, along the Kompa-gorou waterway. The latter was or would have been[84] partially navigable. A visit to the site visit revealed few traces of human activity, unlike other abandoned villages in the region: a few scattered sherds, some baobabs and possible slag. Bako-Arifari – who located it in the same place and estimated its size at 5 hectares – nevertheless reported the remains of an ancient fortification wall (Bako-Arifari 1989: 62). Archaeological investigation of a location shown to us suggested a post-thirteenth century occupation and a short span occupation of just one or two generations. A single, recent, radiocarbon date (Beta-416121) suggested a post-1690 age, but relative chronology markers could narrow this range and suggest that the site can be attributed to a period prior to AD 1850 (Livingstone Smith et al., Catalogue entry for TRO). It is possible that the absence of archaeological remains is due to agricultural activities, but it is also possible that the village was located closer to the river, east of the place that was indicated to us.

With one exception, the stories collected attributed the creation of Turuwe to the Mulanche/Kumate, who would have settled there after[85] or before[86] their arrival in Katanga. The first version was provided by Kumate informants,[87] according to which the installation of their ancestors at Turuwe was due to either the growth of the population of Katanga[88] which led some to cross the river, or to a smallpox epidemic that would have affected residents of Mulabon, on the island of Lété.[89] The version of an installation prior to the arrival at Katanga was given by Songhai informants who did not mention the circumstances in which the Mulanche/Kumate would have initially settled in Turuwe. Finally, a Tyenga/Kumate informant believed that it was the Yoruba of Katanga who settled in Turuwe, following the advice of their genie during a sacrifice ceremony.[90]

All respondents, however, agreed on one point: the main activity of the inhabitants of Turuwe was to provide river crossings to people and to caravans. For this purpose they possessed large canoes, which allowed the transport of the caravaneers' goods – and even their donkeys.[91] This ensured their supremacy over the local fishermen, who only had smaller boats.[92] Turuwe is said to have been the main port of the right bank, although there were two other places of passage, at the level of Boumba and

82 Kompa, Bogo Bogo, Toura, Garbey Kwara and Birni Lafia.

83 The sole exception comes from a Birni Lafia informant (12/02/15) who was especially interested in regional history and had taken part in public meetings dealing with the past of the region.

84 An informant from Kompa (30/01/13) explained that the river crossing started from the Kompa-Gourou river and continued toward Koulou, on the other bank of the Niger River. In 1896, Hourst wrote in his expedition journal: "*Le 19* [*septembre*] *à dix heures, nous pénétrons dans un petit bras d'inondation qui nous mène près du village de Kompa*" (Hourst 1898: 383). His aluminium boat was 13m long and 2.5m wide, with a water depth of 40 cm (*ibid.*: 12). Note that he navigated during the rainy season.

85 Bogo Bogo, 31/01/13 and 29/01/14; Birni Lafia, 12/02/15.

86 Kompa, 30/01/13; Garbey Kwara, 25/01/14.

87 They are Mulanche/Kumate (Bogo Bogo) as well as Tyenga/Kumate (Birni Lafia).

88 Bogo Bogo, 29/01/14.

89 Bogo Bogo, 31/01/13.

90 Birni Lafia, 12/02/15. Our informant also said that Sorko fishermen were already settled in Turuwe before the arrival of Kumate.

91 Kompa, 30/01/13.

92 An informant in Birni Lafia (24/01/14) evokes "*des grandes pirogues taillées dans un seul tronc, qui pouvaient embarquer une vingtaine de personnes*." Such boats were rare at the end of the nineteenth century, since they were only built in a handful of localities. Toutée (1897: 245) described the "*grandes pirogues d'une fabrication toute spéciale*" that he obtained from the "*roi de Boussa*". They were "*manœuvrées chacune par quatre Baribas*" (*ibid.*: 248). He added: "*Les gens d'Ilo sont, comme ceux de Boussa, de remarquables bateliers, et bien que le calme de leurs eaux ne leur ait point donné l'occasion d'acquérir au même degré les qualités de sang-froid et d'intrépidité de leurs frères installés sur les rapides, on y trouverait peut-être plus de ressources en batellerie qu'à Boussa même. Cela tient à ce qu'il existe auprès d'Ilo une forêt d'arbres à bois très dur, très favorable à la construction des pirogues. Le type de grandes pirogues que j'ai rencontré à Boussa et qui circule de Saye* [Say] *à Rabba, est en effet originaire d'Ilo. Ces pirogues portent facilement de trois à cinq tonnes, et* […] *elles exigent pour leur construction un art personnel consommé de la part du charpentier. Il n'y a pas en France quatre ouvriers d'art sur cent qui soient capables d'un pareil travail. Cette industrie est moins développée à Boussa, où elle est d'importation récente*" (*Ibid.*: 272).

Kwachi.[93] In this respect it is interesting to note that some testimonies collected at Bogo Bogo,[94] a village founded by Mulanche/Kumate originally from Katanga and Turuwe, describe boatmaking as a former male craft of importance. The craftsmen belonged to the socio-professional group known as *saace* which Olivier de Sardan (1984: 54) also encountered in the Sirba region and of whom he said that they held "*une sorte de monopole régional de fabrication des pirogues*". Other activities of the inhabitants of Turuwe were fishing, agriculture and, for women, pottery.[95]

The end of Turuwe would come after the arrival of the Songhai Mamar Hamey[96] in the region. Guided by Mamar (or Mamarou),[97] Arigani founded Kompa, a few kilometres from Turuwe.[98] Though the Songhai of Kompa were "*des guerriers qui pillaient les caravanes et étaient impliqués dans le commerce des esclaves*",[99] their leader Arigani would also have sought to control the river crossing. The way he managed this was explained in two ways. For our Songhai informants in Kompa, always quick to point out the martial prowess and violence of their ancestors, it was by strength that Arigani seized this activity.[100] After having been loaned a great canoe by the "king" of Turuwe and having entrusted it to his slaves for their use on the river all day, he was amazed by the reported earnings and decided to build his own canoe.[101] Faced with this competition, the "king" of Turuwe sought to prevent the slaves of Arigani from working on the river and the conflict degenerated into war, finally causing the destruction of Turuwe.[102]

The version given at Bogo Bogo[103] was less violent and focused on matrimonial relations between Mulanche/Kumate and Songhai. Thus, after the head of Turuwe gave one of his daughters in marriage to the son of the head of Kompa, the latter sent his wife back to Turuwe to convince her father to teach the Songhai of Kompa the profession of boatman, so that they could "find ways to feed their children." Thus Kompa would have peacefully acquired the monopoly of the river crossing. And if Mulanche/Kumate finally left Turuwe, this was related to the movement of dispersion that followed the destruction of Katanga, this place seeming to be the counterpart of Turuwe on the left bank.

2.4 *Mulabon*

The name of Mulabon ("head of Mula") was mentioned in four villages between Bogo Bogo and Birni Lafia.[104] This is an archaeological site on the western tip of the island of Lete, from which the hills of Katanga on the left bank can be seen. The ground is covered in sherds, but no traces of pavement or of defensive structure could be observed during our brief visit in 2014.

As is the case with Katanga, Turuwe and Nooru Bangu, the site is associated with Kumate. For most of our informants, it was one of the first settlements of Mulanche/Kumate, together with Katanga and Turuwe.[105] Some think they will have suffered a smallpox epidemic and that it was their "fetish" which ordered them to settle in Turuwe and to appoint one of their slaves as a leader. It was because they opposed the transformation of the political order that one part of the Mulanche/Kumate left the area and moved further east on the right bank.[106]

One Tyenga informant[107] believed that it was Tyenga fishermen of the Kumate and Sikira clans[108] who came from the east to settle in Mulabon, where they traded with the Yoruba of Katanga. Their wives were potters.[109]

3 The Sites in Historical Perspective

Our intention here is to evaluate the content of the traditions relating to the four sites of memory. These accounts

93 Garbey Kwara, 25/01/14. Located on the left bank, Boumba and Kwachi are the two principal markets frequented today by the inhabitants of the Kompa area. It is possible that their mention as historical crossing places stems from a projection of the current situation. Van Driel (2002: 151, map 6.3) also identified eight cattle fords between Pekinga and Tondikwara. Two of them are respectively upriver and downriver from Kompa.

94 02/12/15.

95 Garbey Kwara, 25/01/14.

96 Literally "the people of Mamar" (or Mamaru), which is the name that most Dendi Songhai give to themselves. Such a name underlines a connection with the Gao rulers, and especially Askia Mohammed.

97 Who appears to be a descendent of Askia Mohammed, rather than the Askia itself (see Landerloin 1911).

98 Kompa, 30/01/12, 31/01/12 and 30/01/13.

99 Kompa 31/01/12.

100 Kompa, 30/01/12, 31/01/12 and 30/01/13.

101 Kompa, 30/01/13.

102 Kompa, 30/01/13 and Garbey Kwara, 25/01/14.

103 Bogo Bogo 31/01/13 and 29/01/14.

104 Kwara Tegui Seydou Kwara, Bogo Bogo, Gourouberi and Birni Lafia.

105 Bogo Bogo 31/01/13 et 29/01/14; Gourouberi, 02/03/15. A similar version was recorded by Bako-Arifari (1989: 62).

106 Bogo Bogo 31/01/13.

107 Birni Lafia, 24/01/14 et 12/02/15.

108 The Sikira clan name was not cited in other localities, and "Kumate" is seldom encountered as a clan name among Tyenga. The most widespread Tyenga clans are Late, Siba, Bete, Saki, Guitey, Mishira, Kosoro, Kunkuma (Bako-Arifari 1989; Jones 2010; Walther 2006).

109 Note that this craft speciality is also attributed to the Mulanche/Kumate women of Turuwe (Garbey Kwara, 25/01/14).

have been presented factually so far, but the challenge is now to begin to grasp their possible the historical significance, by focusing on the elements that appear to offer the best option for analysis. The first question to ask is whether the traditions we collected include chronological clues that can be linked with the archaeological context or serve, at least, to establish a timeline.

Inserting sites into a plausible time frame is a perilous and perhaps futile enterprise in the absence of archaeological data, so numerous are the historical collisions and contradictions in the stories of our informants. Katanga is a good case in point. We have seen that several accounts evoke a war that would have resulted in the flight of Katanga Yoruba to Nigeria, and which preceded the settlement by the Mulanche/Kumate. If the latter generally present themselves as the conquerors of Katanga, some traditions collected in Gourouberi[110] and Birni Lafia[111] point to the impact of the insecurity that prevailed "in the time of war" and evoke a deliberate flight of the Yoruba to escape it. In all historical accounts collected in Dendi, "the time of wars" (*wangu wate*) refers to the period of instability and constant guerrilla warfare experienced by the region throughout the nineteenth century and which is echoed by Barth (1859), Monteil (1895), Toutée (1897) and Hourst (1898). Regardless of whether Yoruba were present or not in Katanga, could it be that the site was hit by the wars of the nineteenth century? Some elements allow us to propose a positive reply.

In two stories collected at Bogo Bogo,[112] it was a Fulani who discovers the riches of Katanga and went to inform the Kumate in Mali. It was also he who imagined the stratagem allowing Kumate warriors to find the way to Katanga. Now, the same narrative sequence appears in a story collected at Kompa,[113] but our source said that "it is the Fulani who massacred the Yoruba" to avenge the abduction of one of their daughters. This double connection with the Fulani is interesting because Benoit (2000) collected in Niger (at the periphery of the Park "W") traditions reporting a "battle of Katenga" conducted in 1836 by Fulani of Sokoto (or Gwando), after which part of the population was massacred. The survivors found refuge west of the Mékrou and ultimately at Botou (Benoit 2000: 13–4, 25). Benoit unfortunately provided no details of his sources or the reliability of the date put forward. Part of his information seems to come from the work of Laya (1991). However, Laya placed the battle of 1836 at "Koyanga" (based on the testimony of a Fulani informant of the Tamou [Niger] region), and believed that the name of Katanga would be a phonetic deformation (Laya 1991: 80). His arguments are not really convincing, however, and as he did not situate Koyanga/Katanga on his maps, one is left rather in the dark.

However, all the evidence collected by Benoit and Laya in the region of Tamou suggests a large-scale massacre at Katanga, which had a lasting impression on the Fulani and Gulmanceba communities at the periphery of the Park "W". These notions of "massacre", "destruction" and "flight of the population" also appear in many traditions of Béninois Dendi as we have seen above. If it is the same Katanga – which is a serious possibility in view of the correspondences between the different corpuses of oral traditions – one might consider that this important settlement was destroyed in the 1830s. Two scenarios are then possible as far as the history of the Mulanche/Kumate of Béninois Dendi is concerned. Either this destruction is the one which some stories present as the cause of their installation on the right bank, which means that all Kumate/Mulanche villages were established in the first half of the nineteenth century, or the destruction is that of the ancient Yoruba city mentioned in the oral traditions, which means that the installation of the Mulanche/Kumate in Béninois Dendi is even more recent, since they supposedly settled in Katanga before crossing the river.

The date of 1836 and the connection so often drawn between the Yoruba and Katanga nevertheless introduce a disturbing coincidence. It was in fact in 1836 that the city of Oyo-Ile or Old Oyo – whose Hausa name is Katanga or Katunga – was attacked and destroyed by the army of Sokoto, already established in Ilorin (Law 1977; Peel 2000: 34). These same Fulani are said to have destroyed the Katanga mentioned by Laya (1991) and Benoit (2000), and perhaps also ours.[114] In addition, part of the population of Oyo-Ile took refuge in the province of Oke-Ogun, including at Saki (Adekunle 2004: 208); "Saki" is also the place cited by some of our informants as the refuge of the Yoruba from Katanga.[115]

Three hypotheses are then possible. Either the Katanga of the informants consulted by Benoit and Laya has no connection with ours and we must interpret the convergence of traditions associated with them as mere coincidence; or all these stories relate only to the fall of Oyo-Ilé and then one must wonder about the channels and processes that allowed the dissemination and appropriation of a historical tradition associated with a place which is

110 25/01/13.
111 12/02/15.
112 31/01/13 and 29/01/14.
113 30/01/13.
114 Kompa, 30/01/13.
115 Gourouberi, 02/03/15.

more than 400km away as the crow flies;[116] or, finally, the traditions of Benoit, Laya and ours relate to one same Katanga, but it is distinct from Oyo-Ile. In the latter case, one could hang the "micro history" of the site referred to by our Béninois informants to the "macro story" of struggles that pitted the Fulani of Sokoto, Gwando and Dallol Bosso to the Zarma, Gulmancema and Kebbawa in the first decades of the nineteenth century.

However, such a scenario mainly derives from a homonymic relationship between a place in Dendi, a non-localised site evoked by Nigerien informants, and the Hausa name of Ilo-Ile. A different picture emerges when considering other aspects of the traditions pertaining to Katanga and, notably, the historical trajectory of the population said to have inhabited the place after dislodging the Yoruba: the Mulanche/Kumate. Bako-Arifari envisaged a Kumate arrival in Katanga in the fourteenth century, the destruction of the city in 1505, during the expedition of Askia Mohammed to Borgou and a colonisation of the "*terres vierges de la rive droite* […] *à partir du 16e siècle*" (Bako-Arifari, 1989: 58, 64). His chronology is established on the basis of associations between the references to certain characters or events in the story of his informants and the dates which figure in the Tārīkh as-Sūdān and in the work of Séré de Rivières (1965).[117] Yet Séré de Rivières does not speak of Katanga nor of the Mulanche/Kumate; he merely evokes the conquest of Songhai by Kankan Moussa, the ruler of Mali, in 1325 and the stay that this leader made in Dendi, where he raised an army (Séré de Rivières 1965: 68). Although this author does not provide any reference, his text is obviously based on the Tārīkh al-fattāsh, that he virtually paraphrases[118] – except that the character evoked in the Tārīkh al-fattāsh is Sonni Ali and not Kankan Musa.[119] This brings us to over a century later. Furthermore, when considering the fact that the Tārīkh al-fattāsh is a pastiche, written mostly in the early nineteenth century (Levtzion 1971; Nobili & Mathee 2015), little remains of the timeline proposed by Bako-Arifari (1989: 58, 64), who was, at the end of the day, basing himself on a text of dubious historical content, a fanciful reading of it by Séré de Rivières (who invented a connection with the Empire of Mali), and the establishment of an unsubstantiated link between this "Malian connection" and the arrival of the Mulanche/Kumate in Dendi.[120] For his part, Bio Bigou (1987: 218) did not date the arrival of the Mulanche/Kumate in Katanga, but he placed its destruction in the early sixteenth century as did Bako-Arifari. We also note, anecdotally, that an informant of Walther (2006: 94) argued that it was Askia Mohammed who dislodged the Yoruba of Katanga, while the same Askia Mohammed is supposed to have destroyed the Katanga of the Mulanche/Kumate during his expedition in Borgou (Bako-Arifari 1989: 58).

Depending on the sources considered, the colonisation of Katanga by Mulanche/Kumate could thus either date to the fourteenth–sixteenth centuries or the nineteenth century. Yet neither timeframe proves satisfactory when considering the evidence upon which they are built.

If the question of Turuwe is slightly less problematic, the chronological clues available nevertheless refer us to a fairly recent period. Thus, we know nothing of the period of installation of the Mulanche/Kumate at Turuwe, apart from the fact that it was supposed to be subsequent to their presence in Katanga – with all the uncertainty that this entails, as we have just seen. What we are told, however, is that its destruction (or decline) was contemporary with the emergence of a Songhai power at Kompa under the reign of Arigani. Although this character has acquired mythic stature in Béninois Dendi, to the point that he is considered the first political chief of Kompa and Karimama,[121] he is probably a historical figure. According to Landeroin (1911: 507, 509), Arigani (or Hargani) was the brother of Samsou Beri, first Songhai chief of Gaya. Having succeeded him in 1779, he was expelled from Gaya

116 A similar question was considered by Rouch (1953: 197), who was puzzled by the similitudes of traditions collected some 400km apart about the failed military campaign of Askia Mohammed in Borgu.

117 "*Par exemple, pour situer les migrations des Kumatè au Dendi historique au XIVe siècle, nous avons procédé à un recoupement entre les données de la tradition orale qui se rapportent à KANKAN MOUSSA, Empereur du Mali qui a régné de 1317 à 1337 et qui a conquis Gao en 1325. La même date a été confirmée par Séré de Rivières.*" (Bako-Arifari 1989: 14).

118 In the French translation of the Tārīkh al-fattāsh, it is written: "*Après cela il* [Sonni Ali] *se rendit par le fleuve à Lôlo, leva une nombreuse armée et la mit toute entière sous le commandement du Dendi-fâri Afoumba, qu'il envoya en expédition.*" (Houdas & Delafosse 1913: 89). In the text of Séré de Rivières (1965: 68), this becomes: "*de là il* [Kankan Moussa] *revient vers le Niger et séjourne au Dendi où il lève une armée qu'il envoie en expédition, probablement au Kebbi, sous les ordres d'un "Dendi-Fari".*" In a footnote, he added that Kankan Moussa sojourned in the village of Lalo "*sur le fleuve, probablement près de la frontière Niger-Nigeria, à la limite Dendi-Kebi.*"

119 Refering also to the Tārīkh al-fattāsh, Rouch (1953: 182), rightly mentioned Sonni Ali.

120 In a later text, Bako-Arifari alludes to the expedition of Sonni Ali as described by the Tārīkh al-fattāsh and the Tārīkh as-Sūdān (but the Tārīkh as-Sūdān did not say much about it and did not cite the Dendi or Lalo/Lolo), but he wrote a few lines further down: "*nous savons que les Kumate étaient arrivés au Dendi pour la première fois au quatorzième siècle*" (Bako-Arifari 1998: 273).

121 For Karimama, see in particular Maman Bello (n. d.).

and settled in Karimama where he died around 1794. Though Landeroin did not mention Kompa, it must be stressed that his investigations were carried out on the left bank and only mention the chiefdoms of Karimama and Madekali on the right bank. According to traditions collected in Karimama,[122] it was indeed the same Arigani as the one discussed at Kompa. This was also the opinion of Bako-Arifari (1989: 76), who considered Kompa as "the last step of his exile", after he placed his sons at the head of Karimama, Kargui and Tondikwara. If the politico-familial saga of Arigani evidently contains a good dose of exaggeration, it falls into the same timeframe of the late eighteenth century.[123] As far as Turuwe is concerned, this would bring the Mulanche/Kumate economic growth to an earlier period and the decline of the port on the Niger to the early nineteenth century. Provided, of course, that the actions attributed to the first chief of Kompa were indeed those of this "Arigani" of whom historical traditions speak. Interestingly, we saw above that a radiocarbon date (Beta-416121) from Turuwe suggests a post-1690 age, with relative chronology markers pointing to a period prior to AD 1850 (Livingstone Smith et al, Catalogue entry for TRO, this volume). Even if the archaeological evidence remain tenuous and if we are still unsure about the exact location of the port of Turuwe, a period of occupation spanning the 18 century seems possible. This fits with another body of evidence, as developed below.

3.1 *On the Trail of an Ancient Merchant Network*

We saw above that some traditions of Dendi evoke a former crossing point on the Niger between the existing villages of Kompa (Benin) and Koulou (Niger), and depict the site of Turuwe, east of Kompa, as the port through which once transited traders' caravans. Katanga, located on the other shore, may have played a similar role as Turuwe, both localities being designated by the Kumate (Mulanche and Tyenga) as their first places of installation in Dendi (alongside Nooru Bangu, possibly associated with a significant market for slaves and horses). Although it is difficult to establish a chronology of occupation for these two sites, it is possible that Turuwe was abandoned at the turn of eighteenth–nineteenth century and that, at the same time, the Kumate lost control of the river crossing, to the benefit of the Songhai of Kompa. Moreover, the Kumate would not have lived alone at Katanga, but would have mingled with Sirifi/Traore, Sorko and, allegedly, Yoruba.

At the beginning of colonisation, the main crossing points in the Béninois Dendi were at the level of Pekinga and Karimama, this second locality appearing as the major port of the region. The commercial track that crossed Dendi at the end of the nineteenth century nevertheless seems to correspond to a secondary trade network that connected the villages from the left bank to the northern cities of Borgou and through which transited mainly products destined for local consumption[124] (Drot 1904). The "kola road" crossed the river much further north (at the level of Say and Sansanne Hausa, Niger) or farther east, toward Ilo, Yauri and Bussa (Nigeria).[125] Though multiple elements attest to the involvement of dendiphone populations in long-distance trade (Bako-Arifari 1989, 1998; Brégand 1998ab; Moraes Farias 2013), the Béninois Dendi was not (or no longer) involved at the end of the 19 century, and it is therefore not surprising that one could write in the early twentieth century that the "Dendi people" were doing "very little" or "almost no" trade (Drot 1904: 281; François 1906: 108).[126]

Yet we have a historical source which proves that this marginal position of Béninois Dendi in trade has not always prevailed. When Heinrich Barth went from Sokoto to Timbuktu in 1853, he avoided crossing Dendi because of

122 02/02/14.

123 See also Bako-Arifari (1989: 62).

124 These include salt from dallol Fogha and dallol Bosso, horses, cotton, dried fish, dyed clothes, soumbala, yams …

125 "*La route est la même à l'aller qu'au retour; elle passe par Gandi, Sokkoto, Argoungou, Guiouaé, Dosso. En aval de Say, généralement à Kirtassi, la caravane traverse le Niger, puis entre dans le Gourma, atteint Souou M'Bodjio, aussi appelé Fada N'Gourma ou Noungou, capitale du Gourma, longe la frontière du Mossi et par le Gourounsi, la Mampoursi, le Dagomba, arrive à Salaga, capitale du Gondia.*" (Monteil 1895: 248); "*C'est à Guiris (Giris), port d'Ilo, que toutes les caravanes venues du Tchad, de Kano, de Sokoto traversent le Niger*" (Terrier 1898: 185); "*Toutes les routes sont coupées, au nord par les Touaregs, à l'ouest par les Mossi païens, au sud par le Dendi, à l'est par le Kebbi, le Maouri. A peine quelques rares caravanes, escortées, peuvent-elles passer jusqu'à Sansan Haoussa par Sorgoé.*" (Hourst 1898: 356); "*Les marchands qui mettent en rapport les marchés des états haoussas avec les comptoirs anglais sont en relations constantes avec la région nord-est de notre Soudan. Ils y visitent trois points: Sansan Haoussa, Saï, Dori. Ils ne vont point à Tombouctou. Je ne parle de Saï que pour mémoire; Sansan Haoussa l'a supplanté.*" (Baillaud 1900: 21); "*la route des caravanes venant de Say ou du Nord du Sokoto et allant à Sansanné-Mango,* [*passe*] *par Botou, Kodjar et Konkobiri*" (Pascal 1900: 295); "Traffic from across the Niger is not considerable; but some caravans come to Ilo and Gaya from Dosso, Fogha, Mahouri, and Sokoto, and proceed to Jugu, while others, from north of Sokoto, cross the river at Say or Niamey and visit Gurma" (Bascom 1920: 29–30).

126 Terrier (1898: 185) reported that Dendi people collected kola nuts across Bariba countries, Wangara, Yendi, Salaga and Kintampo and exchangde them in Ilo for salt, carved leather, copper objects, oxen and horses.

insecurity there, but he collected information about the region. Some concerned the delimitation of caravan routes connecting the Hausa country to forest areas from which came kola nuts. They indicated that Komba [Kompa] was an important place for crossing the Niger and that a "few years" before the passage of Barth, the "usual" route of Sokoto traders came through there and continued on through Sansanne Mango to Salaga (Barth 1859: 639–646). On the right bank, the first stop after Kompa is a "Fulani village" named "Korkojango gari-n-'Addu Fellani" (Ibid. 644), which can be translated as "Korkojango, the village of the Fulani Addu." Korkodjengou is actually the former name of Pekinga, at the time this Fulani chiefdom was located further back from the river, in the current Park 'W'.[127] Investigations at Pekinga[128] and Mamassi Peul[129] (another Fulani chiefdom of the region) indicate that Korkodjengou was founded at the very beginning of the nineteenth century and that it pleaded allegiance[130] to Abdoulaye, Emir of Gwamdu and younger brother of Ousmane dan Fodio, in the 1820s.[131] Our informants at Pekinga were, however, unaware of the existence of this old track. They simply mention one that started from Say, passed by Natangou and crossed the river at the mouth of the Mékrou, then headed towards Guene, along the river.[132] This is actually one of the secondary tracks we discussed above (see Drot 1904: 283).

Without more data, we are left with having to extract the maximum from the information provided by Barth. Nevertheless it is possible to draw a number of conclusions. First, the Béninois Dendi was well crossed by a caravan route of primary importance in the first decades of the nineteenth century, crossing the river at the level of Kompa, near the ancient site of Turuwe. Since neither this site nor Katanga were mentioned by Barth – who nevertheless cited the names of several villages of the right bank and left bank[133] – it can be concluded that they had either disappeared or had less importance, unlike Kompa. It will be recalled that the traditions concerning Turuwe evoke a destruction or decline following the takeover of the Niger River crossing by the chief of Kompa. This change would have taken place at the turn of the eighteenth–nineteenth centuries, which is perfectly compatible with the information from Barth. However, the idea that the Songhai chiefdom of Kompa might have served as a port and stopping point for merchant caravans travelling between Sokoto and Salaga completely contradicts the caravan-robbing image that our local informants willingly lend to their ancestors.[134] If this predatory attitude undoubtedly prevailed in the past, we must consider that the control of the river crossing, with all that that implies in terms of fees charged for the transportation and the security of merchant must have started to appear as a more lucrative pursuit in the beginning of the nineteenth century.[135] However, the hegemony of Kompa in this area did not last long. The resistance of the Zarma and Dendi to the Fulani of Tamkalla, Gwamdu and Sokoto threw the region into a state of insecurity that almost never left until the end of the nineteeth century (Salifou 2000; Séré de Rivières 1965). The road to the kola then veered to the north and southeast (see above), bypassing Dendi. This was the situation encountered by the first Europeans who visited the area, and their testimonies, combined with a lack of interest for the history of local populations, contributed to further erase the prominent economic role that Béninois Dendi may have played in the past.

Obviously, approaching Dendi history through some of its regional sites of memory does not settle all the issues raised in previous studies. From time to time, it may even blur the situation rather than adding clarity: think, for instance, of the odd descriptions of technical processes associated with the cowries' collection at Nooru Bangu. Yet such an approach also brings about a series of benefits. For instance, it forces us to consider the historical trajectory and activities of a population – the Mulanche/Kumate – that has been ignored by western scholars (Abadie 1927; Ardant du Picq 1931; Landerloin 1911; Perron 1924; Rouch

127 Its position is: 12.29769 ° N/° E 2.79428. A site visit in January 2012 revealed traces of an oval enclosure with a ditch, concentrations of shards, surface and circular structures in scorched earth.

128 16/02/11; 23–24/01/12; 27–28–29/01/12; 28/01/13; 16/02/15 and 28/02/15.

129 26/01/13.

130 Receiving a standard (*wilwal*) which is still kept in the chiefdom.

131 Although the name of Ousmane dan Fodio is sometimes mentioned, our interlocutors recognised that it was Abdoulaye who gave a flag to Abdu Cuka. The information collected by Barth (1859: 682) showed that Ousmane dan Fodio divided his territory into two before he died in 1817, bequeathing to his brother Abdoulaye the western provinces along the river, with Gando as its capital, and to his son Bello the eastern provinces, with Sokoto as its capital. Aboulaye died in 1827 (ibid: 635). If it is indeed Abdu Cuka who received the standard, he would have been in power around 1820.

132 Pekinga, 28/01/13.

133 Among them Gaya, Tara, Tanda, Karimama and Garou (Barth 1859: 639–640).

134 According to folk etymology, the name of the town means "snatch". It follows that the main activity of the former inhabitants was to "snatch" the goods of merchants; in other words, to plunder the caravans.

135 One could also interpret the strange journey of Arigani between Gaya, Karimama and Kompa in the light of such transformation, as a desire to carve its own power on the right bank, first by military means (which failed), and second by economic control.

1953; Séré de Rivières 1965) and only came to prominence when Beninese scholars with a good knowledge of the area became involved (Bako-Arifari 1989, 1998; Bio Bigou 1987). This population, which eschews the usual dichotomy between "autochthones" and "conquerors", allows us to explore the connections with various places and activities and, from there, different forms of relationships with other social groupings (including clans and craft specialists). Rather than envisioning history as the piling up of independent, well-bounded groups, we are thus in a good (or better) position to explore the relational dimension of past processes.

One such process pertains to the emergence and decline of an important economic pole in the vicinity of Katanga, Turuwe and Nooru Bangu. The comparison of available accounts indicates that it must have been the source of considerable wealth in the eighteenth century and perhaps earlier, due to its position along a major caravan road, control of the Niger River crossing and the trade of various goods that included slaves, horses, salt and some other material(s) that we still cannot identify. Up to the end of the eighteenth century, Mulanche/Kumate seem to have been the main players on the commercial scene. However, some Songhai chiefdoms apparently took control of the commercial exchanges in the first decades of the nineteenth century. This may explain why Bako-Arifari (1989) considered Karimama to be the great trading city of Dendi and even collected testimonies according to which its chiefs also controlled Nooru Bangu. Whatever the case may be, we saw that Songhai involvement in commerce was short-lived. And we certainly disagree with the idea that Karimama was the "financial capital of Dendi" for several centuries before European colonisation (Bako-Arifari 1989: 106).

Another intriguing example of relation in the traditions pertaining to regional sites of memory is the frequent mention of Yoruba people and Yoruba localities. So far, we have not been able to reach any conclusion regarding the presence of Yoruba in Dendi. Yet several elements indicate that the space of experience of Dendi inhabitants may have partially overlapped with that of the Yoruba before the nineteenth century, which could account for the sharing of cultural elements such as legends or place names. We will discuss this issue further in the final chapter of the book.

Finally, some craft relations have emerged from the comparison of oral testimonies. We have seen, notably, that people associated with regional sites of memory specialised in specific activities such as indigo dyeing, boat-making and pottery. In the final chapter, we will specifically examine the case of indigo dyeing which, as we will see, allows us to reconstruct a broader set of relations within West Africa.

CHAPTER 3

Palaeoenvironmental Data on Dendi, in the Last 3000 Years

Anne Haour

Dendi today lies in the southernmost part of the Sahelian zone, receiving about 800mm rainfall per annum. One obvious question in the context of our research concerns the nature of the environment at the time of the occupation of the sites we recovered archaeologically. The point of this chapter is to offer an overview of the palaeoenvironmental information available through studies from the wider West African subcontinent, including clues derived from historical evidence. This complements the faunal, anthracological and archaeobotanical evidence (Linseele & Wouters, Eichhorn, Champion & Fuller, this volume) specific to Dendi which were recovered in the course of our research and which will be discussed later in this book.

Broad African paleoclimatic trends are inferred from sedimentology, geomorphology, pollen sequences, oxygen isotope curves drawn from marine sequences, and/or multiple indicators. Despite an increase in the number and resolution of such studies, they remain rather difficult to use for the archaeology of the period of interest to us, the Late Holocene. The main problems are that palaeoenvironmental records often lack the stratigraphic and chronological resolution that is useful to archaeology, that they may be valid only at a local level, and that they rely on proxy data whose relationship to climate is not always straightforward and which in fact may encode quite different types of information. Spatial variability may partially explain why so many climate proxies do not agree, and this variability is largely a result of factors such as groundwater conditions and vegetation feedback, making the system inherently dynamic and therefore difficult to predict. For the West African Sahel, which is such a sensitive region anyway, this is especially pertinent. In particular, the question of the relative importance of climate and anthropogenic activity in past environment alteration remains a matter of controversy and uncertainty (Ballouche & Neumann 1995; Salzmann et al. 2002; Mayor et al. 2005; N'Dah 2009). It is clear that, certainly for the relatively recent past, human factors have impacted on the natural landscape.[1] Finally, and specific to our region which lies along the Niger, the relationship between rainfall and river levels is not straightforward. Rouch (in Tymowski 1967: 75) noted a paradoxical situation: during the rainy season the Niger River is low, during the dry season it is high. Good floods in the Niger, which helped Sahelian polities thrive, may derive from abundant rain in faraway Sudano-Guinean zones (Nicholson 1980). For all these reasons, we must resist the temptation to read a linear relationship between palaeoenvironmental and archaeological data.

Having said this, there is agreement that an aridification trend intensified after about 4000 years ago in the Sahel. A shift to drier conditions on the Bandiagara Plateau of Mali is inferred from about 3800 bp based on data from the Yamé river, indicating the local termination of the Holocene optimum period (Lespez et al. 2011; but Ozainne et al. 2014 appear to suggest the existence of two arid phases). In the Manga grasslands of northern Nigeria, abrupt changes in stratigraphy and pollen are recorded around 3300 bp at four individual depressions,[2] suggesting drier conditions leading to the establishment of the modern vegetation (Salzmann & Waller 1998: 65). Importantly, while differences of some 1000 years were noted in the timing of vegetation changes between these four depressions for the early and mid-Holocene (10000 to 3300 bp), in contrast the 3300 bp discontinuity speaks of an event during which vegetation was affected simultaneously, which Salzmann & Waller (1998: 65) take to imply a major change in climatic regime. At Jikariya Lake, also in the Manga grasslands, climatic deterioration is likewise apparent after 4000 bp (Wang et al. 2008). A core from Lake Tilla on the Biu Plateau to the south shows a distinct drop in lake level and a shift towards drier environmental conditions around 3800bp, suggesting an open Sudanian savanna with the establishment of woody taxa from the drier Sahelian zones (Salzmann et al. 2002). At Lake Oursi in Burkina Faso the establishment of modern vegetation coupled with a distinct drop in lake levels occurred around

1 As an example, Sutton (1979) saw the conversion of bush and woodland to parkland and open savanna in northern Nigeria as part of the emergence of a "Hausa way of life", a "hausaisation of the land". For another study of the interrelation of climatic alteration, oral history and settlement see Mayor et al. (2005).

2 Kajemarum, Bal, Kaigama, and Kuluwu. But Street-Perrot et al. (2000) use the example of Kajemarun to show (their Table 2) that a comparison of different data sets shows that the deterioration ca 4000–3600 bp was quite a complex event.

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3300–3000bp (Ballouche & Neumann 1995). Finally, and closest to our region, data from the site of Péntènga show an unexpected early dominance of savanna species which is incompatible with the idea that human activities were responsible for a shift from dry forest to savanna in this, the Sudanian zone. Also, an agricultural landscape only became established in the neighbourhood of the site after about 850bp, at first glance suggesting the idea of a late introduction of food production but perhaps more likely a result of the nature of the site, a rockshelter (Frank et al. 2001).

The overall picture is therefore one of aridification. However, Salzmann et al. (2002: 82) point out that although biostratigraphical and sedimentological changes indicative of an aridification trend can be recorded at nearly all West African sites, the timing varied considerably, being as late as 2000 years ago in some locations, such as western Senegal (see also Lézine & Casanova 1989 for a general overview). The strong temporal variations between sites suggest that this change was caused by an intensification of a general trend with different regional amplitudes, rather than by one abrupt climatic event (Salzmann et al. 2002; Lespez et al. 2011). Change was a stepwise process, with quite marked differences in the timing and nature of events (Wang et al. 2008). In short, the lesson, clearly put by Ballouche & Neumann (1995), is that it would be too simplistic to assume latitudinal shifting of vegetation zones to follow climatic fluctuation, and that localised data cannot be used in building general models for vegetational variation.

Again, the question of anthropogenic impact poses itself. The change in the pollen sequence around 3000 years ago at Lake Oursi involves a distribution of taxa which cannot be explained from an exclusively climatic viewpoint, and so may evidence the opening up of grasslands by agricultural activities, such as clearance or shifting cultivation (Ballouche & Neumann 1995: 33). It was noted above that, judging by samples from the Manga grasslands, drier conditions around 3300 years ago produced abrupt changes and led to the establishment of the modern vegetation there; but although the area was occupied since at least 3700 bp, there is little evidence of human activity in the pollen diagrams. The nomadic pastoralism practiced by the human occupants of the Manga grasslands may, conclude Salzmann & Waller (1998), be palynologically undetectable. The lack of unambiguous indicators, even for the late Holocene period, demonstrates the difficulties of detecting human activity within the open vegetation of a savanna, concluded Salzmann et al. (2002) with some frustration based on their study of Lake Tilla.

Having said this, archaeological indications do suggest a break in settlement in some Sahelian areas over the course of the first millennium BC, with the abandonment of certain settlements and new occupations elsewhere (Brunk & Gronenborn 2004: 110, Mayor et al. 2005: 51). Coincidentally or not, our earliest dates for Dendi date to the first millennium BC, at the sites of Alibori 2 and Kozungu. Potentially, as has been hypothesised for the clay plains south of Lake Chad (Brunk & Gronenborn 2004), as the environment became drier, settlement became possible on this vast inland floodplain.

Part of the first millennium AD (roughly AD 300–1100) is seen as a humid optimum period by Brooks (1986) and Mayor et al. (2005). Mayor et al. (2005: 52) suggest that the emergence of the first empires, demographic explosion, the intensive development of agriculture and iron metallurgy, long-distance trade and the expansion of settlement into less favoured zones were all helped by the abundance of natural resources due to climatic improvement during these few centuries. Brooks (1986: 50) similarly suggests commercial linkages, including those across the Sahara, were stimulated. Yet, against this notion of a generally positive environment, Street-Perrott et al. (2000) identify an intense drought at the close of the first millennium AD, based on samples from a dry lake floor at Kajemarum Oasis in the Manga grasslands, and which is paralleled in lake-sediment sequences and peats in Niger, Ethiopia and tropical Mexico. Again, the picture seems to be one of regional complexity. During this optimum, Brooks (1986: Map) suggests that Dendi would have sat on the 1000mm rainfall line. We have abundant evidence of settlement of the region at this time, with over 40 radiocarbon dates. This comes not just from the very sizeable mound of Birnin Lafiya which appears to have been first occupied around the mid-first millennium AD, but from sites all along the river – Gorouberi, Kompa Dune (both smelting and settlement contexts), Tin Tin Kanza, Djaboutchia, Pekinga, Kantoro (both smelting and settlement contexts) and Madekali.

Following this apparently favourable period, the situation for the second millennium AD is much less clear. Mayor et al. (2005) suggest a continuous trend towards aridification starting at the beginning of the eleventh century AD, marked though by climatic instability and some periods of greater rainfall. For Brooks (1986), this period, AD 1100–1500, saw droughts, desiccation and far-ranging population movements; diminished rainfall caused ecological zones to move southwards, perhaps by several hundred km, over four centuries. According to his model, Dendi now sat perhaps on the 700mm rainfall line. In contrast, on the shores of Lake Chad, Brunk & Gronenborn

(2004) suggest that a generally favourable period continued up to the thirteenth century, as evidenced for example by ibn Sa'id's mention of the cultivation of pomegranates, peaches, sugar-cane, grapes and wheat. Nicholson (1979) has similarly identified wetter episodes through the semi-arid zone south of the Sahara through most of the eighth to thirteenth centuries.

In short, there seems little consensus here, beyond perhaps the fact that climatic conditions were unstable. This would have posed considerable challenges to the inhabitants of Dendi, faced with a fluctuating floodplain. We have abundant evidence for settlement in the period AD 1000–1400: our largest sample of dates comes from this time, and from settlement throughout the region: at Birnin Lafiya (especially in a large paved complex and adjacent units), Kompa Dune, Tin Tin Kanza, Pekinga, Alibori Sites 1 and 2, Kantoro, Kozungu, Boukouroubou, Madekali and Toutokayori.

As we approach the modern day, we have the added advantage of historical evidence. Nicholson (1979, 1980, 1981) had already pointed out that the best sources for reconstructing the climate of the past few centuries for Africa are historical and geographical; that is to say, comments in written records such as landscape descriptions, allusions to droughts or storms, or remarks on the navigability of rivers, crops grown and agricultural prosperity. Together with Borno, which lies southwest of Lake Chad, the Niger bend is relatively well historically documented. For Dendi, sources such as the *tarikhs* mention several periods of major drought, as well as floods. The question of the environment is assumed to have been of interest to past chroniclers, and it is often said (e.g. Nicholson 1979) that the agricultural prosperity of the Mali and Songhai empires depended on the floods of the Niger.

Nicholson (1979) identified episodes of wetter conditions through the sixteenth to eighteenth centuries. For the latter period, conditions seem to have been significantly wetter in the semi-arid regions south of the Sahara in at least long periods of, if not during most of, these three centuries; and it is possible that the Sahara contracted (Nicholson 1978). Brooks (1986) talks of a brief but eventful wet period between AD 1500 and 1630 approximately. Based on linguistic data compiled from European sources, dealing with agricultural groups living on the Atlantic seaboard, Brooks (1986) supposes that, faced with changing circumstances, cultivating groups would not have moved north to find ecological conditions similar to those they were accustomed to; they would have remained where they were living and enjoyed greater and more dependable crop yields and perhaps significant population increases.

For the Niger bend specifically, Nicholson's summary (1979, 1980, drawing too on the work of Cissoko, unavailable to me) shows that the Tarikh as-Sudan and Tarikh al-fattash speak of great prosperity in the century, with no famines (but the plague, which in itself may indicate conditions wetter than today); flood descriptions in the chronicles support this argument. Tremendous floods are dated to AD 1592 and 1616, and in 1618 precipitations were very abundant. The Niger Bend experienced good floods at Timbuktu from 1618 to 1639.

Although in Nicholson's (1978: 5) reading the Borno chronicles talk of the great prosperity during the sixteenth to seventeenth centuries and the absence of famine or drought, this is nuanced by the evidence summarised by Brunk & Gronenborn 2004 (see esp. their Figure 4). While they identify this as a period of high lake levels, it was also a time in which droughts are mentioned in the Borno chronicles. And while the later century was indeed a period remembered in the chronicles as a time of prosperity for Borno, aridity, low lake levels and famines appear to have occurred in the middle of that century (Brunk & Gronenborn 2004: 116–117). Mayor et al. (2005: 29) observe that, in contrast to the idea of abundant rains documented by the tarikhs, there is evidence of an accentuation of earlier aridification.

In short, the written records, in combination with palaeoenvironmental studies, offer some frameworks for the consideration of climatic and vegetational change within Dendi, but as none are specific to our area, these data must be treated with caution. In this sense, the anthracological, archaeobotanical and faunal analyses undertaken within the context of our project provide invaluable new information.

CHAPTER 4

The Archaeology of the Eastern Niger Valley

Anne Haour and Didier N'Dah

Very little was known about the archaeology of the Dendi area of Benin prior to the work of the *Crossroads* project. It does not figure in a fundamental source for the archaeology of the Niger Valley basins, the 1993 volume *Vallées du Niger*. Yet initial reports suggested that this would be a rewarding area. A survey carried out in 2001 by one of us (DN'D) had identified the presence of several settlement mounds (N'Dah 2006), and brief comments on the prevalence of surface remains had been made by historians working in the area (e.g. Bako-Arifari 2000; Ayouba 2000). These preliminary observations were all very succinct and not georeferenced (see Khalaf et al., this volume). In this section, the focus is on the areas neighbouring Béninois Dendi: the portion of Dendi falling in the Niger Republic, downstream into the Sokoto/Kebbi river system and the Kainji Lake area, upriver to the Parc W and towards Mali, as well as in the Atakora region at the Niger River's hinterland, all areas in which the archaeological landscape was relatively better known. Dense archaeological landscapes had been reported, some associated with small-scale excavations and radiocarbon dates (Chatelain 1917; Robin 1947; Priddy 1970; Breternitz 1975; Sutton 1976; Obayemi 1977; Gado 1980, 1993, 2004; Nzewunwa 1983, 1993; Vernet 1996; Idé 2000; Haour et al. 2006). Around the time that the *Crossroads* project was developing, new analyses of finds from sites in southwest Niger were also adding to our knowledge of the region's archaeology (S. Magnavita 2013, 2017b, in press).

Looking upriver first, into the *dallols* region of the modern country of Niger, there was evidence of the existence of *tombos*, mounds some 6–30 m wide and several metres high, which were described variously by local populations as burial tumuli or as habitation mounds (Gado 1980: 43). These sites were said to occur predominantly on hilltops and to be covered with evidence of past settlement, in particular pottery; Périé & Sellier (1950: 1018) and Mauny (1961) compared them to *Kjökkenmoddings* (Danish: kitchen-middens). *Agursa*, deep wells carved into ferruginous soil or rock, are also often associated with them (Gado 1980: 43), some of which were still in use in the colonial period (Robin 1947: 60). In his 1980 book *Le Zarmatarey*, Nigérien historical archaeologist Boubé Gado published a map which graphically illustrated the range of evidence attributed to the historical period: *tombo*, ironworking sites, walled settlements (Hausa: *birane*), stray finds of terracotta figurines, and *agursas*. Many of these were thought to relate to the second millennium AD, and many were associated with oral traditions giving indications of suggested affiliation and meaning. For example, these include sites related to resistance to Moroccan occupation in the late sixteenth century, or related to present-day Hausa groups. However, the evidence was not described in any detail; Gado's summary consisted of a five-page section in his book (Gado 1980), drawing in turn on several descriptive papers published during the 1950s and 1960s (e.g. Périé & Sellier 1950; De Beauchêne 1969). The only excavation carried out in the area was that of a tumulus at Rosi, in the *dallol* Bosso, which yielded potsherds and metal fragments, and a radiocarbon date with an unhelpfully wide range falling across the past five centuries (de Beauchêne 1969). As a result, descriptions of the archaeology of the *dallols* could only hazard a guess at the age and affiliations of these remains, while Gado's focus lay farther west, on the Niger River, where he was soon to make public the finds from the remarkable necropolis of Bura (Gado 1993). Gado's work (1980, 1993, 2004) on sites between Niamey and the modern border with Mali is sparsely published – in particular with regard to the materials recovered, and especially the pottery – but he outlined several spheres of cultural influence, based on the regional distribution of key surface material culture items supported by radiocarbon dates. His first phase, which sits in the first millennium and features sites such as Bura and Kareygoru,[1] is suggested to relate to the Songhai sphere (Gado 1980, 2004).

More recent work carried out in these areas by Sonja Magnavita (2013; 2017b, in press) has involved survey and small-scale test pitting along the Niger valley. The site of Garbey Kourou, consisting of two settlement mounds at an elevated point on the northern bank of the Sirba River, one of the Niger's tributaries, lies in the vicinity of gold deposits. The site was explored through two test pits,

1 Unfortunately, Kareygoru suffers from interpretative problems due to 'three widely divergent dates … on samples from similar depths' (R. McIntosh & S. McIntosh 1986: 431; dates reported in Gado 1980: 73), but it appears to fall within the period relevant to our *Crossroads* study. The site yielded 10–20 cm tall anthropomorphic and zoomorphic statuettes, interpreted as votive, as well as a wide range of iron and copper artefacts (Gado 2004).

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which revealed stratified material. In Test Pit B, a refuse pit dated between c. 4th–6th centuries AD contained potsherds, faunal and charred botanical remains, a glass bead and several fragments of clay crucibles, and therefore testified to the arrival of goods from North Africa in the first millennium AD, including brass presumably of North African/Mediterranean origin (S. Magnavita 2013).

The archaeology of the Parc W had, thanks to its listing as a nature reserve, been investigated a number of times, and results included unpublished impact assessment studies by ECOPAS,[2] brief notes relating to the Iron Age remains by De Beauchêne (1969), Vernet (1996: Figures 173–178, 181), and Idé (2000: Figures 135–140, 151–154), and a multi-period field season reported in Haour et al. (2006). In a general survey of the archaeology of Niger, De Beauchêne (1969: 55) had reported past settlement sites of undetermined age, attributed locally to the Gourmantche and featuring grinding stones, pottery and iron artefacts. Later, two dates run by Vernet situated the occupation of the Parc W by pottery- and metal- using peoples from the recent past,[3] while work led by one of us (AH) in 2004 secured evidence of habitation potentially as far back as 1300 bp (OSL, X2323, Haour et al. 2006: 307; also two slightly more recent dates from a slag mound, Haour et al. 2006: 310). The site of Tondikwarey, just outside the park, featuring laterite dykes, has been identified as an exploitation of gold-bearing quartzite (Vernet 1996; Gado 2004; the earlier identification of the site by Toucet [cited in Gado 1980] as an agricultural complex is thought unlikely) (Haour et al. 2006). A single date (UCLA-695A) places it in the middle third of the second millennium AD (Mauny 1970: 307). Just north of the Parc W, a number of sites were test pitted by Robert Vernet; these are reported in his encyclopaedic work *Le Sud-Ouest du Niger de la préhistoire au début de l'Histoire* (1996). They include the sites of Kolo, Tapague, and Gorou Banda (Vernet 1996: 142, 322; summary in Haour 2003b).

In southeast Burkina Faso, the Chaîne de Gobnangou, a sandstone massif with a steep escarpment, rises ca. 100 m above the surrounding plains with their Sudanian savannas. Two rock shelter sites and one open-air site were excavated by Frankfurt archaeologists. The rockshelter site of Péntènga is particulalry relevant as it yielded rich archaeological material and an extensive Holocene sequence. In the 1.9 m thick sequence, pottery, microliths, and plant and animal remains were found, dated between the 7th millennium BC and AD 1300. Thermoluminescence dating was also undertaken on some of the potsherds, pointing to a disturbed sequence.

Heading downriver from Dendi into modern Nigeria is an area about which little is known. The only real point of archaeological enquiry is a cluster of sites around Yelwa, investigated in the 1960s as part of an international archaeological salvage project, and then again in the 1980s. Initial surveys of the area during the early 1960s, by Robert Soper on behalf of the Federal Department of Antiquities, led to the development of the Kainji Rescue Archaeological Project (KRAP), in advance of the flooding of the area due to the construction of a dam. This project permitted the excavation of some 20 sites over a 100 km stretch of the river; some of this work was very substantial (for instance the excavation of 27 × 3 m and 3 × 24 m trenches at Baha Mound) and a number of dates were run. The work brought to light important sites, in particular Baha Mound, Ulaira and Yelwa RS 32/63.

Four radiocarbon dates place the site at Baha Mound in the period 1335–925 bp, and a fifth (N 824), at 460–480 cm depth, is considerably older at 2140 ± 110 bp (initial occupation seems to have begun even earlier, since 140 cm of occupational remains lay below this: Hartle 1972; Nzewunwa 1983; Sule & Haour 2014). Hammerstones and grinders, stone beads and bracelets, iron points, hoes, jewellery, fish hooks, slag, glass crucible fragments, terracotta figurines and clay smoking pipes have been reported, as well as tens of thousands of sherds, including painted, rouletted, incised and burnished wares. Architectural structures (granary foundations, fallen house walls, floors and burnt clay ditches) and burials including beads, iron bracelets, hoes, quartz ear and lip plugs and a bronze anklet have also been mentioned.

Another key site is the mound of Yelwa RS 63/32, just 4 km away and on the opposite (west) bank of the Niger River. Excavated in 1966, it provided evidence of an occupation spanning 1965–1145 bp (four dates, N 361 to 364; Nzewunwa 1983: 36), evidencing burnt clay and potsherd pavements, iron throughout, items of personal adornment and a series of terracotta figurines. There were also four burials with grave goods including intact pottery vessels, ivory and iron bracelets (21 iron bracelets in the case of one of the graves). However, to our knowledge the material from this site, described in a preliminary fashion by Priddy (1970) but with no illustrations, has not been fully studied. Thus Yelwa RS 63/32's connection with other sites of West Africa – and even with the site of Baha Mound close by – remains unknown.

Interest in the Kainji region continued after the damming of the river, with the survey and testing in the 1980s

2 Ecosystèmes protégés en Afrique Soudano-Sahélienne.

3 These are NIA 72 and NIA 74, from ironworking and settlement contexts along the Mékrou; these are 335 ± 120 bp and 175 ± 70 bp respectively.

of the sites of Ulaira and Sawuni, on what had by then become the shores of a lake. The site of Ulaira was reported to archaeologists by the Emir of Yauri after objects were discovered eroding out of the lake shore and, in 1980, six trenches were excavated – four 2 × 2 m pits and two 2 × 20 m trenches – and a maximum depth of 4 m reached (Nzewunwa 1993). A large number and variety of domestic and agricultural iron tools, grindstones, pottery, weapons, ornaments, iron slag, cuprous rings, shell beads, clay figurines and floor pavements of laterite, shell, pebbles, potsherds and stone (on which see especially Nzewunwa 1989: 94–100) were reported, from contexts spanning the mid-first to mid-second millennia (five dates, HAR 4397 and 5183–86; Nzewunwa 1983, 1993). Significantly, several pottery pavements were recovered *in situ* at Ulaira (Nzewunwa 1989, 1993; Haour 2013).

Looking eastwards, along the Sokoto (or Kebbi) River, archaeological evidence is abundant. In a survey carried out in 1975, John Sutton recorded numerous mounds; these occurred widely, but most strikingly near Bunza, where he reported: "flanking either side of the Kebbi river big mounds are especially numerous and conspicuous, some of them standing ten or even fifteen metres above the surrounding land", often covered in potsherds, sometimes evidencing burnt clay indicative of past walls or floors (Sutton 1976: 5). The evidence from this area was included in a summary made by Ray (1983), who proposed the existence of a threefold 'early settlement and archaeology' chronology running from 500 BC to AD 1900; in his view, the mounds fall into any of the three phases but can be differentiated based on their situation relative to the landscape, especially the river.

Southwest of this region is Atakora, a region dominated by the mountain ridge of the same name, part of a wider chain running from the Mékrou river to the Atlantic coast in southeastern Ghana. Work in Atakora in the late 1990s produced evidence of an 8000-year sequence of occupation (Petit 2005). In its remit and activities, 'like wandering in a blank region' (Petit 2005: 1), this project holds close parallels with the work of the *Crossroads* team along the Niger River, even though its temporal scope was much longer. Excavation documented the existence of a number of anthropogenic settlement mounds, dating between the sixth and late fourteenth centuries AD. The two key sites, Perma and Yohongou, are both mounds, lying south and north of the Atakora range respectively, but smaller-scale investigations were carried out at six other locations for the Iron Age, and two further ones for the 'Historic' period. There are four radiocarbon dates from Yohongou (Petit 2005: 54, 56, 65, 69), where ten occupation phases were recognised, spanning AD 650–1200; and three from Perma (Petit 2005: 69, 71). Sundried mudbrick and tauf construction are evidenced at these sites, as well as plaster flooring at Kouisougo (Petit 2005: 72, also Fig. 5.26.d & Fig. 5.54c). An obvious indicator of long-distance contact is the use of cowrie shells, recovered in stratigraphic contexts, e.g. at Yohongou (Petit 2005: 105).

Further work around Atakora includes a Masters thesis by N'Po Takpara (2011) involving investigations in the town of Djougou, and a study of caravan and other past sites in the town and its vicinity (Nixon et al. 2015). Studies of oral traditions in Atakora document a complex sequence of population migrations, partly linked with the waxing and waning of the large political entities alluded to by the historical record (N'Tia & N'Dah 2011; N'Dah et al. 2013). Oral traditions suggest that migrants came from the Volta Basin to the west, and the supposition is that Atakora served as a refuge for populations pressed by the activities of more centralised polities. This, however, is a hypothesis that requires substantiation. Similarly, the timing of these movements is hotly contested. A "long chronology" refers to local historical records (*tarkihs*) which mention rivalries opposing the empire of Mali, and later the Songhai empire, to Mossi and "pagans" of Gourma in the fourteenth and fifteenth centuries (overview in Ki-Zerbo 1978: 246). A competing "short chronology" refers to Mossi oral tradition regarding the creation of the Mossi-Dagomba-Mamprusi and Gourmantche kingdoms to propose a peopling of Atakora during the eighteenth or nineteenth century. This short chronology clearly does not accord with archaeological evidence of occupation in Atakora over much longer timescales, but it may be associated with later episodes of settlement. It is also worth mentioning that oral tradition is vivid concerning past sites of the region. The case of the site of Dikuanténi is particularly interesting, as it was assumed to be of recent date on the basis of the detailed and specific traditions surrounding it today. Surprisingly, test excavation yielded dates of 530 ± 60 bp (NIA 374) and 665 ± 75 bp (NIA 373) (N'Dah et al. 2013). This has been interpreted by the excavators as a case of long-lived historical memory by local populations who, by imposing prohibitions or declaring a place sacred, manage to safeguard sites significant to their history (N'Dah 2009a: 254; N'Dah et al. 2013: 333).

Generally speaking, with some rare exceptions, the pottery from these sites has been poorly published. Therefore, valuable as it is in terms of indicating the broad characteristics and timeline of human occupation of the areas around Dendi, the previously published archaeological data offer little to help contextualise the finds from the *Crossroads* work.

CHAPTER 5

An Archaeological and Ethnographic Approach to a Site and Its Region

Anne Haour, Olivier Gosselain, Alexandre Livingstone Smith, Sam Nixon and Didier N'Dah

As we have outlined in earlier chapters, very little was known about the archaeology of Dendi prior to our work. There existed, therefore, an obvious justification for the idea to carry out large-scale archaeological investigation in the area. However, any research project requires an underpinning story; the one we chose was informed by our conviction that the political dimension of the creation and evolution of material culture in West Africa had too long been overlooked, and that Dendi would be a good place to start thinking about this problem. Ultimately, the hope is to understand how the polities that are the staple theme of historical narratives about first and second millennium AD West Africa influenced the material record across the region. This entails a focus not just on objects, but on the people who made them and on their craft practices, and not just on one archaeological locus, but on a whole region, in order that we can determine how material culture varied over time and space. In this, we integrated ethnography and archaeology, and indeed there is a very strong tradition of such work within Africanist research. And while we focused efforts on a key archaeological site – the large mound of Birnin Lafiya – we carried out test pits much more widely and our ethnographic enquiries concerned not just the modern village of Birni Lafia nearby, but the entire surrounding region.

In essence the *Crossroads* work aimed to fill an archaeological blank between several areas of West Africa and to provide, for the first time, a chronological and material framework for the past occupation of Dendi.

The site of Birnin Lafiya served our purpose well as the focal point of the archaeological research, because it displayed several interesting characteristics. Firstly, the large size of this settlement site, its nature as a high mound and the material found on its surface indicated a very significant occupation, suggesting a regional importance over a long period. Secondly, the site clearly featured good preservation, including remains of habitation structures. Accordingly it appeared to offer potential for establishing a solid, absolutely dated archaeological sequence around which to structure a regional enquiry. Thirdly, the site was considered by people from modern Birni Lafia as part of their history. As we will see, this meeting of memory and archaeology is the backbone of this book. This type of approach linking sites and oral historical enquiry has previously produced important results within Africanist research. We can cite, for example, work in Ghana (Stahl 2001, 2006; Insoll et al. 2013), Mali (Gallay 1994, Mayor 2011a, Mayor et al. 2005, MacDonald & Camara 2012) and Nigeria (Gronenborn & Magnavita 2000).

This approach of combining archaeology and oral inquiry has been successfully applied elsewhere in Benin, for example in Atakora (N'Dah et al. 2013). Indeed, Atakora is currently occupied by segmental communities lacking a centralised political system. For such societies with diffuse political power, it is very rare that oral tradition reaches earlier than the end of the eighteenth century, and, moreover, generally only indirectly, using the history of neighbouring states. Accordingly, archaeological sites were identified from a thorough oral survey and then excavated to better determine the chronological framework of occupation and to characterise the material culture, in particular the chronocultural sequence based on changes in the ceramic sequence. In the course of the oral tradition enquiries, the site of Dikuanténi, which is a sacred site guarded by the leader of the cult of the *fèwaafè* (snake), was indicated as the place occupied by the first immigrants of the Otammari group. Following survey, the site was test pitted and dated. The dates obtained show that the site was occupied around the thirteenth/fourteenth centuries, suggesting that the settling of the present-day population was in its final phase in the fourteenth century, not in the eighteenth century, which had been the initial assumption of the researchers (see Haour & N'Dah, this volume). This approach also helped to better characterise the chronocultural frame thanks to the study of pottery.

Alongside the work at the site of Birnin Lafiya, the *Crossroads* project has pursued archaeological investigation of a range of sites thought to fall within a similar time period. These included Tin Tin Kanza, Pekinga, Gorouberi, Kantoro, Guene, and Kompa Dune (Map 6). These were selected on the basis that they provided a good regional coverage from north to south within the Dendi region, as well as providing a range of site types, including smaller settlements (Pekinga), those directly overlooking the river and associated with sites of ritual importance (Tin Tin Kanza), and those connected with metallurgical production (Kompa Dune). In addition to these key sites, we also

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undertook work within modern villages during the final field season.

As indicated above, a major concern of the project was to better document a region that is described in historical texts as being at the crossroads of many political entities. In terms of considering how political influences affected the material record, ceramics have been particularly important and thus assumed a core importance in our research. Such questions on the interplay of ceramics and politics have recently begun to elicit interest in various parts of West Africa (see Haour 2011, 2013 for a fuller discussion). In particular, in two well-investigated areas, the Chad Basin and the Niger Bend, a link has been suggested between population movements following political upheavals, and the characteristics of the pottery assemblage – both surface treatment and shaping technique.

In the Chad Basin, a number of authors (Connah 1981; Gronenborn & Magnavita 2000; Gronenborn 2001; Wiesmüller 2001; Connah & Daniels 2003) have suggested that the spread southwards through the Chad Basin of two decorative techniques, *sgraffito* (red-slipped pottery incised when the pot is at the leather-hard stage) and folded strip rouletting, may mirror the expansion of Kanem-Borno in the second half of the second millennium AD (overview in Haour & Gado 2009: 367–8). In terms of shaping techniques, Langlois (2001) has noted that, south of the Chad Basin, the pottery shaping technique employing a convex mould occurs mainly within the spheres of influence of Kanem-Borno and neighbouring powers, and that its roots may lie in the commercial links set up by these regional political powers.

Farther west, Mayor (2011b) has connected changes in the 'pilonnage sur forme concave'[1] shaping technique in the Niger Bend with population movements. Among these, she believes that the picture painted by the current state of archaeological research is that the spread of this technique was linked to the expansion of Songhai families, possibly linked to the growth of the polity (Mayor 2011b: 104). Farther west still, the re-examination by van Doosselaere (2010, 2014) of a small group of ceramics from the site of Koumbi Saleh using technical studies identified two distinct shifts in pottery traditions, occurring in the eleventh and fifteenth centuries. Each can be correlated with political and economic changes which accompanied the evolution of the great West African empires (van Doosselaere 2010: 409–10). The eleventh-century discontinuity can, she suggests, be linked to the impact of the Almoravids on trans-Saharan trade routes, which caused a reorganisation of trade networks leading to a greater circulation of pots and potters and new local technical traditions (van Doosselaere 2014: 248–54). While the subsequent rise to power and rule of the Empire of Mali within the region through the fourteenth century led to a continuation of this process, in the fifteenth century the decline of Mali and the rise of Songhai, in addition to the advent of Atlantic trade routes, is thought to have led to a decline in ceramic imports and local pottery production, ultimately associated with the decline of Koumbi Saleh (van Doosselaere 2014: 248–54).

These investigations of the West African past are partly informed by a much wider realm of enquiry running through contemporary anthropology: how and why behaviours or ideas are learned, and shared, between people. These advances in anthropological and material culture theory present a much-needed alternative to historically informed top-down models. Alongside the archaeological investigations undertaken as part of the *Crossroads* research, the ethnographic enquiries aimed specifically at enriching our historical comprehension of the region and finding ways to connect the present to the past. Part of this involved the collection of oral accounts pertaining to the history of extant villages, the genealogy of the various social groups living in the area, former population movements, pre-colonial polities, warfare, environmental transformations, commercial exchanges, and so on. This provided a historical background spanning broadly the last two centuries, which not only allowed us to explore social, political, and economic issues, but also generated a series of questions and hypotheses regarding the long-term evolution of the area. These fuelled subsequent archaeological investigations by team members.

A specific line of ethnographic enquiries focused on material culture and followed a 'comparative technology' approach (Gosselain 2017). Briefly said, comparative technology consists in documenting and comparing the *chaînes opératoires* of any given activity – here, pottery making, metallurgy, weaving, and indigo dyeing – within a specific area. Such comparison allows for the identification of similarities and differences in the choice of materials, tools, and actions upon materials, the distinctive components of which are then mapped and critically examined in terms of spatial correspondence with salient landscape features or social and political boundaries.

1 This technique, which involves pounding out a vessel over a mat-covered concavity, using a clay or stone pounder, has been well discussed previously by Huysecom (1991–1992) and, more recently, by Gosselain ((2008, 2010b) for Niger. Mayor (2011b: Fig. 4) maps several varieties of this technique throughout the Niger Bend, involving various supports or pounding tools. The key advantage of this technique, archaeologically speaking, is that the clay pounders often used by potters, and the mat impressions on the base of the vessels shaped this way, can survive in the material record.

Taking into account the biographies of technical actors as well as the implication of processes of learning on the spatial circulation of technical knowledge, it thus becomes possible to envision historical connections between populations or regions (or boundaries across them), to retrace individual or group mobility, and to identity possible effects of political boundaries on the geography of practice. Though not referring explicitly to the 'comparative technology' method, and with contrasting geographical scope and degrees of detail, several studies have already illustrated the benefit of exploiting extant techniques and material culture as historical documents in West Africa.

Although the inclusion of ethnographic information into archaeological research projects is not exceptional, it can sometimes feel like an afterthought, designed to help explicate the archaeological record (see e.g. Bedaux et al. 2005). Much rarer are projects which integrate both approaches, and over multiple field seasons (see e.g. Stahl 2001, 2006; Mayor et al. 2005; Mayor 2011a; MacDonald & Camara 2012; Insoll et al. 2013). In our case, the fact that we carried out all field seasons jointly allowed for an unusual degree of integration and feedback between the two aspects.[2] Although the archaeologists' base camp was largely at Birni Lafia, with smaller sporadic camps set up close to the various test pits excavated through the region (namely at Pekinga, Guene, Kompa Dune, or Karimama), and the ethnographers' team ranged more widely through the region, interaction between the teams was sustained.

This came perhaps particularly to the fore in the 2014 field season when, faced with a several-century gap between the radiocarbon dates being returned for the archaeological data we were uncovering, and the dates communicated by our informants for the foundation of their villages, an archaeological team led by Alexandre Livingstone Smith began a sustained campaign of test pitting inside modern villages and in past settlement sites reported by informants as the predecessors to their current living places. Three parameters were taken into account in this work. First, historical information collected during previous field seasons provided a list of likely very old settlements. Some had long been abandoned, but most of them were still thriving villages. Second, as regards contemporary villages, the layout of the village was examined, combining settlement fabric analysis and interviews, to identify areas most likely to be part of lie within the settlements' foundation core. Finally, the exact location of the test pits was decided in careful consultation with village elders. At this stage, two factors were important: a consensus had to be reached to identify the oldest compound of the neighbourhood and, when that was decided, the owner of the allotment was asked to choose the location of our test-pit, for minimal disturbance.

Thus, we had the rare opportunity in Dendi to examine a chronological series of sites shedding light on the development of ceramic traditions used by a single population, on several sites successively abandoned before the settlement of the current village, and covering several centuries.

The first outcomes of this approach are presented in this book. Our aim has been to provide a commentary that goes back about 2500 years from the present day, melding archaeological and ethnographic data and linking contemporary understandings of history to the findings of our archaeological and ethnohistorical enquiries.

2 For some remarks on the surprising corollaries of this close association, and more generally on how the past impinges on the present and the present shapes the past, see Gosselain & Smolderen (2016).

PART 2

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CHAPTER 6

Landforms, Hydrography, and Vegetation

Raoul Laïbi, Didier N'Dah and Paul Adderley

1 The Site Location

Using the long-established layer concept (*Länderkundliche Schema*; Hettner 1935, Reichert et al. 2010) this chapter considers abiotic (geology, geomorphology, hydrology and climate) and biotic (vegetation and soils) factors that influence past environmental settings. It discusses these factors for the wider region, but focuses particularly on the mound of Birnin Lafiya, which is approximately 2 km from the present-day course of the Niger River, close to the modern village of the same name. The Birnin Lafiya site presents as an abandoned *tell* and is currently under seasonal agricultural cultivation. There are no comparable sites nearby, and among the hundreds of sites recorded by the team within the wider region, Birnin Lafiya stands out for its scale and for the surface traces of well-preserved architectural features such as potsherd pavements. The site is at least 26 hectares in extent and the mound typically rises between 5 m and 8 m above the surrounding floodplain landscape. Given this contrast with other sites an obvious challenge is to consider the nature of the mound and its environmental context.

2 Geology and Regional Landforms

From a super-regional geological perspective, the territory covered by the Republic of Benin is part of a very old eroded surface of West Africa consisting of ancient bedrock covered in places by more recent sedimentary formations. Three major geological entities can be distinguished: the Precambrian basement, the Voltaian Basin, and sedimentary blanketing of the far south and far north of the country (Adam & Boko 1993: 16). The basement and, more importantly, the sedimentary materials that rest on it are of relevance to Birnin Lafiya and the neighbouring field sites. The Precambrian basement consists of a variety of rock types such as migmatites, mica-schists, leptynites, quartzites, amphibolites, diorites, gneisses and granites (Alidou 1983). Variable depths (0–3000 m) of sedimentary material rest unconformably upon these basement rocks and typically have the greatest influence on the occupied land surface.

In relation to this specific area we draw on field studies from Heide (1977), Bio Bigou (1987) and more recent work within the Kandi basin (Konate et al. 2003). Heide (1977: Figure 8; reproduced by Bio Bigou 1987: Map 6) outlines the geomorphology of the region (Figure 6.1) while Bio Bigou (1987: Map 3) considers the major geological formations (on this, see also Alidou 1983, from which we derived Figure 6.3). A major strike-slip fault in the basement complex gives rise to the geologically defined Kandi basin. This fault – the Kandi fault – runs approximately north to south through Guene and extends southwards into the present-day Atlantic and northwards to the Hoggar mountains in Algeria.

Despite the complexity of the bedrock geology, the relief of the study area is relatively simple. A series of low plateaux have formed on top of the Cretaceous age (145 to 65 million years) sandstones and the clay-rich sandstone of the Continental Terminal deposits (Gaya and Kandi sandstones). These plateaux are capped by hard, indurated lateritic materials which join the river valley (Bio Bigou 1987; Figure 6.2). Within this broad outline, past geological studies have highlighted six major geological formations, each characterised by dominant facies with boundaries which are mapped (Alidou 1983, Konate et al. 2003). The geological formations occurring within the research area are shown on Figure 6.3.

i) The Wèrè formation

Consisting of a polygenic conglomerate with a clay-rich ferruginous sandstone matrix, it is particularly evident near the village of Wèrè, 40 km south of Kandi, from which it takes its name; but it is also present near Karimama.

ii) The Goungoun formation

Located near Goungoun, it is formed by a polygenic breccia with clay-rich sandstone matrix. It outcrops sporadically close to Guene.

iii) The Kandi formation

This consists of conglomerates, white, red or yellow sandstone, white or ochre silt, which are more or less ferruginous. It occurs through most of the region found east of the Kandi fault running roughly north-south through Guene.

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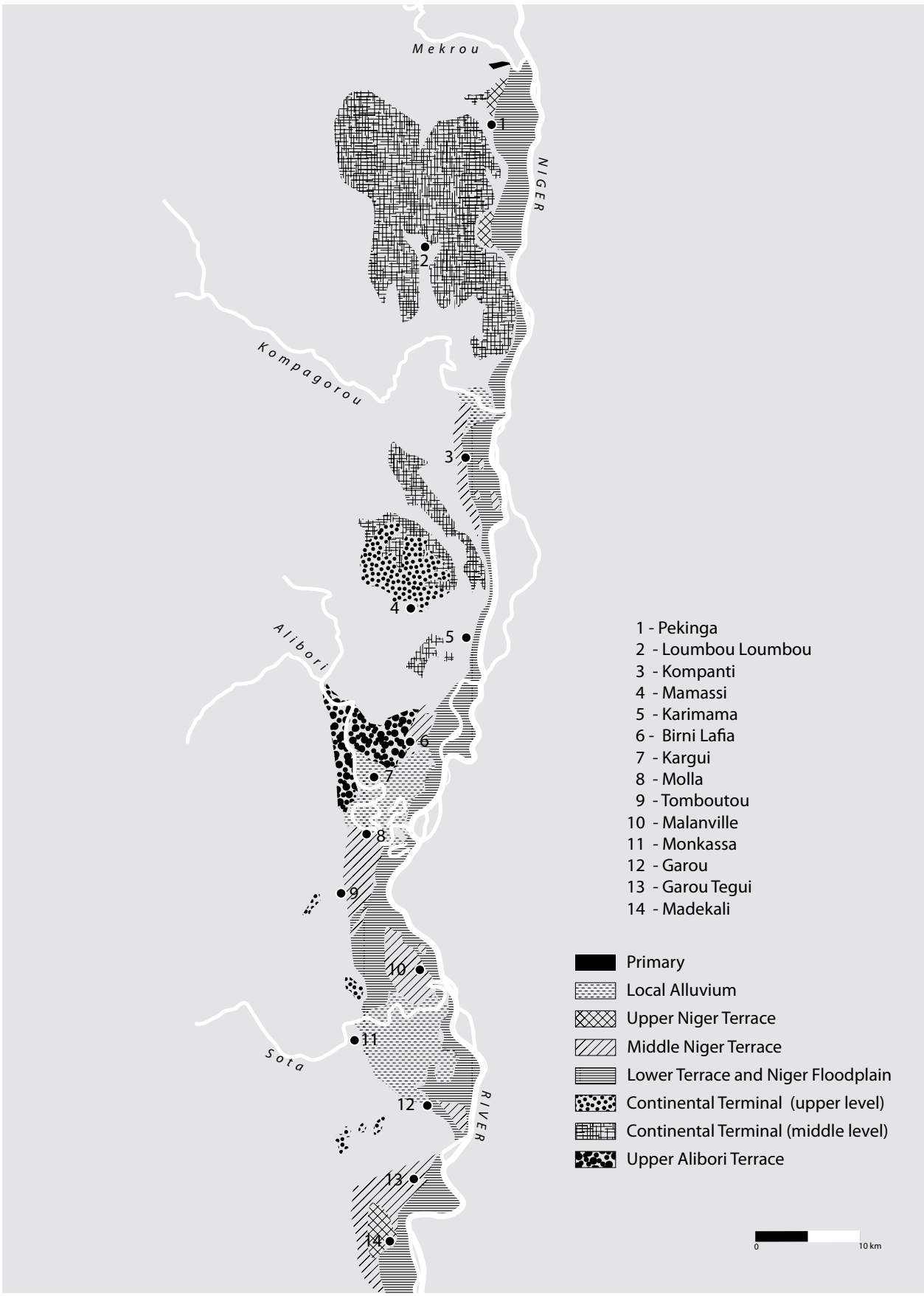

FIGURE 6.1 Geomorphology of the Dendi region
REDRAWN BY FLORENCE REYNOLDS FROM HEIDE 1977: FIGURE 8

FIGURE 6.2 Lateritic hills seen at a distance, taken from Malanville, looking south across the low-lying plain which separates it from Bodjekali

These three sedimentary formations are very old in archaeological terms, at least 240 million years, dating to the Lower Palaeozoic.

iv) The Sendé formation

Located to the north of the basin, it consists of conglomerates and sandstones created by water action, and is evident on the Kandi formation, which dates to the lower Cretaceous period.

v) The Continental Terminal formation

This term covers a range of transformations made to existing rocks through the hyper-aridity experienced in the period following the Eocene (35 million–2.9 million years). It is formed of conglomerates, clay-rich sandstone, clay, oolites and ferruginous pisolites. Ferruginous formations characterise the plateaux of the Continental Terminal, the summits of which are between 250 m (upper level) and 210 m (middle level) ASL.

The Continental Terminal materials are typically associated with gentle slopes towards the present-day rivers. Alidou (1983) has carried out investigations of the Continental Terminal at various locations through Dendi, including Madekali, Karimama and Bodjekali, and notes that the thickness of this deposit varies from about 10 m to the south (east of Kandi, close to the border with Nigeria) to 60 m at the north (at Madekali). These materials weather and erode and the different platforms formed through this long-term erosion are covered with soils whose type, in the absence of other factors, depends on the nature of the inherent material. On the sandstones and sandy-clay deposits, ferruginous tropical soils have formed. Overlying the conglomerates and colluvial material there are more strongly leached soils without carbonate concretions. Finally, a variety of hydromorphic type soils are evident in the wetland areas found in the depressions and on conglomerates (Alidou 1983: 178–179).

In terms of landscape, the impact of the underlying deep-age geology is most visible in places where the Precambrian basement is closer to the surface. In this study region this is notable at the cliffs located at Bodjekali, Madekali, Tin Tin Kanza and Pekinga.

At the end of the Pliocene (5.3–2.6 million years) erosive processes driven by tectonic movements through northern Benin affected the course of the River Niger and its major tributaries, giving these rivers their current general course. The main features of the current basin morphology were set in the Quaternary (Alidou 1983: 176).

vi) Quaternary deposits

The materials deposited and reworked during the Quaternary (2.6 million years to present-day) are of particular interest to the archaeological survey and site investigations, since they form the parent materials for the soils found today and thus greatly influence the land surface

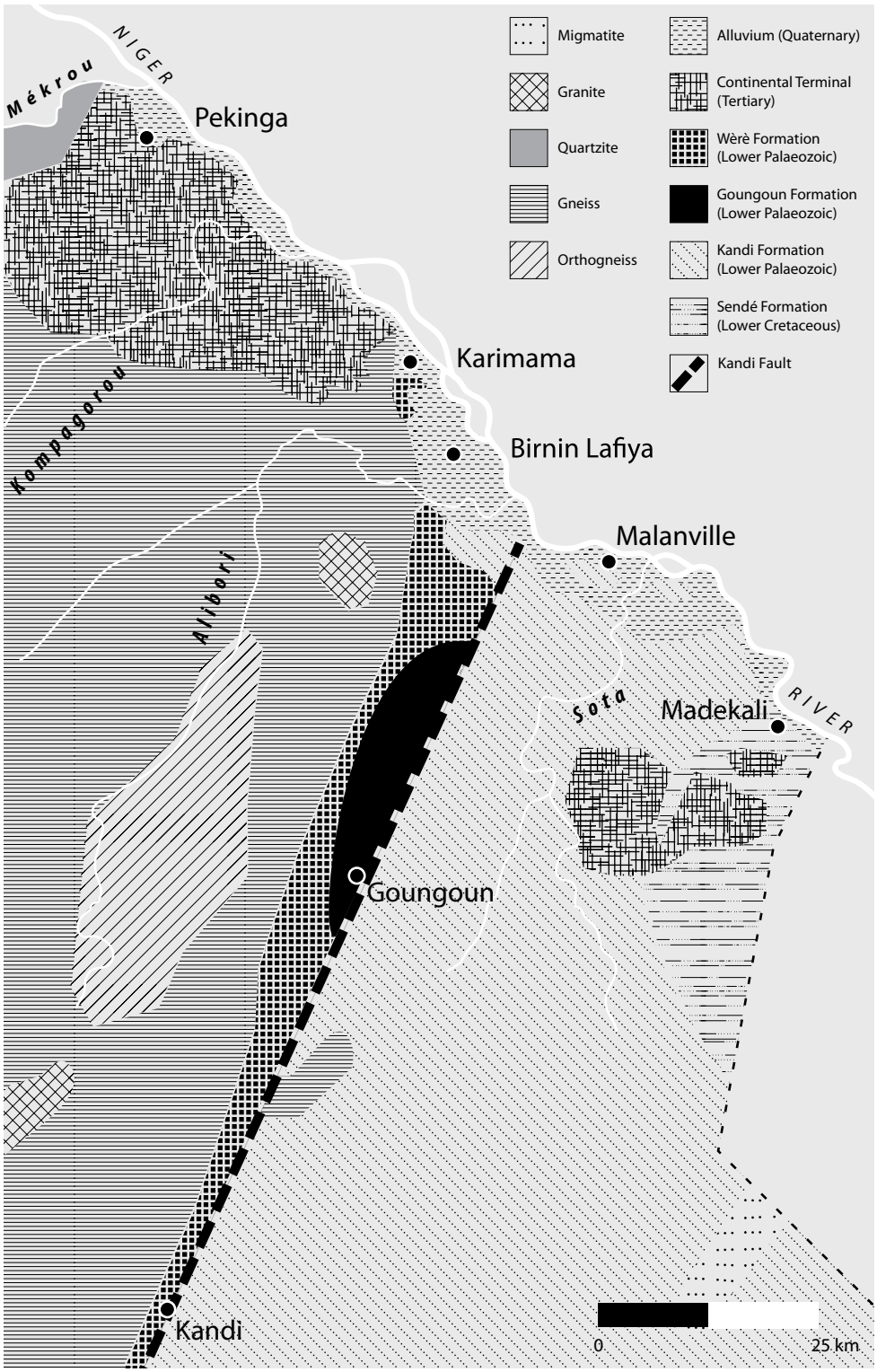

FIGURE 6.3 Key geological features
REDRAWN BY FLORENCE REYNOLDS FROM ALIDOU 1983

occupied. Alluvial deposits are primarily located in the Niger valley and along the major river channels. The scale of the alluvial deposits is particularly significant and these materials are found in areas on either side of the main river channels. In the case of the Niger River, such alluvial materials are found radially up to 10 km from the present channel. The highly-braided river channels today and the extent of the alluvial deposits associated with the Niger indicate that the river systems have been very dynamic and that considerable quantities of material have been deposited and reworked during this period. Whilst their thickness varies considerably throughout the present-day

valley systems, Alidou (1983) has estimated a maximum depth of approximately 100 m for central valley locations. The materials typically consist of sand-sized quartz and clay and are the dominant parent material of the soils at the site of Birnin Lafiya.

3 Geomorphology

As previously discussed for the super-regional geology, the study area falls within a similarly scaled geomorphological province of the West-Saharan basin that, excluding coastal areas, extends across much of West Africa. The Niger valley of southwestern Niger and northern Benin and the areas surrounding the valley have been subject to a limited set of geomorphological and land-use mapping studies. Early work by ORSTOM surveyors of the 1960s and Heide's 1977 overview of the region have been augmented by more recent satellite-based observations and mapping of physiographical units (Hermann et al. 2005). Additionally, the soil and land use of a region immediately to the north of the river was characterised as part of the long-term HAPEX-Sahel study (d'Herbès & Valentin 1997).

Three key geomorphological landforms are summarised by Heide (1977: 19–22), and are found in the *Crossroads* project area:

First, the lower terrace and the floodplain, which lie below 160 m ASL. This region typically forms a broad plain extending 1 to 4 km radially from the main river channel and for shorter radial distances along the major tributaries. This region is consistently mapped as comprising coarse sands and variable thicknesses of clay-rich sediment. The microrelief is characterised by small-scale topographic depressions which are typically relatively more clay-rich.

Second, the middle terrace (160 m–165 m ASL), a kilometre wide, shows sandy ridges again with many elongated depressions filled with clay. The large sandy island upon which the modern city of Malanville is established connects to this terrace.

Third and finally, the upper terrace (165 m–170 m ASL). This covers a very small area and often corresponds to the colluvium and the weathering products of the Precambrian and Cretaceous basement geology. Highly-weathered ferruginous soils are typically seen on these sediments. This terrace landform shares similar characteristics with a region that extends across much of southern Niger and extends towards the upper reaches of the Alibori catchment. In the Niger valley context, this terrace landform contains frequent quartz pebbles from 3 cm to 5 cm in length, cemented by iron oxides. It is characterised by brown clay-rich soils with common calcareous nodules, and their topographical, geomorphological and pedological properties indicate they constitute a former alluvial sediment. Analysis of the soils and sediments shows the dominance of kaolinite, montmorillonite, mixed layer chlorite-illite, and goethite clay minerals (Alidou 1983: 178).

4 Climate

The present-day climate of the study region involves a pronounced two seasons contrast: a wet season of intense short-duration rainfall events and a long dry season. Precipitation, therefore, has an erratic spatial and temporal pattern across the region. Multi-year climate normals from the nearest long-term climate record at Niamey, Niger reveal a mean precipitation of 540 mm with rainfall occurring, on average, for 42 days each year (Le Barbé & Lebel 1997; Figure 6.4).

Studies of past climate in the Sahelian region are dominated by studies of past lake level changes. A comparison of such data allows the generalised characteristics of past climate to be considered. For the study area, the Quaternary is associated with strongly alternating wet and dry climatic periods. These are accompanied by corresponding phases of deposition and erosion (Alidou 1983: 189). From studies conducted in the region by Alidou (1983: Table 21, 190), in turn drawing upon Heide (1977), we can relate the terraces to the climate observations and chronology. These are summarised in Table 6.1.

This leads to the conclusion that the three terraces were already in place at the time that the region was settled. However, what requires further study is the question of what reworking occurred after 6000 years B.P. Although field observations at Karimama confirmed the presence of archaeological pottery and lithics in some places which were buried under alluvium, thus indicating that the course of the Niger River has varied, it is not currently possible to be more specific about the geomorphological processes at play in the region after the lower terrace was emplaced.

5 Hydrography

The Niger River is the most important river in the study area and forms the present-day political boundary between Benin and Niger. It extends over 135 km through the study region. At this stage of its course, it has been running southeast since Bourem, Mali. Passing Gao, the river is hosted in sandstone and this produces a series of rapids (Fafa, Labbezenga and Ayorou), making it a difficult stretch for navigation (Tymowski 1967); but after Ayorou (Niger), the Niger River valley expands and collects the

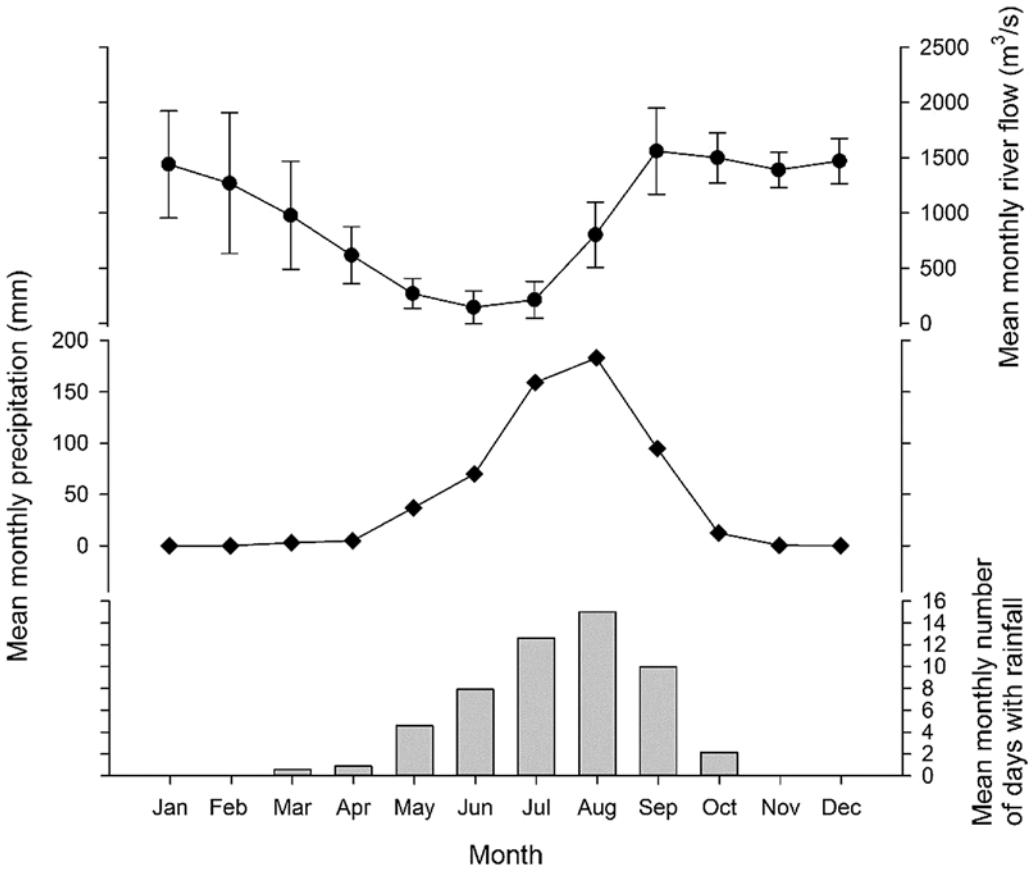

FIGURE 6.4 Mean monthly rainfall, days with rain and associated Niger river discharge rate for the study region DATA SOURCES: RAINFALL DATA FROM NIAMEY AERO CLIMATE STATION 1950–1990 (LE BARBÉ & LEBEL 1997) RIVER DISCHARGE DATA FROM MALANVILLE GAUGING STATION (1970–2000: ANDERSEN ET AL. 2005)

TABLE 6.1 Quaternary alluvial terrace chronology of the Niger valley, after Alidou (1983)

Terrace	Climate	Age
Sediments of the lower level, under 160m above sea level	Humid period Dry period and aeolian reworking	Present Holocene 6000 B.P
Sediments of the middle level, 160–165m	Humid period of moderate rainfall Dry period and aeolian reworking	Ogolian II 20 000–15 000 B.P
Sediments of the upper level, 165–170m	Humid period Dry period Humid period	Inchirian I 40 000 B.P Ogolian I 100 000 B.P Beginning of the Quaternary

first tributaries since the Inland Niger Delta of Mali, all draining into its right bank: these include the Gorouol, draining the extreme north of Burkina Faso and the southern Mali region of Hombori, and two other tributaries originating in Burkina Faso, namely the Dargol and the Sirba (Andersen et al. 2005).

Between Niamey and Malanville (about 340 km), the river is navigable from August through to February (Andersen et al. 2005: Map 10). The first 100 km section, to Kirtachi, crosses recent alluvial deposits. From Kirtachi to Boumba, the river traverses the Atakora sandstone massif for 100 km through a narrow valley with abrupt changes

in direction that form a "W" shape, hence the name of the Parc W nature reserve. Then, from Boumba, at the intersection of the fossil river valley the *Dallol* Bosso, the Niger flows into a wider valley (over 4 km wide) of alluvial deposits and on to the border with Nigeria (Andersen et al. 2005). This stretch is Dendi.

On this short journey, the Niger has a rectilinear course oriented northwest/southeast and receives three major tributaries on its right bank draining the northeast of Benin: the Mékrou, the Alibori and the Sota. On the left bank are the *Dallol* Bosso (Azaouâk), *Dallol* Foga and *Dallol* Maouri, which are *wadi*s, with no water reaching the Niger River (Andersen et al. 2005). The distribution is thus uneven between the left and the right banks.

At Malanville, measurements of the water level and flow rate of the Niger are available from 1952 onwards with mean monthly data presented in Figure 6.4. Greater analysis of these data reveals maximum flows forming two peaks each year, a wet seasonal peak flow and an upstream dry seasonal peak flow. The wet season flow, the 'white flood', is caused by the local inflow between July and October while the other, called the 'Malian' or 'black' flood, is seen between December and March with the arrival of the delayed flood from upstream (Bio Bigou 1987; Andersen et al. 2005).[1] The lowest level of the river is in June and the transition between the two floods is noticeable by a very slight decrease in water level in November (Bio Bigou 1987: 44–48). Until 1971 data always showed two well-defined peaks, each with a flow rate of 2000 to 2500 m^3/s, separated by a period of lesser flow which remained sufficient for irrigation, thus allowing for a period of 8 to 11 months during which the flood was usable. More recently, and probably as a consequence of continental-scale climatic shifts, the Malian high water arrives earlier in the year and recedes earlier, shortening the period suitable for irrigation water-use. Understanding the triggering of such climatic shifts in this region is the subject of intense debate (e.g. Le Barbé & Lebel 1997) and remains difficult to model due to poor or spatially problematic data collection (Chappell & Agnew 2004).

From Niamey to the border with Nigeria, the Niger river gains 20% of its flow from the right-bank tributaries coming from Benin: the Mékrou, the Alibori and the Sota. The runoff for these watercourses varies considerably during both the wet and dry seasons and interannually (Le Barbé et al. 1990).

The Mékrou, 500 km long, drains a basin with an area of 10,500 km^2. Its source lies about 640 m above sea level on the northeast flank of the Atakora chain (Le Barbé et al. 1993, Bio Bigou 1987). The river is tortuous, with numerous meanders and sharp turns, usually of structural origin. The bed is cluttered with many rocks and the course is particularly disturbed in its crossing through Atakora. The Koudou falls, the Dyodyonga gorges and the Barou rapids are all notable features illustrating this aspect of the river. The tributaries of the Mékrou are generally not significant, except for those which come from Atakora and the Tikou-Darou (Le Barbé et al. 1993).

The Alibori, 427 km long, has a basin covering 13,740 km^2. Its source is at about 410 m altitude in the granite massif of Kita on the eastern flank of the Atakora chain. In its middle course, the Alibori is cut by numerous rapids. It first follows a south-southwest/north-northeast course, and then bypasses the Sinende granite massif to form many bends (Le Barbé et al. 1993; Adjinacou & Onibon 2004). The Alibori receives numerous tributaries: on its right bank the Souedarou, the Saredarou and the Darou-Woka; and on its left bank, the Morokou, the Kpare, the Kenou, the Konekoga and the Kpako, before flowing into the Niger upstream of Malanville (Le Barbé et al. 1993; Bio Bigou 1987). Erosional *cuvettes* (similar to those described by Oumarou 2000 for the Mékrou) have developed along its course as it nears the Niger (Figure 6.5).

The Sota, 254 km long, drains an area of 13,410 km^2 and begins at over 400 m above sea level on the eastern slopes of the Kalale sandstone plateau, which it bypasses on its north side before taking a course oriented south-southwest/north-northeast on the basement formations. After 90 km from its source, it enters the Cretaceous sandstone formations, cutting them quite deeply and joining the Niger after 254 km, 1 km downstream from Malanville. On the sandstone formations, the river system is very sparse and there is no tributary of any significance from the plateau of Kandi. However, on the granite and gneiss formations, the river network is denser (Le Barbé et al. 1993, Bio Bigou 1987). It has several major tributaries and receives successively the Souamon on its left bank, and the Tassine, the Bouli and the Irane on its right bank. Downstream of Couberi, the Sota crosses over a distance of 15 km of alluvium in the Niger valley before its confluence with the latter.

The importance of these rivers to the past settlement of the study area is manifold. In terms of irrigated farming practices, these three major rivers rise within significant catchments that extend southwards, and therefore into areas that experience greater rainfall, and so these rivers provide a water source for settlements throughout the year. This is in contrast to the north bank of the Niger in the study area which has no rivers draining into it. Whilst

1 See Andersen et al. (2005: fig. 3.8) for Niamey; Bio Bigou (1987: Fig. 2) for Malanville.

FIGURE 6.5 Erosional *cuvettes* formed along the Alibori

fossil valleys or *dallols* are found on this north bank of the Niger, their present-day contribution to the hydrology of the area is minor and ephemeral.

6 Biotic Factors: Vegetation

The vegetation in the region depends on climate, rainfall and relief. The study area is located in the Sudan Centre agroclimatic zone (White 1983) with two contrasting seasons as discussed above. This can be seen as a transition zone between the Sudano-Guinean savanna and the Sudanese savanna with Sahelian affinities. During the dry season, the months of December, January and February are usually marked by absolute drought, which is the period when the continental influence of the dust aerosol (Harmattan) is most pronounced on the regional climate.

The plant formations observed today not only depend on climate, soil and position in the geomorphological landscape but, above all, on anthropogenic action: the inherited cropping practices, length of fallow time, and the selection of crop plants. Thus the formations observed in traditionally uninhabited areas have no connection with those of densely populated areas.

As a general trend the vegetation becomes more moving from south to north, mirroring the decrease in precipitation seen latitudinally. Thus, in the south, the savanna includes a generally dense set of trees up to 10 m tall, with a substantial shrub layer and a grass mat (de Souza 1988; Le Barbé et al. 1993). The density and size of trees decreases towards the north. On the plateaux small dry forests are typically composed of *Isoberlinia doka*. The slopes are covered by a woodland vegetation composed of *Hymenocardia acida, Entata abyssinia, Cochlospermum trinctorium* and *Cochlospermum planchanii* (Le Barbé et al. 1993). In the north, forests are encountered, consisting of *Diospyros mespiliformis, Ficus* spp., *Khaya senegalensis, Vitellaria paradoxa*, and *Combretum* spp. Thorny tree species mingle with *Combretum* spp. on concreted and shallow soils. Along the Niger, on sandy areas with shallow groundwater, savanna parklands studded with *Borassus* spp. (Palmyra palm) grow. Finally, along major river valleys is a forest gallery featuring *Anogeisus leiocarpus* (African birch), *Khaya senegalensis* and *Ficus* spp. (Brunet-Moret et al. 1986; Gbatcho 1992; Le Barbé et al. 1993).

The long-term changes of the environment remain difficult to quantify. As pointed out by Eichhorn (this volume), the research area will have been especially favourable for human settlement and the exploitation of aquatic resources due to its situation, close to the Niger River (see also Linseele & Wouters, Champion & Fuller, this volume). This will perhaps have implied greater human impact on the landscape but, on the other hand, vegetation here should display higher resilience to anthropogenic

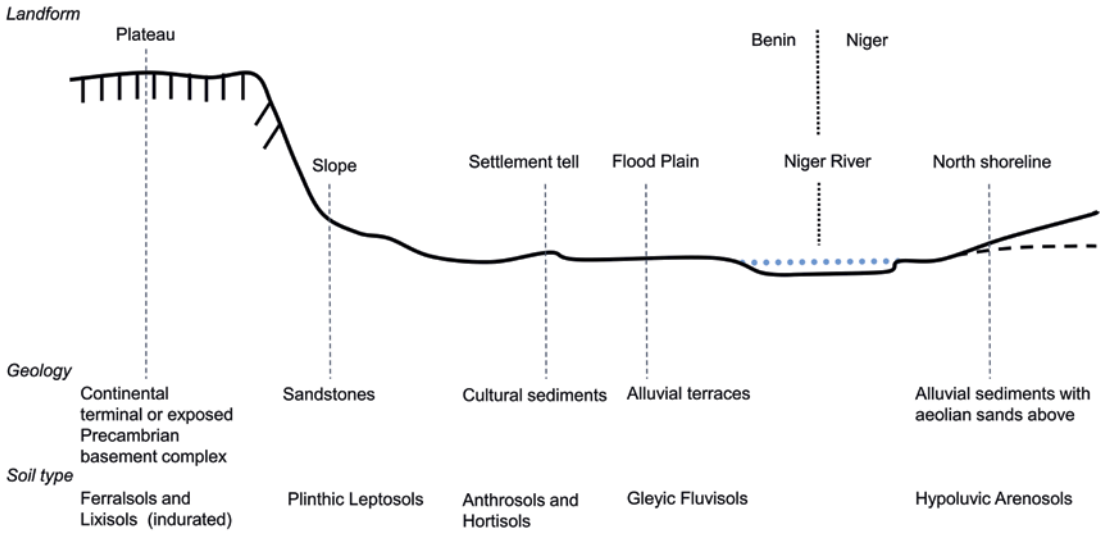

FIGURE 6.6 Schema of the soil catena established across the Niger valley at Birnin Lafiya showing the major soil types, their relative location, the underlying geology, and the associated geomorphological landforms

pressure, at least compared to the better-known Sahelian archaeological sites. What is certain is that the present-day situation cannot be considered a reflection of past environment. The links between human occupation of the landscape and the exploitation of the natural resources appear highly dynamic, as evidenced for instance by Bio Bigou who, writing in 1987, suggests that the occupation of the central flood plain area only began in the 1970s and that this was associated with major land clearance.

7 Biotic Factors: Soils

The inherent soils of the study region are strongly associated with the underlying solid and drift geology. Thus, in the upland areas we see a commonality between the major geological units described above and the resultant soils. In contrast, in the valley areas soils derived from alluvial deposits can be seen, with differences stemming from the varying particle size of the alluvial parent material such that the resultant hydromorphic soils range from sand-rich to clay-dominated. This interaction of the inherent geology, the geomorphology and the age of the exposed land-surface produce a soil catena (Figure 6.6).

In addition to the varying nature of the soils' parent materials, the age of these soils varies markedly. The soils found in upland areas are typically of great age and are hence strongly weathered. The soils developing on recently emplaced alluvial deposits are, obviously, much younger. An important distinction, therefore, is that between the edge of the active floodplain and the more permanently emplaced alluvial materials. This applies not only to the Niger floodplain at Birnin Lafiya, but also to the floodplains of the Alibori and the Sota in the east of the project survey area. The underlying soil conditions are therefore a strong determinant for settlement dynamics along the Niger valley; the site at Birnin Lafiya today presents itself as a land surface that sustaining relatively intense agriculture through a combination of physical and chemical soil properties. These properties are partially inherent and partially a result of land management and past soil accumulation. Chemical indicators of settlement activity include phosphorus, an element long understood to be associated with archaeological settlement and enabling the intensity of settlement to be considered (e.g. Oonk, Slomp & Huisman 2009). For Birnin Lafiya, prospection by elemental analyses of profile and surface samples was undertaken on *ex situ* samples by X-ray fluorescence spectroscopy (Niton XL3t Goldd+, Thermo Corp. Waltham, MA.). Representative surface (0–20cm) samples of the field area adjacent to the sampling site at Trench 3/10 reveal a wide range of values for total phosphorus concentration (260–4180 ppm; mean 2275 ppm; n = 120). Whilst reflecting a modern surface, this prospection tool suggests a highly localised and patchy distribution of past land use. This land surface represents the legacy of tell formation through the build-up of materials by previous site occupants.

8 Conclusion

A wide range of geographical and environmental factors influence both the wider Dendi region and the setting

of the Birnin Lafiya site. Fundamental limitations to the productivity of the landscape in the provision of environmental goods and services, such as agricultural produce, are caused by the underlying geology and the soils that develop upon these materials. The high-energy fluvial environment within the Niger valley and that of its tributaries, similarly and obviously, acts as a constraint on settlement location. The flooding of the Niger is, in turn, dependent upon the regional climate. The balance between flooding and the ready availability of relatively fertile land must, therefore, be considered the major influence on the development and abandonment of the Birnin Lafiya mound.

CHAPTER 7

The Archaeological Landscape: Survey and Settlement

Nadia Khalaf, Anne Haour, Didier N'Dah and Alexandre Livingstone Smith

1 Introduction

This chapter provides a broad overview of the archaeological landscape in the Dendi region discovered through systematic field walking. It discusses the various survey methodologies used during the four field seasons of the *Crossroads* project and how this led to the initial characterisation of the archaeology in the landscape, with a particular focus on data generated during the systematic survey in 2014; for a full account of this work the reader is referred to Khalaf (2016).

As detailed elsewhere in this volume (Haour & N'Dah), the archaeology of Dendi remained almost totally unknown prior to the work carried out by the *Crossroads* team in the area. It was, for example, completely absent from the seminal exhibition and book *Vallées du Niger* (1993). What was known at the time can be summarised from three sets of sources:

– anecdotal remarks (Gado 1980, drawing on earlier sources such as Périé & Sellier 1950, De Beauchêne 1969) alluding to the existence of large mound sites on the left ('Hausa') side of the river, today in Niger, with an implicit assumption that similar remains occurred on the right bank;
– brief reports of archaeological sites and pottery scatters by Béninois and Nigérien scholars whose prime focus was not medieval archaeology (Idé 2000; N'Dah 2001), or was not archaeology at all (Bako-Arifari 1989, 2000; Debourou 1993; Ayouba 2000);
– maps by Gado (1980) and Davies (1956) which positioned specific sites on the landscape.

In short, there existed only the broadest idea of the archaeological landscape, and subsequent field enquiries revealed that the maps mentioned above could not be used as accurate records of sites. One major initial aim of this work was therefore to provide a map of archaeological occurrences in Dendi. This tied in with the research priorities of the national Laboratoire d'Art, d'Archéologie et d'Expertises Patrimoniales (LAAEP) wishing to establish a *fichier archéologique* (archaeology archive), but its importance became clearer as the team realised the scale and significance of the Birnin Lafiya site and vast density of archaeological sites in the region. The longer-term goal of the work was to provide a detailed investigation and contextualisation of the archaeological remains, to achieve a chronology for the settlement of the area and suggest cultural affiliations. In doing so potential variations in material culture would be highlighted, through time over a crucial area, reputed to be a border zone between several great political entities of the Sahel. But first, an understanding of the distribution of sites over the landscape had to be gained.

Therefore, survey formed an important part of the work of the team through each field season. After three field seasons of survey by various members of the *Crossroads* project, an intensive systematic survey was devised by one of us (NK) as part of her doctoral research. This survey examined the occurrence of sites in the immediate vicinity of Birnin Lafiya and two other areas, the Alibori River and a region between the Sota River and the Niger River. The latter area was close to a modern road which was being developed, and which had led to some sites being bulldozed and destroyed. The survey was important here to preserve a record of the landscape, and will be discussed later.

2 Early Surveys

A map published by Gado (1980) identifies several sites on the Benin shore of the Niger: four of these are reported as "Site archéologique non précisé" – one in the general vicinity of Garou, one along the Mékrou, and two within the Parc W west of Kompa. Close to these latter two a fifth site, a fortification or 'Katanga', is mapped. In fact, it became clear that the sites marked on Gado's map referred to locations mentioned to him by informants on the opposite (Niger) bank, and had not involved actual site visits. Efforts made during the 2013 season by Gado and de Moraes Farias failed to find these specific places.

Anecdotal mentions of past settlement remains were made by various (non-archaeologist) authors as part of a general consideration of the history and populations of the Dendi area. These include a mention of potsherd scatters at the "site insulaire de Djaboutchia, situé sur la rive droite du Niger, en face de Garou" (Ayouba 2000: 103). Various sites of past importance, based on oral tradition enquiries, are mentioned by Ayouba (2000) and especially

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Bako-Arifari (2000). These are valuable foundational studies which use written and oral histories to identify directions of migration and population movements, but their primary aim was not the identification of the material evidence on the ground.

The most complete set of data on site location in Dendi had been established during a survey by N'Dah (2006). During fieldwork focusing on the Palaeolithic evidence in the Parc W nature reserve, N'Dah took the opportunity to take GPS points of the various archaeological occurrences he noted, both within the park and between Guene and Karimama, the latter recorded using the prefix VNK (see N'Dah 2006: Table 1). Based on the odometer of the field motorcycle, a systematic stop was made every 4km on the Guene-Karimama road to enable direct surface observation with a view to locating any evidence of human occupation on 150m either side of the road. Before the third systematic stop had been reached, N'Dah had begun to note the presence of mounds. Consequently, alongside the continued systematic stops, additional stops were made whenever mounds were located, for them to be recorded and their coordinates taken. When a site was listed, direct observation of the surface was carried out in order to identify the types of objects found. Measurements were taken on the site as well as geographic coordinates, using a GPS, topographical map and compass. The dimensions of the mounds were estimated on the basis of measurements taken with a 50m measuring tape. Limited surface collections were also carried out. As a result, in the category of '*buttes anthropiques*' ten sites, consisting of about 40 distinct settlement mounds, were recorded, six of them between Guene and Karimama. N'Dah (2006: 4) notes:

"Les sites les plus importants sont localisés dans la vallée du Niger, tout au long de la voie allant de Guéné à Karimama (Figure 4). En général ce genre de sites sont constitués d'une ou de deux grandes buttes principales entourées de plusieurs buttes adventives plus petites. Les dimensions de certains des tertres sont de 280 m de longueur, 250 m de largeur et de 8 m de hauteur.... La surface des sites est jonchée de tessons de poterie, de meules dormantes, de pierres polies, de scories, de flèches métalliques, d'ossements etc".

These mound sites were subsequently a major focus of the *Crossroads* project. One of them, located next to the village of Birni Lafia, had been recorded by N'Dah as 'VNK-01/5 I–VII'. Based on the nature of the surface material N'Dah suggested that the mounds must have been occupied during the Iron Age and compared them to similar sites in the Atakora region, such as Yohongou, suggesting a date of occupation "entre le VIIè et le VIIIè siècle et le XIIIè et le XVè siècle de notre ère" (N'Dah 2006: 10) a bracket which was, as we shall see, largely confirmed by the *Crossroads* team.

3 The First *Crossroads* Survey

The main aim of the 2011 pilot field season was to achieve a rough idea of the archaeology of the landscape over a fairly extensive (80 × 100 km) stretch of territory during 10 days of field walking. It was originally designed to target areas that would be appropriate for test pitting; however, it was Birnin Lafiya that became the focal excavation of the project. This survey was a trial run; therefore the methodology used was rapid and followed the main road that ran parallel to the Niger River from Pekinga in the northwest to Madekali in the southeast. It was carried out by between two and five people at any one time (including three of the authors: AH, ALS and DN'D). Survey was carried out at 5km intervals, using the main road as a starting point and walking perpendicularly to it following a bearing from a compass. Handheld GPS were used to record the locale of any sites encountered. A qualitative assessment of the site was made in some cases, noting the broad topographical position of the site and then making an assessment of the quantity and distribution of material culture (from isolated artefact to concentrations where objects were so abundant as to touch one other). A brief characterisation of the site was made, for example whether it was a mounded site or slight elevation, and many of the sites were referred to as settlements. The ceramic decorations encountered were also briefly described in some cases, noting folded strip roulette in several locations. The results of the survey and descriptions of sites can be found in Gazetteer One (Part 6, this volume) and findings were also published in Haour et al. (2011).

The identification of a major mound site in the outskirts of Birni Lafia led to the decision to carry out two exposures there. The ceramic material from the site was analysed and radiocarbon dates run which indicated the occupations sampled fell from the mid-first to the early second millennium AD.[1] Among the sites identified at the time as being of regional significance were the dyeing pits at Karimama, the *tombo* (abandoned site) outside of Birni Lafia, a site combining settlement and ironworking evidence in the outskirts of Kompa, and the archaeometallur-

1 Beta 305217–305221. See Part 6, Catalogue, this volume, for full list of dates.

gical site of Lolo north of Kandi (Haour 2011). All of these would subsequently be the focus of sustained research by the team. Furthermore, this initial survey established the position of over 400 archaeological occurrences, the vast majority of which had never previously been reported. These ranged from isolated pottery sherds to dense pottery concentrations on large settlement mounds.

Overall, the 2011 survey demonstrated the great abundance of archaeological material, confirmed the existence of a substantial number of large settlement mounds, and indicated a considerable variability in surface ceramic material over the region. As such it confirmed the value of the Dendi region to help answer the questions posed by the *Crossroads* project team, and set useful guidelines for the surveys of subsequent seasons.

4 Field Seasons 2012–2013

Unlike the previous year's activities, the 2012 field season did not cover a vast area. Instead, two intensive surveys were carried out around two key areas, Birnin Lafiya and Pekinga. These data were impressionistic rather than systematic, but they offered a valuable broader context for the excavations underway at both sites. For instance, they demonstrated the existence of a relatively continuous band of occupation along the hills overlooking Pekinga, and identified significant archaeometallurgical remains within the vicinity. These results subsequently proved important in documenting the regional distribution of ironworking techniques (Robion-Brunner et al. 2015; Robion-Brunner this volume).

The 2013 survey was for the most part strategic, aiming at setting the wider context of sites that were being investigated by test pitting. These included Kompa Dune, Kompa Moussekoubou, Tin Tin Kanza and Gorouberi. Survey was also carried out along the Alibori River area by NK and DN'D, where no test pits were being excavated at that time, but which had been identified in 2011 as an area with a high concentration of sites. Protocol survey sheets were used for the first time, ensuring that all surveyors were recording the same range of information. The sheets involved ticking boxes where surveyors could classify aspects of the archaeology including, category of site, position in the landscape, general size (small, or too large to evaluate), material culture density and type. There was also the opportunity to include additional written notes. Again, field walking in transects and handheld GPS were used to pinpoint sites.

The 2013 survey, undertaken over 17 days, identified 283 sites of archaeological importance (Figure 7.1). Of the 283 sites located, 29 were found close to the Pekinga settlement mound, 86 in the vicinity of Kompa, 46 between Tin Tin Kanza and Gorouberi and 79 close to the Alibori River. The other 43 sites were located during other short surveys or by chance during this field season. Over half the sites surveyed were termed "settlement mounds". However, these took a variety of forms ranging from vast, large elevations in the landscape, several metres high, to small and flat sites that were only noticeable when in close proximity. Many of the sites surveyed around the Alibori River were deflated sites with substantial pottery scatters, a type of site which was to guide later test pitting in this area (see N'Dah's accounts of Alibori 1 and 2, Part 6, Catalogue, this volume). The survey carried out in 2013 put the test pit excavations into context and identified the Alibori River region as an area with abundant sites. The subsequent 2014 survey set out to determine the settlement distribution in the Alibori region in finer detail than had been established in 2013 and to fill in gaps elsewhere in the survey.

5 The 2014 Survey

Four members of the *Crossroads* team directed surveys during the 2014 season. Nadia Khalaf conducted a large scale systematic survey using a methodology devised for her doctoral project; Barpougouni Mardjoua built on his 2013 Masters work to further document sites in the Gorouberi-Karimama area; Anne Haour conducted a survey to investigate upland areas neglected by previous surveys and Caroline Robion-Brunner led an archaeometallurgical survey around Malanville described in this volume.

Anne Haour's survey involved an 11.5km transect along the plateaux south of Tomboutou and was designed in order to check the distribution of archaeological remains on higher-lying terrain and also to provide data on this area east of Guene, which had been relatively neglected in previous years. This work confirmed the abundance of archaeological remains on the slope facing the Niger – some apparently quite major sites – and the scarcity (but not total absence) of remains on the higher-lying plateaux (200m above sea level). Details of the sites discovered in this region can be found in Gazetteer One (Part 6, this volume: Survey Refs Ag005–Ag40).

Barpougouni Mardjoua's survey covered the remaining area between Tin Tin Kanza and Birni Lafia, and included a short stretch of around 3km between Gorouberi and Karimama. Here, seven sites were identified, including an archaeometallurgical site, mounds, and evidence of lithics and pavements.

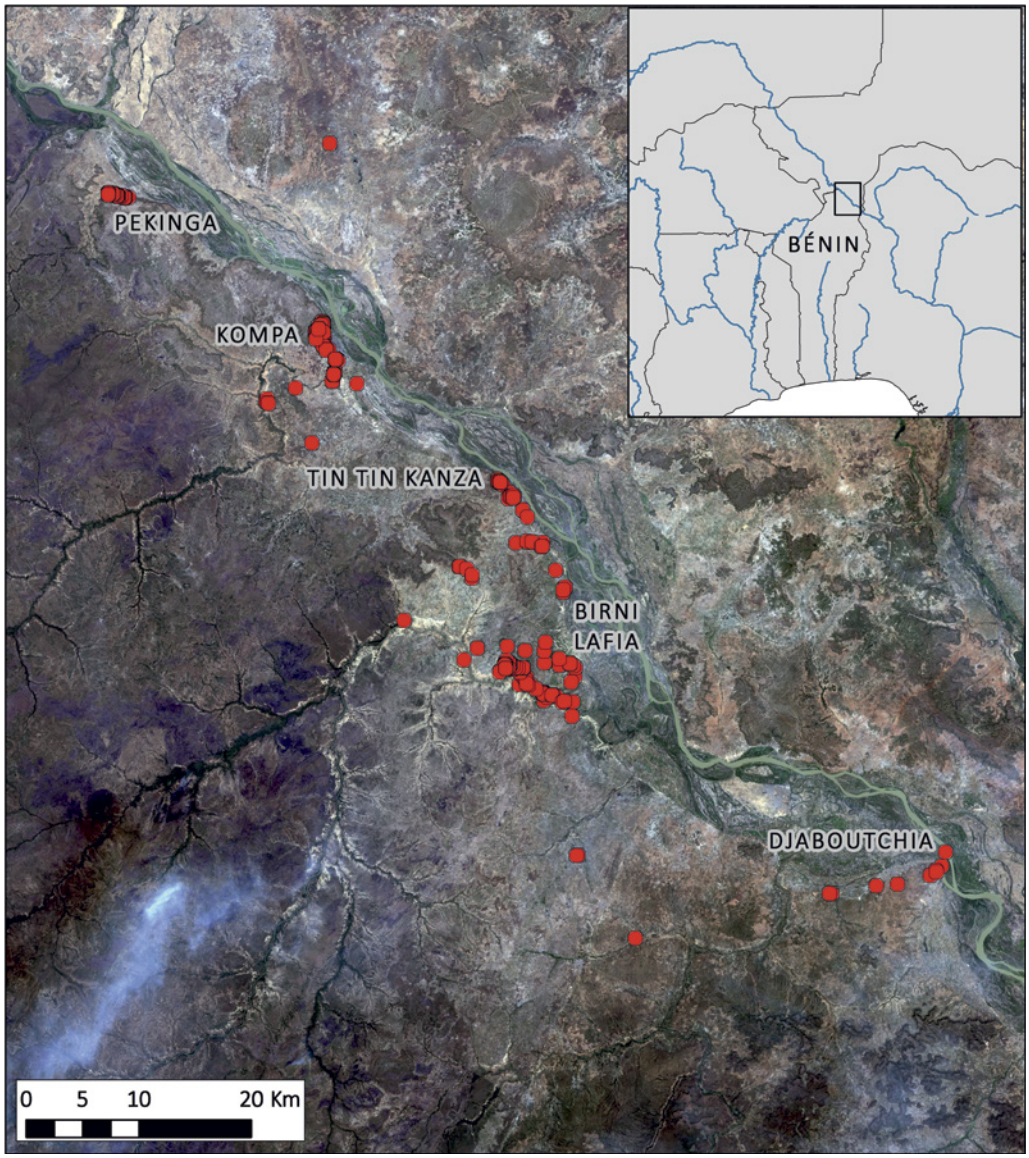

FIGURE 7.1 Landsat 7 ETM+ imagery courtesy of the USGS showing sites identified during the 2013 survey

The survey led by Caroline Robion-Brunner conducted a rapid exploration of the area on the outskirts of Malanville which identified multiple sites of archaeometallurgical significance. Most of the sites were poorly preserved, apart from Tomboutou 2, where a detailed topographic survey and excavation was carried out because of its significant ironworking technology. The site of Kouboukoukourou (excavated by Livingstone Smith as ROU, see Part 6, Catalogue) was also surveyed thoroughly due to its significant slag concentrations. However, the site is being substantially destroyed by cultivation of the land.

6 Niger Valley Survey Project (NVSP) 2014

The NVSP was directed by Nadia Khalaf during the 2014 field season. The overall findings of the project have been condensed for the purpose of this chapter, but a fuller account can be found in Khalaf's doctoral thesis (2016). A more rigorous recording system than that used in previous surveys was devised for the project, involving a quantitative assessment of archaeological variables, such as size of site and density of material culture, which could later be integrated into a Geographical Information System (GIS). This degree of quantitative assessment was missing from previous surveys, as it had merely involved qualitative estimations of archaeological sites.

The NVSP had two main objectives; the first was the characterisation of the historic landscape within delimited survey zones, through systematic and comprehensive field walking. The second was to integrate the field walking results with satellite remote sensing data into a GIS, using spatial analysis functions for a more complete understanding of the patterns in the landscape. The aim was

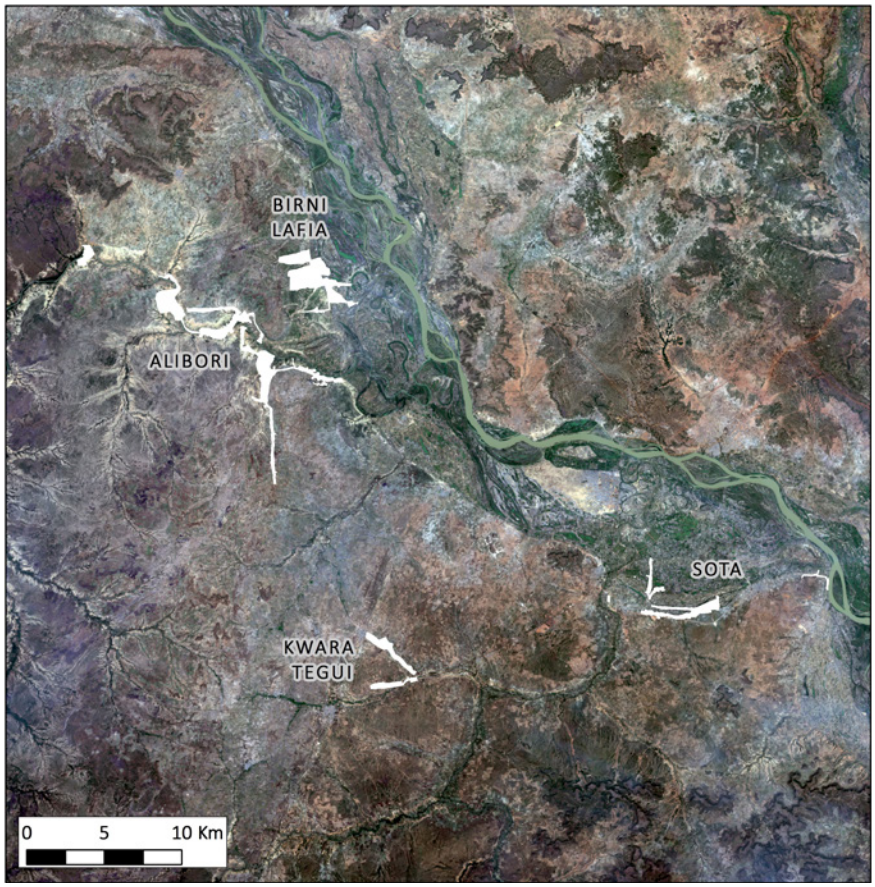

FIGURE 7.2 Niger River Valley study area. White polygons indicate the areas surveyed. Landsat 7 ETM+ imagery courtesy of the USGS

to investigate any spatial variations in the data collected in terms of site types and material culture, to suggest whether different groups of people (or polities) inhabited the landscape. The use of GIS is often used by landscape archaeologists working in other regions, but is under-utilised by scholars in West Africa, as recently highlighted by Magnavita (2016), who argues that satellite imagery and airborne surveys will provide considerable benefits for field research in Africa.

The survey was carried out in four different areas (Figure 7.2). The first area surveyed covered 7km^2 around the modern village of Birni Lafia. The aim of this survey was to investigate the area in the direct vicinity of the main excavation of the *Crossroads* project, to see whether the large settlement was isolated in the landscape or whether there were other sites close by. The second area investigated was around the Alibori River. As discussed, the 2013 survey had identified a high density of sites in this area, which warranted further investigation. Many areas close to the river have suffered high erosion, creating badlands (see Laïbi et al., this volume) causing the destruction of archaeological sites (see N'Dah, Part 6, this volume, for the discussion of the site of Alibori 1, an example of this). A 12km^2 area was surveyed here taking into account the eroded and vegetated areas, which were identified using satellite imagery. The third area surveyed (3km^2) was close to the modern village of Kwara Tegui. Unlike the two previous areas discussed, no survey had been undertaken in this region. It was intended to act as a comparison to the Birni Lafia and Alibori surveys as it was located next to a small, ephemeral channel, very different from the active Niger and Alibori Rivers. Furthermore, it sat on the eastern edge of the Kandi fault line (Laïbi et al., this volume), where landscape topography slightly changes. Finally, the last area studied was in the far east of the Dendi region, close to Malanville and the Sota River. This 3km^2 area was chosen for several reasons. Firstly, only limited survey had been undertaken in this area previously, although the site of Djaboutchia on the banks of the Niger River had been visited. Secondly, the development of a modern road meant that many of the sites in the area were being bulldozed and destroyed and so recording their existence was at a premium. Thirdly, this area, lying far to the east, had slightly different ethnographic and historical connections; therefore an aim was to investigate whether this could be seen archaeologically through field walking survey.

The field walking strategy differed greatly from that used in previous field seasons. The greatest differences

FIGURE 7.3 Université Abomey Calavi student Abass Diallo measuring a 10m² collection unit in the centre of an archaeological site

were that systematic surface collections were taken at each of the sites encountered and that the size of the site was measured using a handheld GPS. Previously, both of these variables had only been estimated but in order to establish patterns in the landscape, accurate measurements of material culture density and site sizes were required. Field walking was carried out in transects measuring 1km at a time following a bearing on the GPS within the survey zones. When a site was encountered, a protocol sheet was used. Surveyors were asked to make an overall written description, describing the type of site they thought it was, i.e. settlement mound, deflated site and so on. Internal features such as pavements, furnaces and small finds were noted and GPS points taken. A map of all pavements discovered during survey is shown on Map 3. Surveyors were asked to record the position in the landscape (for example, close to a river, dry river bed, or hill/escarpment) and to note the site's current utilisation, that is to say whether it was cultivated, abandoned, inhabited, vegetated or non-vegetated/arid. An overall site photo was taken in every instance so that a further evaluation of landscape position could be made away from the field.

After these preliminary observations, the distribution of artefacts on the ground was assessed. It was the distribution of artefacts on the ground and the morphology of the site that defined the overall site area. The area of the site was measured using handheld GPS and recorded in metres squared. A collection of 10m² was taken at the centre of every site, measured using the radius of a circle (1.78m) and then scored into the ground using a tape and nail (Figures 7.3 and 7.4). A GPS coordinate was taken at the centre of every collection unit. All artefacts within the circle were collected and recorded. Sherds were counted and weighed according to site; small sherds were photographed then discarded, and larger sherds were recorded for type (body or rim) and decoration type.

The NVSP recorded 320 archaeological sites within the designated survey zones, and around 50,000 artefacts were collected and analysed. The majority of the artefacts collected were ceramic sherds (49,057); other artefacts included lithics, slag, iron objects and beads. The details of the sites discovered can be found in Gazetteer Two (Part 6, this volume); a full discussion of the artefacts analysed is provided in Khalaf (2016) and will be summarised here.

6.1 *Surface Assemblage*

A substantial variety of ceramic sherds were collected, taking many forms and decoration. As expected, the most common sherds were body sherds, but rims, bases and handles were also collected. Smaller sherds were counted and their decoration and shape recorded by photographs, then discarded. The discarding of sherds followed the *Crossroads* project protocol whereby any sherd with a size

FIGURE 7.4 A 10m^2 collection unit after collection of all pottery sherds. Scale 1m and 0.25m

TABLE 7.1 Decoration of body and rim sherds found during Niger Valley Survey project. Total assemblage = 6,641

Undecorated	Eroded	Folded StripRoulette(FSR)	FSR and plain	Perforated	Incised	Other
2,522 (39%)	2,206 (33%)	1,469 (22%)	88 (1%)	35 (1%)	46 (1%)	182 (3%)

less than the face of a 25 CFA coin was disposed of. This left an assemblage of 6,548 sherds in which 57 styles of decoration occurred. Table 7.1 shows the broad categories of pottery sherds discovered during the survey across all areas.

The highest densities of material culture were recorded in the Alibori survey area; sites here averaged 184 sherds per collection unit. This was unsurprising as many of the sites in this area were eroded and deflated so featured high concentrations of ceramics on the surface. The Sota region sites, on the other hand, averaged 115 sherds per collection. However, this average is greatly increased because of the finds from the large mound site of Djaboutchia. The Birni Lafia survey area evidenced, on average, 82 sherds per site. The Kwara Tegui survey zone had on average 39 sherds per site. The material culture density variation across the survey zones was dependent on post-depositional processes and highlights the heavy disturbance of sites in the Alibori region through environmental impact.

Decoration of ceramics varied across the study area. In the Birni Lafia survey, a third of ceramics recorded showed evidence of the use of folded strip roulette (rfp-1), whilst almost half were undecorated. In the Alibori area, less than a quarter showed evidence of folded strip roulette decoration and almost three quarters of the assemblage were eroded or undecorated. Travelling eastwards through the study region, Kwara Tegui predominantly featured undecorated sherds (63% of the assemblage). Compared to areas in the west, just over 5% of the sherds bore folded strip roulette decoration. Finally, the Sota River survey area also evidenced limited numbers of folded strip roulette-decorated sherds (15%) and a high number of undecorated and eroded sherds (77%). There was also a high frequency of light coloured, burnished sherds in the Sota area (6%), a type not present in the other survey areas. Overall, the ceramic assemblage collected during the field survey signals that the use of folded strip roulette decoration was encountered more frequently in the west of the study area.

Other artefacts collected during field walking included lithics and slag. A distinctly low number of lithics were recovered in the Kwara Tegui and Sota survey regions in the east, with only four found. However, the Alibori and Birni Lafia survey areas yielded 977 lithic objects. The lithic scatters encountered were composed of small flakes, some débitage and some worked pieces of stone. These types of lithics may signal sites of earlier occupation. Slag on the other hand was more homogeneous between the survey areas with 130 fragments collected in the Alibori and Birni Lafia zones, and 136 collected in the Sota. This suggests that metal working practice occurred throughout both the east and west of the Dendi region. This is consistent with the findings of Robion-Brunner (this volume), who states that iron objects and ironworking were a part of everyday life and was an important activity in the Dendi region.

6.2 *Size and Morphology of Sites*

Sites encountered during the survey generally took two forms: settlement mound or flat site. The Alibori and Birni Lafia survey areas were the only regions in the survey evidencing deflated, flat pottery scatters. In the Sota and Kwara Tegui areas in the east, only mounded sites occurred. In the Alibori region, the average size of archaeological occurrences was 2,515 m^2 (0.2 hectares), although one covered a staggering 6 hectares, the largest site encountered during the survey. The average size of sites around Birni Lafia (not including the excavated site, *tombo*) was 4,111m^2 (0.41 hectares). In contrast, sites around Kwara Tegui measured 5,314m^2 (0.5 hectares) and in the Sota area the average site was 11,633m^2 (1.16 hectares) in size, which is considerably larger than sites in any other survey area. The results of the site size analysis can be seen in Figures 7.5 and 7.6.

6.3 *Settlement Distribution and Preference*

This first survey around the modern village of Birni Lafia identified 15 sites in a 7km^2 area (2 sites per km^2), including three which were later test pitted (Kozungu, Tondo windi and Bokorobu; see Part 6, Catalogue). There are two site clusters around Birni Lafia; the first is close to the main excavated site, *tombo*, in the south of the village, and it probably has a direct association with the ancient site as it sits on its periphery. The second is east of the village where the test pits were carried out. In general there is a relatively low density of sites here (two sites per square kilometre in comparison to Alibori with six); therefore it is difficult to determine a distribution pattern in terms of settlement preference. It could be that the settlement shifted through time, creating different clusters in the landscape; a model which agrees with ethnographic accounts provided by modern day informants at Birni Lafia (see e.g. Brunfaut & Pinet, this volume).

The Alibori region featured 219 sites (18 sites per km^2). The size and distribution of these sites is shown in Figure 7.5 and followed an interesting pattern. Firstly, the majority of sites were located close to the edge of the river bank; as the survey transect moved away from the river, sites were no longer encountered. Secondly, three prominent clusters of sites were located at the meanders of the Alibori. These clusters were composed of large and small sites. All of the largest sites are parts of these clusters rather than being isolated; isolated sites generally cover less than 3,000m^2. It is more than likely that these combinations of small and large mounds and deflated sites clustered together form one settlement, with a similar morphology to the Birnin Lafiya site complex. A similar phenomenon has been documented in the Inland Niger Delta where Clark (2003: 190–191) notes a cluster of mounds <1ha close to Jenné-jeno, which in fact form one site that has been 'carved up' by fluvial erosion. As these sites were only visited once during survey, it is difficult to come to solid conclusions about their distribution. The material culture across the Alibori region is homogeneous, therefore the sites may be contemporaneous.

Kwara Tegui featured 19 sites (six per km^2). This survey focused on an ephemeral stream, where water flows seasonally. There were considerably fewer sites per square kilometre in this area, perhaps as it is further away from a perennial water source. The sites that do occur here are

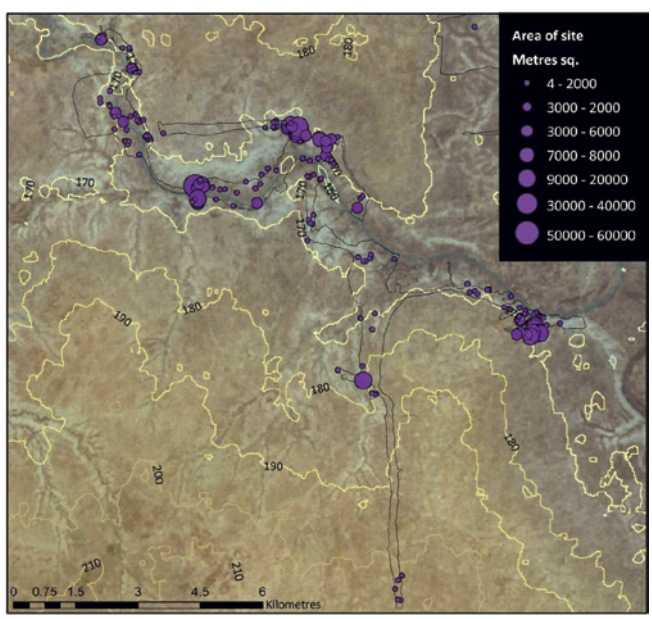

FIGURE 7.5 Size of sites in the Alibori region. Produced by Landsat 7 ETM+ and ASTER GDEM both courtesy of the USGS. ASTER GDEM is a product of METI and NASA

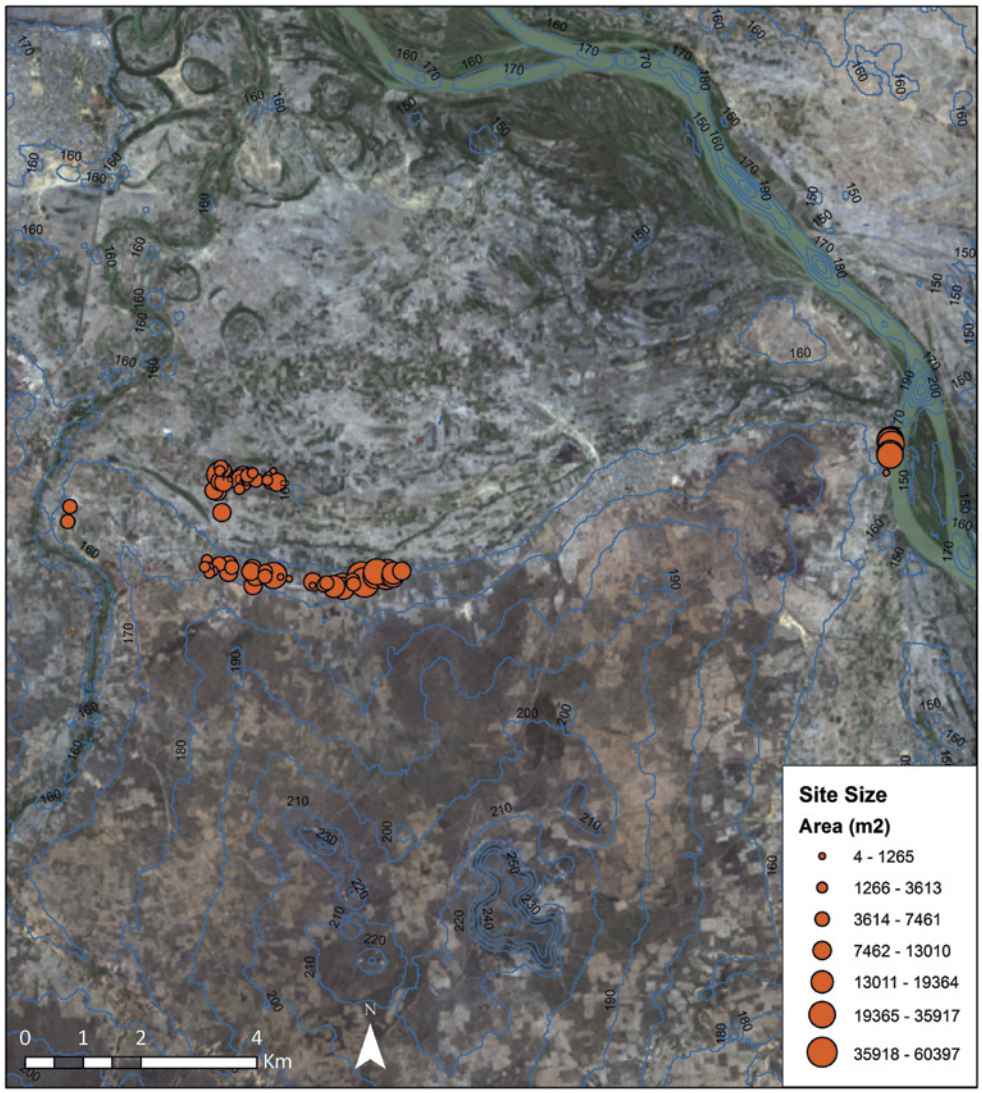

FIGURE 7.6 Size of sites in the Sota region. Produced by Landsat 7 ETM+ and ASTER GDEM both courtesy of the USGS. ASTER GDEM is a product of METI and NASA

clustered together, but there is not enough evidence to determine whether large settlement complexes are present in this region.

Finally, the Sota region featured 66 sites within the predefined zone, measuring just over 3km^2 (20 sites per km^2). The sites in this area had a very distinct pattern that was unlike that found in the Alibori survey area. The sites organised by size can be seen in Figure 7.6. Here, large sites were clustered together along the ephemeral channel and the newly-built road. No smaller sites clustered with them and they appeared to be orientated in a linear fashion, side by side. This arrangement may signify one extensive site of many spatially interlinking mounds that has been cut by the modern road development. Further investigation is needed to fully determine the significance of this arrangement, which is in stark contrast to those sites 20km away in the Alibori region.

What emerged clearly from the NVSP work was that sites tended to be located close to a river channel, whether perennial or ephemeral in nature. As one moved further away from the river the number and the size of sites started to diminish. It is unsurprising in a Sahelian environment that past settlement focused on water. As this is the first extensive survey of the region, future work should include more archaeological investigation of the landscape away from the Niger River and at higher altitudes. In light of this, the test pits investigated by one of the team (ALS) at the site of ROU near Guene, which currently represents our medieval site farthest away from the Niger River, provides a useful first marker.

7 Conclusion

Overall the survey methodologies adopted were successful in meeting their aims, covering a large part of the study area which had never previously been described, and illustrating the differential density of sites along and away from the Niger River, as well as the great diversity of ceramic styles and of settlement types and size. The diversity in pottery glimpsed from the outset, indicates potential synchronic and diachronic variations.

The NVSP demonstrated that there are considerable variations between sites in the east and west of the study region, particularly in terms of material culture distribution and decoration, size and morphology of site, and site distribution within the landscape. Based on the ceramic material, the impression is that these all fall within the 'medieval' phase (Phases 3 and 4). Survey was carried out outside modern villages and very likely these sites are not modern. Further survey and test pitting or shovel testing are necessary to substantiate this idea and to determine whether sites in each zone are contemporaneous. In conclusion, it can also be noted that site size in the region is generally less than 1ha, which is considerably smaller than those documented in comparable regions such as that of Jenné-Jeno, Mali. At Jenné-Jenno there is evidence of sizable settlements, with areas recorded of between 20 and 80 hectares and elevations of up to 10 m, enclosed by smaller mounds within a vicinity of 200 m (LaViolette & Fleisher 2010; S. McIntosh 1999). Within the Niger Valley in Dendi, the general area which the sites occupy collectively covers on average 5–7 ha in the Alibori region and 10–15 ha in the Sota region. Avenues for further work include the characterisation of mound sites, examining their placement and morphology and considering deflation and erosion, which will have greatly impacted the size and position of these sites.

PART 3

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CHAPTER 8

Ethnographic Methods

Olivier Gosselain, Lucie Smolderen, Victor Brunfaut, Jean-François Pinet and Alexandre Livingstone Smith

This chapter outlines the methods and approaches used during work in the region, which aimed at linking archaeology, history, and ethnography and, more broadly, to shed new light on the precolonial past of Béninois Dendi.

1 Developing a Research Agenda

The ethnographical enquiries focused initially on craft activities and material culture. The idea was, firstly, to rely on "comparative technology" (Haour et al. this volume) in order to identify historical processes and cultural connections with other regions; secondly, to find possible material markers for linking the ethnographic present to the archaeological past. The first field season (2011) thus focused on pottery making, and more marginally on iron forging. The technological and material culture studies gradually expanded to include other craft activities, such as cotton spinning and weaving, indigo dyeing, architecture, and iron smelting, some of which proved particularly interesting from a historical point of view.

As archaeological work progressed and new questions arose regarding possible links between the past and the present, it became clear that more thorough information about the history of the populations currently inhabiting the area was needed. Existing historical studies (Ayouba 2000; Bako-Arifari 1989; Landeroin 1910–11; Perron 1924; Séré de Rivières 1965) were indeed too restricted from a geographical and ethnographical point of view and, sometimes, scientifically unreliable. Thus the team launched into a systematic collection of oral traditions pertaining to the history of the communities encountered on the right bank of the Niger River, from Pekinga to Madekali, and from Malanville to Kandi. Enquiries were made in 100 villages, and some 160 individuals were interviewed between 2011 and 2015.

1.1 *Oral Tradition: Some Methodological Issues*

As only a few informants could speak French and the team did not spend enough time in the field to master the Dendi language, most interviews were conducted with the help of interpreters. Some of them – Abass Diallo, Oumarou Bani Guene, Aminou Gambari, Barpougouni Mardjoua and Mossi Wahabou – were students or colleagues from the UAC, with a training in history. Others – Doulla Sindi and Oumarou Alfari – were experienced research assistants, with a good knowledge of the main research goals and the historical topics discussed in the field. Although ethnographical enquiries should best be conducted through direct interviews, the project obviously benefited from the expertise of the interpreters.

As much as possible collective interviews were avoided, as investigation methods did not allow a fine-grained analysis of possible conflicts, and it was important to mitigate the effect of social pressure on personal narratives. When individual interviews were impossible, records were kept of the identity and interrelations of all members of the audience, even if they did not take an active part in discussions. This helped to assess the meaning of some of the information collected. The team also avoided relying on a limited set of key informants, choosing instead to work with a broad and heterogeneous panel of individuals. Nevertheless the long-term nature of the project led to some informants being visited several years in a row, thereby building a stronger relationship which allowed the team to dig deeper and more critically into some historical issues.

Our first task was to periodise and contextualise the various settlements of Béninois Dendi. This implied obtaining information about their inhabitants (places of origins, former movements, social and political affiliations, past activities), as well as the circumstances underlying their creation. To that aim, a similar set of questions was used in every village visited, which constituted the basic line of enquiries. Having identified the oldest settlements and obtained a rough picture of their functioning and interrelations, the team then proceeded to a second and more strategic phase in order to improve the historical contextualisation. It is worth noting that the fieldwork methodology adapted and improved over the years, thanks to gains in experience, but also to a reformulation of the research questions.

At the onset of the field enquiries, the team usually relied on local representatives or notables: the *délégués* (elected chief of the village); the *CA* (*Chef d'Arrondissement*) or the *chefs de terre* (*labukoy*), who either served as our principal informants or designated individuals who could provide historical information. While the latter were considered to

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be particularly knowledgeable, they never included *gesere* (bards), normally considered to be "history specialists".[1] This first round of interviews provided an overview of official narratives pertaining either to the history of the locality or that of particular population segments. Besides some shared legends (such as that of Nooru Bangu, see Gosselain and Smolderen, this volume), such narratives typically centre on the deeds of male ancestors, political conquests and alliances, warfare, and migrations. With regard to the most distant past, a picture similar to that depicted in previous works (Bako-Arifari 1989, 2000; Perron 1924; Bio Bigou 1987; Maman Bello n.d.) was obtained, in which the history of Dendi essentially appears to progress from the gradual superimposition of distinct peoples, originating mostly from modern-day Mali and Niger, who were able to preserve their identity through time despite sharing a similar language and developing a web of interrelations.

This "migration-wave" scenario implicitly takes "autochthony", "origin", or political domination as unproblematic conceptions and legitimate ways to delve into the history of a population or a region. Yet such conceptions mainly reflect how dominant groups currently justify their control over land and/or people. Autochthony has notably become a major issue in the research area, since it conditions land access in a context of heavy land pressure (due to population increase and the development of market gardening). As for conceptions pertaining to origins, Chapoutot (2015: 501) suggests that "[l]a quête récursive et sans fin des origines laisse l'historien professionnel de marbre. Tout au plus peut-il la prendre pour objet et tenter de lire à travers elle une société, une culture, un temps." Unfortunately, most "official" traditions focus on origins (of people, places, names, political systems, cults, customs, etc.), which lead to possible confusion between historical narratives and social explanations (see Bonte & Echard 1976), or transform projections, reinventions and propaganda into historical events.

To mitigate the effects of this top-down approach to history and the over-reliance on official narratives, both the research scope and the profile of interviewees were broadened. Inspired by subaltern studies (Guha 1983; Pouchpadass 2000), other categories of informants were considered, who had, generally been disregarded as potential providers of historical information. For example, many women and descendants of slaves were interviewed, whose specific point of view on history is usually kept aside from the narratives of dominant groups (e.g. Olivier de Sardan 1975). Collecting personal biographies of such informants allowed the linking of individual trajectories to the broader history of the region and the communities to which they are associated. At the same time, informants were questioned about aspects or events seldom mentioned in the narratives spontaneously given: micro-regional wars and conflicts, colonial penetration, trading activities, circulation of goods (water jars, textiles, iron products, jasper, beads, salt, smoked fish), sacrificial sites and rituals, clan names, environmental changes, food crises, epidemics, etc.

Over the years, the iteration between fieldwork and data processing also enabled the team to formulate some historical hypotheses that were submitted to informants. The ensuing discussions helped refine them but also opened new research avenues, due to the reflexive comments and the unexpected associations made by the interlocutors. This culminated in 2015, during the three public restitution sessions which were organised.

1.2 *Documenting Craft Activities*

As stated above, the initial aim was to cover all craft activities liable to provide information about the history of present-day populations, but also to facilitate the dialogue between ethnography and archaeology. Hence the team started with pottery and metallurgy; however, it soon became apparent that such a goal would be difficult to reach. On the one hand, both craft activities are currently dying out in Béninois Dendi, contrary to what is observed on the other bank of the Niger River (as regards pottery, at least). On the other hand, most technical traditions observed on the right bank seem to have been imported by Nigérien migrants since the beginning of the twentieth century (Gosselain 2016). They are thus fairly recent and hardly comparable to archaeological traditions. Other craft activities also emerged as better entry points to document the history of Béninois Dendi, particularly cotton weaving and indigo dyeing. The main problem was that they had completely disappeared in the area, and could only be approached through interviewing former practitioners.

Accordingly, a hybrid research method was devised that relied on both oral descriptions and technical observations. The latter mostly concerned pottery making and the few artisans still active in the craft at the time. The team also witnessed partial or complete reconstructions of the technical processes made by several former

1 Although the actual reasons remain unclear, it could be related to the context of the interviews, which differs completely from that of the performances in which bards usually participate.

potters,[2] a weaver,[3] and an indigo dyer.[4] In each case, technical data was collected through a *chaîne opératoire* approach, in which each step of the manufacturing process is documented by means of a multiple-entry template (location, actors, knowledge and expertise, raw material, tools, actions, relations with other activities, organisation, beliefs and religious practices, technical vocabulary). Such enquiries were systematically completed by interviews aiming at documenting the biography of all technical actors involved.

When direct observations were not possible, former craftspeople were asked to describe the technical process in as much detail as possible. Relying on the team's knowledge of the technique (stemming from both literature surveys and direct observations made in other contexts), they were then questioned in order to fill in possible gaps in their descriptions and to reach a similar level of detail for each of the various processes documented. During this phase of the research, the team was often confronted with material and immaterial remains of the abandoned craft activities (tools, materials, finished products, songs, rituals, etc.), whose documentation and occasional use during interviews proved extremely helpful for getting a better picture of past technical practices (Gosselain & Smolderen 2016).

1.3 *Architecture*

Architectural study focused on present day settlements. Architecture, and the built environment as a whole, are part of material culture, and convey elements of continuity, what Braudel calls "structures" (in terms of building techniques and features) on one hand, and spatial organisation on the other hand. This continuity constitutes the basis of the architects' input to the project (Brunfaut & Pinet, this volume): linking contemporary built elements to archaeological findings. In terms of methods, the approach centred on the concept of urban fabric reading (a concept borrowed and adapted from the Italian school of typo-morphological analysis), using synchronic and diachronic dimensions.

The synchronic dimension aims at studying the existing built environment and formulating a "catalogue" of urban and architectural forms (typology). This typology can then be compared with the archaeological findings in order to check for correspondences. Establishing this typology also means understanding the logic (in technical, structural and cultural terms) of these forms, which can help to interpret archaeological data (for instance, monitoring the *chaîne opératoire* of pottery pavements). In terms of methodological tools, this part of the work mainly consists of architectural survey: plans based on satellite imagery serve as a basis for house-by-house (or rather, compound-by-compound) on-site surveys. The purpose of such surveys is to represent the built-up reality, with its construction materials and techniques (architectural drawings: plan, section, details), and the spatial organisation (measures of spaces and their uses). The architectural survey also is an ideal support for oral history.

The diachronic dimension consists of making assumptions about the history of the built environment, starting from the existing situation ("undoing" time). Particular attention is paid to permanencies, continuities and ruptures in the urban fabric (i.e. in the case of Birnin Lafiya, the traces of ancient *birane* – city walls – left in the modern fabric). The study of these evolutions can serve as a database that helps to interpret archaeological remains. In more practical terms, the diachronic reading can also help to reconstruct the evolution of settlements and locate the oldest nucleus; this helped archaeologists to find the best places for test pits in Birnin Lafiya and Karimama. As there were no historical maps to be found, and old aerial photographs were very scarce or unsuitable because of their poor level of precision, the main tool for diachronic analysis was based on the reading of existing forms, completed by oral testimonies.

Methodologically, oral testimonies proved very useful in complementing architectural drawing and survey. Data were collected through direct interviews with the inhabitants, which were especially useful in testifying to the continuity of human occupation of the site of Birnin Lafiya, and the major transformations imposed by colonisation and modernisation to both urban fabric and social organisation (imposition of a rectangular grid to the villages, for fire protection reasons; shift from circular to rectangular constructions; see Brunfaut & Pinet, this volume) throughout the last century. Architectural survey proved to be a particularly effective medium for understanding the dynamics of transformation of buildings and territory.

1.4 *Referring to Oral Testimonies in this Book*

Since testimonies collected in the field sometimes challenge local hegemonies, contest the claims of particular families or population segments over kinship or land control, or reveal past servile identities, it was decided to keep them anonymous throughout the book. References will thus be made solely to the place and date of the enquiries,

2 In Torozougou and Bogo Bogo.
3 In Mamassi Peul.
4 In Banikoara.

without specifying the name, age, gender, social affiliation or occupation of the informant. Regarding the content of the interviews, two kinds of quotations may appear in the text: a regular text within quotation marks, and an italic text within quotation marks. The first corresponds to transcripts made during interviews, using the words and formulations translated on the spot. The second corresponds to parts of interviews that were recorded and subsequently translated.

2 Building a Chronological Framework

The chronological framework that structures the informants' accounts is based on a small number of events that permit a degree of precision from the second half of the nineteenth century to the present, but leaves the earlier periods in a floating temporality. The few exceptions never go back further than the eighteenth–nineteenth centuries. For example, Ousmane dan Fodio's jihad and the creation of the Sokoto caliphate (1804–1808) are mentioned by some Fulani notables in Pekinga and Mamassi Peul. For the purpose of comparison: the Fulani conquest was systematically mentioned in the oral histories collected by Landeroin (1909), from the Dallol Maouri to the Niger River. In Pekinga, the alliance between the second chief of the village – Abdu Cuka – and the Emir of Gwamdu – Abdoulaye, brother of Ousmane dan Fodio – helps situate certain events in the 1820s. Similarly, the relations between Pekinga and the Fulani chiefdom of Tamkalla (Niger), founded in 1825 and destroyed in 1866 (Beauvilain 1977), cover a period that it is rarely possible to apprehend from testimonies collected elsewhere.

In most of the villages visited, it is the appearance of the Zarma warlord Issa Korombe and the destruction of Karimama (in the 1880s) that are the oldest chronological reference points: an event or the creation of a village will be said to be before or after "Korombeize", i.e. before or after the Karimama war. However, even if this reference point probably has a certain solidity, it should be considered with circumspection when it cannot be related to other chronological elements. Indeed the character Issa Korombe has acquired a mythical status in the Zarmatarey (e.g. Bornand 2005) and its mention on the right bank is not surprising since the area was receiving Zarma immigrants throughout the twentieth century. The war feats attributed to him could be those of other historical figures such as Daouda Bougaram (or Boukara), military chief of Dosso who took part in the so-called "Zarma liberation wars" during the 1850s and 1860s. It is indeed to the latter that Pascal (1900: 310–1) attributes the destruction of Karimama.[5] We thus see that the reference points of "Korombeizé" and "the war of Karimama" may cover a period of several decades.

The next reference point is the arrival of the first Europeans. Although several French military missions crossed Béninois Dendi between 1895–1899, signing treaties with local chiefs and installing military posts, informants often confuse this period with the first decades of the colonial period, when administrative control in the region strengthened and certain services and amenities were developed (such as the Karimama post office in 1902). Occasional mentions of military skirmishes with "white people" (which happened in February 1895 in Tomboutou and November 1897 in Madekali) allow the events evoked by our informants to be situated in relation to the early days of the colonial penetration. But most often, the expression "when the whites came" means 1910–1920 and, particularly, the period during which the region was governed by Raphael Moretti, a District Commander who started work in Guene in 1912 (after having lived in Karimama for several years) and retired in 1927.[6] This red-headed man, nicknamed "l'Adjudant", obviously made a mark and was constantly alluded to when our informants evoke the beginning of colonisation.

A few rare references were made to the First and Second World Wars (indeed, some villagers took part in them), but these events are not shared chronological reference points in the Dendi. In the first half of the twentieth century, it is mainly the famines and the periods of forced labour that permit the situation of certain events. Among the famines frequently mentioned in connection with migratory movements (see Alpha

5 There are in fact some indications that the locality could have been sacked several times during the nineteenth century.

6 Michel Perron (1924: 57) picturesquely portrays this man in terms that are worth quoting in full, as they show why he occupies an important place in collective memory: "celui que les européens avaient appelé 'le roi de Guéné' et les indigènes 'l'adjudant' [...] M. M ..., venu en cette qualité puis passé sur place dans les Services civils, était résident de Karimama, puis Guéné, depuis déjà une dizaine d'années sans interruption depuis 1917. Morganatiquement allié à plusieurs familles de chefs du pays, parlant tous les dialectes, vivant assez facilement à la mode indigène, il faisait le pari en le gagnant toujours, de donner instantanément, pour tout indigène rencontré en n'importe quel lieu de la subdivision, sinon son nom personnel (ce qui arrivait même très souvent), tout au moins ceux de son village, son quartier, sa famille. Le Gouverneur en tournée n'obtenait quelque chose dans un village qu'après un signe d'assentiment de 'l'adjudant' lequel, quoique personnellement fort affable, était intraitable pour toute question, même d'ordre purement matériel, se rapportant à 'sa' résidence."

Gado 1993), there is *gande beeri* (1913–1914) and *doo-djire* (1931–1932). As for forced work (*poltol*), it is known to have intensified in Niger during the 1930s and led many families to flee to neighbouring countries. For the middle of the twentieth century, a frequently mentioned event is the death of Karimama chief, Maiguiso, in 1958 after a reign of 32 years.

Finally, three important events act as reference points for the second half of the twentieth century: the Manga *mooru* famine (1966–1967), the Marxist revolution of 1972 (which temporarily disrupted the political system of chiefdoms) and the *keylu bageize* famine (1984). For the twenty-first century, there are the floods of 2012 which destroyed or damaged the island villages and, anecdotally, the forced landing of a Nigerian aircraft on the bank of the river opposite Dangazuri, in 2014, which could well become "the year of the plane" in future historical accounts.

3 Bridging the Ethnographical Present and the Archaeological Past

During the last two years of the project it appeared that most of the sites found and excavated had been abandoned sometime in the mid-second millennium AD. The great settlement mound complex of Birnin Lafiya, for example, ranged between the fourth and fourteenth centuries AD, but there was no information on what happened next. The gap between the memory of living people and the archaeological sequence was huge. To go further, two elements were considered. Firstly, contemporary settlements had not been surveyed, because they all fell out of the survey grid established in 2011, and the team had no clue as to their age. Secondly, all the settlement mounds that had been tested were located either on, or above, the 170m contour line. This meant that their abandonment could correspond to a broader regional process, related to the dynamics of the Niger River. It was thus hypothesised that in order to find the remaining chrono-stratigraphy and bridge the present to the past, sites should be excavated below the 170m contour line and the older districts of present-day villages. At this stage two elements became crucial: oral history and historical urbanism.

Oral history provided settlement genealogies that could be tested by archaeology. Interestingly, some sites were located in the bush below the 170m contour line and had been revealed by the initial survey grid. Historical urbanism, combined with oral history, gave access to the living settlements. Urban analysis based on satellite images (see above) showed where the layout of the settlement betrayed its old age. This first impression allowed the team to locate villages of interest, and oral enquiries confirmed these desktop hypotheses, enabling the selection of the oldest part of the settlement where archaeological test-pits were then excavated. Some places could not be excavated, because villagers or individuals resented the idea of digging holes in very old places. A bias was also introduced given the diverging opinions about what was the "oldest" compound. As the team was not allowed to excavate everywhere, data are partial. At most three test-pits of 1 × 1 m were dug at any one site. Clearly, that is also a factor affecting the nature of the data. Yet this combination of oral history, architecture and limited test-pitting allowed the team to find occupation contexts that had not been encountered before, and to discover new material culture traditions. This contributed to a reduction of the chronological gap between memory and archaeology. Indeed, most of the sites identified by oral tradition were low intensity occupations compared with the massive medieval settlement mounds which attracted attention in the beginning. One should bear in mind, however, that the overall process is a pioneering effort with much room for improvement.

4 Conclusion

These enquiries have approached the complex settlement history of Dendi through a consideration of crafts – especially textile production, ironworking, architecture and pottery. Most technical traditions observed on the right bank seem to be fairly recent and hardly comparable to archaeological traditions, having been imported by Nigérien migrants since the beginning of the twentieth century (Gosselain 2016; see also Robion Brunner, this volume). Many now obsolete traditions could only be approached through interviewing former practitioners. The team also sought to explore histories of past migrations and settlement sequences, and have tried to move away from the "migration-wave" scenario which characterises much earlier scholarship on Dendi. Instead the team have considered what informants were able to say about the sites, both present and modern and from this have charted the history of the built environment.

CHAPTER 9

Architecture and Settlements Today

Victor Brunfaut and Jean-François Pinet

The considerations developed here are about built forms observable today in Béninois Dendi, and some assumptions related to the historical processes that gave rise to them.[1] The starting point of the research was the desire to investigate possible links between structures discovered by archaeologists within the *Crossroads* project and those that can be found in present day villages.

The study focused on the contemporary village of Birni Lafia, due to its proximity to the archaeological site of Birnin Lafiya[2] (Figure 9.1). Furthermore, inhabitants of the modern day village relate themselves with the archaeological site through stories taking various forms which state that "Tombo" was inhabited by ancestors of the people living in Birni Lafia.[3] At the Tombo site, located on a hill, currently used as farming land, archaeologists discovered and excavated an earth-architecture complex composed of several circular rooms, dated to around the eleventh to thirteenth centuries AD (Nixon, this volume). One of the rooms was accessible by a threshold indicated by a protuberant doorstep, covered by ceramic sherds. Crushed potsherd and laterite pavements were found throughout the complex. During interviews, inhabitants of contemporary Birni Lafia acknowledged the similarity between this kind of doorstep and pavement and current features or techniques used nowadays; which they call respectively *kútíjí* (doorstep) and *fũ kárúíam* (hard-packed floor).[4] The archaeological site is still used by women to find potsherds used in the making of pavements in the contemporary village.

Based on the assumption that architecture is part of material culture (Johnson 1997), what can we learn from modern villages, spatial logics, whether at urban or architectural scale, which could help with the interpretation of archaeological remains?

1 Describing Architecture as an Element of Material Culture

In order to establish long-term hypotheses concerning the evolution of the built environment of the Dendi villages, the team focused on built structures, studied in their synchronic dimension (i.e., what exists today). In methodological terms, we relied on the tools and concepts of the Italian tradition of typo-morphological analysis (Muratori 1959; Rossi 1966; Aymonino 1975; Canniggia 1979), which is intended to describe urban phenomena in a structuralist and dialectical reading. The territory is seen as the background to culturally significant anthropogenic changes, which become the substrate for subsequent transformations (Merlin et al. 1989). Territory and built environment are thus the witnesses of this process of iterative transformations. In this light, built structures can be used as a trigger for story-telling (oral history), but they also tell a story by themselves. The built structures are there, like a text waiting to be read.

However, these tools were created to describe the logic of growth of European historical cities. Applying typo-morphological methods of analysis to the African rural context, where built structures do not result from long term sedimentation processes, should be approached cautiously (Croizé et al. 2000 [1991]). In Dendi, constructions are built of earth and require regular maintenance. When the occupant dies and nobody takes on the property, the buildings are abandoned and rapidly fall to ruin (Figure 9.2). Furthermore, these types of structure were subject to major transformations (i.e. demolition to build roads, destruction by fire) to a great extent,

1 Though nowadays Dendi covers four countries (Niger, Burkina Faso, Nigeria and Benin) the investigations were conducted only in the Beninese part of Dendi (also called Dendina or Dendi Ganda). For convenience, the use of the term 'Dendi' refers specifically to this region throughout this chapter.

2 The inhabitants of Birni Lafia call the archaeological site "Tombo", which means hill. Of the more or less 800 sites identified by the archaeological survey team, many are called Tombo, which seems to be a generic name.

3 Birni Lafia, 2013. Oral history provides various contrasting models on this subject. In Birni Lafia, inhabitants identify a number of successive occupation sites (including Kozungu and Bokorobu – see Livingstone Smith & Nikis, and N'Po Takpara, this volume) which appear consistent with archaeological discoveries. The village would have 'moved' from one site to another for various reasons: famine, war, diseases, etc. A spirit, Zúlúbà, is said to have designated the current location and the name of the village (*birni*: enclosure, wall, *lafia*: health) during a possession ceremony.

4 Most of the Dendi words in this paper have been transcripted following Nicole Tersis (1968) *Le dendi* (*Niger*)*: phonologie, lexique dendi-français, emprunts* (*arabe, hausa, français, anglais*), Paris, Société pour l'étude des langues africaines.

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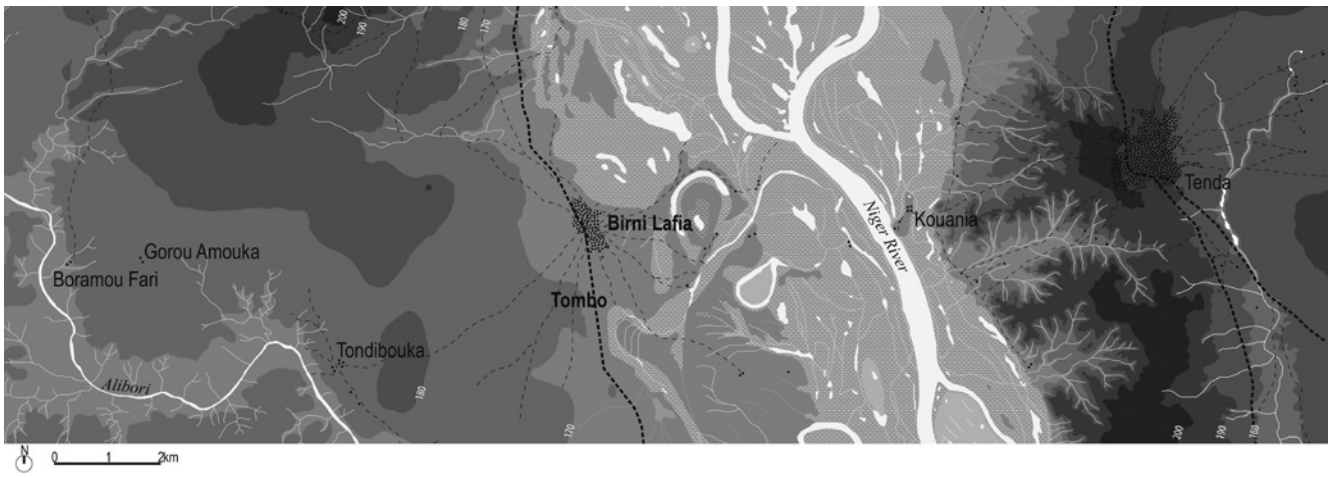

FIGURE 9.1 Map of Birni Lafia and surroundings, including the *tombo* of Birnin Lafiya
AUTHOR: JEAN-FRANÇOIS PINET, BASED ON IGN MAP

FIGURE 9.2 Ruins of a circular house (2014)

especially during last centuries. Given the lack of historical documents that would have allowed us to perform a classic diachronic analysis based on the evolution of forms (cadastral map, drawings, photographs, etc.), the team chose to combine description of architecture (considered as an artefact) and oral history, in order to relate the contemporary settlements to an historical and sociocultural context which has evolved over time (Castex et al. 1996).

Aldo Rossi defined the city as a 'product of culture' (Rossi 1966) and this approach, based on the description of built forms and the understanding of the logic of production/reproduction of building types, is easily associated with anthropological approaches based on study of the space (Paul-Levy & Segaud 1983) and family history, with study of construction techniques and built types seen as elements of material culture. This vision of architecture as a manifestation of a material culture implies the concept of a 'cultural area' where some architectural techniques would have crystallised as the tradition or 'the way to do something', and thus become representative of the local population. The restitution of Dendi material culture can be done through the analysis of tools, furniture and techniques (the artefacts, their production and their evolution) and through the reconstitution of living spaces by describing their organisation, building types, space use and the various forms of household or craft activities (Leroi-Gourhan & Brezillon 1972).

2 Historical Information about Dendi Villages

There is an abundance of literature about the main cities of the great medieval West African empires, based on written historical sources as well as archaeological findings (Haour & Nixon, this volume), but in the specific case of Dendi there is a certain scarcity of information. Most of the written historical sources come from the testimonies of African and European travellers and military officers, reports from colonial administrators and studies starting from the late 1850s (Gosselain et al., this volume).

The region, with boundaries which seem to have shifted over time, was located at the margin of several important political entities including, among others, the Songhai Empire in the north, the Hausa cities in the east and the Borgou kingdom in the south. In these Sahelian empires, capitals and major cities were centres of power dominated by a warrior, pro-slavery aristocracy (Meillassoux 1971, 1986). The margins were 'buffer zones' that could have had some autonomy in certain cases, serving as a refuge to more marginal populations: slaves, animist groups rejected from urban centres following their Islamisation, displaced populations or minorities and outlaws (Amselle & M'Bokolo

FIGURE 9.3 Various aspects of the landscape. From the left to the right: 1. Crops close to Birni Lafia (2013), 2 and 3. Niger River floodplain (2013), 4. Bush (2013), 5. Palmyra forest close to Tomboutou (2016), 6. River bed (2016)

1999; Amselle 2001). Dendi villages presumably resulted from immigration along the Niger River and caravan roads which crossed the region (Gosselain & Smolderen, this volume). According to the scarce historical descriptions available, during the course of the nineteenth and twentieth centuries, most of the Dendi villages seem to have been small fortified villages and caravan posts (Brunet & Giethlen 1900; Bretonnet 1898), located in a 'very bushy tree vegetation' (Toutée 1897, our translation), struggling against each other and occasionally suffering raids (Toutée 1897). Fortifications protecting villages were mostly walls (called *birni*) made of unbaked earth or wood (mostly *Prosopis africana*). According to testimonies, it seems the "bushy" vegetation surrounding the villages also played a very important defensive role by "hiding" them from potential assailants. Oral history reflects the impact wars and slave raids could have had on Dendi villages (Gosselain & Smolderen, this volume). Nevertheless, the process of displacement of villages from one site to another was not solely due to war. Oral history also states that fire (particularly destructive in dense villages composed of thatched roofed houses), famines, lack of water or illness were also causes of important population movements. During the twentieth century, with the colonisation and pacification of the region as well as the implementation of roads, the demographic explosion, the development of agriculture (especially commercial agriculture such as cotton) and the corollary deforestation, Dendi territory seems to have changed drastically (Bio Bigou 1987) (Figure 9.3).

3 Urban and Architectural Study of Birni Lafia

In the absence of precise geographic maps, the first step of the survey involved drawing maps using aerial photographs from Google Earth, as a basis for the work (Figure 9.4). This preliminary step established a series of hypotheses and was subsequently completed by ground surveys. In 2013, 104 compounds in Birni Lafia were surveyed and drawn on the previously prepared map of the village. Each compound included several buildings, for which plans were drawn up, as well as some sections and elevations of buildings. Interviews were conducted using both inquiry forms and semi-directive discussion. The results were crosschecked with historical aerial photographs.[5] The work developed as a dialogue between surveys and drawing.

3.1 *Description of Urban Form*[6]

A main road links Birni Lafia to Karimama and Malanville following a north-south axis, slightly removed from the

5 The photographs related to Birni Lafia which were used are: IGN, 1950 (AOF 29 shot 55), 1960–61 (ND 31 31 IV NC XXII, shot 58), 1975 (DAH 3 P 125, shots 233, 248).

6 The concept of 'urban form' covers many meanings, depending on its use by planners, architects, geographers or urban sociologists. The term was introduced in the 1960s following studies conducted in Venice and Padua by Saverio Muratori (1959) and Carlo Aymonino (1966) respectively. This text will refer to the definition of Alain Borie, who considers the urban form as 'the ratio between

FIGURE 9.4 Cartography methodology
AUTHOR: JEAN-FRANÇOIS PINET. PUBLISHED IN LIVINGSTONE SMITH, A., CORNELISSEN, E., GOSSELAIN, O. & MACEACHERN, S. (EDS). 2016. AFRICAN ARCHAEOLOGY FIELD MANUAL, MUSÉE ROYAL DE L'AFRIQUE CENTRALE, TERVUREN. ISBN-978-9-4922-4427-7 AND 978-9-4922-4428-4, AND REPUBLISHED WITH THE AGREEMENT OF THE EDITORS

densest part of the town. All buildings of colonial or post-colonial periods, such as the school, the market, the main mosque, the clinic and recent residential developments, are organised along this main road, which dates from the twentieth century and clearly acts as a structuring element for the current settlement[7] (Figures 9.5 & 9.6). The analysis of urban form indicates a shift through time from a concentric, dense, precolonial structure, linked to the presence of a *birni* to a more diffuse linear model, where the distance between buildings is larger and land plots are bigger. The difference in dimensions of the properties can be read as the persistence of old layouts: as the village developed within the *birni*, its fabric necessarily remained very tight. Following the pacification of the region, *birane* (plural of *birni*) gradually disappeared, as defence requirements became less imperative.[8] When the town extended beyond the boundaries of the *birni*, the fabric could loosen and plots could become larger. In the case of Birni Lafia, there is still evidence of the permanence of the *birni* in the current built fabric, such as alignments, remains of what could have been *birane* foundations, differences in ground level and roads leading towards the supposed location of former gates. These morphological elements concur with testimonies given by inhabitants about the location of the *birni*[9] (Figure 9.7).

Another very interesting feature, in terms of urban form, is the presence of soil extraction sites within the village and on its edges, creating open spaces that remain for a long period of time and act as structuring elements. In the case of Birni Lafia, the presence of empty spaces around the supposed site of the *birni* could be explained by their use for its construction: for convenience, people choose to extract it as close as possible to the village. These empty spaces can be considered as markers of the successive stages of development of the village because of their permanency in the urban fabric. When the town grows, people tend not build on these areas, which are gradually filled with waste when they are no longer used as earth extraction sites.

3.2 *Roads and Open Spaces System*

The urban fabric of Birni Lafia mainly consists of the superposition of two orders: first, compounds *wúndáí* (sing *wúndî*) and paths *fóndàì* (sing. *fóndò*); second, streets ("*vons*") and the main road mentioned above. The two systems of roads overlap, following distinct logics.[10] The road system is complemented by open spaces within

the urban fabric and urban structure, which consists of the set of singular elements that characterizes the city: major structural axes, large facilities and monuments, configuration of the limits' (Borie & Denieul 1984).

7 In 2016, a new mosque, a secondary school, two cotton warehouses and a water tower were also built along the main road.

8 Based on oral history and written records, it is supposed that this happened during the early twentieth century, probably at the time of French colonisation (Walther 2006).

9 Birni Lafia, 2013.

10 This type of overlapping between distinct systems can be observed in neighbouring regions. In Djenne, for instance, there is also an orthogonal layout from the 1940s, built in extension on the outskirts of the town, or inside the old city, to 'rectify' the old quarters (Maas & Mommersteeg 1993).

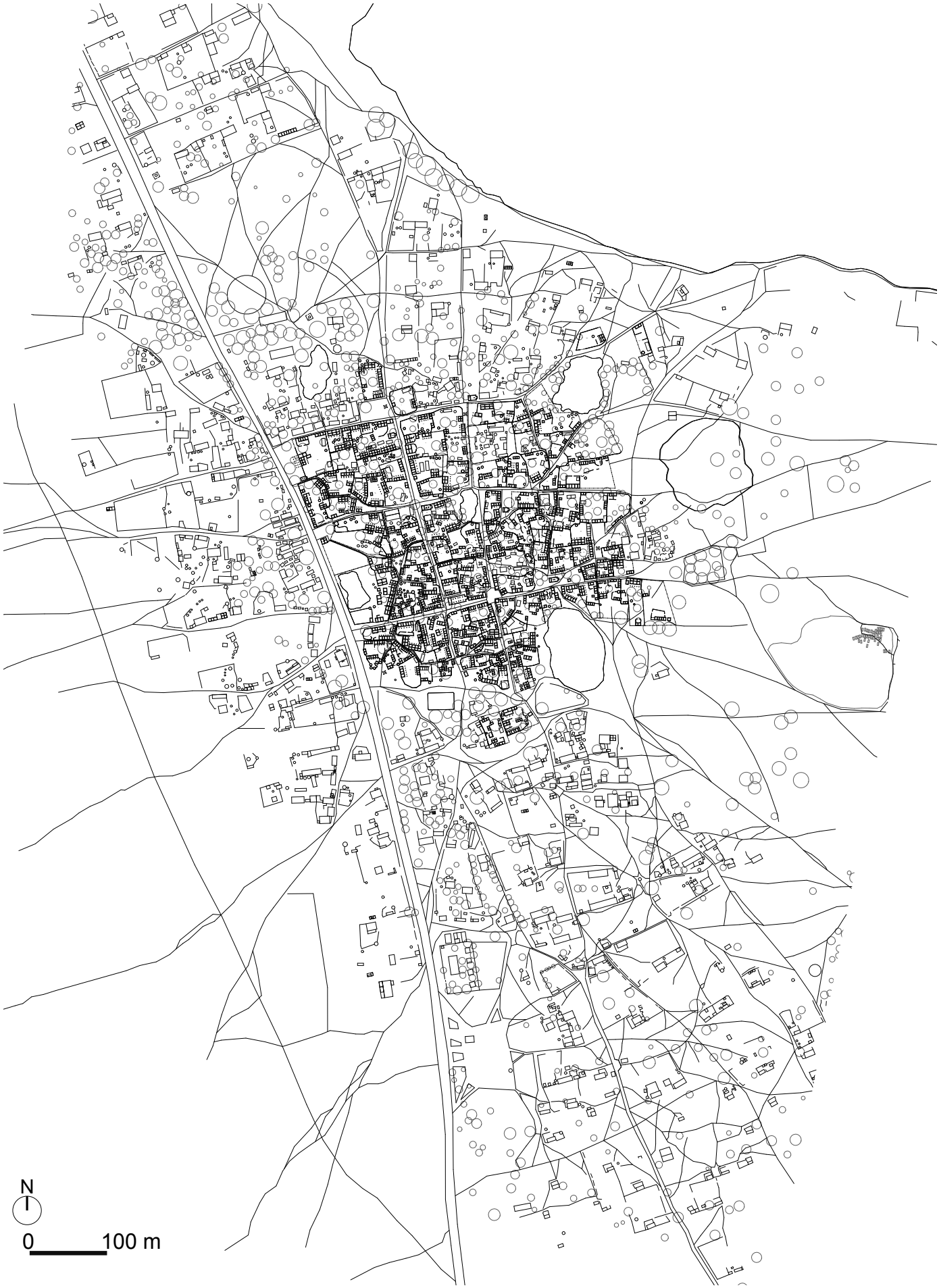

FIGURE 9.5 Map of Birni Lafia

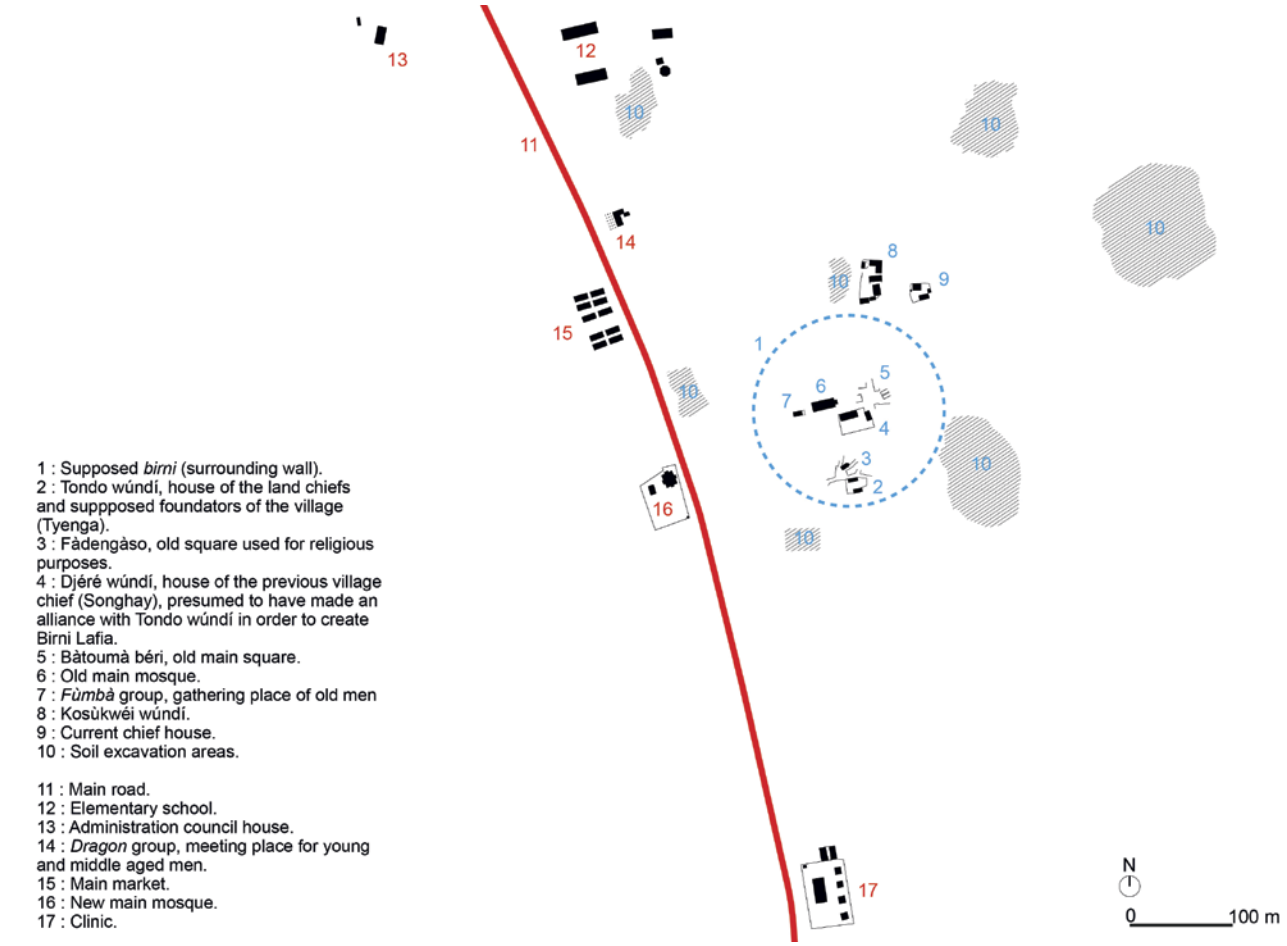

FIGURE 9.6 Development of Birni Lafia

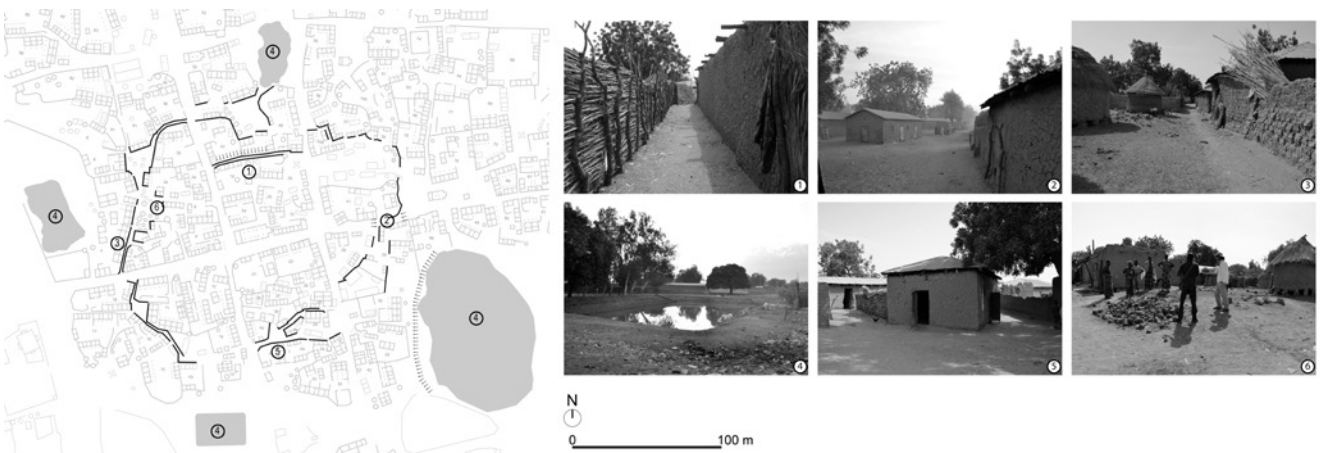

FIGURE 9.7 Remains of the *birni* inside the urban fabric

AUTHOR: JEAN-FRANÇOIS PINET. PUBLISHED IN LIVINGSTONE SMITH, A., CORNELISSEN, E., GOSSELAIN, O. & MACEACHERN, S. (EDS). 2016. AFRICAN ARCHAEOLOGY FIELD MANUAL, MUSÉE ROYAL DE L'AFRIQUE CENTRALE, TERVUREN. ISBN-978-9-4922-4427-7 AND 978-9-4922-4428-4, AND REPUBLISHED WITH THE AGREEMENT OF THE EDITORS

the village or around it. Craft production (such as smithing, weaving, pottery, etc.) takes place in domestic spaces and in some of these open spaces (Figure 9.8ab).

The *vons*[11] are an orthogonal, non-hierarchical mesh: they form a checked pattern superimposed onto the urban fabric. Their creation dates back to French colonisation, although many were created after independence. The *vons* were intended to serve as fire-breakers and as a means of imposing colonial order, both symbolically and practically (i.e. by facilitating the entrance of vehicles).

Fóndàì are elements of a linear hierarchical arborescent system of paths, radiating from the centre of the village. While the creation of the orthogonal grid of '*vons*' is the result of a colonial logic, the structure of some current *fóndàì* could be related to the permanency of old roads and paths. They are of smaller dimensions than the '*vons*': while '*vons*' are roughly 5m wide, *fóndàì* only reach a width of 2–3m. Some narrow *fóndàì* are called *fóndò ndángà ízé*, 'where only one foot passes'.

The societies that have succeeded each other in the Dendi region appear to have been strongly hierarchical (Gosselain et al., this volume). Therefore, it is probable that the duties or prohibitions that bind family clans and everyday relationships (ceremonial greetings and obligations) in Birni Lafia have shaped the system of paths between compounds. Dendi villages are still structured in areas based on extended families, clans and professional monopolies (a neighbourhood may be designated as 'the butchers' quarter' and another 'the *griots*' quarter').

3.3 *Compounds*

The urban fabric is characterised, in terms of housing, by the compound (*wúndí*). Compounds are made of a group of buildings divided into rooms and organised around a collective open space shared by family members. This space can be divided into more intimate sub-spaces through the use of straw fencing, mud walls or by the orientation of buildings. Most of the trees observed in the compound's courtyards are *neems* (*Azadirachta indica*), originating from India, planted during French colonisation in order to reforest villages (Jourand 2013) (Figure 9.9). Animals are usually kept in the courtyard during the night, but agricultural activities mostly develop outside the village. Houses are kept very clean of debris. Rubbish can pile up inside the courtyard of the compound (mostly rubbish due to cattle-keeping) or be thrown away outside, on the roads, the soil extraction areas, or on open spaces at the border of the village, where it can then be burnt or left to decay (Figure 9.10ab). A peculiar element characterises some specific compounds: an entrance building called *kàtà*. The *kàtà* is a small building, usually rectangular, consisting of one room of variable dimensions, with two doors in opposite walls. According to oral history,[12] *kàtà* were built by 'kings, warriors or rich traders' to welcome their guests or to host foreigners. Traditional *kàtà* would allow the short Dendi horses to come inside, and thus the *kàtà* differs from housing structures in the fact that it doesn't have a *kútíjí*, a doorstep materialising the threshold of the room to protect it from floods and snakes. Furthermore, the use of *kàtà* appears to meet Islamic requirements: the householder can welcome guests without them being in contact with the women of the compound, as it is completely enclosed by a wall of straw or earth; the compound is then said to be *kùllé* ('house where women are cloistered'). In cases where the *kàtà* does not have this religious use, compounds may not be fully closed, and their existence as 'symbolic entry' does not preclude the coexistence of other entrances used by locals, such as informal passages between houses linked to *fóndàì*. Although slavery has officially disappeared, the descendants of slave families remain, to some extent, socially and spatially marked. Their houses are often located near the compound of former 'masters' while remaining spatially separated by *kàtáì* (plur. of *kàtà*) or *tàndái* (plur. of *tándà*) (two different types of entrance systems) or by the position of the house, set aside, in the back of the plot.[13]

3.4 *Built System and Typologies*

The building typology is strikingly homogenous in modern day Birni Lafia. The urban fabric is made up of the repetition of a few, regular types.[14] This homogeneity reveals a strong sense of social consensus that concern both building techniques and the social structure as a whole. Building types can be divided into two categories. The first one relates to 'regular elements': the residential

11 The word *vons* is originally the French acronym for *voie orientée nord-sud*, literally "north-south oriented road".

12 Birni Lafia, 2013.

13 In other villages, such as Kompanti, families of slave descendants live in a 'district' located away from the village. The two types of organisation may be the result of different types of slavery: 'captives' have a different status to that of 'slaves' (Gosselain & Smolderen, this volume).

14 A type is a conceptual representation of a building, an ideal form, on the basis of which countless buildings can be built, while individual appearance may vary. The type differs from the model, which is a specific object that can be copied identically. 'The word type appears to be less the image of a thing to copy or imitate completely, than the idea of an element that must itself be used as the rule for the model' (Quatremère de Quincy 1788). Typology here is the comparative study of physical or other characteristics of the built environment into distinct types.

FIGURE 9.8A Most of the squares in Birni Lafia are related to the mosque

FIGURE 9.8B Various aspects of open spaces. From left to right: 1. Square in front of a mosque (2014), 2. A *von* (2016), 3. Square at crossroad (2013), 4. A *fóndò* (2016), 5. A smithy beneath a *tándà*, along a *von* (2013), 6. A *fààdà* ('gathering place', 2013)

FIGURE 9.9 Courtyard (2013)

built elements that form the 'background' of the city. The second category relates to 'singular elements': buildings that differ in shape and/or dimension from the norm, and which usually host collective functions, such as mosques, granaries (still built in a traditional way) or schools, administrative buildings and markets. This text will not describe the last three of these because these buildings date from the post-colonial periods (Figure 9.11).

3.4.1 Regular Elements

The housing structures studied are either of circular or rectangular plan construction. Circular elements include two types, the *búkkà* and the *kùrùkùtù* (plur. *kùrùkùtái*), respectively known under these names throughout Dendi.

Búkkà are stalk and straw constructions of circular plan on a wooden structure. They are built for seasonal occupation: along rivers during the fishing period, in the fields, or as temporary housing by non-sedentary Fulani.

Kùrùkùtù is the word used to describe all circular constructions made with earth. People distinguish four kinds of *kùrùkùtái*. The first three have a thatched roof on a timber structure and are distinguished by the materials used in their construction (unbaked lumps of clay, smoothed lumps, adobe bricks). The fourth has a specific name, *kùdendà*, and is entirely made of smoothed lumps, forming a dome covered with straw. As in the case of *búkkà, kùrùkùtái* comprises a single space without windows. According to testimony, nowadays this type of building is built by old people or poor families. During surveys, it was evident that this particular type was mainly occupied by non-nubile children or the elderly, used as a storeroom or as a shed for small animals. In some very specific cases, *kùrùkùtái* may be used as a 'fetish house' (store for powerful objects). Some *kùrùkùtái* with two doors can also be used as forges or entrances (*kàtà*), in which case they are then placed on the boundary of the compound.

The rectangular buildings category can be divided into subcategories according to internal organisation. The names used below to designate these categories are from the study in Birni Lafia and may not be common to all the Dendi villages. These buildings are referred to as *sìjífà* when covered with a flat roof (used as terrace or drying space for crops such as millet) though most are now pro-

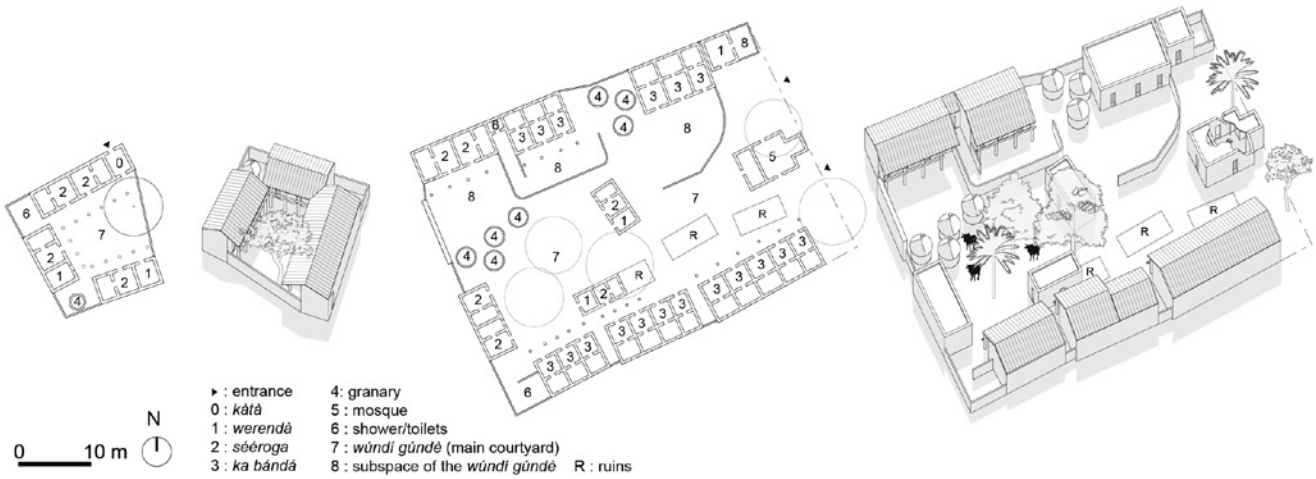

FIGURE 9.10A Examples of compounds surveyed in Birni Lafia
AUTHOR: JEAN-FRANÇOIS PINET. PUBLISHED IN LIVINGSTONE SMITH, A., CORNELISSEN, E., GOSSELAIN, O. & MACEACHERN, S. (EDS). 2016. AFRICAN ARCHAEOLOGY FIELD MANUAL, MUSÉE ROYAL DE L'AFRIQUE CENTRALE, TERVUREN. ISBN-978-9-4922-4427-7 AND 978-9-4922-4428-4, AND REPUBLISHED WITH THE AGREEMENT OF THE EDITORS

vided with corrugated iron sheet roofs. In some cases this roof is overhanging, creating a kind of awning supported by wooden posts. The floor covered by this awning can occasionally be paved or covered with cement.

Werendà is the most elementary type. It consists of a single rectangular room accessible through a door. *Werendáì* shares similarities with *kùrùkùtáì* in terms of use and organisation (i.e. a single room). *Werendáì* are usually *sìjífà*.

Sééroga ('daughter-room next to the main one') is a type formed from a base unit two rooms wide: the first one, called *fǔ nia* (literally 'mother-room' or main room), giving access to the second, called *fǔ ízé* ('daughter-room' or secondary room).

Ka bándá ('daughter-room at the back') are formed from a base unit two rooms deep. An evolution of this type is called *salon*; this type has appeared recently, probably imported from cities such as Parakou or Gaya, with a front main room giving access to two or three rooms at the back (this type can become more complex with the addition of corridors).

3.4.2 Singular Elements

Mosques are rectangular earth buildings, accessible on two or three sides and entrances which may be extended by a small concrete slab (where people can perform ritual ablutions on a clean surface), with the fourth side sheltering the *mihrab* protruding niche.[15] The plan is characterised by the presence of one or more pillars, which support the roof structure, in the axis of the *mihrab*. Mosques can be reserved for men or divided into two spaces (one each for men and women) by a wall with triangular holes in it.

Granaries (Figure 9.12) are generally located at the limit of compounds, sometimes creating real clusters between them. As in the case of houses, the construction techniques used for granaries have evolved, though less consistently. Granaries can be built of earth and raised on stones to isolate them from ground level and protect stored grain from insects and pests. They are then called *bô* or *bóà*. Though the team saw many *bô* built of adobe bricks in the north of Dendi region, techniques involving the use of unbaked clay (smoothed lumps) can still be seen in the south. The granaries from the south are built in a similar fashion to the granaries described by Drot (1904). Some granaries are also built of stalks and straw on a wooden structure. They are called *sùùrù* (a slender type of granary) or *bàrmà* (a short and conical type).

3.5 *Transformations of the Urban Fabric*

The survey conducted in Birni Lafia revealed a continuous process of transformation of the urban fabric. This transformation process takes various forms: densification of buildings in housing properties; abandonment of some buildings, such as those held by a deceased person (if no one needs it or if it is not rented), and demolition or reconstruction of buildings. Yet there is evidence of the maintenance over time of specific buildings such as mosques. When buildings are abandoned, they are not demolished or levelled, but left to decay over time. If someone needs to build a new building in a compound where old

15 Tilho, in his description of Dendi, explains that most of the villages have a mosque, even if it is just a shed. He uses either the words *mihrab* or *soro* (Landeroin 1911).

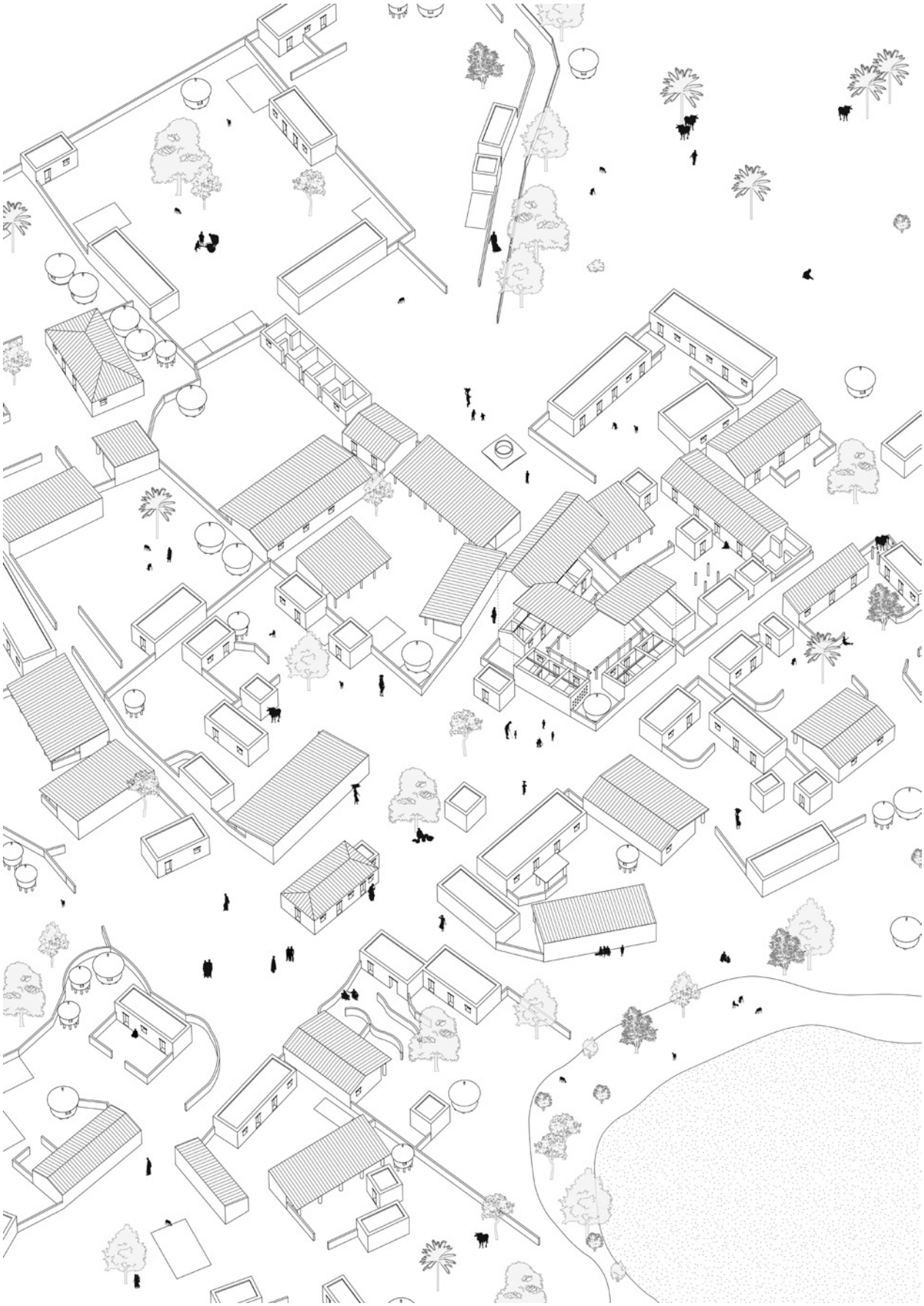

FIGURE 9.10B Axonometric view of the eastern part of Birni Lafia

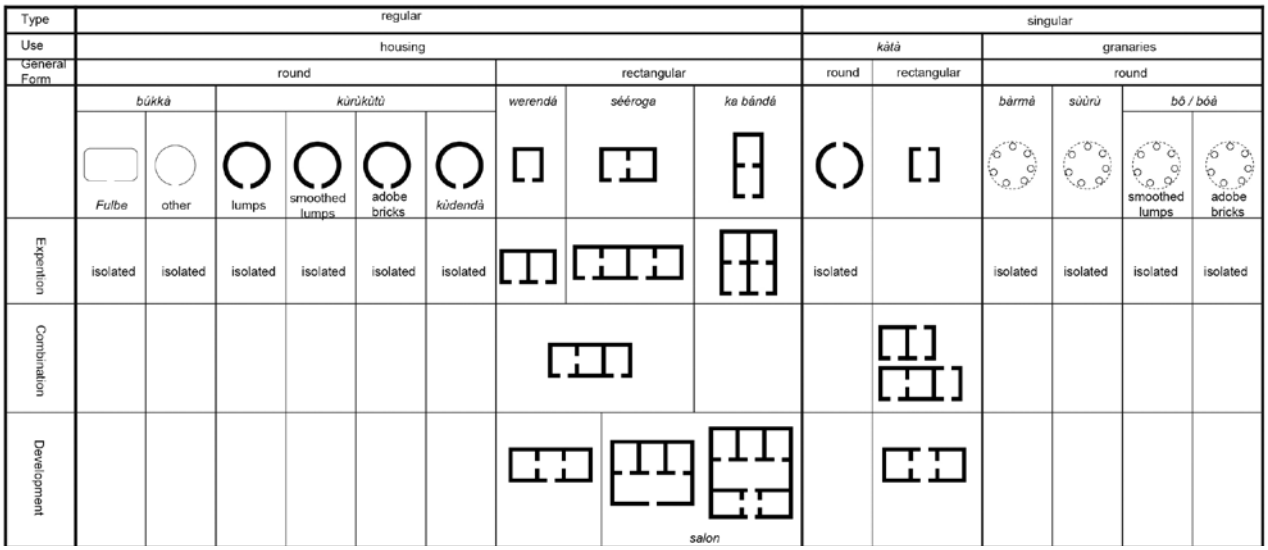

FIGURE 9.11 Typology table of regular and some singular buildings surveyed in Birni Lafia

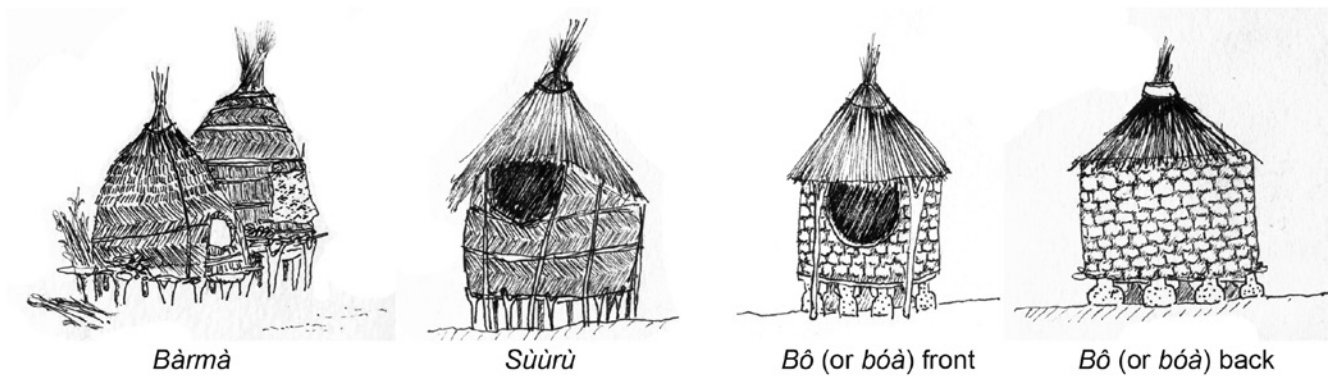

FIGURE 9.12 Drawings of types of granaries

FIGURE 9.13 Using debris and foundations to build a new house (2013)

buildings have collapsed, people will use the debris, crush and tamp it in order to reuse it for new bricks (Figure 9.13). For convenience, masons use the foundations of the ruins for the new building, thus perpetuating their layout in the built system.[16] This process of transformation of the built fabric upon itself continues despite the growth process through new constructions outside the 'historic' centre of the village, on larger plots. This process also sees the replacement of circular buildings by rectangular ones.

Archaeologists did not find evidence of rectangular buildings in the Birnin Lafiya site, either through excavation or remote sensing. According to elderly people's testimonies, until relatively recently and within living memory, villages were mostly composed of circular shaped buildings, with a few rectangular buildings with *sìjífà* type flat roofs, which presumably corresponded to the chief's house and the first mosques. Historic aerial photographs, although not very sharp, confirm these testimonies (Figure 9.14). Compounds underwent the

16 The continuity in the upper layers of the stratigraphy from some of the pits dug inside the villages seems to confirm this process (for example, at Kargui, see Livingstone Smith and Filippini, Part 6, this volume).

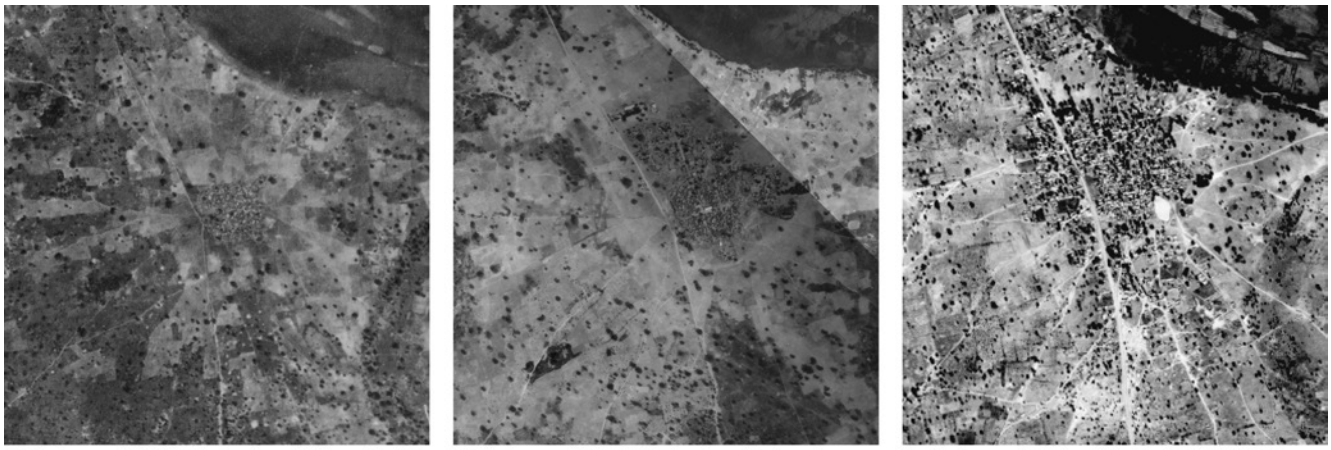

FIGURE 9.14 Evolution of the village since 1960
AUTHOR: IGN, GOOGLE EARTH. PUBLISHED IN LIVINGSTONE SMITH, A., CORNELISSEN, E., GOSSELAIN, O. & MACEACHERN, S. (EDS). 2016. AFRICAN ARCHAEOLOGY FIELD MANUAL, MUSÉE ROYAL DE L'AFRIQUE CENTRALE, TERVUREN. ISBN-978-9-4922-4427-7 AND 978-9-4922-4428-4, AND REPUBLISHED WITH THE AGREEMENT OF THE EDITORS

gradual replacement of circular constructions, the so-called *kùrùkùtái*, by rectangular structures through a substitution process over the course of the twentieth century. In neighbouring regions, such as Burkina Faso (Augustin & Augustin 1994), this transformation was accompanied by the adoption, probably at the initiative of the colonial power, of a non-adjoining buildings rule (still in application today), to fight fires that might completely destroy a village built mostly of earth and straw. During the surveys, people related this transformation from circular to rectangular buildings, to French colonisation. Although colonisation undeniably constituted a drastic rupture in history, it would have been very unlikely that building types would not have undergone transformation before the arrival of the French. In particular, regarding the rectangular building typologies and considering that there existed rectangular pre-colonial earth architecture, with flat roofs, in cities of neighbouring regions (Denyer 1978; Aradeon 1984; Keita & Aradeon 1985), it is probable that the apparition of rectangular types of building in the Dendi region dates back to the period preceding colonisation, although colonisation may have contributed to strongly popularising the rectangular type, which was a sign of 'urbanity', being mostly present in big cities.

3.6 *Construction Techniques*

The construction techniques observed in Birni Lafia combine modern (corrugated iron sheet, cinderblock, cement) and traditional (clay, limestone extracted in the region, plant extracts, straw) materials and techniques. Masonry and carpentry are professions not limited to a specific social group – unlike potters, for example – thus complicating the study of the transmission of building techniques (Seignobos & Jamin 2003). The adobe brick technique seems to have been imported by French settlers, according to oral testimonies.[17] Bricks are made using a mould, the dimensions of which can differ depending on the mason or the person making the bricks. Whereas rich people can afford to buy bricks, poor people make them themselves to give to the masons. Making bricks requires a lot of water, so today the cost of bricks is very different from one city to the other. For instance, in 2014, brick cost was 25 CFA per unit in Karimama and 10 CFA per unit in Birni Lafia, because of its proximity to the Niger River (land is wetter and transport costs are lower). Straw, cow dung, peanut shells or other elements can be incorporated; again, there is no fixed rule. The mould is quickly removed and the bricks left to dry. According to oral testimonies, before using adobe bricks, the people of Dendi made walls with unbaked clods of clay, sometimes smoothed in a fashion similar to the *djeney-ferey* technique of Djenne masons interviewed by LaViolette (1987). As shown above, this technique is still in application for granaries in some parts of Dendi (Figure 9.15).

Traditionally, roof structures are made of palmyra (*Borassus aethiopium*). However, due to deforestation and the scarcity of palmyra trees in the region (Bio Bigou 1987), lower quality wood, such as eucalyptus, is increasingly used. Nowadays, the structure is often left visible,

17 Birni Lafia, 2013. Archaeological fact seems to confirm this testimony: there was no trace of adobe bricks in the archaeological site despite the existence of sun-dried bricks in pre-colonial neighbouring regions (Nixon, Chapter 15, this volume).

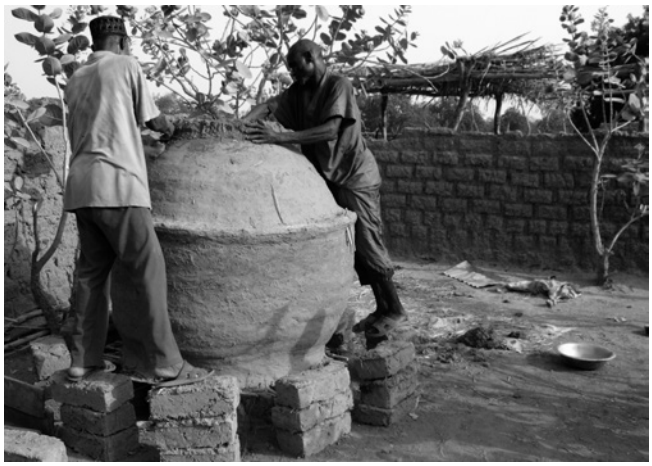

FIGURE 9.15 A granary built of banco, Tomboutou (2016)

FIGURE 9.16 Geometric patterns made by hand (2013)

just covered with corrugated iron sheet. The gap between the roof and walls is used to ensure ventilation, or for storage. Yet traditional techniques of beamed ceilings called *sàmàtá* still exist.

Soil plastering techniques are widespread in the region and continue to be used by the vast majority of people. The plaster is not necessarily made by masons, and its composition can vary considerably. The plaster is left plain on the wall, but can sometimes be modelled, with hands or brushes, to form more or less regular patterns. Geometric patterns can be observed, although they are relatively rare[18] (Figure 9.16). This technique seems to only be performed by men, unlike tamped floors and interior coatings, which are made by women.

When a woman marries, she must prepare the room she will live in, sometimes with the help of her future co-wife.[19] This preparation includes floor and wall maintenance. The future bride coats the inside of the walls with a mixture of burned *néré* leaves (*Parkia biglobosa*), *kòrmòtò* (limestone), and juice from the vine called *bòlòlò* (probably from the *Morinda* specie), producing a kind of brown black coating. The technique is called *fû kóáràì*. Women also prepare and carefully maintain floors, sometimes inserting potsherds. The sherds are taken from broken pottery vessels or collected on archaeological sites as testified by other members of the *Crossroads* team (N'Dah & Mardjoua; Nixon, this volume) and stocked. After placing the fragments, the floor is tamped with a pestle (to flatten the fragments and homogenise the level of the floor) and then sprayed with a mixture of water, *bòlòlò* vine juice, natural glue extract taken from *dèèlìnia* (*Combretum nigriscans*), and *kòrmòtò*. Upon drying, the mixture hardens. Sometimes this technique, called *fû déébé*, is used without sherds in order to obtain a smooth, flat surface, which the locals describe as 'natural cement' (Figure 9.17). Nowadays, people who can afford it prefer to use cement since it requires less maintenance over time.

FIGURE 9.17 Tools and materials used for the creation of a pavement (2016)

4 Conclusion: Is Analogy Possible between Contemporary and Archaeological Settlements?

Trying to make analogies between two built settlements separated by several centuries of difference is quite a complicated and perilous exercise (Asher 1961). Given the existence of these settlements occupying the same area, but dating from two different periods, the work had a twofold objective: to consider the built structures in the contemporary village environment (synchronic dimension), and

18 The second volume of the *Documents scientifiques de la Mission Tilho* includes a photograph by Captain Drot, showing a building decorated with rammed earth bas-reliefs by a Dendi artist (Landeroin 1911, Vol. 2, Figure 2). No informer interviewed seemed to know about this kind of decoration.

19 Birni Lafia, 2014.

to make hypothesis on how these relate to longer term patterns by studying the permanencies in urban and architectural forms (diachronic dimension).

Inhabitants of the modern day Birni Lafia relate to the archaeological site of Birnin Lafiya, and the oral history of successive sites of occupation seems compatible with archaeological fact (see Livingstone Smith et al., this volume). However, making further assumptions about the structures discovered by the archaeologists seems difficult for now, given current knowledge of the archaeological site. Archaeologists discovered two separated circular rooms made of piled or coursed earth, with a protuberant doorstep and associated paved surfaces which do appear to relate to the same architectural horizon (Nixon, this volume). This evidence clearly indicates a multi-component architectural space. This complex can hypothetically be interpreted as a compound since the potential 'compound wall' is currently discussed by Nixon (this volume) as part of the complex. The description of an architectural complex with small circular individual rooms linked into a larger architectural unit by a courtyard and surrounded by a compound wall relate to the structure of the compound as can be observed in the contemporary settlement. Nevertheless, in the contemporary settlement, buildings are isolated from each other. The corridors and joining wall as mentioned by Nixon (this volume) are a major difference. Furthermore, the team did not observe any paved courtyards in the contemporary villages. Paved areas were all inside buildings or in semi-outdoor contexts (i.e. in front of the buildings, covered by awnings but still, in a very narrow area). The spatial arrangement of the site suggests that the discovered remains are a small part of some bigger complex for which the general pattern is still unknown and, thus, difficult to understand in terms of the bigger picture to which it relates. The level of data of the geophysical survey done with a wheeled magnetometer (C. Magnavita, this volume) did not allow the team to go further in the interpretation of architectural remains at the Birnin Lafiya site. However, on an urban scale, some assumptions can be made based on the comparison between the two settlements. While the development of Birni Lafia is clearly linked to the existence of the *birni*, followed by its disappearance (as described above), it is difficult to identify such a centre in the case of the archaeological site. Structures identified seem very diffuse, without a clearly identifiable pattern. So far, no trace of a surrounding defensive wall was found. Unfortunately, the geophysical survey does not identify the outlines of the locality. If what appear as empty areas could perhaps be related to the soil extraction areas existing in the contemporary villages, and could be interpreted as markers of this limit, the overall form of the settlement, made of concentration (cores) and dispersion, cannot be interpreted, as it can relate to either synchronic features or to diachronic evolution.

Unlike the study of ceramics which has proved effective for connecting a pottery type to a population and an era, it is for now very difficult to formulate any assumption regarding architecture. Contemporary architecture observed in Dendi is not a 'remarkable' vernacular architecture, as can be said of that of the Betammaribé, characterised by *tata somba*, to take one geographically close example (Bourdier & Minh-ha 1985, 2005). Mainly composed of adobe brick buildings, current Dendi architecture does not seem specific to any ethnic group inhabiting the region, and similar buildings are seen in neighbouring regions (Denyer 1978; Domian 1989). Built types described are few and very homogeneous, both in terms of organisation or size within the same village, and from one village to another, regardless of the origin or the profession of its inhabitants. Nevertheless, it is believed that structural permanencies exist in the fabric of Dendi settlements. Although the buildings can change very quickly, the structures (plots or common goods such as roads) take much longer to transform. We can read the evolution of structures from the analysis of the existing situation based on the land plots, even if the buildings of the 'old' districts may be as recent as those of the 'new' districts of the cities. These permanencies (impact of the *birni* in the urban fabric, limits of plots, soil extraction areas, old path, maintenance of some buildings over time, and maintenance of the built fabric confirmed by archaeological fact), highlighted through this chapter for the specific case of Birni Lafia, possess their own logic and belong to a specific material culture. It is clear that the work of retrospective analysis, based on existing structures in transformation, requires consideration of the influence of both colonisation and modernisation which occurred during the last century. Colonisation and the following period constitute a rupture in the evolution of Dendi villages, in urban, architectural and technical terms. The lack of data on the periods between those studied by archaeologists and the contemporary period does not allow for precise definitions of the impact of colonisation on every scale, although some key elements – such as deforestation, the passage of clay clod to adobe brick, the disappearance of *birane*, and changes in urban form – are evidence of this rupture.

CHAPTER 10

Textile Production in Dendi: An Ethnographic and Historical Study of a Chain of Production

Lucie Smolderen

Recent research into textile production in Dendi has provided new information on its scope and timing (Smolderen 2013). From the end of the nineteenth century and during the major part of the twentieth century, hand-woven textiles were produced in Dendi. Cotton was cultivated and its fibres were the raw material on which the whole chain of production was based. Spinning was one of the many daily chores undertaken by every woman. Weavers, however, were specialised workers belonging to the servile group of society. They were either locals or migrants from neighbouring regions. During the last quarter of the twentieth century, the weavers gradually stopped working on their looms, the spinners put down their spindles, and cotton became a cash crop sold to the state. In the 1980s, the textile production came to an end.

During fieldwork between 2012 and 2015, the team met with former weavers and spinners (aged from 60 to 95 years old) who kindly let researchers access their knowledge and memories of their past activities. Through these interviews the team was able to reconstruct what the hand-woven textile chain of production was like during the century before its disappearance. Giving a voice to groups of people usually kept aside from oral tradition – slaves, craftsmen, women – offers a specific point of view on Dendi history, which supplements the existing narratives. In this way, the textile chain of production can be used as a point of entry to *another* story (Olivier de Sardan 1976: 23).

1 The Three Stages of Handcraft Textile Production

Handcraft textile production was composed of three stages, each undertaken by a different group of people. The first stage consisted of getting a sufficient supply of cotton and the second and third stages transformed this raw material into a product, first by spinning the fibres into yarn and subsequently weaving the yarn into cloth.

1.1 *The Supply of Cotton*

1.1.1 Historical and Geopolitical Context

From the end of the nineteenth century, in most of West Africa, cotton was of great importance to colonial matters (Roberts 1996; Levrat 2008) as Great Britain, France and Germany all wished to free themselves from the American monopoly on cotton supplies (Duval 1864: 5; François 1906: 162). For these imperial colonial states, their overseas territories, and particularly West African ones, seemed to offer the ideal solution (Duval 1864; Zimmerman 1904: 90–91). During the first quarter of the twentieth century, scientific expeditions were led to estimate the viability of cotton plantations in colonial territories. Experiments were undertaken to find the varieties that offered the best performance, and to this end allogenic seeds from America and Asia were brought to the African continent (e.g. Henry 1906 [1904]; Forbes 1926).

In Benin (Dahomey at the time), the first mission dedicated to cotton was led by the French agronomist Dr. Y. Henry. If the Dahomean territories as a whole seemed promising, Dendi did not present favourable enough ecological conditions to grow cotton on an industrial scale (Henry 1906 [1904]: 199–201). Others believed the Haut-Dahomey (north of 10° latitude) showed potential but deplored the lack of lines of communication (François 1906: 170). Thus, for ecological or logistical reasons, Dendi was never perceived as a serious candidate for these agricultural developments, so no large colonial programmes were implemented.

However, these factors do not seem to be the sole explanation for the French disregard towards Dendi. Rather, it is symptomatic of the way the colonial power perceived the region. Considered a remote area, Dendi was annexed to ensure access to the Niger River and a connection between the Dahomean Atlantic coast and French Sudan (Mali) (François 1906: 20). Moreover, by signing protectorate treaties with the local chiefs, the French were also trying to stop the British and German armies advancing towards the Borgou region (François 1906: 20). Apart from these imperial aspirations, the French showed very little interest in the Dendi region and

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its resources. As a consequence and contrary to the rest of the country, Dendi cotton, from both a botanical and agricultural point of view, was never directly impacted by the French cotton policy until the industrialisation of the textile sector, after the Second World War (Levrat 2008: 5, 2009: 9).

1.1.2 Acquiring Cotton in Dendi

Due to a lack of botanical data, it is difficult to give a precise determination of the *Gossypium* (the scientific name for the cotton plant) cultivated in the region prior to colonisation. As is the case with African cotton history in general, there are still many unanswered questions. While experts recognise the existence of two indigenous species of Old World cotton in Africa (*Gossypium arboreum* and *Gossypium herbaceum*), their patterns of evolution and diffusion are still unclear (Kriger 2005, 2006: 27; Levrat 2008: 18). The story becomes even more complicated from the seventeenth century, as the slave trade and colonisation brought New World species to the African continent, among which were *G. hirsutum* (*punctatum* and "Marie Galante"), *G. barbadense*, and a series of varieties called "Upland" from America (Schaedler 1987: 10–13; Seignobos & Schwendiman 1991: 309; Bassett 2001: 31). Moreover, *Gossypium* presents a high hybridisation potential (Wendel et al. 2010), which results in a large number of varieties which further complicates any determination.

In Dendi, our informants described two different kinds of cotton.[1] The first one, called *Dendi habu* ("Dendi cotton") or *Habu sando* ('Hard cotton') by the informants, was most probably a variety of *Gossypium arboreum*. The plant looked like a small tree in which children could climb to pick the cotton.[2] Each plant could be harvested for several years in a row. Around the middle of the twentieth century, a more competitive variety appeared while the tree-cotton disappeared progressively. According to former spinners and cotton growers, this plant of approximately 1m in height, gave better staples and was easier to spin, although it was less resistant to the Sahelian climate.[3] It was probably a variety of New World cotton brought by the French as part of the industrialisation of the cotton sector.[4] Another possible origin of this new plant could be the uncontrolled hybridisation between endogenous and allogenic varieties.

In some villages the yield was hardly sufficient to cover local needs so a second way of acquiring cotton was essential, given that the Dendi weavers needed a sustainable source of raw material. Fortunately, in the rest of the Borgou region and particularly in the neighbouring regions of Kandi and Banikoara, cotton was plentiful. Baatombu merchants travelled from these southern areas through the forest to sell some of their surplus cotton in Dendi. Situated at the intersection between the fertile lands south and east of the plateau and the drier, left bank of the Niger River, Dendi markets served as platforms where merchants such as Zarma buyers could buy cotton in bulk in order to export it to northern regions.[5]

1.2 *From Fibres to Yarn*

Once the cotton had been harvested, the second stage of the chain of production was the spinning of the fibres into yarn. In the whole West African region, spinning followed a very homogenous technical sequence, which could be divided into three phases: the preparatory phase, the spinning phase and the winding phase.[6] The following is based on accounts and demonstrations from present-day informants.

During the first phase, a series of operations enabled the lint to be collected and prepared for spinning. After a rough cleaning by hand, the cotton was ginned using a stone and metallic rod (Figure 10.1). Pressed between the rod and the stone, in a rotating motion, the seeds were pushed out of the lint. At the same time, the fibres would undergo a first untangling and the seeds were stored for the next sowing. Because these seeds were difficult to come by in Dendi, storing them was a crucial step of the chain of production. Once the ginning was done, the lint could be carded.

Until the 1950s, the spinners used to bow the cotton, using a type of hand-made bow (*bindigi*) to fluff the fibres and untangle them. In the second half of the twentieth century, hand carders arrived from Niamey.[7] Two metallic brushes used in a combing motion finished the untangling process. Once the fibres were carded, the spinning could begin. A small quantity of fibres was placed on a distaff, usually made of a simple branch of wood. The fibres on the distaff were placed in contact with the pointed end of the spindle. The spinner used her saliva to make sure that the cotton stuck to the wood. The spindle was weighted by a whorl, made of terracotta, which moved like a spinning top. By rotating the spindle slowly at first, the fibres

1 13.03.2015, Monkassa.
2 23.01.2013, Kofounou.
3 07.02.2013, Madkali.
4 13.11.2015, Torozougou.
5 26.01.2013, Karimama; 01.02.2012, Birni Lafia.
6 For more details on the technical sequence see Smolderen 2013: 44–55.
7 In other parts of West Africa, the hand carders arrived much earlier (see for example Roberts 1996: 212).

FIGURE 10.1 A woman from Karimama showing how cotton ginning used to be done, using a metal rod and a stone which a friend of hers had inherited from her grandmother.

started to stretch. The spinner accelerated the rotation and the fibres twisted and became thread which wound up around the spindle. After a while the spindle became too full of thread and the spinner unwound it onto a bobbin. The same rotation movement was used, only this time the spindle was held in the left hand (in place of the distaff) and the spinner's right hand held the bobbin. The yarn passed from one stick to the other. The bobbin was weighted with a rough clay whorl, which also functioned as a plug, stopping the yarn from unwinding. The whorl used for the bobbin was not made of terracotta – as was the case for the spindle whorl – but of a small clod of earth dried in the sun.

In Dendi, every woman used to spin cotton without distinction of status or wealth. Even though spinning was obviously a very specialised technical activity, in which the skill of the spinner was constantly called upon and only mastered after a long period of training (Kriger 2006: 10, 90–91), it did not define a precise social category, unlike the technical specialisms of potters, smelters or weavers (Olivier de Sardan 1984; Tamari 1997). Most women spun in a group, sometimes all night long, chatting and singing

FIGURE 10.2 A woman from Birni Lafia, who still spins from time to time, showing her tools and bobbins.

together with their co-wives, friends and neighbours. Indeed, spinning was never only about making threads, it was also a time for socialising. Young girls from six or seven years old sat with their elders, first helping to clean the lint, then learning how to card and progressively trying out the spindle whorl, following the classical pattern of peripheral learning (Lave & Wenger 1991). Spinning was also a difficult and tiresome task. As the young girl coming of age became a spinner, her fingers aching with the task, she came to embody two of the essential qualities required of a woman: hard work and patience. Come the time of marriage, the young bride entered her new household with her spinning tools, ready to take on the responsibility of making enough thread to clothe her husband and children. The technical activity, which socially defined a woman's value and inscribed itself in her body, and its material culture, which played a crucial role in a woman's marriage, were part of a woman's identity (Prado 2004; Naji 2009; Vallard 2012).

Even though the activity has not yet completely died out (Smolderen & Minguet 2014; Gosselain & Smolderen 2016; Figure 10.2), women gradually stopped spinning to-

wards the end of the twentieth century, the generation of the informants being the last one to have practiced the activity.

1.3 *From Yarn to Cloth*

Because the textile arts leave poor archaeological evidence, it is difficult to situate their beginning. In this case, the date of emergence of the Dendi textile production remains a complete mystery. A number of artefacts, interpreted as possible spindle whorls (S. Magnavita, this volume; Tchibozo, this volume), were discovered in archaeological contexts and during surveys. If these archaeological items indicate spinning took place during these times, nothing can be said about what material was being spun (cotton or wool) and if the yarn, once spun, was woven. In the same vein, it is not possible to ascertain the *Gossypium* found in archaeological context (Champion & Fuller, this volume) is the same as the one our informants refer to in the interviews (see above). To anchor the Dendi textile production chronologically, one can only rely on oral accounts which suggest that the technical system, in its latest incarnation, dates from the end of the second half of the nineteenth century. If a previous weaving tradition existed in the region, it left no trace, either in the archaeological soil or in living memory. During the last decades of the nineteenth century, the first weavers arrived in Dendi from neighbouring regions, either looking for a place to settle, or fleeing conflict.[8]

Technically speaking, the weaving tradition of Dendi belongs to the narrow-strip weaving tradition, widely represented in many West African societies from Mauritania to Chad and Cameroon (Lamb & Lamb 1975; Boser-Sarivaxévanis 1980: 5–16). These horizontal looms were characterised by a light wooden frame on which the weaver produced narrow strips of cotton (Lamb 1975: 75; Etienne-Nugue 1984: 182). Traditionally, in Dendi weaving was strictly a man's activity. In West Africa, the general tendency was that horizontal looms were used by men whereas the vertical ones could be used by both men and women (Lamb & Lamb 1975: 19).[9]

However, the apparent homogeneity of this technological system, as suggested by the general shape of the final product, is challenged by a number of small variations that occur regionally: the shape of the wooden frame; the form of the pedals and the position of the legs of the weaver; the number of heddles; the form of the pulley, and the method of applying warp tension, etc (see for example: Picton and Mack 1979; Schaedler 1987; Gillow 2003).

In Dendi, the looms were characterised by their simplicity, bringing together the essential features of a loom as a shedding device and a way of applying warp tension (Picton & Mack 1979: 49), without any characteristic features: no carved frame; no bench to sit on; no supplementary pair of heddles and no sculpted pulley or decorated shuttle etc. The frame was a low structure built by the weaver with wood collected in the bush. The weaver sat on the ground on a small hump of earth, with his feet in a shallow depression (20–30cm deep). The shed (the gap between two sets of warp into which the weft is introduced) was created by way of a single pair of heddles, linked to pedals (either sticks or round pieces of calabash or coconut). The warp tension was obtained by way of a sledge (usually an old wooden mortar cut into two pieces) weighted with stones, on which the warp threads were fixed. On the other end, the threads passed through the heddles and comb and were fixed to the breast beam. This apparatus enabled the warp to be taut but still mobile. While working, the weaver progressively wound up the woven strip of cloth around the breast beam, reducing the length of the unwoven warp thread.

The technological description cannot be taken much further by relying mainly on oral testimonies.[10] In order to understand the specifics of this activity better, it is necessary to turn towards the "social world" of practice (Lave and Wenger 1991).[11] From the end of the nineteenth century to the last quarter of the twentieth century, weaving in Dendi as a social practice had different phases. Here, while focusing on the activity itself and on its relational and situated dimension, socio-historical data will not be set aside; but rather than being considered as *ad hoc* factors, serving as explanations for these changes, such data will be taken as indications of the more general context in which these phases were embedded.

2 The End of the Nineteenth Century

Even though information is limited for this period, there are still a few things about the social status of weavers that are clear. As was the case in Zarma-Songhai society

8 31.01.2013, Kompanti Débéré.

9 The question of the gendered division between horizontal and vertical looms goes beyond the scope of this study and will not be taken further; it should be noted that the gendered division has been criticised by Picton (for more details see Picton 1992: 21–23).

10 The activity was observed only once during a reconstitution project (see Box Feature at the end of this chapter).

11 Here, we follow Gosselain (2016; in prep.) in his use of Lave and Wenger's concept of "practice" and its correlates, which has been largely developed in a substantial literature, in particular Lave (1993), Lave & Wenger (1991) and Wenger (1998).

(Olivier de Sardan 1984: 55), apart from a few exceptions,[12] all weavers in Dendi belonged to the servile rank of society.

During the second half of the nineteenth century, the surrounding region was shaken by conflicts. Taken into slavery and following their masters (as was the case at Madkali, Kompa, Karimama, Mamassi Peul), or fleeing from them (as was the case at Kompanti Débéré), slaves, some of them specialised in weaving, arrived on the right bank of the Niger. These weavers had an ambiguous status, in that they were superior to common slaves, who were only in charge of the daily chores and fieldwork, they were respected for their skill, yet they remained slaves and would always be associated with the social stigma attached to slavery (Olivier de Sardan 1984: 40–50, 55;[13] Gosselain 2016: 39–40). They worked under their master's orders, who in return provided them with food and lodging.

Though exact figures are impossible to ascertain, enquiries suggest that there were few weavers in the area at the end of the nineteenth century. Dendi was far from being a large centre of textile production, unlike those of the Sokoto Caliphate for example (Kriger 1993). On the contrary, production rested upon a few isolated craftsmen, working for their masters and responding to local needs. The production was simple, using a plain weave web of either white or "black" (indigo blue), or sometimes decorated with warp striping patterns, resulting in long stripes of colour obtained by natural dye running parallel to the selvedge.

3 From the Turn of the Century to the Second Half of the Twentieth Century

At the turn of the century, slavery as an institution was abolished with the establishment of the colonial state. Yet the weavers did not abandon their looms and passed on their legacy to the following generations. However, the stigmatisation associated with the activity continued to hover over the weavers and their descendants (Gosselain & Smolderen 2016).

During the first half of the twentieth century, textile production thrived and became economically attractive. External factors may explain this new prosperity: far from the Atlantic coast and isolated from the major communication lines at that time, Dendi was not impacted by the import of industrial cloth until the second half of the twentieth century. Dendi textile production was not challenged by this competition, unlike the rest of the country and most of West Africa (Henry 1906 [1904]: 204–206; Kriger 2006). Therefore local weaving production was the major way of acquiring textiles and garments during the first half of the twentieth century.

However, another channel did exist, that is the local trade of handcrafted textiles. At Dendi markets, merchants sold textiles woven by Gourmantche and Gando weavers, as well as Zarma strips of cotton from Fabidji (Niger), in the same way that Dendi cloths were sold north of the river.[14] A caravan of Hausa merchants also passed through Dendi villages and crossed the river towards present-day Niger, selling shiny black cloth, typical of the Hausa. This was considered to be of better quality than that produced locally, but much more expensive.[15] However limited in scale, Dendi and its weaving tradition was part of a larger regional system.

During this period, the web structure of the cloth remained very simple. Stylistically, the patterns were similar to the warp striping of the previous period. Even though weavers grew in number, it seemed that Dendi weavers never developed a local stylistic signature. They continued to make common pieces of cloth, the same type of material found everywhere in West Africa.

Weaving was a seasonal activity that took place only during the dry season, the rest of the year being dedicated to agriculture. Weavers worked alone in their household or outside the village forming a workshop, with a chief chosen by the group. The local weavers of a village were joined by seasonal migrants from neighbouring regions (from the rest of the Borgou, as well as the left bank of the Niger). In some villages, the workshop could hold as many as 20 or 30 weavers working simultaneously. Dendi weavers also went looking for work in other villages along the valley, following a network of family relations and friends, though their migration remained limited in scale.

From a few isolated weavers working for their masters during the pre-colonial period, to a constellation of craftsmen who travelled and worked together, the activity had changed fundamentally since the end of the nineteenth century. The weavers became members of "a community of practice" as defined by Wenger (1998), in that they shared a joint enterprise (cloth making); engaged

12 In the Gourmantche villages of Kofounou and Mamassi Gourma, weavers were freeborn.

13 Although the social status of Dendi and Zarma-Songhai weavers (as described by Olivier de Sardan 1984) appears to be similar in some measure, it should be noted that the Zarma-Songhai category "*horso*", to which the weavers belong, seems absent from Dendi.

14 19.01.2013, Fabidji; 22.01.2013, Kofounou;; 26.01.2013, Karimama; 04.02.2013, Molla.

15 31.01.2013, Kompa.

mutually in practice (working together in workshops, learning with each other), and shared a repertoire (using the same tools, the same vocabulary, etc.).

It is obvious that this development was the result of multiple socio-historical factors among which the abolition of slavery and the creation of a colonial cotton policy played a major role. Internal dynamics were also at play. Far from being passive recipients of these changes, the weavers were themselves active agents of the process.[16] By migrating, weavers created new 'practice settings' in which the craftsmen met face to face and engaged with one another (Corniquet 2013: 120–125). The multiplication of practice settings, and the widening of the network through which textile goods circulated, contributed to the transformation of the practice.

4 The Progressive Disappearance of the Chain of Textile Production

Around the middle of the twentieth century, the state (first colonial, then independent) started to buy the cotton directly from the producers and made cotton its number one cash crop for exportation. As a consequence, cotton as a raw material for weaving became difficult to come by. Around the same time, industrial textiles flooded the Dendi markets.[17] Faced with competition from these cheap and colourful industrial cloths, the weavers had a difficult time finding clients.

In neighbouring areas weaving had a different evolution. In Banikoara, Kandi and Nikki, the flood of industrial textiles certainly changed the balance, but to this day people have not turned away from handcraft cloths. Hand-woven garments are worn during the *Gaani*, a traditional annual festival, and have progressively become a fashionable outfit. Today, the demand for hand-woven textiles in those regions is such that, besides men weavers working on their looms, many women weave on metal semi-mechanical looms (Gbinsa 1991: 42–54).[18] Similarly, in Niger, Zarma and Fulani weavers continue to produce wedding blankets or wall-hangers, decorated with intricate geometric patterns (Gillow, 2003: 43–45), which are central pieces during wedding ceremonies.

In both these contexts, hand-woven cloths are seen by the local populations to have a "traditional" value and form part of a wider symbolic system of representation. Although the technical process has changed (e.g. new actors, new types of loom etc.), weaving as a craft is still living and even thriving in those regions. In Dendi, the opposite occurred. Hand-woven cloth was not part of a larger symbolic and/or aesthetic system. As a mere means of clothing, industrial textiles appear to have a wider appeal than woven cloth. As soon as industrial textiles were available at markets, weaving activity in Dendi went into decline.

Despite the overall drop in production, a brief resurgence occurred in the 1960s. The transition towards independent states made the circulation of people and goods much easier in the region. According to informants, it was around that time that blankets and cloths from neighbouring regions became available at Dendi markets.[19] Seasonal migrants came to find work, bringing with them new styles and techniques. Meeting foreign craftsmen and confronted with new styles, the "space of experience" and the "space known" of the Dendi weavers suddenly expanded (Gosselain, 2016).[20]

One commodity in particular is a relevant manifestation of these new connections and can be considered as a "boundary object" as defined by Wenger (1998: 129) and used in a similar context by Gosselain (2016). Around the 1960s, the beautifully decorated Fulani blankets appeared at Dendi markets. Following the Nigérien taste, these new blankets became highly fashionable among Dendi women.[21] Mothers offered them to their in-laws for the wedding ceremony and cloths of the same stylistic family were also part of the bride's marriage trousseau. Dendi weavers responded to a new local demand and chose to learn this highly specialised technique from Nigérien migrants looking for work along the banks of the river. The geometrical patterns decorating these blankets imply the use of a supplementary hand-worked heddle, a very

16 This refers to Bassett's original point of view on a slightly different but still comparable topic: the ivorian peasant cotton revolution (2001).

17 Bonyami, 28.01.2013.

18 These looms were probably imported from the Mossi region where a similar evolution has occured (Etienne-Nugue 1982: 156; Boussari Vokouma 1999: 165–173; Grosfilley 2006: 205).

19 01.02.2013, Mamassi Peul.

20 Following the author's definition: The *space of experience* "corresponds to places frequented [...] through daily activities, social interactions, economic exchanges, or travels and around which a person's sense of identity and belonging develops together with practical knowledge and representation" whereas the *space known* "is *representational*. It concerns all the places that a person knows vicariously, for example from kin, friends, foreigners, [...]. Second-hand knowledge generally reinforces a person's sense of belonging but also enriches his/her cognitive repertoire" (Gosselain 2016: 46, his emphasis).

21 In Niger, these Fulani blankets had already had an impact on Zarma weaving and other handcraft traditions (Gosselain 2016: 58–59).

specific technique which requires too much technical expertise to be copied.[22] It had to be learnt in a practice setting that enabled two weavers – a master and an apprentice – to engage mutually in practice (See Box Feature).

In the second half of the twentieth century, there were thus two diametrically opposed tendencies in response to the declining demand for hand-woven textiles in Dendi. On one hand, the consumers turned towards industrial textiles and weavers, faced with unfair competition, abandoned their looms. On the other hand, a few craftsmen adapted to the situation by aligning themselves with the hegemonic aesthetic and symbolic system of Fulani (and Zarma) influence.[23] However, the demand for wedding blankets was not sufficient to sustain the practice and eventually, in the 1980s, textile production in Dendi came to a final stop.

5 Conclusion

By taking into account the multiple agents that participated in the production of textiles – the *Gossypium* plant, the spinner, the weaver and the consumer – this chapter offers a bottom-up view of recent Dendi history. Between the lines, the peripheral nature of the region becomes apparent.

The biographical approach of former craftsmen gave insight into the waves of migration that touched the region during the second half (and mostly during the last quarter) of the nineteenth century. The first weavers to arrive in the region were slaves accompanying their masters, be they Zarma, Songhai or Fulani chiefs. Slaves or freemen fleeing the Dallol Bosso and the Gourma region also found refuge in Dendi. Among a constellation of small independent chiefdoms, it was possible to hide. The fact that it was possible, and even advantageous in the late nineteenth century war-economy, to settle on the right bank of the Niger could highlight a lack of central power at that time. At the border of large and powerful political entities, the attractiveness of the region thus lay in its marginality.

Later, it was again the frontier aspect of the area that interested the French colonials. This remote region was attractive only because it gave access to the Niger (both country and river) and because it would allow them to impede the advance of the British and German colonial armies. The French interest in the region's resources only appeared later on. The first agricultural programmes were put into place around the middle of the twentieth century, to promote cash cropping. Again, it was around the 1950s, much later than in other parts of the colony, that imported goods started to flood the local markets.

When focusing on the practice of weaving activity, the marginal and remote nature of the Dendi region should nevertheless be revised to some extent. Indeed, Dendi weavers formed a community of practice, which integrated a larger network of production and consumption. Confronted with new styles and techniques, the 'space of experience' and the 'space known' of the weavers expanded and were clearly orientated towards what is now the modern Republic of Niger. Wedding cloth production is a good example of this phenomenon: the taste of the consumer and the craft of the weaver aligned themselves on the standards of other groups. Far from being isolated, the craftsmen of the region were part of a larger network, the centre of which lay on the left bank of the Niger.

22 01.02.2013, Mamassi Peul.

23 Other occurences of this Fulani aesthetic hegemony have been given by Gosselain (2016).

Box feature: A reconstitution project in Dendi (Figures 10.3 & 10.4)

During the 2013 *Crossroads* field season two wedding blankets were produced, following the award of a Royal Anthropological Institute/Emslie Horniman Anthropological Scholarship Fund to Sam Nixon to commission craft products in the Dendi region. This process was overseen by Lucie Smolderen.

In 2013, the Horniman Museum (London) financed the reproduction of two *babbagi* wedding blankets. Hamani Boureïma, also known as Tanda, was designated by other former weavers from the village of Mamassi Peul to do the job. He was one of the best weavers in the region and was well practiced at weaving the special patterns of a *babbagi*. Indeed, this wedding blanket belongs to the larger stylistic family of Fulani and Zarma geometrically decorated textiles and it requires the use of a very particular feature: a supplementary hand-worked heddle. In order to complete the geometric patterns, the expertise of the weaver is constantly called upon. He creates the design mentally and then weaves every strip of cloth. It is only at the end of the process, when the strips are sewn selvedge to selvedge, that the overall design appears. Tanda learned this technique from migrants who came from Niger to find work during the dry season. Later, he went on an apprenticeship in Gaya (Niger) to perfect it.

To weave the two wedding blankets, Tanda worked for nearly a month. He rebuilt a loom in his compound while a commissioned merchant was sent to Niamey to buy some thread. Then, the work started and gave the team the opportunity to observe a now extinct activity in action.

Today one of these blankets has entered the collection at the Horniman, the second one is in the Sainsbury Research Unit at the University of East Anglia.

FIGURE 10.3 Tanda at work, weaving a strip of cloth.

FIGURE 10.4 The completed blanket, composed of 13 strips sewn selvedge to selvedge.

PART 4

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CHAPTER 11

Excavation Strategies and Methods: Approaching an Archaeological Terra Incognita

Anne Haour, Didier N'Dah, Carlos Magnavita, Sam Nixon and Alexandre Livingstone Smith

1 Introduction

As highlighted in earlier chapters, although it was known that Béninois Dendi included archaeological landscapes of some importance nothing existed resembling a systematic and comprehensive survey involving the mapping and precise localisation of key sites. Initial, basic, inventories did exist, carried out by Didier N'Dah and, just across the river, by Oumarou Idé. Although our team was aware of these results, when we first approached the Dendi landscape during two weeks in January 2011, it felt very much like a leap into the unknown. This section discusses the way in which we tackled a project which, at its outset, felt very much like "wandering in a blank region", as put by Lucas Petit (2005: 1) in a comparable context (Atakora in northwest Benin).

Alongside major issues of chronology, some of the most pressing questions for researchers working in regions with such virtually unknown archaeology relate to spatial issues. We needed to balance these concerns on several scales. On a regional scale, questions of site locations and distribution are usually best dealt with by undertaking pedestrian and vehicle-based terrain surveys. On a more local, site-centred level, surface inspections and test excavations provide a first idea of site size and approximate site limits, as well as of the nature and depth of archaeological deposits. Though large-area excavations can offer fundamental and detailed spatial information, research actions of this kind are normally restricted to few areas in view of the limited availability of time and resources.

The pilot survey in the first field season was explicitly geared at determining the archaeological potential of the Béninois bank of the Niger River as well as its tributaries, with a focus on the more recent archaeology (to redress the balance, since Idé Oumarou and N'Dah are prehistorians). As detailed above (Khalaf et al., this volume), the survey followed the track along the river, running northwest/southeast between Pekinga and Madekali (Figure 11.1), then ranged inland along the national road linking Guene with Kandi. We sought, at the most basic level, to determine whether this area was a fruitful one in which to develop a long-term, large-scale archaeological project, but also to start developing an archaeological map of the area. There was a fortunate conjunction of circumstances for this, since the establishment of an archaeological site inventory had been identified as a priority of the newly-developing Laboratoire d'Art, d'Archéologie et d'Expertises Patrimoniales (LAAEP) of the Université Abomey Calavi. This priority developed out of the specific national context.

Archaeological and prehistoric research in Benin had long been dependent on investigations dating to the French colonial period. Indeed, during the colonial period Benin benefited only from amateur surveys,[1] with few professional archaeologists. Archaeological discoveries in the territory, by amateurs at that time, were the result of chance. True surveys were made during this period by the British archaeologist Oliver Davies in the course of two field trips in 1956 and 1959.[2] These, added to previous findings, showed that archaeological sites of all periods (prehistoric and historic) existed throughout the Benin territory. But the sites are difficult to identify now, because for the most part they were not recorded accurately. Hence, at the creation in 1978 of the Equipe de Recherche Archéologique Béninoise (ERAB), the main axes of the planned research programme involved identification, cataloging and recording, with a view to constituting an archaeological sites record for Benin. This process was intended to be accompanied by test pitting and excavation at selected sites. ERAB thus had as its stated aim the census of archaeological sites, an indispensable preliminary to any excavation policy. It was necessary to undertake "*une prospection systématique sur le terrain en vue de l'établissement d'un inventaire aussi complet que possible des vestiges d'occupations appartenant aux différentes périodes connues de la recherche archéologique: préhistoire,*

1 In particular Lieutenant Brot, who discovered the first polished axes in 1908, and Enzo Chetelat who, during a mining exploration in the Mékrou in 1928, reported other sites (De Chetelat 1928).

2 In 1956 Oliver Davies located sites on the alluvial terraces near the Sinaiciré bridge south of Natitingou. Others are identified in Djougou, Kandi, Karimama etc. On these sites items such as microliths, nucleii, flakes, a biface, and a backed blade were collected (Davies 1956).

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FIGURE 11.1 2011 survey: On Transect 4, on a plateau near Dangazuri

protohistoire, sites historiques" (Adagba 1987: 135). The execution of this programme led team members to criss-cross all *départements* (regions) of the country. These missions led to the identification of approximately 100 new archaeological sites allowing the elaboration, in 1987, of a preliminary archaeological map.

By 2010, the idea of creating a designated archaeology laboratory had been mooted, and this Laboratoire d'Art, d'Archéologie et d'Expertises Patrimoniales (LAAEP) was set up in October 2012. Its stated objectives were to continue the discovery, identification and precise localisation of archaeological sites on the territory of Benin, assess their potential through direct observation of surface remains, and study some of them that related to the various periods of human occupation by conducting excavation and artefact studies. Article 3 of the LAAEP texts also speaks of the need to promote research on cultural and heritage resources in order to aid development, training in theoretical and practical research in the fields of art history, archaeology and related disciplines, the production of educational materials, and the provision of professional services, as well as to contribute to the protection, management and promotion of heritage, be it in Benin or elsewhere. In effect then, through its focus on continued archaeological inventory, the LAAEP continues the work of the ERAB. The aims of the *Crossroads of Empires* project fit squarely within these goals.

The initial field survey in early 2011 demonstrated the abundance of archaeological material, confirmed the existence of a substantial number of large settlement mounds, and indicated a considerable variability in surface ceramic material over the region. It therefore fully met its objectives and encouraged the launch of a fully-fledged research project in Dendi. Accordingly, in the run-up to the second field season in 2012, we were presented with the challenge of building a chrono-typological sequence for the area from scratch. The decision was made to focus on the site of Birnin Lafiya which, due to its size and nature, offered good prospects of providing a long sequence for the area, from which we could begin to de-

velop a ceramic typology; it also seemed to offer a good chance of recovering *in situ* living structures. This site was therefore investigated in three field seasons, totalling 20 weeks and during which 20 units were investigated – 12 trenches and 8 smaller exposures.

Alongside this, 2012 saw the beginning of a programme of test pitting around the region. It was severely hampered by the late delivery of the field vehicle, so that only one site, Pekinga, could be examined, but this was to yield important results from the northwesternmost edge of the survey area, four hours from Karimama on a picturesque but very poor dirt track.

The 2013 season saw the continuation of both intensive work at Birnin Lafiya and extended survey and test pitting around the region, with excavations at Gorouberi-13 (GOB-13), Kompa (KOD) and Tin Tin Kanza (TTK). The final season, 2014, saw the focus shift squarely to small-scale test pitting and survey. Twenty-one new sites were test pitted. These included 10 localities reported by oral tradition to be predecessors of modern sites: Toutokayori (TTO), Torouwey (TRO), Boyeri (BOY), Kwara zeno (KAZ), Kusulabu (KUS), Kozungu (KOZ), Bokorobu (BOK), Kantoro (KRO), Guene zeno (ENE) and Kouboukoukourou (ROU). Also sampled were 11 modern villages: Komanti (PTI), Bogo Bogo (GOG), Gorouberi (GOB-14), Karimama (KAR), Birni Lafia (TOW), Kargui (KGI), Molla (MOL), Tomboutou (TOU), Garou (GAR), Guene (GUE), and finally Madekali (KLI). Together these spanned the breadth and length of the study area, and offered a balanced archaeological coverage of both ethnohistorically- and archaeologically-informed surveys.

The surveys carried out over the field seasons gave a broad idea of the various sites present within the area and a few notes can be provided here on the large mound which came to be a focus of our work, and on its relationship with other parts of the Dendi landscape. Today the site of Birnin Lafiya is situated c. 1km from the River Niger. It sits on the low-lying shelf which runs parallel to the river, at an elevation of c. 10–20m above the floodplain. The landscape at this point of the valley is undulating, with no dramatic topographic features in the immediate vicinity. From a distance, Birnin Lafiya appears as a large mound (Figure 11.2). Several other sites exist on the edge of the modern village: of these, Bokorobu (see N'Po Takpara, this volume) and Kozungu (Livingstone Smith & Nikis, this volume) were test pitted.

In its undulating, sprawling nature, Birnin Lafiya contrasts with some of the more obviously localised mounds

FIGURE 11.2 The mound of Birnin Lafiya

FIGURE 11.3 Mound located during survey along Transect 6, west of Kompa (2011 survey)

of the area, easily distinguishable in an otherwise flat landscape (Figure 11.3).[3] Birnin Lafiya's position contrasts markedly, for example, with that of the site of Tin Tin Kanza, situated on a narrow riverbank facing a vast floodplain, dramatically backed up against cliffs of the Continental Terminal. Birnin Lafiya's position also contrasts with Djaboutchia where, due to substantial erosion by the river (Khalaf 2016: Figure 5.20), a sheer drop to the river has developed.

Today, while Birnin Lafiya is located relatively close to the Niger it is not possible to see the river itself from the site, during the dry season at least, because of the relatively low-lying nature of the land. The Continental Terminal hills on the opposite shore of the Niger River are visible in the distance, to the east, but to the south and the west the view is more limited. Crucially, the vegetation cover reduces the view of the wider landscape from the site, and it is important to bear in mind that in the past vegetation buffers may have been intentionally maintained around settlements (see Brunfaut & Pinet, this volume). These could not only slow down and disrupt cavalry attacks (as noted by Last 2010: 62, concerning early *kasar Hausa* rural communities), but also allowed the site to be concealed from potential aggressors. Also, the relationship of the site of Birnin Lafiya to the River Niger was likely different in the past, as it sits on a vast plain of alluvial sediment (Laïbi et al., this volume). In wetter conditions the mound would be surrounded by marshes. Even now, the river encroaches on the modern village during seasonal floods.

2 Excavation Strategies

Our excavations were carried out according to two simple strategies. Generally, test pits (generally 1 × 1 m or 2 × 2 m) were excavated by control spits of 10 cm. The emphasis was on acquiring a broad picture of the archaeology of the region. Alongside this, larger-scale, shallow, horizontal exposures were pursued across the site of Birnin Lafiya, with the principal aims of recovering evidence of preserved building remains and the deeper sequence.

In the case of the test pits, within each spit distinct contexts were sieved and bagged separately. When clearly identified natural stratigraphy could be followed between different spits, the same context number was employed throughout spits to reflect this. With rare exceptions, all sediment was sieved (Figure 11.4). Each level was recorded with a simple sketch and noteworthy levels and features photographed throughout. Charcoal for dating was taken

3 A parallel to Birnin Lafiya, in overall nature and size is provided by the site of Sakawan some 15 km to the south, and to some degree by Gorouberi-13 but even that site is rather more restricted in size (see Robion-Brunner, this volume).

FIGURE 11.4 Sieving, Birnin Lafiya, January 2012

during excavation, and in some cases from the completed sections. At completion, section profiles were photographed, interpreted and drawn. At the key locations where excavators followed natural stratigraphy to expose specific structures, full plans and profile drawings were made.

For all sites excavated a total collection of artefacts and eco-factual material was made, with finds bagged and labelled according to individual context. Only in certain cases, where the quantity of excavated deposits was too great, was it necessary to implement a partial collection; this was particularly the case with Trench 3/10 at Birnin Lafiya, where the prime aims were to recover architectural features; or in other units where the top, disturbed, ploughzone was removed without sieving. These instance are noted within the text. All units were backfilled at the completion of the work.

Beyond survey and test pitting, some archaeological sites examined in the scope of the project were investigated by means of a geophysical survey programme (Figure 11.5). The overall goal was to provide a more comprehensive understanding of the subsurface extent of the sites than surface inspections and test- and large-area excavations alone could provide. In the course of three field seasons and approximately 50 days of effective geophysical work with a Sensys three-channel fluxgate gradiometer, a total area of almost 25 ha was mapped on three distinct mound sites.

As detailed elsewhere (C. Magnavita, this volume), the extensive geophysical survey undertaken at Birnin Lafiya was crucial for reliably inferring the actual size, limits and nature of that massive settlement mound. In addition, in early 2013, a 4.25 ha geophysical survey was carried out at Pekinga encompassing the area in which a test pit had been excavated in 2010. It elucidated some remarkable insights into the subsurface extent of that location. Perhaps the most striking result is the fact that a large part of the mound's upper part is characterised by widespread semicircular arrangements of weakly magnetic stones or pebbles that create a continuous paved surface. The purpose of those paved surfaces is as yet unclear, but the tentative suggestion is that they may have been a means of protecting the mound's deposits against erosion. A curious magnetic anomaly detected by geophysics at the site is a lightning strike that struck a tree some days or weeks prior to the survey. These results will be discussed in more detail in a forthcoming publication.

Finally, other than at the two former sites, a geophysical survey planned at Gorouberi was constrained by an instrument defect, so that only 0.5 ha of the planned 2.5 ha of the site area was surveyed. Since one of Gorouberi's major archaeological traits relates to the possibility that iron smelting or smithing was practiced locally, we attempted to use the results of the geophysical survey to identify the potential location of a smelting furnace or smithing hearth. An area showing a magnetic anomaly, regarded as being possibly related to such a structure, was test-trenched up to a depth of 2.6m (see Robion-Brunner, this volume). Other than a number of settlement-related pits in part filled with iron slag, pottery and other

FIGURE 11.5 Geophysics survey underway at Birnin Lafiya, January 2012

artefacts, no furnace or hearth could be found. Drawing upon the results of geophysics at Pekinga and other West African sites, it can be reliably argued that the magnetic anomaly targeted by excavation at Gorouberi originated from a lighting strike and not from a buried ironworking structure.

Despite the technical and interpretive setbacks of the Gorouberi survey, overall the use of archaeological geophysics at the two other project sites proved successful in a number of aspects. Besides providing consistent data to ascertain dimension and limits of the sites, the geophysical surveys allowed us to identify and delimit features, structures and areas of activity that would otherwise have remained undiscovered.

3 Chronology

At the conclusion of the extensive excavations conducted at the site of Birnin Lafiya and the test pits carried out throughout the region, we were left with a much better sense of the nature and chronology of the settlement of the area. In terms of chronology, a total of 121 dates were run,[4] spanning 800 BC to the present day. These were divided into five phases which help to order and make sense of the settlement sequence.

Phase 1: First millennium BC
Phase 2: AD 1–500
Phase 3: AD 500–1000
Phase 4: AD 1000–1400
Phase 5: AD 1400–Present

This five-phase framework is adopted throughout this book. As will be seen, the bulk of the evidence derives from Phases 3 and 4.

4 Outline of Subsequent Chapters

The scope through the past sections has been regional, but a finer-grained resolution is necessary now. Given the extent of the work at the large mound site of Birnin Lafiya, Chapter 12. is devoted to that site, introducing its topography, appearance, vegetation, surface remains and excavation strategy. Following chapters discuss the geophysical survey conducted at the site (Chapter 13) and the pavements and architectural features recovered (Chapters 14 and 15); these take a regional view, but necessarily rely

4 Natural Environment Research Council, NERC radiocarbon facility (Anne Haour and Sam Nixon) [2013/2/9], Natural Environment Research Council, NERC radiocarbon facility (Anne Haour and Alexandre Livingstone Smith) [2014/1/7]. Other dates run through Beta Analytic.

heavily on Birnin Lafiya, the best-documented site. The regional frame is then opened up again, to discuss the regional stratigraphic sequence (Chapter 16).

Turning to the finds, the pottery (Chapter 17), evidence for ironworking (Chapter 18), metal artefacts (Chapter 19), beads and pendants (Chapter 20), cowries (Chapter 21), clay objects (Chapter 22), archaeobotanical (Chapter 23) and anthracological (Chapter 24) remains, and faunal (Chapter 25) and human (Chapter 26) remains are discussed in turn.

The complete list of dates, and descriptions of the excavated units and the finds within them, including the pottery data, are to be found in the Catalogue.

CHAPTER 12

The Mound of *Tombo*: Introduction to the Site

Didier N'Dah, Carlos Magnavita, Sam Nixon, Anne Haour and Alexandre Livingstone Smith

The site of Birnin Lafiya consists of a set of large settlement mounds occupying 26 hectares, called *tombo* by the inhabitants of the present village of Birni Lafia. The location is 14km south of Karimama in the *département* of Alibori, Benin.

Geologically, the site is located on Quaternary formations represented by alluvial deposits constituted by quartz sands and clays. From a geomorphological point of view, the site sits on the middle terrace of the valley of the Niger River, as defined by Heide (1977: 19–22), who distinguished three geomorphological levels for the Niger valley.[1] Surveys conducted around the site illustrate this situation well: to the east it is limited by the flood plain, and to the west by an elevation which consists of the upper terrace. In terms of hydrography, the only permanent river close to the site is the Niger River, but there are also temporary streams draining rainwater and temporary pools around the site. Climatically, the region is characterised by a Sudano-Sahelian climate with a wet season (May–October) and a dry season (October–April), the latter being the season during which our team encountered the mound each year. During the dry season, the whole area of Birni Lafia is under the influence of warm winds and dry northeastern Sahara winds, the Harmattan. Annual rainfall varies between 700 and 900mm.

The site stands out for its extent and height. Site limits are clearly visible to the north and south, based on topography and surface artefact distribution. On the east side, the modern road creates an artificial boundary, and geophysical work showed that subsurface materials occurred right up to, and under, the road. However, the fact that the terrain slopes down towards the road indicates the main part of the mound is largely terminated by this point. On the west of the site, its limits are less clear, and indeed the question of whether further mounds, components of the same site, continue westwards, was a question debated in the 2014 field season and explored through two brief test pits (Trenches 19 and 20, not discussed here).[2] The only other car track or local route near the site skirts around its western side. There are no site boundaries in the form of earthworks or ditches, and the only really anomalous features are a number of relatively small and steep mounds, located in the southern area of the site, the nature of which is unexplained (see N'Dah & Mardjoua, this volume for discussion). Overall the topography of the site is fairly undulating, with distinct zones of topographic peaks and troughs, rather than one continuous sloping mound with the highest point in its centre. Significant erosion gulleys are present at several areas of the site, often where the topography of the mound is at its steepest, in particular around Trenches 6 to 8.

As far as vegetation is concerned, a number of plant species were inventoried on the site: *Acacia macrostachya, Adansonia digitata, Anogeissus leocarpus, Balanites aegyptiaca, Calotropis procera, Diospyros mespiliformis, Ficus platyphylla, Ficus thonningii, Lannea microcarpa, Mytragina inermis, Piliostigma reticulatum, Pterocarpus erinaceus, Tamarindus indica, Vitellaria paradoxa, Ziziphus mauritiana* and *Ziziphus spina-christi* (Jourand 2013: 71–85). Baobab trees (*Adansonia digitata*) seem to be mainly confined to western and southern portions of the site. In certain areas, visibility is impeded by tree cover but other than this there is very limited surface grass and a sparse coverage of low-lying shrubs. Although large areas of the site are seasonally cultivated, some are left entirely uncultivated; the decision not to farm some areas was explained by local inhabitants as a result of their being too difficult to cultivate, difficult to plough and less productive. In uncultivated areas, the soil is relatively compact and largely undisturbed, while in cultivated areas furrows line the land surface and the soil is loose.

Distinct features of the site are "raised pits", that is, pit features from which surrounding soil has eroded, leaving the pit fill standing higher than the surrounding matrix.

1 That is, the lower terrace and the floodplain (elevation under 160m), the middle terrace (160–165m) and the upper terrace (165–170m IGN) (see Laïbi et al. this volume, and figures therein).

2 For Trench 19, see C. Magnavita, this volume. Trench 20, basically aimed at investigating the nature of archaeological deposits in an area of Birnin Lafiya not yet examined by excavations, was the westernmost test pit placed at the site and its main purpose was to recover material remains, particularly pottery, that could be used for addressing spatiotemporal issues. Whilst the spot selected for laying down this 1 × 1m cutting had been covered by the geophysical survey accomplished in that sector of the site, the unit did not deliberately target any magnetic anomaly visible at the geophysical map. Instead, it was placed in an area where archaeological deposits seemed to be undisturbed.

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These present as a small mound about 0.5m high, standing above the surrounding site surface. These features are naturally primarily found in areas of erosion, being most clearly identifiable on the eastern area of the site and around the heavy erosion gulley found near Trenches 6, 7 and 8. The excavation of Trench 4 (Haour & Mardjoua this volume) provides a good illustration of the nature of these features. As well as rising above the surrounding surface, these pits have a distinctive soil type and colour: ashy, or with a darker brown or greenish appearance. Other similar features were characterised by a large proportion of burnt earth debris and we were unsure, at first, whether these represented furnaces or infilled pits.

Erosion also exposed areas of other anomalies in soil composition. This was the case in an area at the northeastern end of the site where an extensive area of ashy deposits was observed (eventually excavated as Trench 5). In some areas of the site, localised digging by a lone looter searching for large stone beads (the large, roughly circular discoid shapes with tapering edges referred to by S. Magnavita, this volume, as "Type 1") had revealed ash features below the surface, possibly burials. There seemed to be a particular density of looters' pits south of the S3/10 complex. Elsewhere on the site, rat hunters or individuals excavating medicinal roots had created small-scale pits.

The most obvious features of the surface archaeology, apart from anomalies of topography or soil colour/nature, were potsherd pavements. These were occasionally associated with burnt mud walls, both *in situ* and dismantled. There is a strong correspondence between the presence of pavements and areas of the site which are not cultivated, and it may well be that pavements were once much more widely distributed across the site. Ploughed-up pavement traces would manifest as dense pottery scatters, indistinguishable from any other pottery scatters, and thus go unnoticed.

In addition to indicating the presence of architectural features, surface pavements also allow insights into the nature of the original mound surface, and into erosion processes which occurred after the site's abandonment. Firstly, in terms of the original surface of the site, it is noteworthy that in some areas at the edges of the mound paved surfaces are arranged on a slope rather than horizontally (Nixon, this volume). The pavements also provide important insights into the extent to which the site has eroded, and the degree to which the upper levels of the mound have been lost through erosion. This is illustrated by the fact that in some areas small patches of pavements still subsist around the bases of trees or shrubs, elevated from the surrounding ground surface; clearly these are the last remnants of larger paved surfaces which have disappeared through erosion, surviving because they have been protected by the proximity of the tree or shrub. This in turn suggests the loss, through erosion, of at least the terminal occupation of the site in some areas. Related to this observation is the fact that at present people come from the modern village of Birni Lafia to quarry potsherd pavements for modern building materials, in order to crush them to produce flooring.[3] This occurs, naturally, in areas of the site where exposed pavements occur, namely at the eastern edge of the site. This contributes to, and escalates, the process of erosion, working together with water action. It is unclear how long this process has been happening and how much of the mound has been lost.

Complete or semi-intact pots can also be seen eroding out of the site surface. These can inform us about the presence of *in situ* living surfaces below the surface, or indeed of pits into which vessels may have been thrown. In a few instances, extremely fragmented bone remains were observed, perhaps indicative of urn burials, but in much too poor a state of preservation to be investigated or conclusively identified. Again, these features also illustrate processes of erosion. Other than this, no other distinct archaeological features were noted on the site surface.

Surface material culture, on the other hand, was relatively abundant. This mainly consisted of potsherds, although a range of other artefacts were encountered, including pounders, beads (stone and occasional glass), slag, ceramic figurines and other other ceramic objects, and also occasional lithic scatters.

As detailed elsewhere (C. Magnavita, this volume), the extensive geophysical survey undertaken at Birnin Lafiya was crucial for reliably inferring the actual size, limits and nature of that massive mound. In addition to those aspects, the survey was successful in identifying areas on which intensive and less intensive past human activity and settlement had taken place, as well as in locating discrete evidence of potential living areas. Another important outcome relates to the recognition that specific settlement activities appear to have been performed in low-lying, flood-liable portions of the site. For instance, this is shown by a 10 × 10m archaeological Trench 12, set on the northeastern base of the settlement mound. Drawing upon geophysical evidence that hinted at the presence of subsurface anomalies in the area, a zone of fire-hardened clay associated with two deposited iron

3 We attempted to slow this practice through several meetings with the women gathering the sherds, during which the value of the archaeological heritage was highlighted. We also made available to collectors the potsherds which had been "desampled" in the course of the ceramic analysis.

spearheads arranged side by side was exposed in the northeastern portion of the cutting. In addition, a number of pit features and remains of a possible potsherd pavement was revealed in adjacent areas. Those findings indicate that some kind of craft involving the use of fire (smithing?) and some construction activities also took place at particular places at the base of the mound, i.e., at some distance from the then densely-settled top of the mound.

With regard to excavation methodologies, these were primarily geared towards securing representative data given the challenges of understanding such a large site. Several test pits were excavated in each field season, responding to our evolving understanding of the site's nature. Additionally, a number of surface features were excavated in order to ascertain chronology and investigate function.

The first field season involved only very brief excavation. During a period of three days, the team excavated a trench of 1 × 2 m (reduced to 1 × 1 m after 0.75 BD) near the top of the main mound (Trench 1), and cleaned and sectioned one of the areas of pavement which had been exposed by erosion (Trench 2). In Trench 2, a beaten earth disc, two discrete accumulations of fired earth resembling pillars, possible postholes, and a succession of three pavements were exposed. Pavement 1, made of decorated sherds, was visible at the surface; beneath it were Pavements 2 and 3. In Trench 1, no features were recovered but bones, charcoal and pottery were retrieved, to a depth of 1.25m (see Haour, Part 6, Catalogue). These two units allowed for a first description of the ceramic material and situated the period of occupation, through five dates[4] falling in the 2–3 centuries either side of AD 1000.

During the 2012 field season work continued in Birnin Lafiya, both amplifying the former Trench 2 (becoming Trench 3) and opening four new units. These included Trench 4, which began as the study of one of the raised features commonly noted on the site and interpreted as a pit plug, but quickly developing into a deep and complex section with a great deal of intercutting pits, giving the first insight into the depth of the stratigraphy at the site. For its part, Trench 5 sectioned the ashy and artefact-rich hillock known locally as the "King's rubbish heap". Its principal goal was to improve understanding of the nature of the soils and to secure archaeobotanical remains. Finally, Trenches 6 and 7 were two exploratory units aimed respectively at characterising the pottery assemblage of a part of the site where surface pottery appeared quite distinctive (multiple-stick cord-wrapped roulette [rce-8]), and at investigating a possible furnace.[5] Work on Trench 3 concentrated on exposing Pavement 2, undecorated, and its associated structures; its focus was therefore primarily on the horizontal. The beaten earth disc was fully brought to light and a curvilinear wall, sherd-decorated step and a low wall were discovered. At the end of the season, Trench 3 was protected with a tarpaulin and backfilled with a view to continuing the following year.

The 2012 season had showed that Birnin Lafiya was a tell-type site of considerable complexity, a type well documented in sub-Saharan Africa but about which little accurate chrono-stratigraphic information exists (see discussion in Huysecom et al. 2015). During the 2013 campaign we sought to better understand the stratigraphy and the nature of the architecture, and also to move away from the northern part of the site which had concentrated all efforts so far (the trenches excavated thus far were within c. 250m of one another). Trench 8 represented a sustained effort to characterise the area briefly sampled the previous year by Trenches 6 and 7. Trench 9 was placed adjacent to the set of structures explored by Trenches 2 and 3, with the expectation that a succession of further pavements would be exposed underlying the three already documented;[6] to our surprise this did not turn out to be the case. However, Trench 9 produced an excellent and long stratigraphy, to complement the (less well controlled) excavation of Trench 4 the previous year. As well as seeking a diachronic view of the site, we continued to extend the investigation of the area examined earlier by Trenches 2 and 3 in order to provide a synchronic snapshot of architectural arrangement and material culture. Two circular rooms and an assortment of crushed pottery were exposed in this trench, called Trench 10. Trench 11 was situated as far as possible (pragmatically, and in terms of safety) from the northern part of the site, to judge the nature of archaeological deposits and get a better idea of the sequence of occupation of this vast mound. It confirmed the existence of a deep stratigraphy as in Trenches 4 and 9. Finally Trench 12 was designed to test a series of round anomalies of 1m in diameter, interpreted as possible furnaces.

In 2014 we continued the drive to sample the site more widely and installed Trench 13 on the as yet untested western slope. Work also continued on the Trench 10 area. These activities were in fact directed towards the

4 Beta-305217 to Beta-305221.

5 These were small-scale investigations and their results are not considered within this volume.

6 We had in mind here the evidence unearthed at Ulaira, where nine floor pavements of laterite, shell, pebbles, potsherds and stone were reported over a depth of just under 3m (Nzewunwa 1989: Figure 3).

same problem of representation, a key problem on a site of this scale; it was important to determine whether the remains excavated so far offered a representative picture. A second question which continued to preoccupy us was whether the settlement was originally established on a natural mound. Trenches 14 to 20 were small-scale investigations designed to test the subsurface, with a view to ground-truthing matters raised by the geophysics and surface surveys.[7] These surveys are the subject of the next two chapters.

7 These are not covered in detail in this book although the architectural insights provided by Trenches 14, 15 and 17 are discussed by Nixon, this volume.

CHAPTER 13

The Geophysical Prospection of Birnin Lafiya

Carlos Magnavita

An important innovation in the work carried out by the *Crossroads of Empires* team involved geophysical mapping. Surveys were carried out at Pekinga (PEK) as well as Gorouberi (GOB-13), but the most substantial work concerned Birnin Lafiya (BLAF), and it is this work that will be outlined here. Non-invasive subsurface imaging by way of archaeological geophysics is a strong approach for archaeological site assessment and mapping. Whilst ground-based geophysical methods have been in common usage in European and North American archaeological field research for several decades (Gaffney & Gater 2003: 13–24), their potential for the archaeology of Africa has remained largely under-exploited for a long time (Magnavita & Schleifer 2004). This has recently started to change, as an increasing number of archaeological research and rescue projects in sub-Saharan Africa have begun integrating geophysical surveys routinely as an essential part of their strategies (Magnavita et al. 2006, 2007, 2009; Fleisher et al. 2012; Wynne-Jones 2012; Fleisher 2014; Magnavita 2017a). This development mainly results from the awareness that archaeological geophysics is capable of detecting evidence of human activity otherwise not recognisable at site surfaces, thus meaningfully complementing excavations. In the case of such a large site as Birnin Lafiya, geophysics offers an opportunity to obtain a sense of the whole site in a way that would be impossible if relying on excavation alone. The primary goal of the survey was to map the site's subsurface extent in order to reveal evidence that would allow assessment of Birnin Lafiya's limits, size, nature and internal organisation of space.

Compared to other geophysical methods, such as ground-penetrating radar (GPR), electrical resistivity and electromagnetic conductivity, magnetometry has become the workhorse of archaeological geophysics worldwide due to its high sampling speed (Kvamme 2005: 430–432). The ability to map large areas in short amounts of time, and previously successful large-scale surveys conducted at West African sites, were major arguments in selecting magnetometry for prospecting the extensive settlement mound site of Birnin Lafiya (see, for example, Magnavita et al. 2009; Magnavita 2016).

The magnetometer used in the survey was a three-channel wheeled fluxgate gradiometer with a resolution of 0.1 nT. Prior to starting work, low vegetation was cleared and survey grids laid out by means of total station and differential GPS. In total, 104 survey grids of various sizes were staked out, mainly covering the northern, eastern and southern site's sectors, as well as its central portions. Survey grids were positioned on the highest part of the settlement mound, down the mound slopes and, to some extent, on the low zones in the surrounding areas. Altogether, a total area of 20.3 hectares was prospected by magnetometry. The greyscale magnetic plot of Figure 13.1 provides a general impression of survey results. It enables conclusions to be drawn concerning three fundamental aspects related to the site's major physical characteristics: its limits, its size, as well as its nature and internal organisation. These are discussed in more detail below.

1 Site Limits

First of all, the magnetic plot shows that the site limits are clearly visible at the survey's northern, eastern and southern sectors. Those limits are defined as areas where concentrations of magnetic anomalies (most black/white dots on Figure 13.1), related to sub-surface archaeological features and past human activities, are no longer discernible on the magnetic plot. Based on this information, inferences about site shape and size can confidently be drawn. In view of recurrent seasonal flooding, the location of permanent living areas at Birnin Lafiya was once undoubtedly dictated by local topography. Indeed, the magnetic plot reveals that the prevalent part of the settlement remains are related to elevated, flood-protected ground (Figure 13.2). Yet, the plot also shows that some lower-lying areas at the mound base were in part similarly used in the past, most probably on a seasonal basis. Because past occupation was so closely related to topography, the site of Birnin Lafiya has a rather irregular shape with widely meandering edges (Figure 13.3).

The site's asymmetrical form is largely caused by the shape of its eastern limits. As a comparison between Figures 13.2 and 13.3 shows, the highest concentration of magnetic anomalies connected to past settlement activities at the site's eastern limits comes to an abrupt end at the mound's upper edge (Figure 13.3, grids G7, H8, I9). The mound slope to the east and most of the lower ground

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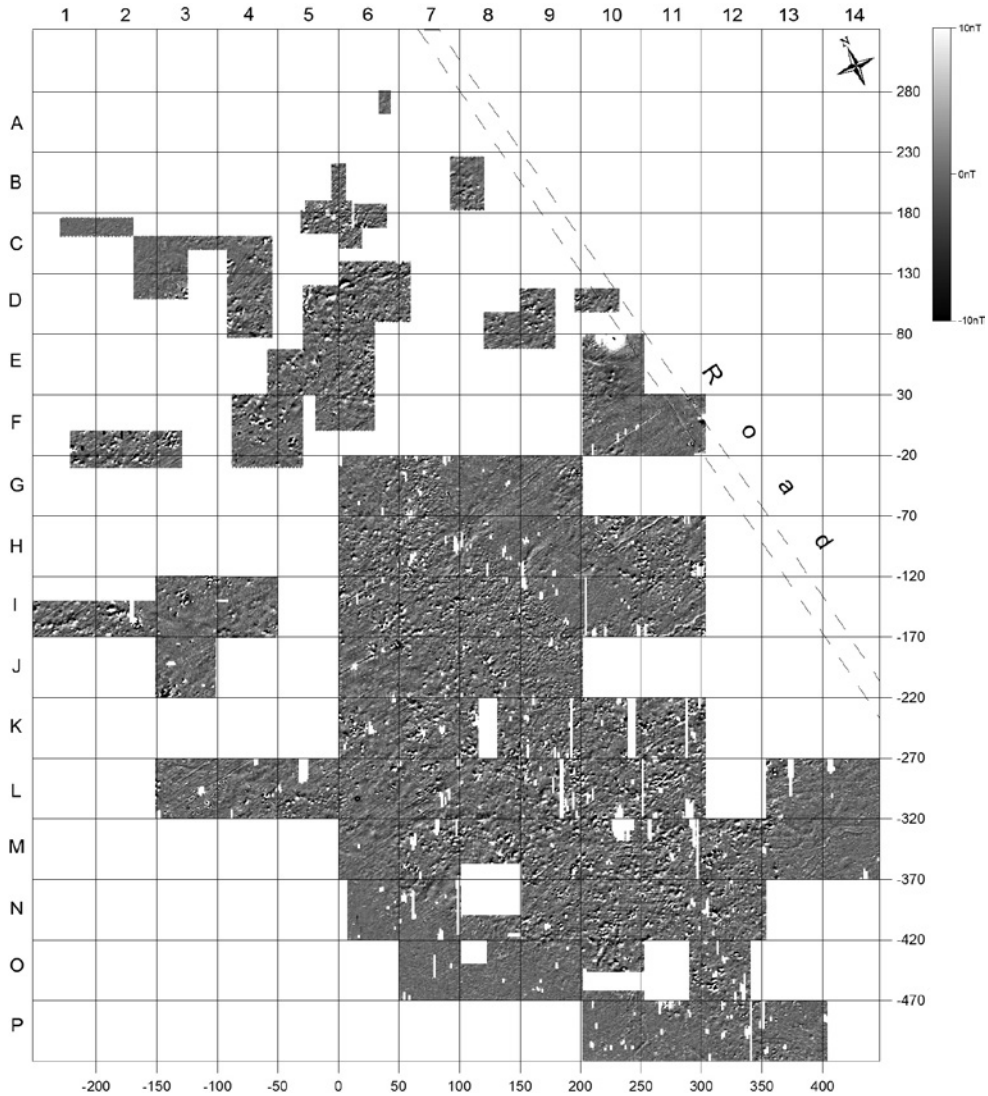

FIGURE 13.1 Greyscale magnetic plan of Birnin Lafiya (scale in metres). Readings were median-filtered and interpolated

beyond are virtually devoid of magnetic anomalies. The question to be answered in this context is: why is this so? What can be said unmistakably is that the lack of magnetic anomalies at the settlement mound slopes is not a common pattern at Birnin Lafiya. As indicated by the magnetic plot, sloping ground above the presumed flooding line was apparently largely used by the inhabitants at the northern and southeastern sectors of the mound. This is shown by the relatively dense clusters of magnetic anomalies visible at those locations. In fact, even flood-liable ground at the base of the mound was not neglected by its inhabitants, at least seasonally.

Beyond probably being used as planting ground at one time, those lower-lying areas may also have been used for seasonal living or for performing craft activities such as ironworking (hearths) and, perhaps, pottery making (borrow pits). The existence of numerous concentrations of magnetic anomalies at some of the lower locations (e.g., in grids B7–8, D9–10 and H10–11, I10–11 and P13 in Figure 13.3) appears to support this interpretation. There are two possible explanations for the lack of magnetic anomalies (archaeological evidence) on the eastern slope. Firstly, heavy erosion over the last hundred years may have wiped out most archaeological structures and features at the slope. Indeed there is hard evidence of old, now completely filled in, erosion gullies at the slope (see Figure 13.3); secondly, the instability of the slope and erosive processes were happening at the same time as the site was settled, so that people avoided the area. In my opinion, the first explanation seems less probable, as it is hardly conceivable that presumably once deep archaeological deposits (as evidenced from the northern slope) would have been entirely washed away, without leaving behind remains that could be detected by magnetometry. As even the low,

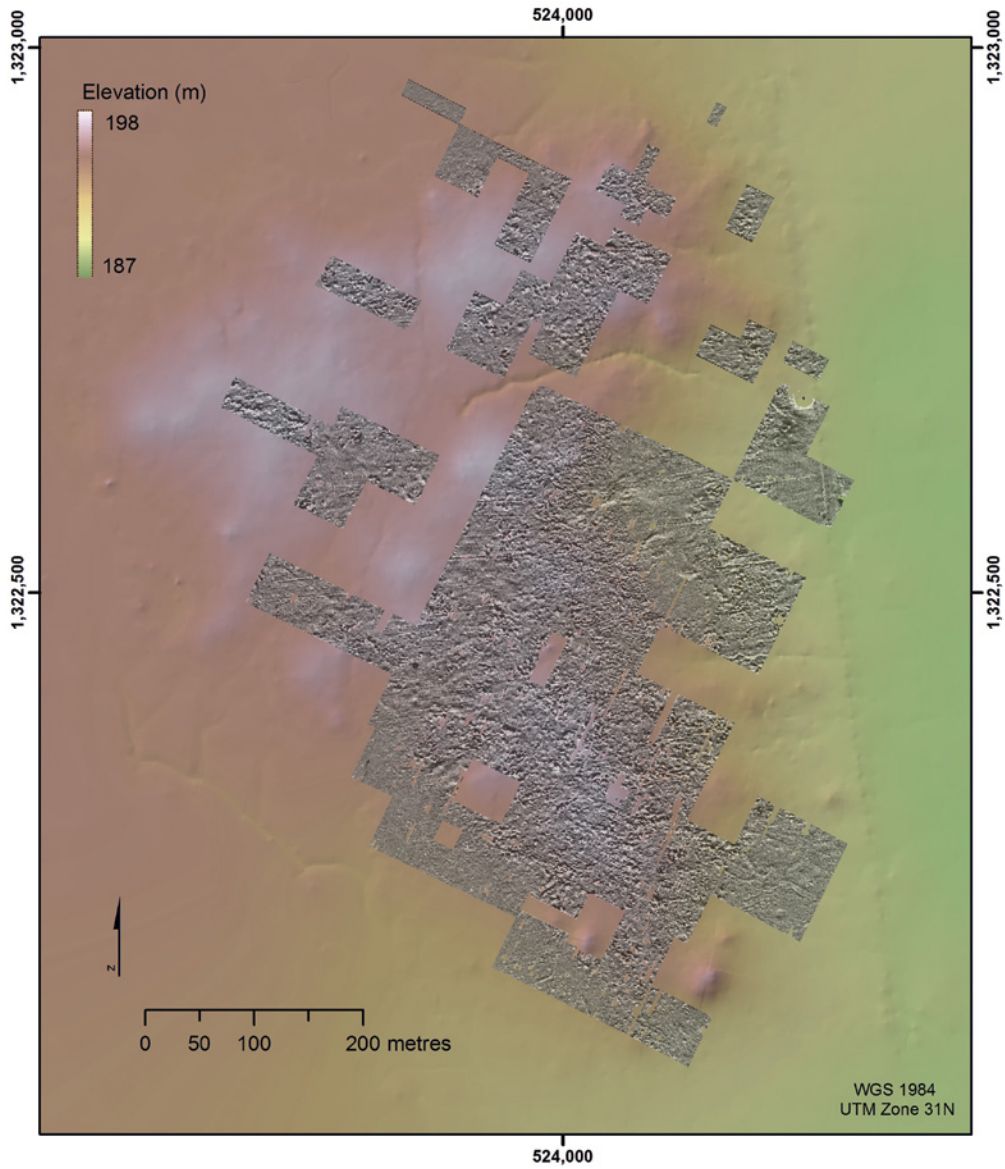

FIGURE 13.2 Topographic map of Birnin Lafiya and geophysical plot superimposed (Topographic map courtesy of Paul Adderley)

flat areas beyond the eastern slope are mostly devoid of magnetic anomalies, it seems unlikely that either the eastern slope, or most of the lower terrain adjacent to it, were ever a suitable living space for those who inhabited Birnin Lafiya.

2 Site Size

The second aspect clarified by the geophysical prospection concerns the size of the site. Based on the site limits detected, the magnetic plot reveals that archaeological remains at Birnin Lafiya cover an area of 26–27ha. The total area was slightly larger (perhaps by two hectares), since further archaeological remains were noted west of the zone surveyed by magnetometry at a late stage in the survey. That evidence consists of a continuous scatter of pottery for at least 120m beyond grid F1–G1 (see Figure 13.1), as well as two low mounds related to past human activity a few metres west of grid L3. The latter may be linked to the magnetic anomalies visible at the western edge of the same grid.

3 Site Nature and Internal Organisation

A third fundamental feature uncovered by the geophysical survey relates to the location and uneven distribution and density of archaeological evidence across the site. The zones that can be considered to have been the site's main residential areas are primarily located along the mound's northern, eastern and southern elevations, as well as their

FIGURE 13.3 Interpretation of the greyscale magnetic plan of Birnin Lafiya (scale in metres)

back and front slopes (Figures 13.2 and 13.3). These are areas of especially elevated ground associated with comparatively high densities of buried archaeological features. The latter suggests that those were preferential places for settling at Birnin Lafiya, since, as a rule of thumb, particularly high densities of buried remains point towards persistent use of an area over time. The notion of residential areas being preferably located at the upper edges of the settlement mound is further reinforced by an increasing quantity of buried archaeological evidence at the western sector of the mound towards its western limits, namely at grids F1–F3 and G1–G3 (see Figure. 13.3).

In contrast to this information, only comparatively dispersed signs of settlement activity in the form of buried archaeological features can be discerned at the remaining parts of the site. This is especially the case at the mound's central-southwestern zone, where a roughly continuous 'open space' with sporadic magnetic anomalies is located. This 'open space' stretches north-south over c. 300m and east-west for over 200m. It is conceivable that this area once fulfilled a different function from those zones which were in part covered by buildings. In this context, the presence of agricultural ground or small farmsteads with gardens are conceivable options for explaining the lack of tightly packed archaeological features in that area.

Based on this evidence, Birnin Lafiya can be considered to have been a large, relatively dispersed settlement at one time, as archaeological remains are not equally densely packed throughout the site, nor clustered around a central point. The rather dispersed nature of the site is corroborated by another significant finding of the geophysical survey: there is no indication that Birnin Lafiya was once surrounded by defensive ditches and/or earthen walls. These are indeed structures that might be expected

at tightly populated, nucleated settlements that arose as a result of external threats. Such massive earthen structures are definitely absent at Birnin Lafiya and the site's fairly dispersed nature makes it unlikely that other sorts of defensive structures, e.g. timber enclosures, might once have been erected.

4 Internal Settlement Boundaries, Areas of Craft Activity, Living Spaces

The analysis of Birnin Lafiya's magnetic plot made critical information available on the site limits, size, nature and internal spatial differentiation. The next level of analysis aimed to identify potential internal settlement boundaries, possible formal areas of craft activities and discrete structures and groups of features related to living spaces. Beyond the probable residential areas at the upper edges of the mound and the area of low magnetic response ('open space') in the southwestern sector of the site, a thorough inspection of the magnetic plot of Figure 13.1 does not suggest the existence of any clear-cut boundaries produced by former standing walls or fences, indicative of a strict division of space within the settlement/site.

The detection of a series of high-amplitude thermoremanent anomalies on the site indicates either the location of potential areas of craft production, or other human activities involving firing at high-temperatures (see Table 13.1 and red arrows in Figure 13.3). An area where ironworking was possibly performed is located within grids L3–L4 at the southwestern limits of the site. This area is related to a single high-amplitude magnetic anomaly in grid L3 (shown by the arrow) with a flux density (B) of –1683 nT to +447 nT, which is surrounded by an elongated arrangement of numerous lower-contrast ones. Due to the high values recorded for the central feature and the similarity of the surrounding ones with a scattering of iron slag, that feature was interpreted on-field as being a probable iron smelting furnace. Though dug to a depth of 2m, a test pit (Trench 19) that should have identified the nature of the feature did not come across any preserved formal feature related to ironworking. Other than a handful of iron slag and fragments of burnt clay from a possible hearth or furnace wall coming from the upper 1m, and a few potsherds found throughout the depth of the cutting, no evidence of the expected feature was located. A possible explanation for this failure is the use of flawed coordinates to stakeout the test pit, but repeated proof of the data counters this suspicion. Six other similar high-amplitude magnetic anomalies were detected on various sectors of the site (cf. the arrows in Figure 13.3), but most of them appear to cluster within, or near to, the 'open space' in the southwestern portion of the site. These high-amplitude magnetic anomalies indicate the location of archaeological features fired at relatively high temperatures.

TABLE 13.1 Range of the seven high-amplitude anomalies detected by magnetometry on Birnin Lafiya (values in nanotesla)

Location of anomaly (**grid**)	**Value range** (**nT**)
L3	–1683 to +447
L6	–170 to +1289
O11	–1370 to +247
I3	–130 to +2294
J6	–689 to +1706
F5	–548 to +802
B5	–945 to +315

In order to understand these anomalies, one of the archaeological features, situated on the north sector of the site, at grid B5, was successfully excavated. It appears to have been a cooking hearth burnt (probably regularly) at high temperatures so as to produce a magnetic anomaly with an amplitude (flux density) ranging from –945 nT to +315 nT. These are in fact values that approach those attested elsewhere for iron slag heaps and bloomery furnaces with trapped iron slag (Vernon et al. 1998; Walach et al. 2011; Gustafsson & Viberg 2012). In view of the similar high magnetic amplitudes of hearths, iron smelting furnaces, slag heaps and, probably, forges, it is not possible *ad hoc* to distinguish between those kinds of thermoremanent features by flux density alone. In this context, the nature of the remaining high-amplitude magnetic anomalies detected in Birnin Lafiya remains unclear. But as discussed elsewhere (Robion-Brunner, Filippini, this volume), whereas studies of the slag remains recovered at Birnin Lafiya suggest that several forges probably existed on the site, these were recovered disparately, showing that forges were not situated in the location of the trenches excavated. Moreover, the identified slag being small-sized and not abundant, it is likely that no smelting activities were practiced at the site itself.

Given the low magnetic contrast between buried earthen walls and the surrounding sediments, it is generally extremely difficult to detect clay buildings by means of magnetometry in archaeological contexts. However, if that contrast is for any reason (naturally or artificially) enhanced, there is indeed a chance of locating preserved mud walls and buildings in that way. A major circumstance of magnetic contrast enhancement of archaeological

earthen buildings is the change of the magnetic properties of clay minerals in walls after a fire (Aspinall et al. 2008: 23–24). At Birnin Lafiya, such a fire event enabled both the partial preservation of a unique former house ensemble and the location of other areas related to possible burnt building remains. The most significant preserved building remains related to living spaces yet uncovered and investigated at Birnin Lafiya, were those excavated at the northern sector of the site in Trench 3/10 (Nixon, this volume). Prior to the initial excavations at those structures, the results of the magnetic survey conducted on the spot in 2012 suggested the existence of structural remains that had once caught fire (grid C6 in Figure 13.2). As the excavations showed, those burnt remains mainly consisted of a series of preserved circular wall foundations, associated with potsherd pavements and collapsed burnt wall remains therein. In the magnetic plot those remains are visible as two large magnetic anomalies side by side (each c 4m in diameter). Based on this knowledge, at least two other large magnetic anomalies detected by geophysics can be identified as potential burnt structural remains. Those are respectively located within grids D5 and D6, c. 40m and 50m southwest of the excavated structures (see Figure 13.3).

Another useful approach for identifying the location of structural remains, or at least archaeological features that were part of former living spaces, is the search for particular geometrical patterns that may relate to such spaces. The universally limited range of shapes that houses and their compounds can take implies that archaeological settlements, as modern settlements, will chiefly bear residential structures and spaces with circular, near-circular, rectangular or near-rectangular forms. No remains of rectangular or near-rectangular features are discernible on the magnetic plot of Birnin Lafiya. However, a number of circular or sub-circular spaces, possibly related to former living spaces, are visible (compare Figures 13.3 and 13.4). They consist of arrangements of a varied number of discrete magnetic anomalies with internal areas devoid, or virtually devoid, of other anomalies. Such spaces are most apparent, for example, at grids F2 to F4, H11 to I11, and at L5 (Figure 13.4). Many more such arrangements probably exist elsewhere on the site, but the repeated use of living areas over centuries and the consequent overlapping of buried features makes their visualisation much more difficult, such as, for instance, at grid I8. It is hardly conceivable that such arrangements of magnetic anomalies, and consequently of archaeological features, were created accidentally; they most probably result from pits dug deliberately along the interior or exterior side of pre-existing, now decayed, fences or walls that once delimited circular spaces. With diameters ranging between c. 12m to 30m, such circular areas may be seen as the remains of formerly fenced or walled residential compounds or other kinds of enclosed areas.

5 Conclusion

The geophysical survey at Birnin Lafiya has shed light on fundamental aspects of the site's major spatial characteristics: its limits, its size as well as its nature and internal organisation. Other than pedestrian surveys and excavations alone would do, the resulting magnetometry plot enabled defining the limits and extent of archaeological deposits on a cost-effective, illustrative and verifiable manner. According to that and other data, buried archaeological features and cultural remains are spread

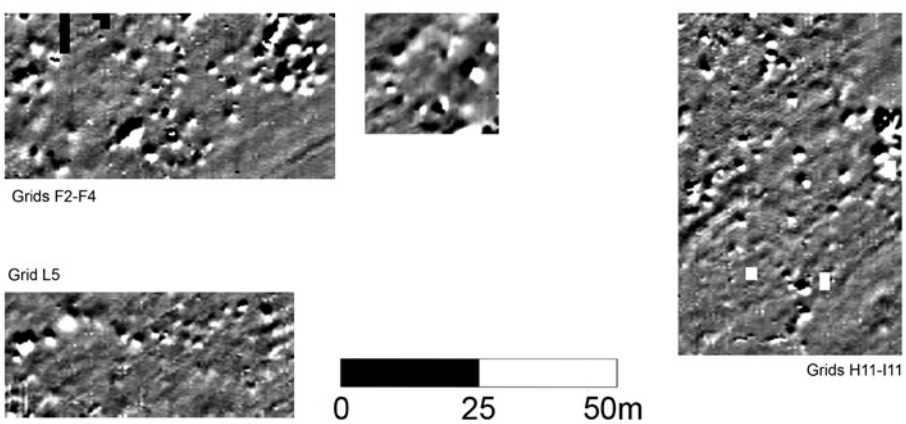

FIGURE 13.4 Circular or near-circular arrangements of magnetic anomalies corresponding to buried archaeological features, most probably pits. The internal, anomaly-free areas are interpreted as former living spaces where houses and other non-detected domestic structures probably stood.

over an area ranging from 26 to 29 hectares. To judge from the distribution of mapped subsurface features, the site's main areas of occupation were located at the mound's northern, eastern and southern elevations, as well as their back and front slopes. The comparatively high density of buried features indicates the permanent or recurrent use of those areas as living spaces. Whilst the western site's sector was only partially surveyed, also that area clearly served as living ground at some point in time. In contrast to those living spaces, the mound's central-southwestern zone appears to have been a kind of 'open space' used for purposes other than habitation. Geophysical evidence of former standing structures in the site emerged in the form of both decayed burnt clay walls and circular to semi-circular arrangement of pits that define the outline of formerly enclosed areas. The geophysical survey also indicates the presence of a number of high-amplitude thermo-remanent anomalies/features within the site's perimeter. Excavation of one of those features suggested an identification as a cooking hearth. Considered as a whole, the results of the geophysical survey points to Birnin Lafiya as a large but relatively dispersed settlement with no signs of defensive structures at its periphery.

CHAPTER 14

The Pavements at *Tombo* Birnin Lafiya

Didier N'Dah and Barpougouni Mardjoua

1 Introduction

The contribution presents the results of a survey carried out during the 2013 field season on the existing pavements on the surface of Birnin Lafiya. The aim is to show the variety of pavements and structures discovered on the surface of this site, but this first requires a brief insight into the literature on West African archaeological pavements. Then, an outline of the methodology display to inventory the different type of pavement, and the criteria for classifying them, follows. Finally, their contribution to daily life of the former inhabitants of the site will be explored.

As has been discussed elsewhere, the site of Birnin Lafiya is known under the name of *tombo* in local oral traditions. This name has a Dendi etymology, meaning in djendjilé, 'a village fallen into ruins or a deserted village' (see also Bako-Arifari 1989: 33; Mardjoua 2014: 63). Recognised by oral traditions as the first site of the current village of Birni Lafia, the archaeological site is located about 1km south of the modern village. The research conducted over four years at the site by the team included a comprehensive survey of the remains of pottery pavements visible on the surface of the site. This survey was important in order to understand the wider distribution of these features across this very large site.

The fundamental objective of the survey was to inventory the pavements throughout the entire surface of the site. To achieve this, a methodology was defined which involved dividing the site of Birnin Lafiya into five sectors, each constituted of three mounds. This allowed systematic survey, the results of which are discussed here.

2 Pavements: A Brief Historical and Archaeological Background

Evidence of pottery pavements used by past inhabitants has been recovered from archaeological sites in many parts of West Africa. A comprehensive review of these archaeological occurrences does not fall within the scope of this paper, and this topic has been well discussed among others, by Nzewunwa (1989), Haour (2013b) and Nixon (this volume). In specifically discussing the question of the distribution of these pavements within the site of Birnin Lafiya, it is however useful to refer here to ethnoarchaeological research carried out on such features in neighbouring Togo. Here, potsherd pavements have benefited from systematic study, the most complete survey being that by Angèle Aguigah (1995). This study focuses on the site of Tado, which is linked to one of the ancient kingdoms of West Africa. Regarding dating, it should be noted that none of the mounds at Tado have been excavated and dated; the majority of dates have been obtained from the excavation of furnaces. Indeed, archaeological research conducted by Aguigah showed that archaeometallurgical activities had been practiced there since the eleventh century (see Gayibor 2012:17). It seems that these activities were carried out both before and after the foundation of Tado and its organisation as a kingdom, which had its floruit between the fourteenth and seventeenth according to oral tradition. This statement is corroborated by dates on ceramics from the site obtained through thermoluminescence (Gayibor 2012: 35).

The potsherd pavements identified at Tado during archaeological fieldwork were constituted of pieces of pottery. However, pounded laterite was also identified at the surface of the site. Both potsherd pavements and pounded laterite are called "beau rouge" by the author. These structures are inventoried principally at Domè, the district occupied by the notables called *azanu*. According to this research, potsherd pavements or pounded laterite would have some status functions: "… les revêtements faisaient partie d'un mode de construction (protection du sol) et d'un décor des demeures, par volonté de prestige" (Aguigah 1995: 587).[1] Indeed, residential homes would be built with beaten earth and tamped floors of either pottery fragments or laterite. These homes were rectangular whereas sanctuaries whose soils were also finished with red earth or pottery sherds would be circular. A large part of these interpretations are derived from recent field observations, but it is of course not clear whether this held true in Tado and at Domè several centuries earlier.

1 "Floor coatings were part of a construction method (floor protection) and decoration of houses, for prestige reasons."

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However, it can safely be suggested that the richness in decoration of the ceramic material at Tado is ultimately a marker of the high level of sophistication reached by its inhabitants at that time (Gayibor 2012: 36–37). As such, these considerations of potsherd pavements in Togo combine archaeological and ethnographic information and as such offers us some first insights about potsherd pavements and their function.

3 The Pavement Survey at Birnin Lafiya

At the site of Birnin Lafiya, potsherd pavements were visible both on the surface and during excavation in Trenches 9, 3/10 and 11. Such occurrences of pottery pavements were also identified, both through survey and excavation, in Dendi more widely (Haour et al. 2016).

Our survey revealed that pavements are unevenly distributed over the large mound site of Birnin Lafiya, and that a wide range of various types can be observed. There are pavements in which pieces of pottery used are richly decorated, while some are undecorated. There are also pavements made of laterite or burnt earth, those recorded features are fewer in number, perhaps because they are more difficult to identify.

The degree to which pavements, as opposed to ordinary pottery scatters or pot bursts, can be reliably identified, varies; therefore a threefold typology was developed to reflect our confidence in identification. This seemed an important contribution given the uncertainty which can surround some identification of potsherd pavements in the literature. Codes were devised to reflect these, as shown on Table 14.1 below.

All types of pavement located throughout the site have been recorded using a GPS. Table 14.2 shows the 63 pavements identified and their coordinates, while Figure 14.1 identifies their location on the site.

TABLE 14.1 Codes and their meanings

Codes	Signification
PV	Proven pavements
PPV	Possible pavements
PVDMTL	Dismantled Pavements

TABLE 14.2 Codes of structures and their geographical coordinates

Codes	Coordinates	Detail
PV1	N11°57'58.5 E3°13'17.3	Undecorated pavement
PV2	N11°57'58.6 E3°13'17.5	Fired structural + potsherd pavement
PV3	N11°57'58.4 E3°13'18.0	Mixed pavement (decorated and undecorated potsherds)
PV4	N11°57'58.2 E3°13'17.5	
PV18	N11°58'00.1 E3°13'18.4	Mixed pavement (decorated and undecorated potsherds)
PPV2	N11°58'00.4 E3°13'18.4	
PPV3	N11°58'00.9 E3°13'13.1	
PV10	N11°57'59.2 E3°13'16.7	Mixed pavement (decorated and undecorated potsherds)
PV11	N11°57'59.0 E3°13'16.8	Mixed pavement (decorated and undecorated potsherds)
PV12	N11°57'59.1 E3°13'17.0	Mixed pavement (decorated and undecorated potsherds)
PV13	N11°57'59.2 E3°13'17.1	Mixed pavement (decorated and undecorated potsherds)
PV14	N11°57'59.0 E3°13'17.1	Decorated pavement
PV15	N11°57'59.1 E3°13'17.2	Mixed pavement (decorated and undecorated potsherds)
PV16	N11°57'59.4 E3°13'16.9	Decorated pavement
PV18	N11°58'00.2 E3°13'18.3	Mixed pavement (decorated and undecorated potsherds)

TABLE 14.2 Codes of structures and their geographical coordinates (*cont.*)

Codes	Coordinates	Detail
PV19	N11°58'00.1 E3°13'15.5	Mixed pavement (decorated and undecorated potsherds)
PV20	N11°57'59.7 E3°13'15.5	Mixed pavement (decorated and undecorated potsherds)
PV21	N11°57'59.7 E3°13'15.7	Undecorated pavement
PV22	N11°57'59.7 E3°13'15.8	Undecorated pavement
PV23	N11°57'59.6 E3°13'15.9	Mixed pavement (decorated and undecorated potsherds)
PV24	N11°57'59.7 E3°13'15.8	Undecorated pavement
PV25	N11°57'59.6 E3°13'15.2	Decorated pavement
PV26	N11°58'00.0 E3°13'15.3	
PV5	N11°57'58.2 E3°13'17.1	Fired structural + potsherd pavement
PV6	N11°57'59.1 E3°13'16.5	Mixed pavement (decorated and undecorated potsherds)
PV7	N11°57'59.0 E3°13'16.5	Mixed pavement (decorated and undecorated potsherds)
PV8	N11°57'59.1 E3°13'16.5	Undecorated pavement
PV9	N11°57'59.1 E3°13'16.6	Mixed pavement (decorated and undecorated potsherds)
PPV4	N11°57'55.1 E3°13'14.4	
PPV5	N11°57'55.6 E3°13'16.3	
PV27	N11°57'56.4 E3°13'14.9	Mixed pavement (decorated and undecorated potsherds)
PV28	N11°57'56.3 E3°13'15.1	Mixed pavement (decorated and undecorated potsherds)
PV29	N11°57'56.3 E3°13'15.2	Undecorated pavement
PV30	N11°57'56.5 E3°13'15.1	
PV31	N11°57'55.4 E3°13'15.5	Mixed pavement (decorated and undecorated potsherds)
PV32	N11°57'57.6 E3°13'16.5	Undecorated pavement
PV33	N11°57'57.8 E3°13'16.3	Undecorated pavement
PV34	N11°57'57.1 E3°13'17.2	Undecorated pavement
PV35	N11°57'56.8 E3°13'17.2	Mixed pavement (decorated and undecorated potsherds)
PV36	N11°57'56.5 E3°13'17.1	Mixed pavement (decorated and undecorated potsherds)
PV37	N11°57'56.7 E3°13'17.4	Undecorated pavement
PV38	N11°57'56.9 E3°13'17.6	Mixed pavement (decorated and undecorated potsherds)
PV39	N11°57'56.3 E3°13'19.8	Mixed pavement (decorated and undecorated potsherds)
PV40	N11°57'56.3 E3°13'19.8	Mixed pavement (decorated and undecorated potsherds)
PVDMTL1	N11°57'56.3 E3°13'15.1	Dismantled
PVDMTL2	N11°57'56.2 E3°13'14.9	Dismantled
PVDMTL3	N11°57'55.4 E3°13'15.8	Dismantled
PV41	N11°57'54.4 E3°13'15.3	Undecorated pavement

TABLE 14.2 Codes of structures and their geographical coordinates (*cont.*)

Codes	Coordinates	Detail
PV42	N11° 57'54.4 E3° 13'15.4	Mixed pavement (decorated and undecorated potsherds)
PV43	N11° 57'54.5 E3° 13'15.3	Undecorated pavement
PV44	N11° 57'54.3 E3° 13'15.2	Undecorated pavement
PV45	N11° 57'54.4 E3° 13'15.5	Undecorated pavement
PV46	N11° 57'54.5 E3° 13'15.5	Undecorated pavement
PV47	N11° 57'53.6 E3° 13'15.2	Undecorated pavement
PVDMTL4	N11° 57'54.7 E3° 13'15.3	Dismantled
PPV6	N11° 57'52.7 E3° 13'14.6	
PPV7	N11° 57'53.0 E3° 13'14.6	
PV48	N11° 57'52.2 E3° 13'13.9	Undecorated pavement
PV49	N11° 57'51.8 E3° 13'13.9	Mixed pavement (decorated and undecorated potsherds)
PV50	N11°57'51.8 E3°13'13.9	Undecorated pavement
PPV8	N11°57'51.6 E3°13'13.5	
PPV9	N11° 57'51.4 E3°13'13.4	
PPV10	N11°57'51.0 E3°13'13.5	

3.1 *PV* (*Proven Pavements*)

Proven pavements are pavements in a good state of preservation. The fragments of pottery used are not disturbed; sherds are tightly conjoined, spread over a given area and firmly set into the ground. They can be differentiated from ceramic vessels broken *in situ*, or pot bursts, by various factors. First, the sherds bear many different decorations, secondly they cover the ground with few or little gaps, thirdly they are homogeneous in size and generally quite small. The latter characteristic can probably be explained by the fact that large sherds would have too great a curvature to be used for paving, as they would not create a flat surface. Occasionally, it is clear from the obvious refitting pattern that a single sherd was crushed in place to break it into smaller components.

A very rarely encountered subgroup of these pavements involves the remains of pounded laterite (PV4, see Figure 14.6) or fired structural remains (PV5 and, in association with potsherd pavement, PV 2).

3.2 *PVDMTL* (*Dismantled Pavements*)

Dismantled pavements are characterised by the presence of scattered but adjoining pottery fragments no longer solidly seated on the ground. They can be identified as former pavements rather than simple potsherd scatters by their consistent orientation; potsherd scatters differ as they include sherds with haphazard orientations. Generally, dismantled pavements manifest a distinctive pattern whereby the centre of the area consists of denser, more closely spaced sherds, often with a variety of decorations, while the outer areas, affected by water and other erosive factors, are more dispersed (see Figure 14.5).

3.3 *PPV* (*Possible Pavements*)

The 'possible pavement' category refers to high concentrations of pottery sherds, of homogeneous orientation but dispersed in nature. They are unlikely to represent crushed vessels in situ due to their density but cannot with certainty be conclusively identified as pavements.

The figures that follow illustrate various types of pavements. Figure 14.2 shows how pieces of pottery used for making pavements may be richly decorated, in this case with folded strip roulette (rfp-1). Figure 14.3 illustrates the use of perforated sherds. Figure 14.4 shows pavements made of undecorated sherds. Figure 14.5 shows the combined use of decorated and undecorated sherds.

The selection of pottery sherds used to make the pavements seems intentional because: (1) decorated sherds may be surrounded by non-decorated pieces of pottery; (2) the differences in size, colour and decoration of the sherds used attest that these often do not constitute fragments from one same vessel.

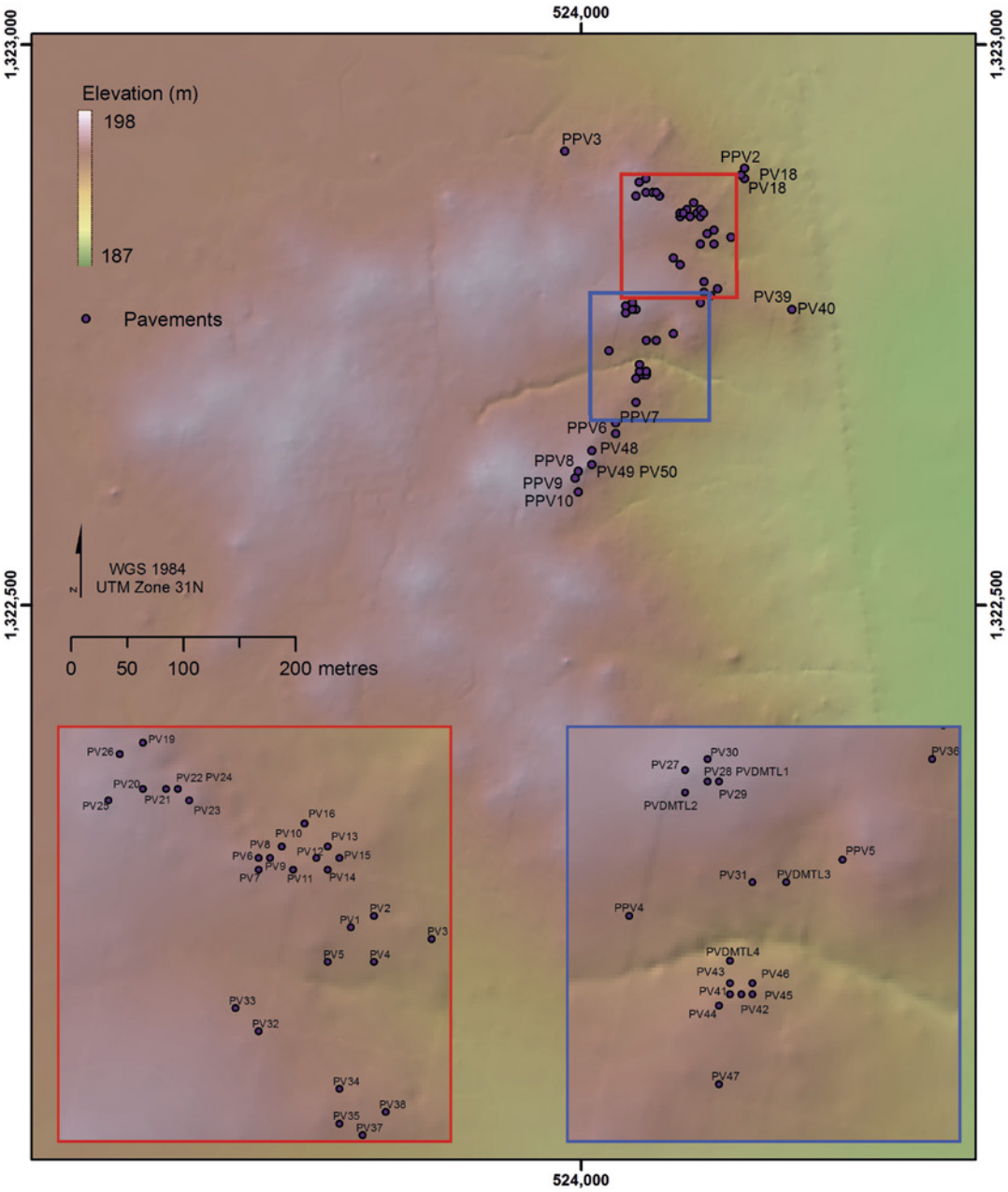

FIGURE 14.1 Birnin Lafiya. Digital elevation model from systematic landscape survey (Leica GS09 GNSS/GPS differential; Leica Geosystems AG, St. Gallen) with potsherd pavement locations (centre of a real extent of pavement) indicated
MAP BY PAUL ADDERLEY

4 Interpretation and Perspectives

As appears clearly on the map, the majority of pavements at Birnin Lafiya are located at the northeast portion of the site.[2] Indeed, more than fifty proven pavements have been identified, whereas dismantled pavements and possible pavements are less than twenty. How can we explain the fact that all these structures are concentrated in this portion of the site?

The concentration of pavements on these parts of the site may be reasonably interpreted as indicating areas where structures were built. Nzewunwa (1989) and Aguigah (1995) have suggested that paved spaces may have signified greater social status. This may also apply at Birnin Lafiya. It may be that the parts of the site on which pavements are located played a key role in the past. Perhaps the mounds on which pavements

2 For further details on some of the pavements in this area, more fully studied in the 2014 field season, see Nixon, this volume.

FIGURE 14.2 Pavement with decorated potsherds (PV14)

FIGURE 14.3 Pavement which includes perforated sherds (PV28)

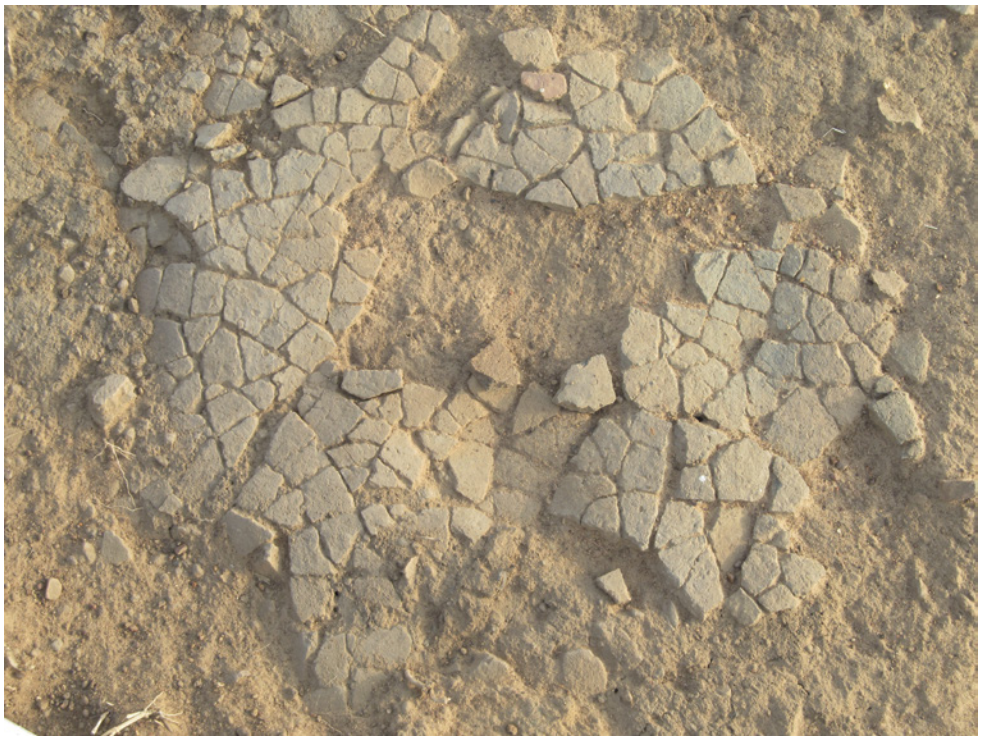

FIGURE 14.4 Pavement in which the sherds used are without decorations (PV 29)

FIGURE 14.5 Pavement combining decorated and undecorated sherds (PV 10)

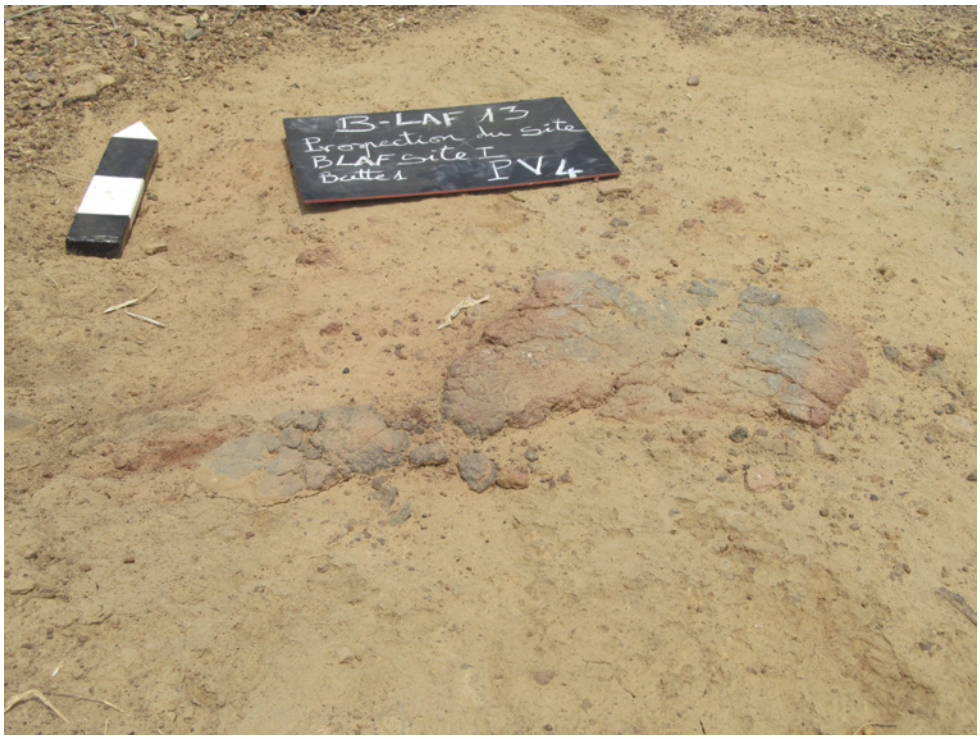

FIGURE 14.6 Pounded laterite floor (PV 4)

FIGURE 14.7 Dismantled pavement (PVDMTL 1)

feature indicated houses of social or religious importance. These would have been better equipped than the homes of the majority of the population, spread in the outskirts and away from the main vantage point from the river.

Another zone featuring extremely dense accumulations of pottery which it is important to discuss here is that of a large mound at the southern edge of Birnin Lafiya. This mound is different from others the site in terms of its high concentration of pottery. Its height exceeds 7m. At this stage of the research, it is not possible to suggest the functions that this mound might have played for the inhabitants of "Tombo". Indeed, even elder persons of Birni Lafia or Kargui – the nearest villages – possessed no information about it. One hypothesis that we would tentatively advance is that this mound may have been used as an altar. In some present-day communities, vessels containing water, beer or food are brought to the altar and are broken near it after the execution of the ceremony in Gourmantche societies. We have observed this in the case of Soroko village in Banikoara district. The reality could have been the same at the time of the occupation of Birnin Lafiya, explaining the concentration of pottery fragments around this mound. This hypothesis is also informed by traditions which we recorded in the Tanguiéta area in Atakora. There, mounds are called *pori*; these are accumulations of material of anthropogenic origin. Some are very high and sacred, bordered by trees and guarded by ritual leaders. All the mounds in that area are massive, bringing to mind the mound at Birnin Lafiya. From an archaeological standpoint, these are not burials; however, oral traditions describe them as such, the majority of respondents suggesting that they are former cemeteries, in which the dead were buried with their property which, according to informants, explains the presence of ceramic fragments, whole pots or other remains. Still others feel that they are old settlement sites which people occupied long ago. But informants know nothing of those who lived or were buried there (N'Dah 1999: 40).

To return to Dendi, as is the case with several other archaeological sites in this area, the site of Birnin Lafiya is subject to a number of destructive processes. Besides natural factors such as water runoff, erosion, or wind, human factors are aggravating the degradation of the site (see Part 6, Catalogue). The distribution of pavements at the site may simply reflect these factors. Indeed, the fact that a pavement was recorded at a depth of about 80cm in Trench 11, (see Lee, Part 6, Catalogue) which was sited at one of the highest-lying parts of the site, but in an area in which our survey identified no surface pavements, would suggest that the present distribution is at least partly a consequence of erosion.

Indeed, the use of fragments from the pavements by women from surrounding villages such as Birni Lafia and Kargui explains the destruction of the site's pavements. Women from these nearby villages typically use crushed potsherds collected from the site as grog to temper pottery or as raw materials to make house floors. It is therefore possible that the surface pavements at the site will disappear completely in the near future if measures are not taken by the authorities. It is important that awareness be raised so that local communities realise the importance of archaeological sites. To this end, political and administrative authorities must adopt and implement the necessary legislation for the protection of archaeological heritage. These texts must be disseminated at all levels so that their application induces visible results in the protection of archaeological sites in Benin.

5 Conclusion

Systematic survey at the site of Birnin Lafiya confirmed the discrete distribution of pottery pavements, an ancient practice of pavement-making, but abandoned nowadays (though see Brunfaut & Pinet, this volume). Unevenly distributed across the site, pavements are differentiated on several aspects, including decoration and state of preservation. The function of the pavements is not clear at this stage. According to the literature, the floors of houses covered with pavements may have been reserved to the houses of socially important people or altars. It is not known whether this applies at Birnin Lafiya and more widely in Dendi. Aesthetic factors were also likely at play; for example, at the site of Dia in modern Mali, faced with a pavement made of fragments of very fine pottery, the excavators commented; "Un tel ouvrage, exigeant un travail intensif, donne à penser que des considérations d'ordre esthétique ont aussi joué un rôle dans son exécution" (Bedaux et al. 2005: 136). We think this will have been true in Dendi too.

Pottery pavements have been identified at many sites in West Africa. This study has contributed to understanding the different types of pottery pavements and structures found on the important archaeological site of Birnin Lafiya. However, multiple factors endanger the site, and its pavements are particularly at risk. It is important that adequate measures be taken for the protection of the archaeological heritage in general.

CHAPTER 15

Pavements and Other Architectural Features

Sam Nixon

1 Introduction

One of the compelling reasons for excavating the site of Birnin Lafiya was the clear potential for the recovery of well-preserved architectural remains, which are relatively rarely recovered at West African archaeological sites. The initial survey of the site revealed the remains of pavements made from fragments of pottery ("potsherd pavements") – manufactured in a similar way to a mosaic – found at multiple locations across the site surface (Figure 15.1; see also N'Dah & Mardjoua, this volume; and below). Survey and initial limited test excavations also revealed the potential for recovering well-preserved mud architecture, including in association with the paved surfaces.

Subsequent field seasons at Birnin Lafiya enabled more in-depth investigation of the architectural traditions at the site. Primarily, the investigation focused on excavation of an architectural complex featuring multiple paved spaces (paved with laterite as well as potsherds), excavated at the northeast edge of the site, as Trench 3/10 (see below and Nixon in Part 6, Catalogue). This work is the main focus of this chapter, but it is important to briefly recall that the category of remains discussed here benefitted from a range of different strands of enquiry. Careful recording of the remains of potsherd pavements across the site surface was undertaken (N'Dah & Mardjoua this volume). Magnetometry survey also provided a range of data that were used for broader thinking about the settlement patterning, and therein the wider context of architecture at the site (C. Magnavita, this volume). Micro-morphology was also undertaken on a range of samples extracted from the Trench 3/10 mud architecture remains, and these samples were also investigated using the developing technology of near infrared (NIR) spectroscopy. In addition to the focused Trench 3/10 excavations, other excavations across the site also provided useful complementary architectural data.

Alongside the Birnin Lafiya work, important architectural data were recorded at other sites. Tin Tin Kanza in particular produced a good architectural sequence, consisting of pavements and mud architecture structural remains (Champion & Haour 2013, and this volume; Khalaf & Haour 2013, and this volume for detailed discussion). Wider regional survey also identified the remains of potsherd pavements at a number of other sites throughout the study region (Haour et al. 2016 and Map 3).

FIGURE 15.1 Investigation and cleaning of eroded potsherd pavements revealed on the Birnin Lafiya site surface.

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Here a summary account is provided of the architectural data recorded at Birnin Lafiya and other sites in the region, followed by a discussion situating the data within the wider picture of past architectural traditions in West Africa and their archaeological recovery.[1]

2 Birnin Lafiya Surface Remains of Architecture and Geophysical Detection

During the initial survey of Birnin Lafiya one particular area of the site (in the the northeastern area) was identified for its potential for recovering evidence of intact mud architecture associated with the remains of pavements, the area which was eventually excavated as Trench 3/10. Specifically, a concentration of fragments of burnt clay were observed on the site surface, found in association with remains of potsherd pavements. It was believed, therefore, that the deposits here might feature mud architectural remains that had been destroyed by fire, thus increasing their archaeological preservation and detectability. Remains of potsherd pavements were also observed at various other points across the site surface. Accordingly, the site appeared to feature a rare archaeological combination of relatively easily detectable living surfaces (potsherd pavements) and clear potential for detection of associated structural remains.

A detailed survey of potsherd pavements present on the surface of the site was carried out (N'Dah & Mardjoua, this volume). A range of pavements featuring undecorated and decorated potsherds were recorded (e.g. Figure 15.1) detected mainly in the northeast of the site (see N'Dah & Mardjoua, this volume). These occurrences are at the edges of the site's higher-lying areas facing north and east, consistent with geophysical findings indicating concentration of occupation there. It is notable that small patches of pavements survive circling the bases of trees or shrubs and elevated from the surrounding ground surface: clearly these are the last remnants of larger paved areas which have mostly disappeared through erosion, the remaining small patches being protected by their proximity to the tree or shrub. This in turn suggests the loss by erosion of at least the terminal occupation of the site in certain areas. Indeed, the areas of the site featuring potsherd pavements may be particularly subject to erosion as people from the nearby village come to sweep up the potsherds, to be crushed and used in the making of floors for contemporary housing (Figure 15.2, and Brunfaut & Pinet, this volume). In addition to recording potsherd pavements, the survey across the site also recorded a single instance of a laterite pavement (N'Dah & Mardjoua, this volume).

While no systematic study was made of the presence of surface traces of mud architecture across the site, no evidence as obvious as that offered by the Trench 3/10 area was observed during regular walks across the site. To determine how representative the Trench 3/10 evidence was of the nature of architectural evidence from the site as a whole, several smaller-scale investigations were carried out in the vicinity on areas which appeared to offer potential for detecting such remains. One area, Trench 15, was located just to the north of the Trench 3/10 excavation, while the other area, Trench 17, was located further to the south, c. 75–100m away (see Map 7).

The surface survey of architectural remains was complemented by geophysical survey, using a wheeled magnetometer (C. Magnavita, this volume). Based upon these results, it was possible to make certain inferences about the sub-surface presence of buildings across the site. The geophysical survey results did not, however, provide a level of data allowing us to systematically map locations of intact architecture across the site, or indeed provide a clear outline of localities where buildings once stood. The pavements did not produce a sufficient magnetic signature to be discriminated from surrounding deposits. As just outlined, the excavation of the Trench 3/10 area was decided on the basis of surface survey during the initial, 2011, field season. Geophysical survey subsequent to the beginning of excavation confirmed this area presented one of the highest geophysical anomalies at the site, and informed the extension of the excavation.

3 The Trench 3/10 Structural Complex

3.1 *Overview*

Situated on the northeastern part of the site where initial survey identified remains of burnt mud structural remains (Figure 15.3), Trench 3/10 provided the best evidence of preserved architecture (see Nixon, Part 6, Catalogue). Pavements, stumps of mud-built walls, as well as postholes, allow the remains of a significant portion of a building complex to be traced (Figures 15.4 to 15.11). This work extended over four field seasons, the latter three

1 The reader is also referred to the Trench 3/10 trench description in Part 6, Catalogue, which is designed to be read in conjunction with this chapter. It provides additional commentary on the structural remains, a summary account of the deposits excavated, and details on the in situ pottery clusters and the radiocarbon samples collected and analysed. It also provides commentary on the various other areas of Trench 3/10 excavated which are not treated in detail in this chapter.

FIGURE 15.2 Women sweeping up potsherds from the surface of the site to be crushed for use in contemporary house floor construction – this practice often focused on remains of potsherd pavements, as the most visible concentrations of potsherds.

FIGURE 15.3 Left: area of BLAF Trench 3/10 building before excavation; right: illustration of the three levels of potsherd pavements evidenced by surface cleaning and an initial exploratory test pit.

under the direct responsibility of this author. This building was exposed over c. 100m², with six distinct spaces, all with potsherd and laterite paving (see e.g. Figure 15.8), lying 20–40cm below the surface. Further portions of this structural complex remained unexcavated to the south, while to the east unknown parts have been lost to erosion. The complex is well-dated through 14 radiocarbon dates ranging between 921 ± 23 bp (OxA-29892) and 740 ± 40 bp (Beta-305218) (full dates provided in Part 6, Catalogue).

The structure was almost certainly destroyed by fire. Deposits immediately overlying the paved surfaces contained burnt clay and large clusters of charcoal, likely representing roofing material (see Eichhorn, this volume), as well as crushed pots. This structure was overlain

FIGURE 15.4 Cleaning the portion of the Trench 3/10 building revealed by the end of the 2012 season – in the foreground is a large paved area (one portion composed of potsherds and one of laterite) while in the background, the first evidence of the wall stumps of the building can be seen emerging.

FIGURE 15.5 Overview image of the Birnin Lafiya architectural complex recorded in Trench 3/10 (shown at the end of the 2013 season). The circular Rooms 1 and 2 can be seen as well as the paved areas adjoining these rooms. Trench 9 is also visible on the right side of the image.

by an eroded pavement and, as demonstrated by keyhole trenches, is underlain by another building horizon featuring well-preserved pavements and apparent signs of intact structural remains. Consequently the deposits here indicate at least three stratified levels of construction, relating to a sequence of three building complexes, the middle one of which formed the principal focus of excavation (Figure 15.3). Excavation of Trench 9 immediately adjacent to the house complex (Livingstone Smith & Nikis, Part 6, Catalogue, this volume) cut through the

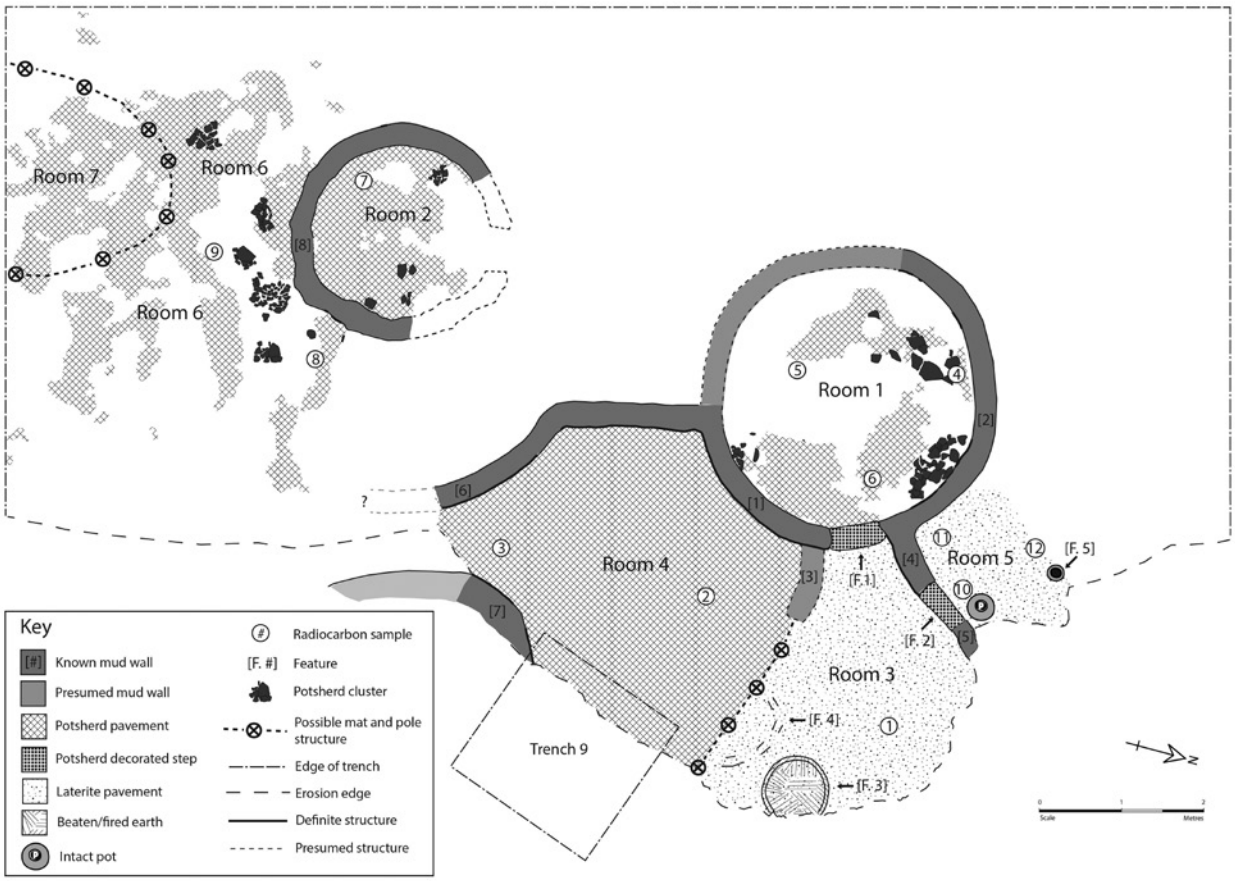

FIGURE 15.6 Plan of structural complex with mud walls and potsherd and laterite pavements, excavated in Trench 3/10 (relationship to Trench 9 also indicated)

FIGURE 15.7 Looking across a portion of the excavated Trench 3/10 house (in 2013) showing Room 1 in the centre of the image. Note the pottery decorated step into Room 1 (at centre), and a complete pot (bottom right)

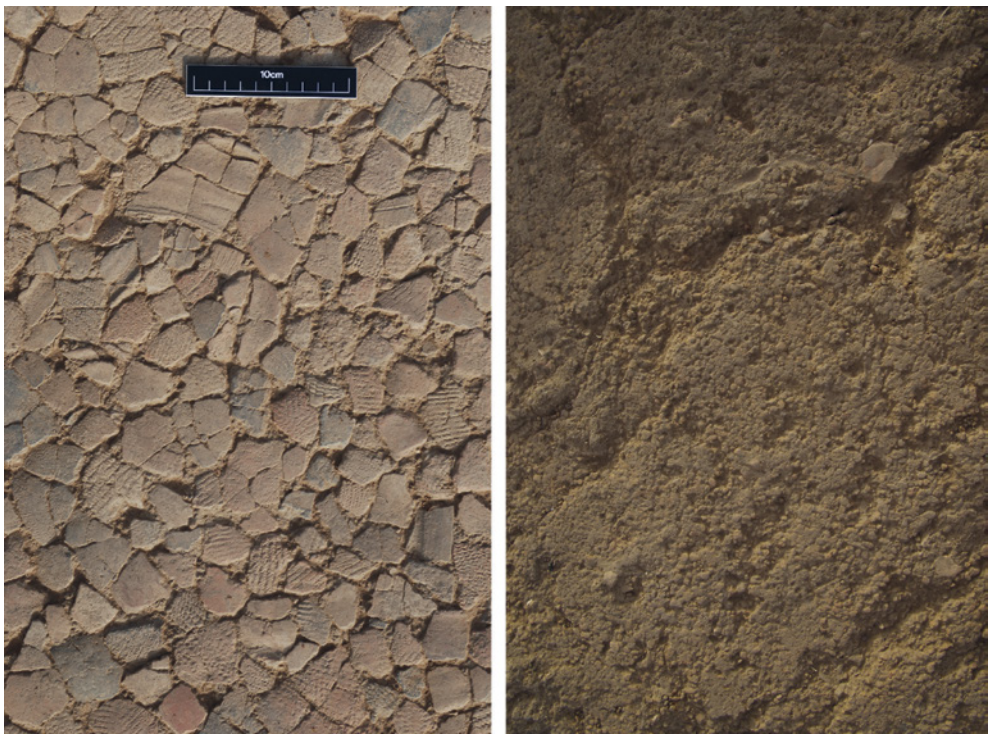

FIGURE 15.8 Close-up views of potsherd and lateritic pebble paved surfaces – both recorded in Trench 3/10

FIGURE 15.9 Features excavated within the Trench 3/10 building complex (clockwise from top left): close up of wall-stump of mud wall of Room 1 – note the fired surface of the wall, a result of burning during destruction of the building; potsherd covered step of Room 1; ceramic cylinder vessel embedded in laterite floor; pounded earth disc feature

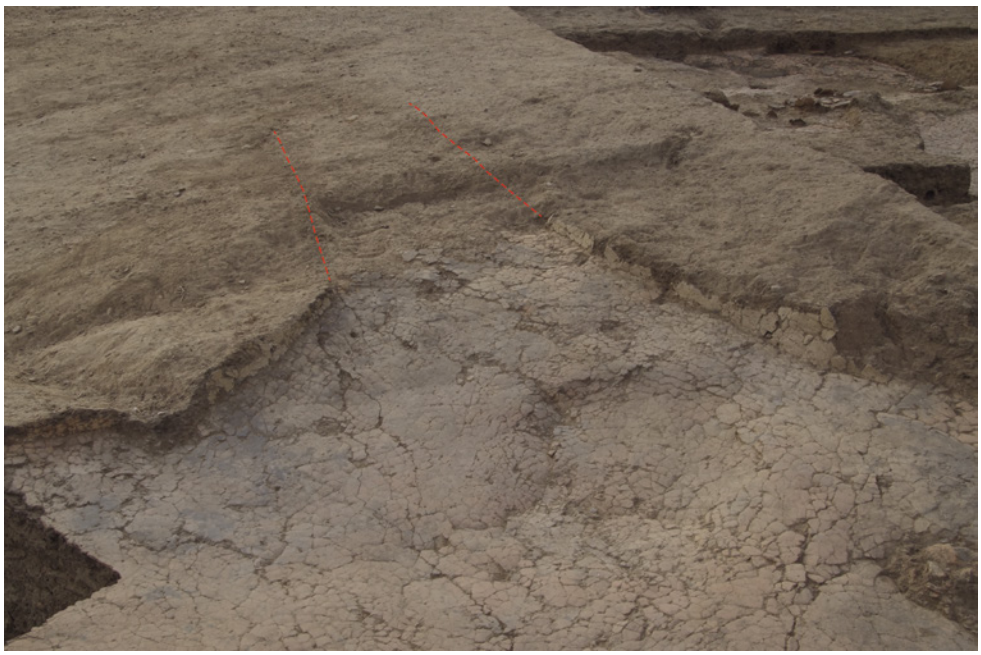

FIGURE 15.10 Corridor leading off from the large potsherd-paved space abutting Room 1 in Trench 3/10 (corner of Trench 9 can be seen in bottom left of image) – the commencement of the walls of the corridor is indicated by low wall stumps, while its continuation is indicated by differences in soil composition in a continuous line with the wall stumps (indicated here by red lines).

FIGURE 15.11 Elevated view of Trench 3/10 Room 2 and surrounds showing crushed *in situ* pots.

middle pavement surface uncovered, but did not produce clear evidence of structural remains below it.

3.2 *Definition of the Principal Structural Remains*

3.2.1 Room 1 (See Figure 15.6)

The element of the structural remains exhibiting the best preserved standing remains was Room 1, a broadly circular room space, approximately 3m in diameter (see Figures 15.6, 15.7 & 15.12). The team was unable to fully trace the circular form of the room, or to clarify the number of entrances, as the walls were difficult to follow and the pottery pavement surface was quite fragmented. The pavement was made of flat laid potsherds (all examples at the site were flat-laid), the vast majority of which featured surface decoration. In analysing the floor surface, it was observed that the paved surface was almost entirely missing from the central area of the room, an area which also featured some burnt remains. Initially, it was thought that this may relate to the presence of some kind of central roof support, but in the final, 2014, field season a burial was uncovered below the surface (see Nixon, Part 6, Catalogue, and Power & Haour, this volume for a fuller discussion of this burial), suggesting that this disturbance in the floor surface might relate to it. The section of wall on the east side of the room [Wall 1] was very compact, the wall stump standing ca. 35cm high, with a thin coating of mud plaster fired orange during the burning of the house. While initially interpreted as rammed earth due to its compact nature, it is possible that this was a result of the burning of the building, effectively leading to firing of the wall. The other sections of walls defining the room space [Wall 2] were more difficult to detect (see Nixon, Part 6, Catalogue). There was a clear entrance on the east side of the room, identifiable by a potsherd-covered step, Feature 1 (Figures 15.6 & 15.9), c. 25cm in height, with a curved section. All the potsherds within this step were undecorated. Within the northern part of the room space a large cluster of potsherds was encountered, at least some of which were seemingly broken in place, and some relating to very large vessels (see Nixon, Part 6, Catalogue).

3.2.2 The Paved "Courtyard" Area and Associated Corridor

To the area immediately east of Room 1 were found the largest intact paved spaces recorded within the complex, Rooms 3 and 4 (see Figure 15.6). Unknown portions of these paved areas had been lost on the east to erosion. Room 3 was paved in laterite and Room 4 in potsherds. The laterite paved area was dark red and concretized. By comparison with other laterite surfaces detected it was far

FIGURE 15.12 Trench 3/10 Room 1 from above, showing the positioning of the child burial found immediately below the floor surface.

more compact, and it was deduced that that this had been fired solid by burning. Likewise, careful study of the surface and comparison with other laterite areas suggested it was originally yellow in colour, the red colour therefore being caused by firing.

Within the laterite paving of Room 3 was a raised circular area in the shape of a disc made of clay/pounded earth [Feature 3], measuring c. 60cm in diameter and raised c. 5cm above the floor surface (Figure 15.9). The function of this feature remains unknown – it may have been some form of plinth. Close to this was another feature, Feature 4, but this was poorly preserved and only detectable by ridges in the laterite surface (see Figure 15.6). While the dividing line between Rooms 3 and 4 was very obvious, it is unclear whether these were separated by a solid wall or a mat and pole divider. On the south side of Room 4, remaining wall stumps [Walls 6 and 7] (about 5cm high) – the surface of which were also fired (white) – demonstrate that the large potsherd paved area of Room 4 was some form of enclosed or semi-enclosed space, perhaps an internal courtyard (Figure 15.6). These remaining wall stumps also indicate a corridor led off this paved area southwards (Figures 15.6 & 15.10), though erosion only allows for it to be traced over a limited distance. This corridor was approximately 75cm in width.

3.2.3 The Paved Area to the North of Room 1

To the north of Room 1 was another laterite-paved space, Room 5 (Figure 15.6), separated by a wall featuring another potsherd-paved step [Feature 2] (Figure 15.6). Compared to that associated with Room 1, this step was far lower (ca. 5cm), rectangular rather than curved in section, and composed principally of decorated potsherds. In Room 5 the majority of the laterite surface was yellow and less solid than in the laterite surface described above. Small areas of the surface were however red and more compact, indicating the impact of fire. This paved laterite area was not extensive, but had likely suffered from erosion. One important feature was a ceramic cylinder which had been buried in the laterite paved surface up to its neck [Feature 5], so that only the upper 10cm of the vessel was visible (Figures 15.6 & 15.9; Plate 25:3). The function of this feature is unclear, though interpretations offered for this include use as a gourd holder or storage vessel. CT scanning and subsequent excavation of the soil within the cylinder did however suggest that the cylinder was largely empty at the time of the destruction of the building.

3.2.4 Room 2 (Figures 15.6 & 15.11) and Associated Paved Areas

Further south in the excavation unit was another circular room (Room 2) with a larger associated paved area around it, somewhat replicating the scenario of Room 1. While there is no clearly traceable archaeological connection between Rooms 1 and 2 (and their associated paved areas), they were interpreted as being part of the same complex. While Room 2 was broadly circular, it was difficult to define the exact parameters of the room due to the difficulty of detecting the walls throughout. There were no fired surfaces to these walls, and the consistency of the mud used was practically identical to the surrounding matrix. The stumps were very low, possibly as a result of the collapse of the house but perhaps also truncated during excavation.

The interior of Room 2 was paved with undecorated potsherds. It was assumed that the entrance to the room lay on the poorly preserved northern side, given that the southern wall [Wall 8] appeared to have no clear break in it. In the area to the south of Room 2 further paved areas were revealed [Rooms 6 and 7] within which a distinct anomaly in the arrangement of potsherds was noted: a raised ridge forming a semi-circle, apparently suggesting they were previously built up against the base of a vertical surface. There may have been a mat-and-pole fence demarcating a living space which almost certainly extended beyond the excavated area. Lack of time unfortunately meant that this could not be pursued further. This putative space was referred to as "Room 7" (Figure 15.6).

3.3 *Summary Comments on the Complex and Chronology*

The Room 1 and Room 2 areas, with their respective associated paved spaces, were considered to be part of the same complex on stratigraphic grounds (see Nixon, Part 6, Catalogue for further discussion). A crucial element of this understanding related to the identification of an earlier potsherd paved surface which undercuts the paved spaces adjoining both Room 1 and Room 2 (detailed further below).

The complex clearly extended further south and also further east, into an area now lost to erosion. Two circular rooms were recorded, linked as part of a connected complex, associated with a covered or semi-covered courtyard, other paved exterior or interior areas, and other connected architectural spaces defining a total of seven distinct living spaces. Just how extensive the original structure was remains unknown, but some comments can be made concerning its immediate surroundings.

3.4 *The Surrounding Remains and Underlying Contexts*

3.4.1 The "Compound Wall" and Vicinity

Immediately to the north of the structural complex discussed above, what appeared to be a substantial mud wall [Wall 9] was tentatively identified as a compound wall (see Figure v.10 in Nixon, Part 6, Catalogue). This was aligned east-west and was recorded over a distance of c. 5m. This hypothesised wall was not as clearly traceable as some of the other walls evidenced in the excavation, but when the team investigated a fracture line running across the unit, the soil clearly and consistently broke away, suggesting a possible wall surface, while the appearance of a series of relatively consistent anomalies in the soil giving the appearance of buttresses, and the presence next to these of postholes, seemed convincing supporting evidence.

The relationship between this "compound wall" structure and the main building complex could not be worked out: it was not possible to discern a relationship of this wall with either Room 1, or with the laterite paved Room 5. All that can be said at present is that if this was indeed some form of compound wall, based upon their stratigraphic relationships, it was either contemporaneous to the main building or immediately anterior.

3.4.2 Excavations in the Adjoining Area to the North of the Structural Complex [Zone G]

Excavations were extended further to the north in anticipation of detecting similar preserved architectural remains in that area. While evidence of architecture was indeed recovered it proved less easy to detect than the remains outlined above. A series of pavements were encountered immediately below the current land surface, but these were poorly preserved (see Figure v.11 in Nixon, Part 6, Catalogue). Trial trenches attempting to recover evidence at depth identified a series of living surfaces, formed from orange-red clay and laterite pebbles. Given that such surfaces had been encountered in areas adjoining Room 1 and were in that context clearly floor surfaces, the same assumption was made here. However, these compact orange-red surfaces did not occur in a consistent manner, and were therefore difficult to follow. It was also not possible to detect any associated walls or structural remains. The most likely explanation for the patchiness of these compact orange-red surfaces is that they represented restricted areas affected by fire, part of a larger living surface which was less easy to detect. One significant feature recorded was a clay/laterite-lined pit which had been exposed to fire, Pit B (Figure v.13 in Nixon, Part 6, Catalogue), thereby allowing the team to trace some elements of its form.

Finally, one, or possibly two, burials were recovered close to the surface at the northwesternmost extreme of the excavated area (in Zone G (ii): see Figure v.3 in Nixon Part 6, Catalogue).

3.4.3 Excavation of Pavements below the House Complex

When investigating the area of pavements to the south of the structural complex, Rooms 6 and 7 (Figure 15.6), the team detected apparently undercutting pavements, suggesting the existence of an earlier level. The excavation of a slim trench exposed a solid area of pavement underlying Room 6 (Figure 15.13). Study of Figure 15.13 shows that in fact this exploratory trench appears to have cut through the edge of a circular wall (see left side of image); this also demonstrates the difficulty of detecting such walls in excavation. The existence of this underlying paved area demonstrates that Rooms 1 and 2, and their associated paved areas, were indeed part of the same complex (see Nixon, Part 6, Catalogue for further discussion).

FIGURE 15.13 Exploratory trench revealing intact potsherd-paved surface underlying the principal building phase explored in the Trench 3/10 area (dotted line in left-hand image indicates circular wall cut through by trench).

4 Evidence from Other Excavations at Birnin Lafiya

Investigations were also carried out at other points of the site, with the aim of recovering in situ architectural remains associated with pavements. Traces of burnt mud structural remains were observed in association with surface remains of pavements c. 25m to the north of the Trench 3/10 area (see Map 7). However, keyhole trenches here showed that erosion processes had destroyed any significant evidence. An investigation was also carried out in a promising location c. 75–100m to the south of the Trench 3/10 area (see Map 7). While processes of erosion had similarly led to the destruction of any formerly significant intact remains, clearer evidence for structural remains associated with pavements was recorded here (Figure 15.14). This consisted of potsherd pavements with limited associated burnt mud structural remains, as well as some evidence of crushed in situ pots.

Other trenches excavated across the site also revealed architectural remains. The clearest additional evidence of architecture occurred in Trench 11, where several instances of likely destroyed wall features were recovered, possibly associated with ash and burnt soil (Lee, Part 6, Catalogue, this volume). Additionally, in the same trench a portion of a potsherd pavement was recovered, located at 81cm depth (Context 7), dated by association with radiocarbon dates to cal AD 1160–1260 (Lee, this volume). This was the only other example of a subsurface potsherd pavement detected at Birnin Lafiya. Trenches 8 and 9 are also of interest for this discussion as they were excavated in the vicinity of the surface occurrences of potsherd pavements (Trench 9 was in fact located next to Trench 3/10), but did not produce evidence of any sub-surface pavements or other structures.

Within all the other excavations no clear evidence was found of intact architecture, either pavements or in situ structural remains. This said, burnt chunks of clay, almost certainly representing debris from collapsed burnt walls, were recovered within several trenches across the site. As detailed above, the most extensive evidence of these came from Trench 3/10, including certain fragments featuring impressions which appear to relate to wattle and daub structures (Figure 15.15). Other excavations only produced very limited examples of this evidence, from Trench 5 (90–100cm = 3 fragments), Trench 6 (A con. 1 = 1 fragment; A con. 3 = 1 fragment), and Trench 11 (con. 1/level 2 = 5 fragments; con. 6 = 1 fragment; con. 3/level 2 = 1 fragment).

FIGURE 15.14 Potsherd-paved surface with associated traces of fired mud structural remains and featuring remains of crushed pots on its surface – located in the eastern portion of Birnin Lafiya site, *ca* 75m south of Trench 3/10.

FIGURE 15.15 Fragments of fired clay excavated from Trench 3/10 apparently bearing impressions of wood structural remains, potentially related to a wattle-and-daub structure.

As these remains were not collected systematically across the site this evidence can only be viewed as a rough guide to the distribution of this type of material across the various excavations. This said, none of the trenches produced anywhere near as extensive evidence of burnt clay remains as were found in Trench 3/10.

Numerous fragments of clay with a polished surface (often dark red) were found in Trench 7. No other examples of these were found across the site – one such similar example was found at Pekinga (PEK 12 context. 8).

5 Summary Account of Birnin Lafiya Evidence

The combination of surface data, geophysics and excavated data provides a good overall sense of the built environment and architectural traditions of Birnin Lafiya.

The majority of the structural remains recovered from Birnin Lafiya appear to relate to a tradition of piled earth construction. The possibility that rammed earth technology was used had been considered in light of the very compact walls recorded within Trench 3/10, but these walls are now believed to have been compacted through firing during the burning of the structure. The team recovered no evidence for the use of sun-dried mud bricks, although it may be that builders used rudimentary blocks of wet mud during construction. Suggestive evidence also exists for the structural use of wood, potentially related to mat-and-pole construction, indicated both by the post-hole evidence from Trench 3/10, as well as by impressions on some of the mud architecture fragments recovered (Figure 15.15).

Given the almost total absence of structural remains at depth, it is not possible to make any significant assessment of the nature of architecture in the earliest phase of the site. However, there is evidence of occasional finds of small chunks of burnt clay, testifying to the presence of mud architecture and its burning. Likewise, the depth of the archaeological layers is suggestive. The depositional build-up of c. 4m at Birnin Lafiya is almost certainly related to the accumulation of wall melt, either occurring through a gradual process of deterioration of mud walls linked to water action, or linked to more dramatic destruction and rebuilding as seen in the case of Trench 3/10.

The surface evidence and excavated pavements provide a reasonable summary of the nature of pavements at the site (N'Dah & Mardjoua this volume). The potsherd pavements recorded were all formed from unworked potsherds, flat laid with the outer (convex) surface facing upwards. On the whole, these potsherds were a random arrangement of sherds from different vessels, and only occasionally could contiguous potsherds from the same vessel be seen (likely crushed *in situ*). The potsherds were generally 3–5cm^2 and c. 1cm in thickness. One discernible characteristic of the pavements was that there was clear choice in the selection of potsherds for different paved surfaces. Some pavements were made of predominantly decorated potsherds (e.g. Figure 15.8), while others were composed entirely of undecorated sherds.

No patterning was seen in the arrangement of potsherds within a single pavement and there was no combination of potsherds with other materials. There was far less evidence for laterite pavements, so we are therefore largely restricted to the relatively small excavated sample (e.g. Figure 15.8). Those identified appear to have been made from yellow lateritic pebbles, heavily compacted to create a solid surface. The largest expanse of laterite pavement recorded (in Trench 3/10) had been fired, converting it into a solid surface and changing it from yellow to red. Whether this firing was an accidental result of the destruction of the house by fire, or an intentional process, is unknown. Only one laterite pavement was identified during surface walking (N'Dah & Mardjoua this volume), but it must be acknowledged that surface walking was principally focused on identifying pottery pavements, and laterite pavements are far more difficult to distinguish from surrounding natural surface soils.

Insights into the use of pavements at the site have been based almost exclusively on the evidence from Trench 3/10. Here, potsherd pavements were used for the interior of the small circular rooms, but also in courtyard-type areas, in the surrounds of rooms, and in corridors. One particular use was in the decoration of steps (e.g. Figure 15.9). Based upon the evidence available it is not possible to say if pavements were used for outdoor or semi-outdoor contexts as well as interiors. The excavated Trench 3/10 space was also important for showing that both potsherd and laterite pavements were used in the same structure, and indeed side by side, clearly showing the use of these flooring techniques for different functions or types of spaces. The fact that seven distinct paved architectural spaces were identified shows these surfaces were not restricted to certain types of spaces.

Based upon the excavated evidence then, it can be hypothesised that a significant proportion, if not the majority, of potsherd pavement remains seen across the site relate to the paving of interior architectural spaces. While most potsherd pavements on the surface of the site were so eroded as to make it impossible to reconstruct their original layouts (and, as noted above, laterite pavements are even less easy to identify on the surface) certain observations are possible regarding their original form. A significant number were of relatively large dimensions (see N'Dah & Mardjoua this volume), suggesting large paved spaces existed comparable to those detected in Trench 3/10, and therefore that the use of paved spaces in addition to discrete small circular rooms was not exceptional.

Providing an account of the spatial and temporal distribution of pavements at the site is complicated. Pavements appeared to be most common in the northeast of the site, but caution is necessary in interpreting this pattern. Existing evidence for pavements was largely found in the unploughed areas of the site, and many pavements were also revealed on erosion slopes. It may be that ploughing has entirely dismantled pavements in some parts of the site, and their remains would simply appear as relatively intense concentrations of potsherds (see Connah 1981, who notes concentrations of potsherds at Daima which may be destroyed potsherd pavements). The survey of the site (N'Dah & Mardjoua this volume) encountered widely distributed potsherds, and it was not always possible to discriminate between concentrations of potsherds that might have been a destroyed pavement and those resulting from other causes.

Regarding the temporal presence of pavements at the site, the Trench 3/10 data suggests that the potsherd pavement phenomenon is relatively late at the site, as it occured in the upper 50cm of the site, dating to c. tenth to twelfth centuries AD. The existence of three or four levels of pavements in the Trench 3/10 area seems borne out by the various other excavations carried out in this vicinity. The proposed dating for the pavement recorded in Trench 11 supports this chronology, being dated to AD 1160–1260 (Lee, Part 6, Catalogue, this volume). Likewise, the failure to detect pavements below those present on the surface in both the area c. 75–100m to the south of Trench 3/10 and in the Trench 8 area corresponds well with this pattern.

6 Other Evidence in Dendi

A range of other evidence of past architecture was recovered during fieldwalking by the project team (see Map 3 for site locations). These pavements can be broadly approximated to what was found at Birnin Lafiya, being composed of unworked broken potsherds laid flat, and not formed into a decorative pattern nor combined with other materials. That said, no intact structural remains were noted in association with the pavements encountered in survey. At certain sites visited during the regional survey (e.g. Ag038, see Gazetteer), potential evidence for burnt mud-architecture was recorded, though this was not seen and verified by this author, and these were not recorded in association with pavements.

In addition to Birnin Lafiya, three sites presented excavated and dated examples of pottery pavements. Firstly, excavation at Alibori Site 2, 4km west of Birnin Lafiya, produced a date for a pottery pavement of 730 ± 30 bp [Beta-378257]. At Pekinga, 60km northwest of Birnin Lafiya, a

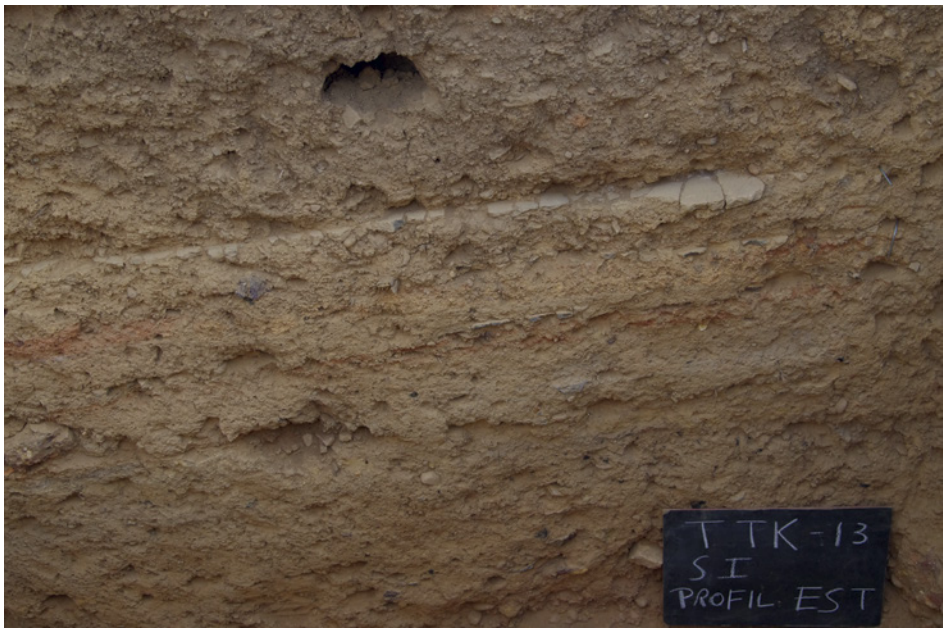

FIGURE 15.16 East profile of TTK Trench 1 showing multiple layers of paved surfaces in the section wall (scale: width of board = 30cms)

potsherd pavement was dated to 610 ± 30 bp [Beta-321057]. At Tin Tin Kanza, 20km north-northwest of Birnin Lafiya, two trenches were excavated recovering a range of paved surfaces, including potsherds, laterite, and unidentified red and white materials (Champion & Haour 2013, this volume; Khalaf & Haour 2013, this volume). In Trench 1, seven superimposed pavements were recovered over a depth of some 110cm (Figure 15.16). Amongst the radiocarbon dates from Tin Tin Kanza the two most reliable dates from deposits associated with pavements are 880 ± 30 bp [Beta- 417594] for Trench 1 and 920 ± 30 bp [Beta-348774] for Trench 2, though the chronology from the site is complex and potentially flawed. In Trench 2, excavations were stopped before attaining sterile soil and were terminated at the level of a pottery pavement; so the date of the earliest pavements is unknown. On the basis of the present evidence therefore, these sites provide relatively good overlap with the chronology of pottery pavements from Birnin Lafiya, with the example from Pekinga, and possibly Tin Tin Kanza, extending this chronology perhaps into the late fourteenth century.

While the pavements from Tin Tin Kanza showed parallels with the evidence from other sites, they also provided important variations. Firstly, and most obviously, certain pavements at this site featured potsherds used in combination with pebbles (e.g. Figure 15.17). Other forms of floor surfaces were also evidenced, including unidentified white and red substances (e.g. Figure 15.18). There also appeared to be parallels with the laterite pavements recorded at Birnin Lafiya, including burnt examples recorded within the TTK Trench 1 sequence, although there is some uncertainty here as to whether they may represent destruction rubble (see Champion & Haour, this volume). Potentially the use of these materials for flooring relates to the distinct functions of the spaces. Tin Tin Kanza also produced important evidence for structural remains associated with these pavements (e.g. Figure 15.19). While the limited test excavations meant that no detailed account of the wider structures could be provided, the evidence recorded provides a good sample of structural remains from the site. There was evidence of the use of mud walls, apparently for both piled earth walls and walls which were highly compact and of a lighter colour than the surrounding soil, potentially indicating a different construction technique (e.g. Figure 15.19). Again, as with Birnin Lafiya, there is no evidence of the use of mud brick. There is also evidence of curvilinear forms and multi-component structures (Figure 15.19) rather than simple hut forms. The evidence available from Tin Tin Kanza came from two separate trenches, showing that the structural remains from the site were not simply restricted to one building.

7 Discussion

7.1 *The Archaeology of Early Architecture in West Africa*

The evidence recovered provides a crucial contribution to the data set of early West African architecture. Despite the great amount of interest in past traditions of West

FIGURE 15.17 Pavement uncovered in TTK Trench 1 featuring both potsherds and pebbles

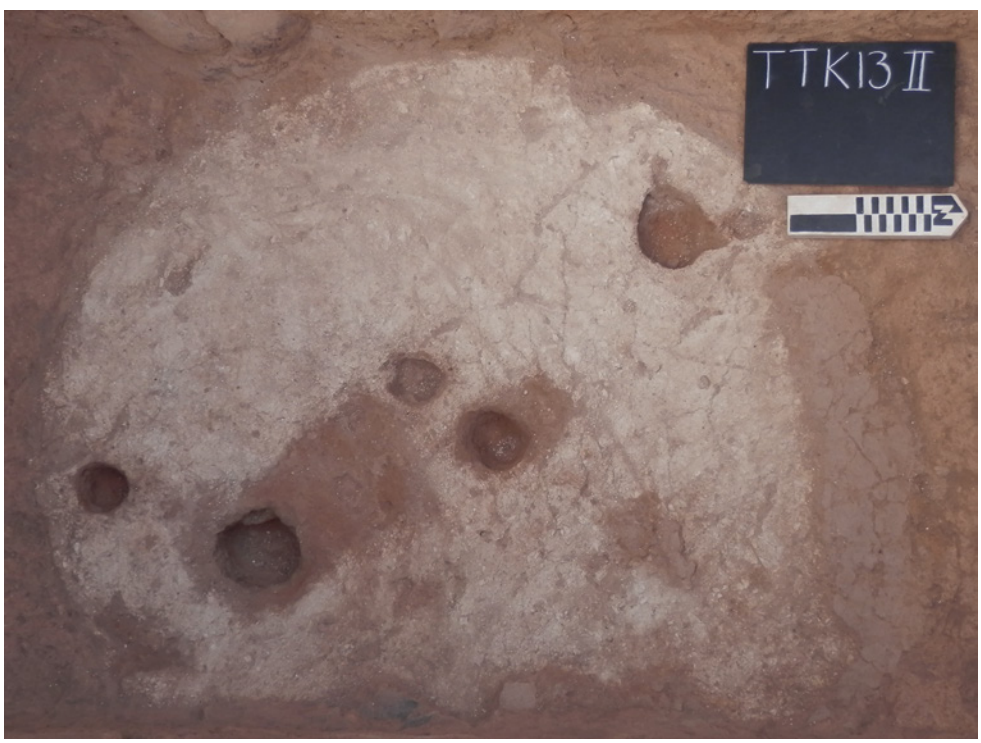

FIGURE 15.18 Small circular architectural space in TTK Trench 2 featuring a white floor surface of an unknown material

African architecture, archaeological recovery of architectural remains is rare, and most studies of West African architectural traditions are based upon ethnographic study or documentation from relatively recent periods (e.g. Prussin 1986; Dmochowski 1990; Blier 2004). While stone architecture is found in certain regions – particularly the northern Sahel and southern Sahara (e.g. Munson 1980; Devisse 1983; Berthier 1997; Nixon & Suzanne 2017) – the mud architecture which was commonly used in the past throughout most of West Africa is far more difficult to detect archaeologically, leading to a dearth of good data for early West African construction. First millennium and early second millennium AD sites from which there is substantive evidence of mud structural remains are

FIGURE 15.19 Sections of curvilinear mud walls associated with potsherd pavements, uncovered in TTK Trench 2

limited to a handful (e.g. McIntosh 1995; MacDonald 1998; Bedaux et al. 2005; Petit et al. 2011; Dueppen 2012; Gestrich 2013; Gestrich & MacDonald 2018), and the recovery of very well-preserved examples is incredibly rare. The relatively recently discovered evidence from Oursi Hu-beero, Burkina Faso, resulting from particular conditions of preservation, is perhaps the most notable exception to this (Petit et al. 2011). Prior to this work, no recorded evidence existed for early architecture in Dendi or the wider surrounding region (Brunfaut & Pinet, this volume).

The evidence from Birnin Lafiya demonstrates the existence of complex architectural forms, multi-element

architectural units with complex articulation of the built space, and expenditure of energy on such features as floor surfaces. The most complete form is the excavated example from Birnin Lafiya (Trench 3/10), where multi-element architectural spaces, both individual rooms and what appear to be larger communal spaces can be seen. A high level of finish can be seen both in the treatment of the pavements and in the elaboration of individual features, including the use of mud-plaster, the paved-step features [Features 1 and 2], the "raised disc" [Feature 3], and the buried ceramic cylinder, Feature 5 (Figure 15.9). Comparable examples across the site surface, albeit in less complete form, and the fairly widespread existence of pavements across the site, indicates that the excavated examples from Trench 3/10 represent a wider architectural tradition at the site. The tentative identification of the compound wall [Wall 9] should also be noted here, even though such a feature awaits definitive identification at the site. The evidence from other sites in the wider region also points towards a similar pattern elsewhere, with a widespread occurrence of pottery pavements at sites across the study area. This is also borne out with excavated evidence from the site of Tin Tin Kanza, which provided further demonstration of the nature of architectural forms, recording in situ remains of multi-element spaces and associated paved surfaces. Accordingly, it can be demonstrated that the Dendi region was home to a developed architectural tradition in the late-first millennium and early-second millennium AD.

Archaeological evidence of similar complex architectural forms from this period in West Africa has principally been recovered further north in the Sahel. Well-known evidence from the sites of Jenné-jeno (McIntosh 1995) and Dia (Bedaux et al. 2005) shows the presence of multi-component mud architectural forms dating back to the first millennium AD, found in conjunction with evidence for potsherd pavements. Other evidence includes the well-preserved mud-architecture subject to large exposure excavations at Tongo Maaré Diabal, a medium-sized tell near Douentza, Mali dating to ca AD 400–1100 (Gestrich 2013; Gestrich & MacDonald 2018). Recently, work at other Sahelian sites has uncovered parallel evidence. Excavations at the site of Oursi, dated to the tenth century AD and preserved by fire (Petit et al. 2011), identified a very large and well-preserved complex with mud walls and mud-plaster flooring. Recent work on the upper levels of the site of Sadia (Huysecom et al. 2015) has demonstrated a variety of mud-built structures in "honeycomb" type clusters, dated to the early-second millennium AD. Below the Sahel, similar forms of evidence have been limited. However, recent work at the first to second millennium AD savanna site of Kirikongo in Burkina Faso has recorded buildings with walls of sun-dried bricks or puddled mud, and crushed laterite or clay/laterite flooring (Dueppen 2012). Incidentally, crushed pots were commonly encountered within these buildings, as observed at Birnin Lafiya.

7.2 *Building Form, Construction Technique, and Function*

The architectural forms evidenced by this work relate primarily to a curvilinear tradition, this having been evidenced both at Birnin Lafiya and Tin Tin Kanza. The only example of a form relating to a rectilinear construction was the possible "compound wall". Birnin Lafiya's Trench 3/10 provides the only good example of a large horizontal exposure of an architectural complex, composed of small circular rooms linked into a larger architectural unit, with communicating corridors and associated courtyards, as found for instance at sites such as Oursi (Petit et al. 2011). As the ethnographic studies conducted in Dendi have shown, this form of construction was common in the region up until relatively recently (Brunfaut & Pinet, this volume). The archaeological evidence now provides an important demonstration of the time depth of such forms in the region.

One clear measureable form for comparison with evidence from elsewhere in West Africa is the complete circular rooms evidenced at Birnin Lafiya [Trench 3/10 Rooms 1 & 2], measuring c. 2.5–3.5m. These fall within a fairly standard range, the average at Oursi being c. 3.5m (Petit et al. 2011: Ch. 5), while this is also the case at Jenné – jeno (e.g. McIntosh 1995: 100–101). The most common examples noted at Sadia were slightly smaller, however (Huysecom et al. 2015). While the conditions of preservation do not allow a judgement to be made about the upper levels of the buildings recorded at Birnin Lafiya, there is every likelihood that such a building had a flat roof, allowing access and enabling its use as a work space or storage space, as is seen at Oursi (Petit et al. 2011: Ch. 5). Roofing material almost certainly incorporated beams and poles and the charcoal evidence from Trench 3/10 relates well to types of woods commonly used for such construction historically within the region (Eichhorn, this volume). Of note are the very small rooms recorded at the site of Tin Tin Kanza, something also seen at Sadia (Huysecom et al. 2015) – it is unclear what these could have related to, though it is possible that they had a storage function.

On present evidence, it would appear that the tradition of construction at Birnin Lafiya was one that used piled or puddled mud (although the possibility of rammed earth cannot be totally discounted) rather than mud brick. The evidence from Tin Tin Kanza provides a similar picture

and may indicate a regional pattern. During this period there is evidence of mud brick technology at Jenné-jeno from c. AD 800–900 (McIntosh 1995: 18), using the round *Djenne fere* style mud bricks. Mud brick building can also be seen from a similar period at Dia (Bedaux et al. 2005). Likewise, mud brick is evidenced in the first millennium at the site of Kirikongo, used in combination with puddled mud (Dueppen 2012). Mud brick technology is also the common technology at the sites of Oursi (Petit et al. 2011: Ch. 5) and Sadia (Huysecom et al. 2015), broadly comparable in date with the evidence from the Dendi region. While recognising the relatively limited sample, at present the evidence available suggests that mud brick technology was not used in the Dendi region until later than at these contemporary sites from Mali and Burkina Faso.

It is not possible to determine at present the likely function of the buildings uncovered, given that the archaeological finds within the buildings do not provide precise clues. Based upon parallels with other examples such as Oursi (Petit et al. 2011), however, the most likely explanation of the buildings is as domestic building complexes. The relatively elaborate nature of the building recorded in Trench 3/10 does, however, certainly pose the question of how common such a structure would have been. The recovery of a burial under the Trench 3/10 building also raises certain questions, including whether the person buried may have been a previous occupant of the building.

7.3 *Potsherd Pavements*

One of the features of West African architectural traditions which has been relatively well-detected archaeologically are pavements, principally those made from potsherds, but also those made from lateritic pebbles and other materials. Potsherd pavements in particular have seen a certain number of studies providing a broad sense of their distribution and formal attributes, and discussing their possible functions (e.g. Nzewunwa 1989; Ogundiran 2000; Haour 2013). One of the issues hindering the interpretation of potsherd pavements has been the limited identification of associated structural remains; again, almost certainly a result of the vagaries of preservation, and the difficulty of detecting mud architecture or other organic structural features. The recovery in particular of a well-preserved building at Birnin Lafiya now provides one of the best West African examples of structures associated with potsherd pavements. This is of regional significance, since potsherd pavements are one of the most distinctive features within West African architectural traditions.

The most well-known examples of pavements are from Yorubaland, and particularly from southern Nigeria, and in this context these have come to take on a great importance within archaeological debate, indeed in some cases defining regional archaeological periodisations (Nzewunwa 1989; Ogundiran 2000). The Yorubaland tradition is most well-known for potsherd pavements formed using edge-laid sherds, as well as the combination of potsherds with other materials, including pebbles, and the arrangement of the sherds into patterns. The best-known southern Nigerian examples are from Ife, dating from c. twelfth century AD onwards (Shaw 1968; Willett 1969; Garlake 1974: 114–120, Figures 15.3 & 15.4, Plate XXXVI), but pavements are relatively widespread within Nigerian Yorubaland (see e.g. Ogundiran 2000). While the edge-laid variety is most common, examples also exist of flat-laid potsherd pavements, such as those recorded at Old Oyo, in the Agbaku Rockshelter site (Folorunso 2008: 7). Examples using edge-laid sherds arranged in patterns are also found in thirteenth and fourteenth century contexts in Benin City (Connah 1975: 32–33).

Pavements in a similar style to those encountered in Nigerian Yorubaland have also been found in southern Togo, dating to a similar period, and often associated with the cultural influence of Ife (Nzewunwa 1989). In southern Togo pavements are found at multiple sites, and there are examples of both flat- and edge-laid types (Aguigah 1993). In particular, those at Notsé and Tado have seen dedicated study, including an extensive excavated example which features the same decorative arrangement of edge-laid sherds in concentric circles as seen, for example, at Ife (Aguigah 1993: 141). Again, like at Ife, this pavement features a pot buried immediately below the pavement, placed so as to be aligned with the decorative pattern of concentric circles at the centre of the pavement (note: excavation below this pot recovered evidence of bones).

While there has been recording of a wider distribution of potsherd pavements outside southern Nigeria and the relatively well-studied southern Togo examples, this wider distribution has been less extensively discussed (see however Nzewunwa 1989; Haour 2013). For example, in northern Nigeria, pavements dating from c. eighth century AD can be found at Daima, of the edge-laid variety and featuring geometric patterning (Connah 1981). In northern Nigeria at Maleh (Birnin Leka) there is evidence of flat-laid pavements (two levels) overlain by a laterite pavement, recorded within the upper metre of the site, and from the limited dating thought to post-date the fourteenth century (Obayemi 1977: 74). Further along the Niger, southwards from Dendi, there are also important records of potsherd pavements in the Kainji region of Nigeria, with both edge-laid and flat-laid varieties, sometimes at the same site, the major site discussed being Ulaira (Nzewunwa 1989). Old Warra (Breternitz 1968: 37) also produced evidence for

five superimposed levels of flat-laid potsherd pavements over c. 0.50m and 2.50m below the surface. Edge-laid varieties have also been recorded from surface contexts at Amkunchu in Chad (Connah 1975: 32), while at Garoua, in the Benue Valley of north Cameroon, there were flat-laid varieties (David 1968). Within central Benin there is undated surface evidence for edge-laid potsherd pavements at Djougou (N'po Takpara 2011; Nixon et al. 2015). Likewise, flat-laid potsherd pavements were recorded on the surface in the modern town of Savè, and from a fourteenth century excavated context at Odo Akaba, 75km to the north (Gurstelle et al. 2015). Further south at Allada there were edge-laid examples, but again these are undated surface finds (Randsborg & Merkyte 2009: 35, Part VIII plates). Potsherd pavements have also been recorded at sites in northern Togo (Aguigah 1993). The same author (Aguigah 1993) also notes the recording of evidence for pavements in Burkina Faso.

Looking much further west, to the Inland Niger Delta of Mali, there is a range of examples of pavements using flat-laid sherds, using both worked and unworked potsherds, with recorded and dated examples from both Jenné-jeno (McIntosh 1995) and Dia (Bedaux et al. 2005). These are amongst the oldest known examples from West Africa so far, going back to at least the latter half of the first millennium AD. It is also useful to consider relatively well-documented sites where there is no evidence of potsherd pavements, including along the Niger at Timbuktu (McIntosh & McIntosh 1986a; Park 2010), Gao (Insoll 1996, 2000) and Bentyia (Arazi 1999), and inland between the Inland Niger Delta and northern Benin at the sites of Oursi (Petit et al. 2011) and Kirikongo (Dueppen 2012). While the evidence from the left bank of the Niger facing Dendi is limited, several examples were recorded at the site of Katanga by the investigations of the IRSH Niamey team in 2014 (Oumarou Idé, 2014 *Crossroads* fieldwork report).

While still a long way from arriving at coherent explanations in terms of defining overall patterning in the distribution and chronology of potsherd pavements, the Dendi evidence provides a useful addition to the wider regional picture, both in terms of its broad area and its position on the Niger River. There has been a tendency to approach the pavements in terms of diffusionist ideas with an ultimate origin in Mediterranean tessellated pavements, potsherd type pavements also being found at Jebel Moya, Delos in Greece (second century BC), and Utica, north of Tunis, as previously detailed by Connah (1975). Certainly the early dates available for pavements are in the Sahel, with the southern Nigerian dates being later. The Dendi evidence actually fits in quite well to a chronology based around the idea of a gradual movement of pavement production southwards, sitting roughly between the Inland Niger Delta and Daima dates and the "pottery pavement period" at Ife, c. AD 1100–1450. One must be cautious with these ideas as the evidence is relatively thinly spread. However, it would be remiss not to raise the hypothesis that pavements might be a phenomenon that spreads with the intensifying trade networks linking the Niger Bend and southern Nigeria around this period, as best exemplified by the trade evidence from Igbo-Ukwu at this time (Shaw 1970).

In terms of the style of potsherd pavements, there do seem to be fairly clear patterns in the regional distribution and again the Dendi evidence helps add to this regional picture. Edge-laid pavements are only found in the east and south, while flat-laid pavements are less common in these same regions. Posed alternatively, one sees no evidence of the edge-laid pavements in the Mande world of the Inland Niger Delta. The Kainji region, some 200km along the river to the south of Dendi, is a point at which a clear meeting of these two traditions can be seen, with both edge-laid and flat-laid varieties apparent (Nzewunwa 1989). Given this picture, it is interesting to see the total absence of edge-laid varieties in the Dendi region. In this same light, it is also interesting to observe the usage of pebbles interspersed with potsherds in the pavements at Tin Tin Kanza, although this is not seen at Birnin Lafiya. Importantly, the use of pebbles with potsherds is one of the defining characteristics of the highly distinctive pavements from Yorubaland, including those from Ife (Garlake 1974), and seen also in examples from Togo (Aguigah 1993). Dendi would therefore appear to be right at the north-south and east-west divide between the predominant flat-laid and the edge-laid traditions, and in terms of the use of different materials with potsherds in pavements.

Much discussion has taken place about the function of pavements, some informed by ethnographic analogy (e.g. Nzewunwa 1989). However, this debate has mainly concerned the southern Nigerian examples. In that context potsherd pavements are identified with a number of functions, including street paving, house paving, and ritual surfaces. Importantly, in southern Nigeria there has also been an identification of the edge-laid variety as a superior form of pavement, the flat-laid being seen as a basic type (Nzewunwa 1989). Crucially, in the vast majority of cases there have been no structural remains identified in association with potsherd pavements, which makes the Dendi evidence fundamentally important in this debate. In terms of interpretation of the function of the pavements in Dendi, one would say that the flat-laid style is strongly associated with usage in internal spaces. In this

context it is important to observe that while edge-laid varieties are far more durable, they are also in many ways less functional for internal surfaces. Flat-laid pavements provide a smooth surface that can easily be swept and washed without accumulating dirt and residual water (see Brunfaut & Pinet, this volume). Indeed, when considering the edge-laid paved examples, it would appear that many of these were used as external spaces such as street paving – in this context, their greater durability was more important than the need to clean them. It is possible therefore that such an external function for pavements did not exist in the Dendi region, therefore making the edge-laid variety less appropriate.

Linked to this explanation is one of aesthetics. The arrangement of edge-laid sherds into patterns is almost a logical step when arranging such sherds. This is not so with the flat laid sherds (though note that patterning can be achieved, especially in combination with other materials, as seen at Tin Tin Kanza). However, one should also consider the flat-laid style as an aesthetic in itself. The clean and smooth surfaces of these pavements are impressive and convey a sense of order and elaboration of the built space. This smooth surface aesthetic is something that is not achieved by the edge-laid variety of pavements. When considering the choice of paving and the clear dominance of the flat-laid paved tradition in Dendi, one should consider that this would have become part of the regional cultural tradition, coming to be identified as "a way to make pavements", in the same way that any craft tradition or "technical style" (Gosselain 1992) comes to dominate in a particular culture.

CHAPTER 16

Stratigraphy and Dating: Excavation Units and Associated Dates

Alexandre Livingstone Smith, Louis Champion, Nicolas Nikis and Anne Haour

1 Introduction

The various surveys and test pits carried out by the team in Dendi can best be understood when combining their stratigraphy and associated finds with the landscape in which they are set (Khalaf et al., this volume) and the historical data collected in modern villages. In this regard, the settlement mound of Birnin Lafiya and its surrounding region provide a good case study to understand the cultural chrono-stratigraphy of Dendi. The central axis of this work is the settlement mound complex, which apparently flourished between the fourth and the fourteenth century AD. Understanding the chronology of the fourteenth to nineteenth century part of the sequence was rendered more difficult by the limitations of radiocarbon dating. To relate the present to the archaeological past and oral history the following parameters were therefore used: the nature of the deposits and their associated finds, their relative chronology, their position in the landscape, radiocarbon dating, architecture and oral history.

Individual stratigraphies are detailed in the Catalogue. As regards the nature of the deposits and their associated finds, we will see that sites range from large settlement mounds with several metres of stratigraphy (such as Birnin Lafiya (BLAF), Kantoro (KRO), Kouboukoukourou (ROU-14-SI), or Tin Tin Kanza (TTK-13-SI & SII)), to medium intensity occupations (such as Karimama (KAR-14-SI) or Boyeri (BOY-14-SI)) to shallow deposits (such as Kompanti (PTI-14-SI), Kwara zeno (KAZ-14-SI & SII) or Torouwey (TRO-14-SI)). The sites consist of living floors, building rubble, pit structures or ashy midden heaps (such as at Birnin Lafiya Trench 5, Madekali (KLI-14-SI), or Bogo Bogo (GOG-14-SI)) and occasionally of cloth dyeing refuse heaps and dying pits such as those found at Boyeri (BOY), Karimama (KAR) or Guene (GUE).

In this respect, some artefacts or techniques were deemed to be useful chronological markers to build a relative chronology. As far as roulette impressions are concerned, multiple stick roulette decoration (rce-8) is relatively early and is most common on the sites of the Birnin Lafiya area while folded strip roulette (rfp-1) mainly occurs in the period AD 400–1400. In terms of small finds, cowries are mainly found in detrital layers and considered to be post AD 1850 (although they should theoretically be present in the area at least since the eleventh century AD[1]), glass is deemed to be post AD 1900 and plastic artefacts post AD 1950.[2] Of course, these crude ante/post quem dates should not be considered too strictly, but, as we will see, they provide a good guideline to put order into the various stratigraphies. A typical stratigraphy in a Dendi village will show the first layers containing various artefacts and ecofacts with the omnipresent plastic and glass. As one digs deeper, plastic will disappear, then cowries may be found as glass also disappears, leaving pottery and metal implements as the dominant material. Simple as they are these elements provide a rationale for our stratigraphic observations.

As regards position in the landscape, a schematic transect of the valley around Birnin Lafiya is crucial to understand its chrono-stratigraphy. The general morphology has been discussed above by Laïbi et al. (this volume – see especially Figure 6.6). Birnin Lafiya, as most of the settlement mounds of this part of Dendi, is set in the middle of a plain bounded in the west and southwest by the plateau of the Upper Alibori terrace, and to the east, south and north by the Niger River and its floodplain. We have some information on the plateau, and certainly the low slopes leading from it to the valley display abundant evidence of human occupation (Khalaf et al., this volume, especially Figure 7.5). The sites appear as eroded beaches just at the bottom of the plateau or as very low settlement mounds. Walking further south and east one crosses a plain where archaeological evidence is rather scarce. A few very low

1 Judging by their recovery in the Atakora (Petit 2005). But in the case of Dendi, the only two cowries we recovered which were not incontrovertibly modern were from Tin Tin Kanza SII and Kozungu SII. These may well be late medieval, but stratigraphic uncertainties make this difficult to be definite about (Christie & Haour, this volume). Iroko (1987: Map 9) has identified northern Benin as one of the areas of West Africa where cowries remained in usage into the twentieth century.

2 Exceptionally, we also recovered two coins from our excavations, the archaeologists' dream for dating. One (SF 2014-56) was a 5-centime French franc minted likely in 1925, from Tomboutou; the other (SF 2014-03) was an unidentifiable coin with a head on one side, from Bogo Bogo. The two coins seem to have been used as pendants after/instead of being used as currency (see also Note 1, above).

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dunes topped with baobabs may display scattered potsherds, evidence of low intensity occupations. Nearing the present position of the Niger River, one cannot miss the settlement mound of Birnin Lafiya. The profile of the mound itself is asymmetrical; its northwestern slope is gentle, while its eastern face is rather steep. From the bottom of the eastern face, another few hundred metres of plains give way to a lower valley, the modern floodplain of the Niger River, in which protruding rocky inselbergs or sandy islands can be found – archaeological remains are very rare in this part of the landscape. Modern villages are generally installed on the edge of this floodplain, at the 170 m. contour line of topographic maps. Such a distribution is a factor of the nature of the landscape, as discussed by Laïbi et al. (this volume), who note that the balance between flooding and the ready availability of relatively fertile land must be considered the major influence on the development and abandonment of the Birnin Lafiya mound.

In understanding the archaeological landscape, radiocarbon dates are crucial and provide the backbone for the chronocultural framework of Dendi. We have a hiatus between the early occupation of sites such as Alibori 2 and Kozungu (both first part of Phase 1), and the settlement of the mound of Gorouberi (which begins right at the start of Phase 2). It is difficult at this stage, however, to understand the meaning of this hiatus: shift in settlement pattern or lack of relevant finds? The question of the settlement picture at the turn of the Common Era will have to await further work, but for their part the problems surrounding the chronology of the past 300 years can be approached by using a range of other information. The imprecision of radiocarbon dating is notoriously problematic as we near the present, but we will try to narrow the range of uncertainty and discuss the dates with respect to the other parameters. Architectural and oral history are fundamental and are used to outline some hypotheses about the sequence connecting the different stratigraphies. To do so we will treat the various sites as clusters or groups related by oral history (see also Gosselain & Smolderen, this volume, and Brunfaut & Pinet, this volume, for points specific to oral tradition and to architecture, respectively).

To sum up, what follows is a hypothesis on the chrono-stratigraphy of Birnin Lafiya and by extension Dendi, based on broad stratigraphic correlation and material culture, strengthened by radiocarbon dating and with, for recent periods, historical data and oral testimonies.

2 The Birnin Lafiya Site Cluster

Some of the various test-pits excavated around Birnin Lafiya were identified during standard surveys, but local informants pointed out others to us as forming part of their history. Here we will consider them following their chronological order, which fits strikingly with oral tradition – at least for the last six centuries.

The oldest occupations are found at Kozungu, a high sand dune overlooking the modern floodplain, just on the outskirts of the contemporary village of Birni Lafia, and at Alibori Site 2, a flattened mound on the terrace of the Alibori River, some 4km southwest of the same village. At Kozungu (KOZ-14-S1 & S11), the stratigraphy can be divided in two parts. S11 is the most evocative here. The lower part of the stratigraphy – below 70–80cm – yielded a distinctive type of pottery with incised designs and a dominance of multiple stick rouletting. This unit was dated to the late second millennium BC (Beta-411136, Beta-411137). Around 70–80cm, there is an important chronological hiatus, with a gap of some two millennia – we will come back to the upper part of the stratigraphy later. In KOZ-14-S1, the lower levels were sealed by a hardened floor below which a part of a refuse pit was found. It is not clear whether this unit belongs to the early occupation or not. At Alibori 2, Trench 3, four stratigraphic levels were detected (N'Dah, Catalogue). The excavation yielded quartz débitage and ceramics, but their archaeological contexts are not clear. The ceramic material is currently under study in Bénin.

The next part of the sequence can be found at Birnin Lafiya, at the mound known as *Tombo*. Observations made in all the testpits indicate that the mound was initially a clay hill on which low intensity occupations similar to the one found in the lower levels of Kozungu took place. Multiple stick rouletting is present at Birnin Lafiya in Trenches 8 and 11 – never in great quantities, but consistently; there are two occurrences at Trench 5. At some point during the first part of the first millennium AD, the intensity of occupation increased dramatically and the mound started to rise as an accumulation of settlement debris. The overall stratigraphy ranges from AD 400 to 1300 and is characterised by a superimposition of floor levels, some of which are stratified pavements made of potsherds, refuse pits, graves, and ash middens. The dominant material remains include very abundant pottery, mainly decorated with rolled folded strip roulette impressions, as well as abundant animal and vegetal organic remains. The animal remains indicate an emphasis on the exploitation of aquatic fauna, mainly animals from the floodplain and marshy areas rather than the main river channels (Linseele & Wouters, this volume). Analysis

of vegetal remains indicates that the sequence is dominated by cereals, including rain-fed savanna cultivation of pearl millet and maybe sorghum, and seasonal décrue cultivation, especially for rice and perhaps also sorghum. There is evidence for shifts over time in the frequency of rice and pearl millet, and the extent to which this reflects social changes or a response to climatic conditions needs targeted investigation (Champion & Fuller, this volume). On the eastern side of the site, the settlement extended on the lower slopes (structures were detected under and on the other side of the road from Birnin Lafiya to Guene at the eastern side of the site).

Although the entire mound seems to have been occupied for most of the period, specific functions vary from locus to locus and through time. For example, the crest overlooking the valley on the eastern part of the site displays evidence of high density occupation with continuous successions of floors and interlocking refuse pits. In Trenches 4 and 9 for instance, some of the profiles do not display anything else but interlocking pits from the top of the modern surface to the natural clay substrate – traces of the original surface of the mound are very rare and consist only of very narrow fragments of palaeosoil between refuse pits. Other areas evidence only an accumulation of house rubble (Trench 1), while one testpit seems to be at the interface of two areas. The west profile of Trench 9 (next to the architectural complex excavated as Trench 3/10, see Nixon, this volume) displays important evidence of superimposed living floors, while the opposite face shows only refuse pits. Since Trench 9 spans Phases 2 to 4, this continuity could indicate some rather long-term functional partition of the site. However, some parts of the site (e.g. as seen in Trench 11) display an overlapping of floors, graves, and refuse pits, attesting that this functional stability was not true everywhere.

The site of Birnin Lafiya seems to have been abandoned after AD 1300. In the northeastern part of the site, the occupation ends with a succession of pavements, the last one overlaying the destroyed architectural complex (Trenches 2, 3 and 10), probably associated with a large ash midden nicknamed by the nearby villagers "*la poubelle du roi*" (Trench 5; see Livingstone Smith et al., Catalogue, this volume). It is important to note that the latest occupation of the site was not dated. Indeed, the youngest date from Birnin Lafiya, Beta-305218, comes from a probable posthole structure that was below an eroding pavement structures in Trench 2; thus this last radiocarbon date is on a feature that was rebuilt on. We can expect the effective abandonment of the site sometime after. This hypothesis may be confirmed as slightly younger dates were obtained from sites upriver, both featuring potsherd pavements: Pekinga (some 50km northwest of Birnin Lafiya) and Tin Tin Kanza (18km northwest). Based on the present evidence therefore, these sites extend the chronology for pottery-pavement sites perhaps into the late fourteenth century (see also Nixon, this volume).

According to oral traditions, the later part of the chrono-stratigraphy can be found successively at Bokorobu (BOK-14-SI), in the upper part of Kozungu (KOZ-14-SI & SII), a site already discussed above, and finally at Tondo windi (TOW-14-SI), a compound within the modern village of Birni Lafia. At Bokorobu, a low-intensity site was found[3] that appears to postdate the abandonment of *Tombo* (N'Po Takpara, this volume). At Kozungu, the upper part of the stratigraphy (above 70–80 in KOZ-14-SII, and most of KOZ-14-SI) indicates that site was occupied after the abandonment of the settlement mounds. The stratigraphy and radiocarbon dates do not fit perfectly, but we can see that this site was occupied around AD 1300–1400 and around AD 1500–1600. It was probably abandoned during the seventeenth century AD. The excavations at KOZ-14-SI revealed the existence of a series of layers of occupation and a small pit structure. This pit structure, dug into the last dated unit, was refilled and covered by another archaeological layer. That of KOZ-14-SII consists mainly of a three occupation layers, cut by a pit, sealed by a compacted unit. At Tondo windi, within the former *birni*, material included glass beads, cowries and fish hooks, and three radiocarbon dates. This stratigraphy seems to reflect the presence of a settlement site, with one context resembling a wall. The three dates taken collectively suggest the bottom part of the trench (below about 70cm) formed before AD 1700, while the two other dates, both from 60–70cm, calibrate to between the mid/late-seventeenth and the mid-twentieth century. The finds are supplemented by radiocarbon dating. The three glass beads, all from above 60cm, are likely "Prosser" or "tile" beads, mould-pressed beads made after the mid-nineteenth century (S. Magnavita, this volume). The fish hooks, all from above 50cm, the three cowries at 80–90, and the glass bracelet fragment of a type very similar to those recovered at Phase 5 sites such as Tomboutou (TOU), Molla (MOL), Kargui (KGI) or Bogo Bogo (GOG), all argue for a rather recent date. It is important to note that the excavation could not be carried out beyond 170cm here for safety reasons. But the lowest spits displayed a steady decline of material remains and occasional heavily eroded folded

3 There was a degree of uncertainty among our informants as to the exact location of this former settlement.

strip roulette decorated sherds which can probably be related to the occupation at Birnin Lafiya *Tombo*.

The combination of stratigraphic information collected in the various test-pits excavated in the area of Birnin Lafiya provides us with an almost complete overall framework for the Dendi. In conclusion, while archaeological data do not fit totally with oral traditions, particularly as regards cultural attributions, it is worth noting that the various settlements mentioned by the oral tradition did yield archaeological sites and that their relative radiocarbon chronology matches that of oral accounts.

3 Other Reference Clusters

Elsewhere in the valley, we identified at least six other clusters (or groups of sites that are historically related): Torouwey (TRO), Boyeri (BOY), Gorouberi (GOB-14), Karimama (KAR), Guene (GUE, ROU and ENE) and Madekali (KLI).

Here, we will discuss these clusters trying to make room for oral testimonies as well as strictly archaeological data. Indeed, as we said above, while each test pit is archaeologically independent, it is possible to group the various test-pits into clusters according to oral history narratives. Most of these test-pits were indeed located and excavated because of oral testimonies, and several of them confirmed crucial elements of the narration. In general, the length of occupation indicated by oral tradition was directly correlated with archaeological deposit thickness (short occupations being attested by shallow deposits), but specific events were also confirmed (such as the sacking of Boyeri, confirmed by the important destruction deposits we excavated at the site). The calendar dates derived from oral traditions referred to here are very conservative, that is, estimates were always drawn towards recent periods and thus can be considered as minimal ages.

3.1 *Tourouwey Cluster*

This is certainly the most complex historical grouping. According to oral historical sources, the site of Torouwey (TRO) is an ancient settlement founded by the Mulanche/Kumate and may have been abandoned towards the end of the eighteenth century or early nineteenth century (Gosselain & Smolderen, this volume), leading to the development of Kwara zeno (KAZ) towards the end of the eighteenth century and then later to that of Bogo Bogo (GOG), towards the beginning of the nineteenth cent.

Going back in time, archaeological data collected at GOG-14-SI fit with oral accounts. The place we excavated is a trash midden today, but was supposed to be between the oldest compound and the former *birni*. The presence of plastic in the first 40 cm, glass down to 130cm–140cm, and seven fragments of coloured glass bracelets down to 90cm, fits with use during the twentieth century. Two pits were found at the bottom. The first was completely filled before being cut by the second. These overlapping pits indicate an important change in spatial organisation around the locus. Three radiocarbon dates fall, after calibration, between the mid-seventeenth and the mid-twentieth century. But combined with artefacts and with stratigraphic parameters we can suggest the deposition we excavated at Bogo Bogo took place during a period of time between the eighteenth and nineteenth century. The pottery associated with these contexts is characterised by the presence of black polished vessels decorated with twisted cord roulettes and red pigment, as well as pottery decorated with blepharis roulette (Nikis & Livingstone Smith, Catalogue).

The two test pits we excavated at Kwara zeno (see Amoussou et al., Part 6) yielded a low intensity occupation, with an underlying pit in KAZ-14-SII. The dates obtained on this small stratigraphy give a date of between the early sixteenth and late eighteenth centuries for the pit in SII, and between AD 1700 and the modern day for the occupation layer in SI. The finds include two pipe fragments (one in each trench, and in both cases in the 20–30 layer), a large translucent blue glass bead (SF 2014–77; S. Magnavita, this volume) at 30–40 in SI, and two iron objects. The site is devoid of modern pollution such as glass, cloth or plastic. The most striking feature is the presence of very loose folded strip roulette decoration and blepharis roulette decoration as well as large fragments of undecorated pottery built with the hammering (or pounding on a concave mould) technique.

At Tourouwey,[4] the shallow stratigraphy is similar to that of Kwara zeno, consisting of a thin occupation layer covering a shallow pit. The fact that it is located in the flood plain below the 170m contour line and the absence of folded strip roulette decoration indicates a post fourteenth century AD occupation. A radiocarbon date obtained from organic material in this depression gave a date of between AD 1700 and 1920. The pottery finds are characterised by the presence of pottery decoration including blepharis roulette, some carved wooden roulette and cross-hatched geometric designs (see Plate 5: 1, 2).

4 There was a degree of uncertainty among our informants as to the exact location of this former settlement.

It is difficult to know if archaeological data can support the claim of oral tradition as regards the filiation of the three sites. In fact, radiocarbon dates are of little or no use in this debate as all, once calibrated, roughly span the late seventeenth century to present day, and as we saw there is a strong possibility that the site we excavated at Torouwey is not the one alluded to by historical sources. Taken together, however, the radiocarbon dates could indicate a continuous occupation, in accordance with oral traditions, starting during the sixteenth or seventeenth centuries.

3.2 *Boyeri Cluster*

This small cluster is related to the founding and destruction of Boyeri. According to oral history the site was a thriving dyers' community burnt down in the second half of the nineteenth century by the army of the Saka of Kandi (Gosselain & Smolderen, Gosselain & Haour, this volume). Although, we have no radiocarbon dates to confirm this hypothesis, one of our test-pits (BOY-14-SI) did yield major levels of destruction, under which two older archaeological units could be identified. The pottery material found here is similar to that of TRO-14-SI, with the presence of blepharis roulette impressions and potsherds bearing macrotraces of the hammering technique (also known as pounding on a concave mould). After the sacking of the city, it is said that refugees obtained from Loumbou Loumbou the right to settle in Kompanti. In Kompanti (PTI), we encountered a very shallow stratigraphy. The ceramics are wholly insufficient to draw any conclusion; we recovered one potsherd with blepharis roulette decoration on the site surface, and a single folded strip roulette sherd (Plate 5:4) – which is probably out of its original context. Small finds included a cowrie shell fragment and a plastic sheath at 0–20, and (in level 20–30) an opaque pale pink glass bead of a type apparently made after the mid-nineteenth century (S. Magnavita, this volume). At Loumbou Loumbou, the predecessor settlement, called Toutokayeri (TTO), was sampled through three trenches. These establishments can be attributed to the medieval settlement mound complex (TTO-14-SII) – a radiocarbon date and the presence of a pottery pavement support this idea – and to a post-medieval settlement (TTO-14-S1 & SIII). The pottery plates (Plate 3) clearly illustrate the contrast between the material from the medieval and more recent trenches.

3.3 *Gorouberi Cluster*

The sites surrounding Gorouberi are all grouped under the same village name as they are all clustered on a hill bordering the flood plain. This is a case were the contemporary village practically sits on top of the medieval settlement mound. The earliest radiocarbon dates are from a unit called GOB-13-SII (Robion-Brunner, this volume), on the mound at the north side of the modern town. The beginning of the settlement appears to have been at the beginning of the first millennium AD (Phase 2), with the lower part of a pit (Context 3a) dating back to the first two centuries AD, and to have continued into Phase 3 (the filling of Context 3a, for example, seems to have been completed around the ninth century AD). We have no date later than the early eleventh century. These dates match in part with the earliest dates at Birnin Lafiya, and the two sites share the common feature of being quite large mounds at a similar distance from the Niger (at least today). There is however a major difference between the two sites. The faunal assemblage from Gorouberi is small but it is notable that it yielded mainly unidentifiable mammal bone; the absence of fish is interesting to note and makes the assemblage stand out from most of the other studied assemblages (Linseele & Wouters, this volume).

The picture painted by the trench excavated in the modern settlement of Gorouberi (GOB-14-SI) is quite different. This test pit was placed in the location which informants stated lay inside the oldest compound of the village. The striking element here was the abundance of charcoal and slag, probably related to ironworking activities nearby. Plastic items occurred up to 40cm, glass was rare, and there were two cowrie shells and two ceramic pipe bowls. Blepharis and twisted cord roulette-decorated pottery were present. Metal objects were fairly abundant, and two radiocarbon readings indicate a Phase 5 date.

3.4 *Karimama Cluster*

This cluster groups two sites related to Gourma oral history: Kusulabu and Karimama. We have no dates on the former settlement, which can probably attributed to a late phase of the Phase 3–4 settlement mound complex in view of the presence of a pavement. The latter part of this settlement sequence, in the Gourma quarter of the modern city of Karimama, yielded one date which calibrates to AD 1700 to the present. Considering that the sample comes from the earliest context of a test-pit in the oldest Gourma compound, we can reasonably eliminate the twentieth century AD. This occupation can be related to that of the Tourouwey cluster as, KAR-14-SI also yielded blepharis roulette-decorated pottery.

According to oral historical data, the village of Kargui could be related to this cluster. Here the upper part of the stratigraphy revealed modern rubbish and this part of the stratigraphy is essentially a reflection of the surrounding architectural space. It yielded a mixed assemblage featuring blepharis roulette impressions and black polish.

Above 90 cm, glass (including three bracelet fragments) and metal were quite abundant, and there were three cowrie shells. Below that, a pit was found, but the pottery material was not distinctive. Two radiocarbon dates, both unfortunately marred by analytical anomalies, fall between the late seventeenth century AD and the modern day. Taken together, however, we can hypothesise that the earliest context in this part of Kargui goes back to between AD 1650 and 1800. In conclusion, the stratigraphy at Kargui clearly belongs to the post-medieval settlement of the valley.

3.5 *Guene Cluster*

This cluster includes Guene proper (GUE), in the dyers quarter of the modern city of Guene, Guene zeno (ENE), reputedly the former version this city, and Kouboukoukourou (ROU). Oral traditions are rather disjointed in this matter. According to some informants the former Guene was Guene zeno, while others, though they acknowledged the role of Guene zeno, said that an earlier place existed: Kouboukoukourou (ROU), named after the prevalence of *Combretum micranthum* shrubs at the site. Furthermore, according to some informants, there exists a historical relationship between this historical cluster and that of Tourouwey.

The three sites are in the same area; Guene zeno (ENE) is on the northern outskirts of the town, while Kouboukoukourou (ROU) is on its western edge. Going back through time it is clear that Kouboukoukourou is a large medieval settlement mound, with its classical assemblage of twisted cord roulette and folded strip roulette decorated pottery. Four radiocarbon dates (OxA-31045 to 31048) on the upper section of the mound cluster tightly, calibrating to between AD 1050 and 1250, which makes this site contemporary of Birnin Lafiya – *Tombo*. Iron production seems to have been an important component of the site. The site at Guene zeno is not dated, but was said to have been founded by Bariba princes. The pottery assemblage was very meagre but the recovery of wavy-line decoration on the shoulder (Plate 36: 4, 6) is notable as it resembles contemporary Bariba pottery. Guene (GUE) proper did not yield any significant material which might enable us to date it. Today, it is a busy modern town and a truckers' crossroads.

3.6 *Madekali Cluster*

Our final cluster to consider, the Madekali cluster, is a group of what oral tradition considers to be old Tyenga settlements, although they are not linked by a common narrative. In both cases the lower part of the stratigraphy indicates the presence of an occupation that can be attributed to the medieval mound complex – it is clearly present at KLI-14-RC1, with four dates spanning Phases 3 and 4, and is evidenced by one date from S1. After a hiatus, a sequence of trash deposits range from the mid-seventeenth to the early twentieth centuries. There was no glass or plastic throughout the sequence, but metal occurred as well as two beads of an unidentified material (polished ceramic, soft stone, or fossil bone – see S. Magnavita, this volume) and a possible spindle whorl. A pottery fragment of black burnished pottery bearing twisted cord roulette decoration and red paint was found at -100cm in a layer radiocarbon dated to Phase 5. According to a villager, some of the ash deposits constituting the stratigraphy were related to dyeing refuse.

4 Discussion

Several points can be made considering these results. Firstly, combining the different clusters we can substantially, if not completely, close the gap between, on the on hand, oral history and, on the other hand, the medieval settlement mound complex and prior occupations in this part of the Niger Valley.

The relationship between the type of site, their position in the landscape and in the minds of people, as well the material found at each location, generally fit, and they provide a structured overall picture. It is interesting to note that oral historical data are generally confirmed as regards relative chronology, as well as certain specific events (such as the sacking of Boyeri). Strong discrepancies are sometimes also noticed in cultural attribution – which is not surprising. For example, at Birnin Lafiya, if the chronology of the cluster fits rather well with oral tradition, there are also clear cultural breaks in the sequence (such as between Birnin Lafiya *Tombo* and Bokorobu). These breaks are not explained by oral testimonies.

This brings us to a second point, the relationship between the various sites. One noteworthy element is the ubiquitous presence in post-medieval occupations of blepharis roulette-decorated pottery or black polished/red painted wares. It is difficult, however, to be sure of the relative position. On small assemblages, the presence of certain potsherds could be the effect of the recycling of materials during building activities.

Nonetheless, it is possible to tentatively organise the various sites and associated pottery styles found in post-medieval deposits. The first style is characterised by buff coloured vessels decorated with a horizontal band of twisted cord roulette or very loose folded strip roulette. These vessels do not display any indication of hammering

on their internal surface. This style is mainly found at Kwara zeno (KAZ), but may also be represented in the upper levels of Kozungu (KOZ). It is a typically post-medieval style and it can tentatively be dated to AD 1400 to 1600. The second style, characterised by buff coloured vessels with blepharis roulette decoration and incised geometric designs, may also be associated with carved wooden roulettes and a specific shaping technique: hammering (or pounding on a concave mould). This style is also found at Boyeri (BOY-14-SI), Karimama (KAR-14-SI), and Bokorobu (BOK-14-SI). It is clearly post-medieval and seems to predate the colonial period. It can be very tentatively dated to the period ranging from AD 1600 to 1900. A third style is characterised by black polished vessels with horizontal twisted cord roulette decoration associated with a horizontal band of red pigment. There are no indications of the use of the hammering technique. This type of vessel is found at Bogo Bogo (GOG-14-SI), but also Kargui (KGI-14-SI) and Madekali (KLI-14-SI). Considering that in the Tourouwey cluster it appears only in Bogo Bogo, the later occupation, we tentatively suggest this style can be dated to post-AD 1800. This would fit with the position of this style in the stratigraphy at Kargui and Madekali.

5 Conclusion

This chapter has outlined the regional stratigraphy, taking Birnin Lafiya as a starting point then moving on to consider other sites. The analysis combined the various test pits realised across the region – especially those of the 2014 fieldwork season, directed by one of us (ALS) in close collaboration with Olivier Gosselain, Victor Brunfaut, Lucie Smolderen and Jean-François Pinet, who guided the choice of excavation locations. The analysis has combined the different test pits undertaken in the area, considering stratigraphic information, material culture, and radiocarbon dates. We are able to organise the chronostratigraphy through the presence of various elements: plastic (post 1950), glass (post 1900), cowries (post 1850); as well as specificities of the ceramics, particularly folded strip roulette, multiple-stick-roulette, blepharis, carved wooden roulette and painted decorations (see Haour et al., this volume, for detailed discussion of this).

Overall, the various excavations organised in the course of the project can be organised in a reasonably structured picture. It appears that the settlement pattern of this stretch of the Niger valley has changed through time, with at least one dramatic phase leading to the abandonment of the settlement mounds and the foundation of a number of modern establishments. Although our data are not precise enough for a detailed reconstruction, we hypothesise that the abandonment of settlement mounds and the foundation of contemporary villages below the 170m ASL contour line, around AD 1400, could be related to climatic changes. According to global temperature curves (Verschuren 2004), this period saw the end of a medieval climatic optimum and this also seems to fit with a major regression of Lake Chad (Maley & Vernet 2015). Clearly, the environment has seen many changes over the 3000 years which we have documented archaeologically; in particular, the highly-braided river channels seen presently and the extent of the alluvial deposits associated with the Niger indicate that the river systems have been very dynamic (Laïbi, this volume). The changes in agricultural practices evidenced by the archaeobotanical analyses (Champion & Fuller, this volume) can be seen as signs of both environmental and cultural change. Through the data discussed in this chapter, we have seen there are indications of cultural shifts and possibly the development of new styles of ceramics at certain stages. The material culture of the various chronostratigraphic units has thus been defined.

CHAPTER 17

The Pottery

Anne Haour, Sam Nixon, Alexandre Livingstone Smith, Nicolas Nikis and David K. Kay

1 Introduction

This chapter, to be read in conjunction with the site-by-site pottery data and the ceramics illustrations in the Catalogue (Part 6), has two principal objectives. The first is to outline the ceramic analysis methodology employed throughout the *Crossroads* project and to present the corpus recovered. The second objective is a comparison with other assemblages known from archaeological work in the wider region.

The first point to note is that, as in many parts of West Africa, it was necessary to effectively design a pottery typology from scratch for Dendi. Contrary to certain (rare) parts of the subcontinent, such as the Inland Niger Delta and Bandiagara Plateau, or the Lake Chad area, assemblages from this part of the Sahel were, and remain, very poorly known. We did utilise studies carried out in areas nearby, such as the Parc W (Vernet 1996; Idé 2000; Haour et al. 2006), the Atakora (Petit 2005), and Kainji River Dam (Nzewunwa 1983, 1993). In these publications, the attention devoted to ceramic analysis varies and is often minimal. We also considered assemblages from sites much further afield, often much better published (see especially McIntosh 1995b; Insoll 1996, 2000; Cissé 2011; Cissé et al. 2013; York 1973; Mayor 2011a; Huysecom et al. 2015). Finally, we consulted broader methodological publications such as Hurley (1979), Wotzka (1995), Rice (1987), Shepard (1980 [1956]) and Haour et al. (2010).

While it is important to consider the nature of contemporary potting traditions as a possible guide to informing the archaeology, at the same time there are few parallels between present-day potting traditions of the area and the archaeology. As regards these contemporary pottery traditions, the area under study can be divided into three broad geographical zones. The first stretches along the River Niger, from Pekinga to Malanville. It is characterised by the production of long-necked polychrome vessels of the kind typically observed in Zarma and Bella communities from the opposite bank of the River Niger, a tradition that has been well discussed (see, most recently, Gosselain 2016). According to most people interviewed in Dendi, long-necked polychrome vessels are rather new in the area, as a twentieth century innovation (Haour et al. 2011). The second geographical zone is situated to the east of Malanville, to the Nigerian border and further south. Here, vessels are made with the same shaping technique as in the first zone, "converging pounding" (see Gosselain 2010), but they have a more globular body, a short neck and no painted decoration. The third geographical zone starts south of Guene and extends southward and eastward into Borgou. It involves vessels with short everted necks and a decoration consisting of a single band of twisted cord roulette impression or a wavy-line motif made with a comb (Haour et al. 2011). Folded strip roulettes are not used at all through the region today.

The ceramic material recovered archaeologically included items such as shaped sherds, clay beads, pipes and figurines, as well as fragments of baked clay, but these are not discussed here (instead, see Small Finds tables; Tchibozo, this volume; Nixon, this volume). We recovered several examples of complete vessels, as well as a relatively large number of crushed vessels whose pieces were all found in distinct potsherd "clusters" during excavation (see especially Nixon, Part 6, Section V), enabling the piecing back together of complete or near-complete vessels. In addition, throughout our post-fieldwork analysis, refitting was a major component of the analysis strategy, taking place alongside the more conventional sherd-by-sherd typological analysis. Complete and near-complete vessels, as well as larger sections allowing significant reconstruction of vessel form, are for the most part illustrated rather than recorded in tabular form.

2 The Crossroads Pottery: Methodology

Most of the material recovered during our work was in the form of fragmentary pottery sherds. The volume to contend with was very large and our methodology was refined over the successive years of the project. The need for a thorough description of the materials – from a previously unresearched region – had to be balanced with the realities of what was achievable within the time available.

The initial stage, which involved on-site sampling of material, was straightforward. From the outset we applied one basic principle, namely that sherds smaller than a 25 cfa coin (26 mm diameter) were counted and discarded. This offered an objective means of reducing the amount of material for study, while incurring mini-

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FIGURE 17.1 On-site "desampling" of pottery. Birni Lafia, January 2014

mal loss of information given that analysis of variables such as temper and, in particular, decoration, can be very unreliable on items this small. An advantage of this type of sampling is that it could be reliably applied by a range of team members (even those with little formal education), so it was carried out by the team as a whole (Figure 17.1). All retained material was then washed, and bagged with internal and external labelling. The bulk of the material was exported to the UK on a temporary export permit and analysed in the United Kingdom and Belgium.

Analysis was carried out on material issuing from 40 trenches over 25 different sites (Table 17.1). Together they offer a representative cross-section of archaeological occupation of the Dendi region and of the various phases involved. The entire assemblage analysed numbers over 48,500 pottery sherds. As is natural with an assemblage this size, and a research project extending over five years, the analysis was carried out as a collaborative effort between a number of people, but at all times either Anne Haour, Alexandre Livingstone Smith, Sam Nixon, or Nicolas Nikis oversaw the process.

Given that we were working in a pottery terra incognita, we decided to present our data in the form of a catalogue (Wotzka 1995 is an example which particularly inspired us). This was complemented by tables recording the material on a sherd-by-sherd basis. Throughout we aimed for as neutral a presentation as possible. The hope here is that this will enable patterns to emerge from our data and will also subsequently allow for thematic analyses if such were desired.

Significant energy was devoted to refitting. Reconstruction of ceramic vessels not only provides a more complete account of vessel shapes (and thus potentially the function of the vessels, or the techniques by which they were made), but also provides significant insight into pottery decoration. Firstly, the reconstruction of larger surface areas improves our chances of identifying some of the more complex tools used, such as strip roulettes, as well as the way they were manipulated. It also clarifies the location of decoration on the pot and the extent to which the surfaces of pots were decorated. Larger areas also shed light on the way in which several decorations may have been combined on a pot (on these topics, see Caneva 1987, von Czerniewicz 2004a, Gallin 2011) – a particularly important aspect of this concerns the often intricate combinations of incised decorations ("is-geo") which we encountered.

The pottery assemblages from each of the trenches were dealt with one by one, and the following text outlines the methodology of our refitting and recording procedure. The data can be found in the Catalogue, Part 6, this volume.

2.1 *Refitting*

The pottery from a trench was laid out on a large table, keeping contexts separate (Figure 17.2). Sherds were placed with their outer face upwards. Within each context, sherds where a portion of the lip survived, and other diagnostic sherds (showing significant aspects of vessel form, or with other noteworthy features, such as perforations) were lined up. Once this arrangement was completed,

TABLE 17.1 Trenches analysed, sorted geographically (running upstream to downstream, northwest to southeast)

Pekinga, 2012	PEK
Toutokayori I, II and III, 2014	TTO
Kompa Dune, 2013	KOD
Torouwey, 2014	TRO
Kompanti, 2014	PTI
Tin Tin Kanza I, 2013	TTK
Boyeri I and II, 2014	BOY
Bogo Bogo, 2014	GOG
Kwara zeno I and II, 2014	KAZ
Gorouberi II, 2013	GOB-13
Gorouberi I, 2014	GOB-14
Karimama, 2014	KAR
Kusulabu I and II, 2014	KUS
Kozungu I and II, 2014	KOZ
Tondo windi, 2014	TOW
Bokorobu, 2014	BOK
Birnin Lafiya SI, 2011	BLAF
Birnin Lafiya SIV, 2012	
Birnin Lafiya SV, 2012	
Birnin Lafiya SVIII, 2013	
Birnin Lafiya SIX, 2013	
Birnin Lafiya SXI, 2013	
Kargui I, 2014	KGI
Molla, 2014	MOL
Tomboutou, 2014	TOU
Kantoro I and II, 2014	KRO
Garou, 2014	GAR
Guene zeno I and II, 2014	ENE
Guene, 2014	GUE
Kouboukoukourou, 2014	ROU
Madekali I and RC1, 2014	KLI

sherds were grouped according to a sort of "family game", based on the principle that what looks alike often goes together. Sherds with similar colours, surface texture, or other distinguishing features were grouped. They were then flipped over to refine the groups by comparing the internal surfaces. Further groupings were then established based on thickness, fabric or specific surface characteristics (scratches, fingerprints, use-wear, etc.). Sherds which appeared uncommon, as well as groups of similar sherds, began to emerge. Particular care was taken to identify refittable groups of potsherds that would offer a better understanding of shape and/or decoration. Only at this stage did the analyst begin to look across contexts for possible refits.

Technically speaking, this stage does not constitute analysis, but rather a stage in the sorting and preparation of the material. An attempt was made to keep the amount of time devoted to identifying refits roughly constant for each trench analysed. As a rule of thumb, three hours were devoted to a 1 × 1 m trench, and proportionately more for the larger units. Searching for refits and refitting continued until the end of the time period allotted for the process, and was only concluded earlier if a point was reached at which it was clear no further refitting appeared possible. At the conclusion of this phase, refits were glued using Paraloid B 72 (which is reversible if warmed), while the remainder of the sherds were dealt with as detailed below. Selected sherds were shipped at this point to the Royal Museum for Central Africa for illustration.

2.2 *Recording*

Following the refitting process, we proceeded to analyse the remaining material on a sherd-by-sherd basis. In order to do this, we separated our assemblage into four broad categories.

Body sherds which were either undecorated (i.e. those which had no surface treatment at all), or on which the decoration was illegible (due to poor application of the decoration or post-depositional factors), were simply counted and recorded, then bagged for return to Benin. These are termed "Category 4" sherds.

Body sherds on which the decoration could be recognised were given more attention. These are termed "Category 3". Decoration, including burnish, was recorded. In the initial phase of our work, we also recorded colour, fabric and the presence of slip, but we subsequently abandoned this. Colour was difficult to pin down objectively (unless one were to resort to the extraordinarily time-consuming use of a Munsell chart), fabric variations were (with the notable exception of a small number of sherds tempered with chaff or with white minerals) largely on a gritty continuum, and slip was (except for the very rare cases where it differed markedly in colour from the sherd fabric) almost impossible to distinguish reliably from surface wash.[1] Burnish was usually much more straightforward to diagnose, as a distinct shiny patina, resulting from rubbing at the leather-hard stage.[2] This was consequently recorded as a decoration. It was specified whether burnishing was internal (int), external (ext), or both (int/ext). For the great majority of other decoration types, motifs were only present on the outside; in the

1 Rice (1987: 151) and Shepard (1980 [1956]: 191) outline the difficulties in identifying slip. Certainly our material seemed to evidence the existence of what Rice (1987) terms self-slip, where the surface of a finely-textured clay is wiped, for example with a wet hand, to bring the finest particles of the paste to the surface and orient them.

2 In a few rare cases, this shine might result from post-depositional patina.

FIGURE 17.2 Classification of potsherds underway. Norwich, September 2014

(rare) instances where internal decoration occurred, we recorded this.

In some cases, specific decoration techniques could be identified with certainty ("twisted cord roulette", for example). Occasionally, we found a group of sherds with a specific, recognisable decoration, clearly the product of the same tool, although its precise nature may still escape us. In all instances we were conservative, recording the broader category (e.g. "strip roulette") when we were not able to be more specific (e.g. "small folded strip roulette"). The terminology we used followed Hurley (1979), Soper (1985), McIntosh (1995b), Schmidt et al. (2005), Nixon (2008), Haour et al. (2010), and Gallin (2011). Representative examples of both common and less frequent decorative types were recorded and selected for photographic illustration. Sherds not set aside for this purpose were re-bagged at this point, to be returned for museum storage in Benin.

Rim sherds, defined as sherds where the lip was present, whether decorated or not, were recorded separately, as Categories 2 and 1. We use the term "rim" in a rather broad sense: it refers not merely to the termination of the vessel wall (Lawton 1967), but also to the upper portion of the vessel. By not just looking at the formal attributes of the lip of the vessel, we could consider how the upper section of the vessel is finished off, including for example, any tapering or thickening. We were able to identify 86 overall rim groups (Table 17.2), plus five types of base sherds and four types of carination (Figures 17.3a–k). Rim groups were defined based on shape and irrespective of angle.

For each rim sherd, we recorded rim type code, nature and location of the decoration, and maximum thickness. Where possible, the vessel diameter was recorded, as was the angle of the rim,[3] thus indicating whether the upper part of the vessel was open, closed or vertical.[4]

2.3 *Illustration*

Central to our approach was the creation of plates of illustrations of pottery material. Illustration work was carried out by Anja Stoll, the professional illustrator of the Université Libre de Bruxelles' Centre de Recherches en Archéologie et Patrimoine, and the process overseen by Alexandre Livingstone Smith. All pottery from our project has been described either in a data table or in a Plate; thus no data have been duplicated.

All entire vessels (whether intact or refitted) were illustrated. In addition, other items, both refitted and non-refitted sherds, were illustrated based on the following selection principles.

In terms of rims, those enabling reconstruction of angle and diameter, with a significant portion of body, were almost all illustrated, especially if they were also decorated. Rims enabling reconstruction of diameter and

3 The method described by S. McIntosh (1995a: 141) at Jenné-jeno, Mali, was used to determine angle and diameter of rims. The lip of the rim sherd is placed in contact with a horizontally-held flat rigid surface (e.g. a hardback book); rocking the sherd back and forth, the position of closest contact gives the correct position of the rim. Rim sherds were placed on a sheet of paper on which arcs of circles of known diameters had been drawn with a compass, and the circle giving the best fit with the arc of the rim lip gave an indication of the diameter of the pot at its opening. Most sherds were unfortunately too small to be reliably recorded.

4 This was worked out by matching the curvature of the rim lip with a series of circles of known diameter drawn on paper.

TABLE 17.2 Rim groups defined during the pottery analysis

Simple Rims	
S1	Simple rim of even thickness with rounded tip.
S2	Simple rim of even thickness with partially flattened tip.
S3	Simple rim of even thickness with channel along tip.
S4	Simple rim of tapering thickness with rounded tip.
S5	Simple rim of tapering thickness with partially flattened tip.
S6	Simple rim of even/tapering thickness with fully flattened tip.
Thickened Rims	
T1	Slight rounded external thickening, with rounded tip.
T2	Slight rounded external thickening, with flattened tip.
T3	Slight angular external thickening, with sub-rounded tip.
T4	Greater rounded external thickening, with rounded tip.
T5	Pointed external thickening, perpendicular to vessel wall.
T6	Pointed external thickening, approx. 75° to vessel wall.
T7	Pointed external thickening, approx. 75° to vessel wall, with additional thickening to shoulder.
T8	Slight largely external thickening, tapering to tip.
T9	Greater largely external thickening, tapering to tip.
T10	Greater external thickening on outside of rim, tapering to internally facing tip.
T11	External thickening forming slight ridge, tapering to tip.
T12	External thickening forming greater ridge, tapering to tip.
T13	Slight internal thickening on inside of rim, widening to tip.
T14	Slight rounded internal thickening.
T15	Greater rounded internal thickening.
T16	Internal thickening forming ridge.
T17	Slight elongated internal thickening.
T18	Greater elongated internal thickening.
T19	Slight internal and external thickening, with sub-rounded tip.
T20	Greater internal and external thickening, with sub-rounded tip.
T21	External thickening, with channel along tip.
T22	Internal and external thickening, with channel along tip.
T23	Internal and external thickening forming Y-shaped cross-section.
T24	Thickening forms external ridged carination below tapering tip.
T25	Internal and external thickening of rounded tip, with additional rounded external thickening below.
T26	Internal and external thickening forming widened tip with small asymmetrical ridges and poorly defined central channel.
T27	Rounded external thickening, with pointed tip curving slightly outwards.
Everted Rims	
E1	Simple eversion of even thickness with rounded tip.
E2	Simple eversion of even thickness with flattened tip.
E3	Simple eversion of even thickness with channel along tip.
E4	Simple eversion tapering to rounded tip.
E5	Simple eversion tapering to flattened tip.
E6	Simple eversion with rounded external thickening.
E7	Simple eversion with extended external thickening.
E8	Simple eversion with extended external thickening, with carination below.
E9	Rounded tip everted by <90° relative to vessel wall.
E10	Tapering rounded tip everted by <90° relative to vessel wall.
E11	Slight “pinched” eversion of tip relative to tapering vessel wall.
E12	Greater “pinched” eversion of tip relative to tapering vessel wall.
E13	Slight “pinched” eversion of partially flattened tip relative to tapering vessel wall.
E14	Tapering rim with slight eversion of tip relative to vessel wall, and slight internal thickening below tip.
E15	Tapering rim with slight eversion of tip relative to vessel wall, and pronounced internal angle at point of eversion.

TABLE 17.2 Rim groups defined during the pottery analysis (*cont.*)

E16	Rounded thickened tip narrowing at point of eversion between tip and tapering vessel wall.
E17	Tip with rounded external thickening everted by approx. 45° relative to vessel wall.
E18	Rounded tip everted from vessel wall of equal thickness at approx. 70–90°.
E19	Approx. 90° eversion of tip relative to comparatively thinner vessel wall.
E20	Approx. 90° eversion of sub-rounded tip relative to vessel wall of equal thickness, with pronounced internal angle at point of eversion.
E21	Approx. 70–90° eversion of tapering tip relative to vessel wall, with pronounced internal angle at point of eversion.
E22	Collar broken at neck, thickness with rounded tip.
E23	Collar broken at neck, thickness with flattened tip.
E24	Collar broken at neck, of even thickness with channel along tip.
E25	Collar broken at neck, of even thickness with an inwards curve and rounded tip.
E26	Collar broken at neck, tapering with rounded tip.
E27	Collar broken at neck, tapering with channel along tip.
E28	Collar broken at neck, tapering with an inward curve and narrowing at point of eversion along neck.
E29	Collar broken at neck, tapering with thickening of collar above neck.
E30	Collar broken at neck, with sub-rounded tip and collar thinner than vessel wall.
E31	Broken tip of everted rim with asymmetrical taper, similar to E19.
E32	Collared rim, of even thickness with rounded tip.
E33	Collared rim, of even thickness with flattened tip, and angle of eversion of approx. 45° at neck.
E34	Collared rim, of even thickness with external thickening forming small ridge at tip.
E35	Collared rim, elongate thickening to collar but with tapering tip.
E36	Collared rim, slight elongate internal thickening of collar, narrowing at neck, with rounded tip.
E37	Collared rim, with short tapering collar and rounded tip.
E38	Collared rim, with long tapering collar and rounded tip.
E39	Collared rim, tapering with channel along tip.
E40	Collared rim, with flattened, horizontal lip and angle of eversion of approx. 90° at neck.
E41	Collared rim, with inward curving collar and rounded tip.
E42	Collared rim, of even thickness with rounded tip, and eversion of approx. 90° at neck.
E43	Collared rim, of even thickness with channel along tip, and eversion of approx. 90° at neck.
E44	Collared rim, with channel along tip, eversion of approx. 90° at neck, and with collar thicker than vessel wall.
E45	Collared rim with rounded tip and collar thinner than vessel wall, with thickening creating pronounced internal angle at point of eversion along neck.
E46	Collared rim with tapering collar and rounded tip, with internal thickening at point of eversion along neck.
E47	Collared rim with inward curve at tip, and internal thickening at point of eversion along neck.
E48	Collared rim with outward curving collar of even thickness, and internal thickening at point of eversion along neck.
E49	Collared rim with channel along tip and collar thinner than the vessel wall, and some degree of internal thickening at point of eversion.
E50	Collared rim with sub-rounded tip and short collar of even thickness, often with pronounced interior angle at point of eversion along neck.
E51	Collared rim, with external thickening forming ridge below tapering tip.

angle, but not including a significant part of the body, were assessed on the distinctiveness of the decoration and of the rim profile: undecorated rim tips were recorded and re-bagged, while those with sufficiently distinctive profiles and decoration to represent vessel types were illustrated. Those falling between these two extremes were illustrated, or not, depending on the general aspect of the rest of the assemblage. Rim tips from which the diameter could not be deduced (though the angle might be) would tend to be merely recorded in data table form, although such items featuring either a distinctive decoration or a distinctive profile might be illustrated, while such sherds featuring a combination of distinctive decoration and distinctive profile were usually illustrated.

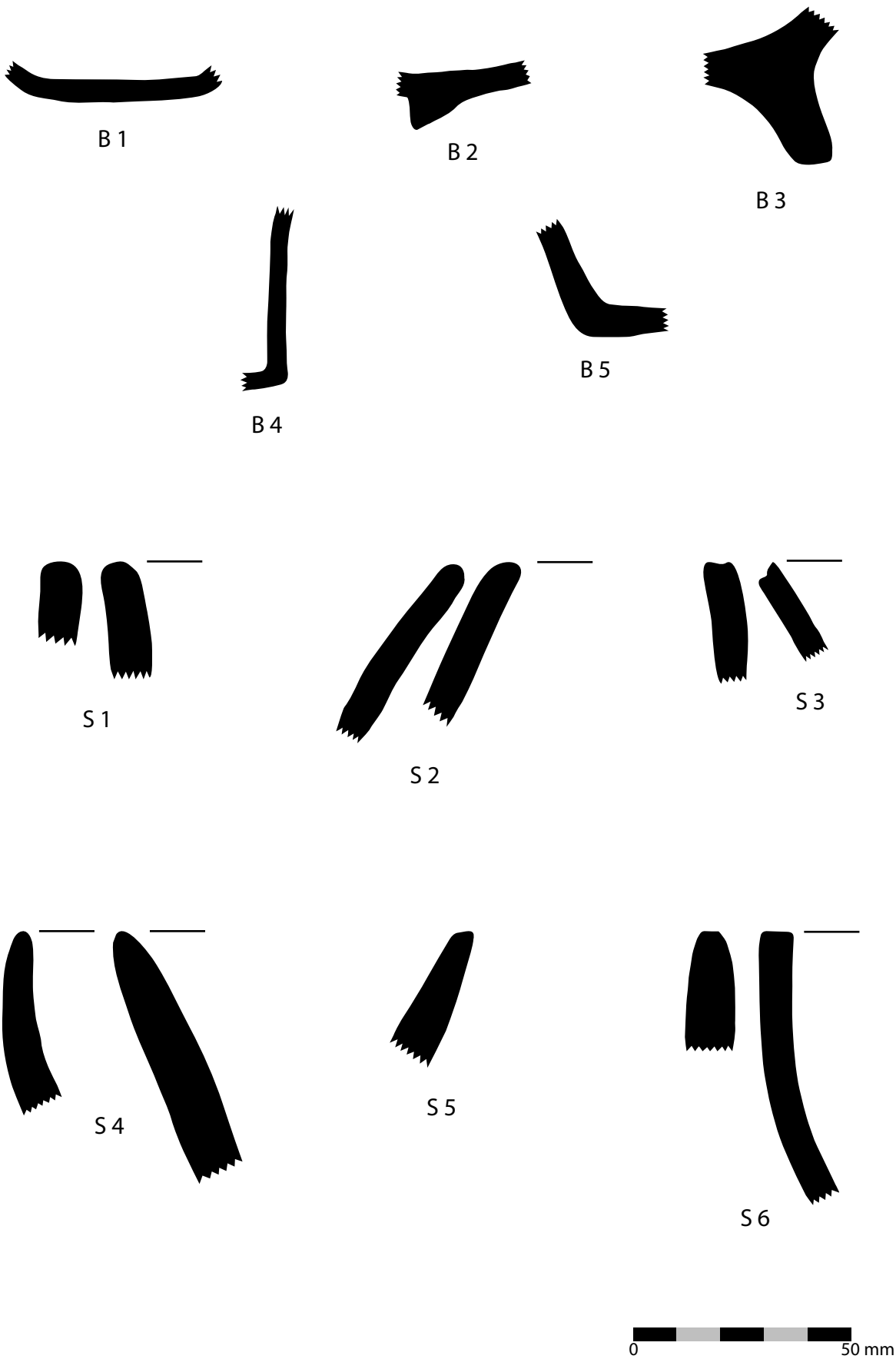

FIGURE 17.3A Simple rims and bases

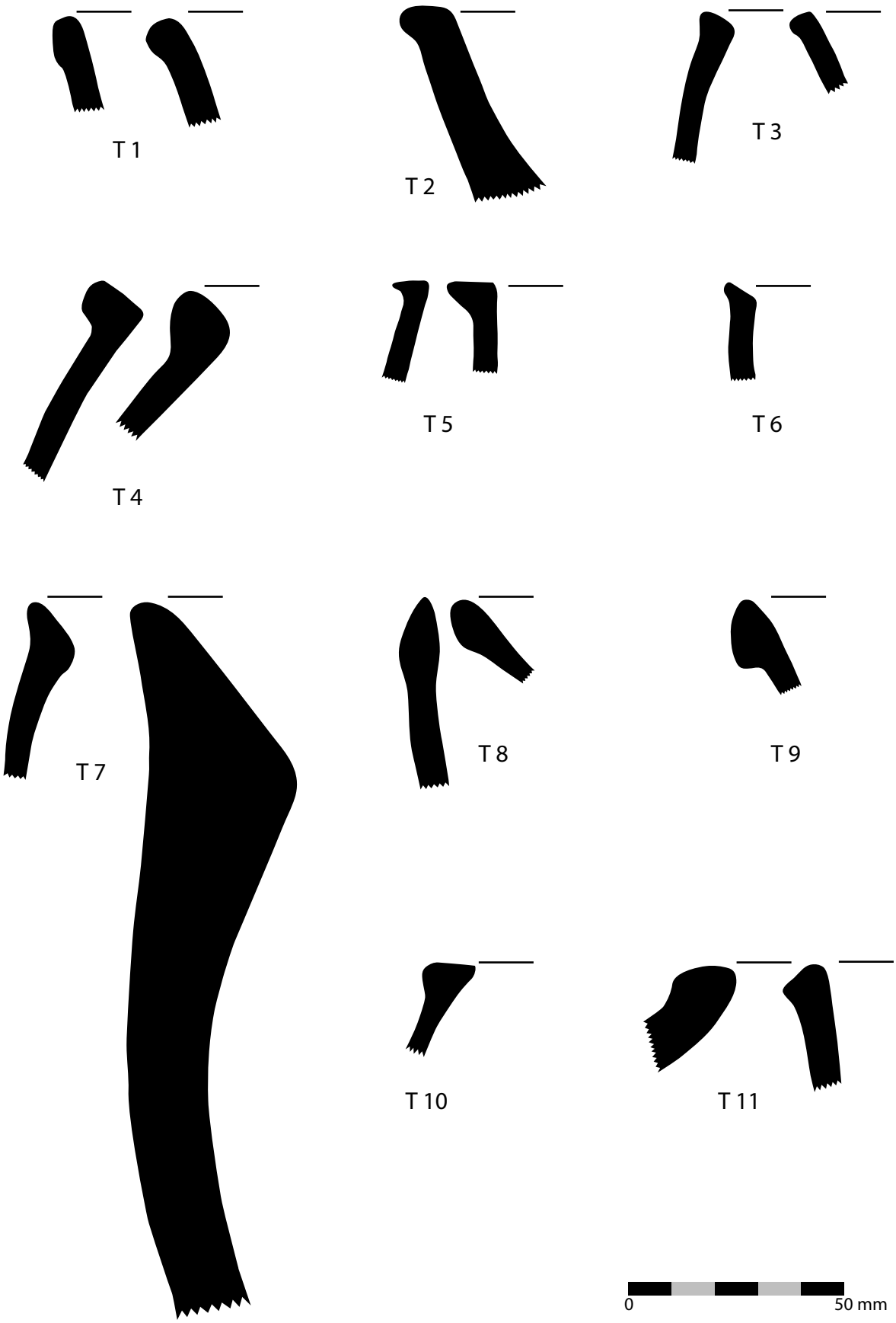

FIGURE 17.3B Thickened rims 1 to 11

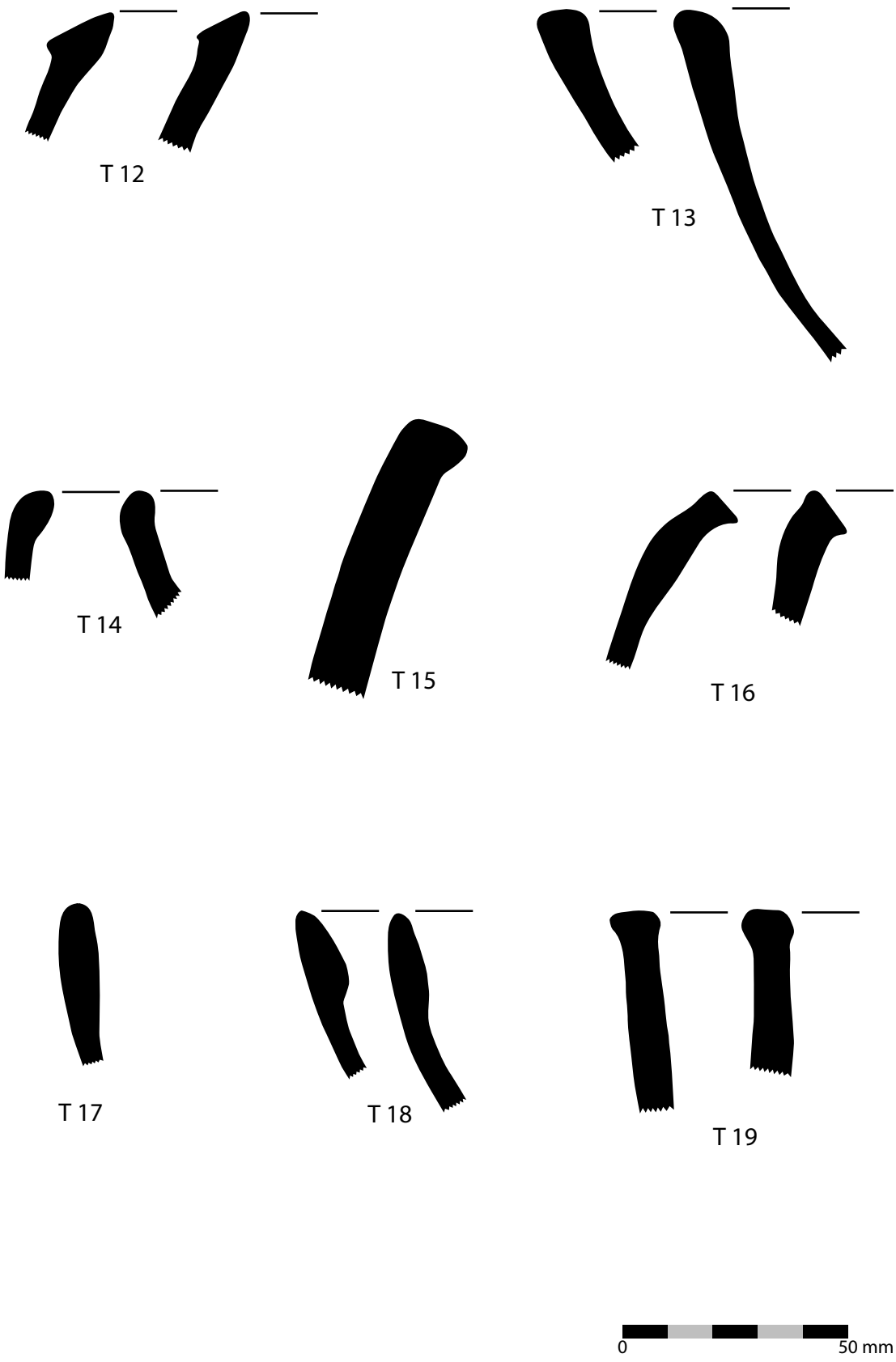

FIGURE 17.3C Thickened rims 12 to 19

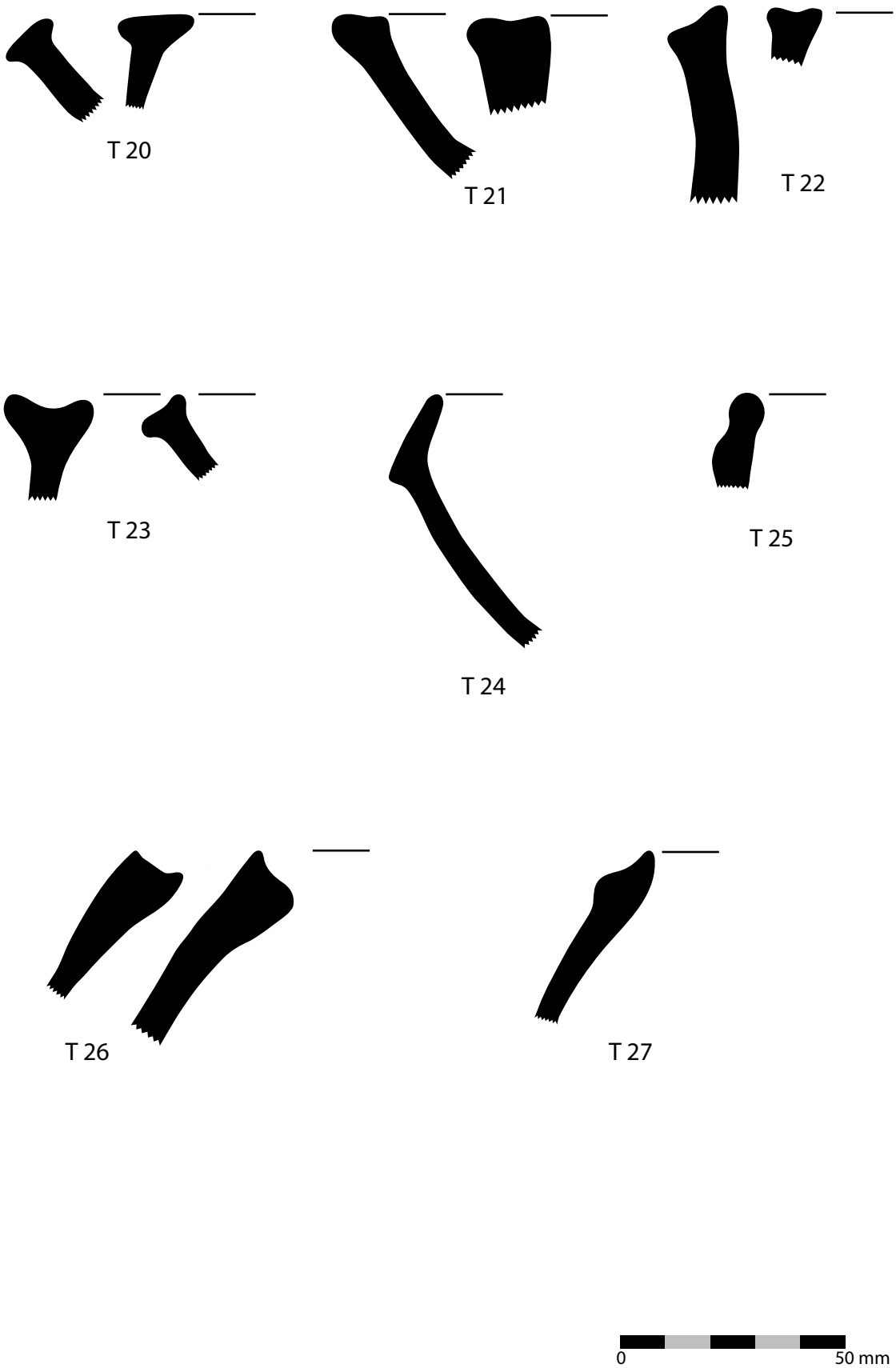

FIGURE 17.3D Thickened rims 20 to 27

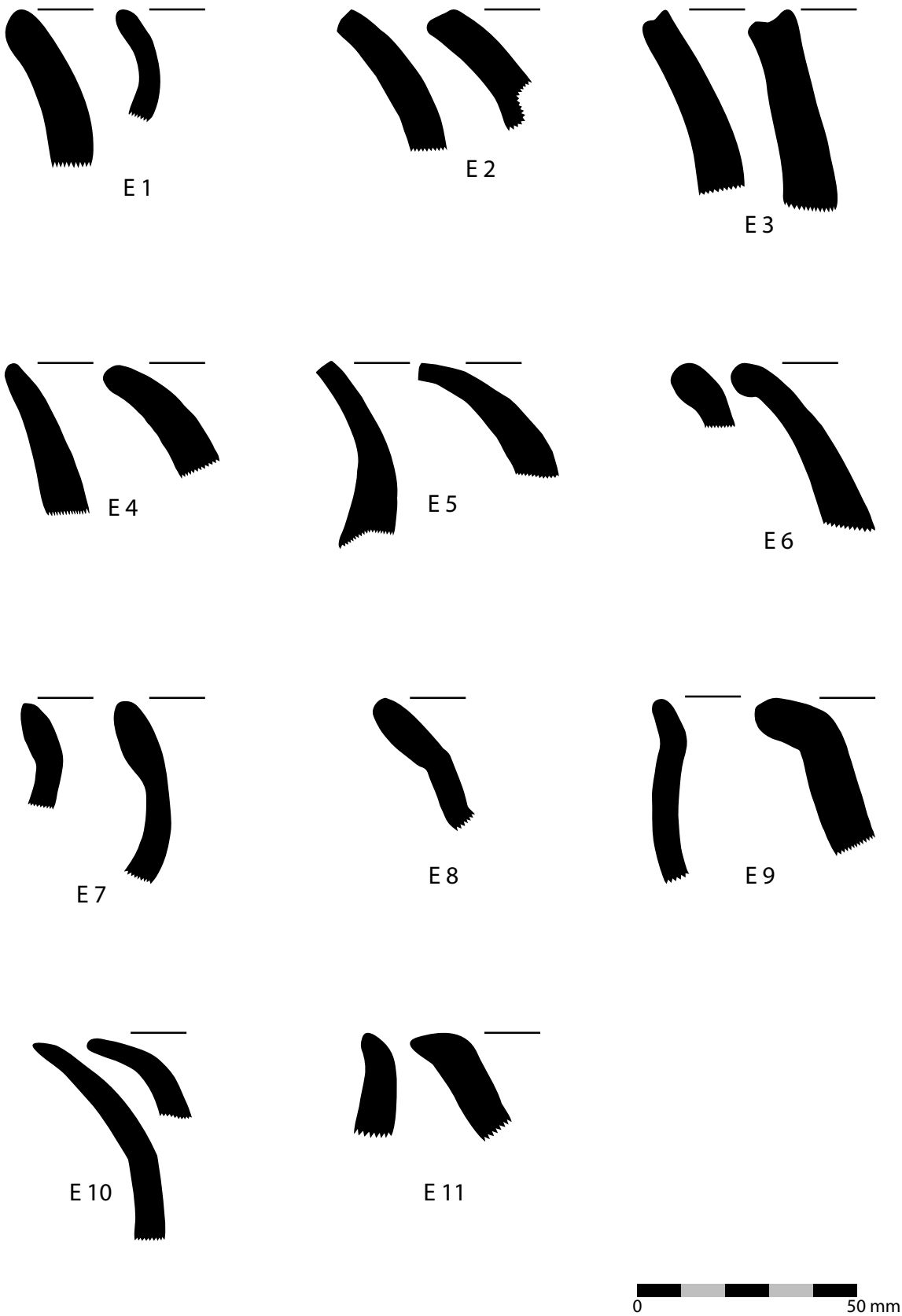

FIGURE 17.3E Everted rims 1 to 11

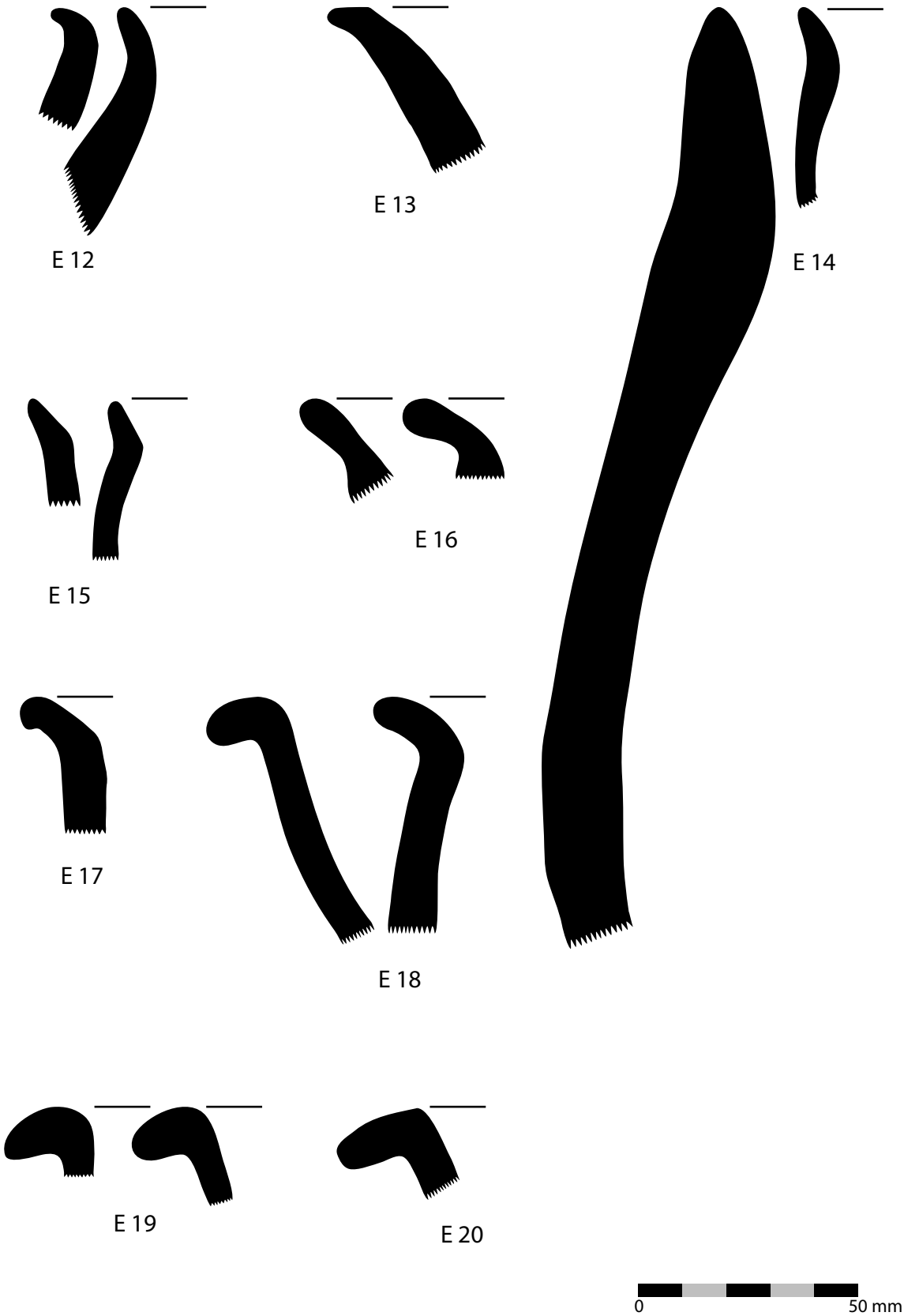

FIGURE 17.3F Everted rims 12 to 20

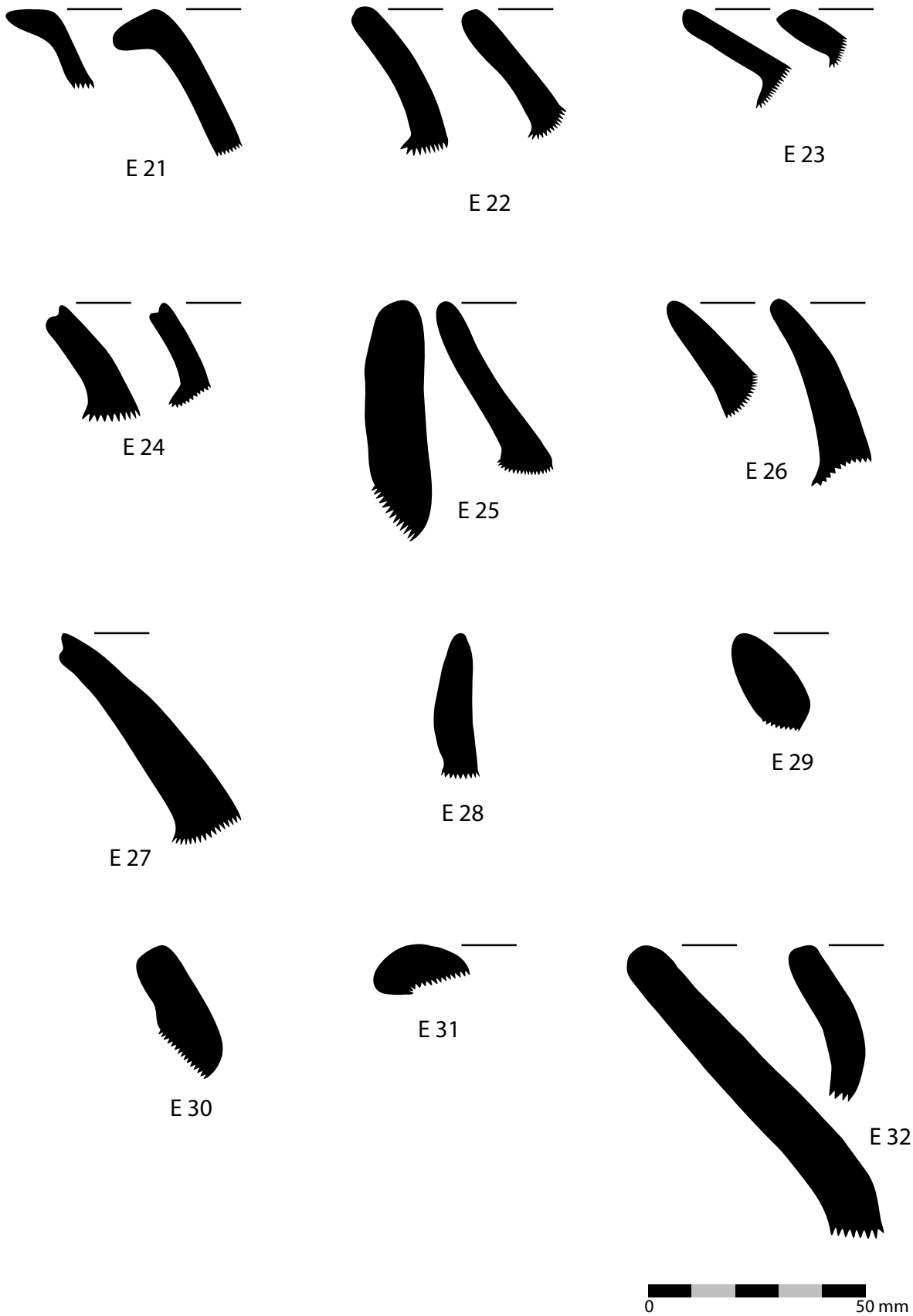

FIGURE 17.3G Everted rims 21 to 32

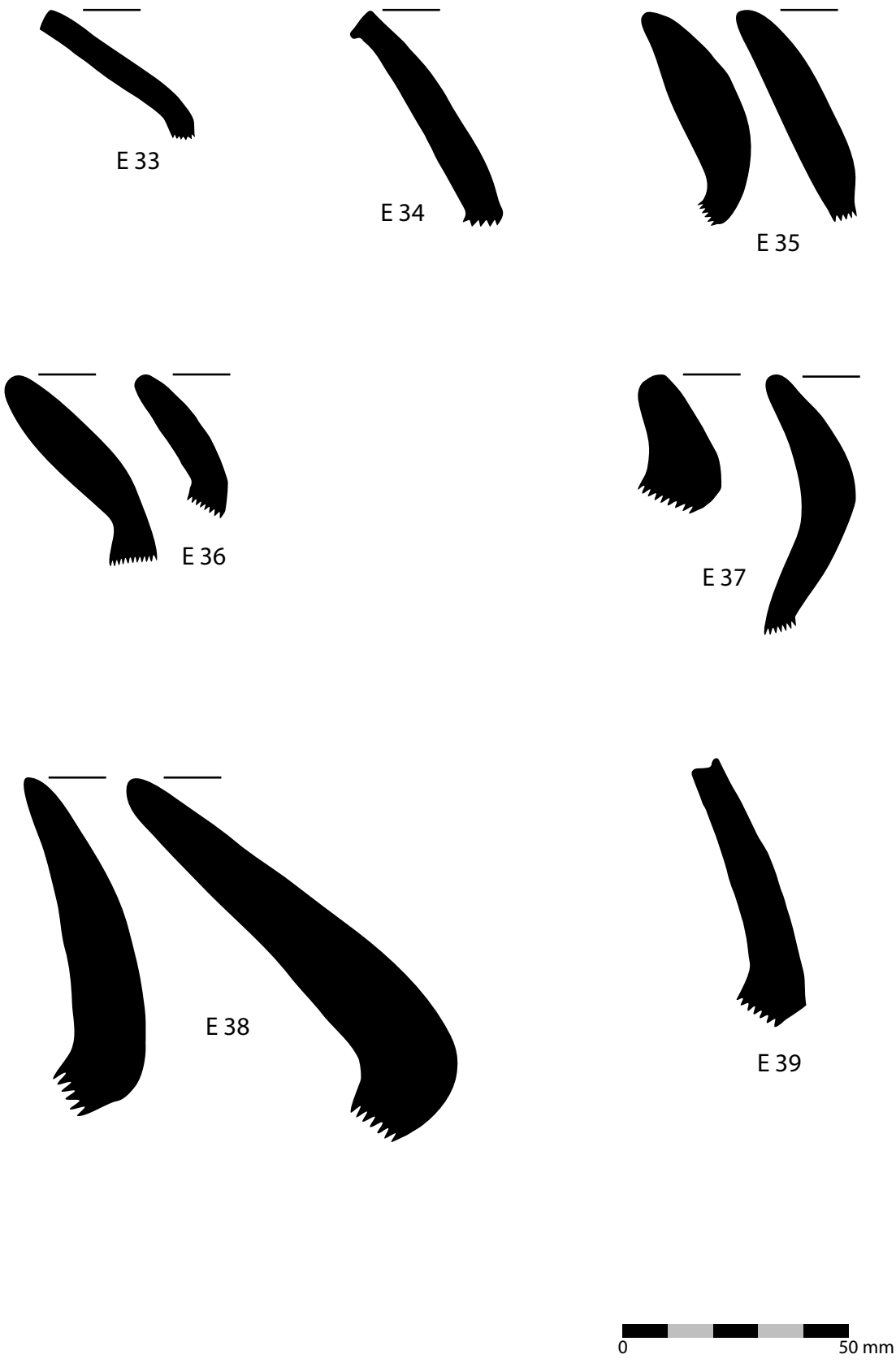

FIGURE 17.3H Everted rims 33 to 39

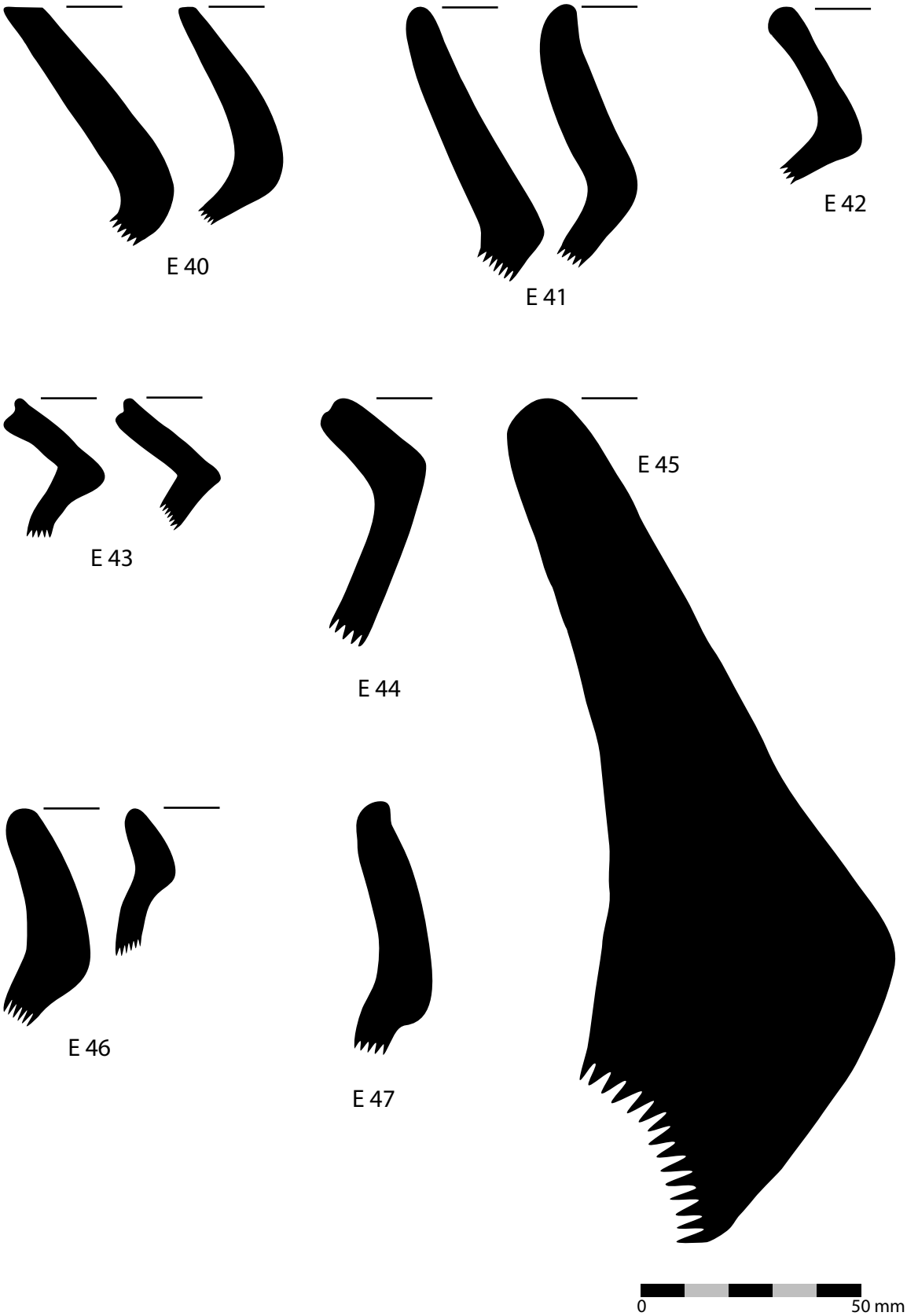

FIGURE 17.31 Everted rims 40 to 47

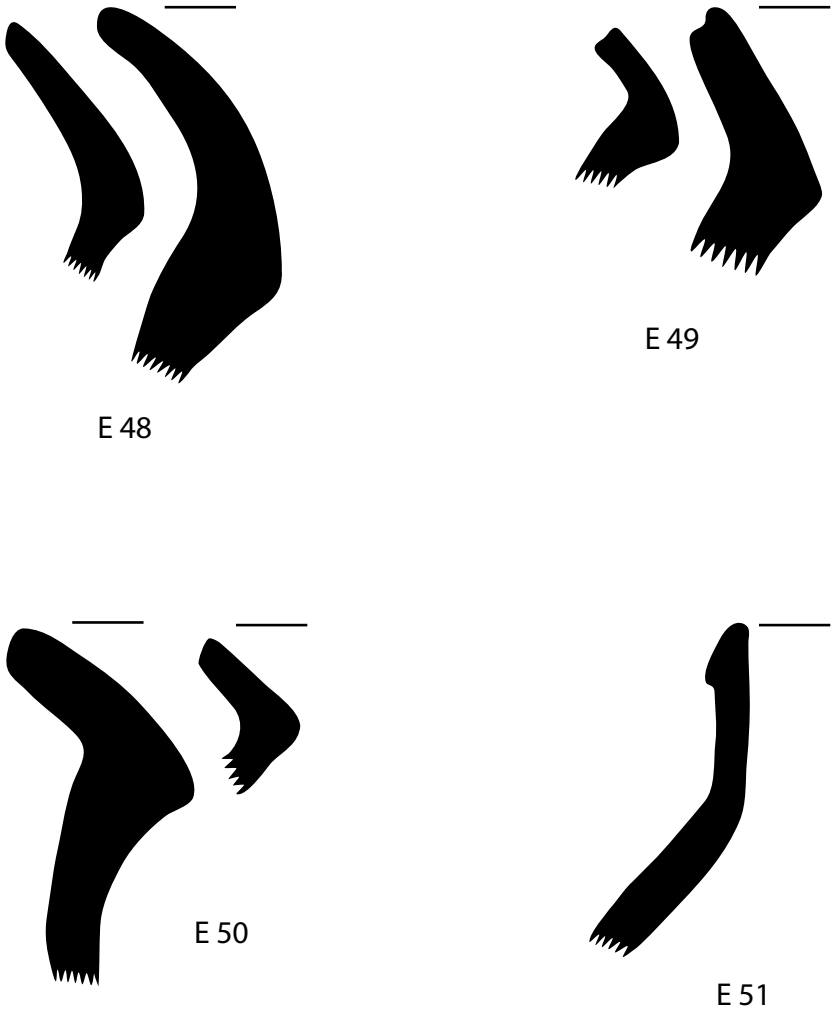

FIGURE 17.3J Everted rims 48 to 51

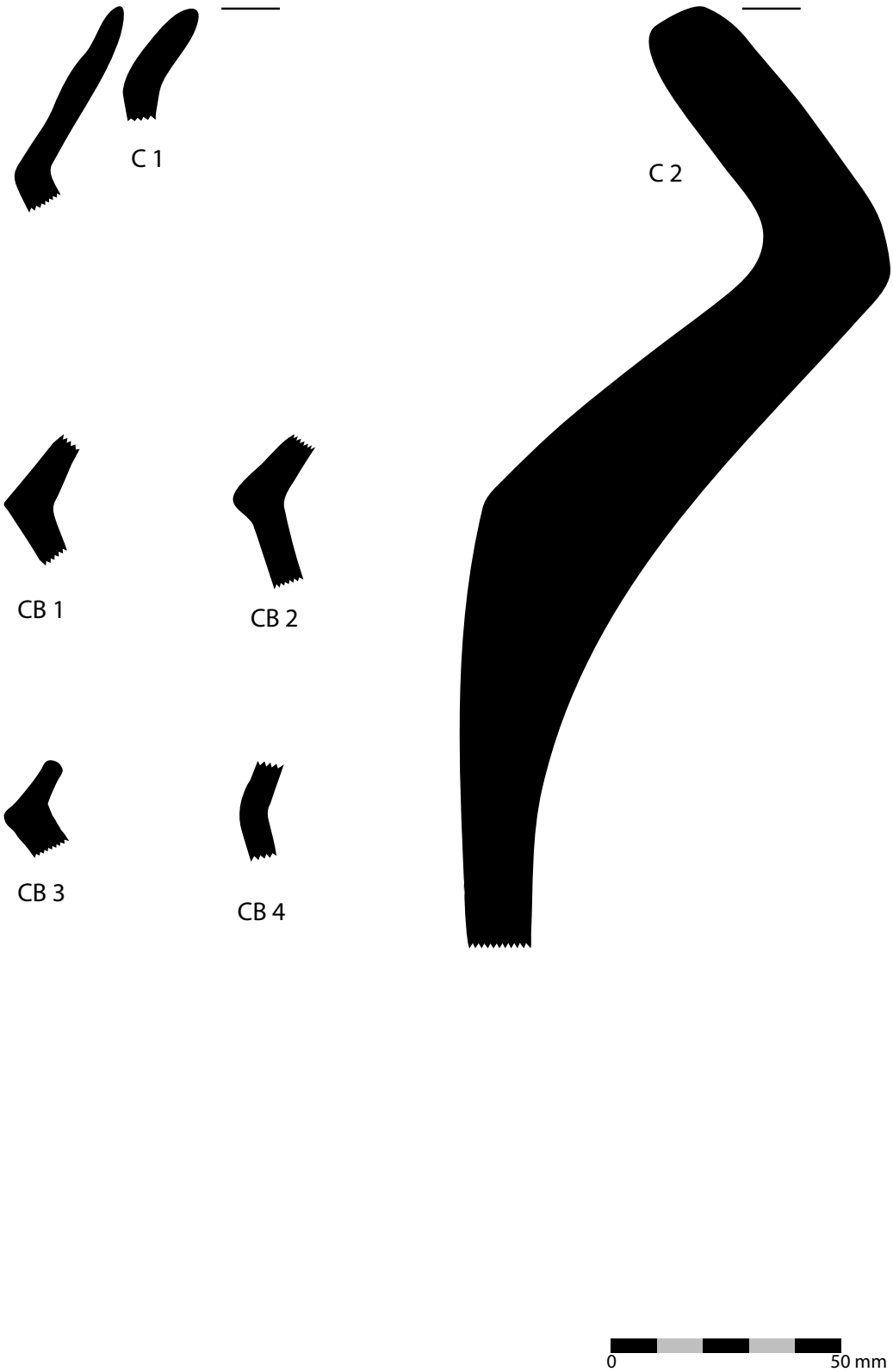

FIGURE 17.3K Carinated rims and body sherds

In terms of body sherds, only exceptional items (such as decoration on both sides) or those with form attributes (such as carination or perforations) were drawn, with a view to providing illustrative examples.

Naturally there was an element of relativity here. An attempt was made to illustrate a representative sample from each trench, rather than a proportional sample, and the size and quality of assemblages varied between trenches. In some cases (for example, Bokorobu) it was necessary to include some fairly mundane decorated body sherds in the material illustrated, as sufficient material did not otherwise exist which would give a good sense of the site's pottery assemblage.

3 The Crossroads Pottery: Characteristics

The main decoration types noted in our assemblage were as follows (for codes, see Table 17.3 and Figure 17.4a–c).

3.1 *Main Decoration Types*

Here we discuss in turn incision, single and rolled impression, paint, perforations and appliqué, and finally burnishing. We recorded perforations, carinations and appliqué as decorations, even though these features cross over with formal characteristics and certainly could have functional aspects (in the case of perforations, allowing sifting and steaming), as well as possible ritual use (see Norman 2011).

3.1.1 Incision

Incisions are created by drawing a pointed tool over clay, creating lines in the clay surface. One may distinguish variants of this kind of decoration depending on the state of the clay (Rye 1981: Figure 47; Balfet et al. 1983; Rice 1987). Incision into a wet surface, sometimes also called "drawing" (Balfet et al. 1983), leaves clean lines, sometimes bordered by material accumulation from the displacement of the clay (Rice 1987). Incision into dry or fired clay, on

TABLE 17.3 Decoration codes used during analysis

Modifications of Surface Texture	
Rolled and Impressed Roulettes	
Cord Roulettes and Cord Impressions	
Rolled Cord Roulette with No Core (*roulette de cordelette*)	
rc-1a	Twisted cord roulette – small [<3mm width for individual beads] (Hurley 1979: Cords 54–62, McIntosh 1995 Twine 6)
rc-1b	Twisted cord roulette – medium [3–5mm width for individual beads]
rc-1c	Twisted cord roulette – large [>5mm width for individual beads]
rc-2	Looped cord [chevron roulette] (Hurley 1979: Cord 172, McIntosh 1995 Twine 12)
rc-3	Knotted twisted cord (Hurley 1979: Cords 165–167)
rc-4	Twice-twisted cord (Hurley 1979: Cords 139–140)
rc-5	Single twisted cord (Livingstone Smith et al. 2010: Fig. 1.2)
rct-1	Single braided cord roulette (McIntosh & Guèye 2010)
rct-2	Double braided cord roulette (McIntosh & Guèye 2010)
Impressed Twisted Cord with No Core	
ic-1	Simple twisted cord impression in a single row/channel
ic-2	Series of impressions of simple twisted cord impressions side by side
Impressed Cord-Wrapped Core (*Cord-Wrapped Cord/Stick*) (*Cordelette enroulée imprimée*)	
ice-1	Tightly spaced (<1.5mm between wraps) – stick marks
ice-2	Widely spaced (>1.5mm between wraps) – stick marks
ice-3	Tightly spaced (<1.5mm between wraps) – no stick marks
ice-4	Widely spaced (>1.5mm between wraps) – no stick marks

TABLE 17.3 Decoration codes used during analysis (*cont.*)

	Rolled Cord-Wrapped Core (*Roulette de cordelette enroulée*)
rce-1	Tightly spaced (<1.5mm between wraps) – with stick marks
rce-2	Widely spaced (>1.5mm between wraps) – with stick marks
rce-3	Tightly spaced (<1.5mm between wraps) – no stick marks
rce-4	Widely spaced (>1.5mm between wraps) – no stick marks
rce-5	Untwisted fibres (Hurley 1979, Cord 215; S. McIntosh 1995, Twine 14)
rce-6	Counter-wrapped cord-wrapped stick (MacDonald & Manning 2010, Fig 3.15)
rce-7	Double bead [interlocking ovals], single base (MacDonald & Manning 2010, Fig 3.14)
rce-8	Multiple cord-wrapped stick roulette (Hurley 1979, Cords 262–270; Livingstone Smith et al. 2010, Fig 1.29 & 1.30)
rce-9	Cord wrapped roulette on a continuous core (Livingstone Smith et al. 2010, Fig. 1.18)
rce-10	Braided cord roulette on a continuous core (Livingstone Smith et al. 2010, Fig 1.19–1.21)
	Rolled Cord of Indefinite Identification
rc	Rolled cord decor, insufficiently clear to determine nature of tool
	Strip Roulettes and Strip Impressions
	Rolled Strip Roulette (*roulette de fibre plate*)
rfp-1a	Folded strip roulette – small [<3mm width for individual beads] [Roulette de fibre plate pliée] (S. McIntosh 1995 Twines 4 & 5, Schmidt et al. 2005 CR-4, Haour & Keita 2010)
rfp-1b	Folded strip roulette – medium [3–5mm width for individual beads]
rfp-1c	Folded strip roulette – large [>5mm width for individual beads]
rfp-2	Knotted strip roulette [Roulette de fibre plate nouée] (Soper 1985, Fig.5)
rfp-3	Braided strip roulette [Roulette de fibre plate tressée] (Mayor 2010)
rfp-4	Loose folded strip roulette (a poorly understood category)
rfp-5	Poorly impressed folded strip roulette. Essentially the same action as rfp-1, but impressions less clear
	Indeterminate Strip Roulette
rfp	Strip roulette insufficiently clear to show precise decorative pattern
	Other Roulettes
rbt	Carved wooden roulette
Blepharis	Ear of *Blepharis ciliaris* (Livingstone Smith et al. 2010: Figure 1.37)
roul	Roulette insufficiently clear to identify type
	Other Fibre Decor/Impression
	Other Cord
C	Impressed or rolled cord – too eroded to identify precisely: could be cord roulette or impression, or cord mat.
	Other Strip
FP	Impressed or rolled strip – too eroded to identify precisely: could be strip roulette or impression, or grass mat

TABLE 17.3 Decoration codes used during analysis (*cont.*)

Incised and Stabbed Decor	
Dragged Incisions	
Individual Incised Lines (*single pointed tool; cross-section is a V; quite narrow*)	
SL-*n*	One or more straight, parallel lines, with number (e.g. SL-3)
SX-*n*	Cross-hatching (indicate number of lines)
SW-*n*	Waves, one or more parallel lines, with number (e.g. WI-4)
SC-*n*	Curved line (s)
SH-*n*	Hatched lines (not crossing)
SX	Lines forming an X
ST	Lines forming triangles
SO-*n*	Incised circles
Inc	Indeterminate incision (typically the use of this code relates to quick analysis in the field)
Dragged Comb (*Several points in a fixed matrix; cross-section is a V; quite narrow*)	
PeigEL-*n*	Linear (straight line or lines), indicating number of lines
PeigEX-*n*	Cross-hatched (indicate number of lines)
PeigEW-*n*	Wave, one or more lines, with number
PeigEC-*n*	Curved line (indicate number of lines)
Other	
Herb	Dragged straw or palm frond
Stabbed	
Impression with End of Single Pointed Tool (*stylus or other similar single pointed tool*)	
Suffix L = in a line S = Stacked E.g.: SP4-V means stacked SP4	
SP1	Impression of point of a round-ended tool, making circular holes or depressions
SP1-L	Line of the above
SP1-C	Impressions of point of a round-ended tool, in a wavy/curving line
Sp1-cl	Impressions of point of a round-ended tool, in a circle
SP2	Impression of point of an angular tool, making square holes or depressions
SP2-L	Line of impressions of the above
SP3	Impressions of flat-sectioned tool, making a rectangular indent
SP3-L	Line of impressions of the above, side by side, forming a line of dashes
SP3-V	As SP3-L, but impressions flipped 90 degrees
SP4	Impression of a tool creating impressions that are oval with pointed extremities
SP4-L	Line of the above
SP4-V	As SP4-L, but impressions flipped 90 degrees
SP4-T	SP4, impressed for form a broken line roughly in a zig-zag
SP5	Impression of point, making triangular holes or depressions
SP5-L	Line of the above
SP-6	Impressions of the side of a rounded sectioned tool
SU	Multiple impressions of fingernail-like object in uneven rows/columns

TABLE 17.3 Decoration codes used during analysis (*cont.*)

	Stabbed Comb
PeigIL-*n*	Linear (straight line or lines) (indicate number of lines)
PeigIX-*n*	Cross-hatched (indicate number of lines)
PeigIW-*n*	Wave (indicate number of lines)
PeigIC-*n*	Curved line (indicate number of lines)
	Finger and Nail Impressions
OI	Impression of a fingernail, making a crescent shape
DI	Impression of a finger
	Stabbed/Dragged Impressions
	Pivoting Comb (*peigne pivotant*)
Peig-P	
	Rocked Comb (*peigne basculant*)
Peig-B	
	Incised/Stabbed Geometric Design
Is-geo	Geometric design (complex combination of designs): see Figures 17.4A to C
	Smoothing/Working of Surface
	Smoothing over Decorated Surface
Smth	Blank or smoothed area within a previously decorated area
	Channels (*cross-section is a U; relatively wide*)
Ch	Single Channel
Mch -*n*	Multiple parallel Channels, indicating number
Mch-*n*-T	Parallel channels, forming triangles

Indistinct

Ind	Modification of surface texture of some type (indeterminate) – unable to be precisely defined due to erosion.

Other Surface Treatments

Paint

Initial Code> Pnt- = paint
Colour Code> R = red, Bl = white, N = black, Br = brown, Or = Orange
Design Code> C = cover (wash); X = Cross-hatch, L = parallel lines = detail number> L-1 is a single line); T = Triangles, P = points (dots), B = Band, R = Stripes

Appliqué

PA-1	Nubbins – rounded
PA-2	Nubbins – flattened

TABLE 17.3 Decoration codes used during analysis (*cont.*)

PA-3	Spikes
PA-4	Bands – rounded section
PA-5	Bands – angular section

Rims and Shapes

For rim typology, see Figures 17.3A to K

Perf	perforated sherd

In coding the position of decoration on rim sherds, the following abbreviations were used:

C	Collar
N	Neck
U	Upper
M	Middle
B	Base
L	Lip
C-int	Collar interior
U-int	Upper interior

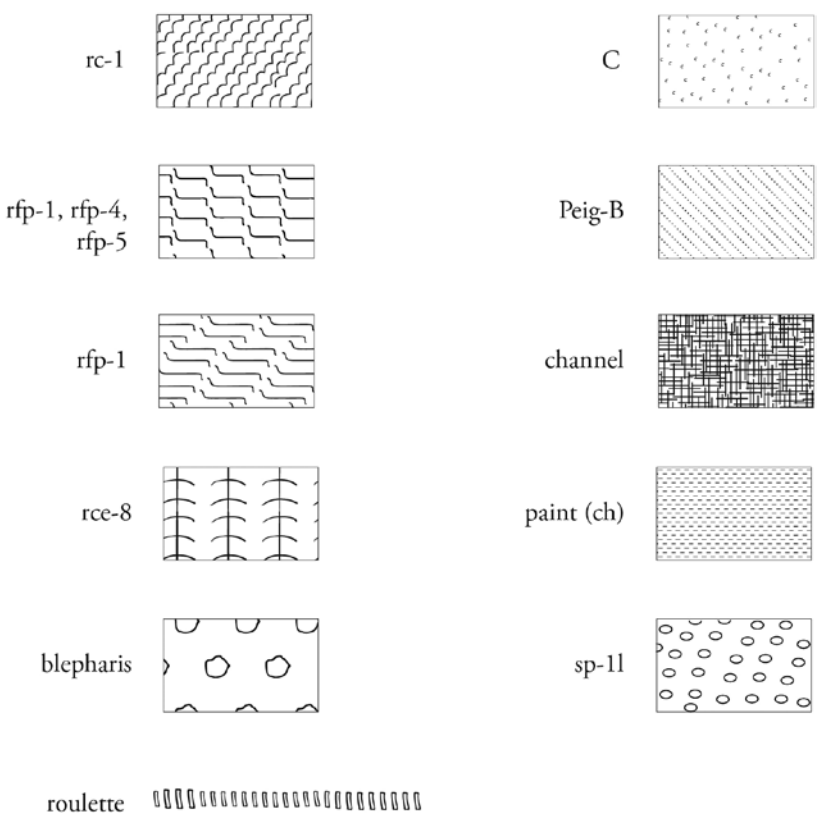

FIGURE 17.4 Key to the representation of decoration types

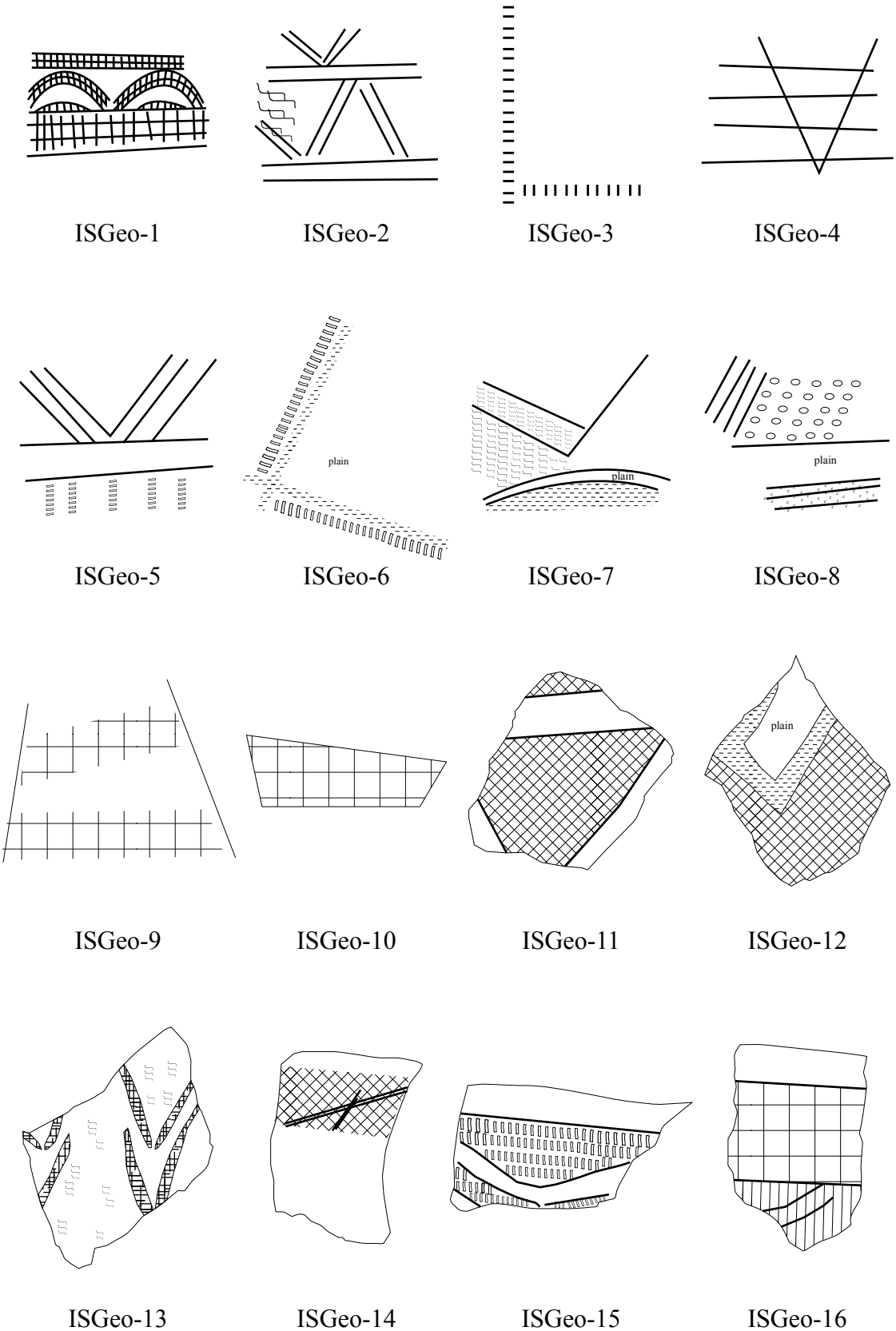

FIGURE 17.4A Typology of Incised Geometric decorations (is-geo)-1 to 16

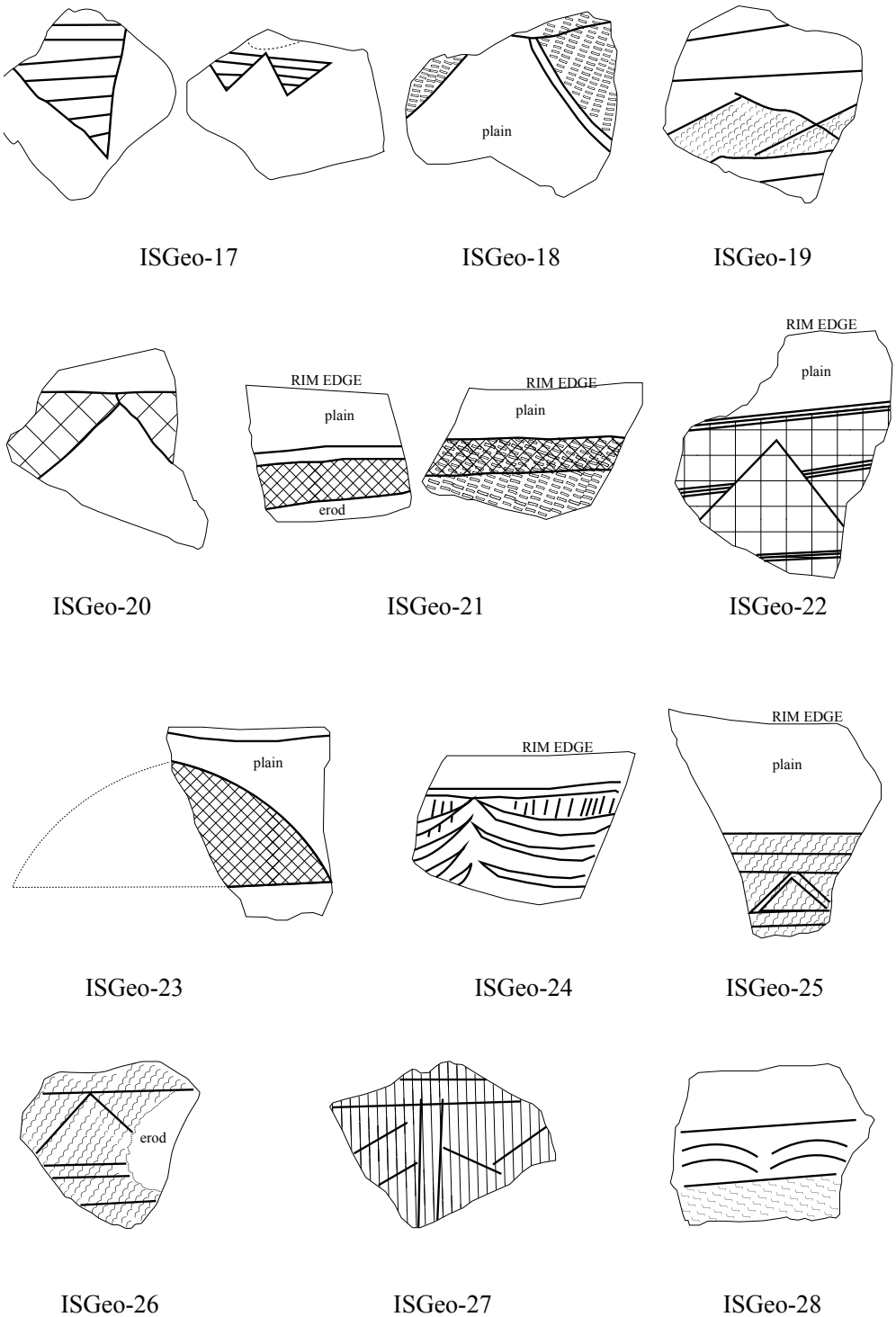

FIGURE 17.4B Typology of Incised Geometric decorations (is-geo)-17 to 28

the other hand, leaves a fine chipping of clay or slip at the margins of the line (Rice 1987). A number of tools can be used, such as wooden sticks, metal points, or combs. The cross-section of the incised line may be a clue to identifying the tool (Rice 1987), and our typology recognises several sub-categories, depending on this variable. A related category is accordingly that of "channels". These involve a rather broad mark, while incision is narrower and has a cross-section in the form of a V rather than a U.

Incisions include a great variability in formal composition, including arcs, parallel wavy lines, parallel straight lines, and cross-hatching, and these forms are also often combined with rouletting. When lines were made, whether singly or individually, and whether parallel or crossing, it was possible to designate this with a code (such as SL-2

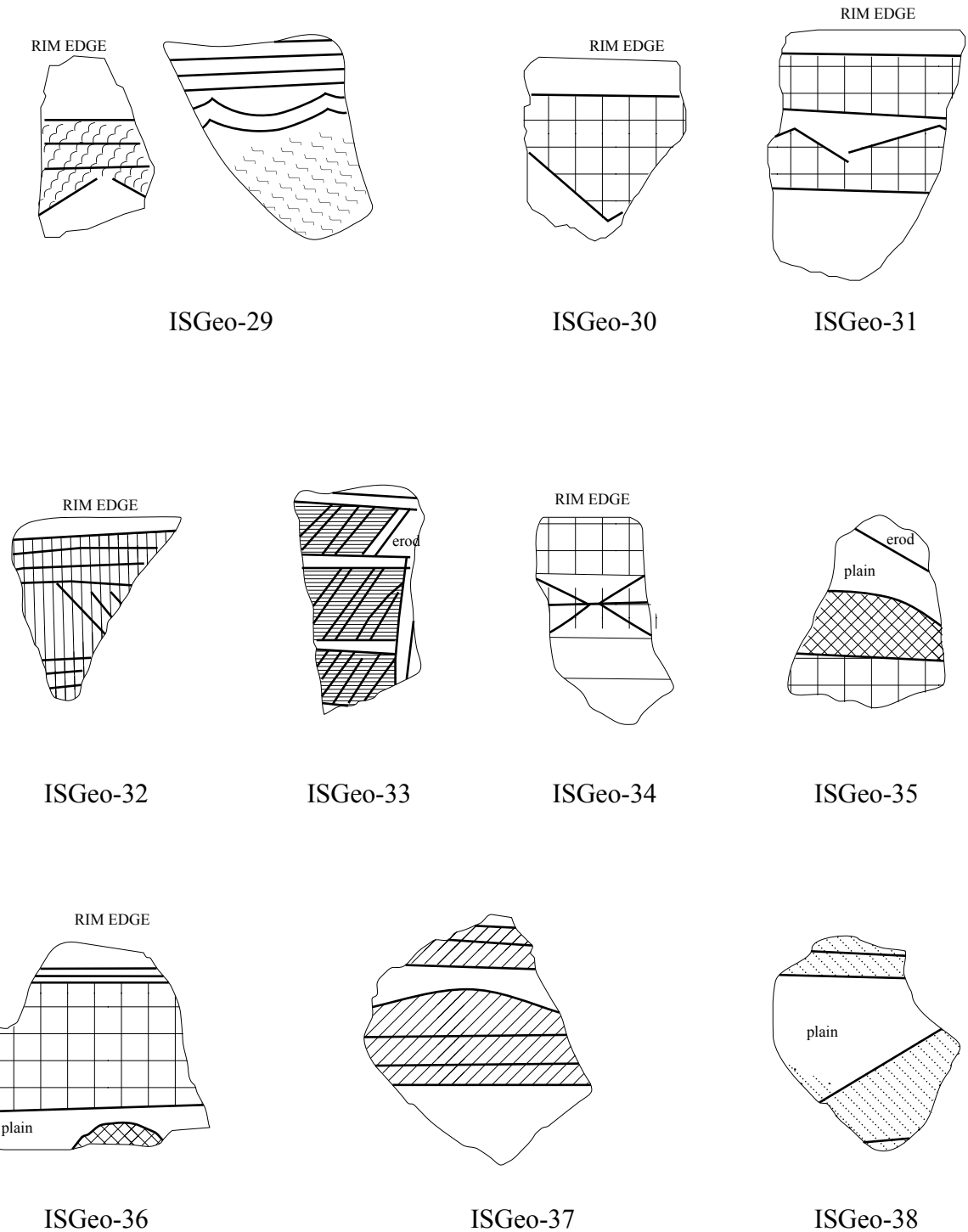

FIGURE 17.4C Typology of Incised Geometric decorations (is-geo)-29 to 38

or SH-16, for example), but incised decorations quickly take on a great complexity, such that we were obliged to create distinct "Incised Geometric" (is-geo) designs, each related to a particular arrangement or grammar (Figure 17.4A to C).

In some cases, parallel lines occur that may have been produced with a comb. These were recorded as such where it could be identified with certainty.

3.1.2 Single Impression

Single impression, or stamping, was observed on some sherds. This decoration technique involves impressing a pattern, repeated or not, in the surface of wet clay (Balfet et al. 1983; Rice 1987). Various tools may be used such as nails, sticks, reeds, or straw, a roulette (see below), or the tip of an object such as a shell. It is sometimes difficult to identify the object which created the impression, because of overlapping or indistinct marks (Rice 1987), but the

nature of the impressed cross-section may be a clue. In our assemblage, the most frequent type of single impression involved the occurrence of bands of circular or triangular impressions. Single impressions are coded in a range of ways, depending on the tool involved; for example, ic-1 or ic-2 for a single-impressed twisted cord roulette, SP1 for a stabbed impression of a point or stylus.

3.1.3 Rolled Impression

Some impressions are obtained by rolling a tool called a roulette onto wet clay, leaving a continuous impressed design (Soper 1985; Rice 1987; Gosselain et al. 2010). Each kind of roulette leaves a characteristic pattern according to its morphology. Their study has long been a topic of interest in African archaeology, complemented by studies of roulettes from ethnographic, museological, and experimental contexts (Camps-Fabrer 1966; Bedaux et al. 1978; Hurley 1979; McIntosh & McIntosh 1980; Gallay 1981; Soper 1985; Gosselain 2000; Langlois 2004; Mayor et al. 2005; Schmidt et al. 2005; Livingstone Smith 2007; Haour et al. 2010; Mayor 2011a; also Yamanouchi 1964 and Hurley 1979 for non-Africanist examples). Roulettes are classified according to their material and their mode of manufacture (Livingstone Smith et al. 2010).[5] A first subdivision occurs between unmodified materials (such as shells or manufactured objects like bicycle springs), modified materials (such as bones, wood or fruits) and materials that are assembled. The last category involves either cord or a flat fibre (a strip) and it can be further subdivided into two groups:

- simple tools, using cord or strips assembled by twisting, folding, knotting or braiding;
- tools on a core, which can be on a continuous core – the core and the wrap are made from a single element, generally a flexible or semi-rigid cord or strip – or on an independent core, single or multiple, and generally made on a rigid support.

Decorations made with roulettes were abundant in the Dendi assemblage.

The double twisted cord roulette (double TCR), also called twisted string roulette or TGR, is made by rolling fibres between the palms of the hands, on a thigh or the ground and by knotting the ends of the tool. Variations in the patterns are influenced by the material used, the number and the thickness of fibres and the force exerted during twisting. The pattern left by the double twisted cord roulette when rolled consists of a succession of discontinuous impressed units, the beads delimited vertically and laterally, oriented diagonally and with a quadrangular shape. We defined three types of twisted cord roulette (rc-1a to rc-1c, depending on the size of the impressed units). Single impressions were exceedingly rare, there only being one documented case at Kantoro (Trench 1) (coded ic-2).

Twisted cord roulette impressions are widespread across modern Africa, and have been dated back to the mid- to late third millennium BC in the Lower Tilemsi valley in Mali (Manning 2008), and by 2500bp they are documented throughout most of the West African Sahel and savanna (Arazi & Manning 2010).

Braided cord roulettes are made by braiding two or more cords. The number and thickness of the cords, differences in the braiding technique, and the direction and pressure exerted during application on the soft paste of the vessel all influence the final design; experiments by Hurley (1979) and by S. McIntosh (McIntosh & Guèye 2010) give an idea of the range of possibilities. No definite occurrences were noted in our assemblage.

Impressions made by roulettes manufactured from flat-sectioned materials (strips) were extremely common within the assemblage. The folded strip roulette, made with two flat strips or a single strip folded over itself, occurred most frequently. In this tool, the strands are alternately twisted and folded, one over the other, and a knot is made at the extremity. The impressed elements are repeated every third element due to the triangular section of the roulette. The typical impression of this kind of tool is asymmetrical and rather angular and convex, resembling a horizontal Z, but variation may occur depending on the strip size and the degree of tightness in each fold (Livingstone Smith et al. 2010: 62).

Such variations in the tightness of the folding can cause considerable differences in size and orientation of the impressions. Indeed, the classification of strip roulettes remains a work in progress and, in the course of the analysis of our ceramic assemblage, we came to name a number of different types of folded strip roulette: three sizes of classic folded strip roulette (rfp-1a to rfp-1c), plus loose (rfp-4) and poorly impressed, possibly rocked, folded strip roulette (rfp-5). Nonetheless, folded strip roulettes are relatively easy to distinguish from other types of roulette in the archaeological record, as the individual impressions are typically convex and are ordered in distinct, regular rows. They remain some of the best-documented roulettes archaeologically.

Folded strip roulette is extremely common in Dendi. It is present in very large quantities at most sites, including Birnin Lafiya, often dominating the assemblage. But it is completely or near absent at some of the sites which are thought, or known, to be recent. These include Boyeri, Guene zeno, Bogo Bogo, Karimama, Kompanti,

5 For a detailed explanation of the classification, the reader may refer to Livingstone Smith et al. (2010: 53).

Tomboutou and Torouwey. Admittedly, some of these are very small assemblages; nonetheless, we find this absence telling.

Globally, the use of folded strip roulettes seems to have been more widespread in the past in Africa than it is now (Livingstone Smith et al. 2010: 62). Examples of folded strip roulette impression were recovered dating back to the first millennium BC at Dia, Mali (Schmidt et al. 2005); to the first millennium AD at Kumbi Saleh, Mauritania (Berthier 1997) and in Dogon country (Mayor 2011a); to between the ninth and fourteenth centuries AD in the Chad Basin (Gronenborn & Magnavita 2000), and to the fifteenth to nineteenth centuries AD at Garumele, Niger (Haour 2008). To our knowledge, although several authors have made distinctions based on the size of the impressed units, few have considered the variations resulting from the tightness and number of strips used in folding this sort of roulette. For example, Haour & Keita (2010: Figures 3.37 and 3.41), show material which we would now distinguish as a specific sub-type, and would code as rfp-4.

The knotted strip roulette is made using one, two, three or four strips, knotted and tightened to varying degrees. At least three variants are known, although further types almost certainly existed in the past (Livingstone Smith et al. 2010: 62–65). Within archaeological analysis, this roulette type has unfortunately been regularly confused with folded strip roulette (Langlois 2004). The best-known example of knotted strip roulette (or KPR) was that defined and illustrated by Soper (1985) in his seminal paper. It involved a modern Kenyan roulette made from a single strip of baling tape, looped back through itself, giving a roulette with a pentagonal cross-section. This experimental item was shown alongside a sherd that was thought to have been decorated with a similar roulette (Soper 1985: 35–37, Figures 5.1–5.2). After this, the term "KPR" came to be used in a rather generic manner, to mean simply "strip roulette", a semantic extension which was often incorrect as it ended up including roulettes that were made not by knotting, but by folding (Langlois 2004: 110).

One characteristic of knotted strip roulette impressions is a near-systematic anomaly, resembling a series of figures of eight, which is due to the geometry of the roulette. Although such impressions are amply documented in the East African archaeological record, we are not convinced that these "true" knotted strip roulettes have previously been credibly identified in West Africa, either archaeologically or ethnographically (Haour 2010). Certainly in recent times their distribution seems not to have extended west of southeastern Nigeria (Livingstone-Smith et al. 2010). Interestingly, we were able to recognise the distinctive figure of eight impression in our Dendi assemblage. It occurs only in very small amounts, but is certainly present in Birnin Lafiya Trench 8 and Kantoro Trenches 1 and 2; in the latter case, it is often associated with a distinctive micaceous fabric. It is also recognised, albeit in more recent contexts, in the Savè region of central Benin (Gurstelle 2015). These seemingly extend the reliably documented range of this decoration type.

We recovered no sherds decorated using a braided strip roulette. The patterns impressed are parallel rows of concave impressions arranged like the steps of a staircase (Livingstone Smith et al. 2010: 70; Mayor 2010: 181). The braided strip roulette is present today in some areas of West Africa, in south-central and southern Mali, northern Ivory Coast, northern and western Burkina Faso and northern Togo. An isolated area is also reported in north Nigeria (Livingstone Smith et al. 2010: 72). This kind of decoration is found at archaeological sites in north Cameroon in the first and second centuries AD (Langlois 2004: 116); in Dogon country from the second to the mid-twelfth centuries AD (Bedaux & Lange 1983; Mayor 2011a); the Seno plain of Mali in the eighth to thirteenth centuries AD (Huysecom et al. 2015), and at sites associated with the Bamana Empire of Ségou between the seventeenth and nineteenth centuries (MacDonald & Camara 2011). They also occur at Kororofa (de Meulemeester 1975) between the fifteenth and seventeenth centuries AD. They are common at Kirikongo in the earlier phases of the settlement, AD 100–700 approximately (Dueppen 2015).

Roulettes on multiples cores are made by interlacing one or several cords around three or more rigid cores. The tool leaves vertical impressions of stacked segments of cords, oriented horizontally or obliquely (Langlois 2004: 120). Experimental reconstructions are presented by Hurley (1979), Livingstone Smith et al. (2010: 76, and Figure 1.29), and Ozainne (2013: 87). Such tools are currently used between the Lake Chad Basin and the northern part of the Great Lakes region of East Africa (Livingstone Smith et al. 2010: 76). The use of the roulettes on multiple cores extended in the past to Diamaré in north Cameroon from the fourth century AD (Langlois 2004). The use of roulettes on multiples cores is largely attested in the ceramic assemblage from Ounjougou, Mali, impressed onto a large part of the body, and seems to be the main tool used between the eighteenth and fifteenth centuries BC (Ozainne 2013: 157). The technique is also documented at Jenné-jeno, Mali (MacDonald & Manning 2010: Figure 3.19). Langlois (2004: 120) suggests it may have occurred archaeologically at the Nigerian sites of Sou, Kursakata and Daima and at Kororafa.

In our region, we encountered this decoration and coded it "rce-8". In the classic multiple-stick cord roulette, each column of impressions is separated from the next by a zone devoid of impressions, but in the Dendi

material there was only a very small gap between columns. Occasionally, stick marks were visible. Generally this decoration occurred on body sherds, not on rims. We recovered material bearing this decoration from sites ranging throughout the region. However the pattern is more subtle than it first appears. This decoration only occurs consistently at Gorouberi and in various trenches at Birnin Lafiya; the reports from Kompa Dune and Kantoro relate to single sherds and the decoration is not identified with certainty, and so is simply coded "rce". These are all Phase 2 to 4 sites. Single sherds occur from the lowest levels at Boyeri S1 and Tondo windi, and from a near-surface level at Kwara zeno S11. These are all recent, Phase 5, sites, and the presence of this decoration there could be dismissed as intrusive from an earlier period, were it not for the fact that such sherds are relatively abundant at the site of Kozungu, up to and including the Phase 5 levels in Trench 1. In short, we have here a decoration type with a spatial distribution that is tightly clustered around Birnin Lafiya and related sites, such as Bokorobu and Kozungu. Our sense is that this decoration is early, a hypothesis to be tested in future through the analysis of the ceramic material from the Phase 1 exposures at the site of Alibori 2.

Carved wooden roulettes are made by carving or doing poker-work on a small cylinder of wood (or sometimes bone) to create geometric patterns. Their impression is continuous, but the units are limited vertically and horizontally (Livingstone Smith et al. 2010: 78, and Figure 1.36). A handful of possible instances were recovered in our assemblage: at Kwara zeno (both trenches), Boyeri Trench II, Torouwey, and Bokorobu. We coded this "rbt", not distinguishing between the various designs given the complexity of the patterns which can be created: there is no real symptomatic configuration, apart from a cycle of repetition of variable length.

The modern distribution of the carved wooden roulette spans a large area, from southern Togo to northwestern Kenya (Livingstone Smith 2007). Some isolated occurrences have been observed in other parts of West Africa and could have come from an area where carved wood roulettes are known to be used. David & Vidal (1977: 52) had noted that archaeological occurrences of carved roulettes occupy a relatively restricted geographical range through Africa. Gosselain (2000: 197–198) has identified several geographical isolates of these roulettes in West Africa, while Livingstone Smith (2007: 205) points out that the spread of their use has been irregular, in both space and time. Such roulettes have occurred since the first millennium BC in the Nok culture, in central Nigeria, but by the second millennium AD they were in use over an extensive area of Africa (Livingstone Smith 2007).

Blepharis linariifolia or *Blepharis ciliaris* is a small plant of the Acanthus family, commonly found in Sahelian environments. If the lateral leaves of the ear are removed to free the central vein, a series of protrusions emerge, enabling this to be used as a roulette. The impression takes the form of a staggered network of very tiny depressions in the shape of horizontal figures of eight, either rectangles or lozenges depending on how worn the tool is (Livingstone Smith et al. 2010: Figure 1.37). The use of this vegetal roulette seems marginal today compared to the distribution of the plant (Livingstone Smith et al. 2010). We recovered its impressions in our archaeological material from Molla, Torouwey, Kargui, Karimama, Bogo Bogo, Gorouberi, Boyeri, Bokorobu, and Madekali. At Madekali Trench 1, which is a long sequence, all three occurrences are above a hiatus at -110cm, ie. post-AD 1600. At none of these sites is blepharis decoration plentiful: it only concerns around 3–7 sherds. In other words, this decoration is exclusively associated with layers which are known, or strongly thought to be, sub-modern (post-1600 AD); it is totally absent from our enormous pottery assemblage of medieval date.

3.1.4 Paint, Perforations and Appliqué

Painted motifs occurred in our assemblage, both in the earlier parts of our sequence (at Birnin Lafiya[6] and Kantoro Trenches I and II) and in more recent deposits (Bokorobu, Boyeri Trenches I and II, Gorouberi 14 Trench I, Bogo Bogo, Karimama, Madekali Trench I, Molla, Tomboutou, Tondo windi, Torouwey, and Toutokayeri Trenches I and III). We used a three-part code describing colour and design.[7] In archaeological terms, painted decorations are perhaps best known from what is now Ghana (York 1973). One other, very relevant, archaeological instance is a type of pottery found at Gao and elsewhere within the Niger Bend region defining what Cissé et al. (2013) have called the "Niger River polychrome zone" characterised by the prominence of red, black, or white paint, with or without red slip and likely indicating river-based cultural interaction along the Middle Niger. This features fairly distinctive decorative styles, including hatching of white paint overlain on a slipped surface. The present-day pottery tradition of much of the Dendi area and upstream is dominated by painted designs.

Sherds which are perforated, either after firing or, much more frequently, prior to firing, also occurred. Such perforated sherds are widely known, for example at the seventeenth/eighteenth century AD site of Akroso Beposo in

6 Trenches 4, 5, 8, 9 and 11.

7 Example Pnt-RX = a painted red cross-hatch design.

Ghana (Davies n.d.), from survey in the Seno plain of Mali (Loukou et al. 2013), at Gao (Cissé 2011: 178), and at Dia (Bedaux et al. 2005) and Promontoire (Mayor et al. 2005: 35). The items we recovered were multiple-pierced vessels rather than shaped sherds with a single hole within them.

Appliqué refers to the application of shaped pieces of clay to the vessel (Rice 1987). In the cases we documented this could be in the form of a raised band (PA-4 and PA-5, "cordoned" pottery), nubbins (PA-1 and PA-2), or spikes (PA-3).

3.1.5 Burnish

Polishing, or burnishing, involves rubbing a smooth, hard object such as a pebble onto leather-hard clay prior to firing. This produces a shiny surface due to the compaction and re-orientation of fine clay particles. The surface shows narrow parallel linear facets, which are more or less visible according to the quality of the polishing (Balfet et al. 1983; Rice 1987: Figure 5.13a; van Doosselaere 2014). The technique is well attested both ethnographically (Gosselain & Livingstone Smith 1995; Martineau 2010) and archaeologically.

Another surface treatment involves smoothing by dragging straw or a palm frond across the pot surface (coded "Herb"). In many cases it is difficult to be certain whether this represents an intentionally created decoration or simply results from final finishing of a pot surface. Finally, smoothing, coded "Smth", involves the creation of a blank or smooth area by wiping clean a portion of a larger surface area decorated with a surface texture.

3.2 *Form*

The extensive refitting work on the Dendi pottery provides us with a representative range of pottery forms, which gives us an understanding of vessel appearance as well as clues as to usage and cultural attribution. Birnin Lafiya's pottery features a very wide range of vessel forms with a multitude of rim shapes, but amongst this variety some key pottery forms stand out.

The most common category are small to medium closed vessels, most commonly with a simple everted collar. These are mostly of medium thickness and are almost always decorated, most commonly with poorly impressed roulette decorations (e.g. Plate 23: 2, 3). These are found right across Sahelian West Africa, and fulfil a range of common storage functions. In addition, the assemblage features a range of larger closed vessels, both with a simple rim or a simple everted collar and with a thick body. These include examples recovered within the house excavated in Birnin Lafiya Trench 3/10. Again, these commonly feature relatively poorly impressed roulettes. Possibly these vessels served for water or grain storage.

A number of bowls were also identified. These include large open bowls (Plate 23: 4), with a fairly thick body, often well-formed and burnished. Possibly these relate to food presentation or communal eating practices. We also recorded a significant quantity of small and medium bowls, commonly with relatively thin bodies and quite finely finished, often burnished. A distinct subset of this category are burnished bowls with incised decoration, and the characteristic "is-geo" decorations are often found in association with this type of vessel (Plate 20: 3–14; Plate 21: 18–20). It seems highly likely that these small to medium bowls related to food and/or drinking practice. Certainly, the common occurrence of highly distinctive decoration types might indicate their linkage to some form of social practice.

In addition to indicating possible vessel functions, refitting has allowed us to define specific pottery types serving as material cultural signatures of Birnin Lafiya pottery, and also suggesting different chronological phases of the assemblage. For instance, Trench 11 at Birnin Lafiya features a number of pots of a type not seen in significant numbers elsewhere, namely a slightly closed vessel with a short open collar, featuring a square rim, often notched, and most frequently associated with channelled decoration (Plate 29: 3–4, 11; Plate 30: 19, 21; Plate 32: 43, 49). This appears as a distinctive Birnin Lafiya vessel type, and represents a chronological phase within the region's archaeology which can aid future survey in the region.

Some key features are not present at Birnin Lafiya. Handles, modelled bases and potlids do not occur, and there is also very little evidence of what could be classified as bottle forms.

Looking across the range of forms from the Dendi region more widely, strong parallels in key types emerge, including in the prevalence of small and medium closed vessels, larger storage vessels and bowls. The material from Tin Tin Kanza provides a useful corpus for comparison, given that significant reconstructions of form were carried out (Champion 2013) and that deposits date to similar periods as Birnin Lafiya. The small to medium bowls featuring incised geometric ("is-geo") decoration, which are a key type at Birnin Lafiya, do not occur at Tin Tin Kanza. Likewise, distinctive types present at Tin Tin Kanza are often absent at Birnin Lafiya. These include large collared vessels with incisions in bands over roulette impressions (Plate 9: 16; Plate 10: 27) and a black burnished vessel type with distinctive channelled and incised decoration (Plate 10: 22, 25). Such comparisons suggest a variability of pottery forms over relatively short distances

within medieval Dendi, possibly reflecting regional potting traditions.

Carinated vessels (Figure 17.3k) were only minimally present within the assemblage. We note their presence at Toutokayeri, Gorouberi 13 (Plate 13: 6; Plate 14: 11, 13), Gorouberi 14 (Plate 13: 2), Kantoro, Kompa Dune and, with a single carinated body sherd (CB4), at Madekali RC1. They only occur in very small numbers, and their absence at other sites may not be evidence of absence (sherds readily break at the point of carination). This said, the fact that the vast majority of the instances recorded occur in the northern part of our research area may be significant.

Where rims were found in association with carinations, these were almost universally simple rims, the exception to this being type C2, associated with an everted vessel (Figure 17.3k; Plate 13: 6). The limited recovery of carinations in association with rims and larger portions of vessel forms makes it difficult to describe the overall formal characteristics of carinated vessel forms in the study area. On the balance of the evidence recovered so far, these tend to be relatively small vessels, of a diameter of less than 24cm and sometimes much less.

Like carinations, bases (Figure 17.3a) were also minimally present. These were encountered at Birnin Lafiya (Trench 11 only), Tomboutou and Kantoro. These bases include relatively simple forms (types B1, B4, B5), but also fairly distinctive footed bases (types B2 and B3). As with carinations, bases were only rarely recovered in association with larger portions of vessel forms, and – not surprisingly – never in association with rims.

4 Comparison with Wider Regional Assemblages

Having presented the main facets of the Dendi assemblage, we now discuss material from the subregion, in order to identify parallels and dissimilarities. In this overview we proceed largely geographically, ranging from Dendi outwards (see Maps 1–3 for sites mentioned in the text). We focus on sites broadly contemporaneous with the main occupation of Birnin Lafiya (sixth to fourteenth centuries AD).

If we look, first, at the immediate vicinity of our sites – ie. within a 250–300km radius (Map 2) – we are quite poorly served. What archaeological work has taken place (Haour & N'Dah, this volume) has paid little attention to pottery. Thus, claims such as Ade Obayemi's (1983: 10) that Ulaira and Kareygorou yielded a "broadly identical cultural inventory" remain extremely difficult to evaluate properly; yet, problematically, they have made their way into mainstream published literature (see e.g. Kuba 2009).

Vernet (1996: 347) comments that the ironworking and settlement contexts he identified along the Mékrou were linked with a homogeneous and abundant ceramic group, unslipped and mineral-tempered. In his assessment, this group was unlike any of the other ceramic cultures he had encountered through his work in southwest Niger, leading him to suggest that affinities may have to be sought around the *dallol* Bosso and in Benin. The work of Haour et al. (2006) in the region did not involve excavation, apart from the investigation of a mound of ironworking debris which included a partial pottery vessel. One point of note is the occurrence of carinated shapes in the Parc W, also reported by Vernet (1996: see e.g. Figure 181) and ECOPAS (2002). These are, according to Gado (2004: 165), very rare in southwest Niger generally; he reports their presence at the large mid-late first millennium AD site of Gabu near the Malian border, in Parc W, and a single occurrence from one of the sites of the Bura system. As noted above, the occurrence of carinated vessels is certainly sporadic within our assemblage. This distribution likely bears on the reconstitution of the complex cultural links along the Niger River.

In southeast Burkina Faso, the Chaîne de Gobnangou, a sandstone massif with a steep escarpment, rises ca. 100 m above the surrounding plains. Two rockshelters and one open-air site were excavated (Frank et al. 2001; Wotzka & Goedicke 2001). The rockshelter site of Péntènga in particular yielded rich archaeological material. In the 1.9 m thick sequence, pottery, microliths, and plant and animal remains were found, dated between the seventh millennium BC and 1300 AD. Several pottery groups, some directly dated, some dated by inference, are assigned to broadly the same temporal horizon as Birnin Lafiya. Among these are groups featuring red slip and incisions, comb impressions and twisted cord roulette, the latter sometimes applied over the middle of the body, sometimes in single or multiple horizontal bands and occasionally paired with wavy lines produced by knotted twisted cord roulettes (Wotzka & Goedicke 2001). For its part, one group, Group 5, bears similarities with recent Gourmantche pottery of the region, featuring carved roulette, red slip and incised triangles filled with impressions; this is considered sub-recent (Frank et al. 2001: 161, Figure 39).

The excavations by Petit (2005) of several mound sites of the Atakora yield a valuable sequence. The earliest pottery that can be assigned to the Iron Age occurs in the lowest phases of the mound site of Yohongou-I (discussed in Petit 2005: 50–69 in detail; 104–105 for an overview). It includes a vast range of forms and rim shapes, and the preferential use of braided strip roulettes and strip roulettes – the latter becoming the most common type of

surface treatment around the eighth century AD. Strainers (as identified by the occurrence of pierced potsherds) appear at a similar time. Cord roulette was never as important as strip roulette (Petit 2005: 104). Unfortunately, Petit's use of the term "strip roulette" is rather vague, encompassing several different categories including "twisted strip", "braided strip" and "pleated strip" (Petit 2005: 18; see Figure 3.15a:1–6). This makes comparisons difficult; at Birnin Lafiya, folded strip roulette certainly dominates, but this is not the case for other roulettes such as the braided strip. The Atakora ceramic evidence of the eleventh and twelfth centuries shows a near-disappearance of cord roulette and rocker stamping and an increasing prevalence of braided strip roulette. This marks a major difference with the assemblage from Dendi.

Down the Niger River, the artefacts recovered from the large site of Baha Mound, surveyed and excavated by Hartle in 1968, and evidencing occupation between the sixth and eleventh centuries AD, have not been the subject of detailed publications. An overall summary by Nzewunwa (1983) suggests that tens of thousands of sherds including painted, rouletted, incised and burnished wares were recovered. In the nearby case of Ulaira, a huge range of iron artefacts, grindstones, pottery, iron slag, cuprous rings, shell beads, clay figurines and floor pavements are reported from contexts dated to the mid-first to mid-second millennia AD (Nzewunwa 1983, 1993; McIntosh & McIntosh 1986b; Sule & Haour 2014). This work would be very relevant, but as it did not include in-depth discussion of the pottery it is of limited value.

In short, as far as the regions neighbouring Dendi are concerned, several points can be retained. First is the possible significance of carinated shapes, which are reported to be unevenly distributed through contiguous southwest Niger but are known from Parc W and occur at a small but geographically spread-out series of sites within our study region. Concerning the material from Pénténga, we note the similarity of Group 5 ceramics (Frank et al. 2011: Figure 39) with the pottery of Gourmantche communities; it resembles some of the materials from Dendi. Comparisons with Atakora reveal a mixed picture; the presence there of braided strip roulette marks those sites apart from those of Dendi. Finer work in the future might focus on unpicking the various types of fibre roulette in use there, and at differentiating assemblages from either side of the Atakora chain.

If we widen our circle to archaeological sites within 600km of Dendi, we find a greater range of data relating to pottery. To begin with research conducted within the Republic of Benin, we can mention work around Abomey (Randsborg & Merkyte 2009) and Savè (Gurstelle 2015). Working clockwise from there, we have the site of New Buipe in Ghana (York 1973); in Burkina Faso, the group of sites of Kissi, Oursi and Saouga (von Czerniewicz 2004a, 2011; S. Magnavita 2015, chapter 6); and in Mali, Gao (Insoll 1996; MacLean 2000; Cissé 2011; Cissé et al. 2013).

The data published by Randsborg & Merkyte (2009) constitute the result of salvage excavations around the town of Abomey, while Gurstelle's doctoral thesis (2015) concerns the Shabe kingdom, centred on the Savè Hills of central Benin and part of a network of loosely integrated polities with some symbolic kinship with Ile-Ife. Both studies offer good descriptions of the ceramics uncovered. Anecdotally, both also recovered the remains of potsherd pavements (Randsborg & Merkyte 2009: Figure 4.3 and Plate 1.1, edge-laid; Gurstelle 2015: Figure V.7, flat-laid).

The material recovered by Randsborg & Merkyte (2009: Vol II: Plates 76–86 and 88–93) from test pits sampling seventh century BC–thirteenth century AD occupations shows little commonality with the Dendi wares, being dominated by carved rouletting, comb-stamping, stabbing and incisions/grooves. The material documented by Gurstelle (2015), for its part, largely falls in the period post-AD 1600. It involves a small minority of nineteenth century glazed sherds but much more common are the so-called coarse wares. The majority of sherds are plain; braided cord, knotted strip, maize cob, carved and twisted cord roulette impressions occur, as do incised and stabbed impressions (Gurstelle 2015: Figures B1–B6). None of this material resembles the Dendi data, unsurprising given the difference in region and chronology.

The study of the pottery from the site of New Buipe, a series of three mounds along the Mouhoun River in Ghana, is of more direct significance given New Buipe's similarity, in terms of both architecture and chronology, with some aspects of our sites from Dendi. Pottery occurs in New Buipe's Phases 2 and 3, which roughly span the eighth to seventeenth centuries. Slightly unexpectedly given that the two phases are separated by perhaps as much as seven centuries, almost half the ceramic types defined occur in both phases (York 1973: 90). Four basic decorative techniques account for most of the decorations: incisions, "plaited grass" roulettes, toothed comb impressions, and painted designs. These techniques are found throughout the sequence, but their proportions and method of application are chronologically diagnostic: this is true in particular of the ratio between comb impressions and painting (York 1973: Figure 37). Neither of these techniques is particularly common in the Dendi assemblage where, as we saw, rouletted wares are far more numerous.

Unfortunately, the roulettes of New Buipe are poorly described; apparent twisted cord rouletting is alluded to

but not quantified (York 1973: 155). Plaited grass and grass roulette are described, but, as pointed out by Dueppen (2015: Table 3), the specific nature of the roulette is not easily determined from the published illustrations. Looking at the figures published by York (1973), it is also possible that some of the decorations referred to as "combing" may in fact involve rouletting.

That said, in seeking parallels with our Dendi assemblage we can note the existence of New Buipe's Type 18, a small group of sherds with homogeneous fabric, commonly involving a scalloped or arcaded pattern of incised lines, with the zones between filled with "plaited grass" roulette impressions (York 1973: 159, no illustration), and Type 22, consisting of sherds decorated with plaited grass roulette impressions (York 1973: 161). Of note too is "Utility Ware" at New Buipe, regrouping a wide range of forms and sizes of vessel which have in common a similar fabric and a "severely utilitarian" character. Occurring through a range of periods, Utility Ware is one example of the continuity of ceramic traditions between Phases 2 and 3 (York 1973: 107). Many are large, thick-walled vessels, sometimes permanently set upright in the ground, and which were probably used for storing liquids (York 1973: 107 and Plate VIIb). This ware also includes drainpipes (York 1973: Figure 49; called "Type 3(c)"), of a diameter of 13–18 cm and a height of 30–45 cm. Morphologically, though not functionally, these are similar to the ceramic cylinder which we recovered in Room 5 in Trench 3/10 at Birnin Lafiya (Plate 25: 3). At New Buipe they are most characteristic of Period 6, spanning ca. AD 1640–1700 (York 1973), so they are much later than the Birnin Lafiya examples.

Von Czerniewicz's study (2004a, 2011) of the pottery from three settlement mounds in the Oudalan region of northern Burkina Faso (Saouga, Oursi Village and Oursi) offers another valuable point of comparison. The nature of the sites – mounds covered in pottery and pisoliths, which are interpreted as traces of past buildings – and their dates (roughly the first half of the first millennium AD for Oursi, and the first millennium and early second millennia for Oursi Village and Saouga; von Czerniewicz 2004a: Tables 2, 16, 29, 30, 45) – make them directly comparable to many of our Dendi sites.

In the "early Iron Age" (the first half of the first millennium AD), mat impressions, twisted cord roulettes ("Schnurroulette") and finger impressions together account for over three quarters of the assemblage (von Czerniewicz 2004a: Diagram 36). In the next phase, these three decorations occupy an even greater share of the total assemblage, although the frequency of each changes (twisted cord roulettes become the commonest). A new decoration type, the polished stab mark, appears (von Czerniewicz 2004a: Diagram 37). In these two phases, combined decorations involving both incisions and rouletting account for just a few percent. The Late Iron Age, which runs AD 1000–1350, sees the continued dominance of mat impressions, finger impressions and twisted cord roulettes, but also the appearance of the folded strip roulette ("Bastroulette"; von Czerniewicz 2004a: Diagram 38; Oursi Village is a case in point, see Diagram 12 and Plate 49: 2, 3). "Straining vessels" also characterise this phase (von Czerniewicz 2004a: Plate 89 shows an example from Saouga). This Late Iron Age assemblage shows the closest similarity with the Dendi pottery, in particular through the occurrence of perforated pottery and of folded strip rouletting. However, folded strip roulette still only accounts for 6% of the assemblage there; the most common decorations are mat and finger impressions (von Czerniewicz 2004a: Diagram 38), neither of which feature in Dendi. In the earlier periods, the occurrence of channels, incisions and incision/rouletting combinations (similar to our "is-geo") is somewhat reminiscent of the Dendi assemblage.

Oursi Village was re-excavated three years after the initial test pitting, and revealed extensive architectural remains now known as Oursi Hu-Beero (Petit et al. 2011). The pottery assemblage from Oursi Hu-Beero is consistent with the Middle-Late Iron Age transition noted in earlier work, in both vessel forms and decoration styles. Pots seem to have been made via the tamper and concave anvil technique, with the rim modelled later after initial drying. The forms are of six types, and include two types of closed vessel (which make up the majority), as well as open bowls, potlids, footed bowls and large static bins.

Decoration consists of twisted cord, folded strip (called "twisted strip") and composite roulettes; fingertip, mat, comb and single cord impressions; channelling; incision; polishing; and burnishing. The comb and mat impressions suggest a Middle rather than Late Iron Age origin, at least for earlier phases of the architectural complex, whereas the folded strip roulettes may indicate a Late Iron Age date, as do high percentages of twisted cord roulette and polished surfaces. However, half of all sherds are undecorated.

Combinations of decorations often occur. Although some of the decorations reported (slip, twisted cord roulette, folded strip roulette, incisions, channelling) are common enough in Dendi, others (comb impressions, single cord impressions) are not, and certainly the combination on a single pot of rouletting and mat impressions described at Oursi Hu-Beero has no parallel in our assemblages from Dendi.

At Kissi, in the same part of Burkina Faso, excavations took place in settlement areas of all the major phases. The

pottery shows an evolution over three phases (S. Magnavita 2015: Chapter 6; Figures 36–38 especially). The earliest, from the first few centuries AD, represented by a test pit at the mound of Kissi 22, delivered a ceramic assemblage characterised by restricted bowls, a flattened rim that is sometimes roulette-decorated, and abundant channelled ware, with mat impressions as the main decoration, possibly as a by-product of shaping technique. The later, main, occupation, which is evidenced by excavations at Kissi 3b and 22b, saw changes in the proportions of various decorations, but mat impressions and cord roulette remain the dominant type. The final phase (ninth/tenth to thirteenth centuries AD, represented by Kissi 14b and 40) sees the arrival of new ceramic forms and decorations and the abandonment of others. The assemblage from the top part of the 4.8m sequence in the 2 × 2m test pit at Kissi 40 is taken to be illustrative of this late period. This sequence provided evidence of tenth–twelfth century living structures, a rarity in Oudalan barring the notable exception of Oursi Hu-beero (S. Magnavita 2015: 32–33, 44). Mat and cord roulette impressions predominate. Crucially, classic markers of the late Iron Age recovered at other sites of the Oudalan, such as pierced pottery and folded strip roulette rouletting (von Czerniewicz 2004a), are absent at Kissi 40 (S. Magnavita 2015: 46, 47).

At the site complex of Gao – consisting of Gao Ancien and Gao-Saney – a range of archaeological studies have taken place which have produced one of the most important datasets for pottery studies of the Niger Bend region (Insoll 1996; MacLean 2000; Cissé 2011; Cissé et al. 2013). These have evidenced fibre roulette impressed wares dominating the assemblage up to the seventh century (Insoll 1996; MacLean 2000; Cissé 2011). This includes various forms of twisted cord roulette, as well as folded strip roulette (see e.g. MacLean 2000). This "twine-impressed" assemblage is then replaced by a channelled rim assemblage with associated slipping, burnishing, and comb impressions around the seventh/eighth centuries AD (Cissé et al. 2013), part of a wider pattern throughout the Niger Bend at that time.

This transition from twine to polychrome wares has been studied in depth recently at the site of Gao-Saney, where excavations by Cissé and colleagues yielded an assemblage forming a relatively coherent ensemble over the three trenches excavated to a depth of over 6m (Cissé 2011: 176).[8] This assemblage is dominated by organic-tempered jars with long, funnel-like everted rims, decorated with broad parallel channels and often a combination of red slip, white and/or black paint (Cissé et al. 2013). Another distinctive but less common vessel is the small simple-rim bowl with fine fabric, decorated with impressed comb in linear or geometric patterns and then slipped and burnished. Together, these two forms account for 70–80% of the assemblage, and neither are reminiscent of the Dendi finds. Folded strip and twisted cord roulette impressions are common at Gao, but less so than other types of roulette, which are either unidentified or classed as recognised entities resulting from the use of a single, as yet unknown, roulette.

Cissé et al. (2013) conclude that the Gao assemblage lies within the broad zone of first millennium AD polychrome pottery that is found along the Niger River, from the lower Inland Niger Delta (McIntosh 1995a; Arazi 2005; Schmidt et al. 2005) and the Lakes region (Raimbault & Sanogo 1991) to Timbuktu (McIntosh & McIntosh 1986a; Park 2010), and downriver past Gao to Ansongo and Bentia (Arazi 1999). The distinctive polychrome pottery assemblage found in the Gao-Saney deposits occurs along a 500km stretch of the Niger Bend, appearing suddenly and intrusively c. 650–700 AD (Cissé 2011). While within this "Niger River polychrome zone" forms and fabrics change from one region to another, the prominence of red, black, or white paint (with or without red slip) is a constant, and the excavators postulate the existence of a river-based cultural interaction along the Middle Niger.

In short, sites at some distance from Dendi raise a series of observations. The ceramic analysis from New Buipe suffers from terminological uncertainties in the description of roulettes, and little can be said beyond the fact that similarities exist in the use of ceramics as near-architectural features – which might of course simply be linked to shared use as storage vessels. The Oudalan (Burkina Faso) sites offer a much better documented range of evidence. In this long sequence, the Late Iron Age pottery most resembles the Dendi evidence, mainly because it is only then that folded strip rouletting, so prevalent in Dendi, occurs in Oudalan. But folded strip rouletting remains far less popular in Oudalan than do other decorations, which are not seen in Dendi. It is near-absent at the site of Kissi, abandoned around the thirteenth century. As for Gao and sites up and down river from it, we see in Dendi nothing that resembles the painted wares that seemingly mark a cultural connection along the river from the last third of the first millennium AD.

If we widen our circle to archaeological sites within 1000km of Dendi, mound sites contemporaneous with the main occupation of Birnin Lafiya and with well-published ceramic assemblages all lie to the northwest:

8 This is the first analysis of ceramics from the full depositional sequence at the site; previous excavation was terminated at a depth of 2m because of the instability of the ashy deposit (Insoll 1996: 42).

these include Kirikongo (Dueppen 2012, 2015), Jenné-jeno (McIntosh 1995b), Dia (Schmidt et al. 2005), and Sadia (Huysecom et al. 2015).[9]

Turning firstly to Kirikongo, photographs of the material excavated are scarce in the site monograph (Dueppen 2012), but the best source is Dueppen (2015). His Figures 10 and 11 map the evolution in frequencies of different types. In the first phase of occupation, Yellow I (AD 100–500), pottery was homogeneous, mainly consisting of cooking jars, decorated with mat and braided strip roulette impressions. In Yellow II, ceramic decoration techniques expanded to include both vertical and diagonal mat impressions, simple and alternate braided strip roulettes, and some carved wooden roulettes. Burnishing was also used. In Red I (AD 700–1100), the diversity of ceramic forms and decorative techniques increased. Mat impressions were predominantly diagonal rather than vertical; decoration changed from braided strip roulettes to twisted cord and folded strip roulettes. Carved roulettes were increasingly popular, especially in a double-toothed pattern. The changes in Red I are considered representative of wider divergences in the tradition that had previously used similar pot forms and braided strip roulettes. The usage of carved roulettes at that point seems to have been imported from the savanna/forest edge to the south (Dueppen 2015).

In general, the decoration of the Kirikongo assemblage bears little similarity to our Dendi material. Braided strip roulettes, carved wooden roulettes, and mat impressions (thought to be derived from the pounding on a concave form shaping technique) were the preferred decorations, and none of these are common in the Dendi material. At Kirikongo, folded strip roulettes were never abundant, even after they replaced braided strip roulettes.

One of the most important early pottery studies is that of Jenné-jeno, and the associated sites of Hambarkatelo and Kaniana, in the Inland Niger Delta (see McIntosh 1995b: 153–157 for summary). In Phase 3 (ca. AD 350–850), simple unrestricted and restricted vessels and potlids dominate the rim assemblage (50–70%). Carinations are also very popular at that time at Jenné-jeno (10–30% of rims). This frequency in potlids and carinations is in marked contrast to Dendi. Shallow dishes and plates are common, associated with thickened, outturned rims, and fibre roulettes are dominant (60–75% of body sherds). Plaited strip roulette impressions in particular are extremely frequent, and braided twines grow in popularity, so much so that by the end of the period they account for 50% of the fibre roulette-decorated body sherds. Overall, the assemblage is very highly decorated, and plain sherds are uncommon (<10%). There is a very high incidence of paint decoration, concerning 20–50% of the rims and 2–5% of the body sherds. This painting is both monochrome (black or white) or polychrome (white, black and/or red/magenta), and includes linear and geometric decorations. This is markedly different from the situation in Dendi where, on the whole, paint is a late, submodern, phenomenon.

The assemblage from Phase 4 (ca. AD 850–1400) retains certain broad commonalities with Phase 3. However, the occurrence of unrestricted simple rims declines significantly, while that of potlids increases. New rim forms also appear, principally related to, or variations of, carinated forms. Rouletted decoration remains dominant (40–60% of all sherds). Braided cords account for 60–80% of these. Painted decoration decreases; painted decoration on rims, for example, decreases to about 10%. In a departure from the earlier phases of the assemblage, combinations of channelling and plastic motifs into geometric patterns occur, and are in fact the main type of rim decoration. This also includes anthropomorphic and zoomorphic designs.

The Jenné-jeno assemblage shares with ours the popularity of fibre rouletting, but it has a far higher incidence of decoration as a whole, and some of its most significant decorative and formal attributes (paint, carinations, potlids) are of limited significance in the Dendi assemblage.

Elsewhere in the Inland Niger Delta, excavations were carried out between 1998 and 2003 on the Dia archaeological complex, comprising three large low mounds. Surveys, test pitting and excavations on the mounds of Dia-Shoma and Dia-Mara identified five horizons (Bedaux et al. 2005: 186–189). Generally speaking, the assemblage shows little change in ceramic shape, decoration or decoration location. Most decoration types are present from the beginning (Horizon I: 800 BC-0 AD), but sometimes in small quantities. The most common roulette is the twisted cord,[10] but in Horizon II (first half of the first millennium AD) folded strip roulettes[11] become more frequent. Both twisted cord and folded strip decorations remain in use up to the abandonment of Dia Shoma (completed by AD 1600) and Dia-Mara (which was slightly longer-lived). As in the

9 While Essouk-Tadmekka, in the Malian Adrar des Iforas, is of similar date and has a well-published ceramic assemblage (Nixon 2017), the site is situated in a very different environmental and cultural zone – namely the Saharan Berber world.

10 Twisted cord roulettes are called CR-6; see Bedaux et al. (2005: Figure 7.1.7.i), which confusingly seems to show some kind of strip roulette, though the image size is too small to be sure. Generally speaking, the set of codes and rather sparse illustrations in the Dia publication render the understanding of different decorations and motifs somewhat difficult.

11 Folded strip is called CR-4 at Dia (Bedaux et al. 2005, Figure 7.1.7.g).

case of Birnin Lafiya, these decorations sometimes occur over the whole surface of the pottery, or are associated with incisions.

Building on earlier models for Dogon settlement dynamics which examined the correlations between ceramic traditions and surrounding empires (Gallay 1994), Huysecom and colleagues have expanded the study range both chronologically and geographically (see Mayor et al. 2005 for an early statement). Of direct relevance is recent work on the Seno plain south of the Bandiagara escarpment, centring on the mound site of Sadia (Huysecom et al. 2015). Sadia consists of five mounds covering c. 3 ha, with the most complete chronostratigraphic framework coming from Mound I. Over 20 types of pottery decoration are identified, of which six are considered most significant in describing local production and interaction with other areas: folded and braided strip roulette, braided cord roulette, straight mat with corded strands (Huysecom et al. 2015: Figures 8.1, 2, 3, 5, 14), and two as yet unidentified composite cord roulettes (Huysecom et al. 2015: Figure 8.6–7). The frequency of decoration types from the surface of Sadia is homogeneous: braided strip roulette and straight mat with corded strands dominate, while folded strip roulette, braided cord roulette and one of the unidentified composite roulettes are poorly represented. The material from the two younger phases of the excavation, spanning roughly the late ninth to the late thirteenth centuries AD, a time of expansion of the tell, corresponds well with this pattern. On the other hand, the earliest phase of occupation, which predates the formation of the tell, is characterised by composite cord-wrapped roulettes, including the so-called "OCAMET" (Huysecom et al. 2015). This is identical to our "rce-8" in Dendi and, as we saw above, occurrences of this decoration type appear tightly clustered around Birnin Lafiya and nearby sites, and are early. Beyond this shared antiquity of the multiple-stick cord roulette, the Sadia sequence is quite dissimilar overall from that of Birnin Lafiya, where mat impressions and braided strip impressions are lacking and folded strip roulette (never more than 11% at Sadia: Huysecom et al. 2015: Figure 9) dominates.

Wider survey in the Seno plain (Loukou et al. 2013, also briefly summarised in Huysecom et al. 2015) suggests the existence of a coherent set of sites – both mounds and non-mounds – along the valley, indicating an important occupation of the region in the period between the late ninth and the late thirteenth centuries. The survey revealed that although several different decorations might be combined, certain types which most often occur on the body of vessels, such as mat impressions and the "outil composite à motif d'échelle", seem not to combine with each other, although they often co-occur with other decorations. This is a point of parallel with the Dendi material where, for example, rce-8 seems only extremely rarely paired with folded strip rouletting. The material from sites contemporary with Birnin Lafiya is, however, quite different, involving braided strip, straight mat with corded strands and the "motif en échelle" (Loukou et al. 2013).

In other words, in this part of Mali the time range and general nature of settlement is comparable to that of Dendi, but the pottery differs. For these researchers, in the Niger Bend folded strip rouletting is a decoration characteristic of mid-first millennium BC to mid-first millennium AD settlement (Huysecom et al. 2015: 24). Its past occurrence in this region could be linked to population movements in the context of the development of empires (Mayor et al. 2005: 48; see also Mayor 2011a: 208).

In this wider region, which offers some of the best-dated sequences in West Africa, we find little fit with our materials from Dendi. In particular, we find that in Dendi mat impressions, braided strip and braided cord rouletting, carved wooden roulettes, and paint are extremely rare or absent – whereas they provide key components of the assemblages at Kirikongo, Jenné-jeno, and Sadia.

5 Concluding Comments

This chapter has set out the principal decorative and formal characteristics of the ceramic material issued from our work in Dendi. The aim here has been to provide a comprehensive description of the assemblage, and in particular one in which the stratigraphic provenance of items is clearly identifiable (see Livingstone Smith 2007 for some methodological points surrounding this issue). More detailed studies – for example, concerning the usage of vessels, the precise nature of some of the folded strip roulette items recovered, or a systematic overview of shaping techniques – will be developed from the foundations we have set here. Already we have been able to show that ceramic decorations are a sensitive marker in Dendi (see also Livingstone Smith et al., this volume). Multiple stick roulette decorations seem favoured in the region around Birnin Lafiya and are rare or absent elsewhere. Sites of Phases 3 and 4 are largely dominated by folded strip roulette and incisions, with the balance between the two possibly shifting between the west and the east of our region (regarding surface distributions of folded strip rouletting, see Khalaf et al, this volume). Decorations typical of later sites include blepharis roulette, small numbers of carved wooden roulette, and painted wares. As nothing was known about the archaeological sequence of this part of West Africa, our findings provide a basis on which continued work can build.

CHAPTER 18

Ironworking

Caroline Robion-Brunner

1 Introduction

This chapter presents the analysis of archaeological remains related to the production of iron, both at Birnin Lafiya (where slag, iron tools and iron ornaments were discovered) and beyond. Our survey and test pitting throughout Dendi has allowed the identification of a number of iron production sites and the characterisation of several technical repertoires, some of which are now dated. Additionally, it has been possible to assess the amount of slag produced in order to suggest the type of market supplied by the sites. We discuss these data in terms of population dynamics, but one important consideration to bear in mind when using both ethnographic and archaeological data is that the current population of Dendi is quite recent, and removed from most of the technical traditions visible archaeologically.

The bulk of the archaeological material retrieved by the *Crossroads of Empires* project concerns iron-using populations. From first occupation of Birnin Lafiya, for example, the inhabitants wore iron, as demonstrated by the burial recovered in Trench 11, Context 23 (Lee, this volume), which included items resembling a belt and earrings. Nevertheless, remains of smelting activities are fairly rare (Filippini, this volume). Except for four slag fragments, all the metallurgical remains are related to blacksmithing activity on the site, suggesting a long-term regular use of iron and the presence of at least one blacksmith's workshop in the village.

While no smelting site was found near the modern village of Birni Lafia and its associated archaeological sites, the survey carried out along the Niger River Valley identified several smelting sites: iron production certainly did take place in Dendi country (Figure 18.1). To understand the development and the importance of this activity in this part of West Africa, a multidisciplinary approach was used (following Robion-Brunner 2010). The ethnohistorical approach focuses on collecting oral traditions related to metallurgy; due to the fact that living memory is still rich, we were able to recover much information about the history of producers and consumers of metal in the last few centuries. Such enquiries help to understand the historical, social and economic aspects that are impossible to identify through the material record alone. They also provide information on the spiritual and symbolic world in which iron production and working were integrated. Finally, the practical knowledge of modern craftspeople helps to understand and reconstruct early practices. At all stages care is taken not to decontextualise the data, ensuring this multidisciplinary approach remains solid.

The archaeological approach focused on the inventory, description and interpretation of the material evidence of iron metallurgy: mine pits, bloomery furnaces used to extract iron during smelting, and smithies in which objects were made. These sites were systematically located across the landscape and documented through detailed description, photographs and topographic mapping. Characteristic sites were selected, and studied in greater detail through test excavations. Such fieldwork exposed bloomery furnaces, making it possible to study their operation, to collect charcoal samples in stratigraphic contexts with a view to establishing the chronology of the site and the kinds of wood used as fuel, and to sample metallurgical residues such as ore, slag, and pottery. These were subsequently analysed in laboratory conditions in order to better understand technological aspects, different modes of production, and their development through time.

Two field sessions taking place January–February 2013 and February 2014 were undertaken to uncover the ironworking traditions of Dendi. We were able to conduct interviews in seven villages (Pekinga, Kompa, Karimama, Kofounou, Birni Lafia, Kantoro and Toumboutou), which allowed us to identify 35 smelting sites, map three sites, excavate two furnaces and four tests pits, and date four sites. Survey was carried out in four zones, around villages where ethnohistorical data were collected.[1] Slag from different sites was sampled, and analysed after the fieldwork by Marie-Pierre Coustures, archaeometallurgist at the TRACES laboratory of Toulouse.[2]

1 See Map 3 for the location of sites discussed in the text.

2 The slag samples analysed come from a range of contexts and are all derived from the *Crossroads* project work. Slag from the sites of Pekinga, Mommassaga and Gbanogo were sampled on different smelting sites during survey. Slag from Tin Tin Kanza issued from a test pit excavated at this large settlement mound (Champion et al., this volume; Champion & Haour 2013). Slag from Gorouberi issued from a test pit excavated on a large refuse heap composed of slag,

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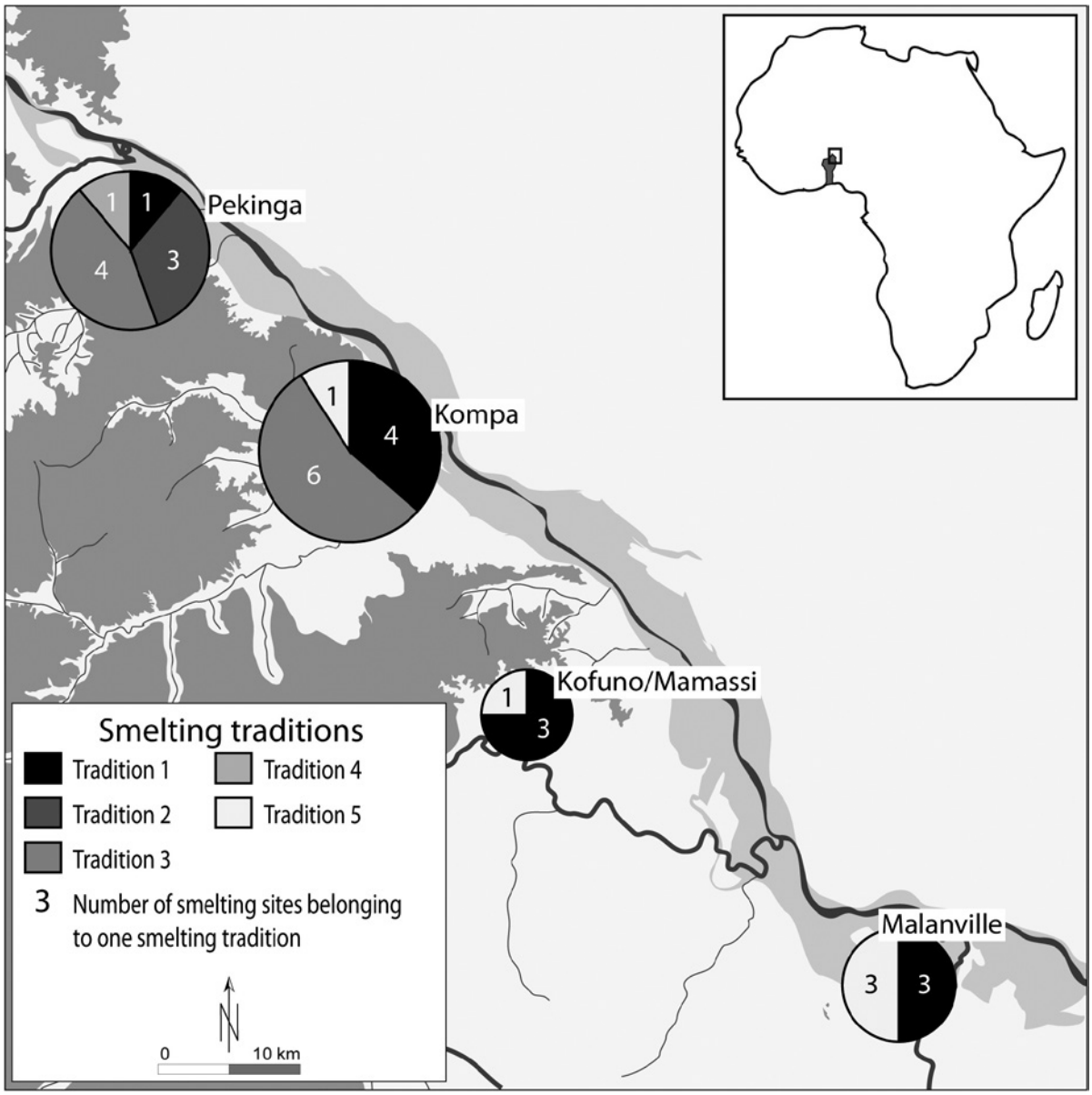

FIGURE 18.1 Localisation of the five smelting traditions

Iron production in this region of Africa (and across the continent) has progressively decreased since the middle of the twentieth century, to be replaced by the use of scrap iron. Nevertheless, the local production of iron objects is still alive in Dendi country and the forge is still the focal point for many villages. Data are currently insufficient to date the beginnings and fluctuations in iron production, but we observed significant variability in metallurgical remains within this relatively small geographic region. In order to explain such diversity, we have aimed to construct a classification based principally on technological criteria, i.e. the characterisation of metallurgical waste. We have accordingly distinguished five smelting traditions divided into three groups: that of the reusable furnace with tapped slag (Tradition 1), that of the non-reusable furnace with internal slag (Tradition 2), and finally those of the reusable furnace with internal slag (Traditions 3–5; Figure 18.1, Table 18.1).

2 The Five Metallurgical Traditions of Dendi Country

2.1 *Tradition 1*

Tradition 1 is one of the most frequent smelting traditions in Dendi. It was observed throughout the area surveyed,

pottery and ashes (Robion-Brunner, this volume). Slag from Kompa Moussekoubou issued from a test pit excavated near a furnace complex (see Robion-Brunner et al. 2015).

TABLE 18.1 Summary table of the principal characteristics of the five metallurgical traditions distinguished in Dendi country

Smelting tradition		**Tradition 1**		**Tradition 2**	
		Reusable furnace with tapped slag		**Reusable furnace with internal slag**	
Number of site			11 sites		3 sites
Localisation	NW	Pekinga	CRB 20	Pekinga	CRB 23 CRB 34? CRB 35-1?
		Kompa	Kompa M. CRB 4 CRB 42 CRB 48		
		Kofunou/ Massi G.	CRB 55 CRB 56 CRB 60		
		Malanville	Kantoro Tomboutou 1		
	SE		Kouboukoukourou		
Slag		Fayalitic		Fayalithic	
Morphology of the pricipal type of slag		External	Large ropes tap slag	Internal	Slag block with entrapped tuyere fragments
Associated with		External/Internal	"Footed bowl with no base"		
		Internal	Siliceous platter-shaped slag Oxidized slag		
Tuyères		Yes	Banco	Yes	Banco
Morphology		Ovoid shape with a flattened side		Circular shape	
External and internal diameter		7cm	4 at 5,5cm	7cm	6cm
Furnace		Reusable furnace		Reusable furnace	
Draft		Natural draft		Natural draft	
Drain slag		Tap slag run horizontally out of the furnace		Slag accumulate in the base of the furnace, it is fragmented ofter its cooling and thrown out of the furnace	
Shaft section		Ovoid section	55 × 88cm	Circular	1 to 2m
Shaft profile		Concave	~15cm depth	Concave?	?

	Tradition 3		Tradition 4		Tradition 5	
			Non-reusable furnace with internal slag			
	10 sites		1 site		5 sites	
Pekinga	CRB 27 CRB 36 CRB 37 CRB 38	Pekinga	CRB 35-2			
Kompa	CRB 49 CRB 50 CRB 51 CRB 52 CRB 53 CRB 54 Momassaga			Kompa	CRB 43	
				Kofunou/ Massi G.	CRB 57	
				Malanville	Toumboutou 2 Garou 1 Garou 2	
Fayalitic Internal	Cylindrical slag block with horizontally stacked ropes	Fayalitic Internal	Cylindrical slag block with concentric wrinkles and central depression on the upper surface	Fayalitic Internal	Fragmented slag bottom with traces of millet stems on the lower surface	
External	Flat tap slag			Internal	Oxidized slag	
Internal	Oxidized slag					
Yes Semi-circular shape	Banco	No		Yes ? ?	Banco Very fragmented	
Non reusable furnace Natural draft Tap slag run vertically in a pit made bellow the base of the furnace		Non reusable furnace Maybe bellows Slag accumulate in the base of the furnace		Non reusable furnace Natural draft Slag accumulate in the base of the furnace		
Circular Concave with a central hole?	45 to 70cm ?	Circular In form of champagne cork?	20cm ?	Circular Concave	70 to 85cm ~30cm depth	

TABLE 18.1 Summary table of the principal characteristics of the five metallurgical traditions distinguished in Dendi country (*cont.*)

Smelting tradition	**Tradition 1**		**Tradition 2**	
	Reusable furnace with tapped slag		**Reusable furnace with internal slag**	
Pit Profile				
Oppening	5? Tuyere ports	15 × 18 × 22cm	>4	
	1 door	39 × 18 × ?cm	1 door	
Chimney	Conical chimney	20cm preserve	Yes	
Building materials	Clay		Clay + recycled tuyeres	
Layers of retreading	Yes		Yes	
Spatial organization	Isolated furnaces	1 to 17 furnaces	Isolated furnace or linear battery	1 to 4 furnaces
Furnace disposal	1 or 2 furnaces in the middle of waste dump		Furnaces in the middle of waste	
Waste zone morphology	1 to 8 dumps		Thinly spread of waste	
Diameter	~10m	~50t. of slag	?	
Thickness	20cm to 1m		~30cm	
Datations	9th/12th c. AD	10 dates	?	
Similar technical traditions in other part of West Africa			Burkina Faso, Korsimoro (11/13th c.), Serneels et al. 2012, 2014	
	?			

and was most frequent in the southeast, from Kompa onwards (Figure 18.1, Table 18.1). Its characteristic technology of reusable furnaces with tapped slag is found commonly in West Africa. The smelters regularly produced iron in natural draft furnaces with tapped slag. Our fieldwork revealed a particular type of slag present within the waste assemblage, which we have called the 'footed bowl with no base', due to its shape. This specific type of slag has not been observed before, and has been studied for the first time during the *Crossroads* project. Its morphology and internal structure do not allow us to associate it with a known type. This type of slag does not dominate numerically, but seems to form in every smelting operation. The tests pits excavated at Kompa Moussekoubou and Kantoro show that this type is quite rare: only 1–2% of the slag. An example was accordingly selected for achaeometrical analysis (Robion-Brunner et al. 2015). Thin sections, prepared by lengthwise cutting, reveal two distinct parts: part A formed inside the furnace (with two different structures: massive at the bottom, and porous at the top) and part B formed outside the furnace (Figure 18.2). Preliminary archaeometallurgical analyses show that this type of slag presents a classic mineralogical composition in terms of both the close vicinity of the bloom, and its formation inside and outside of the furnace. The excavations of Furnace 14 at Kompa Moussekoubou confirm the formation of this slag. On a thick layer of ash settled at the bottom of the pit, we found that slag covered most of

Tradition 3	Tradition 4	Tradition 5
Non-reusable furnace with internal slag		
Concave or platter? >30cm		
Maybe not	1?	?
Maybe not		?
Yes, maybe removable	Yes	Yes, maybe removable
?	Clay	Clay
?	No	No
? X to 10 furnaces?	Linear battery 4 furnaces	Aggregated battery 21 to 37 furnaces
Furnaces in the foot of the dump?	50cm between 2 furnaces	2 to 4 furnaces by battery
1 to 8 dumps	No waste zone	No waste zone
~50m		
1 to 4m		
End in the beginning of the 20th c. AD	?	16th/18th c. AD 2 dates
Niger, Niamey (2th/13th c.), Guillon et al. 2010, Guillon 2013	Burkina Faso, Korsimoro (17th c.), Serneels et al. 2012, 2014	Burkina Faso, Korsimoro (7th to 10th c.), Serneels et al. 2012, 2014
Nigeria, Oyo (19th c.), Bellamy 1904	Niger, Niamey (possibly 20th c.), Guillon 2014	Niger, Niamey (7th to 9th c., 17th to 20th c.), Guillon 2013
Nigeria, Opi/Lejja/Aku (5th c. BC/ 1st C. AD), Okafor 1993, 2002		Niger, Ader (20th c.), Echard 1965, 1968, 1983
		Mali, Lake zone (17th to 20th c.), Chieze 1991
		Senegal, Silla (15th c.), Robert-Chaleix and Solange 1983, Robert-Chaleix 1994

the internal diameter of the furnace with ropes of a size of some centimetres, oriented towards the opening of the furnace. The rest of the metallurgical waste consists of a majority of tapped fayalitic slag (70%), associated with silica-rich platter-shaped slag cakes (25%), and oxidised slag (4%). The *tuyères* have an ovoid shape with a flattened side, and a circular hole at the centre.

The furnaces were ovoid or circular with a small pit and a superstructure made of clay. The walls were constituted of several layers. The different layers were probably added at the beginning of each metallurgical season in order to restore the furnace. This evidence of successive rebuilding indicates that several smelting events were performed within a given furnace. Furnace 14 at the Kompa Moussekoubou site was excavated to provide an example of this tradition (Figure 18.3; Robion-Brunner et al. 2015). It had an ovoid shaft with walls pierced at the base by approximately five *tuyère* ports and one door.

The spatial organisation of the waste zone was quite similar at each site: several dumps of small size (20–100 cm high) with one or two furnaces in the middle of the waste. The topographical plans drawn up at Kompa Moussekoubou and Kantoro (Figures 18.4, 18.5), and the observations made at Kouboukoukourou (ROU), show that the smelting sites were always near, or at the foot of, the settlement mounds. At Kompa Moussekoubou and Kantoro, several dates were run from each type of site. In both cases, they place the iron production in the

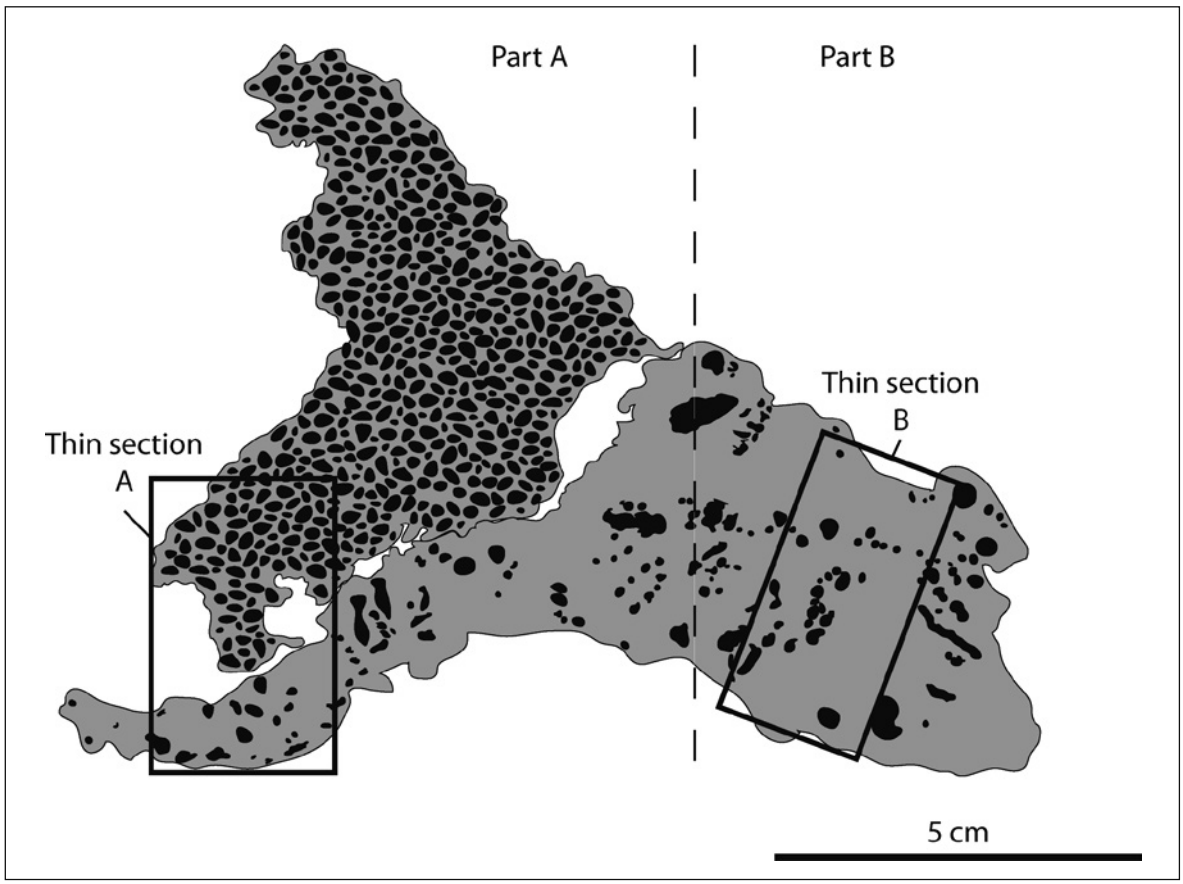

FIGURE 18.2 Profile of the "footed bowl with no base" slag (KMK13-1-AB) showing the position of the thin sections. Part A is formed inside the furnace and B is outside. Grey represents the grey slag material and black the porosity.

same time range as the occupation of the settlement site. At Kompa Moussekoubou, the readings suggest a tenth to twelfth century AD date, and at Kantoro, a ninth to twelfth century AD date (Table 18.2). At Kouboukoukourou, only the settlement has been dated, and the four charcoal samples issued from three different levels of the test pit returned very similar ages which after calibration suggest an occupation between the mid-eleventh to the mid-thirteenth centuries (Table 18.2). We do not know the exact timespan of the smelting sites. However, thanks to the quantities of slag recovered at Kompa Moussekoubou (Robion-Brunner et al. 2015), the production of this tradition seems to be small but regular enough to provide for domestic needs.

2.2 *Tradition 2*

Tradition 2 sites were observed only in the Pekinga area (Figure 18.1, Table 18.1). This tradition was characterised by large furnaces, with natural draft and multiple utilisations. The spatial organisation of the waste zone consisted of thinly spread slag. Waste was rejected at random, without visible organisation. These zones possess irregular forms. Big fragments of fayalitic slag blocks largely dominate the metallurgical assemblage. Fragments are often very compact with a grey colour and a complex form of vertical flows. They are not magnetic. We have no evidence to indicate whether these slag blocks formed in one or several smelting events, yet the fact that several smelting events were performed within the same furnace is confirmed by the presence of different layers constituting the walls of the furnace. This kind of slag is very similar to that which Vincent Serneels found at Korsimoro in Burkina Faso (Serneels et al. 2012). Moreover, the spatial organisation (furnaces in linear battery with a thick spread of waste), size (diameters of 1–2 m) and morphology (circular) of the furnaces are the same.

Only one complete block was observed in place at the bottom of a furnace at the CRB 23 site. It possessed a diameter of c. 1 m and a thickness of 30 cm. This slag block contained several fragments of used *tuyères* (Figure 18.6). They were placed at the bottom of the pit, before smelting began. The slag was caught at the back of the furnace and ran between the *tuyères*. The function of the reused *tuyères* is not clear, except that they were not used to draw the air into the furnace. They could play several roles: supporting the charcoal at the beginning of the operation;

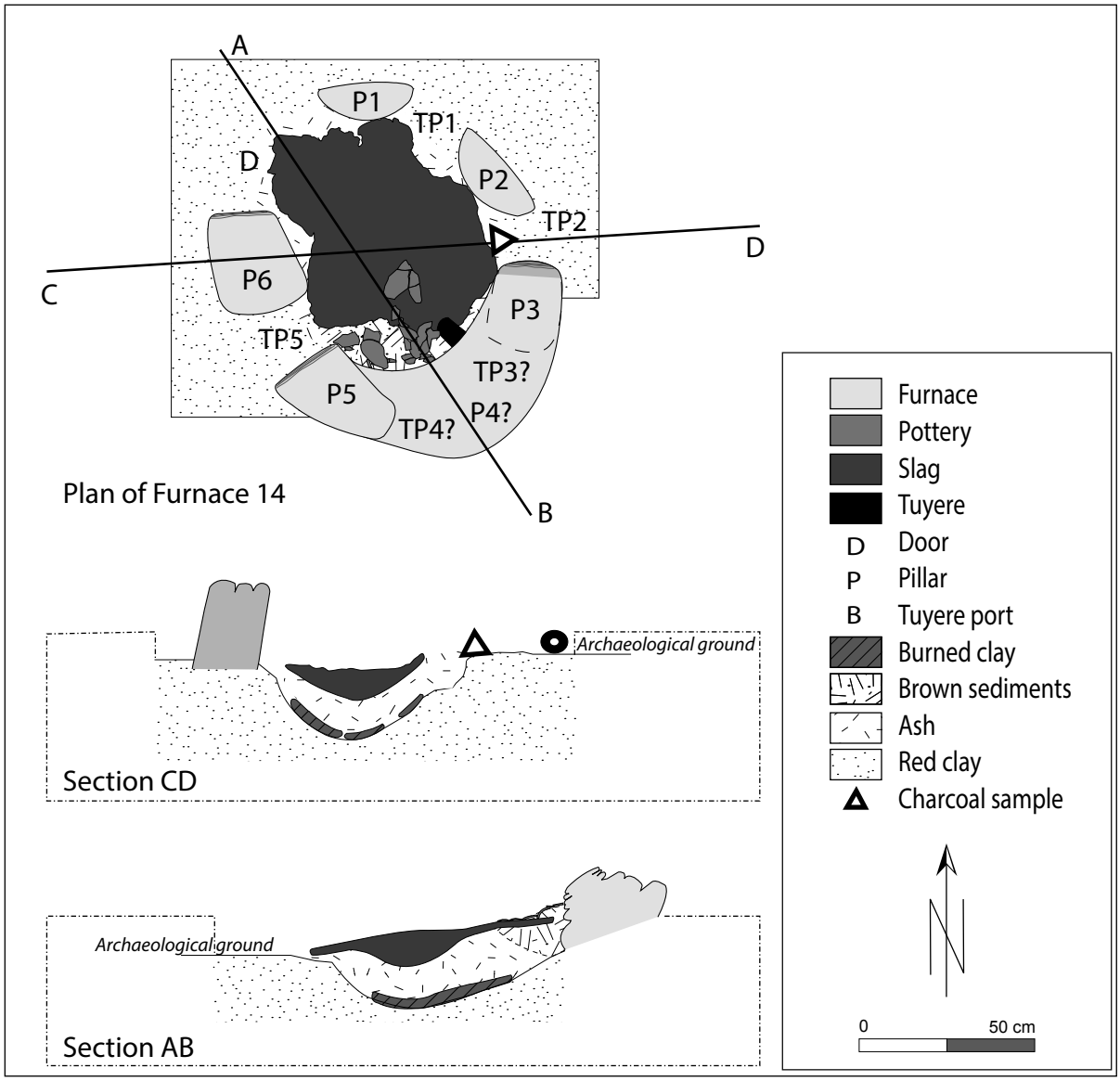

FIGURE 18.3 Plan and sections of Furnace 14 at Kompa Moussekoubou

facilitating the infiltration of slag into the bottom of the pit during the smelting process, or, after the cooling of the furnace, allowing the slag to be easily broken and removed from the pit, and thus enabling the re-use of the structure several times. The placing of *tuyères* or masses of clay at the bottom of the pit was observed in other African ironworking, for example at Markoye in Burkina Faso (Fabre 2009), the Lakes zone in Mali (Chieze 1991) and Rwanda (Jane Humphris, pers. comm.) (Map 1). However, in these cases, their function seems to differ, as the furnaces were used only once.

We have no radiocarbon dates for the Tradition 2 sites investigated in Dendi. At Korsimoro, charcoal samples collected from the site and belonging to this tradition suggest activity between the eleventh and thirteenth centuries AD (Serneels et al. 2012, 2014).

2.3 *Traditions 3–5*

Traditions 3–5 can be placed in the same group: non-reusable furnaces with internal slag. This technology was commonly found in Africa. The smelters let the slag accumulate in the base of the furnace to form a furnace bottom. The upper part of the furnace was then broken to remove the bloom, being slight enough to be rebuilt or moved to another location when the slag pit was full.

2.3.1 Tradition 3

Second only to Tradition 1, Tradition 3 is the most frequent smelting tradition found in Dendi country, with its bloomery sites observed only in the northern part of the survey area (Figure 18.1, Table 18.1). They are characterised by the presence of very large fayalitic slag blocks at the foot

TABLE 18.2 Dates for the Kompa Dune, Kompa Moussekoubou, Kouboukoukourou, Kantoro and Toumboutou 2 excavations, calibrated using Oxcal 4.2 and IntCal13 (https://c14.arch.ox.ac.uk/oxcal/OxCal.html; Bronk Ransey 2014) to 2-sigma

	Site	Name of the sample	Localisation of the sample	Lab code	Date (BP)	Calibrated range (cal AD)
	Kompa Dune	KOD13-I-9	Charcoal from a white, hardened soil, associated with potsherd, Layer 5.	Beta 348773	1190±30	722–945
	Kompa Dune	KOD13-I-7	Charcoal directly associated with fragmented pot and a stone, Layer 3.	Beta 348772	910±30	1033–1204
	Kompa Dune	KOD13-I-6	Charcoal collected *in situ*, sizeable chunks, Layer 3.	Beta 348771	910±30	1033–1204
Tradition 1	Kompa Moussekoubou, Dump 1	KOD-MOUS-1	Charcoal collected at the back of the test pit	Beta 354922	1000±30	983–1152
	Kompa Moussekoubou, Furnace 14	KOD-MOUS-4	Charcoal collected at the base of blowhole 2	Beta 354923	1050±30	900–1027
	Kouboukoukourou	ROU-14-SI	Charcoal collected at layer 40–50cm	OxA-31047	849±29	1055–1260
	Kouboukoukourou	ROU-14-SI	Charcoal collected at layer 70–80cm	OxA-31045	852±27	1057–1257
	Kouboukoukourou	ROU-14-SI	Charcoal collected at layer 70–80cm	OxA-31046	851±29	1053–1260
	Kouboukoukourou	ROU-14-SI	Charcoal collected at layer 80–90cm	OxA-31048	860±27	1055–1255
	Kantoro, Mound A, forge zone	KRO-14-Aa-191	Charcoal collected from a yellow/brown soil, associated with potsherd, slag and metal objects, 70–80cm	Beta 397870	890±30	1040–1220
	Kantoro, Mound A, forge zone	KRO-14-Aa-127	Charcoal collected from a yellow/brown soil, associated with potsherd, slag and metal objects, 110–120cm	Beta 397866	960±30	1020–1155
	Kantoro, Mound A, forge zone	KRO-14-Aa-133	Charcoal collected from a yellow and compact soil, associated with potsherd, 150–160cm	Beta 397871	1050±30	905–1025

TABLE 18.2 Dates for the Kompa Dune, Kompa Moussekoubou,, Kouboukoukourou, Kantoro and Toumboutou 2 excavations (*cont.*)

	Site	Name of the sample	Localisation of the sample	Lab code	Date (BP)	Calibrated range (cal AD)
Tradition 1	Kantoro, Dump 6	KAN-14-6-287	Charcoal collected at the back of the test pit	Beta 402971	1170±30	770–965
	Kantoro, Dump 7	KAN-14-7-294	Charcoal collected at the back of the test pit	Beta 402972	960±30	1020–1155
Tradition 5	Tomboutou 2, Furnace 14	TOM2-14-298	Charcoal collected inside the furnace	Beta 397872	320±30	1470–1650
	Tomboutou 2, Furnace 10	TOM2-14-299	Charcoal collected inside the furnace	Beta 397873	270±30	1520–1795

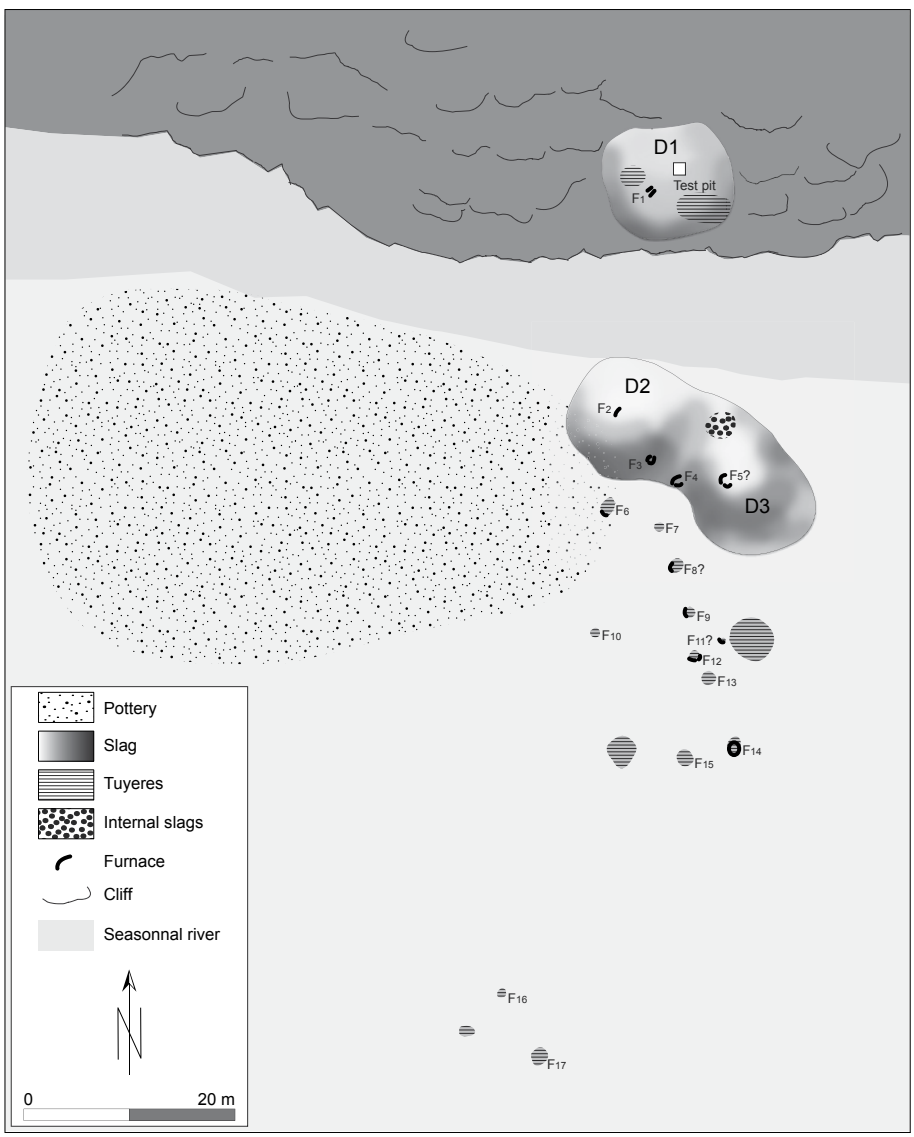

FIGURE 18.4 Topographical plan of Kompa Moussekoubou iron production remains

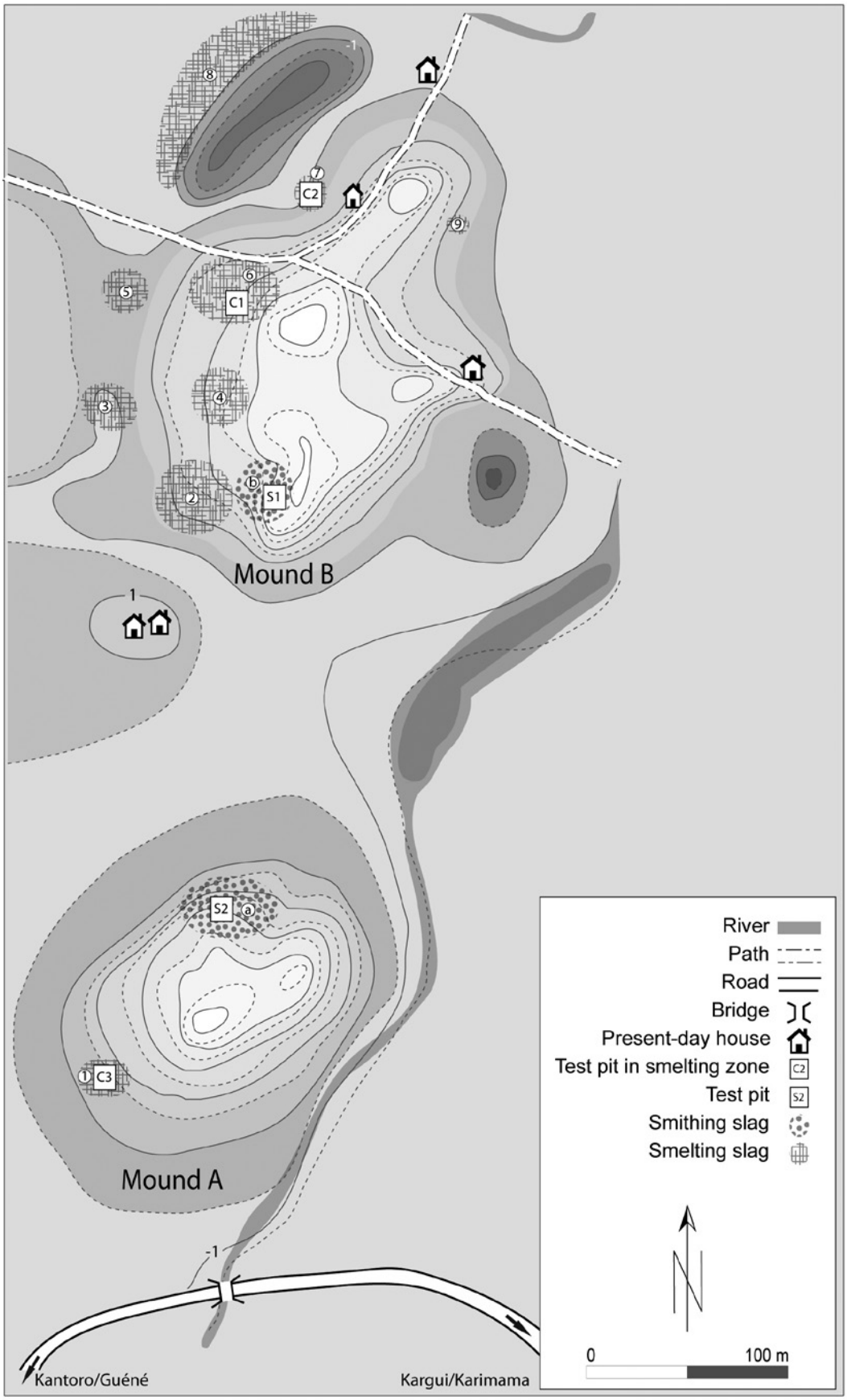

FIGURE 18.5 Topographical plan of Kantoro iron production remains and settlement. The two units excavated on the settlement mound (see Part 6, this volume) are shown by 'S1' and 'S2'. The three archaeometallurgical test pits are shown as C1–C3.

FIGURE 18.6
Slag block with entrapped *tuyère* fragments at Site CRB 23.

of small heaps of tapped slag. These slag blocks can be organised into three parts (Figure 18.7): first (A), the body, a cylinder (c. 60 cm diameter and c. 30 cm depth) with horizontal stacked ropes; second (B), the top, a little column (10 cm high) with vertical aggregated ropes, placed in the centre or near the edge of the cylinder; and third (C), on one side of the upper part of the mass of slag, a flat tapped slag. No furnace has been observed associated with this kind of slag block, so it is only possible to deduce the smelting process from the study of the slag. The direction of the ropes indicates that the slag flowed vertically into a circular pit dug into the substratum. When the pit was full, the slag continued to flow out of the pit through a rather wide opening. The last slag run formed a column resembling a stalactite. One sample of the column collected at the CRB 54 site was selected for archaeometrical analysis. The section of this sample shows that the passage of one slag rope to another is systematically marked by the presence of a border of magnetite (Fe_3O_4; Figure 18.8). Generally, this line of magnetite indicates that the slag cooled in an oxidizing atmosphere, rather than a reducing one. The same evidence has been observed in the Nigerian ironworking site of Leja:

"Leja is a small town 14 km south of Nsukka which has the largest quantity of iron-smelting residues in the south-eastern Nigeria. They consist of cylindrical blocks with average height of 28 cm, a diameter of 43 cm and weigh between 34 kg and 57 kg. [...] An interesting result of the Leja slag analysis is the discovery of bands of magnetite that separate individual slag tappings. Until now Leja iron-smelting has been described as having been conducted in a bowl or pit furnace and the residues as resembling furnace bottoms (Anozie 1979: p. 126). However, visual inspection of the external surface of the blocks reveals that they made up of various layers. These layers seem not to extend into the core of these blocks when they are fractured. [...] under the SEM samples[3] taken from the core of these blocks reveal individual layers separated by bands of magnetite, products of oxidation after the slag tapped from the furnace before another batch was superimposed on it. [...] At Opi a forced draught shaft furnace was used, with slag pits connected by channels at the base. Slag from the furnace was tapered intermittently from openings at the base of the furnace and run through the channels into the pits. The slag later solidified in the pits, giving rise to the cylindrical blocks that are observed at both Opi and Leja".

OKAFOR 2001: 439–447

The description given by Bellamy (1904) of the operation of a natural draft iron-smelting furnace near Oyo, Nigeria, is particularly useful to help understand the process used to obtain slag in the form of a cylindrical block. Before the smelt, the blacksmiths sealed with clay the six vertical apertures, the door, and the orifice at the bottom of the furnace. Then they put the ore and the charcoal inside the furnace. At the appointed time, one of the attendants descended into a tunnel leading to the bottom of the furnace, and, with an iron pike, opened out the orifice in the bottom, thus allowing the slag to run off. The pike kept the orifice open and cleared until the slag had ceased to run. Preparations were then made to open the furnace and to remove the raw iron.

Near Niamey, Niger, between the Niger valley and the dallol Bosso, Rodrigue Guillon found archaeological evidence of this smelting process (Guillon et al. 2012). At present, he is the only researcher to have excavated the

3 Sample preparation for Scanning electron microscopy.

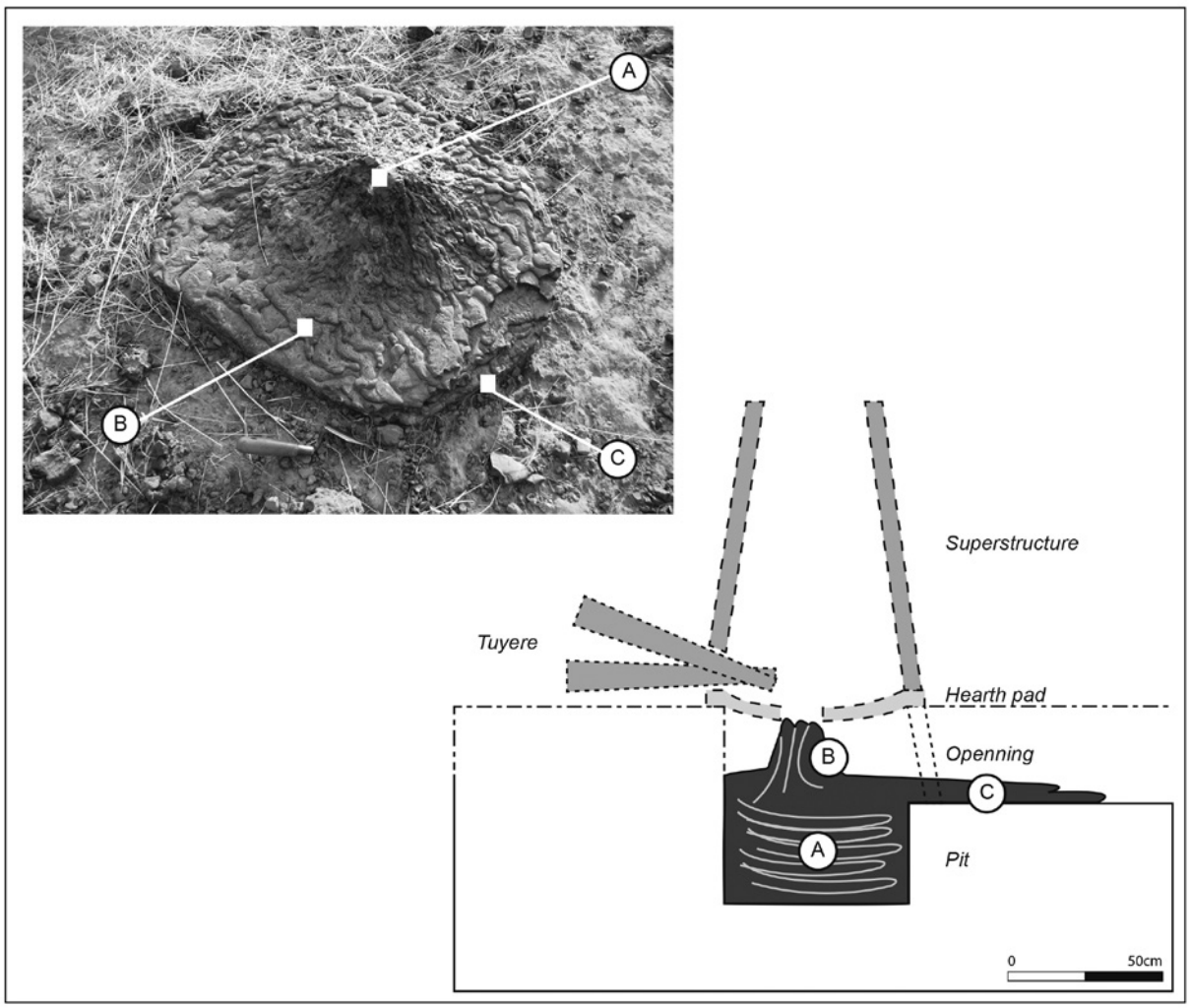

FIGURE 18.7 Reconstitution of the furnace with large cylindrical slag block at the Site CRB 36

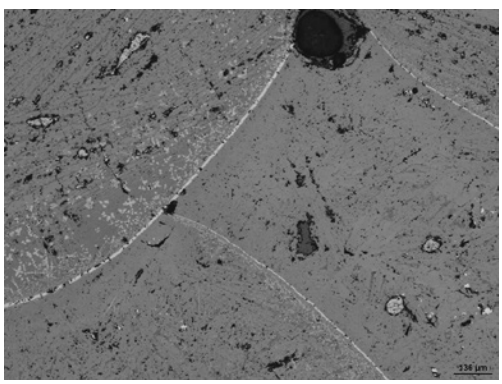

FIGURE 18.8
Photomicrograph (reflected light) of CRB 54 slag (MMS-13-1) made of spinel (up to 10% Al_2O_3; light grey) and fayalite (grey) crystals in a glassy matrix (dark grey). The limit of each rope is marked by a line of magnetite (Fe_3O_4).

furnaces associated with large cylindrical slag blocks of this sort. The furnaces remain recognisable only by the presence of the base; the upper structures have disappeared. His excavations show the existence of a hole at the base of the furnace, through which the slag ran, and a pit dug down and filled with a slag block. Guillon classifies them in the category of slag-tapping furnaces and not in that of slag pit furnaces; his argument is that the slag runs outside the furnace (Guillon 2013). This classification can be proposed because, since all slag goes through a viscous phase, whether it is tapped and separated from the bloom or not does not represent a decisive criterion. The most important factor is whether the slag is tapped outside of the furnace or whether it is allowed to flow into the lower part of the furnace.

In archaeometallurgical studies conducted in Europe, researchers distinguish two types of furnaces:

"'Tapping furnaces', best known from the late Iron Age, Roman and medieval periods, had a hole at ground level in the furnace wall that could be opened during the smelt so that the slag could run out. The resulting tap slag has a flowed appearance, like lava. From the Iron Age and Saxon periods, 'slag pit' or 'non-tapping' furnaces are known [...]. During the smelt, the slag gradually drained into a pit beneath the furnace and cooled there, either as numerous small runs and lumps or as a large block of slag upwards of 10 kg in weight"

ENGLISH HERITAGE 2011: 3

Because of the morphology of the slag and its position in the furnace, we classify Dendi Tradition 3 as 'slag pit' or 'non-tapping' furnaces, and consider that the pit is a part of the furnace. Several experiments allow a better understanding of how these furnaces worked:

"Using this furnace the smelter made an important advance [...]. This consisted in transferring slag from the reducing zone of the furnace into the specially prepared pit (Figure 3: a, b, c). As a result the ancient master could separate slag from the iron bloom as it collected and obtain a piece of iron ready to be forged[.]"

BIELENIN 2011: 31; but see also Coles 1973. cf. Abrahamsen et al. 1998; Bielenin & Suliga 2008

In West Africa as well as in Europe, the shaft part of the furnace was only extremely rarely discovered. Research suggests that the smelters had two possibilities for removing the bloom once the smelt had finished: either to break the shaft, or else to move the shaft over a freshly dug pit. In this second case, the furnace superstructure may have been slight enough to be moved to another location. This hypothesis recalls the ethnographic observations made by Nicole Echard on Hausa metallurgy in Ader (today in the Republic of Niger):

"Le dispositif de réduction lui-même était constitué par une cheminée tronconique d'argile installée sur 7 tuyères au-dessus d'une cavité pratiquée dans le sol qui recevait les scories et la loupe. La cheminée était déplacée après chaque réduction sur un nouveau foyer".

ECHARD 1983: 216

At site CRB 37, we found some *tuyères* of semi-circular shape associated with large cylindrical slag blocks. In Ader, Hausa smelters used this kind of *tuyère*, yet for several reasons we do not posit a link between Tradition 3 noted in Dendi, and the Hausa metallurgy studied by Echard. Firstly, in the Hausa process, the base of the furnace consists of a deep pit divided into two parts, with no hearth pad, and the slag produced is unknown – it has not been described, and Echard's film (1968) does not show it correctly. Secondly, concerning the Tradition 3 sites, we have no radiocarbon dates and only one ethnographic mention: Amadou Mounkala, currently a blacksmith at Pekinga, told us that his father had produced iron at the beginning of the twentieth century at the site we called CRB 27. This evidence alone therefore cannot illuminate the working life of Tradition 3; while ethnographic data place it within the recent past, the lack of radiocarbon dates means that we cannot say when it began. Moreover, the different sites where these slag blocks are found cover different chronological periods: Opi/Leja dates to between the eighth century BC and the first century AD (Okafor 2001); Niamey to the second to thirteenth centuries AD (Guillon et al. 2012), and Oyo to the nineteenth century AD (Bellamy 1904).

2.3.2 Tradition 4

Tradition 4 is observed on only one site, CRB 35–2, in the Pekinga area (Figure 18.1, Table 18.1). The furnaces of this tradition are very small (diameters of 20 cm) and filled with dense slag (Figure 18.9). Like the Tradition 3 furnaces, they can be classified as slag pit furnaces, although the morphology of the slag is different. Their upper surface is marked by concentric wrinkles and a central depression, and they feature numerous vegetal imprints. These characteristics connect them to the items studied by Serneels on the site of Korsimoro:

"Les scories typiques sont des blocks cylindriques ou en forme de bouchon de champagne. La surface supérieure est marquée par des rides concentriques et une dépression centrale".

SERNEELS ET AL. 2012: 26

To date, no excavation has taken place at CRB 35-2, but a thin layer of clay was noticed around the slag. It seems to have been broken. Serneels' research can help us to better understand the smelting process of the Dendi Tradition 4. His excavations show that the slag filled a pit which had a cylindrical profile or one that was weakly flared downward, like a champagne cork. A thin layer of clay (3–5 cm in thickness) covered the entire pit. No opening or air inlet was visible in the superior part of the pit, but the flared shape on a single side of certain slag blocks could indicate the existence of a unique opening situated above

FIGURE 18.9
Several cylindrical slag blocks with concentric wrinkles and central depression on the upper surface at CRB 35-2

the slag. As one might expect, it was at this height that the air inlet would have been placed. Neither at Korsimoro nor at CRB 35-2 were fragments of *tuyère* observed in association with the slag blocks. The extremely small size of the furnace and the absence of the *tuyères* could indicate the use of bellows. Similar signs of breakage are present on the furnaces of Korsimoro. For Serneels, they indicate that a superstructure was attached to the pit and broken after the smelt in order to remove the bloom. The furnaces would have been used only once, and they were very small with a forced draught. Serneels associates them with the group of '*fononse*' furnaces described by Jean-Batiste Kiethega (2009). Similar remains have been found in the Sanmatenga province, and in the neighbouring provinces of Boulkiemde (Kienon-Kabore 2003) and Passore. Guillon has observed this type of furnace and slag near Niamey (Guillon et al. 2010; Guillon 2013). Beyond these metallurgical remains, the spatial organisation in a linear battery is the same. Indeed, the furnaces are placed in lines with a spacing of 50 cm. At present, no radiocarbon date exists for this tradition in the north of Benin. At Korsimoro, three charcoal samples suggest activity during the seventeenth century AD (Serneels et al. 2012, 2014). Guillon has no date for this smelting tradition, but thinks it could be recent (2013).

2.3.3 Tradition 5

Finally, the Tradition 5 sites were observed in the south-east of Dendi country (Figure 18.1, Table 18.1). Their remains are principally constituted by the bases of furnaces grouped in lines of 2–4 units. The distance between two furnaces of the same line was less than 1 m. These units were added to form furnace fields (Figure 18.10). The furnace remains consist of a circular bowl of a diameter of 75 cm and a depth of 30 cm (Figure 18.11). The pit was dug into the natural substratum. It would have been smooth at the bottom, and strengthened by a wall at the top. This wall was built around the pit without interruption. Made with clay, it was 10 cm high and its top smooth and convex. It is at this level that the wall presents burn patterns. The thermic impact would have been less at the bottom of the pit. Sand, fragments of internal slag, *tuyères* and walls fill the furnace pits. The dimensions of the *tuyères* are unknown because they are too fragmented. Internal fayalitic slag (90%), associated with oxidised slag (10%), composes the metallurgical assemblage. They are rarely found complete. Most of the internal slag presents a sand layer or the negative imprints of stalks on the generally convex bottoms. These signs indicate that the slag was formed on a straw bed. The slag and *tuyères* are found only in the bases of the furnaces, and there is no waste zone on the surface.

Based on observations made at the Tradition 5 sites, and the ethnographic studies made by Echard on the traditional iron production of the Hausa (1965, 1968, 1983), we can propose the following reconstitution of the smelting process. The smelter dug several pits on the ground and strengthened them at the base with clods of clay. He filled one pit with straw and placed approximately ten *tuyères* on the floor around the pit. They project at least 10 cm into the furnace. A chimney was built separately and, when dry, was placed on the *tuyères*. The holes between the *tuyères* were then filled. The furnace was charged with fuel and preheated, with hot ore and charcoal fed into the furnace from the top, and then the smelt began. During smelting, one part of iron oxide reduced to

FIGURE 18.10 View of work ongoing at the site of Tomboutou 2

iron and the rest formed a liquid slag. Slag accumulated in the base of the furnace, to form a furnace bottom. The quantities of slag depended on the quantity and quality of ore, and the efficiency of the process. At Toumboutou 2, close to the village of Tomboutou, the bases of furnaces contained only 10 kg of slag approximately. When smelting finished, the smelter left the furnace to cool, before removing the chimney onto a new pit in order to smelt again. The bloom was taken off the base of the furnace and cleared of the slag. To minimise the moving of the chimney, the new pit would have been dug as close as possible to the previous pit. This process led to a particular spatial organisation with several furnaces grouped in lines and filled with metallurgical waste. Such spatial organization and metallurgical remains have been discovered already on several West African archaeological sites – from Niger to Senegal, via Burkina Faso and Mali – and in different chronological periods spanning the seventh to the mid-twentieth centuries (Table 18.1; Echard 1983; Serneels et al. 2012, 2014; Guillon 2013; Chieze 1991; Robert-Chaleix & Solange 1983; Robert-Chaleix 1994). Two charcoal samples collected from within Furnaces 10 and 14 of Toumboutou 2 suggest a sixteenth to eighteenth century date AD date (Table 18.2).

3 Conclusion

Can we reconstruct the history of ironworking in Dendi? In spite of our recent research, it remains too early for a conclusive reconstruction. Only two traditions have been dated, despite the density of metallurgical remains discovered in this West African area. More than thirty smelting sites have been located for the first time, and certainly more will be found. Ironworking sites occur throughout Dendi, yet the waste recovered is not huge, and the sites are composed of only small slag heaps. Reflecting smaller scale metallurgies, the evidence from these sites suggests that production was regular, seasonal and conducted by smelters who lived in the nearby villages. This human activity thus would have been oriented towards a purely local market, and strongly tied to a village and a metallurgist family (Robion-Brunner 2010; Robion-Brunner et al. 2013).

Our research shows that these smelting sites belong to different technological traditions: diverse technologies have been used to produce steel and iron in this part of Africa. We have distinguished five traditions, with significant characteristics: whether the furnace was reusable or not; whether the separation of the slag took place inside or outside the furnace, and the nature of the spatial organisation of the workshop. It is still difficult to interpret the significance of the technological diversity. Different

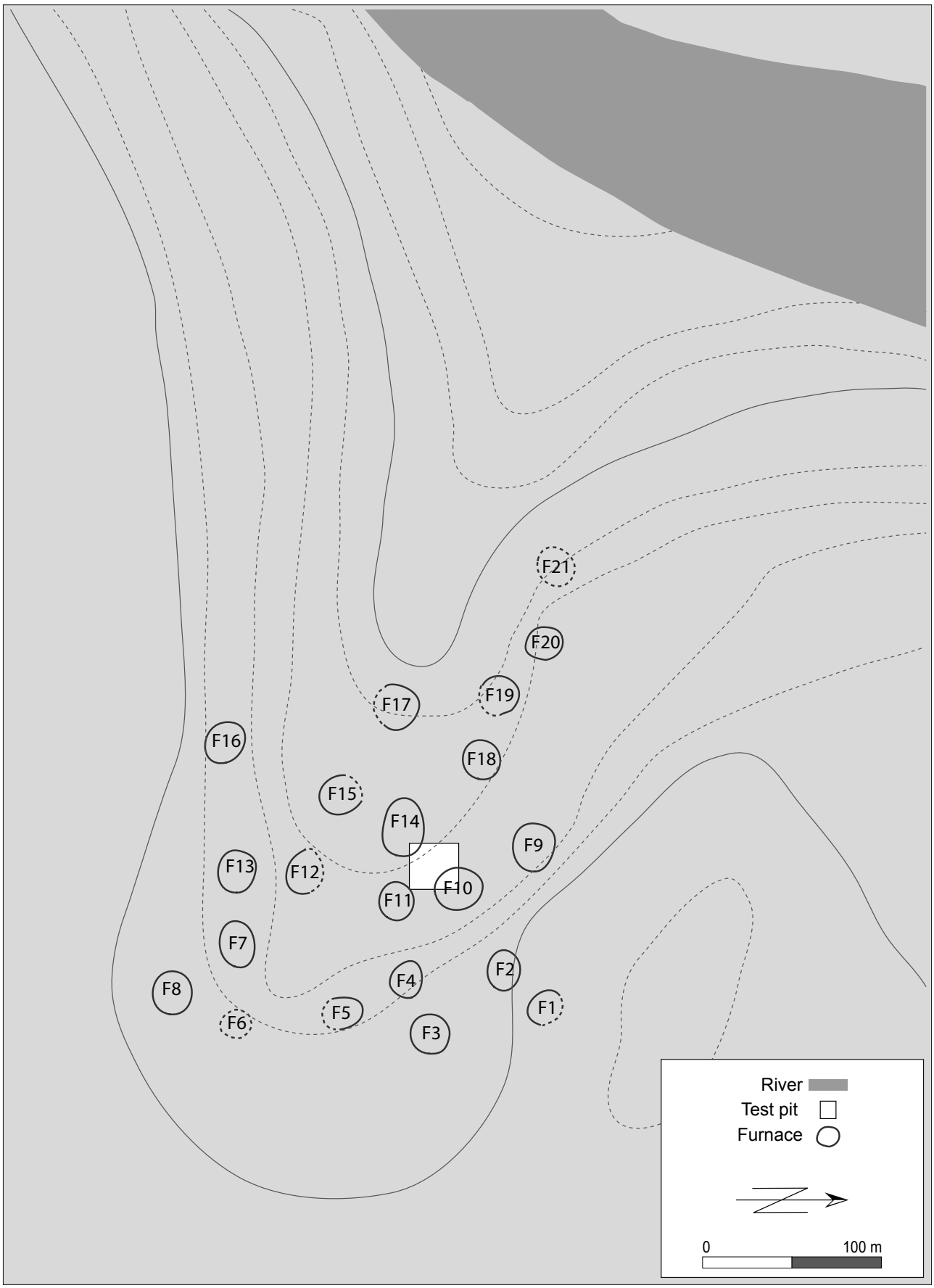

FIGURE 18.11 Topographical plan of Toumboutou 2 iron production remains

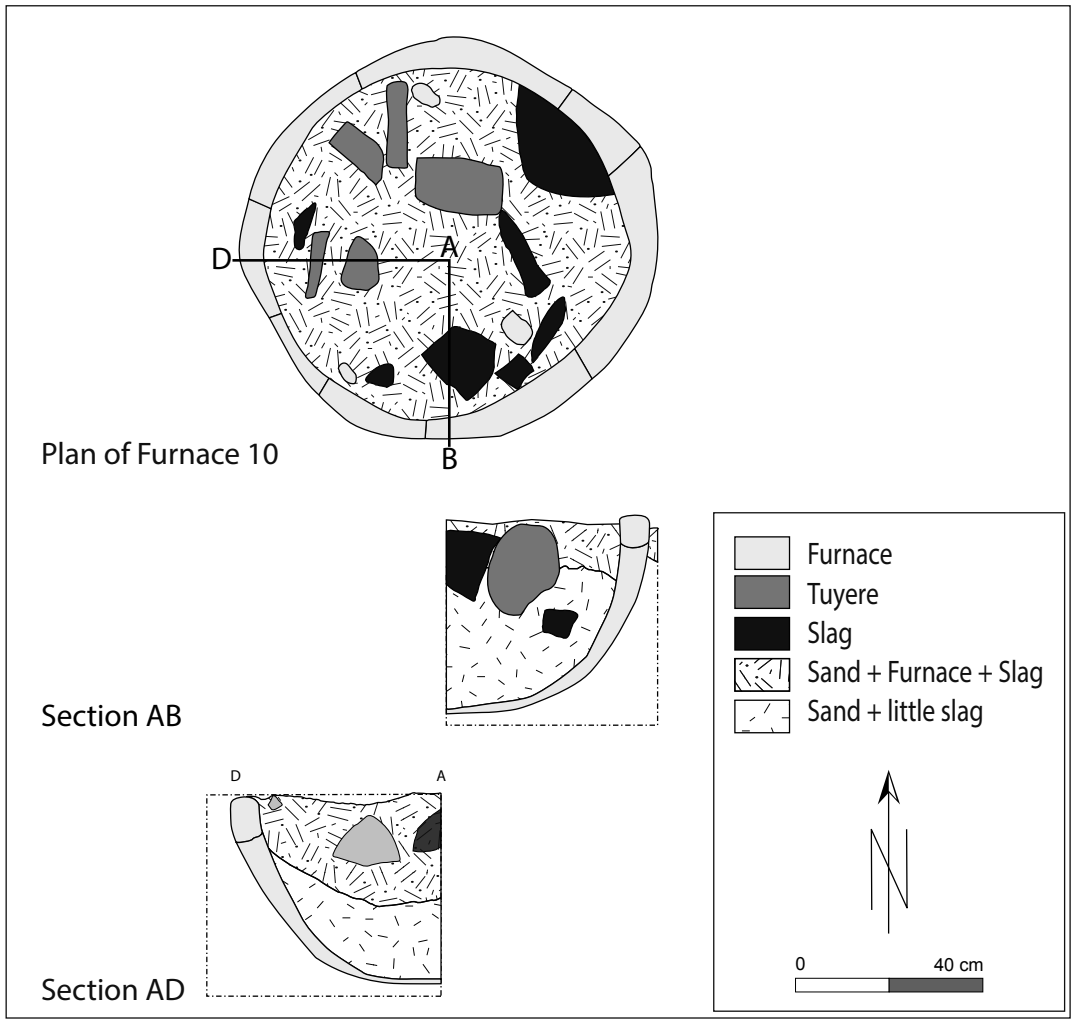

FIGURE 18.12 Plan and sections of Furnace 10 at Tomboutou 2

factors can be involved. First of all, Africa is a vast continent with variable local conditions. Metallurgists need to adapt their iron process to local resources, which play a significant role in the variability in iron waste and the processes used. To estimate their impact, further analyses of global chemical compositions of the ore and the slag are needed, as well as archaeobotanical investigations. In spite of these raw material constraints, metallurgists made a fundamental choice to exploit them. The issue of political control over resources could also be a factor in local heterogeneity in technological practices and the archaeological evidence. Archaeological data show that iron smelting is also an issue of style (see e.g. Childs 1991; Childs & Killick 1993). Different ways of producing the same thing suggest the presence of populations of several cultures. Smelting techniques reflect social identity. But the presence of several smelting styles in a single area can be proof of population movement, technical transmission or increased production. With archaeological artefacts alone, have we the elements to differentiate between these hypotheses? With regional studies, we can acquire much information from different periods and examine whether metallurgical diversity is linked with one factor (raw material constraints, settlement history, technological transmission, technological evolution, economic level of production, etc.) or several.

The localisation of iron traditions shows that the northwest is more diverse than the southeast. All the traditions are present around the village of Pekinga. This area seems to have welcomed blacksmiths belonging to diverse geographical origins. The craftsmen expressed their identity through their skills. We still do not know whether their settlement was contemporary, but what is certain is that Pekinga was a crossing zone.

A series of 12 radiocarbon dates and oral traditions confirm that iron production started at least at the end of the first millennium AD and progressively decreased since the beginning of the twentieth century. Data are currently insufficient to assess the beginnings and fluctuations in iron production over this long period, and to conclude

whether the different traditions were contemporary or consecutive.

Nevertheless, the variability of the metallurgical remains probably reflects significant modifications in population settlements. Moreover, some of these variations are very close to other West African remains. At least four traditions have the same spatial organisation, the same type of furnace, and the same type of slag as those observed at Korsimoro by Serneels and near Niamey by Guillon. What is the meaning of this extreme variability in term of settlement history (Robion-Brunner et al. 2013)?

Today, the Dendi blacksmiths belong to three ethnic groups: the Tyenga, the Zarma and the Gourmantche. Interethnic and interprofessional marriages are not taboo in this part of West Africa: there is no caste system in this zone. The geographic spread of the blacksmiths is not uniform. They are settled in different areas, and in varying densities: Zarma are present in five villages, whereas the Tyenga are present in only two. This different spread of smiths constitutes a good indicator for distinguishing the waves in which the blacksmiths arrived.

Historical data collected cover only the last three centuries. In the course of our work, as mentioned above, we collected oral traditions related to metallurgy and were able to recover much information about the history of producers and consumers of metal in the last few centuries. Although the materials we collected during a cumulative period of two weeks are not sufficient to write a comprehensive history of blacksmiths at this time, our impression is that the story of the blacksmiths is quite similar to that of other craft groups in Dendi (Gosselain, this volume). In common with other craft groups, it seems the current smith population of Dendi is quite cut off from most of the technical traditions visible archaeologically. The oral inquiries show that the current families of blacksmiths arrived in Dendi recently, around the eighteenth century; at the present state of knowledge, no smith's family appears to be native to the area. Thus, the iron traditions cannot be linked with an ethnic group or a human migration because the metallurgical remains pre-date the arrival of the current population. However, ethnological and archaeological data show certain connections with populations to the northeast, northwest and southeast.

The reconstruction of human migrations suggests that the Tyenga are native to Nigeria (although, as outlined elsewhere, the linguistic data disagree [Gosselain & Haour, this volume]). The grandfather of the current smith of Karimama arrived at Karimama at the end of the eighteenth century after the destruction of the old site by the Zarma war chief Issa Korombé (1880) and the foundation of the current site seven years later. It is said to have been the leader of the village who fetched him from Kassati in Nigeria.

It is said that the Zarma arrived in Dendi in two phases and that the first was at the end of the eighteenth century. The smiths are said to have come with the Fulani and Songhai during their arrival in the region. The Zarma were supposedly slaves, and may have run away from their masters a short time after reaching Dendi. The second phase took place at the beginning of the nineteenth century. These Zarma smiths would have come on their own initiative, for economic reasons or improved access to the iron ore. They are present to this day in Dendi country.

The Gourmantche smiths were the last ones to arrive in the area, in the middle of the nineteenth century. We were only able to carry out enquiries in a single Gourmantche village, Kofounou, so our information is too partial to draw firm conclusions. However, according to oral traditions collected by Gosselain, most Gourmantche present-day villages in Dendi were created no earlier than the first half of the nineteenth century, at the earliest the eighteenth century (Gosselain & Haour, this volume), so the data on smiths obtained at Kofounou is probably representative.

In the history of ironworking, Dendi seems to be a crossroads where different ethnic groups have settled and developed their technological traditions. The presence of diverse iron traditions and several ethnic groups in a same area indicate a complex population history and intricate cultural interactions. With further work, and particularly well-dated excavations, a clearer picture will hopefully emerge.

CHAPTER 19

Metal Objects and Slag from Birnin Lafiya

Anne Filippini

1 Introduction

This chapter discusses the metal objects and slag which were recovered from the team's excavation at the site of Birnin Lafiya. Comments on the slag can be considered in conjunction with Robion-Brunner, this volume.

2 Analysis of the Small Finds

A total of 213 metallic small finds were studied in detail, and the focus here is a subset of these, 97 objects recovered from Birnin Lafiya.[1] In this process, a very precise reading grid was used, to allow reconsideration of each object where necessary. Every item was designated by the name of the site on which it was discovered, the year of discovery, and a unique object number assigned on the ground, or reassigned in the lab if needed. Origin and context of discovery, and level, excavation square and depth, were included where available. Each object was then described, mainly on the basis of its morphology, but also including a consideration of any detail which might give a clue to function or use. The weight, the number of remains, and all dimensions are recorded. Finally, the artefact was identified when possible, and placed within a functional category. These categories have been established with numbers of studies of metal artefacts, and we draw here primarily on the work of J.-P. Guillaumet (Guillaumet 2003).

Seven functional categories can be identified among the metal objects discovered. We give here the definition of each category and the nature of the objects it contains

- Culinary activities: this concerns small finds which relate to food preparation and consumption. Generally, knives are the most frequently represented, but this group also includes spoons, forks, skewers, etc.
- Weaponry: this category consists of weapons, whether defensive or offensive.
- Crafts: we place in this category all artefacts related to metal (iron, bronze, etc.) production. It includes raw material, waste, unfinished objects, etc.
- Tools: this category is linked to the previous one, but we wanted here to specifically identify tools which relate to other activities (working the earth, wood, wool, fabric …).
- Hardware: in this category are grouped all artefacts related to building structures, furniture, and everyday life (such as several types of nails and others metal accessories for building, home improvement, but also accessories for fishing for example)
- Adornment: this includes jewellery and clothing accessories (rings, bracelets, necklaces, earrings, brooches …)
- Indeterminate: this category regroups all artefacts which have not been identified.

The study of this corpus therefore constitutes a qualitative approach to the material, which allows us to approach the functional aspects of the objects (Guillaumet 2003; Dubreucq 2013).

Comments on finds from sites other than Birnin Lafiya feature in the Catalogue (Small Finds tables and Trench descriptions; an indicative sample is also shown on Figure 19.1).

The set of artefacts is in a medium state of preservation. Oxidation has affected the finds in various ways, which are probably a factor of both the nature of the metal and the size of the object, but also depend of its use and the context of its recovery. Almost all the recovered material is fragmentary, sometimes damaged during excavation but also broken during original usage. The objects are mostly of iron or steel, more rarely other metals: three are made of copper alloys, one of brass, and five of an indeterminate metal. Among the assemblage 94 items are ferrous.

3 The Birnin Lafiya Finds

The functional categories that could be identified for material from the Birnin Lafiya site are as follows: culinary activities, weaponry, crafts, tools, adornment, hardware,

1 Analysis is based on first-hand inspection except for a small number of items which could not be studied because they were at the time on display in an exhibition at the University of East Anglia concerning the *Crossroads* project and its finds. A note is made of these objects where appropriate, based on visual inspection, but as they were not studied directly they are not included in the quantitative data presented in the tables for this chapter.

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FIGURE 19.1 Representative examples from test pits in modern Dendi villages of Bogo Bogo (GOG), Karimama (KAR), Kwara zeno (KAZ), and Kargui (KGI)

and indeterminate, the latter for items where function cannot be specified (Table 19.1). Figure 19.2 gives a representative sample of the objects recovered from this site.

The cooking activities category is represented exclusively by fragments of blades of various sizes: the maximum width of the blade fragments is 20–28 mm. There are four such items which almost certainly belonged to knives. This would indicate medium-sized knives, probably used for the preparation of meat products.

Seven elements relating to weapons were identified: there were three arrowheads, one harpoon, two fragments of the blade of a dagger or double-edged sword, and one object which may be an arrowhead but with a shape that resembles an olive leaf – that is to say rather long and thin, like a miniature spear tip. The harpoon seems

TABLE 19.1 Occurrence of different categories of metal find

Functional categories	Weight (g)	Number of fragments	Number of objects
Culinary activities	35.4	4	4
Crafts	13.6	4	4
Weaponry	29.2	7	6
Tools	32.5	7	7
Adornment	3.2	1	1
Hardware	64.5	16	14
Indeterminate	374.9	74	60

similar to one found on the site of Kirikongo, Burkina Faso (Dueppen 2012: 204–205, Figure 10.2).

Crafts are relatively little represented on this site, with a total of five items most likely related to these activities. One of them (SF-2013-53) is certainly a tang, an item generally identified in the context of a metallurgical workshop, or a forge more specifically. A second object (SF-2014-42) could also be likened to this. Two rods may be regarded as smithing offcuts because of the presence of a flattened end which may have been sliced. Another rod ends in a point at one end (the other end has been broken), suggesting this may have been a small awl.

Seven objects were categorised as tools, but it was impossible to identify them precisely. Five of them retain one or two sharp edges, but their morphology is very different from that of known cooking utensils, so they were excluded from that functional category. The other two are rods of which at least one end presents an active part: point or edge.

Adornment is represented by a bracelet fragment with a quadrangular section.

The hardware category includes 17 objects. There are three fragments of rings, corresponding to three different items. A fragment of hook or ring was also identified. Five objects are small rods of quadrangular section, which decrease in section along the length that has been preserved. Despite the absence of a head, these may be identified as nails, especially given that we are in a settlement context.

Finally, seven items have been assigned to this adornment category even though we cannot identify them clearly. They mainly consist of rods or fragments of rods, but we also recovered a plaque, the function of which remains undetermined.

The category of indeterminate objects is by far the most numerous, comprising 62 items. This mainly involves rods of varying sections and lengths, but a few plaques and sheets are also present. With the exception of one item which appeared complete, the indeterminate objects are fragmented. The poor state of conservation prevents their identification.

Although indeterminate, the objects discovered with the Trench 11 burial (Context 23) should be considered as a set (SF 2013-200-1 to -200-3, SF 2013-201-5 and -6, SF 2013-202-1). The position at the pelvis of some of the SF 2013-200 and -201 items may indicate they belong to a belt but further investigation, using X-ray, would be one way to learn more about function.

In addition to the items discussed above, objects from Birnin Lafiya include two coiled metal rings, both about 2.5cm in diameter (SF 2011-2 and 2014-47, not illustrated, but comparable to SF 2013-43 on Figure 19.2), a coiled object for which we cannot specify the function, and an item which we interpret as a dagger blade because of the double cutting edge, although the blade is very short (about 10 cm) and the point is broken (SF 2013-47a; Figure 19.3, bottom). There are also four shapeless metal fragments: two of them, a little rod and a plaque which could be related with ironworking. A long point (SF 2013-49) resembles a nail used in carpentry, a bracelet, open ring, with a diameter of 5 cm and a section of 0.4 cm (SF 2013-50), and an agricultural implement, possibly a hoe (SF 2013-204, Figure 19.4).

4 Slag from Birnin Lafiya Site

Among the items related to ironworking, broadly defined, we identified a scorified wall fragment and a heated wall fragment, as well as seven fragments of various rocks, rich in iron oxides, which might be regarded as fragments of iron ores. Two of them show traces of having been exposed to fire (roasted), and one of them may even present an incomplete reduction. There were also eight fragments of rock, different from the former, with no visible macrographic relation to ironworking.

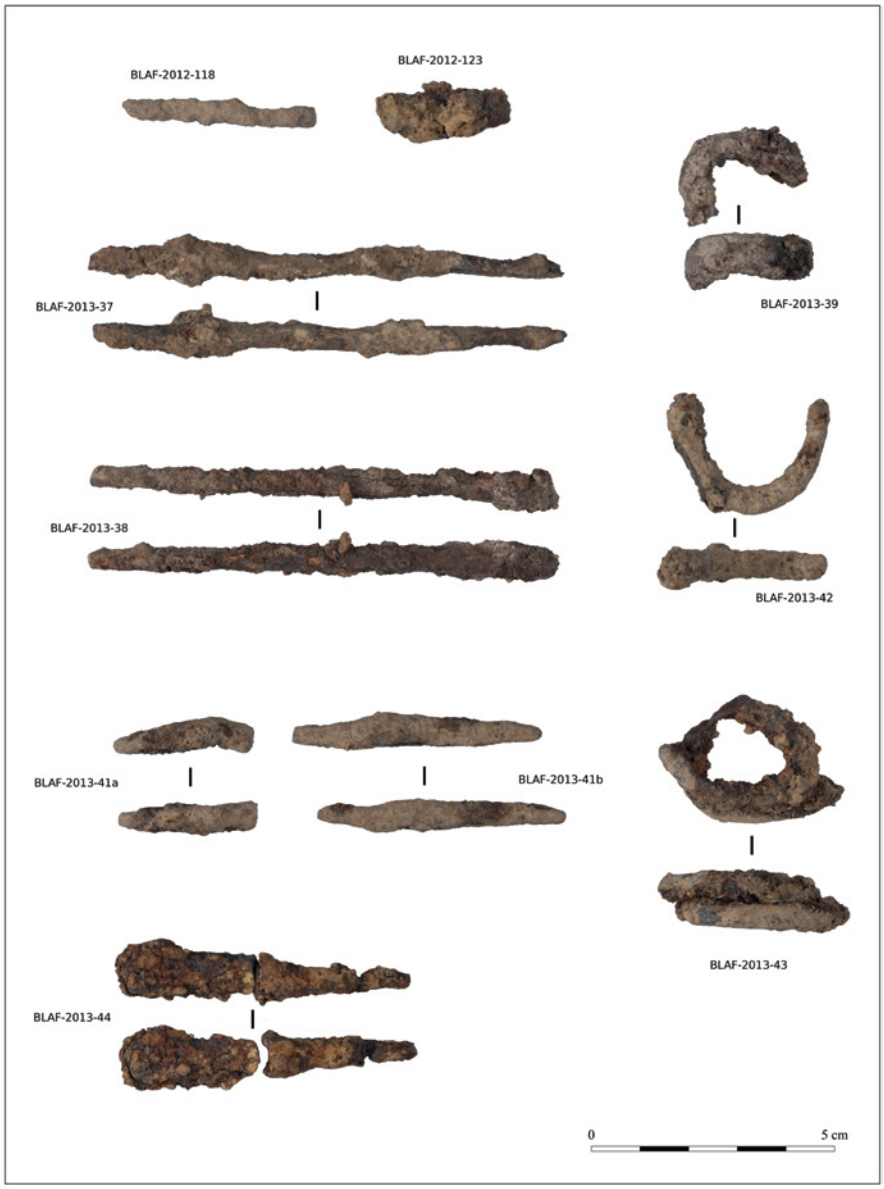

FIGURE 19.2 Representative examples of metal finds from Birnin Lafiya

Six iron objects were also studied in this batch, mainly rods or little bars, which can be directly related with ironworking.

The rest of the material consists of slag. We observed the presence of four batches of slag that relate to activities of reduction of preliminary treatment of raw iron mass reduction. They only account for nine pieces of slag, for a total weight of 476.4 grams. They were discovered in different trenches and contexts.

Macroscopic observation makes it possible to attribute all slag and post-reduction tape slags to the three main types of slag usually found in smithy workshops, namely dense grey slags, slags with an oxidised surface, and sandy clay slags (Serneels et al. 2004).

We noted the presence of 44 batches of dense gray slag, of which six are true smithing tape slags, with an almost flat upper surface and a rather convex lower surface moulding the bottom of the furnace and bearing evidence of its position on the ground (as seen by small incrustations of sand and gravel). There are 139 instances of slag, slag fragments and dense grey tape slags, representing a weight of 1151.5 grams.

The category of slag with an oxidised surface is also represented, but with fewer items than the grey slag.

FIGURE 19.3 Two blades: one from Tin Tin Kanza (SF 2013-74, at top) and one from Birnin Lafiya (SF 2013-47a, at bottom)

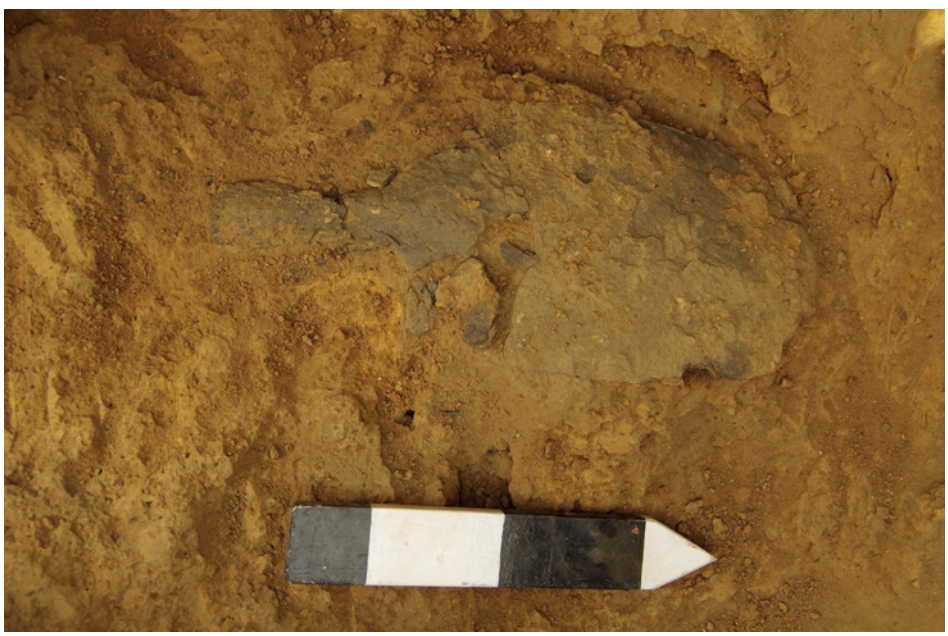

FIGURE 19.4 Possible hoe (SF 2013-204) from Birnin Lafiya Trench 11

We noted seven batches of this particular slag, totalling 15 pieces of slag and 451.5 grams.

Finally, the category of sandy clay slag contains 16 items for a total of 35.4 grams. They can be split into seven batches.

Figure 19.5 shows the proportions of each type of slag on the site according to the weight and number of the remains. The two diagrams show clearly the reality of the situation as concerns ironworking on this site. Whichever we choose to consider, we can clearly say that the place of reduction or primary treatment on the site of Birnin Lafiya is minimal. Given the presence of forging waste or more broadly of post-reduction artefacts in non-negligible quantities at the site, we can strongly envisage the presence of a workshop treating iron ore close to the settlement. However, the presence of three types of slag characteristic of forging activities, in amounts which again are characteristic of sites where ironworking has

been documented, is attested: there is a greater proportion of grey slag and a lesser amount of sandy clay slag. Slag with an oxidised surface is always present on these sites.

The weight of the complete forge bases recovered demonstrates the working of medium-sized iron masses, for the making of everyday objects such as knives, for example, to get an idea of the amount of metal worked. It is also possible that several working sequences followed one another in order to create several small objects.

Among the metal items found at Birnin Lafiya, some can be attributed to the craft of ironworking, which corresponds quite well to the presence of post-reduction slag as mentioned above. However, we cannot go further in the investigation of the *chaînes opératoires* which may have been used.

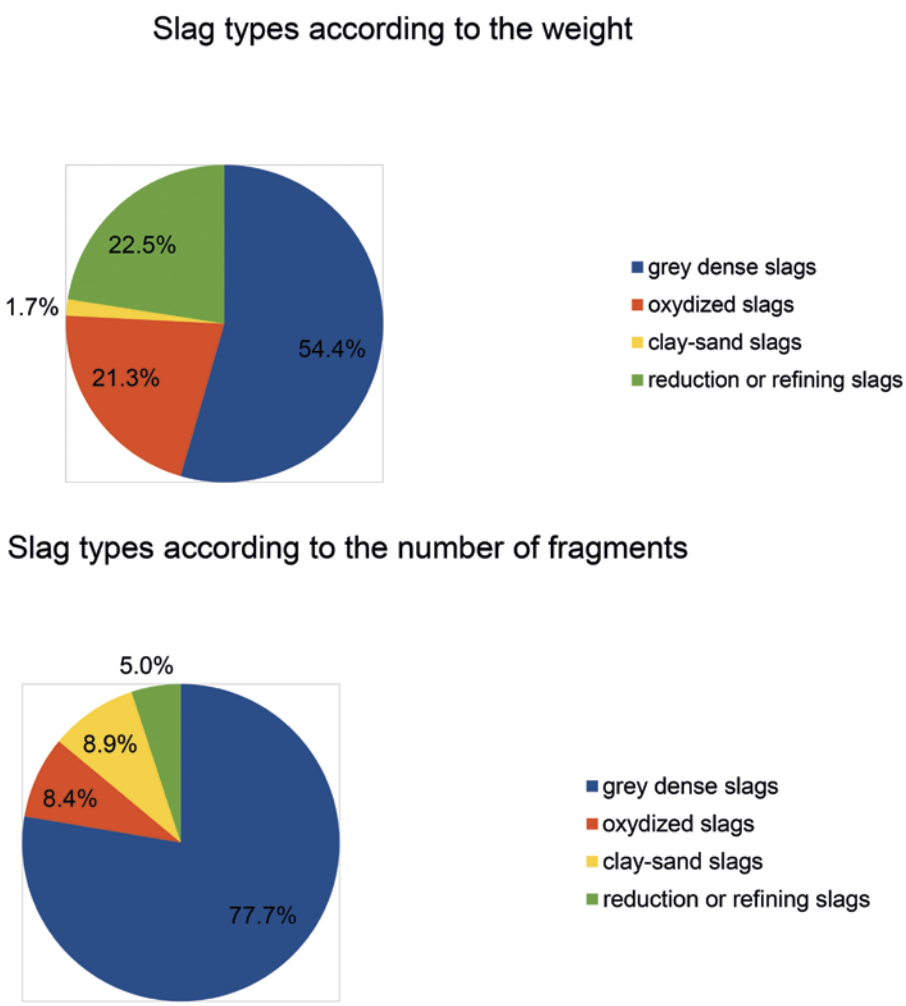

FIGURE 19.5
Slag types from the assemblage

CHAPTER 20

Beads and Pendants

Sonja Magnavita

The beads of the *Crossroads of Empires* project, deriving from several different locations and contexts, represent a cross section through the local bead usage during more than one and a half millennia. Most of the objects are from Birnin Lafiya (162 beads), while the rest (29 beads, as well as about 75 plastic beads) were found at other locations nearby. Over a third of the whole assemblage derives from two contexts at Birnin Lafiya (Trench 11, Contexts 21 and 23, which are a burial and a likely associated context, see chapters by Lee and by Power & Haour, this volume), while most of the rest of beads are surface or near-surface finds. Most can be assigned to a particular type with certain key characteristics. These bead types will be detailed in the present chapter. Full descriptions are provided in the Small Finds Table in Part 6. A small number of beads, not featured in the table because they do not issue from key contexts, have also been studied and are mentioned in this chapter where appropriate.

1 Shell Beads

Most abundant in the assemblage are shell beads, 85 in number, a few of which are broken. While at first glance they look similar to ostrich eggshell beads, a closer look reveals they are more likely made of mollusc or gastropod shell (cf. Meziani 2013). The shell material exhibits a horizontally layered structure with interfaces displaying vertical lamellae. All beads are made in a flat discoid shape, the vast majority being circular. Three types can be recognised: the first comprises 15 relatively large beads with small perforation (Fig. 20.1, No. 1); the second, c. 46 fragmentary and intact comparatively small beads with small perforation (Fig. 20.1, No. 2); the third, c. 24 fragmentary and intact similarly small beads with a relatively large perforation (Fig. 20.1, No. 3). Except for one that was found in the lower part of the test pit at Molla (MOL) (SF 2014-64), all other shell beads derive from Contexts 21 and 23 at Birnin Lafiya, which as mentioned above are both funerary contexts.

2 Plastic Beads

Plastic beads are numerous (n = 75) and obviously derive from the youngest contexts investigated by the project; many of those are surface and near-surface finds. They were all found outside of Birnin Lafiya. The majority of these beads belong to either one of two types: flat circular discs, so-called "Vulcanite" beads (Fig. 20.1, No. 4), 16 of which are black and red and one is yellow, and 57 barrel-shaped beads in bright colours, mainly green and very few red and blue (Fig. 20.1, No. 5). No specific comment is possible on the latter. As far as the so-called "Vulcanite" beads are concerned, these are a popular modern bead type in Benin and elsewhere. It is likely that they all date from the early twentieth century onwards, once introduced from Europe, and nowadays imported from China.

64 of the plastic beads were found at Bogo Bogo (GOG), from the surface down to a depth of c. 110 cm, and four beads derive from Gorouberi-14 (SI), from the surface down to c. 50 cm. At Molla and Tomboutou (TOU), plastic beads were only found in the uppermost level. This is consistent with the local accounts and a number of radiocarbon dates which place these contexts in the sub-recent phase (see Radiocarbon Dates Table in Part 6).

3 Stone Beads and Pendants

Stone beads (n = 72), as well as two pendants, were made of various stone raw materials, though the vast majority of this assemblage is made of hard siliceous stone. The textures range from macro- to crypto- crystalline and the dominant colours are whitish, pinkish and reddish to reddish-brown. Since boundaries between these stone varieties are difficult to assess with the naked eye and further analysis has not been undertaken, the identification of a specific raw material must be regarded here as tentative. Most of the materials used are linked to a specific bead type; within this assemblage, four particular types are distinguishable by their key features and will be detailed in the following.

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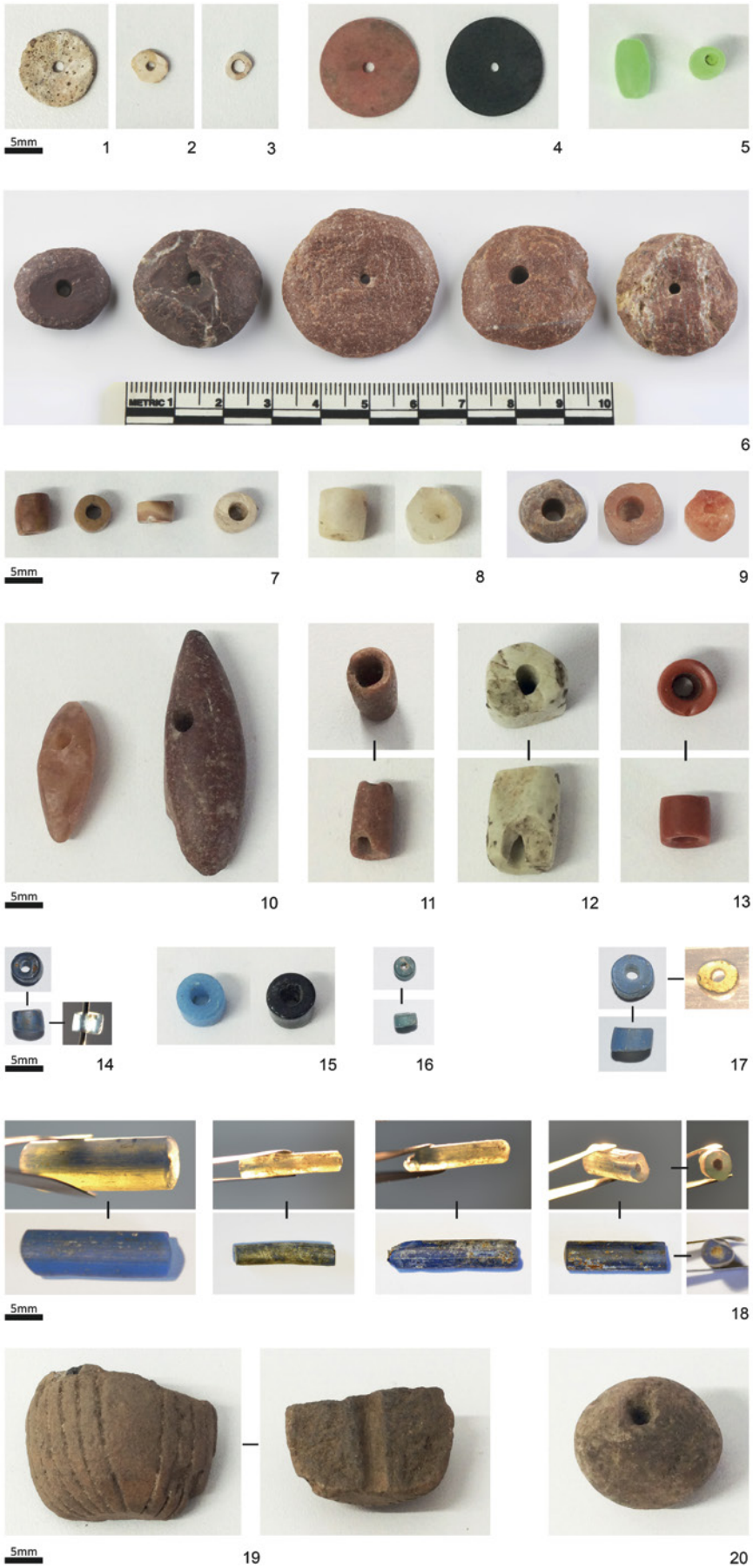

FIGURE 20.1
Beads and pendants. 1–3: Shell beads (BLAF S11 Context 23, SF 2013-29); 4–5: Plastic beads (GOG 14 SI, SF 2014-41); 6: Stone bead Type 1 (all from BLAF Unit 3/10; left to right, SF 2013-12, 2012-06, 2012-12, 2013-10, 2013-09); 7: Stone bead Type 2, bauxite(?) (BLAF Trench 11 Context 23 and 21, SF 2013-29 and -26); 8: Stone bead Type 3a, milky-white quartz (BLAF S13 Context 18, SF 2014-08, and BLAF S9 Context 1 130–140, SF 2013-08); 9: Stone bead Type 4 (BLAF; left to right, S10 décapage SF 2013-16, S9 Context 4 30–40 SF 2013-23, S3 Surface SF 2012-12); 10: Pendants, carnelian (left, BLAF Surface near S6, SF 2012-08) and haematite(?) (right, BLAF S8, Context 2, SF 2013-06); 11–13: stone beads of no assigned type (11: BLAF S4 Context 2, SF 2012-25; 12: BLAF S13 Context 19, SF 2014-06; 13: BLAF Surface find, SF 2012-13); 14: Glass bead Type 1, drawn monochrome (SF 2012-04, blue transparent, left: reflected light, right: transmitted light); 15: Glass bead Type 2, "Prosser" beads (Left: GOB-14 SI 30–40, SF 2014-55; right: TOU SI 40–50, SF 2014-58) 16: Glass bead Type 3, seed bead (BLAF S6 Context 3, SF 2012-42, greenish-blue); 17–18: Glass bead Type 4, "Dichroic glass" under reflected and transmitted light (17: Surface on site A024, SF 2014-43; 18, from left to right: BLAF S6 Surface, SF 2012-19; BLAF S6 0–10, SF 2012-31; BLAF S10 Context 4, SF 2013-18; BLAF S3 Context 8, SF 2012-34); 19: Spindle whorl(?), fragment (KOZ 14 SII 0–20, SF 2014-21a); 20: Spindle whorl(?) (BLAF Surface, SF 2013-04). (Photos – 6: A. Sapey/F. Reynolds/A. Haour; all others: S. Magnavita)

3.1 *Type 1 Stone Beads*

Stone bead Type 1 comprises 15 beads, mostly of a dark reddish-brown hard stone, often with white veins (quartz or calcite) and sometimes with further inclusions. Hardness is in the range of quartz and the texture is mostly fine crystalline, except for two beads which appear to be macro-crystalline. Except in the case of the latter beads, which may be of a sort of red quartzite, the raw material is tentatively identified as a sort of radiolarian rock.

This bead type is characterised by large, roughly circular discoid shapes with tapering edges (Fig. 20.1, No. 6). The length along the perforation axis varies from 7 to 11 mm, with diameters in the range of 19–32 mm. The mostly near-central perforation was made by drilling from one side to the other with a slightly conical borer, tapering between c. 2.5 and 4 mm. For most of the beads it can be observed that when the drilling was near to complete, a smaller or larger flake chipped off, probably due to the pressure and heat generated by the drill. The negative of that flake is still visible on many of the beads.

Further characteristics of this bead type are a generally asymmetrical form and rough or only partly smoothed surfaces, giving the beads an unfinished, crude touch. Since the stone has the hardness of chalcedony or quartz, it is possible that its polishing was either a very time-consuming issue or technically difficult, or both. As the drilling was obviously successfully achieved, it is possible that perforated bead rough-outs were traded as such, and not (or only slightly) further refined at their final destination.

3.2 *Type 2 Stone Beads*

The 21 beads of stone bead Type 2 are largely made of a reddish-brown soft stone with orange to ochre-coloured patches or white patches (18 beads), and the remaining three beads are of whitish soft stone with ochre-coloured patches (Fig. 20.1, No. 7). This soft stone is probably bauxite, an aluminium ore found in pebble form and made into beads, especially common in Ghana (Shaw 1945; Bredwa-Mensah 1996). The chemical composition of four of these beads (2013-28-1, 2013-29-1, 2013-29-2 and 2013-29-3, all from Trench 11, Context 23) was chemically tested by micro-X-ray fluorescence with the result that the stone might indeed be bauxite (Chloë Duckworth, University of Leicester, pers. comm. with Anne Haour December 2015). All these beads were found together with shell beads, the reddish-brown ones in Birnin Lafiya Trench 11 Context 23, a burial, and the whitish beads in Context 21, which is thought to be associated with this burial. Those found in Context 23 probably formed a set, a fact also suggested by their relatively uniform characteristics. The beads are mostly short and cylindrical (15 beads) or barrel shaped (five beads). All are medium-sized, ranging in diameter from 5 to 6 mm and in length along the perforation axis from 3 to 5.5 mm. In contrast to almost all other stone beads of the assemblage, these Type 2 beads seem to have been drilled from both sides. They have an identical perforation width of 2 mm (though one of the whitish beads has 2.5 mm). One barrel-shaped bead has a third hole into its perimeter side, due to a defective drilling channel. Further characteristics of these beads are their very smooth, glossy surfaces and sharp edges.

3.3 *Type 3 Stone Beads*

The nine Type 3a beads are of a milk-white quartz and shaped in a short cylindrical or cylindrical form (Fig. 20.1, No. 8). Eight of these are medium-sized, ranging from 4 to 7 mm in length along the perforation axis with diameters of 6 to 8 mm. One further white quartz bead (SF 2013-03, a surface find) is similar, albeit double in size. These beads were drilled from one side to the other with a conical borer, commonly tapering between 1.5–3 mm in diameter. Several beads have distinct longitudinal grinding facets or at least traces of such on their perimeter. Beads of this type are frequent at other first and second millennium AD sites in the Niger River valley and surroundings: they are especially common at Kissi (S. Magnavita 2003; 2015), and are also present at Igbo-Ukwu (Shaw 1970; Insoll & Shaw 1997). The two stone beads of Type 3b (SF 2014-46 and SF 2012-30, both surface or near-surface finds) are similar overall, but have a larger diameter of c. 12 mm.

3.4 *Type 4 Stone Beads*

Stone bead Type 4 is more difficult to characterise, due to less uniform raw material and shapes. Nevertheless, 17 beads share as common feature the fact they are made of a variety of reddish to orangey and pinkish siliceous stone, most of which seem macro-crystalline (like rose quartz or red quartz) and few have a more fine-crystalline texture, resembling a sort of chalcedony or carnelian. Two further beads have a different appearance due to their raw material, which seems to be a dark greyish quartz or quartzite and a greyish-brown undetermined rock, though they otherwise share the characteristics of the other Type 4 beads. Shape varies from short cylinders and discs (often uneven in length), or short barrels and doughnuts (Fig. 20.1, No. 9). All Type 4 beads have diameters of 7 to 10 mm, with a length along the perforation axis of 2 to 4.5 mm. All beads were drilled from one side with a conical borer, tapering mainly between c. 2–3 mm.

3.5 *Pendants*

The two pendants resemble each other in shape, though their sizes and raw materials are different. The smaller pendant (22 × 8.5 mm) is made of pinkish to pale orangey carnelian, the other (38 × 12 mm) is of a dark reddish-brown soft stone, possibly haematite (Fig. 20.1, No. 10). Both have a long ogival shape and are pierced in their upper third. The carnelian pendant has been drilled from one side with a conical borer, tapering between 1.5 and 3 mm. A depression around the narrower side of the hole indicates that a flake chipped off when the borer reached this end. The perforation of the larger pendant seems relatively straight with c. 3 mm throughout, but it is unclear whether this was done from one or both sides. There is a large area of damage on one side of the pendant, including around the perforation.

3.6 *Stone Beads of No Assigned Type*

Three beads do not match the aforementioned categories. One is a reddish quartzite(?) bead in a long-cylindrical, very slightly conical shape (Fig. 20.1, No. 11). The perforation has been drilled from one side with a slightly conical borer, tapering between 2.5 and 3 mm, which is relatively large compared to the bead's diameter of 6 mm, giving it the shape of a tube. The surface of the bead was smoothed by grinding, and traces of facets from this process are still visible.

Another bead is of an indeterminate hard stone, opaque greenish-white in colour and very fine grained in texture (Fig. 20.1, No. 12). It is damaged on one side and heavily worn; the shape is therefore not totally clear but can be described as a long barrel with flattened sides. Drilling was carried out from one side to the other and is relatively fine, only 1.5–2.5 mm in width. With its length along the perforation axis of 15 mm and a diameter of 10 mm, it is the largest cylindrical stone bead of the assemblage.

A third bead is possibly made of red jasper, or is an imitation of such made of glass (Fig. 20.1, No. 13). It is shaped in a cylindrical form, with a slightly irregular length along the perforation axis of 6–7 mm and a diameter of 7 mm. The perforation is conical, tapering between 2.5 and 3.5 mm. The edges are sharp and the surfaces are very smooth and glossy; traces of facets are almost invisible.

Except for two beads (SF2014-44 and 2014-46, from Gorouberi-13 and from site Ag 0028 south of Tomboutou respectively; both are surface finds), all stone beads were found at Birnin Lafiya. While the stone beads of Type 2 were limited to a specific context (the burial in Trench 11, Context 23 and associated Context 21), all other stone bead types were present at different areas and levels of the site at no meaningful concentrations. Most of these beads might therefore be interpreted as occasional loss or waste. However, it seems peculiar that the largest stone beads (Type 1) in particular should have gone astray in such numbers, given their large size and colour.

4 Glass Beads

In total, 30 glass beads were found, most of which derive from modern contexts or are surface and near-surface finds. In deeper stratified contexts they are rare occurrences, accounting for only six beads at Birnin Lafiya (five of which[1] associated with the excavated compound structure Unit 3/10 or the burial within it) and one at Kwara zeno (SF 2014-77) at a depth of c. 30–40 cm. The latter and one of the six glass beads from Birnin Lafiya (SF 2014-14, near a juvenile burial) exhibit severe signs of glass corrosion: the bead from Kwara zeno has a thick corrosion crust on its surface, while the other is completely decayed. This might be seen as an indication of a longer deposition in the ground than the other glass bead finds; however, such reasoning is disputable, since chemically different glass types might be affected by their depositional environment in a very different way or at a different rate.

The vast majority of the glass beads recovered are monochrome drawn beads of generally cylindrical or barrel-shaped form, in different sizes and lengths. The following types of beads can be distinguished:

4.1 *Type 1 Glass Beads*

The 12 beads of Glass Type 1 include small, monochrome drawn beads in cylindrical or barrel shape (Fig. 20.1, No. 14). They comprise seven translucent blue beads, three glossy opaque sky blue beads, one glossy opaque green, and one so heavily decayed that its original colour is no longer discernible. All are from modern contexts (uppermost levels at Bogo Bogo and Molla, some of which still on their original fibre string), except for one translucent dark blue bead (SF 2012-04; Fig. 20.1, No. 14) and the decayed bead (SF 2014-14), which are both from contexts at Birnin Lafiya, i.e. respectively the compound structure, dating to the eleventh/thirteenth centuries approximately, and a juvenile burial at the same location (Nixon; Power & Haour, this volume). They have diameters of 3.5 to 4.5 mm and lengths along the perforation axis of 2.5 to 5 mm. The width of their perforations is 1.5 mm wide. One further, translucent blue bead (from Kwara zeno, SF 2014-77) shares some characteristics in form and

1 SF 2012-04, 2014-14, 2012-34, 2013-18 and 2012-03.

colour, but is otherwise considerably larger, with a diameter of 7 mm and a length along its perforation axis of 8 mm.

4.2 *Type 2 Glass Beads*

Glass Type 2 comprises eight medium-sized, monochrome beads of cylindrical or barrel shape (Fig. 20.1, No. 15). There are two beads each of blue, black and red colour, and one each in pale green and pink. They range in diameter from 5.5 to 8.5 mm and from 4 to 6.5 mm in length along their perforation axes, with perforations of 2–3 mm in width. All beads of this type were found outside the mound site of Birnin Lafiya, including five in the test pit excavated in the modern village close to that site, Tondo windi (TOW), from the surface down to a depth of 60 cm. Their technique of manufacture is not clear, but it appears that these are "Prosser" or "tile" beads, mould-pressed beads made after the mid-nineteenth century (see, e.g., Sprague 1983; Kirkish 2014). An identical red "tile" bead was found on the surface of the site of Garbey Kourou at the bank of the Sirba river in southwest Niger (field observation by the author), ca. 180 km north of Birnin Lafiya.

4.3 *Type 3 Glass Bead*

The two beads of Glass Type 3 are so-called "seed beads", i.e. monochrome cylindrical beads of very small size (Fig. 20.1, No. 16). The beads are translucent greenish-blue and opaque yellow in colour, and are 2–3 mm in diameter with a length of 2 mm along their perforation axes. The perforations are c. 1 mm wide. One (SF 2014-53) is from the uppermost level at Gorouberi-14 and must be considered relatively recent; the other is from Birnin Lafiya Trench 6 (SF 2012-42; Fig. 20.1, No. 16), the context of which has been dated to the eleventh to thirteenth centuries (850 bp, Beta-321055).

4.4 *Type 4 Glass Bead*

Glass Type 4 comprises five drawn beads of dichroic glass: what appears to be blue or pale blue under reflected light turns to yellowish-green glass under transmitted light (Fig. 20.1, No. 17 and 18). One bead is short and cylindrical, with a diameter of 5.5 mm and a length along its perforation axis of 3 mm (SF 2014-43, Fig. 20.1, No. 17, from a surface collection at site A024 upriver from Kompa – see Map 3). The other four beads are long-cylindrical (one being not totally straight), with diameters of 3 to 4 mm (three beads) and 6 mm (one bead), and length along the perforation axis of either 14 mm or 19 mm (two beads, respectively) (Fig. 20.1, No. 18). All the five beads of Type 4 have longitudinal striations in the glass due to the forming technique. The production of such beads is currently only known from Nigeria around Ile Ife, where it started perhaps at the end of the first millennium AD (Lankton et al. 2006; Babalola et al. 2018) and continued to be produced up to more recent times. The blue long-cylindrical type is known from the Ile Ife area under the name of "segi". Dichroic beads, in long-cylindrical and shorter forms as the ones in this assemblage, were widely traded in the broader region and appear in several archaeological sites, such as Igbo-Ukwu in southern Nigeria, Kissi in northern Burkina Faso and Garbey Kourou in southwest Niger (Insoll & Shaw 1997; S. Magnavita 2009, 2015; S. Magnavita pers. observation). The chemical composition of those glass beads produced at Ile Ife is very characteristic, with amounts of lime and alumina usually ranging in two-digits decimal weight percentages (Lankton et al. 2006; Babalola et al. 2018). This very particular composition (High-Lime High-Alumina, or HLHA) was also noted in a number of blue glass beads at Elmina in coastal Ghana (see Brill 1999), which shows that beads of this type of glass were traded extensively over a long period (at least between the tenth and sixteenth centuries approximately) and over a large geographical area.

4.5 *Glass (?) Beads of No Assigned Type*

Only a few further beads do not match one of the five glass bead types defined. One is a fragmented bead with a whitish core and a heavily broken pink coating from Molla (SF 2014-65). The other is a glossy, opaque black bead from Birnin Lafiya in the form of a tabular lozenge or "flat diamond" shape (SF 2012-03). Its manufacturing technique is unknown, but if glass, mould-pressing would be a possibility. One last bead, from Kantoro (KRO) SI (SF 2014-27) is barrel-shaped and dark opaque, with longitudinal opaque white stripes. None of the three beads have yet been identified with certainty as glass beads. While the latter two are likely of tenth-thirteenth century date the Molla example must be much later.

5 Beads of Other Materials

Remarkably rarer than all other bead categories are those made of baked clay. Only eight objects of this material can be clearly identified, but it is unclear how many of these were indeed used as beads or for another purpose. One is a roughly formed bicone (SF 2014-1, from a near-surface context at Birnin Lafiya), while the other seven are formed into more or less hemispherical to ellipsoid shapes (one is not completely pierced, i.e. SF 2012-07). Among the baked clay beads are at least two whose function was likely that

of a spindle whorl. One of these (SF 2014-21a; Fig. 20.1, No. 19), from Kozungu (KOZ) SII, is merely a fragment; it is the only one with a decorated surface, displaying incised longitudinal lines and, due to the fragmentation, only a short piece of a line in cross direction. There seem to be traces of white incrustation in the incised lines. The other one (SF 2013-04; Fig. 20.1, No. 20) is undecorated. Both are surface or near-surface finds. Further objects likely representing spindle whorls were found and are discussed by R. Tchibozo (this volume).

Two further objects from Madekali (KLI) (SF 2014-23 and SF 2014-24) are well-modelled beads, but their raw material has not been determined with certainty; they possibly consist of a sort of soft stone. These two have a thoroughly polished surface of brown colour. One bead is long-barrel shaped, and the other one is conical, a form not seen in any other bead of the assemblage.

6 Metal

A circular copper alloy disc with central perforation found at the uppermost level of the test pit at Tomboutou (TOU) turned out to be a corroded, almost illegible 25 centimes coin, issued in France in 1925. It is possible that it was secondarily used as a bead.

7 Conclusion

The bead assemblage from Birnin Lafiya and neighbouring sites reflects a variety of raw materials and shapes in use over more than a thousand years. Most of these raw materials were available within the Niger Valley (i.e., quartz/quartzite, varieties of chalcedonies, radiolarian rock) or might stem even from the immediate neighbourhood of Birnin Lafiya (i.e., the baked clay beads and mollusc/gastropod beads). There are no clear indications for a local bead production. Rather, it seems likely that most derive from vivid trade contacts along the Niger River Valley, both up- and down- river. The river will have facilitated such trade activities (which were of course not limited to beads; see also Kuba 2009), but the wider hinterland west of the Niger river will have been participating in a network of trade and contacts. The bauxite beads in particular and the characteristic glass beads from the Ile Ife area show how far-reaching the interregional contacts were in the early second millennium AD: their original production centres were more than 500 km away from Birnin Lafiya. Imports from even greater distances can be seen by other types of glass beads and further materials (such as the black lozenge bead, and the carnelian pendant), which likely connected the eastern Niger bend area with Saharan and trans-Saharan routes. In addition to the carnelian items examined by the present author, six other beads were determined through micro-XRF to be definite carnelian and one possible (Chloë Duckworth, University of Leicester, pers. comm. to Anne Haour, Dec 2015); all but one are from Birnin Lafiya stratified contexts. Given that such beads are rather exceptional finds at Birnin Lafiya, their occurrence does not allow us to assume a particular trade function of the site, but does suggest that contacts were flourishing within the region.

Two other aspects of the bead assemblage are notable. The first concerns the difference in types found connected to the burial contexts when compared to the rest of the site. Bauxite beads and almost all shell beads were found exclusively in the funerary context. In the case of the shell beads, this might be a matter of preservation, but there is no obvious reason why the bauxite stone beads should not feature among the settlement remains together with other stone beads. Their exclusive distribution in or close to a burial might thus be meaningful, but it is clear that this small sample might not be at all representative.

Another notable aspect can be drawn from the stone beads of Type 1 (Fig. 20.1, No. 6). As stated above, due to their relatively crude surface and slightly irregular shapes, these beads have a rather unfinished feel. This concerns especially the flat sides when these beads are viewed from above. When strung and worn in a necklace, the flat sides would not have been very visible; instead, the main view would have been of the tapering edges of the beads. Given that these tapering edges are mostly relatively sharp, it is questionable whether these heavy beads were indeed worn in this way. We may need to think here of a different way that these beads might have been used, for example strung in the manner of a pendant, either within a necklace or for example as hair ornaments.

CHAPTER 21

The Cowrie Shells

Annalisa Christie and Anne Haour

1 Introduction

Cowrie shells *Monetaria moneta* (Linnaeus, 1758) and *Monetaria annulus* (Linnaeus, 1758) (Figure 21.1; formerly known in the literature as *Cypraea moneta* and *Cypraea annulus*), as well as unidentified *Cypraea Sp*. shells were recovered from 11 archaeological sites excavated during the *Crossroads of Empires* project:[1] Kozungu, Tomboutou, Tondo windi (Birni Lafia), Gorouberi-14, Bogo Bogo, Kargui, Molla, Toutokayeri, Boyeri, Kompanti and Tin Tin Kanza[2] (Table 21.1). These sites cover a range of dates from the fourteenth to the nineteenth centuries AD. This chapter summarises the preliminary outcomes of the assessment and highlights areas for further work and investigation.

Cowries' importance to the West African past is undeniable: they are inevitably mentioned as markers of Africa's global connections (e.g. Mitchell 2005), and their role within the West African social fabric suggests a deep history. Cowries in West Africa are first mentioned in the mid-tenth century, as ornaments in women's hair (Levtzion & Hopkins 2000: 35). In the eleventh century, al-Bakri states that cowries are among the most sought-after commodities in Kugha, which is seemingly an early capital of the Songhai empire, in present-day Mali or Niger (in Levtzion & Hopkins 2000: 83). By the fourteenth century, cowries are described as currency, and an import on which vast profits were made (al Umari, in Levtzion & Hopkins 2000: 260, 269). In the same century, ibn Battuta saw 1150 cowries sold for one gold dinar in Mali. Simon Lucas, in the late eighteenth century, explicitly writes that sub-Saharan consumers valued cowries for both ritual and currency usage (Le Coeur 1985: 44). Oral traditions today evidence the centrality of cowries to West African thought (see especially Iroko 1987), while archeology confirms the antiquity of cowrie usage. They are routinely recovered, some well-known instances being the first-millennium necropolis of Kissi, Burkina Faso (Magnavita 2009), the eleventh to fourteenth century 'lost caravan' from the Mauritanian Sahara (Monod 1969), the mound of Yohongou in Atakora (Petit 2005), and the fifteenth/sixteenth century site of Durbi Takusheyi, Nigeria (Gronenborn 2011).

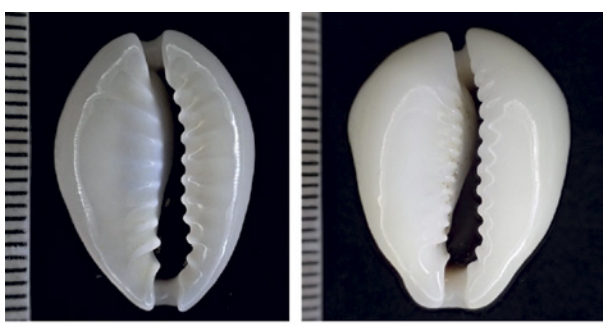

FIGURE 21.1 Differences in teeth morphology and shape on *M. annulus* (left) and *M. moneta* (right). Note the more pronounced teeth and wider aperture of *M. annulus*, and the rhomboidal shape of *M. moneta*

TABLE 21.1 Sites from which cowries were evaluated

#	Site code	No. of specimens
1	KOZ-14-SI	1
2	TOU-14-SI	4
3	TOW-14-SI	3
4	GOB-14-SI	3
5	GOG-14-SI	1
6	KGI-14-SI	3
7	MOL-14-SI	2
8	TTO-14-SI	2
9	BOY-14-SI	2
10	PTI-14-SI	1
11	TTK-13-SII	1

2 Methodology

The shells were assessed to determine their species, size and condition, and to identify any evidence for anthropogenic modification.

1 This analysis of the cowrie shells from Benin was undertaken as part of the *Cowrie Shells: An Early Global Commodity* project (award from the Leverhulme Trust RPG-2014-359 to Anne Haour as PI with Alastair Grant, University of East Anglia, as Co-1).

2 We might also note, anecdotally, the recovery of a cowrie pendant made of blue plastic from the upper levels (0–20cm) at Molla (SF 2014-12) as well as one occurring as a surface find within the modern village of Birni Lafia.

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TABLE 21.2 Summary of visual factors used to determine species

Feature	Description
Teeth/aperture	The length and protrusion of the collumellar and labial teeth differ between the two species. In *M. annulus*, the teeth are generally longer and the grooves between them more defined. In *M. moneta* the teeth are generally shorter and finer. This is clearly demonstrated in Figure 21.1. Figure 21.1 also highlights the differences in the size of the aperture with the aperture of *M. annulus* being generally wider than that of *M. moneta*.
Shape	In general (but not exclusively) *M. annulus* tends to be more ovular whereas *M. moneta* tends to be more rhomboidal. While *M. moneta* often has two tubercles on either side of the posterior of the dorsum, this feature is not always present or visible in archaeological assemblages.
Colouration/shell pattern	On intact specimens it was often possible to identify the distinctive gold ring of *M. annulus*, even when the shells are bleached and the ring is no longer coloured.

2.1 *Species*

Shell species was determined by visual assessment using a combination of features summarised in Table 21.2. Due to the preservation of the shells, the teeth were often the most important factor for differentiating between the two species.

2.2 *Size*

The length, width and height of each intact specimen (Figure 21.2) was measured using Vernier callipers. In instances where the dorsum had been removed as a result of either natural or cultural modifications, it was not possible to record shell height.

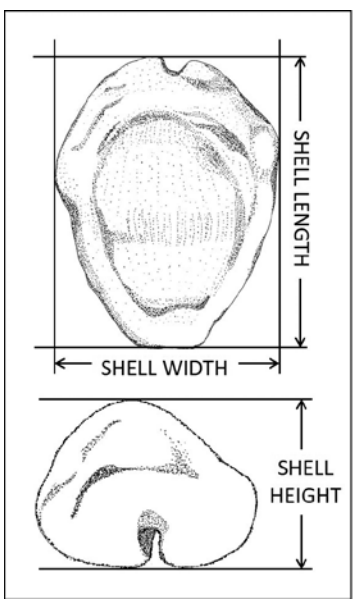

FIGURE 21.2
Shell measurements taken on intact specimens

2.3 *Condition*

The condition of the remains was a factor both of processes likely the result of natural taphonomy and of those considered the result of anthropogenic modifications. These were classified and a coding system devised to speed the recording process.

Classifications of shell condition influenced by natural factors included: natural wear/bleaching (W), friability (F), cracked lustre (CL) or natural dorsum perforation (DP). These are likely a result of preservation conditions on sites.

As many of the shells were fragmentary (Fr), this classification was further divided to clarify the portion of the shell that remained (Table 21.3, Figure 21.3).

TABLE 21.3 Cowrie fragment classification coding

Region of shell surviving	Code
Base Labial (Intact)	1a
Base Labial (Anterior)	1b
Base Labial (Posterior)	1c
Base Labial (Unknown)	1d
Base Columellar (Intact)	2a
Base Columellar (Anterior)	2b
Base Columellar (Posterior)	2c
Base Columellar (Unknown)	2d
Base Unknown	3a
Base Intact	3b
Base (Anterior)	3c
Base (Posterior)	3d
Dorsum	4

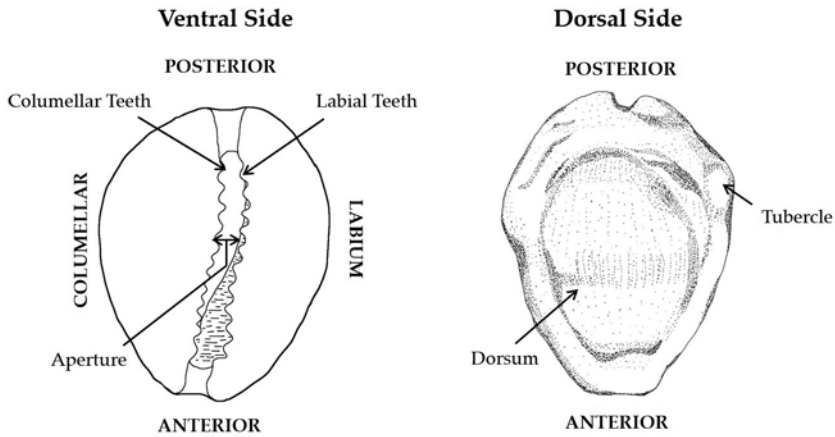

FIGURE 21.3
Morphology of a cowrie shell

Anthropogenic modifications were often harder to distinguish and fell into the following categories:
– Intentional polishing (PI);
– Anterior or posterior perforation (PAnt, PPos) – required for stringing the shell for example;
– Burning (B);
– Incisions on the base of the shells (In) – further differentiated by the position of the incision on the columellar (1a), labial (1b) or both sides (1c) of the shell base;
– Removal of the dorsum (D) – further differentiated by extent: partial (D1) and total (D2); and by whether there was any evidence to suggest the shell had been polished after the dorsum had been removed (D3).

3 Preliminary Results

3.1 *Species*

A total of 23 cowrie shells were examined from the sites evaluated. Of these, the majority (n = 17) were *M. annulus*. It was possible to identify the specimens to species level in all but one instance, in which the shell was considered too fragmentary and friable for classification.

In light of the small sample size it is difficult to make any substantive comment regarding changes in the abundance of one species over another from different sites, particularly when assessed chronologically. While M. Moneta appear to occur in small numbers across the assemblages from various sites, they are not from consistently early or late contexts.

3.2 *Modifications*

52% (n = 12) of the shells in the assemblage were found to have evidence of anthropogenic modification. A further 13% (n = 3) were too fragmentary to make an assessment. 35% (n = 8) of the shells were unmodified. Given the small sample size it is not possible to determine whether specific modifications were limited to specific species.

Four modification practices were observed:

1. Removal of the dorsum (identified on 9 specimens – both *M. moneta* and *M. annulus*)

This was further sub-divided into total dorsum removal with sharp edges (n = 7) and total dorsum removal with rounded or apparently polished edges (n = 2). It is possible that this modification facilitated the stringing of shells – as recorded in historical sources (Johnson 1970: 27). It is unclear at this stage when, where and how the dorsa were removed in the exchange process.

2. Burning (identified on 2 specimens)

These two shells – SF 2014-23 and 2014-25 – were completely blackened. It is unclear whether this burning was deliberate or accidental. These shells come from the sites of Tondo windi (in modern Birni Lafia) and Toutokayeri. It should be noted that neither of the two Boyeri shells examined showed signs of burning, despite the oral traditions stating that this site was burnt to the ground and the archaeological recovery of extensive evidence of burning at the site (Nikis, Livingstone Smith & Gosselain, Part 6, this volume).

3. Linear incisions (identified on 1 specimen)

Less frequently observed was the use of linear incisions on the columellar and labial sides of the aperture (Figure 21.4). This was observed on one shell, SF 2014-08a, from Molla, which also showed evidence of unpolished total dorsum removal. This modification has been observed on shells from other sites across West Africa and is highly likely to have been the result of anthropogenic modifications.

TABLE 21.4 Species and context

Small find no.	Location	Context/ Depth	Species	Likely date	Anthropogenic modification
SF 2014-01	BOY-14-SII	C2 40–50	*M. annulus*	Phase 5	None
SF 2014-02a	BOY-14-SI	0–20	*M. annulus*	Phase 5	Dorsum Removed
SF 2014-03a	GAR-14-SI	20–30	*M. moneta*	Phase 5	Dorsum Removed
SF 2014-04	GOB-14-SI	60–70	*M. annulus*	Phase 5	None
SF 2014-05	GOB-14-SI	30–40	*M. annulus*	Phase 5	Indet.
SF 2014-06a	GOG-14-SI	80–90	*M. annulus*	Phase 5	Worn
SF 2014-07a	MOL-14-SI	60–70	*M. annulus*	Phase 5	None
SF 2014-08a	MOL-14-SI	50–60	*M. annulus*	Phase 5	Aperture Incision; Dorsum Removal
SF 2014-09	KGI-14-SI	40–50	*Cypraea Sp.*	Phase 5	Indet.
SF 2014-10	KGI-14-SI	70–80	*M. moneta*	Phase 5	Polished Dorsum Removal
SF 2014-11	KGI-14-SI	80–90	*M. annulus*	Phase 5	Polished Dorsum Removal
SF 2014-16	PTI-14-SI	0–20	*M. moneta*	Phase 5	Dorsum Removed
SF 2014-17	TOU-14-SI	70–80	*M. annulus*	Phase 5	None
SF 2014-18	TOU-14-SI	60–70	*M. annulus*	Phase 5	None
SF 2014-19	TOU-14-SI	50–60	*M. annulus*	Phase 5	None
SF 2014-20	TOU-14-SI	40–50	*M. annulus*	Phase 5	Dorsum Removed
SF 2014-22	TOW-1-14	C3 80–90	*M. annulus*	Phase 5	None
SF 2014-23	TOW-14-SI	C3 80–90	*M. annulus*	Phase 5	Burnt
SF 2014-24	TOW-14-SI	C3 80–90	*M. annulus*	Phase 5	None
SF 2014-25	TTO-14-SI	0–20	*M. annulus*	Phase 5	Burnt
SF 2014-26	TTO-14-SI	C2 30–40	*M. moneta*	Phase 5	Dorsum Removed
SF 2014-28	KOZ-14-SII	50–60	*M. moneta*	Phase 4	Indet.
SF 2013-04	TTK-13-SII	Con. 4N	*M. annulus*	Phase 4	Polished Dorsum Removal

4. Circular wear (identified on 1 specimen)

One shell (SF 2014-06a), from Bogo Bogo, had a distinctive white line around the dorsum, which on close examination is associated with a slight groove (Figure 21.5). The wear pattern appears too regular to be the result of natural causes. It is possible that this represents the early stages of dorsum removal by grinding, but further investigation should confirm this.

Modified shells from sites of similar periods were grouped together to determine whether there was any evidence of changing modification practices over time. While the sample size remains small, some general trends can be observed, particularly between the sixteenth/ eighteenth and post-eighteenth centuries. In particular, while the removal of dorsum was noted on shells from both periods, the polishing of the edges was only observed on shells from later period sites. In addition, the incision of the columellar and labial surfaces appears to be a later addition to modification practices. Burnt shells were identified from both periods.

The shells from the assemblage were generally in very good condition, with very little evidence of post-

FIGURE 21.4 *M. annulus* with linear incision on labial and columellar surfaces. SF 2014-08a, from excavations at Molla.

FIGURE 21.5 *M. annulus* with circular groove around the dorsum. SF 2014-06a, from excavations at Bogo Bogo.

depositional damage from natural taphonomic processes. While it is possible to make some observations regarding species abundance, size and anthropogenic modifications across the sites, the sample size is restrictive. Additionally, the low numbers from individual sites make it impossible to look at possible chronological changes on a site by site basis. That said, the assessment does raise questions for further consideration.

4 Discussion

The cowries come from a range of contexts and dates, and are mainly associated with layers which likely date to the last 200–300 years. During these periods, import of cowries would have been possible through both the Saharan and the Atlantic routes, and the latter, in particular, would have seen massive imports (Hogendorn & Johnson 1986). Two of the cowries are late medieval (items from Kozungu and Tin Tin Kanza), raising some interesting questions on the routes by which they arrived in Dendi. The common view in the literature is that in West Africa *M. moneta* originates in the Maldives and was the cowrie first used for currency and cultural functions, with quantities going across the Sahara via North Africa. An abandoned medieval cargo discovered in an isolated tract of the Mauritanian Sahara (Monod 1969), cowrie jewellery in graves at Kissi (Magnavita 2007, 2009), and al-Bakri's eleventh-century remark that cowries were one of two products most in demand at medieval Kugha, are all compelling illustrations. The general assumption is that East African cowries are of the *M. annulus* species and that these only reached West Africa relatively late.

For instance, in Ghana, York (1972) – a thorough, albeit very brief, Africanist treatment of archaeological cowries – argues that on West African sites *M. moneta* only occur before AD 1800 (coming from the Maldives), and that large numbers of *annulus* (from the East African coast, once European traders realised their commercial value) would indicate a later date. He also suggested that the treatment of shells may offer valuable chronological pointers. York (1972: 97) found that most *M. moneta* recovered on Ghanaian sites had been pierced to permit stringing, while this occurred more rarely on *M. annulus*, which were more likely to have been chipped. If correct, this offers an important route for us to assess the dates of sites – particularly important for sites from the past 300–400 years, where fluctuations in the calibration curve make radiocarbon dating unreliable or impossible (McIntosh & McIntosh 1986b). In this assemblage, dorsal removal occurs equally in *M. moneta* and *M. annulus* shells. It is hypothesised that this was achieved through grinding rather than chipping as the edges of the dorsa, even in unpolished shells, are far more rounded. This will be evaluated further using use-wear analysis.

Incisions were noted on the columellar and labial surfaces, and their purpose remains unknown. Were they made as a way of highlighting the teeth? Such incisions were present on five other specimens (3 *M. annulus*, 2 *M. moneta*) recovered from surface collections at Karfi, Nigeria, also studied as part of our wider assessment. Four of these shells had their dorsa removed in line with the specimen which issued from the *Crossroads* excavations at Molla. Incisions such as these have not been discussed or evaluated in the wider archaeological literature from the region; our identification of this practice is thus of considerable interest.

Given the high proportion of shells within the Dendi assemblage with removed dorsa, one wonders at what stage this piercing took place, and who was involved. Removal would seem challenging, and it would appear risky to import shells unmodified and process them locally, given the possibility of damaging them. At this moment, we have no way of answering this question. We do wonder, however, whether some parts of the stories alluding to the cowrie shell pond of *Nooru bangu* – the allusions to wealth, to the grinding of shells, to a process generating great amounts of waste material, and to the sewing of cowries into mat bags (Gosselain & Smolderen, this volume), might allude to a role played by this area in cowrie processing. On the basis of field observations and the excavation of two test pits at the mound of Tin Tin Kanza (Champion & Haour, Khalaf & Haour, this volume) we can certainly discount the idea raised by one informant (Gosselain & Smolderen, this volume) that the mound was constituted of an accumulation of shell powder. It is interesting to note, however, that a cowrie was recovered from one of the test pits here, given the proximity to the 'cowrie shell pond', *nooru bangu* (Gosselain & Smolderen, this volume).

CHAPTER 22

Figurines and Terracotta Objects

Romuald Tchibozo

1 Introduction

The survey and excavation carried out by the *Crossroads of Empires* team led to the recovery of a number of modelled clay objects. The fact that the pieces were found in a range of contexts, some dated to over 1000 years ago, challenges conventional art-historical wisdom in terms of contemporary perceptions of the technological and artistic situation of this part of Benin. People in this area are now overwhelmingly Muslim in belief; this fact, together with the distance from most of the Béninois centres for art historical research, which are in the south of the country (Tchibozo 1995; Gnonhouevi 2013), has led to the easy and rather lazy assumption that no figurative tradition had existed in Dendi. This chapter presents a few brief observations on the objects of modelled clay that were recovered. These should be read as art-historical in approach and should be seen as preliminary, as future research and publications will allow further refinement.

2 Classification of the Pieces

Before beginning the analysis, a few starting points must be outlined. The objects derived from several sites and different contexts, all situated on the Béninois bank of the Niger valley. Several forms of object classification are envisageable depending on the specifics of each research site, or the objectives of particular studies. In this case, as nothing had previously been published concerning terracotta art in the region, the choice has been made to provide a basic yet rigorous typology. The study of modelled clay objects from Jarma (Libya) by Townsend (2013) served as a useful model; it adopted the principle of ordering each item by category, form and genre. The items described in the present chapter are studied as a whole, without discrimination by site or year of discovery, distinguishing them solely through the method of classification. Objects are classified only in terms of major category, and here category is understood to be the various forms that the pieces can take.

Four categories are proposed: Category 1, anthropomorphic pieces; Category 2, zoomorphic pieces; Category 3, utilitarian objects, and Category 4, unidentifiable objects (Table 22.1).

3 Methodology

For reasons fundamentally related to the specificity of this study, the methodology adopted is qualitative and not quantitative. One reason for this choice is the relatively

TABLE 22.1 Classification of terracotta small finds

	Anthropomorphic	Zoomorphic	Utilitarian	Unidentified	Total
2011				SF 09, 11.	2
2012	SF 140, 149.	SF 148.	SF 07, 29, 35, 62, 79, 136, 257.	SF 67, 68, 125, 126, 134, 139, 147.	17
2013	SF 89, 203.	SF 91, 93, 95, 99, 204.	SF 19, 20, 21, 22, 90, 96, 102, 103, 105, 111, 112, 206, 211, 212.	SF 92, 106, 110, 115, 205, 207, 209.	28
2014	SF 31, 39.	SF19, 22b, 32b.	SF 03, 04, 05, 06, 07, 08a, 10a, 10b, 11, 12, 13, 14, 15, 20a, 20b, 21a, 21b, 22a, 23, 26, 32a, 33, 34b, 35b, 59, 78, 200.	SF 08b, 09, 16, 17, 24, 25, 27, 29, 30, 36, 37, 40.	44
Total	6	9	48	28	91

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FIGURE 22.1
A zoomorphic figurine from Birnin Lafiya, Trench 13 (SF 2014-19)

small number of objects; it is recognised that only a general assessment of the assemblage is achievable. A total of 91 items were examined, coming from the four seasons of excavation. Another factor linked to the sites from which these items were recovered is that objects from Birnin Lafiya predominate within the assemblage. This is because the site received the most sustained excavation, as it had proved an exceptional example of the mound culture within the region. Modelled clay objects were present from other sites, some quite close to Birnin Lafiya, but their low number does not allow any reliable analysis including quantitative method and statistical projections. A qualitative methodology must therefore be preferred, until further research has taken place that can allow for a fuller corpus of modelled clay objects from the region to be studied.

3.1 *Formal Analysis*

Given the relatively small size of most of the objects found on the different sites, no subcategories were created to reflect the measurements of the pieces, but this information is provided in the Small Finds tables (see Part 6, this volume). Also, in view of the poor state of some of the pieces, with irregular shapes, it is difficult to assign particular functional categories to the various objects without using personal judgment, which Hurcombe (2007: 57) called the intuitive type. The one exception might be that of items of personal adornment. Amorphous items were catalogued, but have not been studied in detail.

The total corpus studied consists of 9 zoomorphic objects, 6 anthropomorphic objects, 48 utilitarian objects and 28 unidentified.

In terms of the zoomorphic objects category, classification criteria relate to a clear identification of quadrupedy. This is the case for example of SF 2014-19, which was excavated from Birnin Lafiya Trench 13, Context 19 310–330cm (Figure 22.1). This piece is recognisably zoomorphic and resembles a cattle representation. The four members and the animal's position can clearly be identified, even though the head is broken off. The fact that SF 2014-22b, which is also zoomorphic, was recovered in the same context suggests a tendency to craft this kind of piece. The presence of the cattle shape is common in other studies of the wider region, for example in the Chad Basin (Breunig 2008; but see also his brief overview of the distribution of cattle figurines through the African Sahel and Sahara from the second millennium BC).

As outlined above, in other cases classification became a matter of intuition and of subjectivity in assigning a category. That is the case of SF 2012-148, SF 2013-95, SF 2013-99 or SF 2014-32b. In the case of these four items, the subject of the figures is not plainly distinguishable, but the shapes suggest an animal form in comparison with other pieces.

Only six objects feature in the anthropomorphic category. Again, some pieces are readily characterised thanks to relatively clear indications of bipedalism. This is the case for three items issued from the deep sequences at Birnin Lafiya: SF 2014-31, from Trench 13 Context 13, 130–140cm (Figure 22.2), SF 2013-203 from Trench 9, Context 11 (Figure 22.3), or SF 2012-149 from Trench 4 (Figure 22.4). All fall within the mid-first to early second millennium. These three pieces share one same specificity: their feet are not clearly distinguished. SF 2012-149 appears to have had feet, but they have been broken off, as has the head. SF 2013-203 is highly stylised, while the third, SF 2014-31, is much more realistic. Of the three pieces, only SF 2014-31 seems to possess a distinguishable

FIGURE 22.2 A terracotta figurine from Birnin Lafiya Trench 13 (SF 2014-31)

face with eyes, nose and mouth, at least the traces. It is possible these facial features have faded over time from the other figures. One noteworthy comment concerns the navel visible on SF 2012-149. Little or not featured on the two other objects, here not only is it visible, but it features so prominently on the sculpture that one would say there is a face at this place.[1] Looking at these figures collectively it is interesting that three different types of figurine appear to coexist in the same time period and at the same site.

As with the previous category, there are objects for which a certain degree of subjectivity is necessary in assigning them to a specific category. Regarding the category of utilitarian objects, these are easier to identify. There are all kinds of items useful for daily life without prejudging their intrinsic function. SF 2014-05, –06 (both

1 SF 2012-149 bears some similarity to the figure shown in Breunig (2008: Figure 6).

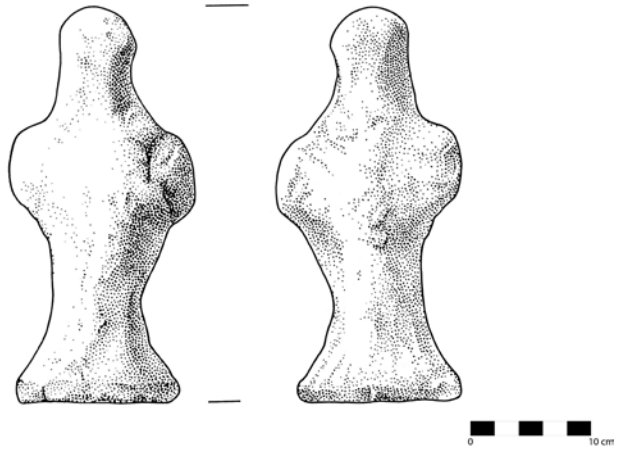

FIGURE 22.3 A figurine from Birnin Lafiya Trench 9 (SF 2013–203).

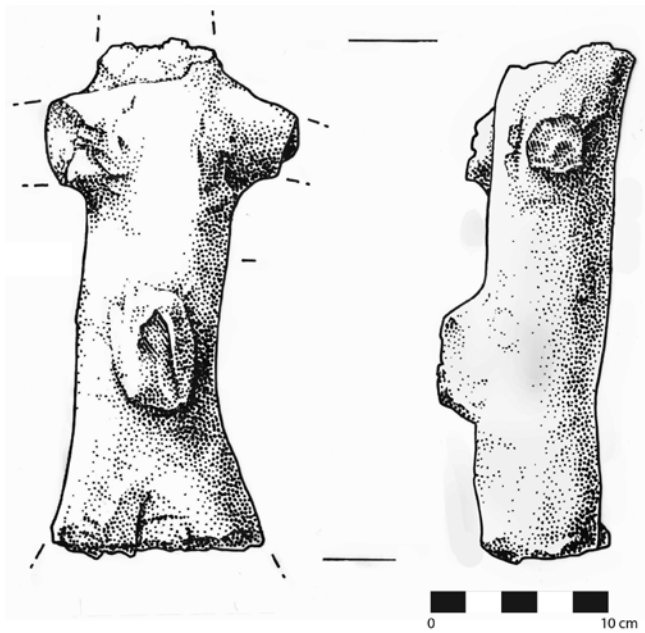

FIGURE 22.4 A figurine from Birnin Lafiya Trench 4 (SF 2012-149)

from Kwara zeno), –07 (from Torouwey), –08a, –10a both from Gorouberi) and –35b (from Madekali) are pipe fragments. SF 2013-96 is from a surface context and is thus not studied in detail, but provides a good illustration of this type of artefact (Figure 22.5). Three miniature pots were recovered (SF 2012-257, 2014-26 and 2014-200), but the role of such small items is unclear; some may be toys or medicinal items, as discussed below. Objects clearly linked to crafts are the possible spindle whorls SF 2014-22a from Madekali, 2014-59 from Tondo windi in Birni Lafia, and 2014-78 from Toutakayori. However, it can be difficult to distinguish spindle whorls, which can be conical, biconical or spherical, from clay beads. Certainly, clay beads were rare in the material, with stone beads and pendants much more common (S. Magnavita, this volume). One

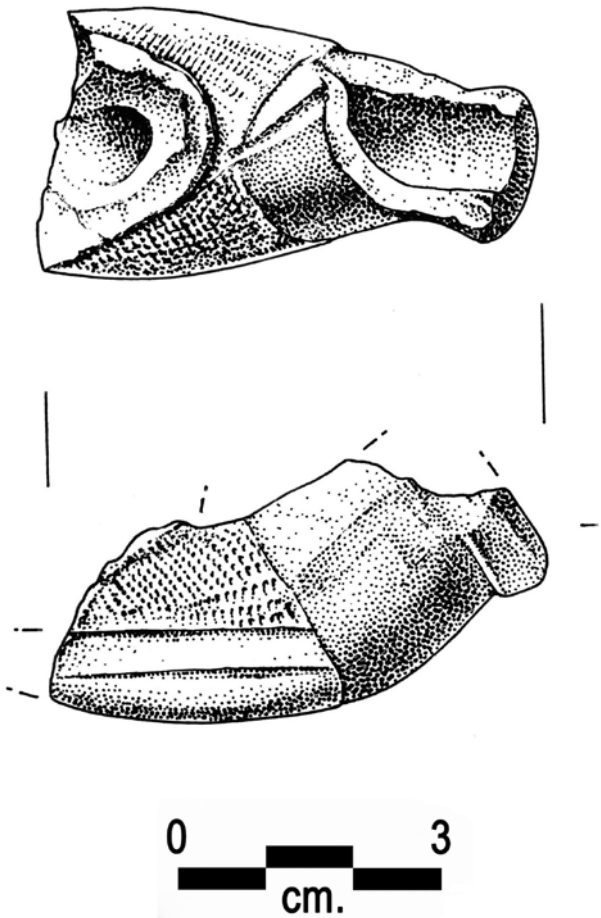

FIGURE 22.5 A pipe fragment from surface survey (SF 2013-96)

exception here is a clay disc with multiple holes (SF 2014-20a) from Birnin Lafiya Trench 13, which appears to have been a pendant.

Following these three categories, one final class is devoted to objects that could not be clearly identified. Their usage or their connection to other objects may remain unknown. For the most part, these are fragments of objects and it will not be necessary to present them here. Our classification methodology allows this, as we offer a schematic reading of the pieces in our study.

4 Interpretation and Discussion

The relatively small number of items found on various sites does not detract from their diversity in form and style. Yet two main problems create limitations to this study.

The first is the lack of field data concerning these items. Interviews were conducted on the topic of these pieces, and during the various field seasons a specific thread of enquiry was dedicated to the field research on these objects and on changes in the production of such ceramics. It was however, impossible to pursue this due to a lack of collaboration from the local populations. One factor is certainly the current religious context, which made these questions almost taboo subjects. This was palpable on the ground at the stage of the initial enquiries, when informants were asked whether there was once anything other than Islam that ruled the daily lives of people. This resistance to acknowledge the existence of non-Islamic belief was encountered by the author while researching the textiles of the Dendi region as part of the *Crossroads* fieldwork, and this was true also for figurines.

The second difficulty in interpretation arises through the fact that this seems to have been a region of cultural exchanges. The corpus as it was recovered consists almost exclusively of portable art, items that can easily be held in the hands; they are easily transportable, and may be trans-contextual. It cannot be assumed that these objects were manufactured in the place they were recovered.

Against this, it should be mentioned that one of the potters from Birni Lafia recognised a vessel used to keep medicines in one of the small jars recovered from surface survey at Birnin Lafiya (SF 2014-200), which may suggest that at one point such items were manufactured in the region, or not very far away. Conversely, many of the figurines go a long way back in the history of Dendi; for example, several of the anthropomorphic representations (e.g. Figure 22.2, above) likely date to the second half of the first millennium AD.

Future studies on these issues will allow further progress. Here, a certain number of pieces have been showcased for the study, and their selection was carefully undertaken in order to be representative of all categories of items and all sites.

It is clear that, at a certain time in its history, artistic practices existed in this region of which the recovered material culture is living proof. Despite various studies of these and similar materials in West Africa (Tchibozo 1995; Gnonhouevi 2013; Koukpaki 2014),[2] it would be inappropriate to try to confirm clear stylistic trends at this stage of our knowledge.

This said, the question can be posed: why did past people only choose to express themselves through this category of items? There is a rather intractable problem that leads us to adopt an analysis close to that of Townsend (2013). The creative process sometimes uses strategies from designed forms to create significant modes of communication of the pieces that are made and passed on

2 These studies refer to the evolution of sculpture practices in various parts of the Benin territory, notably Dassa, Abomey, Savè, Savalou, Agonlin and also in Couffo. All of these are in southern or, in the case of Dassa, central Benin.

to other generations. To develop his analysis, Townsend refers to the work of anthropologist Alfred Gell (1998: 163) who argues that "Style is to artworks what group identification is to social agents." In support of this, he cites the anthropologist Georges Devereaux (1961: 367) who defines art as a stylised form of communication, and once again Gell (1998: 215) who defined it as: 'Relations between relations of forms.' In other words, style can be recognised as the main form of communication, the mode of transmission of information on society, and thus as part of the process of setting out identity.

In the case of the sites we have investigated, further research will allow an improved interpretation and analysis of the artefacts. However, their considerable variety, which indeed conditioned the classification methodology used here, has allowed for initial analysis and interpretation. The present author hypothesises that the anthropomorphic and zoomorphic figurines were probably not created as toys, though of course this will never be known for sure (though see Okoro 2008 for some useful thoughts on the interpretation by archaeologists of objects in the Ghanaian archaeological context). In the present study, as stated above, difficulties are compounded because pre-Islamic contexts are concerned, and it is almost impossible to make a comparison with the contemporary realities. The context in which the figurines were recovered tells us little about their function; many were found in stratigraphic contexts together with items of daily life such as pottery sherds or faunal remains, which we associate with habitations. The small size of the objects does however seem to suggest they may have been linked with individual practices.

5 Conclusion

This chapter has dealt with a number of terracottas found during the four years of excavations on the Benin side of the Niger valley. This represents rich evidence for past society, and although there is much that remains unknown, a few closing notes are possible. The recovery of pipe remains, clay beads and jewellery suggests a society where the development of technologies exceeded mere daily needs, to add pleasurable activities. The possible spindle whorls give indications of the processing of fibre. Artistic creation could be related to several circumstances, given the special character of the area, which is a crossroads of many human influences. However, at present we have no other source to confirm the tradition out of which these artefacts were issued, and from there to place any analysis in a diachronic perspective. The hope is that studies will intensify in this area to bring additional elements which will improve knowledge.

CHAPTER 23

Archaeobotanical Remains

Louis Champion and Dorian Fuller

The analysis of the archaeobotanical remains collected in the course of the *Crossroads of Empires* project has been orientated towards developing a better understanding of plant food traditions and cultivation through time. There has been almost no archaeobotanical research in Benin, with some preliminary results available from the site of Yohongou in the Gourma region (Petit et al. 2000). Therefore the data reported here, from several sites and periods in the Dendi region, represents a major contribution to the agricultural history of the country. Although work in neighbouring areas has been carried out, our understanding of the long-term development of agriculture in this part of Africa remains patchy (e.g. Fuller et al. 2014; Kay & Kaplan 2015). These new archaeobotanical data thus provide the first empirical evidence for the history of the use of major crops, especially cereals, and other food plants in these regions. The sequence of shifts in crop repertoire can in turn be linked to broader social and economic developments in the region. One of the most important modifications in the African landscape, during the first millennium BC and the first and second millennia AD, is the growth of the West African states and empires such as Ghana and Mali, as well as various Songhai polities and the *kasar hausa*. The extension and maturation of these political entities certainly involved many changes that would have had an impact on local agricultural systems, urbanisation and trade networks.

1 Methods

Due to the large team involved in the *Crossroads* project, the sampling methodology was adapted according to the excavations. The strategy was to obtain samples through three avenues, (1) archaeobotanical survey, (2) exploratory sampling dictated by excavation questions, and (3) an archaeobotanical index trench (Table 23.1).

1.1 *The Archaeobotanical Survey*

The archaeobotanical survey consisted of small-scale sampling from many small test pits (generally $1m^2$) on many sites. The samples collected within this strategy are usually small (averaging 5 litres of sediment) and represent each archaeological context of interest.

1.2 *Exploratory Sampling during Excavation*

This strategy had a very simple goal: to obtain more information about a context, structure or pit, particularly problematic contexts for which we did not yet have a good understanding during excavations. This strategy included sampling the contents of ceramic vessels. In most cases, these samples comprised very small volumes of soil (c. 1–3 litres).

TABLE 23.1 Number of samples collected (150 samples were collected in 13 sites in 29 test-pits), and sampling strategy by site: (1) The archaeobotanical survey; (2) Exploratory sampling during excavation; (3) The archaeobotanical index trench

Sites	**Birnin Lafiya**	**Kantoro**	**Tin Tin Kanza**	**Alibori SII**	**Alibori SIII**	**Pekinga**	**Madekali**	**Madekali RC1**	**Kozungu**	**Bogo Bogo**	**Kargui**	**Gorouberi**	**Guene zeno**	**TOTAL**
Samples	78	34	12	1	5	6	3	1	4	2	2	1	1	150
Litres	1354	510	200	20	100	89	15	5	106	10	10	8	5	2452
Test-pits	14	2	2	1	1	1	1	1	2	1	1	1	1	29
Sampling strategy	(2)	(1)	(2)	(2)	(1)	(1)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	

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1.3 *The Archaeobotanical Index Trench*

These samples were collected systematically from some particular trenches in which all stratigraphic contexts were sampled after the stratigraphy was fully recorded. Where possible, a minimum sample volume of 15 litres per context or arbitrary spit was maintained. Smaller contexts (< 15 L) were sampled in their entirety.

During the three fieldwork seasons (2012, 2013, 2014), flotation was carried out by one of the authors (LC) with assistance from students and local labourers. Sediments were processed manually by bucket flotation (washover method; see Pearsall 2000: 32; Fuller 2008a). Flots were collected on a 0.25mm mesh and then air dried in a single bag. Flotation is a method widely used to separate materials of different density, and is the most common way of recovering charred plant remains from archaeological contexts. The basic principle is to mix the sediment with water to wet it and then break it apart. The buoyant material, including the plant macro-remains, is then poured off and collected in a fine mesh (Fuller 2008a). This process was pioneered by Hans Helbaek in the early 1960s (Helbaek 1969; see also Nesbitt 1995).

Due to the lack of water and technical resources on sites during the 2012 fieldwork season, the same water was re-used for each sample. To prevent any contamination the water was filtered with 0.25mm mesh filters (the same mesh used to collect the flots). In 2013, there was access to a manual water pump and in 2014 the flotation was carried out near a well ensuring a sufficient water supply (Figure 23.1).

In the UCL laboratory, the weight and volume of each flot was measured, and each sample was then sieved into five size fractions (>4mm, 2–4mm, 1–2mm, 0.5–1mm, <0.5mm). The ≥0.5mm sub-samples were scanned for charred plant structures such as seeds, fruits, nutshell and parenchyma with the aid of a low-power stereomicroscope (6x–40x).

Cereals, chaff, pulses, millets, weeds, nuts and fruits were identified by comparing taxa with specimens in the modern reference collection housed at the Institute of Archaeology, University College London, supplemented by modern reference specimens collected during fieldwork. Photographs and descriptions of identifications from a variety of published literature were also used (e.g. Fuller 2003; Fuller & Harvey 2006; Nixon 2011; Murray 2007a, 2007b; Murray et al. 2007; D'Andrea et al. 2001).

All samples, regardless of sampling strategy, were analysed in the same way. Whole vegetal items were recorded by count in a list of taxa, from which tables of relative frequency were constructed and ubiquity could be calculated. The relative frequency is the percentage of total seed count. It can be calculated by sample, phase, test pit or site as necessary. In addition, every taxon was logged in a ubiquity table. The ubiquity is the number of samples in which a taxon is present as a percentage of the total number of samples. Some authors have argued that ubiq-

FIGURE 23.1 Archaeobotanical work in progress

uity (also called presence analysis) may be more appropriate for comparisons between sites and researchers as it will reduce biases between the recovery and recording of different taxa counts (e.g. Hubbard & Clapham 1992). Ubiquity requires multiple samples from the site or phase. Ubiquities on a regional scale were also determined by taking the percentage of sites per archaeological phase for each crop.

2 Results

During the three seasons of fieldwork, 150 samples were collected comprising 2452 litres of sediment from 29 test pits across 13 sites. These included 78 samples (1354 litres, in 14 test pits) from Birnin Lafiya, 12 samples (200 litres in 2 test pits) from Tin Tin Kanza, 6 samples (89 litres in one test pit) from Pekinga, 6 samples (140 litres, from Alibori sites 1 (Trench 2) and 2 (Trench 3), 34 samples (510 litres, in 2 test pits) from Kantoro, 14 samples (158 litres, in 8 test pits from 7 sites) from a range of contemporary sites sampled in 2014 (Table 23.1 & Figure 23.2). The location of the sites discussed can be seen on Map 3. Of the 150 samples collected, 88 have been analysed thus far and are presented here. The remainder will be analysed as part of Louis Champion's doctoral research.[1] Five of the analysed samples were entirely sterile of plant remains.[2] The other 83 samples yielded around 8085 archaeobotanical remains; raw quantitative data are summarised in Table 23.2.

The most common and abundant crop on sites across the whole region and all periods was pearl millet (*Pennisetum glaucum*). The two other staple crops present in the samples were African rice (*Oryza glaberrima*) and sorghum (*Sorghum bicolor*). Some sites also showed evidence of baobab (*Adansonia digitata*), oil palm (*Elaeis guineensis*) and cotton (*Gossypium sp.*), suggesting that the production of condiments and raw materials for crafts also contributed to agriculture in this part of West Africa. In contrast, evidence for the presence of cowpea (*Vigna unguiculata*), one of the major pulse crops in West Africa and probably domesticated in the grassy woodlands of

1 Louis Champion, "The evolution of agriculture, food and drink in the ancient Niger river Basin: Archaeobotanical studies from Mali and Benin" PhD thesis underway at University College London (UCL) under the supervision of Dorian Fuller and Kevin MacDonald (UCL).

2 These were Pekinga Contexts 1 & 3; and three contexts relating to the compound excavated in the northern part of the site, namely Birnin Lafiya Trench 3 Context 9 and Birnin Lafiya Trench 10 Room 2 Pot 11 and Room 1 Pot 3.

TABLE 23.2 Raw quantitative archaeobotanical evidence from the Dendi region, Benin. Total Numbers of identified specimens have been summed by sample. The type of feature is also mentioned: pit, pot, D (for deposit), W (for well), Mid (for midden)

Sites				*Pennisetum glaucum*				*Oryza glaberima*			
	Context	Structure type	Volume (litres)	Spikelet	Involucre	Seed	Total	Lemma	Spikelet	Seed	Total
ALB-14-SIII	30–40	Pit	10			5	**5**				**0**
	40–50	Pit	10		1	5	**6**				**0**
	50–60	Pit	20			7	**7**				**0**
	60–70	Pit	20			1	**1**				**0**
	70–80	Pit	60			2	**2**				**0**
BLAF-12-SIV	Pit 4 Veg 2	Pit	20			25	**25**		13	3	**16**
	Pit 4 Veg 3	Pit	4			10	**10**		130	1	**131**
	Pit 3 Veg 4	Pit	6				**0**		117	4	**121**
	Pit 9 Veg 1	Pit	20			2	**2**		1	1	**2**

Ghana or adjacent areas (D'Andrea et al. 2007; Fuller & Hildebrand 2013), seemed paradoxically weak. Just a few remains of possible fonio millet (*Digitaria* cf. *exilis*) were found. A description of the main economic taxa follows.

2.1 Pennisetum glaucum – *Pearl Millet*

Within the archaeobotanical assemblage 3094 pearl millet remains were identified; involucre bases and seeds of this taxon represent around 40% of all of the remains identified from the samples studied. (On the recognition of these parts of pearl millet see, Klee & Zach 2003; Murray et al. 2007; Fuller et al. 2007). The seeds represent 80% (2496 seeds) of the millet assemblage for 17% of involucre bases (517). Due to their morphological characteristics, the seeds and involucres were very easily determined as pearl millet (Figure. 23.3A, B, C, D). Indeed, pearl millet seeds are characterised by a large ovate seed (usually up to 3mm in length) with an ovate or wedge-shaped section, relatively long and wide scutellum (1/2–2/3 caryopsis length) (D'Andrea et al. 2001). The involucre apex gives rise to a dense group of bristles, preserved as stubs; it has attachments that normally give rise to two spikelets/grains as well as a torn pedicel characteristic of domesticated pearl millet (Manning et al. 2011).

Pearl millet has likely been an important staple cereal of West Africa since the Neolithic period (Dupuy 2014). More often used in porridge and beer, pearl millet is one of the more commonly consumed cereal crops in Africa, along with sorghum and rice (Brunken et al. 1977; Haaland 2006, 2007; Ricquier 2014). Pearl millet was domesticated in West Africa sometime before 2000 BC (Fuller & Hildebrand 2013). The earliest archaeobotanical evidence for it comes from sites located in the Lower Tilemsi Valley, Mali, which date to between 2500 and 2000 cal BC (Manning et al. 2011; Manning & Fuller 2014). Finds of millet chaff in ceramic temper from the Neolithic period in southwestern Mauritania, dating back to 1700–1500 BC (Fuller et al. 2007), have been suggested to represent a plausibly independent domestication trajectory (MacDonald et al. 2009; Manning & Fuller 2014). Good archaeological evidence of pearl millet has also been recovered in all the Niger River valley sites, mainly in the Inner Delta as in Dia and Jenné-jeno but also at Gao, Sorotomo, Tongo Maaré Diabal and Winde Korodji (Map 1).

2.2 Oryza glaberrima – *African Rice*

2104 remains, around 27% of the total assemblage, were found at just four sites: Birnin Lafiya, Tin Tin Kanza, Kantoro and Madekali. Spikelet bases (Figure 23.3I, J) constituted 96% (n = 2047) of the rice finds, compared to only 19 finds of grain (i.e. less than 1%) (Figure. 23.4A). In addition, some contexts produced large quantities of rice husk fragments (e.g. Figure 23.4B), which were not counted individually and therefore were not represented

Seed	Involucre	*Sorghum bicolor* Total	Indet seeds	*Nuts indet.*	*Adansonia digitata*	*Elais guineensis*	*Canarium schweinfurthii*	*Vigna unguiculata*	*Gossypium sp*	*Capparidaceae*	*Digitaria*	*Panicum Sp.*	*Brachiaria*	*Acacia*	*Moraceae*	Total
		0	15	2												22
5		5	15	12												38
10		10	102	30												149
		0	35	1				7								44
		0	6	8												16
3		3	1									1				46
		0	5													146
3		3			2											126
		0	10													14

TABLE 23.2 Raw quantitative archaeobotanical evidence from the Dendi region, Benin (*cont.*)

Sites	Context	Structure type	Volume (litres)	*Pennisetum glaucum*				*Oryza glaberima*			
				Spikelet	Involucre	Seed	Total	Lemma	Spikelet	Seed	Total
BLAF-13-SVIII	C 4/5		18			11	**11**		2		**2**
	C10 int pot	Pot	5			1	**1**		1		**1**
	C17 250–260		21		60	109	**169**	26	508		**534**
BLAF-13-SXI	C18 Pot	Pot	7		2	25	**27**		35		**35**
	C7		10				**0**	5			**5**
	C4	D	15			42	**42**		29		**29**
	C1	D	17				**0**				**0**
	C3	Pit	18				**0**				**0**
PEK-12-SI	C5	Pa	14			8	**8**				**0**
	C6	D	16				**0**				**0**
	C8	D	14				**0**				**0**
	C9	D	10			1	**1**				**0**
	C6 ±100cm	Pit	30		15	69	**84**	10	20	2	**32**
	C8–10	Pit	20		60	4	**64**		20		**20**
	C11 160–180	Pit	20			15	**15**				**0**
BLAF-13-SIX	C 11 200–210	Pit	10		4	6	**10**	17	245	1	**263**
	C 11 inf.	Pit	10		3	7	**10**		5		**5**
	C12 120–130	Pit/W	40		149	137	**286**		315	2	**317**
	C 12 Inf.	Pit/W	10		4	21	**25**		3		**3**
	C1 Niv 6–7	Pit	35			10	**10**				**0**
	C 17 Niv 10	Pit	15			55	**55**				**0**
	C7 Niv 7	D	25		3	46	**49**		31		**31**
	C9 Niv 10	D	11		4	1106	**1110**		69		**69**
TTK-13-SI	C14	fire	2			19	**19**		4		**4**
	C22 Niv 14	D	10			100	**100**		63		**63**
	C23 Niv 16/17	D	11			58	**58**		42		**42**
	C 19 Niv 24/25	Pit	25			35	**35**		51		**51**
	C19 Niv 35/36	Pit	38			70	**70**		190	2	**192**
KLI-14-RCI	U6	Mid	5		5	25	**30**	1	46		**47**

Seed	*Sorghum bicolor* Involucre	Total	Indet seeds	*Nuts indet.*	*Adansonia digitata*	*Elais guineensis*	*Canarium schweinfurthii*	*Vigna unguiculata*	*Gossypium sp*	*Capparidaceae*	*Digitaria*	*Panicum Sp.*	*Brachiaria*	*Acacia*	*Moraceae*	Total
		0	3	1												17
		0														2
8		8	30	15			10	1	2							769
		0	5													67
		0	1													6
25	12	37	40	5	3											156
		0														0
		0														0
		0			5											13
		0			5											5
4		4														4
1		1	12		1											15
10		10	71	5	3	5	6	4								220
6		6	20	42	2	1			1							156
25		25	18	5												63
		0														273
32		32	30	7												84
86		86	5	31				2				5				732
10		10	2	10		1										51
15		15	10	25	9	6										75
2		2	20	12	4											93
3		3	41	30												154
4		4	15		6											1204
		0	15		1											39
25		25	9		10				1							208
1		1	12	25												138
1		1	15													102
60		60	100													422
2		2	6	9	1	7	4	1			3					110

TABLE 23.2 Raw quantitative archaeobotanical evidence from the Dendi region, Benin (*cont.*)

Sites	Context	Structure type	Volume (litres)	*Pennisetum glaucum*				*Oryza glaberima*			
				Spikelet	Involucre	Seed	Total	Lemma	Spikelet	Seed	Total
	C1 40–50	D	15			13	**13**				**0**
	C 1 50–60	D	15			10	**10**				**0**
	C2 70–80	D	15			23	**23**			1	**1**
	C2 80–90	D	15			26	**26**				**0**
	C 3 90–100	D	15			41	**41**		1		**1**
KRO-14-SII	C4 100–110	D	15		1	50	**51**				**0**
	C4 110–120	D	15			45	**45**				**0**
	C4 120–130	D	15			17	**17**				**0**
	C4 130–140	D	15			15	**15**		1		**1**
	C5 140–150	D	15			25	**25**		2		**2**
	C5 150–160	D	15			41	**41**		4	1	**5**
	C5 160–170	D	15		3	60	**63**	2	15	1	**18**
	C18 270–280	D	35			25	**25**		20		**20**
	C19 310–330	D	20		10	21	**31**		50		**50**
	C19 350–370	D	10			6	**6**		5		**5**
BLAF-14-SXIII	sample 1 C14	D	15		1	6	**7**		1		**1**
	Sample 3 C23	Pit	30		1	1	**2**	1	1		**2**
	Sample 4 C21	Pit	40			2	**2**				**0**
	Sample 5 C21	Pit	40			1	**1**		1		**1**
	Sample 6 C11	Pit	30		1	3	**4**		6		**6**
BLAF-12-SIII	C 6	D	19				**0**				**0**
	C 9	D	18				**0**				**0**
	C7 north		10			14	**14**				**0**
	Burnarea room 2		5				**0**				**0**
	Under room 1		10			3	**3**				**0**
	Sect° compl wall		10			1	**1**				**0**
BLAF-13-SX	C8 ext pot		5				**0**				**0**
	Room 2 pot 7	Pot	2			1	**1**				**0**
	Room 2 pot 8	Pot	5				**0**				**0**
	Room 2 pot 11	Pot	5				**0**				**0**
	Room 1 pot 1	Pot	2				**0**				**0**
	Room 1 pot 3	Pot	5				**0**				**0**

Seed	Involucre	*Sorghum bicolor* Total	Indet seeds	*Nuts indet.*	*Adansonia digitata*	*Elais guineensis*	*Canarium schweinfurthii*	*Vigna unguiculata*	*Gossypium sp*	*Capparidaceae*	*Digitaria*	*Panicum Sp.*	*Brachiaria*	*Acacia*	*Moraceae*	Total
1		1	25	8		2										49
		0	18	1												29
4		4	5			3										36
		0	13	7												46
		0	24													66
2		2	35		2											90
15		15	20	25	15	1										121
1		1	16	1												35
1		1	13		17	10		4								61
		0	15	12	3	2										59
6		6	25		3											80
7		7	40	15	3	6										152
1		1	8													54
2		2	67	15	2											167
		0	5				6									22
		0	8													16
		0	2	4	1											11
1		1	2													5
		0	5	5	2											14
2		2	2													14
		0	15		2								1			18
		0														0
2		2	18					2								36
		0	5													5
5		5	9	25	1											43
		0	10	17	3											31
		0	2													2
		0	4													5
		0	3	1												4
		0														0
		0	1		2											3
		0														0

TABLE 23.2 Raw quantitative archaeobotanical evidence from the Dendi region, Benin (*cont.*)

Sites	Context	Structure type	Volume (litres)	*Pennisetum glaucum*				*Oryza glaberima*			
				Spikelet	Involucre	Seed	Total	Lemma	Spikelet	Seed	Total
ROU-14-SI	U6	D	5				**0**				**0**
KOZ-14-SI	U4	D	30			15	**15**				**0**
	U5	Pit	30				**0**				**0**
KOZ-14-SII	U4	D	15			1	**1**				**0**
	U5	D	30				**0**				**0**
GOB-14-SI	60–70	Pit	5				**0**				**0**
GOG-14-SI	U5	Pit	5	60	182	11	**253**				**0**
	U6	Pit	5		4	2	**6**				**0**
KGI-14-SI	U7	D	5	2	2	3	7				**0**
	U11	Pit	5			1	**1**				**0**
	U8	D	5	12	2		**14**				**0**
KLI-14-SI	U16	Mid	5			2	**2**				**0**
	U18	Mid	5	7			7				**0**
Total			1298	81	517	2522	3120	62	2047	19	2128
Frequency				1.01	6.47	31.55	**39.03**	0.78	25.61	0.24	**26.62**

Seed	Involucre	*Sorghum bicolor* Total	Indet seeds	*Nuts indet.*	*Adansonia digitata*	*Elais guineensis*	*Canarium schweinfurthii*	*Vigna unguiculata*	*Gossypium sp*	*Capparidaceae*	*Digitaria*	*Panicum Sp.*	*Brachiaria*	*Acacia*	*Moraceae*	Total
		0	35	26		5										66
		0			4					1						20
		0	10	10	5											25
		0			7											8
		0	10													10
		0			3				3							6
3		3	40	32	2	4			4							338
4		4	10	23		6	4		2							55
1		1	12													20
1		1	144	5		6				14	5				1	177
11		11	20	20	3	23	10		25					1		127
2		2		7	1	5	1									18
		0	10	25	4	8	1		15							70
413	12	425	1375	559	137	101	42	21	53	15	8	6	1	1	1	7993
5.17	0.15	5.32	17.20	6.99	1.71	1.26	0.53	0.26	0.66	0.19	0.10	0.08	0.01	0.01	0.01	100.00

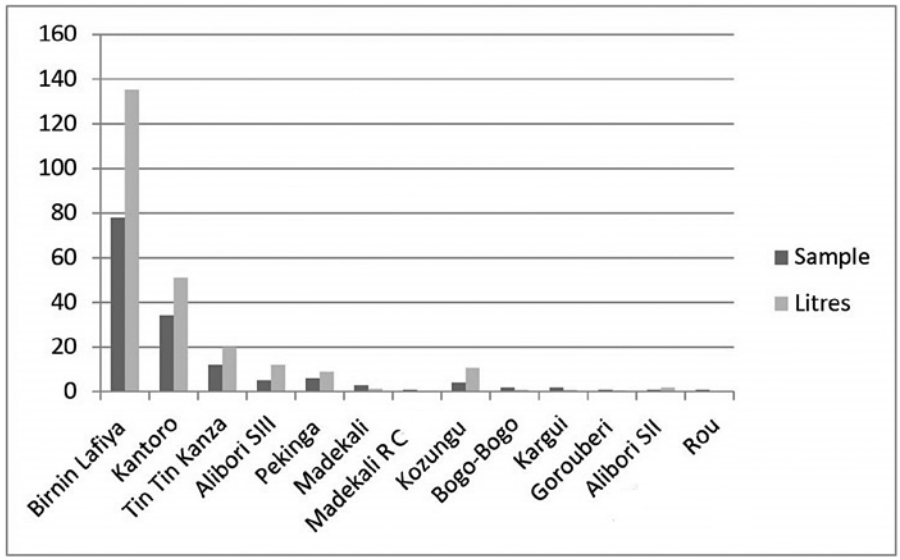

FIGURE 23.2
Summary of the number of samples collected in North Benin. Black = number of samples by site. Grey = number of decalitres (10^{-2} m3) by site

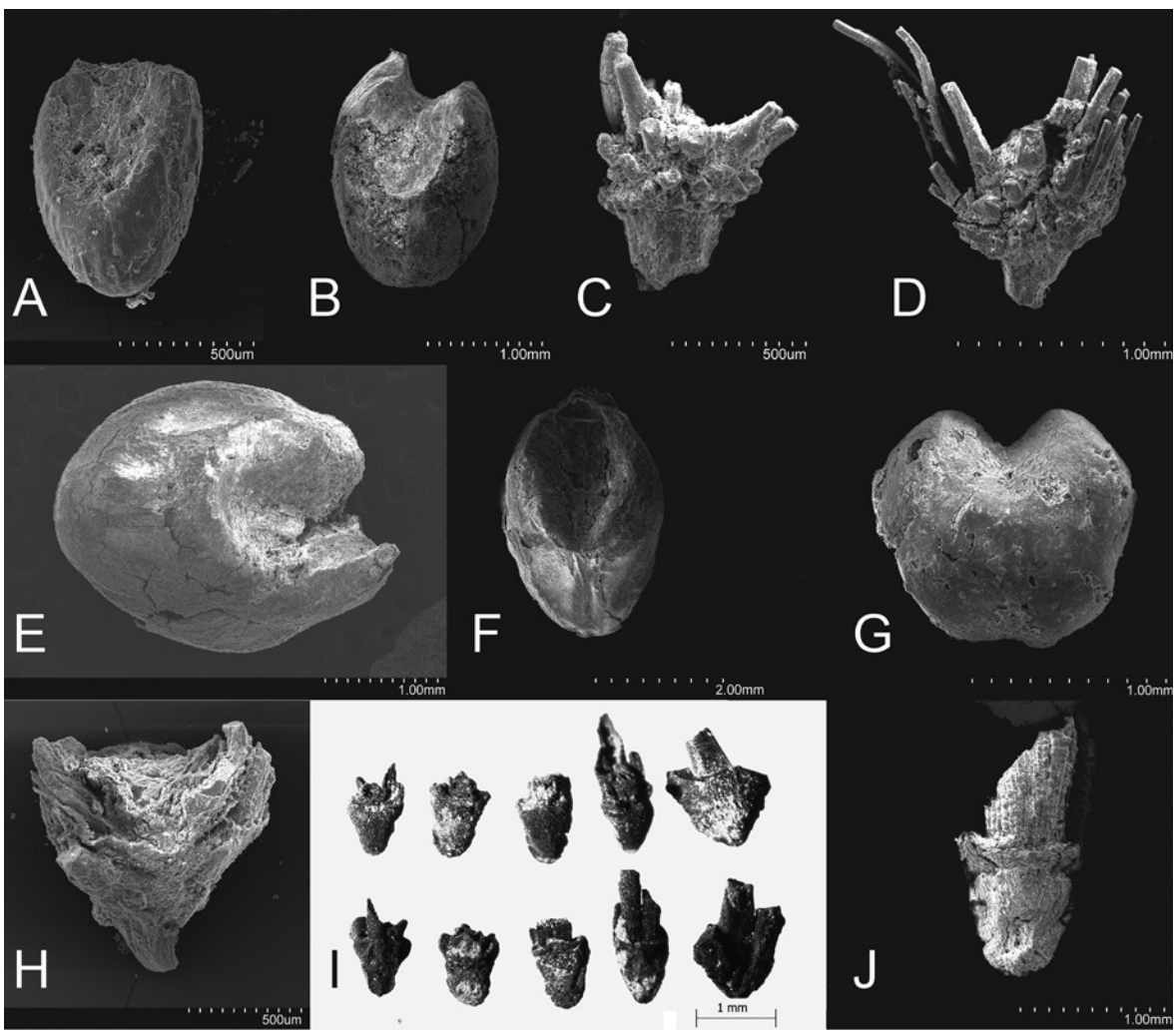

FIGURE 23.3 Examples of archaeobotanical specimens.
A. *Pennisetum glaucum* grain, from Alibori Site 2, SIII 30–40cm; B. *P. glaucum* grain, from Birnin Lafiya BLAF S9 Context 12 120–130cm; C. *P. glaucum* involucres base, domesticated type from Birnin Lafiya BLAF S9 Context 12 120–130cm; D. *P. glaucum* involucres base, domesticated type from Birnin Lafiya BLAF S9 Context 12 120–130cm; E. *Sorghum bicolor* grain, probably race bicolor, from Birnin Lafiya BLAF S9 C11; F. *Sorghum bicolor* grain, probably race bicolor, immature, from Birnin Lafiya BLAF S9 Context 6 100cm; G. Sorghum bicolor grain, probably race guinea, from Birnin Lafiya BLAF S9 Context 17 250–260cm; H. Sorghum bicolor chaff (spikelet base), probably race bicolor, from Birnin Lafiya BLAF S9 Context 11; I. Spikelet bases of rice (*Oryza glaberrima*), from Tin Tin Kanza TTKS1 Context 19 355cm; J. Spikelet base of rice (*Oryza glaberrima*), from Birnin Lafiya BLAF S11 Context 17 250–260cm

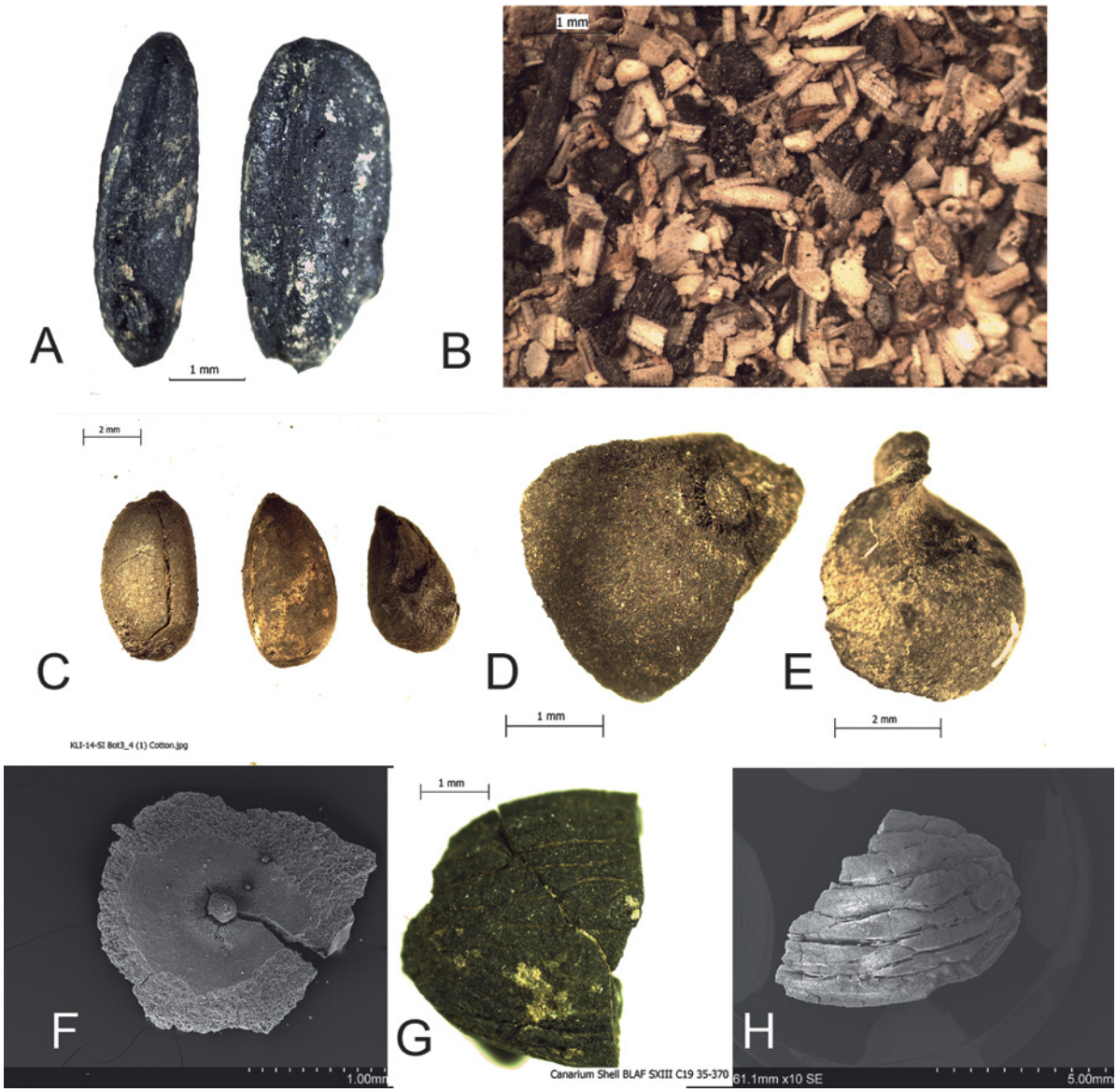

FIGURE 23.4 Examples of archaeobotanical specimens.
A. Rice (*Oryza glaberrima*) grain, in dorsal and lateral view, from Birnin Lafiya, BLAFS4 Pit 3; B. Concentration of silicified (ashed) rice husk fragments from Birnin Lafiya BLAF S4 Veg. 3; C. Seeds of cotton (*Gossypium* sp.), from Madekali KLI-14-SI Bota 3; D. Seed fragment with hilum of baobab (*Adansonia digitata*) from Madekali KLI-14-RC1 Context 6; E. Seed fragment with hilum of baobab (*Adansonia digitata*) from Kozungu KOZ-14-SI-80–100cm; F. Cotton seed fragment, funicular cap, from Gourouberi GOB SI 60–70cm; G. African olive (*Canarium* cf. *schweinfurthii*) nut shell, from Birnin Lafiya BLAF S13 Context 19 350–370cm; H. African olive (*Canarium* cf. *schweinfurthii*) nut shell, from Madekali KLI Context 8.

in the quantification. Currently, there are no direct AMS radiocarbon dates on rice remains from Benin. All the rice comes from well-dated contexts from the mid-first millennium AD (Birnin Lafiya Trench 4) to AD 1200. Rice grains are identifiable by being relatively uniform in their shape, almost rectangular with rounded corners and rounded or slightly pointed ends, and two parallel grooves down each broad side. Grain metrics can be used to separate domesticated *O. glaberrima* from its congeneric wild African relatives (Murray 2007a). The other characteristic remains of rice are the spikelet base (e.g. Fuller 2000; Fuller & Castillo 2014); wild and domesticated types can be differentiated based on the morphology of the abscission scar, which is smooth in wild types and torn in domesticated types (see Fuller et al. 2009, for examples from Asian rice). Those recovered in the Dendi sites were almost entirely of the domesticated type.

Today African rice is most often boiled or steamed whole, which contrasts with sorghum or pearl millet, which are usually pounded into coarse flour. But it can be

used in other ways such as rice flour, which in turn may be fermented (McCann 2009). The oldest evidence of wild rice comes from ceramic impressions at Kursakata (c.1000 BC) and Gajiganna (around 1800–800 BC) in the Chad Basin (Klee et al. 2004). Evidence of domesticated rice is more recent, coming from the Inland Niger Delta in Jenné-jeno, Dia and Sorotomo in Mali (Fuller 2013; Murray 2007a; McIntosh 1995). Since perhaps 800 BC, African rice was probably cultivated along the Niger River bend (Fuller 2013; Murray 2007a; Agnoun 2012). At Dia, a large quantity of rice grains was studied and AMS dates indicated rice was present from c.2500 years ago (800–400 BC); similarly at Jenné-jeno rice was present from the earliest occupation (250 BC) (Murray 2007a). Given that Asian rice domestication took c. 2000–3000 years (Fuller et al. 2009), earlier rice cultivation must have preceded that at Dia and remains to be found archaeologically.

Currently, with the four Benin sites analysed in this study, there are about a dozen African archaeological sites that have provided evidence of African rice. Because of the small numbers of sites involved, it is not yet possible to adequately document the origins and early diffusion of African rice agriculture. Currently in many regions African rice (*Oryza glaberrima*) is being replaced by the Asian species (*Oryza sativa*) introduced to Africa around the middle of the sixteenth century AD by the Portuguese (Linares 2002). In addition, in a few areas hybrids of *O. glaberrima* and Asian *O. sativa* are cultivated (Nuitjen et al. 2009). In some regions, as African rice has declined, it has remained a minor crop of ritual importance, for example amongst the Jipalom in Senegal (Linares 2002).

2.3 *Sorghum Bicolor*

Around 410 (6% of the total assemblage) sorghum remains (mainly grains but also spikelet bases) were found in the different test pits excavated (Figure. 23.3E, F, G, H). The sorghum grains had a rounded top, narrowing to a pointed bottom, and a smooth concave embryo that is between 1/2 and 1/3 the length of the grain (Fuller 2000). Most grains are likely to be the thinner ovate forms from race *bicolor*, while a few examples suggest a plumper free-threshing race, such as race *guinea* (e.g. Figure. 23.3G), although further work on systematically separating these types is needed. Chaff remains consist of basal chaff and rachilla (e.g. Figure 23.3H) and indicate a domesticated sorghum with a torn rachilla. Such remains likely come from the dehusking waste, probably from race *bicolor*. Through all time periods the representation of sorghum is similar with an average of 6% in every period.

Sorghum did not originate in West Africa but arrived from East Africa. Its origin is still controversial. Genetic studies provide evidence of an African centre of domestication. For a long time the oldest domesticated samples were from India, around 2000–1700 BC (Fuller & Hildebrand 2013), but recent evidence from the Kasala region of eastern Sudan in suggests a domestication process in this region in the 4th millennium BC (Winchell et al. 2017; Fuller 2014). Nevertheless, wild sorghum was widely utilised by Saharan and Sudanese Mesolithic and Neolithic societies (Fuller & Hildebrand 2013; Fuller 2015). Wild sorghum used as a subsistence staple has not been documented in western Africa.

Sorghum has a multitude of uses. It is most regularly used in the production of a beer that is consumed in large quantities in Africa. Sorghum can also be eaten as the main form of flour in porridge or cakes. These cakes can be fried, grilled or cooked in water (De Wet 2006; McCann 2009).

2.4 **Vigna unguiculata** – ***Cowpea***

The number of *Vigna unguiculata* remains found was rather few, although this was expected to have been the primary pulse crop in this region. Indeed only 21 seeds, less than 1% of the total assemblage, were recovered in the *Crossroads of Empires* assemblage. Due to its morphological characteristics the cowpea seed is very easily identified. Indeed, the seed is flat and sub-rectangular in shape. Also the hilum is ovate and generally placed asymmetrically on the hilum edge (Fuller 2003; Fuller & Harvey 2006). As this is free-threshing pulse (see Fuller & Harvey 2006), it is likely that processing took place shortly after harvest and may have been offsite, leading to less opportunity for preservation. In addition, cooking by boiling will also reduce the likelihood of specimens being preserved in a recognisable form by charring.

Often called '*Niébé*', cowpea is one of the most important pulse crops of the savanna area in West and Central Africa, and is also present in eastern and southern regions. It is also a major pulse crop in India and South Asia (Fuller & Harvey 2006). Cowpea can be prepared in many ways, including frying and boiling. Its leaves and pods are excellent fodder for livestock. In terms of agricultural practices, cowpea grows very fast and can be intercropped with pearl millet and sorghum, which may aid soil fertility (D'Andrea et al. 2007). Linguistic evidence and genetic data tend to suggest that cowpea was domesticated in the West African grassy woodlands, possibly around Ghana where the earliest finds occur, in the Kintampo culture (second millennium BC) (D'Andrea & Casey 2002; Fuller 2003; D'Andrea et al. 2007; Fuller & Hildebrand 2013).

2.5 Gossypium sp. – *Cotton*

Cotton, *Gossypium sp.*, was found at four sites and represented only 0.67% of the assemblage (53 seeds, seeds fragments or caps). Cotton seeds are diagnostic being obovate and asymmetrically depressed on their long sides, and have a small, squarish, woody protuberance at the narrow end, with a woody/fibrous beak also at the narrow end (Figure 23.4C), and often preserving fragments of bases of charred fibres. Although seeds often fragment during or after charring, one structure on the inside of the seed coat at the hilum end appears to survive well and to be diagnostic (Figure 23.4F): this is referred to as the funicular cap (e.g. Fuller 2008b, Figure 1F; Crowther et al. 2014, Figure 13d). However, identification beyond the genus level remains an unsolved challenge, i.e. whether this represents *G. arboreum* or *G. herbaceum*, or even one of the two new world cottons that were brought to the Old World by the Spanish and Portuguese (*G. hirsutum, G. barbadense*) (see Wendell 1995). *Gossypium arboreum* L. was probably domesticated in Pakistan/northeast India where there is evidence that cotton commercialisation has been established since the 3rd millennium BC (Fuller 2008b). For its part, *Gossypium herbaceum* L. seems to have been domesticated in Africa. The earlier evidence of cotton in Africa comes from Nubia and southern Egypt during the Roman/Meroitic era (Clapham & Rowley-Conwy 2007, 2009), and at least some samples from Nubia have been proven to be *G. herbaceum* based on ancient DNA (Palmer et al. 2012). In West Africa, finds of cotton come from the early Islamic period along the Niger River (Fuller 2000, Murray 2007b) and in the Saharan settlement of Essouk (Nixon et al. 2011). At the site of Sorotomo, upstream of the Inner Niger Delta and dated to AD 1200–1500, *Gossypium* is an important plant represented in the assemblage (c. 7%) Currently under study by the authors.

Historical sources suggest that clothing and the use of cloth, presumably much of it cotton, became important with the Islamisation of western Africa, and in the urban centres of the Islamic era (Kriger 2005; Candotti 2010):

> "Wearing clothes became an indication of the conversion to Islam and belonging to the Islamic *umma* (community)."
>
> CANDOTTI 2010, p. 189

This fits the archaeobotanical evidence for cotton from all Islamic era urban centres where archaeobotanical sampling has been undertaken (see Nixon et al. 2011, Table 3), i.e. from about AD 1000 onwards. The extent to which cotton was cultivated anywhere in western Africa prior to this is unclear (see Kriger 2005). Sets of loan words in several language groups suggest borrowing from Arabic speakers (Kriger 2005), while early finds of clay spindle whorls suggest two zones for the development of textile production, one northeast of Lake Chad from the eighth century AD and the other in the middle and upper Niger valley from the tenth century (Kriger 2005, Figure 1). In this regard it is surprising that evidence for cotton occurs so late in the Dendi region, although cotton was presumably widely traded, and from the thirteenth century was associated with Wangara traders who imported eastwards into Hausaland (Candotti 2010). In the Dendi area during the 1960s the French introduced a new cotton variety; prior to that, the population cultivated 'indigenous cotton' (Van Driel 2001). The presence of cotton and African rice fields is documented by the Portuguese on their arrival on the African coast in the fifteenth century. In 1446 the chronicler Gomes Eanes de Azurara states, 'They found the country covered by vast crops, with many cotton trees and large fields planted with rice …' (Linares 2002: 16360). In terms of textile production, the use of cotton is important in the Dendi area today (Smolderen, this volume).

2.6 Adansonia digitata – *Baobab*

Baobab is represented in the material by 137 seeds, seed coats and fragments (c. 2% of the assemblage). The complete seed is very distinctive as it is lunate (crescent-shaped) with a circular cross-section. Most often archaeological remains are fragments (Figure 23.4E). The seed coat has a double layer of palisade cells; on the exterior surface the hilum has a protruding pappus ringed by elongated cells arranged radially (Figure 23.4D).

Baobab trees are native to Africa, and recent genetic work suggests that they originated in western Africa (Pock Tsy et al. 2009). It is therefore inferred that baobab were dispersed to eastern Africa with agro-pastoralists, and in that region archaeological baobab is widely associated with middle Iron Age sites in regions of the Eastern Bantu and near-shore islands (Boivin et al. 2013; Crowther et al. 2014). The seeds and fruits are edible and when dried can be readily transported; they may have provided a key food for mobile pastoralists. At the same time the distinctive and long-lived tree is widely associated with permanent human occupations in the African savannas (Wickens 1982; Baum 1995; Blench 2007). Early evidence for it comes from numerous finds, especially in wood charcoal, from the Neolithic and Iron Age in Burkina Faso (Kahlheber & Neumann 2007).

2.7 Elaeis guineensis & Canarium schweinfurthii – *Oil Palm & Incense Tree*

The incense tree, *Canarium schweinfurthii*, (Figure 23.4 G, H) and oil palm, *Elaeis guineensis*, have the same principal uses and their fruits can be very similar (D'Andrea et al. 2006). D'Andrea et al. (2006) provide identification

TABLE 23.3 Identification criteria for fruits from *Canarium schweinfurthii* and *Elais guineensis*. Reproduced from D'Andrea et al. 2006: 205

Feature	E .guineensis	C. schweinfurthii
Exterior surface of endocarp	Striated	Smooth
Interior surface of endocarp	Clear network of vein-like reticulation	Smooth, with clear cell structure at high magnification
Endocarp cross section	Dense, sporadic pores, rarely layered	Dense, with linear layers sometimes present in endocarp
Shape of nut	Bulbous, irregular	Sharply angular, elongated
Thickness	Variable, usually 1.4–3.7 mm	Variable, usually 1.2–4.3 mm
Other	Germ pores (2-3)	None

criteria (Table 23.3). There are several varieties of oil palm. The main one is *E. guineensis* var. *communis*, which has five main fruit forms. Oil palms are grown in the secondary forest region between the deciduous forest and the savanna. There are no diagnostic morphological criteria for domestication (D'Andrea et al. 2006). The oil palm is indigenous to West Africa. In cooking, oil palm is used for its oleaginous fruit but most of the tree can be used for other purposes, such as construction. The kernel and the mesocarp oil are the primary food product. The oil palm sap can also be tapped as a sweet base for alcoholic drinks, i.e. a kind of palm wine (D'Andrea et al. 2006), but distinct from the *Raphia* palm wines also available throughout Central Africa.

2.8 *Undetermined Seeds and Nuts*

Due to the absence of reference material for Africa, a significant part of the plant remains have not yet been fully identified, representing 17% of the assemblage of seeds or fragments, and a further 7% for nutshell fragments. Further work on identification of wild seeds, including likely field weeds, as well as edible fruits/nuts, is ongoing.

3 Changes through Time

The 83 samples discussed here have provided plant macro-remains from 13 sites dating from the mid-first millennium AD to the early second millennium AD, and two sites dating from the mid-first millennium BC. As reported elsewhere in this volume, the sites studied by the *Crossroads* team overall can be attributed to five phases, supported by material cultural and radiocarbon dating evidence. Patterns in the archaeobotanical evidence are summarised in relation to these periods in Figure 23.5.

3.1 *Phase 1: First Millennium BC*

During this period, the climate was turning drier and more arid (Ballouche & Neumann 1995; Mayor et al. 2005). Period 1 is represented by test pits at the Alibori 2 (ALB 2) and Kozungu (KOZ) sites. In total, six archaeobotanical samples were collected (five from Alibori 2, Trench 3, and one from Kozungu, Trench 11).

These samples included evidence of pearl millet, sorghum and cowpea, which are characteristic of traditional agricultural systems of the grass savanna bio-climatic area (Harris 1976). However, these three plants represented only a small amount of all the plant remains. Indeed, more than 60% are currently undetermined seeds and seed fragments, most of which appear to be wild taxa. Most of these are small seeded taxa (smaller than 1mm); the majority appear to be various small-seeded grasses, which have not yet been comprehensively studied.

3.2 *Phase 2: From cal AD 1 to 500*

It is difficult to figure out what happened during the last part of Phase 1 and the beginning of Phase 2. To date, only the site of Gorouberi has yielded dates from this interphase period. This interphase is characterised by a very dry, unstable climate (Mayor et al. 2005), and it has been identified as a period of abandonment in Burkina Faso (Breunig & Neumann 2002; Höhn & Neumann 2012). Nevertheless, this period corresponds to the emergence of large, subsequently urban sites in the Inner Niger Delta, for example at Jenné-jeno and Dia, both in Mali, and both of which provide evidence of African rice (*Oryza glaberrima*) (McIntosh 1995; Gallagher 2011; Gallagher & McIntosh 2015).

For this second phase, the six archaeobotanical samples came from the initial occupation of Birnin Lafiya (Trenches 4 and 11). Currently these pits provide the earliest evidence of African rice in northern Benin. Looking at Figure 23.5, African rice clearly dominated the plant assemblage (more than 60%). This suggests that the

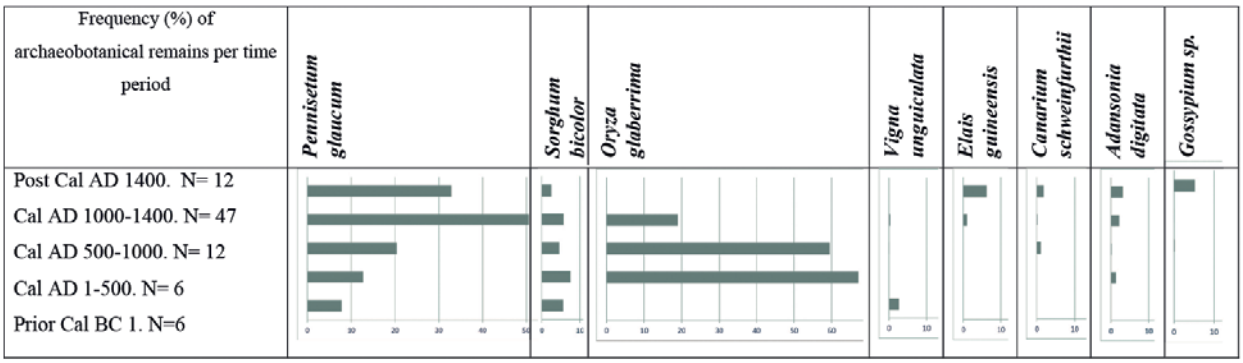

FIGURE 23.5 Patterns in the occupation of sites with archaeobotanical evidence in Dendi

extensive occupation represented by Birnin Lafiya was supported by highly productive African rice, grown in wet alluvial contexts, together with dryland cultivation of pearl millet (less than 20% of seeds) and sorghum (around 5% relative frequency). Baobab consumption is also evidenced.

3.3 *Phase 3: From cal AD 500 to 1000*

Phases 2 and 3 are the two initial periods of the development of Birnin Lafiya. During Phase 3, rainfall and overall humidity likely increased, reaching maximum humidity around 900 AD (Mayor et al. 2005). Material from this period came from 12 samples, selected in the lower contexts of Trenches 8, 9, 11 and 13. These probably represent the second development phase of the settlement of this site. The same archaeobotanical patterns were observed as in the initial phase of development (Phase 2 in Birnin Lafiya), together with the beginning of *Canarium* consumption (Figure 23.5).

It is worth noting the relative productivity of the staple crops under traditional cultivation. Irvine (1969) reports that traditional rain-fed west African pearl millet yields from 270–900 kg/ha, with an average of perhaps 450 kg/ha (Acland 1971), whereas irrigated *O. glaberrima* can yield 1000–3000 kg/ha (Borlaug et al. 1996). Rainfall in the region today averages 600–800mm, and is unlikely to have been very much over 800mm on average, which is taken to be the absolute minimum for any rainfed rice (e.g. Jacquot & Courtois 1987). Therefore most, if not all, rice in this area would have been grown on the floodplain, some perhaps in well-watered shallow pools and some under décrue cultivation (see Harlan & Pasquereau 1969), in contrast to the high rainfall areas of Guinea, for example. Sorghum might also have been grown on the margins of décrue, with drier areas focused on rainfed pearl millet. Rainfed sorghum can be expected to produce at least 550–1000 kg/ha but up to 1700 kg/ha has been reported from some traditional cultivation (Irvine 1969; Acland 1971).

3.4 *Phase 4: From cal AD 1000 to 1400*

Sites from the fourth period form the main assemblage of this study in terms of the number of samples (n = 47). The Dendi area during Phase 4 seems to have been more densely occupied than in previous periods. Birnin Lafiya seems to reach an intensive occupation (Haour et al. 2016) and other sites such as Pekinga, Tin Tin Kanza, Kantoro and Madekali thrive during this period. With the exception of Pekinga, all those sites showed evidence of a smaller proportion of African rice (c. 20%) than during Phase 2. The pearl millet frequency is c. 50%. For the first time in this region, a very small proportion of oil palm was also present (1%) and there were also remains of Baobab (2%) (Figure 23.5). A few specimens of possible fonio (*Digitaria* cf. *exilis*) and *Brachiaria sp*. also came from this period. At Jenné-jeno *Brachiaria*, identified as *B. ramosa*, and smaller quantities of fonio (*Digitaria exilis*) were prominent parts of the urban agricultural produce, alongside African rice, sorghum and pearl millet (McIntosh 1995). This has been suggested to indicate urban populations that remained agricultural and were supported without intensification (Gallagher & McIntosh 2015). However, rice would probably require more labour on average than millet or fonio. Rather, these small millets may have played a role in buffering risk by being more tolerant of poor soil and unpredictable rainfall conditions.

The end of Phase 4 was marked by a progressive decline in the quantity of rice found. In the Kantoro stratigraphy (KRO Trench 2), for example, rice was only found in the lower contexts. The last occupation of Birnin Lafiya, i.e. the excavated house compound Trench 10, also produced no rice remains. Thus throughout the sites, evidence of rice consumption sees a progressive decline in the late first millennium AD, before disappearing. It could be that declining populations meant that less labour was available for tending and harvesting the rice, making the crop less viable than the more efficient millet, but equally one must

consider whether environmental changes in flood heights, for example, might have forced a decline in rice production. In either case the decline in many settlements, and particularly in the site of Birnin Lafiya, at the end of the period (the fourteenth century) appears to correlate with the decline in rice cultivation.

In summary, the plant assemblage is clearly dominated by pearl millet, with minor sorghum, but African rice is also a major component of the food crops at the transition between the first and second millennia AD, after which agriculture turned away from rice.

3.5 *Phase 5: Post cal AD 1400*

The last period differs from the others. Although pearl millet still dominated cereals in the food package of this period, utilisation of tree plants such as baobab and oil palm increases. It is clear that the oil palm tree and the *Canarium* do not grow naturally in the Sahelian area but rather belong to the rainforest complex. Moreover, cotton is visible for the first time in the assemblage. This abrupt appearance illustrates a great change in plant utilisation in the valley. This raises the question of how to explain the higher presence of oleaginous nuts and cotton, which may well have been cultivated for craft and trade more than for food.

We suggest that this represents an increasing importance in crop trade, both in terms of food grains and cash crops. Further north, on the Saharan fringes, this was evident somewhat earlier during the high medieval period of Islamisation. For example, this was already evident before the end of the first millennium AD at Essouk in northeastern Mali, with evidence of cotton and imported wheat and sorghum (Nixon et al. 2011), as well as wheat and cotton from Dia in the Inland Niger Delta (Murray 2007b). Perhaps after AD 1400 such trade became more important in the Dendi region, with imported food grains less likely to end up charred and preserved archaeologically than locally grown and routinely processed crops. This would be true especially of imported free-threshing sorghum or pearl millet as food grains. Meanwhile the cultivation and processing of cotton for the export of textiles would leave a presence of seed remains archaeologically and take arable land away from food production. With increased trade greater volumes of oleaginous nuts could be imported from the more forested regions to the south.

Another factor related to trade is the likely increased impact of the growing slave trade, which would have provided both a ready source of imported grain to the wealthy and a depletion of local agricultural labour. As discussed by Gosselain & Haour (this volume), it is possible that Dendi was linked into this transatlantic commerce. The Dendi area, as other regions of Benin, may have been a slave reserve. If this is so then a reduction of local agricultural production and population can be expected during the fifteenth century, as trade between the Sahel and savanna declined in relation to trade with the Atlantic coast.

It is surprising that there is no evidence for rice production in this period. Indeed the Tarikh al-fattash, which describes the Songhai empire during the sixteenth century, mentions rice in the Dendi area. Dendi, bordering the empire, had to produce one thousand *sounnou* of rice by year (approximately 250 litres) for the empire (Gallais 1967; Houdas 1913). It is perhaps the case that what rice was produced was largely for export to the north, as rice in the husk, meaning that there was little local consumption and therefore little local dehusking, leaving no archaeobotanical local evidence.

4 Conclusions

The sequence at Birnin Lafiya is dominated by cereals, including rainfed savanna cultivation of pearl millet and perhaps sorghum, and floodplain décrue cultivation based on seasonal river flooding, especially for rice and perhaps also sorghum. In Birnin Lafiya, there was evidence of a shift in frequency of rice and pearl millet, with early pearl millet dominance giving way to rice dominance in the first millennium AD. After AD 900, the rice proportion decreased from 60% to 20%, and millet proportion increased from 20% to 50%. The extent to which this reflects social changes or a response to climatic conditions needs targeted investigation.

It can be assumed that the earliest settlers arrived with a package of three domesticated cereals (rice, pearl millet and sorghum). As suggested by Susan McIntosh (1995) for Jenné-jeno, the settlers arrived in the area from a similar ecological area with floodplain basin rice cultivation and more distal cultivation of millet and sorghum. The source for the Dendi area settlers in Phase 2, with the founding of Birnin Lafiya, could have been upstream on the Niger river. As hypothesised by Portères (1949) and Gallais (1967), the first rice cultivators of the Inland Niger Delta were presumably related to the Nono, a group of people speaking a Mande language. We suggest that the first inhabitants of Birnin Lafiya may have been associated with the ancestors of today's Tyenga ethnic group, also Mande speakers. These Mande speakers would have come from Mali and expanded down the Niger River early in the first millennium AD. In this period agriculture became more diverse, with a greater range of crops and varieties within crops (such as race *bicolor* and race *guinea* sorghum), and

probably expanded into more land, increasing productivity and supporting increased population and density.

During the second millennium AD a shift takes place in the composition of the charred plant assemblages. First rice declined after the tenth century AD, then the dryland cereals, sorghum and pearl millet, became increasingly scarce, while oil palm, *Canarium* and baobab increased as cotton was adopted. This suggests a major reorientation of agriculture (e.g. cotton as a cash crop) and the rise of trade (e.g. in oleaginous nuts). These shifts, perhaps linked to increasing market trade and the slave trade, are likely to have undermined local agricultural production for subsistence.

In this regard it is worth noting that until AD 1400, the crops for which there is evidence are all African (as also noted at Jenné-jeno by McIntosh 1995). This is in stark contrast with the situation today, when Asian rice and New World crops like peanuts, chilli, maize and tomatoes are prominent. This tends to suggest that population growth, sedentism and urbanism could all emerge from a mixed agricultural economy based by and large on native taxa (although sorghum had probably been introduced from the eastern savannas of Sudan). Thus, a very profound change to agricultural production took place during the past 500 years, through both labour depletion and new crop adoptions.

Acknowledgments

Aspects of this research have been supported by the ERC ComPAg grant to Dorian Fuller (ERC Grant Agreement 323842).

CHAPTER 24

Wood Charcoal

Barbara Eichhorn

1 Introduction

Wood charcoal analysis (anthracology) on a restricted number of samples from the *Crossroads of Empires* project sites was conducted to obtain an insight into Iron Age wood use and into vegetation composition in the vicinity of the sites currently situated in the Sudanian phytogeographical zone of northern Benin. Wood charcoal analysis is a useful method for the reconstruction of past woody vegetation and human wood exploitation. Recent studies centred in West Africa have helped to decipher the Holocene and particularly the Iron Age development of vegetation under the influence of changing climate, land-use and the exploitation of wood, e.g., for iron metallurgy and construction (e.g., Neumann et al. 1998; Höhn 2005; Höhn 2011; Höhn & Neumann 2012; Eichhorn 2012; Eichhorn et al. 2013 a, b; Eichhorn & Neumann 2013; Huysecom et al. 2015). In contrast to palynological studies which generally reflect regional vegetation, anthracological studies yield information on local environments and their changes in the vicinity of a site.

Distinct changes of woody vegetation in the course of the Iron Age related to human land use have been reconstructed for the Sahel of northern Burkina Faso. Around 2000 bp, the formation of large settlement mounds by sedentary populations was accompanied by the establishment of shifting cultivation with fields and fallows. Cultivation was practiced in park savannas an agroforestry system with protected wild fruit trees in the fields. Whereas, during the first millennium AD extensive cultivation with long fallows prevailed, fallow periods became shorter after the onset of the second millennium AD. Contemporaneously, the influence of cattle herding on the vegetation increased. In concert with decreasing precipitation, anthropogenic pressure finally caused the lower species diversity of the modern woody vegetation (Höhn & Neumann 2012). In the Seno plain near the Dogon Plateau in Mali, close to the transition of the Sahelian and Sudanian phytogeographic zones, the trend of Iron Age vegetation development was similar in many points. However, a general shift to shortened fallow periods due to strong agricultural intensification was not evident here (Huysecom et al. 2015). Intensive iron metallurgy at the western margin of the Dogon Plateau operated close to the ecological threshold in the course of the second millennium AD, likely to have caused part of the vegetation changes evident from the charcoal sequences retrieved from slag mounds (Eichhorn 2012; Eichhorn et al. 2013 a, b; Eichhorn & Neumann 2013). Though the establishment of agroforestry parks together with agricultural intensification and diversification in course of the Iron Age (e.g., Kahlheber & Neumann 2007; Kay & Kaplan 2015) are more than just local to regional phenomena, their detailed chronology and extent remain to be deciphered for many West African regions to eventually understand the supra-regional consequences for vegetation history.

The anthracological studies within the frame of the *Crossroads of Empires* project have aimed to supplement our knowledge of Iron Age woody vegetation development in the Sudanian zone, and of wood use in a region especially favourable for human settlement and the exploitation of aquatic resources, due to its situation close to the Niger River (see Linseele & Wouters, this volume; Champion & Fuller, this volume, concerning freshwater animal and rice exploitation respectively). This favourable situation attracting people may, on the one hand, imply strong human impact on the vegetation surrounding the settlement sites. On the other hand, the woody vegetation of the area belonging to the Sudanian phytogeographic zone (Wezel et al., retrieved July 2015) should display higher resilience to anthropogenic pressure, as well as climate change, than the Sahelian sites investigated in most of the aforementioned anthracological studies. This is due to the higher rainfall rates allowing for higher woody biomass reproduction. Wood biomass reproduction in West African savannas and woodlands increases proportionally to annual precipitation (Clément 1982). Furthermore, gallery forest vegetation of the Niger and its tributaries, with their high regenerative capacity due to year-round water availability, may in the past have provided an important source of wood for different purposes.

The analysed wood charcoal samples were retrieved from five Iron Age settlement sites in the vicinity of the Niger River excavated in the course of the *Crossroads of Empires* project (Birnin Lafiya (BLAF), Gorouberi-13 (GOB), Kompa Dune (KOD), Kompa Moussekoubou (KM) and Tin Tin Kanza (TTK); see Map 6). Details concerning the sites and the attribution of phases to radiocarbon dates

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in this paper follow the five-phase scheme outlined in Haour et al., Chapter 11, this volume.

The samples from trenches 3 and 10 at Birnin Lafiya are of special interest as they yield an instantaneous image of a building at the moment of its destruction, thus giving insight into the woody taxa used for construction during the eleventh to thirteenth centuries AD.

2 Material and Methods

Most of the charcoal samples were hand-sampled during excavation, with only a minority retrieved through dry sieving at Birnin Lafiya. Sample sizes and numbers per site are strongly heterogeneous making the attempt of a diachronic analysis worthwhile only at Birnin Lafiya, where archaeological Phases 2–3 to 4 are represented in the anthracological assemblage. We know little about the taphonomy of the individual charcoal samples at Birnin Lafiya and have to bear in mind that, in addition to wood intentionally collected to be burnt in hearth fires, wood which was initially brought into the settlement for other purposes (fodder, used furniture and household items, replaced roof beams, etc.) may have been burnt in a second step and entered the archaeobotanical assemblage.

Prior to analysis, all available charcoal fragments ≥2.5mm were split into the three diagnostic planes – transverse, tangential and radial – and studied with a Leica Laborlux S incident light microscope (range of magnifications: 62.5 × to 625 ×).

Identification followed the IAWA standards (IAWA Committee 1989) consulting the Inside Wood internet database (Inside wood 2004 onwards) and using the reference collection of modern African woods in the Frankfurt Archaeological Institute at Goethe University, wood anatomical atlases, as well as anthracological catalogues (Neumann et al. 2001; Eichhorn 2002; Höhn 2005).

Similar to Ekblom et al. (2014), a type concept for identification was used, according to which a type represents either a morphological or, in the case of wood charcoal, an anatomical category, distinguished from other types either by one typical character or a significant combination of characters.

A type may thus include a single or, more often, a number of species (see Punt et al. 2003). In the case of charcoal analysis, this attribution to types is necessary as, in most cases, wood anatomy does not allow for an unambiguous species determination, but several taxa with similar wood anatomical structure have to be grouped together (Ekblom et al. 2014; Höhn & Neumann 2018). The attribution to existing woody taxa and interpretation should follow in subsequent steps (Höhn & Neumann 2018).

3 Results

3.1 *Birnin Lafiya*

At Birnin Lafiya, the majority of charcoal samples stem from Trenches 9, 10 and 11, whereas from Trenches 3 and 8 samples were much fewer.

Charcoal from Trenches 3 and 10 is correlated with the destruction of a building during Phase 4, and therefore dealt with separately below. The samples from the other trenches were, whenever possible, grouped together according to occupation phases in order to allow for a diachronic interpretation (Phase 2–3 to 4, Figure 24.1). During all phases, the assemblage is dominated by the anatomical type Sapotaceae/*Vitellaria paradoxa*. This type most probably represents the shea butter tree *Vitellaria paradoxa*, a highly valued tree yielding oleaginous fruits protected in agroforestry parks. The type *Vitex* spp. also represents useful fruit trees and is present in all occupation phases. Taxa indicative of fallows are barely represented in the charcoal assemblage of Birnin Lafiya. Likely candidates are only the types *Terminalia* spp., and Rubiaceae, whereas typical indicators of short fallow periods (taxa able to re-sprout and regenerate quickly after felling) such as *Combretum* spp., or *Guiera senegalensis* are absent. The type *Anogeissus leiocarpa* represents a single species mainly occurring in vegetation types with little anthropogenic influence (savannas, old fallows, dry forests). The type Meliaceae at Birnin Lafiya most probably represents *Khaya senegalensis*, typical for Sudanian and Guinean savannas and for watercourses in the southern Sahel (Neumann et al. 2001; Arbonnier 2002). Other taxa are represented in small proportions only.

The wood charcoal assemblage of trenches 3 and 10 (Figure 24.2), made up mainly of burnt construction material from the destruction of a house during Phase 4, is dominated by two types, Sapotaceae/*Vitellaria paradoxa* type and *Anogeissus leiocarpa*. Rubiaceae and *Pterocarpus* (probably all *Pterocarpus erinaceus*) are a regular occurrence whereas other taxa occur in minor proportions only.

3.2 *Gorouberi*

The site of Gorouberi-13 yielded a small but diverse charcoal assemblage (Table 24.1). In addition to taxa which were also frequently observed at Birnin Lafiya, the types *Combretum* type *micranthum, Prosopis africana* and Chrysobalanaceae (probably representing the species *Parinari curatellifolia*) were identified. The latter is only

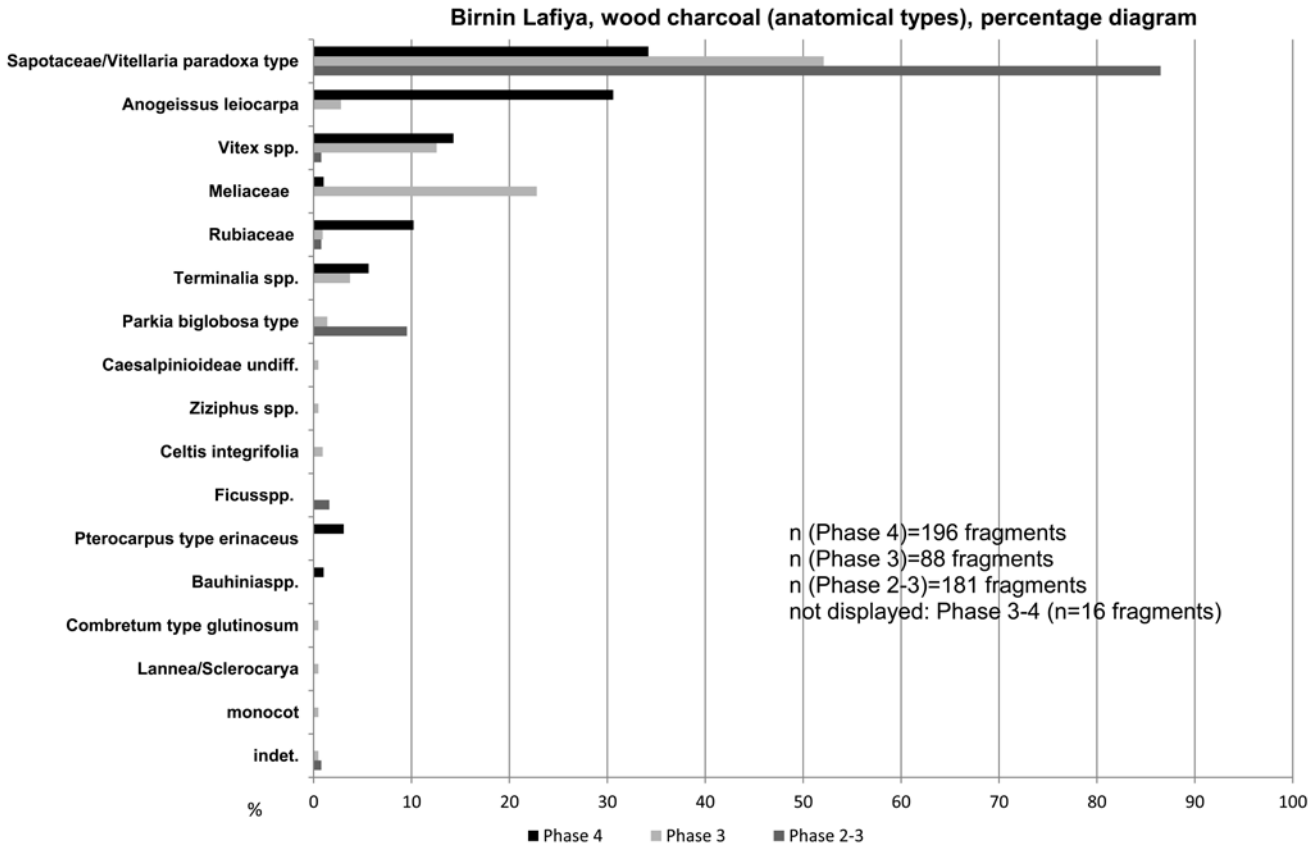

FIGURE 24.1 Wood charcoal at Birnin Lafiya, attribution to phases (trenches 3 and 10 excluded), percentage diagram

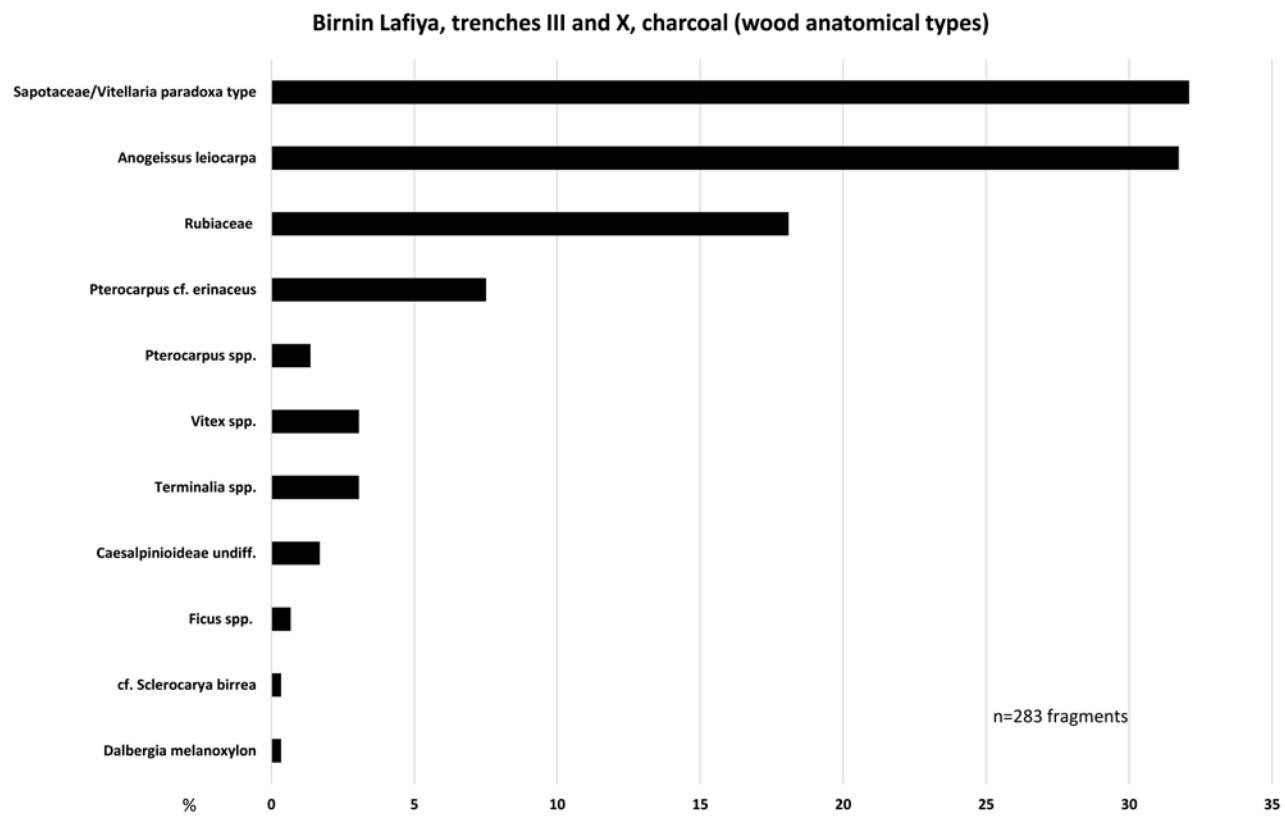

FIGURE 24.2 Wood charcoal at Birnin Lafiya, trenches 3 and 10, percentage diagram

present in a single sample of the early occupation phase at Gorouberi (Phase 2) and absent from all other sites.

3.3 *Kompa Dune and Kompa Moussekoubou*

Only a few wood charcoal fragments were available from these sites (Table 24.1). At Kompa Dune, the small assemblage is mainly made up of different members of the Combretaceae (types *Guiera senegalensis, Combretum* type *micranthum*) and Fabaceae families (type Caesalpinioideae undifferentiated). Charcoal of Sapotaceae/*Vitellaria paradoxa* type is associated with the furnace at Kompa Moussekoubou.

3.4 *Tin Tin Kanza*

Considering the small sample size, the assemblage at the site Tin Tin Kanza is rather diverse (Table 24.1). In addition to taxa also observed at Birnin Lafiya, different *Combretum* species are represented, as well as *Prosopis africana* and *Cola* spp. The most remarkable find is that of Sapotaceae/*Mimusops* type which is not represented at the other sites.

4 Interpretation

4.1 *Ecological Interpretation*

In general, the woody species composition of all sites reflects typical Sudanian vegetation. However, with the exception of Tin Tin Kanza, there is a strong bias towards a few dominant taxa, particularly Sapotaceae/*Vitellaria paradoxa* type and *Anogeissus leiocarpa*.

The wood charcoal fragments identified as Sapotaceae/*Vitellaria paradoxa* type most probably represent a single species, the shea butter tree (*Vitellaria paradoxa*). Although other Sapotaceae tree species display a rather similar wood anatomy, the combination of parenchyma distribution, ubiquity of calcium oxalate crystals and absence of silica particles point to *Vitellaria paradoxa*. It is the only Sapotaceae species occurring as far north as the southern Sahel (Neumann et al. 2001; Höhn 2005). Phytogeographically, the research area belongs to the Sudanian zone (Wezel et al. retrieved July 2015). In northern Benin, the Niger River Valley and gallery forests of other watercourses in particular may have hosted further

TABLE 24.1 Wood charcoal at Tin Tin Kanza, Gorouberi, Kompa Dune and Kompa Moussekoubou (furnace), absolute numbers

Charcoal (wood anatomical type), absolute numbers	Tin Tin Kanza	Gorouberi	Kompa Dune	Kompa Moussekoubou furnace
Sapotaceae/*Vitellaria paradoxa* type	23	16		7
Anogeissus leiocarpa	28			
Mimosoideae/Caesalpinioideae*, **, ***	23	4	3	
Cola spp.	19			
Sapotaceae/*Mimusops* type	8			
Guiera senegalensis	8		1	
Combretum type *glutinosum*	6			
Combretum type *nigricans/molle*	5			
Combretum type collinum	4			
Combretum type micranthum	2	1	1	
Terminalia spp.	5	2		
Meliaceae	5	2		
Rubiaceae	5	1		
Vitex spp.	2			
Chrysobalanaceae		1		
Pterocarpus cf. erinaceus		1		
cf. *Celtis integrifolia*			1	
monocot.	2			
indet.	1			
sum	**146**	**29**	**6**	**7**

* Tin Tin Kanza: *Detarium* spp., *Prosopis africana* type, *Acacia* type, *Bauhinia* spp. and Caesalpinioideae undiff.

** Gorouberi *Prosopis africana* type, Caesalpinioideae undiff.

*** Kompa Dune: *Faidherbia albida* and Caesalpinioideae undiff.

Sapotaceae species as indeed indicated at Tin Tin Kanza by the presence of Sapotaceae charcoal with abundant silica bodies (Sapotaceae/*Mimusops* type; see Ekblom et al. 2014).

In Benin, shea butter trees are distributed from Atchérigbé (7'52"N and 2'03"W) to Malanville (11'52"N and 3'23"W) (Gbedji 2003, cited in Kakai et al. 2011). They require 600–1400 mm annual precipitation (Orwa et al. 2009). At Birnin Lafiya, the species has been encountered during a survey of the current woody flora of the site (N'Dah et al. Chapter 12 this volume). *Vitellaria paradoxa* is highly esteemed for its fruits used for the production of shea butter and thus is normally left standing when other trees are felled during the preparation of fields. Together with other useful trees or in almost pure stands, it is an important constituent of Sudanian agroforestry parklands (e.g., Pélissier 1980; Boffa 1999; Kahlheber 2004: 204–206; Schreckenberg 2004; Höhn & Neumann 2012). Shea butter tree wood is hard and valuable, and yields house posts or household utensils. It also furnishes high quality firewood. As the trees are so valuable, they are seldomly cut for fuel (Orwa et al. 2009). Nevertheless, as dead wood is normally used from all tree species for firewood, it may enter an archaeobotanical assemblage. In fact, *Vitellaria paradoxa* is one of the most important firewoods in southeastern Burkina Faso (Gallagher 2010: Table 3.5). Old shea butter trees that no longer bear enough fruit may also be cut, e.g., for house posts, as evidenced in medieval Oursi hu-beero in the Sahel of Burkina Faso (Höhn 2011).

The regular occurrence and high proportions of Sapotaceae/*Vitellaria paradoxa* type charcoal at Birnin Lafiya and most of the other investigated sites points to the presence of agroforestry parklands with protected shea butter trees in fields and possibly fallows close to the sites during the period of occupation. In fact, the Dendi area fruit and seed assemblages (Champion and Fuller, this volume) indicate pearl millet and sorghum cultivation during all settlement phases. These predominantly rainfed crops are cultivated in addition to floodplain rice. Rice is particularly important during settlement Phases 2 and 3. In Phase 4 the assemblage of domesticated plants is supplemented by cotton, whereas rice cultivation seems to have progressively declined. Shea butter macro-remains have so far not been identified in the Dendi area seed and fruit assemblages. This might be due to either the state of the still ongoing macro-remain analysis, the lack of reference material, or to poor preservation of the macro-remains. Kahlheber (2004: 204–206) describes the difficulties of securely attributing small testa fragments to *Vitellaria paradoxa* and points out that shea butter finds are probably under-represented in many West African sites because of high seed fragmentation or unsuitable sampling. Shea butter tree macro-remains were identified in the charred fruits and seed assemblage of the Iron Age site Yohongou in northern Benin (Petit et al. 2001: Figure 4; Gallagher et al. 2016: Figure 1) and Kahlheber (2004: 206) highlights that there is no reason to assume that this now intensively used species is absent from ecologically similar sites of similar age. All archaeobotanical shea butter testae finds documented so far were recently listed by Gallagher et al. (2016: Table 1). However, concerning the Dendi area, the assumption that shea butter trees were considered as valuable because of their oleaginous fruits and therefore promoted in agroforestry parks is thus far mainly based on the high representation of Sapotaceae/*Vitellaria* type in the wood charcoal assemblages. For Yohongou, the dominance of shea butter tree wood charcoal and the presence of a number of other taxa were tentatively related to the selection of high-quality firewood (Petit et al. 2001). A high number of anthropogenic and taphonomic factors affect the formation of archaeological charcoal assemblages (summarised in Théry-Parisot et al. 2010). According to the 'principle of least effort' applied to firewood collection, availability and accessibility play a primary role in the formation of archaeological wood charcoal assemblages. Therefore, they generally mirror the surrounding woody flora and vegetation, particularly in periods after the initial occupation of an area (Shackleton & Prins 1992).

Other useful fruit trees represented by *Vitex* spp., *Ficus* spp., *Ziziphus* spp., and *Parkia biglobosa* type (representing the néré tree) were also identified in the charcoal assemblage of Birnin Lafiya. It is likely that they were spared from felling when preparing the fields and subsequently became constituents of agroforestry parks. This supports the hypothesis of the transformation of savannas and woodlands to park savannas. Future studies, including detailed wood charcoal analysis for the early Dendi area settlement in Phase 1, when cultivation of domesticated plants was seemingly less and collecting of wild plants more important (Champion & Fuller, this volume), might be helpful to shed further light on this assumed transformation to shea butter tree dominated agroforestry parklands.

Indicators of young fallows (see Höhn & Neumann 2012) are seemingly absent at Birnin Lafiya, which may point to either predominantly long fallow cycles or to areas characterised by permanent cultivation, with shea butter trees spared from felling and left protected in the field. In addition to being useful because of their oleaginous fruits, the trees may help maintain the fertility of the soils (Traoré et al. 2004) and yields are higher than in fields without trees if density is not too high. With the exception of the shea butter tree itself, possible indicator species for long fallow cycles are also relatively rare at this site (*Terminalia* spp., Rubiaceae, *Pterocarpus* cf.

erinaceus). Therefore, permanent cultivation, at least in the vicinity of the site, is likely.

Potential gallery forest taxa such as *Khaya* spp., *Celtis integrifolia* and riverine Sapotaceae species (included in the Sapotaceae/*Mimusops* type) point to the exploitation of riverside vegetation. This might also be the case for the represented Rubiaceae, though attribution to species is not possible in this case, hindering an unequivocal attribution to a certain vegetation type. According to historical sources, vegetation along the Niger River, which nowadays is characterised by denuded hills and marshy areas, was much denser in the past (Gosselain 2016b; Jourand 2013: 62). *Anogeissus leiocarpa* has a wide ecological range and is able to withstand seasonal inundation but generally indicates vegetation patches with restricted anthropogenic impact such as savannas, dry forests and gallery forests (Arbonnier 2002: 253). These were obviously present in the vicinity of the site, consistent with historical reports indicating that most intensive agriculture of cash crops, with the clearing of formerly still wooded areas is recent in Dendi (Gosselain 2016b). It is remarkable that this taxon is not represented in the samples attributed to the transition of Phases 2–3. This might be a hint that during this period wood collecting in remote areas, particularly in gallery forest, was still restricted, a supposition which is also supported by the absence of Meliaceae and *Celtis* wood charcoal. For Gorouberi, a similar interpretation is reasonable, though the assemblage is small. The presence of the type *Prosopis africana* points to sites with little human influence. This tree is sometimes spared from cutting when preparing fields due to its use as extraordinarily high quality fuel e.g., for iron metallurgy. Remarkable is the presence of Chrysobalanaceae wood charcoal, probably representing *Parinari curatellifolia* during the early occupation Phase 2. It is not present during later occupation phases or at any of the other sites. The taxon virtually vanished from a number of Sahelian and northern Sudanian sites in the course of the Iron Age due to climatic deterioration or overuse (Eichhorn 2012; Höhn 2007; Huysecom et al. 2015).

At Kompa, the small sample size inhibits a detailed interpretation. The indicated use of shea butter tree wood for iron smelting at Kompa Moussekoubou is consistent with observations in Mali and Togo where this species has regularly been used for the same purpose (Eichhorn & Robion-Brunner 2017; Eichhorn 2012; Eichhorn et al. 2013 a, b; Eichhorn & Neumann 2013). Its frequent use for iron metallurgy is also indicated by ethnobotanical interviews in Burkina Faso (Kiéthéga 2009: 249–257).

At Tin Tin Kanza, taxa able to re-sprout quickly after cutting like *Guiera senegalensis* and different *Combretum* species may be indicative of the practice of short-cycle fallows. They are also favoured by browsing. Shea butter tree parklands are indicated. The types *Cola* spp. (including the riverine species *Cola laurifolia*), Meliaceae and possibly the Rubiaceae point to gallery forest exploitation.

4.2 *Ethnobotanical Interpretation: Wood Use for Construction at Birnin Lafiya*

The majority of charcoal retrieved from trenches 3 and 10 at Birnin Lafiya (Figure 24.2) derive from the destruction of a house during Phase 4, and represent burnt roof beams (Haour et al. 2016). Most fragments belong to two types, *Anogeissus leiocarpa* and Sapotaceae/*Vitellaria paradoxa* type, followed by Rubiaceae. In the Republic of Sudan, *Anogeissus leiocarpa* wood is used for posts, rafters and roof construction (Persson, retrieved 2015). According to Nikiema & Umali (2007), *Vitellaria paradoxa* is used, among others, for poles, house posts, rafters and flooring. *Vitellaria paradoxa, Pterocarpus erinaceus*, and *Mitragyna inermis* (Rubiaceae) are highest ranked in importance for use as construction wood in Burkina Faso (Gallagher 2010: Table 3.6). The most prominent charcoal types are thus consistent with modern uses in the Sudanian zone. One must, however, bear in mind that the assemblage is generally rather similar to the other assemblages at Birnin Lafiya, with the exception of those attributed to Phases 2–3 in which Sapotaceae/*Vitellaria paradoxa* type is extremely dominant and *Anogeissus leiocarpa* absent (Figure 24.1).

5 Conclusion

The wood charcoal analyses at the sites investigated in the frame of the *Crossroads of Empires* project have been helpful to reconstruct past vegetation in the vicinity of the sites. Although the number of charcoal fragments and contexts is too low for a sound diachronic reconstruction and for in depth comparison of different sites, taxa composition as reflected in the charcoal assemblages indicates that vegetation around the settlements was shaped by the maintenance of agroforestry parklands. Furthermore, the exploitation of gallery forest is indicated. Indicators of short fallow cycles are rare. Long fallow cycles, as well as permanent cultivation of a part of the agriculturally used surface, are consistent with the taxa composition. Charcoal remains related to a burning event destroying a house (Birnin Lafiya, Trench 3/10) elucidate the selective use of hard-wooded taxa, particularly *Anogeissus leiocarpa*, shea butter tree and Rubiaceae for construction. The choice of such hard-wooded taxa for construction, matching current preferences in the Sudanian zone, is thus confirmed.

CHAPTER 25

Animal Remains

Veerle Linseele and Wim Wouters

1 Introduction

This chapter reports on the faunal remains recovered during fieldwork by the *Crossroads of Empires* team. As the first ever to be conducted in Dendi, this archaeozoological study will first of all serve as a baseline for the reconstruction of the animal economy and the natural environment in the area. The emphasis at this stage is on sketching a general image, while more and more precise identifications, as well as more detailed diachronic and intersite comparisons, will follow at a later stage, as part of a new project of the first author. However, connected to the specific goals of the *Crossroads of Empires* project, a first investigation into changes in subsistence strategies that may be related to movements of peoples has been undertaken. Specific questions include whether the fauna provide evidence of cultural influences, for example through food preferences or taboos, such as those that existed among Muslim groups? Does the fauna evidence groups of specialists, like fishermen or hunters? Can the fauna reveal anything on long distance contacts or trade? The emphasis is on Birnin Lafiya, but results from other sites are also included. Many more faunal remains than anticipated were recovered during the archaeological excavations in Dendi. Due to time constraints, it has not been possible to study all of these, and a selection had to be made (see below).

1.1 *The Modern People, Their Natural Environment and Subsistence*

Today the Dendi area is populated by a mixture of different ethnic groups. Subsistence strategies, often linked with ethnicity, range from pastoral nomadism, to agriculture and fishing, or different combinations of these (van Driel 2002). Dendi is part of the northern Sudanian ecoclimatic zone in West Africa (see summary in N'Dah et al., this volume). The Niger River and its floodplain are very prominent (van Driel 2002: 50). The river floods twice a year, with a peak around September and another around February. Beyond the floodplain, there is open grassland with scattered trees. The nature reserve Parc W, dominated by Sudanese wooded savanna and typical northern Sudan savanna fauna (McGinley 2009), is adjacent to Dendi.

1.2 *The Dendi Archaeological Sites*

The presentation of the data here follows the scheme of five chronological phases, as defined above (see 4.1. Haour et al.): (1) late second to first millennium BC, (2) first half of the first millennium AD, (3) latter half of the first millennium AD, (4) eleventh–fourteenth centuries AD and (5) a post-1650 AD occupation linked to modern sites. Phase 4 marks the most intensive occupation, when Dendi was possibly a major regional hub involved in long-distance trade. There are gaps in the chronology that may correspond to periods of abandonment or at least reduced occupation intensity.

The most intensively investigated site has been Birnin Lafiya, where 20 units were excavated on the outskirts of the modern village. Trench 4 (Phase 2–3) and the base of trench 9 (Phase 2–3) have yielded the oldest traces at Birnin Lafiya, dated to the middle of the first millennium AD. In fact, in Trench 9, 4 different phases of occupation (Groups 1–4) have been recognised, dating between the fifth and thirteenth centuries AD. Trench 5 (Phase 4) was dug in a midden locally referred to as "the king's rubbish heap". In Trench 3/10 (Phase 4) good architectural features, with the remains of a burnt house, were found. Trenches 4 (Phase 2–3), 9 (Phase 2–4), 11 (Phase 2–3) (south end of site) and 13 (Phase III) (west end of the site) had the longest stratigraphic sequences.

In addition, smaller-scale excavations have been carried out on a number of sites (Map 6). A brief outline follows here of the broad nature of each site as it will have had an impact on the composition, survival and recovery of the faunal remains. At Pekinga (Phase 4) a trench was dug outside of an existing village, important in the history of the traditionally pastoralist Fulani. The site of Tin Tin Kanza (TTK) (Phase 4) is a small settlement mound close to a modern fishing village; it lies very close to the Niger River and extensive areas of marshland. Gorouberi (GOB) (Phases 2–3) is a large mound site close to the confluence of a sizeable seasonal stream with the Niger. In the present village of Bogo Bogo (GOG) (phase 5), less than 10km from the Niger but on a dry plateau and at the highest altitude (ca. 198m a.s.l.) of all studied localities, a small trench was dug in the oldest house, revealing three horizons and two pits in a stratigraphy of 190cm. Kozungu (KOZ) (SI: Phases 4–5; SII: Phases 1 and 4) is one of the sites close

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to Birnin Lafiya. On the outskirts of the modern village, the site is unusual because of its long sequence: indeed, the layers in Trench II were marked by a physical boundary around 70–80cm BD; layers below 110cm date to the late second or early first millennium BC and their faunal remains are the oldest ones that have been analysed. Within a rubbish deposit in the present village of Birni Lafia a unit (Tondo windi, TOW) aimed to identify the first occupation of the site; remains uncovered date to Phase 5, but for safety reasons the trench could not be continued to sterile. The site of Bokorobu (BOK) (undated, but presumed Phase 5) is said to be another predecessor of Birnin Lafiya, although the site has no real stratigraphy. At Kargui (KGI) (Phase 5), one of the villages downstream of Birnin Lafiya, a trench was dug in the courtyard close to the *birni*. Kantoro (KRO) (Phase 4) is a mound site located on a small affluent of the Niger, about 12km away from the latter. A small test pit in the modern village of Madekali (KLI), and a stratigraphic exposure a dozen metres away, yielded a deep stratigraphy (Phase 3–4-5). Boukouroubou (ROU) (Phase 4) is furthest away from the river Niger proper, lying as it does in the outskirts of Guene, 20km inland but close to the Sota, a tributary of the Niger.

2 Material and Methods

Where possible, excavation was carried out following features or stratigraphic layers, but where these were not recognisable or where fills were thick and homogenous, artificial spits of 10cm were dug. The excavated sediment was always sieved through 5mm mesh to collect animal bones and only exceptional contexts were sieved finer through 2mm mesh. Analyses were done by Veerle Linseele and Wim Wouters at the Royal Belgian Institute of Natural Sciences with the aid of the reference collection of recent animal skeletons there.

As bones were collected in much larger quantities than anticipated and as there was no time to study all remains, a selection has been made. All excavated trenches were ranked according to their priority in function of the type of contexts, dates, the depth of their stratigraphic sequence, whether archaeobotanical samples were also being studied, particular research questions, etc. Fish was usually the most frequent animal group and for some priority 1 sites only a subsample of the fish has therefore been identified, but the total number of fish was always quantified. Altogether, nearly 20,000 animal remains have been processed. Very roughly estimated, the same amount of fauna still remains unstudied.

The faunal assemblages mainly consist of hard parts that survived in archaeological deposits, more particularly bones, teeth and shells. Mammal remains were usually not well-preserved and very fragmented. The preservation status of bones of fish and reptiles, mainly turtles, was, on average, better, except at Bokorobu where the fish bones exhibited the typical fibrous structure of poorly preserved remains. Bird bones were rare and also not well preserved. Standard methods were applied during the study of the animal remains and the following features have been recorded: taxon, element, weight, information on the age at death (fusion data long bones, tooth eruption and tooth wear), estimate of the standard length (SL, length from the tip of the snout to the beginning of the tail) for fish, measurements (in mm; see von den Driesch 1976), traces of burning, butchery, etc. Quantification is based on Numbers of Identified Specimens.[1]

3 Description of the Animal Remains

Table 25.1 summarises the animal taxa that were identified by context and phase. In what follows, remains are briefly described by animal group. More information on identification criteria as well as habitats etc. can be found for most taxa in Linseele (2007).

Marine shells included the remains of 4 bivalves that could not be identified more specifically, but mainly cowrie shells. The cowrie shells are not discussed here with the other faunal remains, but are reported with the small finds (Christie and Haour, this volume). In Trench 4 at Birnin Lafiya, a fragmentary shell of *Lanistes varicus*, a freshwater gastropod, was present. Fragments of freshwater bivalves, mainly in the size range of the large *Chambardia rubens*, have been recorded at most sites, but none could be identified more precisely. A few sites yielded shells of Achatinidae, larger landsnails of which several taxa are bred for consumption over large parts of West and Central Africa today (Hardouin et al. 1995).

With a total of over 11,000 remains, fish were the most common group from the studied contexts, with at least 18 species present. The most common taxa, in order of decreasing numbers of identified bones, were tilapia (Haplotilapiini), Clariid catfish (Clariidae), *Heterotis niloticus* which was particularly numerous at Tondo windi (TOW), and *Synodontis* catfish. Tilapia was presumably

1 See Linseele 2007 for a discussion of why this is preferred over minimal numbers of individuals. Other aspects of the methodology followed are also described in more detail there.

TABLE 25.1 List of identified animal taxa by site and phase (Numbers of identified specimens)

	Birnin Lafiya												
Phase	**4**	**2-3**	**4**	**3-4**	**4**	**4**	**3**	**2/3**	**4-3-2**	**4**	**2-3**	**3**	
	SIII	**SIV**	**SV**	**SVI**	**SIX – Group 1**	**SIX – Group 2**	**SIX – Group 3**	**SIX – Group 4**	**SIX – other**	**SX**	**SXI**	**SXIII**	**Total**
Shells													
Marine bivalve	–	1	–	–	–	–	–	–	–	–	–	2	**3**
Lanistes varicus	–	1	–	–	–	–	–	–	–	–	–	–	**1**
Unid. freshwater bivalve	–	11	12	–	–	1	2	1	–	–	4	16	**47**
Achatinidae	–	–	–	–	–	–	–	–	–	–	–	2	**2**
Unidentified gastropod	–	7	12	1	–	–	–	–	–	–	1	6	**27**
Unidentified shell	–	–	–	–	–	–	–	–	–	–	–	–	–
Fish													
Lungfish (*Protopterus annectens*)	–	4	5	–	–	–	–	–	–	–	–	–	**9**
Polypterus sp.	–	8	11	70	–	–	–	–	–	–	–	1	**90**
Heterotis niloticus	–	38	32	63	–	–	–	–	–	–	–	–	**133**
Mormyrid (Mormyridae)	–	4	–	–	–	–	–	–	–	–	–	–	–
Gymnarchus niloticus	–	6+1?	6	7	–	–	–	–	–	–	–	–	**19+1?**
Tigerfish (*Hydrocynus* sp.)	–	–	1	–	–	–	–	–	–	–	–	–	**1**
Citharinidae/Distichodontidae	–	12	6	14	–	–	–	–	–	–	–	–	**32**
Carp etc. (Cyprinidae)	–	–	1	–	–	–	–	–	–	–	–	–	**1**
Catfish 1 (*Bagrus* sp.)	–	–	2	–	–	–	–	–	–	–	–	–	**2**
Catfish 2 (*Chrysichthys* sp.)	–	–	–	–	–	–	–	–	–	–	–	–	–
Catfish 3 (*Auchenoglanis* sp.)	–	12	11	13	–	–	–	–	–	–	–	7	**43**
Catfish 4 (Clariidae, mostly *Clarias* sp.)	1	84	131	209	–	–	–	–	–	–	–	16	**441**
Catfish 5 (*Synodontis* sp.)	–	65	15	47	–	–	–	–	–	–	–	3	**130**
Siluriformes	–	–	–	–	–	–	–	–	–	1	–	6	**7**
Parachanna obsura	–	20	4	13	–	–	–	–	–	–	–	–	**37**
Nile perch (*Lates niloticus*)	–	18	12	23	–	–	–	–	–	–	–	10	**63**
tilapia (Haplotilapiini)	–	85	116	163	–	–	–	–	–	3	–	4	**371**
Mullets (Mugilidae)	–	–	–	–	–	–	–	–	–	–	–	–	–
Pufferfish (*Tetraodon lineatus*)	–	–	–	1	–	–	–	–	–	–	–	1	**2**
Unidentified fish	–	458	524	757	745*	465*	531*	50*	338*	6	311*	50	**4237***
Amphibians													
Bullfrog (*Pyxicephalus edulis*)	–	–	–	–	–	–	–	–	–	–	–	–	–
Frog/toad (Anura)	–	23	6	–	–	1	18	–	–	–	2	1	**51**

* not or only partially identified more specifically

						Other sites						
4	4	2–3	5	4-5	1	5	5?	5	4	4	3-4-5	
Pekinga	Tin Tin Kanza	Gorouberi	Bogo Bogo	Kozungu (younger)	Kozungu (older)	Tondo windi	Bokorobu	Kargui	Kantoro	Boukouroubou	Madekali	Total all
–	–	1	–	–	–	–	–	–	–	–	–	**4**
–	–	–	–	–	–	–	–	–	–	–	–	**1**
–	3	–	4	10	–	3	1	4	7	–	5	**84**
–	7	–	–	–	–	–	–	–	2	–	–	**11**
3	5	–	1	4	–	–	–	1	5	–	2	**48**
–	6	–	–	1	–	–	–	–	–	–	–	**7**
1?	4?	–	–	1	–	4	–	–	2	–	–	**16+5?**
4	2	–	1	4	1	26	2	6	3	–	6	**145**
–	10	–	2	6	2	301	4	18	1	–	105	**582**
1	–	–	–	11	–	–	–	–	–	–	4	**20**
1	7+1?	–	–	4	1	9	12	2	–	–	10	**65+2?**
1?	–	–	–	–	–	3	–	–	–	–	–	**4+1?**
1+1?	–	–	–	–	–	37	–	6	–	–	27	**103+1?**
–	–	–	–	–	–	2	–	3	1	–	1	**8**
–	–	–	–	–	–	–	–	–	1	–	–	**3**
–	–	–	1	–	–	–	–	–	–	–	–	**1**
–	–	–	1	3	–	32	–	–	3	–	5	**87**
15	67	1	47	43		191	33	58	16	–	94	**1005**
3	6		4	3		60	–	5	–	–	1	**212**
–	8	–	1	14	–	61	2	3	2	–	5	**103**
4+1?	3	–	–	14	2	47	–	1	4	–	20	**132+1?**
5	1	–	–	4	1	8	–	4	2	–	5	**93**
81	29	–	37	36	12	652	11	118	3	–	90	**1440**
–	–	–	–	1	–	–	–	–	–	–	–	**1**
1	–	–	–	–	–	–	–	–	–	–	–	**3**
495	52	–	55	397*	359*	797	86	204	24	–	655*	**7359**
–	–	–	–	1	–	1	–	–	–	–	–	**2**
1	–	–	1	3	–	–	–	–	4	–	–	**60**

TABLE 25.1 List of identified animal taxa by site and phase (Numbers of identified specimens) (*cont.*)

	Birnin Lafiya												
Phase	**4**	**2-3**	**4**	**3-4**	**4**	**4**	**3**	**2/3**	**4-3-2**	**4**	**2-3**	**3**	
	SIII	**SIV**	**SV**	**SVI**	**SIX – Group 1**	**SIX – Group 2**	**SIX – Group 3**	**SIX – Group 4**	**SIX – other**	**SX**	**SXI**	**SXIII**	**Total**
Reptiles													
Softshell turtle (Trionychidae)	1	2	3	2	6	1	1	–	–	4	–	1	**21**
Terrapin (probably mainly *Pelusios adansonii*)	–	73	9	25	22	4	1	1	1?	1	7	8	**151+1?**
Small lizard	–	3	2	–	–	–	9	–	–	–	2	–	**16**
Monitor lizard (*Varanus* sp.)	–	–	1	–	1	1	–	–	–	–	–	1	**4**
Snake (Serpentes)	–	12+1?	5	45	2	3	2	–	–	–	–	6	**75+1?**
Crocodile (*Crocodylus* sp.)	–	–	–	1?	1	2	3	–	–	–	6	–	**12+1?**
Unidentified reptile	–	1	2	–	–	–	3	–	–	–	–	–	**6**
Birds													
Stork (Ciconiidae)	–	–	–	–	–	–	–	–	–	–	–	–	–
Heron etc. (Ardeidae)	–	–	–	–	–	–	–	–	–	–	–	2	**2**
Small and medium-sized ducks and geese (Anatidae)	–	3	–	–	–	1	1	–	3	–	–	–	**8**
Large ducks and geese (Anatidae)	–	–	–	–	–	–	–	–	–	–	–	–	–
Chicken (*Gallus domesticus*)	–	–	–	1?	–	–	–	–	–	–	–	–	**1?**
Large Galliformes	–	–	–	–	–	–	–	–	–	–	–	–	–
Charadriiformes	–	–	–	–	–	–	–	–	1	–	–	–	**1**
Unidentified bird	–	7	3	4	3	2	4	–	4	–	1	5	**33**
Wild mammals													
Bat (Chiroptera)	–	–	–	–	–	–	–	–	–	–	–	1	**1**
Olive baboon (*Papio anubis*)	–	–	–	–	–	–	–	–	–	–	1	–	–
Hare (*Lepus* sp.)	–	3	–	–	–	–	–	–	–	–	–	1?	**3+1?**
Micromammals	–	20	8	3	4	5	22	1	2	–	6	9	**80**
Greater cane rat (*Thryonomys swinderianus*)	–	–	–	–	–	–	–	–	–	–	–	1	**1**
Northern giant pouched rat (*Cricetomys gambianus*)	–	–	–	–	–	–	–	–	–	–	2	–	**2**
Large rodent	–	–	–	–	–	–	–	–	–	–	–	–	**0**
Mongoose (Herpestidae), genet or civet (Viverridae)	–	–	–	–	–	–	–	–	–	–	–	1	**1**
Caracal/serval (*Caracal caracal/Leptailurus serval*)	–	–	–	–	1	–	–	–	–	–	–	–	**1**
Warthog (*Phacochoerus africanus*)	–	–	–	–	–	–	–	–	–	–	–	–	**0**
Pigs (Suidae)	–	–	–	–	–	–	–	–	–	–	–	1	**1**
Giraffe (*Giraffa camelopardalis*)	–	–	–	–	–	–	–	–	–	–	–	1	**1**

						Other sites						
4	4	2–3	5	4-5	1	5	5?	5	4	4	3-4-5	
Pekinga	Tin Tin Kanza	Gorouberi	Bogo Bogo	Kozungu (younger)	Kozungu (older)	Tondo windi	Bokorobu	Kargui	Kantoro	Boukouroubou	Madekali	Total all
–	8+1?	–	1	14	–	11	33+2?	–	–	–	7	**95+3?**
9	113	–	4	41+1?	46	28	1	2	5	–	9	**409+2?**
1	–	–	–	–	–	–	–	–	–	–	–	**17**
–	–	–	2	5	5	6	–	3	5	–	17	**47**
–	4	–	–	5	–	1	2	–	1	–	–	**88+1?**
–	2	–	2	6	1	3+1?	2	–	–	–	2	**30+2?**
2	–	–	–	3	–	–	5	–	1	–	2	**19**
–	–	–	–	–	–	–	–	–	–	–	1	**1**
–	–	–	–	–	–	–	–	–	–	–	–	**2**
–	–	–	–	1	–	–	–	–	–	–	1	**10**
–	–	–	–	–	–	–	–	–	–	–	1	**1**
1?	–	–	–	–	–	2	–	–	1	–	–	**3+2?**
–	–	–	6	1	–	8	–	1	–	–	9	**25**
–	–	–	–	–	–	–	–	–	–	–	–	**1**
2	3	–	3	3	–	5	–	4	2	–	3	**58**
–	–	–	–	–	–	–	–	–	–	–	–	**1**
–	–	–	2	–	–	–	–	–	–	–	–	**3**
–	–	–	2	–	–	1	–	–	3	–	–	**9+1?**
1	–	–	–	3	–	–	–	–	3	–	1	**88**
–	–	–	1	–	2	2	–	–	–	–	–	**6**
–	–	–	–	–	–	1	–	–	–	–	–	**3**
–	–		–	–		–	–	–	1	–	–	**1**
–	–	–	–	1	–	–	–	–	–	–	–	**2**
–	–	–	–	–	–	–	–	–	–	–	–	**1**
–	–	–	1	1	–	–	–	–	1	–	–	**3**
–	–	–	1	–	–	–	–	–	1	–	1?	**3+1?**
–	–	–	–	–	–	–	–	–	–	–	–	**1**

TABLE 25.1 List of identified animal taxa by site and phase (Numbers of identified specimens) (*cont.*)

	Birnin Lafiya												
Phase	**4**	**2-3**	**4**	**3-4**	**4**	**4**	**3**	**2/3**	**4-3-2**	**4**	**2-3**	**3**	
	SIII	**SIV**	**SV**	**SVI**	**SIX – Group 1**	**SIX – Group 2**	**SIX – Group 3**	**SIX – Group 4**	**SIX – other**	**SX**	**SXI**	**SXIII**	**Total**
Bush duiker (*Sylvicapra grimmia*)	–	–	–	–	–	–	–	–	–	–	–	–	**0**
Bush duiker or oribi (*Ourebia ourebi*)	–	–	–	–	–	–	–	–	–	–	1	–	**1**
Small antelope	–	1	–	–	1	–	–	–	–	5	1	8	**16**
Bushbuck (*Tragelaphus scriptus*)	–	–	–	–	–	–	–	–	–	–	–	–	**0**
Bohor reedbuck (*Redunca redunca*)	–	1?	–	–	–	–	–	–	–	1	–	–	**1+1?**
Kob (*Kobus kob*)	–	–	–	–	–	–	–	–	–	1	–	–	**1**
Medium antelope	–	–	–	–	–	–	–	–	1	3	–	3	7
Large antelope	–	2	–	–	–	–	–	–	–	–	–	1	**3**
Buffalo (*Syncerus caffer*)	–	–	–	–	–	–	–	–	–	–	–	1+1?	**1+1?**
Domesticated mammals													
Dog (*Canis familiaris*)	–	1	–	–	–	–	–	–	–	–	10	5	**16**
Horse (*Equus caballus*)	–	–	1	–	–	–	–	–	–	–	–	–	**1**
Horse or donkey (*Equus asinus*)	–	–	–	–	1	–	–	–	–	–	–	–	**1**
Sheep (*Ovis aries*)	–	–	–	–	–	–	–	–	–	–	–	–	–
Goat (*Capra aegagrus*)	–	1	–	–	–	–	1	–	–	–	8	–	**10**
Sheep or goat	1	–	3	1	5	–	2	–	–	1	7	7	**27**
Cattle (*Bos* sp.)	–	–	–	–	6	8	5	1	–	4	8	30	**62**
Wild or domesticated mammals													
Medium-sized canid	–	–	–	–	–	–	–	–	–		1	–	**1**
Medium-sized carnivore	–	1	1	–	1	–	–	1	–	–	12	6	**22**
Small bovid	–	9	5	3	13	6	23	–	2	5	28	36	**130**
Large bovid	–	6	3	4	15	20	17	1	1	22	44	53	**186**
Unidentified mammal	31	283	168	205	221	258	213	14	56	536	801	896	**3682**

* not or only partially identified more specifically

caught even more frequently than the numbers of bones suggest, as remains of this fish preserve less well and are not as easy to recognise as that of others, such as Clariid catfish. Most of the fish from the studied sites can be classified into one of three groups according to the type of environment in which they mainly occur. The first group, which is the least common, contains the fish typical of open, deep water, including mormyrids (Mormyridae), tigerfish (*Hydrocynus* sp.), bagrid catfish (*Bagrus* sp.) and particularly Nile perch (*Lates niloticus*). Nile perch can grow up to 2m in length, but the specimens recorded usually had a standard length of c. 40–50cm, except

			Other sites									
4	4	2–3	5	4-5	1	5	5?	5	4	4	3-4-5	
Pekinga	Tin Tin Kanza	Gorouberi	Bogo Bogo	Kozungu (younger)	Kozungu (older)	Tondo windi	Bokorobu	Kargui	Kantoro	Boukouroubou	Madekali	Total all
–	–	–	–	–	–	–	–	–	2	–	1	**3**
–	–	–	–	–	–	–	–	–	1	–	–	**2**
–	–	–	8	3	–	–	–	–	7	–	1	**35**
–	–	–	–	–	1	–	–	–	–	–	–	**1**
–	–	–	–	–	–	–	–	–	–	–	–	**1+1?**
–	–	–	–	–	1	–	–	–	1	–	–	**3**
–	3	–	–	2	–	1	4	1	1	–	1	**20**
–	–	–	1	–	–	1	–	–	1	–	1	**7**
–	–	–	–	–	–	–	–	–	–	–	–	**1+1?**
–	3	–	2	2	–	–	–	–	7	–	1	**31**
–	–	–	–	–	–	–	–	–	–	–	–	**1**
–	–	–	–	–	–	–	–	–	–	–	–	**1**
1	–	–	1	–	–	–	–	–	–	–	–	**2**
–	–	–	–	–	–	–	–	–	1+2?	–	–	**11+2?**
–	4	–	4	5	–	9	–	1	3	–	–	**53**
–	5	–	2	1	–	4	–	–	6	–	1	**81**
1	–	–	–	–	–	–	–	–	–	–	–	**2**
–	–	–	2	1	–	–	–	1	1	–	1	**28**
11	6	–	20	26	5	15	1	4	24	–	25	**268**
4	15	1	7	18	1	5	1	2	22	2	21	**285**
109	301	33	262	492	213	244	44	95	424	6	126	**6031**

at BLAF S13 where they were between 80–140cm, and in Context 19 at Tin Tin Kanza a specimen of c. 10cm was found. The second group contained the fish from marshy, well-vegetated areas, including *Polypterus* sp., *Heterotis niloticus, Gymnarchus niloticus*, Distichodontidae and Citharinidae, *Auchenoglanis* catfish and *Parachanna obscura*. The third and most frequent group consisted of the taxa that are chiefly confined to shallow water and that can survive in adverse conditions with low oxygen contents, high temperatures and high salinity, notably lungfish (*Protopterus annectens*), clariid catfish and tilapia. Lungfish is the only one of the three that can survive

complete habitat desiccation, by forming a cocoon. The tilapia would have been usually between 15–30cm SL, and the clariid catfish between 30–50cm SL, which for both taxa points to adult specimens.

Over all studied contexts, c. 60 bones of frogs or toads were found. Most of these remains come from Birnin Lafiya Trenches 4 and 9, but these probably each represent a single specimen. Species identifications were not possible due to a lack of reference skeletons as well as identification manuals. The only exceptions were a skull fragment from Kozungu (KOZ) and a dentale from Tondo windi (TOW) that could be identified as bullfrog (*Pyxicepalus edulis*), due to their very characteristic ornamentation (Sheil 1999).

After fish, reptiles were the second-most common group. A first species is the softshell turtle (Trionychidae), mainly represented by pieces of plastron or carapace which are recognisable from their thickness and ornamentation. One piece from Bokorobu (BOK) had the ornamentation worn or polished away, but it is not clear whether this was intentional. More precise identifications still need to be done, but all species of soft shell turtle are freshwater animals. By far the most common reptiles were the terrapins (Pelomedusidae). They were particularly numerous at Tin Tin Kanza, where two concentrations counted more than 10 bones, two others more than 20, and these concentrations probably represent one individual each. The total minimal number of individuals of terrapins at Tin Tin Kanza is estimated at five, based mainly on the fact that they were spread over as many different contexts. Like for the softshell turtle, more precise identifications are still necessary for the terrapins, but presumably mainly Adanson's mud turtle (*Pelusios adansonii*) was present. Terrapins of the genus *Pelusios* have semi-aquatic habits. When the pools in which they live dry up, they bury themselves and stay there until the pools fill up again (Villiers 1958: 223). Softshell turtles and terrapins were probably caught together with the fish, using similar techniques. While fish are trade products, it seems that this may not have been the case for the turtles and terrapins (Linseele 2017).

Another reptile present at the Dendi sites was the monitor lizard. No diagnostic pieces allowing us to distinguish between *Varanus niloticus* and *V. exanthematicus*, the two species that have to be taken into account, were present. The first typically lives in areas with a rich plant cover and close to water, while the second is a species preferring open and dry areas (Mertens 1942: 36–40). There were also bones from a small lizard, the size of an Agama, but which could not be identified more precisely. Snake remains, mainly vertebrae, were present too. After the first *Crossroads* project excavation season in Dendi, snake seemed to form an important component of the fauna, which was considered to be unusual. Snake remains are indeed common in two of the earliest trenches dug at Birnin Lafiya, 4 and especially 6, but have not been recorded in similar numbers since. It is of note, however, that the multiple snake remains from both 4 and 6 are unlikely to be of one individual, as they were found spread over different depths of the trenches. Finally, crocodile (either *Crocodylus niloticus* or *C. cataphractus*) has been found, but was not very common. The two possible species can be found in a variety of water bodies, small and large (Villiers 1958: 312–314, 324).

Birds were not common as a group and this may in part be due to their poorer preservation chances, as their bones are lighter and more fragile. Most bird bones could not be identified any further. The recognised taxa are stork (Ciconiidae), Ardeidae (a bird family which contains herons amongst others), ducks and geese of different sizes, and Charadriiformes, a diverse group of mainly wading birds. In general, these birds can be associated with aquatic habitats. However, the largest group of identified bird bones belongs to large galliforms. These could either be guineafowl (*Numida meleagris*), different species of francolin (*Francolinus* sp.) or chicken (*Gallus domesticus*), and distinction is only possible on a selection of elements (MacDonald 1992). Out of a total of 30 large galliform bones in the *Crossroads* assemblages, three were diagnostic for chicken, two others were probably chicken as well, while the remaining bones were undiagnostic. The large galliforms seemed to be more common in the Phase 5 contexts, which were the youngest ones. Chicken is not native to Africa as its origins are in southern Asia, and it appears first in West Africa in the mid-first millennium AD (MacDonald 1992; Dueppen 2011).

Approximately 1000 mammal bones, out of total of c. 7000, were identifiable to a higher taxonomical level. Of these, c. 200 were certainly of wild taxa. However, almost half of these were micromammals, presumably mainly mice and rats up to the size of the unstriped grass rat (*Arvicanthis niloticus*). The remains included concentrations of bones belonging to a single individual. A few skulls and mandibles were present that should allow more precise identifications at a later stage. Compared to the other sites, micromammals were more common at Birnin Lafiya. As well as their bones, gnawing marks created by small rodents have occasionally been observed.

Apart from the micromammals, there were c. 100 bones of other wild mammals. At Birnin Lafiya S13, a proximal humerus of a bat was found. At Bogo Bogo (GOG), a first metatarsal (Measurements: GL: 50.7mm; Bd: 10.8mm)

and a second phalanx (Measurements: GL: 21.9mm; Bp: 8.8mm; Bd: 7.8mm) of a primate were recorded, which following comparison with measurements in Van Neer (1989) have been attributed to the Olive baboon (*Papio anubis*). At Birnin Lafiya Trench 11, a first phalanx of baboon was also identified. Olive baboon is the largest monkey and the most widely distributed and common baboon in West Africa (Kingdon 1997: 34–35). The metatarsal had cut marks on the diaphysis. 10 hare (*Lepus capensis/saxatilis*) bones were recorded among all studied contexts, but more precise attribution to either *Lepus capensis* or *Lepus saxatilis* was not possible. Hares are typical savanna animals (Kingdon 1997: 154–155). Two large rodents, the greater cane rat (*Thryonomys swinderianus*) and the northern giant pouched rat (*Cricetomys gambianus*) have been recognised. The first one is the larger of the two and is usually found close to water, associated with reedbeds or dense, tall and thick grass, in riverine or similar environments (Hoffmann 2008). The giant pouched rat occurs over large parts of Africa in a variety of habitats (van der Straeten et al. 2008). Most of the carnivore bones were probably from dogs (see below), but a few wild species were present as well. Mongoose (Herpestidae), genet or civet (Viverridae), as well as caracal (*Felis caracal*) or serval (*Leptailurus serval*) was present, but more precise identifications are not possible.

A molar from Kantoro (KRO) and one from Kozungu (KOZ), as well as a premolar from Bogo Bogo (GOG) were of warthog (*Phacochoerus africanus*). Some postcranial suid elements were present as well. Warthogs can occur in arid and open areas, but are more typical on alluvial soils in lightly wooded areas (Kingdon 1997: 335). Elephant (*Loxodonta africana*) was represented through ivory, in the form of a bracelet fragment from BLAF Trench 4, and one from Trench 2 at Gorouberi (SF 2012-255 and SF 2013-05 respectively). These are not included in Table 1 but are described in the Small Finds table.

With approximately 70 identified bones, the antelopes were the most common group within the wild mammals (micromammals excluded). Species of all sizes were present. More than half of the bones were from small antelopes, among which bush duiker (*Sylvicapra grimmia*) has been identified. Bush duiker is one of the most widely distributed African antelopes, occurring throughout savanna woodland zones south of the Sahara. In spite of dense human populations in many areas, its historical distribution has remained largely unchanged (Group 2008). Among the medium-sized antelopes, bushbuck (*Tragelaphus scriptus*), bohor reedbuck (*Redunca redunca*) and Kob (*Kobus kob*) have been identified. Bushbucks need thick vegetation cover and are confined to habitats close to water (Kingdon 1997: 352). Bohor reedbucks typically live in highly unstable, large grasslands where extensive flooding and droughts alternate in the course of a year (Kingdon 1997: 401). Kob is a species that needs to drink regularly and is therefore tied to habitats close to water (Kingdon 1997: 403). Apart from antelopes, also another wild bovid, the buffalo (*Syncerus caffer*) was present, more particularly in BLAF S13. A talus (measurements GLl: 74.2mm; GLm: 69.5mm; Dl: 41.5mm; Bd: 52.5mm) found there clearly falls outside the size range of cattle and within the limits for savanna buffalo (*Syncerus caffer*) (Peters 1988). A distal calcaneus fragment from BLAF S13 was presumably also from a buffalo. Savanna buffaloes stay within a distance of c. 20km from water, as they need to drink daily (Kingdon 1997: 348–349). Combined with their need for dense cover and grass, this makes them favour savannas with patches of thicket, reeds or forest.

Apart from wild mammals, c. 200 bones were attributed to domesticated mammals. Bones of dog-sized canids were all attributed to dogs (*Canis familiaris*), although diagnostic elements were missing. It is possible that also some jackal (*Canis aureus/adustus*) was present among them. The ten dog bones from BLAF 11 (Context 18) were probably from one individual. Dogs have also been attested indirectly through the occasional presence of gnawing marks on bones. Dogs in West Africa have a wide range of functions and are sometimes eaten (Boettger 1958: 13–19). A horse mandible (*Equus caballus*) was found at BLAF SV (Spit 6, 50–60 cm). The distinction from donkey was made based on the tooth enamel pattern (Armitage & Chapman 1979). At BLAF Trench 9 (Context 4, 30–40cm), there was an incisor from either a donkey or a horse. Domesticated equids first appeared in West Africa early in the first millennium AD (MacDonald and MacDonald 2000). While donkeys are relatively common nowadays, horses are much less so because they are not well-adapted to local environmental circumstances (see summary in Linseele 2007: 64). In precolonial Islamic West Africa, horses were often associated with warfare and with the wealthier people of society (Law 1980: 176–196). It is therefore striking that horse was found in a midden that local informants from the modern village call the "king's rubbish heap" (Livingstone Smith, Nikis, Champion & Haour, this volume). In total, two sheep (*Ovis aries*) bones were found. A complete metacarpal was recovered from the uppermost layer at Bogo Bogo (measurements: GL: 162mm; Bp: 26.4mm; SD: 13.3mm; Bd: 28.8mm). The estimated withers height for this animal is 79cm (von den Driesch & Boessneck 1974). This is very tall and in the range of modern long-legged sheep (Epstein 1971). In Pekinga (PEK) a fragmentary skull with os petrosum was attribut-

ed to sheep. Altogether 13 goat (*Capra hircus*) bones have been recorded, among which six formed a concentration at BLAF 11 (Context 6). They represent the remains of at least two individuals. A goat bone from Context 7 in the same trench probably goes together with these. For 53 bones the distinction between sheep and goat was not possible. Among the sheep/goat, animals from all age classes were present, from very young animals to those at least 3–4 years old. Some foetal or neonate sheep/goat bones are probably present among the remains identified as small bovid (see below). Distinction from wild bovids was not possible in these cases on a pure osteological basis. Apart from the large sheep from Bogo Bogo, compared to the sheep/goat from other archaeological sites in West Africa, the specimens from Dendi usually fall into the lower size ranges (Linseele 2007). However, none of these allowed the calculation of withers heights. Approximately 80 remains have been attributed to cattle (*Bos* sp.). They contain both diagnostic as well as undiagnostic bones to separate cattle from buffalo (Peters 1988), but considering the context, cattle is considered most likely. Like most of the sheep/goat remains, the cattle were in the lowermost size range recorded from West African archaeological sites (Linseele 2007). Only a second phalanx from the hind foot from Tondo windi was larger than the rest, but still too small to be buffalo. It seems that cattle were on average slaughtered comparatively older than the sheep/goat. However, this remains tentative, due to the limited data on ages at death that could be collected. Some butchery marks have been found on bones of sheep/goat as well as cattle.

Apart from mammal bones that could be attributed either to a wild or domesticated taxon, there was also a large group of c. 600 undiagnostic bovid bones, separated in a group with small species (small or medium-sized antelopes, or sheep/goat) and large species (large antelopes, buffalo or cattle). Finally also some human (*Homo sapiens*) bones have been recorded among the faunal remains. These are discussed further in the chapter by Power & Haour later in this volume.

4 Discussion

4.1 *Taphonomy*

Some of the identified animals must have lived and died at the sites around the time of the human occupation, though independently of the humans. This is probably the case for many of the smaller animals: landsnails, frog or toads, small lizard, bats and micromammals. The wild carnivores were likely caught for their skin and the cutmarks on the baboon metatarsal suggest that the skin of this animal was also removed. However, most of the animal remains represent food refuse, as shown by their disarticulated and fragmented nature, as well as by occasional butchery marks. Animals that were not eaten are more likely to occur in concentrations of bones pertaining to one individual. Complete, articulated skeletons have not been found, but this may be due to post-depositional disturbance. Indeed, the fact that odd human remains are regularly encountered, hints at a relatively high degree of disturbance. Burning has been observed on the bones of consumed taxa but is probably not linked to food preparation. For some animals, the taphonomic category is not clear. Snakes are usually considered intrusive, but in BLAF Trenches 4 and 6 they occur in large numbers, and there is no obvious reason to assume that they represent the remains of one individual. They may well therefore have been eaten. For the dogs and equids, it is not clear whether they were eaten or not. Molluscs do not seem to have been consumed at the studied contexts and it has been suggested earlier that molluscs were not eaten in West Africa in the past, unless perhaps in times of famine (Connah & McMillan 1995).

4.2 *Fish and Fishing*

The general pattern that has emerged from the study of the animal remains is an emphasis, sometimes very strong, on the exploitation of aquatic fauna, in the first instance fish, but also aquatic reptiles, and especially terrapins. The emphasis on aquatic resources is similar to what has been observed at other sites in West Africa near large water basins (Linseele 2007). In the studied material from Dendi, there is variation in the importance of aquatic resources within and between sites (Table 25.1; Figure 25.1). This may partially be connected to taphonomy, in the sense that on living floors the larger bones, mainly of mammals, would have been removed, resulting in overrepresentation of taxa with smaller bones, and thus of fish. In waste disposal areas, the opposite pattern could be expected. However, living floors have only sporadically been recorded. A question is, whether in areas with lower proportions of mammals, mammal bones have perhaps been destroyed differentially. However, although there is always some degree of bias due to differential preservation, it is believed that the predominance of aquatic fauna at the Dendi sites reflects a true human behavioural pattern. The large number of different aquatic taxa can be connected to the presence of a large water body, the River Niger. However, looking at the different habitats in which the fish were caught, it seems that mainly the floodplain and marshy areas were being exploited, rather than the main river channels. The underrepresentation of open water fish speaks against specialised fishers. Recent specialised

fishers in Dendi, who are actually a small subgroup of all the people who fish, exploit the main river channel with boats (van Driel 2002: 54). The lungfish is probably the only fish that can be caught in the floodplain until well into the dry season, and its presence has been linked to permanent settlements (Linseele 2007: 107). It is also reported that lungfish is occasionally found by farmers ploughing their fields in the floodplain (Daget 1949). Adult tilapia and clariid catfish were most common among the investigated faunal remains indicating a concentration of fishing activities early in the (first) flood season, around September, when these fish spawn in shallow water (Van Neer 2004). Clariid catfish spawn for a relatively short period only and disperse after that (Bruton 1979), while tilapia have a prolonged stay on the flood plain where they can easily be caught in their circular nests (Bruton and Boltt 1975). The composition of the aquatic fauna for the moment seems similar at the different sites and contexts (Figure 25.2). Small variations may be due to the slight differences in the type of environments exploited. No patterns in skeletal distribution (e.g. underrepresentation of vertebrae; see Linseele & Haour 2010) or other possible indications for the export of fish have been noted as yet.

4.3 *Wild Birds and Mammals, Fowling and Hunting*

The economic importance of birds may have been very small and the wild bird taxa reflect the presence of aquatic environments. A limited number of remains of terrestrial wild game has been found, but nevertheless includes a relatively large number of different species. Hunting does not seem to have been an important activity to obtain food and was probably often opportunistic in nature. Part of the hunting activities may have been aimed at the protection of fields rather than for food. The habitat requirements of the animals found are indicative of a vegetated savanna and gallery forests, as evidenced by the charcoal analyses (see Eichhorn, this volume). Wild game must have been attracted to the Niger River Valley and the floodplains because of the drinking water available there, particularly during the dry season.

4.4 *Domesticated Animals and Herding*

All major domesticated animals were present at the studied sites, chicken, dogs, horse, sheep, goat and cattle. The low numbers in which they were found may seem surprising in view of the recent dates of the site, particularly in the case of the food species. The small size of the caprines and cattle can probably be linked to their life in an environment near the River Niger. Small stature in domesticates has been connected to resistance to humidity related diseases (MacDonald & MacDonald 2000). Unsuitable environmental conditions may also explain why domestic livestock was not more common. A continued importance of wild animal resources is more typical for the wetter areas of West Africa, where keeping domesticated animals is more difficult (Gautier & Van Neer 2005). At the

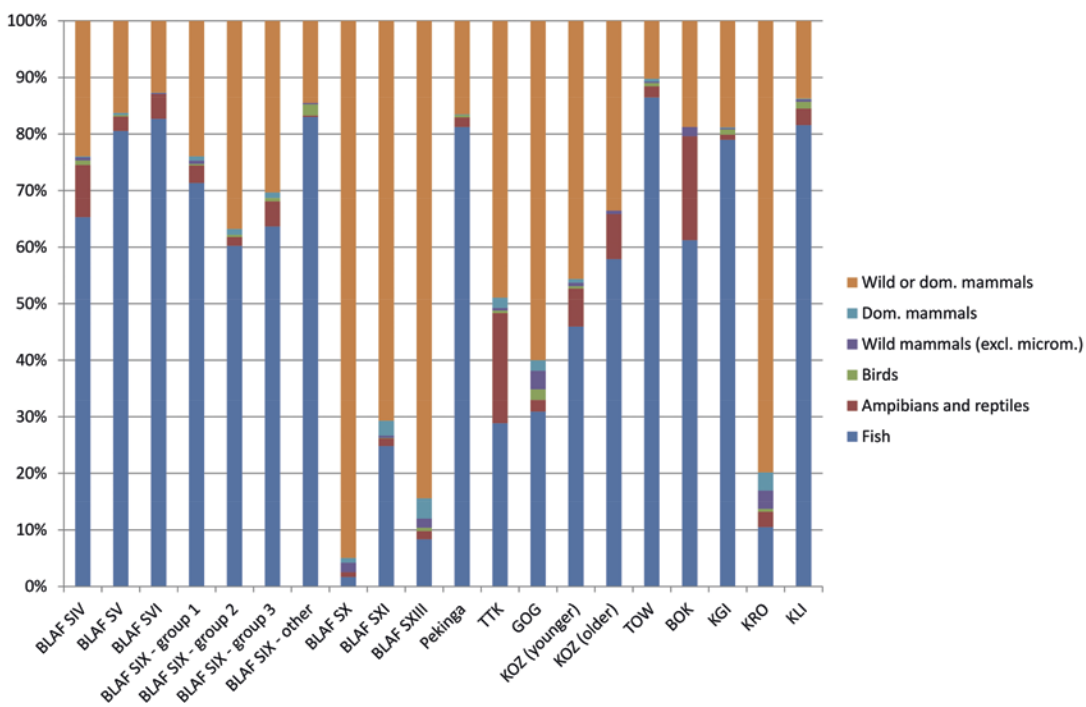

FIGURE 25.1 Proportions of numbers of identified remains by group of animals. Samples of less than 100 specimens have been excluded. See Table 1 for absolute numbers of bones and text for abbreviations of site names. Unidentified remains of each group have been included.

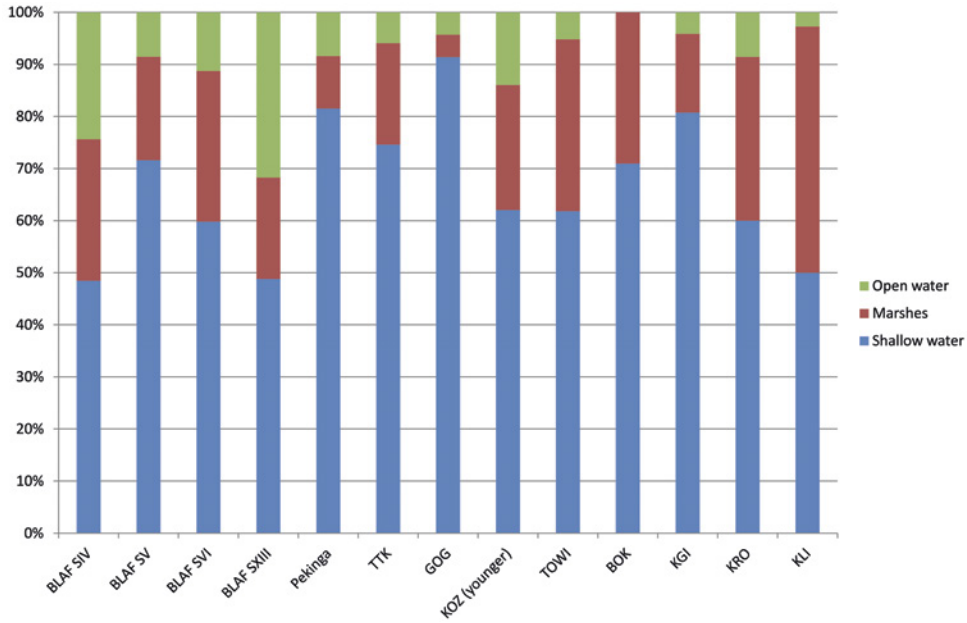

FIGURE 25.2 Proportions of numbers of fish grouped by major habitat type. Samples of less than 20 fish specimens attributable to a habitat type have been excluded. See Table 1 for absolute numbers of bones. See text for abbreviations of site names and fish taxa included in each group.

studied sites in Dendi, cattle bones were in general slightly more common than those of caprines, but this is rather variable according to location (Table 25.1). Environmental conditions, but also the function of the sites and the social status of the sites inhabitants, may have been factors determining herd composition. Sheep remains were less common than those of the hardier goat. Pastoral nomadic groups were at least seasonally present in Dendi in recent times, but have not been documented archaeologically. A problem with pastoral nomadic sites is their poor archaeological visibility because of the ephemeral nature of occupation, certainly in comparison to sites of farmers and fishers (Linseele 2007). Both for the cattle and sheep/goat, apart from the small individuals, some larger individuals were present. It is possible that these larger ones were obtained through contacts with pastoral nomads and that the smaller ones were kept locally.

4.5 *Diachronic or Spatial Patterns in Faunal Composition?*

Until now, the fauna has been discussed mainly by animal group, but in what follows an attempt is made to describe particularities of the faunal composition of different contexts. A few samples were too small to be discussed any further, such as is the case for Trench 3 at Birnin Lafiya. Gorouberi yielded, apart from a marine shell and an ivory bracelet, one clariid catfish bone, but mainly unidentifiable mammal bones. Despite the very small sample, the absence of fish is interesting to note and makes the assemblage stand out from most of the other studied assemblages. The sample from Boukouroubou was even smaller and contained no fish. At Birnin Lafiya, Trenches 4, 5 and all phases of trench 9 yielded a lot of fish, in contrast to trenches 10, 11 and 13. These differences do not seem to be diachronic and the variation within the same site suggests that, unless there were important short term fluctuations in river levels, the natural environment may not have been the only parameter determining the importance of fish. Of the four chronological groups in Birnin Lafiya Trench 9, Group 2 had more sheep/goat remains than the others, Group 3 more intrusive animals. Other differences within this trench have for the moment not been found. Of the sites with larger assemblages, Kantoro, Bogo Bogo and Tin Tin Kanza had comparatively few fish remains. The inland positions of Kantoro and Bogo Bogo, away from the River Niger and its floodplains, may be an explanation in these cases. However, there is no obvious possible explanation for the lower numbers of fish at Tin Tin Kanza. In both trenches at the site, large numbers of terrapin bones were found in comparison to elsewhere. Perhaps terrapins were particularly easy to catch locally, in the marshes around the site. Kozungu has the oldest deposits of all sites but at this stage, the fauna does not seem to be different to elsewhere.

The archaeobotanical data show some clear diachronic shifts in the predominant crops, particularly in the propor-

tion of rice (Champion & Fuller, this volume). There has not been time to verify whether there are parallel changes in faunal composition. It can be imagined that the cultivation of rice in wetland, for example, had repercussions on fish and their exploitation by humans. The possible link with a higher social status and the presence of horse in BLAF SV has already been mentioned, and also proportionally larger numbers of cattle may be linked to a higher social status, amongst others. Monitor lizard (de Buffrénil 1993), snake (Benkheira 2000) and crocodile (Lewicki 1974: 96) are all animals that are not eaten by certain Muslim groups, apart from more obvious taboo animals like dog and pig, both wild and domesticated (Simoons 1994). At this point, no obvious patterns in the animal composition are seen that could be linked to cultural taboos or preferences.

5 Conclusions and Prospects

The studied faunal remains from Dendi point to an emphasis on aquatic resources, notably fish and terrapins, to obtain animal proteins in historical periods. Most evidence is from the eleventh to fourteenth centuries AD or later. Mainly shallow water and marshy habitats of the flood plain were exploited and therefore we may not be dealing with specialist fishers, but rather fisher-farmers. This makes sense when combined with the archaeobotanical data (see Champion & Fuller, this volume), which point to an import component of décrue farming, i.e. farming in the flood plain at low water levels. The same environment thus seems to have been exploited in different ways depending on the part of the year. It is possible that fish were traded from Dendi to other areas, but the species composition, skeletal element distribution and traces on the fish remains need to be investigated more closely in order to make firmer statements on this. Hunting was probably an occasional and opportunistic activity. The hunted animals point to a green savanna type of environment and probably, without humans, such an environment would still exist in Dendi today. Domesticated cattle, goat and a few sheep were kept, but were recorded in the archaeological assemblages in limited numbers only. These livestock animals were mainly small-sized and this may be linked with the humid circumstances and associated diseases in the Niger River Valley. The horse may be seen as a marker of high social status. Although variation in the faunal composition has been recorded between and within sites, it has not been possible to establish clear and meaningful diachronic trends. This report is not an end product of faunal analyses, but rather a starting point for finer and more detailed studies. The *Crossroads of Empires* project is now finished, but research on the Dendi region is ongoing, particularly anthropological and archaeobotanical studies. Additional faunal analyses – about half of the remains have been studied at present state of research – are also planned and these will be integrated into this growing body of information. It is not expected that these additional analyses will alter the general image. The aim of the continued archaeozoological research is to concentrate on fishing in Dendi and to investigate the productivity and the sustainability of this activity compared to hunting and stock keeping to obtain animal proteins, as well its relation with crop cultivation. Regional and local climatic and environmental changes, including changes in river behaviour, will therefore also be considered. These will have influenced subsistence strategies on the one hand, and on the other hand need to be known in order to better distinguish between anthropogenic impact and natural changes to the environment.

CHAPTER 26

Human Skeletal Material

Ronika K. Power and Anne Haour

1 Introduction

This chapter offers an initial inventory and description of the material recovered by the *Crossroads of Empires* project. The remains discussed here primarily concern material from the large mound site of Birnin Lafiya, and specifically, from Trenches 3/10, 6, 9, 11 and 13 at that site. Material from the sites of Kantoro and Kozungu, and from a small trial excavation on one of the islets on the Niger River at the level of the hamlet of Pekinga, are also presented.

The majority of the remains are fragmentary and dispersed. The nature of some of the contexts in which they were recovered, ie. layers suggestive of wall melt, suggests that remains may have been in a secondary or even tertiary context, a hypothesis in line with their level of extreme fragmentation. With the exception of clearly diagnostic items such as teeth, human remains were typically only identified definitely during post-excavation analysis, retrieved by Linseele during the faunal analysis and forwarded on to the present authors. Limited samples were taken from the two *in situ* burials recovered during excavations, one from Birnin Lafiya Trench 11 (Lee, this volume) and the other, a juvenile, within the large-scale exposure of a compound (Nixon, this volume); these are also discussed here.

No soil chemistry studies have been undertaken in the area with a particular concern for conditions of archaeological preservation, but the poor state of most of the remains is consistent with expectations in an area of alternating extreme aridity and heavy seasonal rainfall. In addition, the overburden of the heavy clayey soils is likely to have contributed to some of the fragmentation noted. That much of the damage occurred *in situ* is indicated by the extensive fracturing and fragmentation noted even on those remains that were excavated with the greatest care, using a dental pick and fine brush. Ploughing and excavation trauma are to be considered a factor in the Pekinga Baobab excavation. In addition, once excavated, remains will certainly have suffered from the poor state of the roads between Dendi and the Benin capital Cotonou, followed by air shipment to Europe, despite being carefully packed, usually within re-used metal powdered milk canisters.

In terms of dating and stratigraphy, the broad nature of the four deep stratigraphies at the large mound of Birnin Lafiya – Trenches 4, 9, 11 and 13 – have been well discussed elsewhere in this volume, but some further notes specifically addressing the context from which the human remains were retrieved are appropriate here. In addition, some of the contexts mentioned here are not discussed elsewhere in the book and will thus be briefly presented at this point.

Pekinga Baobab site was investigated as part of a wider examination of the interplay between water and topography in this region. This past settlement mound lies close to the River Niger floodplain, and 58km northwest of Birnin Lafiya. The Pekinga Baobab profiles were dug as a series of test pits. These were dug in spits and sieved (<2mm). The materials (incuding bone) were selected from this material and depths recorded. The dates returned were submodern.

Birnin Lafiya Trench 6 for its part was an initial investigation, in the 2012 field season, of an area of the site characterised by the surface presence of cord-wrapped-multiple-stick-roulette pottery; the excavation yielded a good suite of ceramic material and two dates placing the deposits to late eighth and very early thirteenth century AD, that is, the main period of occupation at Birnin Lafiya as identified in other units. But this excavation could not be completed due to lack of time and thus has not been discussed in detail in this book. Trench 8, in 2013, represented a completed investigation of that same part of the site.

Some material was issued from Trench 3/10, which is an architectural complex, well dated through 14 radiocarbon dates ranging from 921 ± 23 bp (OxA-29892) to 740 ± 40 bp (Beta-305218) (Haour et al. 2016; Nixon, this volume).

As far as Trench 9 is concerned this is a deep, well-dated section through the northeastern part of the site of Birnin Lafiya. The human remains discussed in this chapter are issued from a first millennium context, at a depth of 230–240cm, in a layer identified as rubble from collapsed houses at the time of excavation (Livingstone Smith & Nikis, this volume). It is supposed that the human bone fragments may have been excavated during the extraction of clay by past inhabitants, and inadvertently integrated into bricks/mud walls.

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For Trench 11, a deep, well-stratified section through the southern part of the site, the key context is an *in situ* burial in Context 23, at the base of the unit, which is directly dated to 1560 ± 30 bp (Beta-345492). The skeleton was lying on its back, fully flexed, skull on its right side facing west; the upper part of the body was well preserved, the lower part decayed. Possibly related to this burial are Contexts 18 and 21, both of which yielded remains which are discussed here. Context 18, which sealed the burial, is dated to 1460 ± 30 bp (Beta-412224); Context 21 for its part is undated but its distinctiveness and spatial relationship to the burial suggest it may have been a grave marker, or represent the remains of a layer originally covering the grave but then removed (Lee, this volume). The upper part of the trench is dated to 890 ± 30 (Beta-412222) on Context 1, and 920 ± 30 bp (Beta-412223) through a date on Context 3 which relates also to Context 5 and to a large iron implement (SF 2014-204) and pottery pavement. Problematically, contexts 12, 14, 15 and 16, from which came a number of the notable human remains discussed here, fall within the undated middle part of the stratigraphy, bracketed by the two pairs of dates just mentioned but otherwise undated. It is planned to run further dates on these in the near future.

Trench 13 is a deep stratigraphy in the west part of the site. Three dates from other parts of the trench place its date at late first millennium AD. The contexts from which the human remains were issued (Contexts 12 and 15) have not been dated, as these were encasing sediment rather than the pit fills on which our dating efforts focused. As in the case above, it seems from the sediment in which they were recovered that these human remains were in a secondary or even tertiary context, excavated during clay extraction and integrated into bricks/mud walls.

There are no dates on the juvenile burial in Trench 16 (Figure 26.1). Question marks still surround the context of this burial: it occurred under a house floor and in such a central position below a room space that it seems unlikely to be unrelated to it, but the fill of the grave included a range of materials such as slag, fauna and pottery, indicating some degree of mixing. A level of post-depositional disturbance was confirmed by the analysis undertaken for this chapter, which identified a pedal element near the mandible. We consider the burial most likely took place in the same timeframe as the final phase of use of the architectural complex, that is to say around the eleventh to thirteenth centuries.

The sites of Kozungu and Kantoro are also considered. Kozungu lies close to the settlement mound of Birnin Lafiya and is identified as one of the other precursor sites of the community. Kantoro lies about 17km south-southeast of Birnin Lafiya. The human remains discussed here from Kozungu, SI, are from part of the sequence dating to the poorly-understood mid-first millennium AD. Finally, human remains from both test pits excavated on the settlement mound of Kantoro have been studied.

FIGURE 26.1 Nestor Labiyi excavating at Birnin Lafiya Trench 16

Though only Trench II has been dated, the nature of the material points to a similar spread as in Trench I, that is tenth to early thirteenth century.

2 General Observations

Upon examination, the assemblage was determined to contain comingled elements of both human and faunal skeletal remains, as well as assorted items of material culture including ceramic fragments, a bead, a quantity of slag and some unidentifiable objects/materials. The faunal elements and material culture were separated from the human remains, maintaining all relevant contextual information, and are not discussed here.

Almost all skeletal elements are highly fragmented, with rare exceptions including a few juvenile pedal phalanges and some deciduous teeth. This observation is worth noting, as it is often assumed that juvenile skeletal remains are more susceptible to taphonomy than those of adults, and thus less likely to survive intact in archaeological contexts (for discussion of this issue, see Lewis 2007: 23–26). Across the assemblage, individual bone fragments average between 0.5–3.0cm in length and present both transverse and longitudinal postmortem fractures. Osseous preservation is generally good across both cortical and trabecular structures, although the bone appears to be quite demineralised and it is suspected that there is little chance of collagen preservation. The bone is generally very pale brown to light yellowish brown in colour and does not appear to have been excessively weathered, although sun bleaching was observed in several contexts. No skin, hair or textiles were observed in association with the skeletal material. Neither adhesives nor consolidants were applied to any of the examined remains during excavation or post-excavation processes. Burnt bone was only encountered in one context (Birnin Lafiya Trench 3/10; Context 8).

3 Methodology

Every bone fragment was examined in order to identify the original element, and wherever possible, to determine the side of the body from whence they were derived. On occasion, the elements were too fragmented or damaged to reliably assign anatomical identity or siding. An inventory was created in order to record all extant elements and facilitate the establishment of a minimum number of individuals (MNI) within the assemblage (see Table 26.1, below).

4 Results Summary

The assemblage was determined to feature an MNI of at least 6 individuals, although given the high fragmentation levels and wide spread of contexts from which remains were retrieved; it is probable that the original number of interments was much higher. The demographic profile features at least four adults (based on duplication of the left maxillary third permanent molar and the right mandibular first permanent molar); at least one child of 1.5–10.5 years of age (based on the presence of a right mandibular first deciduous molar); and at least one perinatal baby (based on fragments of the distal humerus and proximal ulna). The age of the child exhumed from within the architectural compound at Birnin Lafiya (Trench 16, presumed eleventh to thirteenth centuries) may be further refined to 6 years (±24 months) based on examination of photographs detailing dental development (see Figure 26.2; schema after Ubelaker 1989: Fig. 71). The size and stage of development of pedal elements examined from this context also support an approximate age of 6 years (Scheuer & Black 2000: 434–439, 453–462, 464–466; Baker et al. 2005: 124–153).

Remains were too fragmentary to assign biological sex to all but one individual: a very robust mandible with a thick corpus and pronounced mental trigone was examined from the site of Pekinga Baobab and assessed to be that of a "possible male" (criteria after Buikstra & Ubelaker 1994: 20, Fig. 4).

Each fragment was also examined in order to identify any pathology, non-metric traits, congenital variation, occupationally-related change and cultural modification. The incidence of pathology was quite low within the sample, although it should be noted that the highly fragmented state of the remains may be obfuscating further observations. Fragments presenting pathological lesions include a right frontal bone (Birnin Lafiya Trench 11; Context 16: 230–240cm; currently dated to between 900–1500 bp), which retains a portion of the orbit. *Cribra orbitalia* is observed on the orbital surface of the anteromedial aspect of the orbital plate (see Figure 26.3). Only part of the lesion is extant due to fragmentation. This lesion appears to have been healing at the time of death. The aetiology of *cribra orbitalia* is much-debated within palaeopathological literature, with recent studies challenging the formerly widely-held notion that it may be attributed to iron-deficiency anaemia. Walker and colleagues (2009: 119) argue that the cause/s may be more variable and perhaps less specific, including infantile megablastic anaemia acquired through depleted maternal B_{12} reserves, in conjunction with nutrient loss associated with gastrointestinal infections

TABLE 26.1 Inventory of human skeletal remains and associated material derived from the *Crossroads of Empires* Project

Birnin Lafiya, 2012 excavations	
Trench 3, Con 8	Fragment of crown of ***36*** (?), burnt, petrified
Trench 6, C Con 3	Distal femoral metaphysis fragment (unsided) **Taphonomy:** General bone preservation: poor Cortical bone preservation: poor General colour: Munsell Very Pale Brown (10YR 8/4) to Light Yellowish Brown (10YR 6/4) PM damage: general fracturing transverse and longitudinal; fragmentation; bleaching; excavation/handling trauma Staining: no Weathering score: From 3 = patches of rough homogeny, compact bone, rounded cracks; to 4 = course, fibrous, rough splinters, open cracks Likelihood of collagen preservation: slim-to-none
Trench 6, interface of 3 and 1	R III metatarsal fragment, distal aspect; <4cm **Taphonomy:** General bone preservation: fair Cortical bone preservation: fair General colour: Munsell Pale Brown (10YR 6/3) PM damage: general fracturing transverse and longitudinal; fragmentation; excavation/handling trauma Staining: no Weathering score: 0 = no signs of cracking or flaking due to weathering Likelihood of collagen preservation: slim-to-none
Trench 6 Con 1 50cm	Small fragment of ulna diaphysis (unsided); <4cm **Taphonomy:** General bone preservation: fair Cortical bone preservation: fair General colour: Munsell Pale Brown (10YR 6/3) PM damage: general fracturing transverse and longitudinal; fragmentation; excavation/handling trauma Staining: no Weathering score: 0 = no signs of cracking or flaking due to weathering Likelihood of collagen preservation: slim-to-none

TABLE 26.1 Inventory of human skeletal remains and associated material derived from the *Crossroads of Empires* Project (*cont.*)

Pekinga Baobab	
Pekinga BAOBAB 1, Spit 3	Femoral metaphyseal fragments (unsided) Assorted diaphyseal fragments L frontal bone fragment **Taphonomy:** General bone preservation: poor Cortical bone preservation: poor General colour: Munsell Pale Brown (10YR 6/3) PM damage: general fracturing transverse and longitudinal; fragmentation; excavation/handling trauma Staining: no Weathering score: From 1 = cracks parallel to fibre structure, mosaic cracks of articular surfaces; to 2 = flaking on the outer layers with cracks, angular crack edges (a lot of sediment adheres to cortical surface)
Pekinga BAOBAB 2, Spit 3	L humerus, distal aspect and diaphyseal fragments; *N.B.* the L olecranon fossa presents a small septal aperture (non-metric trait) L ulna, proximal aspect, featuring olecranon, trochlear notch and fragmentary coronoid process R + L radial diaphyseal fragments Vertebral fragment Rib fragments × 7 **Other:** Faunal fragment **Taphonomy:** General bone preservation: poor Cortical bone preservation: poor General colour: Munsell Pale Brown (10YR 6/3) PM damage: general fracturing transverse and longitudinal; fragmentation; excavation/handling trauma Staining: no Weathering score: From 1 = cracks parallel to fibre structure, mosaic cracks of articular surfaces; to 2 = flaking on the outer layers with cracks, angular crack edges (a lot of sediment adheres to cortical surface)
Pekinga BAOBAB 2, Spit 3	R radius fragment, distal diaphysis with R lunate adhering with depositional matrix L ulna fragment, proximal aspect L clavicle fragment, medial aspect L scapula, fragments of glenoid fossa, root of spine and lateral border Assorted diaphyseal fragments 0.5–5cm, × >20

TABLE 26.1 Inventory of human skeletal remains and associated material derived from the *Crossroads of Empires* Project (*cont.*)

	Rib fragments × ~14 Manual intermediate phalanx fragments × 2 R distal III metacarpal fragment Vertebral fragments × ~10 **Other:** Faunal fragments Ceramic fragment × 1 (rim fragment) **Taphonomy:** General bone preservation: poor Cortical bone preservation: poor General colour: Munsell Pale Brown (10YR 6/3) PM damage: general fracturing transverse and longitudinal; fragmentation; excavation/handling trauma Staining: no Weathering score: From 1 = cracks parallel to fibre structure, mosaic cracks of articular surfaces; to 2 = flaking on the outer layers with cracks, angular crack edges (a lot of sediment adheres to cortical surface)
Pekinga BAOBAB 2	Corpus of mandible, fragmented, retained dentition ***31–32, 34–37, 41–47*** (see **Appendices 1** and **2**); mandible appears very robust, corpus is thick, mental trigone is quite pronounced [*possible male*] Mandibular metrics: Chin Height (*id-gn*): 31.80mm; Mandibular Body Height: (R) 33.48mm; Mandibular Body Breadth: 14.48mm R *pollux* (metacarpal I), fragmented R III metacarpal, fragmented, proximal aspect Unidentifiable distal metacarpal, fragmented L clavicle, fragmented L(?) scapula fragments × 2 Assorted diaphyseal fragments × ~10 Radial diaphyseal fragments × 2, unsided Rib fragments × ~22 Vertebral fragments × ~24 Unidentifiable bone fragments 0.5–3cm × >20 **Other:** Faunal fragments Ceramic fragments × 2 (including 1 rim fragment) **Taphonomy:** General bone preservation: poor Cortical bone preservation: poor

TABLE 26.1 Inventory of human skeletal remains and associated material derived from the *Crossroads of Empires* Project (*cont.*)

	General colour: Munsell Pale Brown (10YR 6/3) PM damage: general fracturing transverse and longitudinal; fragmentation; excavation/handling trauma Staining: no Weathering score: From 1 = cracks parallel to fibre structure, mosaic cracks of articular surfaces; to 2 = flaking on the outer layers with cracks, angular crack edges (a lot of sediment adheres to cortical surface) Likelihood of collagen preservation: slim-to-none
Pekinga BAOBAB 3 Spit 3	L os coxae, including ischial tuberosity, iliac crest and greater sciatic notch, fragmented Femoral diaphysis fragment (unsided) Assorted unidentified diaphyseal and metaphyseal fragments × >30 **Taphonomy:** General bone preservation: poor Cortical bone preservation: poor General colour: Munsell Pale Brown (10YR 6/3) PM damage: general fracturing transverse and longitudinal; fragmentation; excavation/handling trauma Staining: no Weathering score: From 1 = cracks parallel to fibre structure, mosaic cracks of articular surfaces; to 2 = flaking on the outer layers with cracks, angular crack edges (a lot of sediment adheres to cortical surface)
Birnin Lafiya, 2013 excavations	
Trench 9, Con 1, 230–240	***81***, individual <1.5 years of age due to open apex Juvenile rib fragments × ~7 Cranial fragments × >60, <1.5cm **Taphonomy:** General bone preservation: poor Cortical bone preservation: poor General colour: Munsell Very Pale Brown (10YR 7/3) PM damage: general fracturing transverse and longitudinal; fragmentation; excavation/handling trauma Staining: no Weathering score: 0 = no signs of cracking or flaking due to weathering Likelihood of collagen preservation: slim-to-none

TABLE 26.1 Inventory of human skeletal remains and associated material derived from the *Crossroads of Empires* Project (*cont.*)

Trench 10, Con.4	Dentin calcification crown of ***28***
Trench 11, Context 5	Fragmented ***16, 21, 24, 25, 26***; plus fragment of unidentified molar crown; *N.B.* ***16*** presents Carabelli's cusp (non-metric trait) Unidentifiable diaphyseal fragment **Taphonomy:** General bone preservation: poor Cortical bone preservation: poor General colour: Munsell White (10YR 8/1) to Pale Brown (10YR 6/3) PM damage: general fracturing transverse and longitudinal; fragmentation; sun bleaching; excavation/handling trauma Staining: no Weathering score: From 3 = patches of rough homogeny, compact bone, rounded cracks; to 4 = course, fibrous, rough splinters, open cracks Likelihood of collagen preservation: slim-to-none
Trench 11, Context 9	Cranial fragments × 3 (parietal) **Taphonomy:** General bone preservation: poor Cortical bone preservation: poor General colour: Munsell Pale Brown (10YR 6/3) PM damage: general fracturing transverse and longitudinal; fragmentation; excavation/handling trauma Staining: no Weathering score: 0 = no signs of cracking or flaking due to weathering Likelihood of collagen preservation: slim-to-none
Trench 11, Context 11, 190–200cm	R zygomatic fragment × 1 Rib fragment × 1 **Taphonomy:** General bone preservation: poor Cortical bone preservation: poor General colour: Munsell Very Pale Brown (10YR 7/3) PM damage: general fracturing transverse and longitudinal; fragmentation; excavation/handling trauma Staining: no Weathering score: 0 = no signs of cracking or flaking due to weathering Likelihood of collagen preservation: slim-to-none

TABLE 26.1 Inventory of human skeletal remains and associated material derived from the *Crossroads of Empires* Project (*cont.*)

Trench 11, Context 11, 200–210cm	Rib fragments × 2 **Taphonomy:** General bone preservation: poor Cortical bone preservation: poor General colour: Munsell Very Pale Brown (10YR 7/3) PM damage: general fracturing transverse and longitudinal; fragmentation; excavation/handling trauma Staining: no Weathering score: 0 = no signs of cracking or flaking due to weathering Likelihood of collagen preservation: slim-to-none
Trench 11, Context 12, 170–180cm	Rib fragment × 1 Juvenile cranial fragment × 1; <2cm L petrous portion of temporal bone fragment × 1, juvenile *circa* perinate Unidentified bone fragments × >20; <1cm **Taphonomy:** General bone preservation: poor Cortical bone preservation: poor General colour: Munsell Pale Brown (10YR 6/3) PM damage: general fracturing transverse and longitudinal; fragmentation; excavation/handling trauma Staining: no Weathering score: 0 = no signs of cracking or flaking due to weathering Likelihood of collagen preservation: slim-to-none
Trench 11, Context 14	R distal humerus fragment, perinate R proximal ulna fragment, perinate R distal radius fragment, perinate L ulna diaphysis fragment, perinate **Taphonomy:** General bone preservation: fair Cortical bone preservation: fair General colour: Munsell Pale Brown (10YR 6/3) PM damage: general fracturing transverse and longitudinal; fragmentation; excavation/handling trauma Staining: no Weathering score: 0 = no signs of cracking or flaking due to weathering Likelihood of collagen preservation: slim-to-none

TABLE 26.1 Inventory of human skeletal remains and associated material derived from the *Crossroads of Empires* Project (*cont.*)

Trench 11, Context 15, Level 1	R radius, fragmented, proximal aspect and diaphysis extant; juvenile (perinatal). *N.B.* Periosteal woven bone deposition is observed on the proximal aspect of this element, in the area surrounding the radial tuberosity, and inferior to the epiphyseal line. Appears to have been active at the time of death. Possible non-specific infection. Taphonomy: General bone preservation: poor Cortical bone preservation: poor General colour: Munsell Pale Brown (10YR 6/3) PM damage: general fracturing transverse and longitudinal; fragmentation; excavation/handling trauma Staining: no Weathering score: 0 = no signs of cracking or flaking due to weathering Likelihood of collagen preservation: slim-to-none
Trench 11, Context 16, 220–230cm	Radius diaphyseal fragments × 2, unsided Ulna diaphyseal fragment × 1, unsided Diaphyseal fragments × 2; <1.5cm Cranial fragments × 5; <3cm **Taphonomy:** General bone preservation: poor Cortical bone preservation: poor General colour: Munsell Very Pale Brown (10YR 8/4) to Light Yellowish Brown (10YR 6/4) PM damage: general fracturing transverse and longitudinal; fragmentation; sun bleaching; excavation/handling trauma Staining: no Weathering score: From 3 = patches of rough homogeny, compact bone, rounded cracks; to 4 = course, fibrous, rough splinters, open cracks Likelihood of collagen preservation: slim-to-none
Trench 11, Context 16, 230–240cm	Fragments of ***11, 17, 18, 22, 24, 28, 32, 38, 43, 46, 48***; plus fragmented tooth roots. *N.B.* ***11, 22*** are observed to have been modified antemortem. The enamel on the mesio – and distolabial aspects of these teeth has been deliberately removed, leaving a triangular-shaped enamel platform on each tooth. Very small areas of sheen on the modification margin indicate *in vivo* wear, therefore suggesting that the modification was antemortem. *N.B.* ***11***: Non-metrics: tooth presents *tuberculum dentale* to a score of 3 (Strong ridging; Turner *et al.* 1991: 16). *N.B.* ***22***: Morphological variation: tooth presents *dens invaginatus coronalis* (Alt & Türp 1998: 98). Cranial fragments × 16.

TABLE 26.1 Inventory of human skeletal remains and associated material derived from the *Crossroads of Empires* Project (*cont.*)

	N.B. Fragments include a R frontal bone, which retains portions of the supraorbital margin, zygomatic process and orbital plate. The orbital surface of the orbital plate presents *cribra orbitalia*, consistent with Stuart-Macadam's Level 4 criteria, where foramina have linked into a trabecular surface, interspersed with porosity. Due to fragmentation only part of the lesion is extant; the maximum dimensions are W: 12.28 × L: 6.38mm. The lesion appears to be located in the anteromedial aspect of the orbital vault. (After Stuart-Macadam 1991: 109, Figures 9.3a & b). This lesion appears to have been healing at the time of death. **Taphonomy:** General bone preservation: poor Cortical bone preservation: poor General colour: Munsell Very Pale Brown (10YR 8/4) to Light Yellowish Brown (10YR 6/4) PM damage: general fracturing transverse and longitudinal; fragmentation; sun bleaching; excavation/handling trauma Staining: no Weathering score: From 3 = patches of rough homogeny, compact bone, rounded cracks; to 4 = course, fibrous, rough splinters, open cracks Likelihood of collagen preservation: slim-to-none
Trench 11, Context 16	Fragments of ***12, 13, 14, 21, 23, 24, 25, 27, 28, 35, 36, 37, 44, 45, 46***; plus fragmented tooth roots Mandibular alveolar process fragment × 1 Vertebral fragment × 1 Cranial fragments × ~22 Assorted diaphyseal fragments 0.5–3cm, × >20 **Other:** Faunal fragments *N.B.* ***12, 21*** are observed to have been modified antemortem. The enamel on the mesio – and distolabial aspects of these teeth has been deliberately removed, leaving a triangular-shaped enamel platform on each tooth. Very small areas of sheen on the modification margin indicate *in vivo* wear, therefore suggesting that the modification was antemortem. *N.B.* ***21***: Non-metrics: tooth presents *tuberculum dentale* to a score of 2 (Trace ridging; Turner *et al.* 1991: 16). *N.B.* ***12***: Morphological variation: tooth presents *dens invaginatus coronalis* (Alt & Türp 1998: 98). **Taphonomy:** General bone preservation: poor Cortical bone preservation: poor General colour: Munsell Very Pale Brown (10YR 8/2) to Light Yellowish Brown (10YR 6/4) PM damage: general fracturing transverse and longitudinal; fragmentation; sun bleaching; excavation/handling trauma Staining: no Weathering score: From 3 = patches of rough homogeny, compact bone, rounded cracks; to 4 = course, fibrous, rough splinters, open cracks Likelihood of collagen preservation: slim-to-none

TABLE 26.1 Inventory of human skeletal remains and associated material derived from the *Crossroads of Empires* Project (*cont.*)

Trench 11, Context 18	Vertebral fragments × 4 Crown of ***13*** Mental trigone of mandible (too fragmented to use for sex assessment); fragment of L mandibular corpus L clavicle, lateral aspect; fragment of L clavicle diaphysis L scapula fragment of acromion process Cranial fragments × ~14; R zygoma fragment Assorted diaphyseal fragments 0.5–3cm, × >20 **Other:** Faunal fragments **Taphonomy:** General bone preservation: poor Cortical bone preservation: poor General colour: Munsell Very Pale Brown (10YR 8/4) to Light Yellowish Brown (10YR 6/4) PM damage: general fracturing transverse and longitudinal; fragmentation; sun bleaching; excavation/handling trauma Staining: no Weathering score: From 3 = patches of rough homogeny, compact bone, rounded cracks; to 4 = course, fibrous, rough splinters, open cracks Likelihood of collagen preservation: slim-to-none
Trench 11, Context 18	Humerus diaphyseal fragment × 1 Scapula fragment × 1 **Taphonomy:** General bone preservation: poor Cortical bone preservation: poor General colour: Munsell Very Pale Brown (10YR 8/4) to Light Yellowish Brown (10YR 6/4) PM damage: general fracturing transverse and longitudinal; fragmentation; sun bleaching; excavation/handling trauma Staining: no Weathering score: From 3 = patches of rough homogeny, compact bone, rounded cracks; to 4 = course, fibrous, rough splinters, open cracks Likelihood of collagen preservation: slim-to-none
Trench 11, Context 18	Cervical vertebral body × 1 **Taphonomy:** General bone preservation: poor Cortical bone preservation: poor General colour: Munsell Very Pale Brown (10YR 7/3)

TABLE 26.1 Inventory of human skeletal remains and associated material derived from the *Crossroads of Empires* Project (*cont.*)

	PM damage: general fracturing transverse and longitudinal; fragmentation; excavation/handling trauma Staining: no Weathering score: 0 = no signs of cracking or flaking due to weathering Likelihood of collagen preservation: slim-to-none
Trench 11, Context 21	Mandibular fragment × 1 (mental eminence and partial R corpus) Diaphyseal fragments × 6 **Taphonomy:** General bone preservation: poor Cortical bone preservation: poor General colour: Munsell Pale Brown (10YR 6/3) PM damage: general fracturing transverse and longitudinal; fragmentation; excavation/handling trauma Staining: no Weathering score: 0 = no signs of cracking or flaking due to weathering (a lot of sediment is still attached to bone) Likelihood of collagen preservation: slim-to-none
Trench 11, Context 23	L mandibular condyle fragment Rib fragments × 11 L distal ulna fragment Proximal manual phalanx fragment (unsided) **Taphonomy:** General bone preservation: fair Cortical bone preservation: fair General colour: Munsell Very Pale Brown (10YR 8/4) to Light Yellowish Brown (10YR 6/4) PM damage: general fracturing transverse and longitudinal; fragmentation; sun bleaching; excavation/handling trauma Staining: no Weathering score: 1 = cracks parallel to fibre structure, mosaic cracks of articular surfaces Likelihood of collagen preservation: slim-to-none
Trench 11, Context 23	Crowns of ***27, 28***
Birnin Lafiya, 2014 excavations	
Trench 14	Crown of ***48***

TABLE 26.1 Inventory of human skeletal remains and associated material derived from the *Crossroads of Empires* Project (*cont.*)

Trench 16, fragment	~7 fragments <3cm, one of which may be a portion of the mandibular notch (?) Taphonomy: General bone preservation: poor Cortical bone preservation: poor General colour: Munsell Very Pale Brown (10YR 8/4) to Light Yellowish Brown (10YR 6/4) PM damage: general fracturing transverse and longitudinal; fragmentation; sun bleaching; excavation/handling trauma Staining: no Weathering score: From 3 = patches of rough homogeny, compact bone, rounded cracks; to 4 = course, fibrous, rough splinters, open cracks Likelihood of collagen preservation: slim-to-none
Trench 16 near jaw	R II metatarsal of juvenile, circa 6 years of age, fragmented **Taphonomy:** General bone preservation: fair Cortical bone preservation: fair General colour: Munsell Pale Brown (10YR 6/3) PM damage: general fracturing transverse and longitudinal; fragmentation; excavation/handling trauma Staining: no Weathering score: 0 = no signs of cracking or flaking due to weathering Likelihood of collagen preservation: slim-to-none
Trench 16	Unidentified bone fragment; <1cm **Taphonomy:** General bone preservation: poor Cortical bone preservation: poor General colour: Munsell White (10YR 8/1) to Pale Brown (10YR 6/3) PM damage: general fracturing transverse and longitudinal; fragmentation; sun bleaching; excavation/handling trauma Staining: no Weathering score: From 3 = patches of rough homogeny, compact bone, rounded cracks; to 4 = course, fibrous, rough splinters, open cracks Likelihood of collagen preservation: slim-to-none

TABLE 26.1 Inventory of human skeletal remains and associated material derived from the *Crossroads of Empires* Project (*cont.*)

Trench 16	Unidentified cranial fragment of juvenile; <1.5cm **Taphonomy:** General bone preservation: fair Cortical bone preservation: fair General colour: Munsell Very Pale Brown (10YR 8/3) PM damage: general fracturing transverse and longitudinal; fragmentation; excavation/handling trauma Staining: no Weathering score: 0 = no signs of cracking or flaking due to weathering Likelihood of collagen preservation: slim-to-none
Trench 16	Unidentified L(?) metatarsal diaphyses of juvenile, circa 6 years of age, fragments × 2 Proximal pedal phalanges of juvenile × 2 Distal pedal phalanx of juvenile × 1 **Taphonomy:** General bone preservation: fair Cortical bone preservation: fair General colour: Munsell Pale Brown (10YR 6/3) PM damage: general fracturing transverse and longitudinal; fragmentation; excavation/handling trauma Staining: no Weathering score: 0 = no signs of cracking or flaking due to weathering Likelihood of collagen preservation: slim-to-none
Trench 16	Fragmented ***54***
Trench 16	Intact ***61, 62, 63***
Trench 16	Intact ***83*** *N.B.* Antemortem tooth wear associated with habitual behavior is observed on this deciduous tooth. The wear presents as a strongly demarcated crescent-shaped facet on the distal aspect of the occlusal surface of the crown. The margins of the feature are sharp and smooth. The maximum dimensions of the feature are W: 4.40 × 2.48mm.

TABLE 26.1 Inventory of human skeletal remains and associated material derived from the *Crossroads of Empires* Project (*cont.*)

Trench 16, Context 1	Cranial fragments × >20; <2cm, juvenile **Taphonomy:** General bone preservation: poor Cortical bone preservation: poor General colour: Munsell Pale Brown (10YR 6/3) PM damage: general fracturing transverse and longitudinal; fragmentation; excavation/handling trauma Staining: no Weathering score: 0 = no signs of cracking or flaking due to weathering Likelihood of collagen preservation: slim-to-none
Trench 16, Context 1	2 × unidentified bone fragments; <1cm **Taphonomy:** General bone preservation: poor Cortical bone preservation: poor General colour: Munsell Pale Brown (10YR 6/3) PM damage: general fracturing transverse and longitudinal; fragmentation; excavation/handling trauma Staining: no Weathering score: 0 = no signs of cracking or flaking due to weathering Likelihood of collagen preservation: slim-to-none
Trench 16	Cranial fragments × >20; <2cm, juvenile **Taphonomy:** General bone preservation: poor Cortical bone preservation: poor General colour: Munsell Pale Brown (10YR 6/3) PM damage: general fracturing transverse and longitudinal; fragmentation; excavation/handling trauma Staining: no Weathering score: 0 = no signs of cracking or flaking due to weathering Likelihood of collagen preservation: slim-to-none
Trench 16	Unidentified bone fragments × >20; <1cm **Taphonomy:** General bone preservation: poor Cortical bone preservation: poor

TABLE 26.1 Inventory of human skeletal remains and associated material derived from the *Crossroads of Empires* Project (*cont.*)

	General colour: Munsell Very Pale Brown (10YR 8/4) to Light Yellowish Brown (10YR 6/4) PM damage: general fracturing transverse and longitudinal; fragmentation; sun bleaching; excavation/handling trauma Staining: no Weathering score: From 3 = patches of rough homogeny, compact bone, rounded cracks; to 4 = course, fibrous, rough splinters, open cracks Likelihood of collagen preservation: slim-to-none
Trench 13, Context 15, 210–220cm	Fragmented ***23*** Unidentified bone fragment, <1cm **Taphonomy:** General bone preservation: poor Cortical bone preservation: poor General colour: Munsell Pale Brown (10YR 6/3) PM damage: general fracturing transverse and longitudinal; fragmentation; excavation/handling trauma Staining: no Weathering score: 0 = no signs of cracking or flaking due to weathering Likelihood of collagen preservation: slim-to-none
Trench 13, Context 12, 100–110cm	Proximal manual phalanx fragment, distal aspect, unsided Intermediate manual phalanx fragment, proximal aspect, unsided Taphonomy: General bone preservation: poor Cortical bone preservation: poor General colour: Munsell Pale Brown (10YR 6/3) PM damage: general fracturing transverse and longitudinal; fragmentation; excavation/handling trauma Staining: no Weathering score: 0 = no signs of cracking or flaking due to weathering Likelihood of collagen preservation: slim-to-none
Kozungu SI, 80–90	***31***? Tooth extremely worn, only maximum 4mm of crown extant. Wear is unusual in so far as the primary occlusal surface/wear platform is curved/convex, with the apex of the curve at the most mesial aspect of the tooth. There is also a secondary wear facet/carious lesion observed on the distal interproximal aspect of the tooth, presenting as a crescent-shaped erosion of the crown. This facet/lesion is located in the distal interproximal cervical region, with maximum dimensions of W: 4.39 × L: 2.85 × D: 1.04mm. Identification of element difficult due to level of wear.

TABLE 26.1 Inventory of human skeletal remains and associated material derived from the *Crossroads of Empires* Project (*cont.*)

Kantoro SII, 50–60	Distal juvenile L radius diaphysis (?) fragment; <6cm Juvenile radius diaphysis (?) fragment, unsided; <3cm Unidentified fragment (possible faunal?); <3cm **Taphonomy:** General bone preservation: poor Cortical bone preservation: poor General colour: Munsell Pale Brown (10YR 6/3) PM damage: general fracturing transverse and longitudinal; fragmentation; excavation/handling trauma Staining: no Weathering score: 0 = no signs of cracking or flaking due to weathering Likelihood of collagen preservation: slim-to-none
Kantoro SI, 40–70	L lateral aspect of 1st cervical vertebra (atlas) Proximal manual phalanx, unsided **Taphonomy:** General bone preservation: poor Cortical bone preservation: poor General colour: Munsell Pale Brown (10YR 6/3) PM damage: general fracturing transverse and longitudinal; fragmentation; excavation/handling trauma Staining: no Weathering score: 0 = no signs of cracking or flaking due to weathering Likelihood of collagen preservation: slim-to-none
Kantoro SI, 50–60	R *pollux* (metacarpal 1), fragmented, proximal aspect **Taphonomy:** General bone preservation: poor Cortical bone preservation: poor General colour: Munsell Pale Brown (10YR 6/3) PM damage: general fracturing transverse and longitudinal; fragmentation; excavation/handling trauma Staining: no Weathering score: 0 = no signs of cracking or flaking due to weathering Likelihood of collagen preservation: slim-to-none

TABLE 26.1 Inventory of human skeletal remains and associated material derived from the *Crossroads of Empires* Project (*cont.*)

Kantoro SI, 80–90	Fragment of ***11***
	L humerus fragment, distal aspect; maximum width (epicondylar breadth) = 50.6mm
	R rib, fragmented
	Distal pollucial phalanx, unsided
	Taphonomy:
	General bone preservation: poor
	Cortical bone preservation: poor
	General colour: Munsell Pale Brown (10YR 6/3)
	PM damage: general fracturing transverse and longitudinal; fragmentation; excavation/handling trauma
	Staining: no
	Weathering score: 0 = no signs of cracking or flaking due to weathering
	Likelihood of collagen preservation: slim-to-none
Kantoro SI, 100–110	Cervical vertebral body × 1
	Taphonomy:
	General bone preservation: poor
	Cortical bone preservation: poor
	General colour: Munsell Pale Brown (10YR 6/3)
	PM damage: general fracturing transverse and longitudinal; fragmentation; excavation/handling trauma
	Staining: no
	Weathering score: 0 = no signs of cracking or flaking due to weathering
	Likelihood of collagen preservation: slim-to-none

Tooth notation (numerals in ***bold italics***) follows the convention established by the *Fédération Dentaire Internationale* (ISO 3950). No skin, hair or textiles were observed in association with the skeletal material. Neither adhesives nor consolidants were applied to any of the examined remains during excavation or post-excavation processes.
(Abbreviations: R = right; L = left; PM = post-mortem)

FIGURE 26.2 Birnin Lafiya Trench 16 child burial, detailing dental development, right lateral view

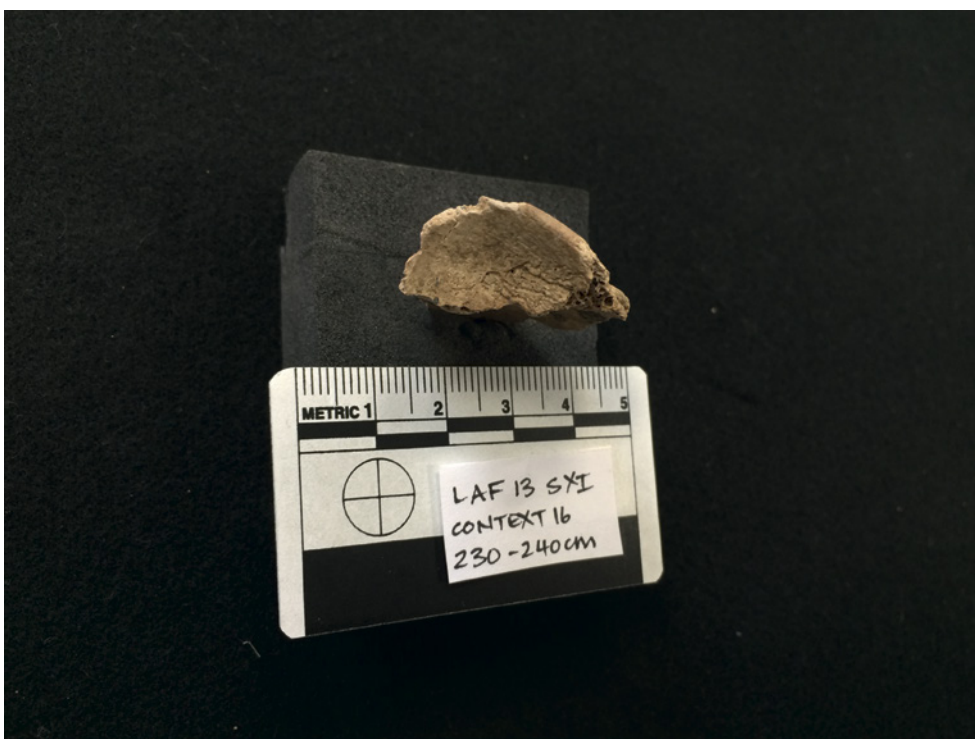


FIGURE 26.3 Fragment of a right frontal bone, inferior view, exhibiting *cribra orbitalia* on the orbital surface of the anteromedial aspect of the orbital plate (Birnin Lafiya Trench 11; Context 16: 230–240cm)

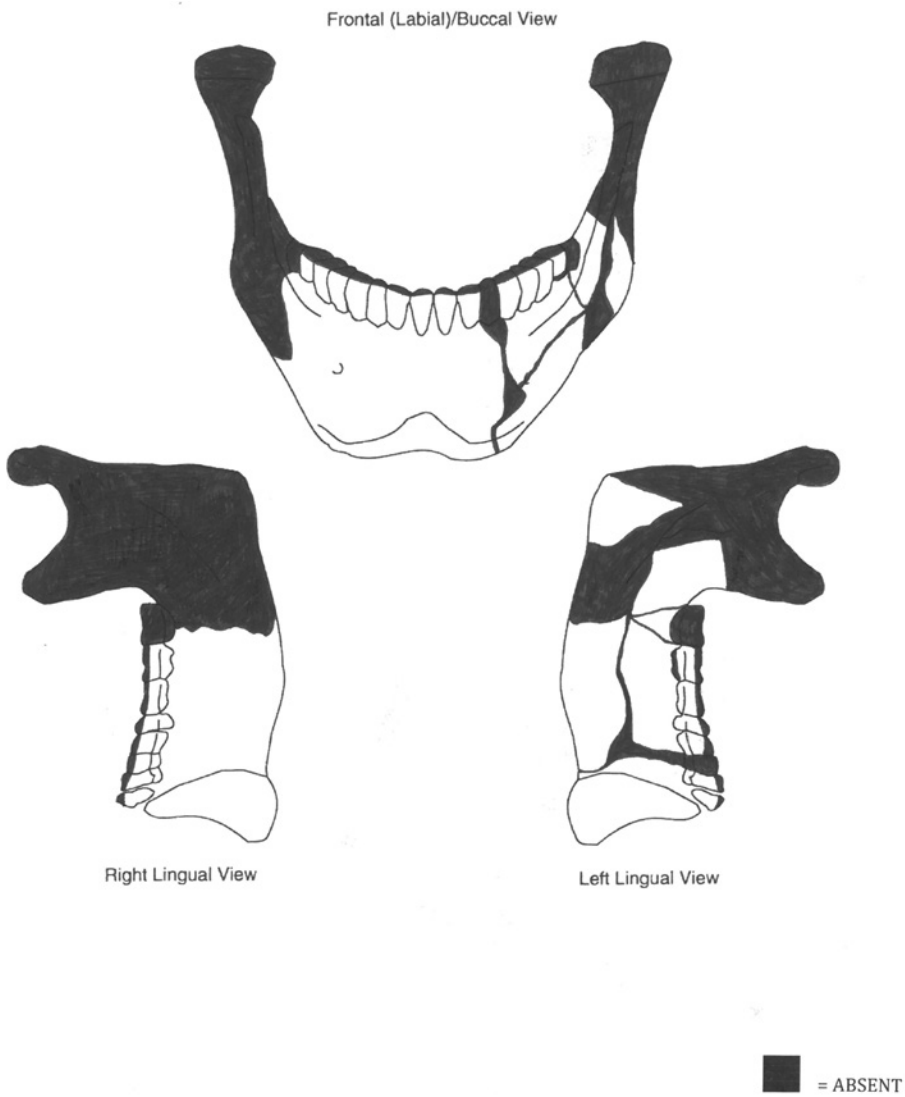
acquired through exposure to unsanitary living conditions during the process of weaning (see Oxenham & Cavill 2010; Rothschild 2012; and McIlvaine 2013 for arguments). Causes may also include subperiosteal bleeding associated with co-deficiencies of vitamins C and B_{12}; or specific deficiency of Vitamin C (scurvy; Walker et al. 2009: 119). *Cribra orbitalia* has also been described as a symptom of chronic eye infections such as trachoma (Webb 1990); malaria (Rabino Massa et al. 2000; Nerlich et al. 2008; Gowland & Western 2012; Smith-Guzmán 2015); and/or chronic inflammation and osteoporosis (Wapler et al. 2004).

Antemortem tooth wear associated with habitual behaviour is observed on a deciduous right mandibular canine tooth (Birnin Lafiya Trench 16). The wear presents as a strongly-demarcated crescent-shaped facet with sharp and smooth margins on the distal aspect of the occlusal surface of the crown (see Figure 26.4). It is likely that this wear facet was caused by the engagement of the teeth as a 'third hand' (Eshed et al. 2006), by placing objects between the upper and lower tooth rows to be held in the corner of the mouth, and may even provide clues towards individual handedness. Diachronic and synchronic evidence for this practice has been noted in archaeological and ethnographic populations across cultures (Molnar 1971; Larsen 1985; Eshed et al. 2006; Volpato et al. 2012), however in this context, this observation is of particular interest considering that the individual under study was a child of approximately 6 years of age. Further study may reveal the particular practices associated with such wear patterns, potentially including occupation and recreation, diet, as well as the age at which such practices were undertaken within the community to which this child belonged.

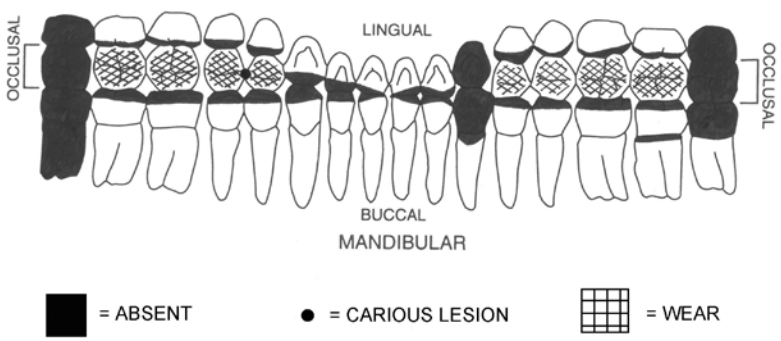
Additional insights into juvenile health may be gleaned from the observation of a proliferative lesion on a fragmented right radius (Birnin Lafiya Trench 11, Context 15). The size and developmental stage of the extant portion of this element indicate that it was from a perinate (Scheuer & Black 2000: 289–298; Baker et al. 2005: 107–109). Periosteal woven bone deposition is observed on the proximal aspect of the radius, and the lesion appears to have been active at the time of death (see Figure 26.5). As an isolated fragment, it is only possible to attribute the lesion to a possible non-specific infection. Nevertheless, this finding indicates that infectious diseases were experienced by this community and were a contributing factor in infant morbidity and mortality, as in so many pre-industrial societies across the globe (Lewis 2007: 133).

The identification of four modified teeth was a highlight of the analysis of this assemblage. One of each of the right and left permanent central and lateral maxillary incisors (***12, 21***: Birnin Lafiya Trench 11, Context 16; ***11, 22***: Birnin Lafiya Trench 11, Context 16, 230–240cm) are observed to have been modified antemortem. Evidence including the shared archaeological context, anatomical alignment within the dental arcade, and similarity of modification patterns combines to strongly suggest that these elements are all derived from one individual. In each case, the enamel on the mesio- and disto-labial aspects of the teeth has been removed down to the level of the dentine, leaving a triangular-shaped enamel platform on each tooth. The adjacent right and left permanent maxillary canines (***13, 23***: Birnin Lafiya Trench 11, Context 16) do not appear to feature any modification, nor do any of the remaining dentition of the maxillary or mandibular arcades. Under microscopic examination, very small areas of sheen on the modification margins indicate *in vivo* wear, therefore indicating that the modification occurred antemortem. The limited nature and extent of these wear patterns suggests that the modification may have taken place a relatively short time before death. Alternatively, the individual may not have used the mouth in a typical fashion if they were suffering chronic ill health, or if the modifications (or the processes of producing them) caused pain or inhibited normal incisal activity. The position of these modifications – supero-lateral and -mesial to the incisal edge –, their clearly-defined shape and apparently symmetrical placement across the anterior dentition suggest that the enamel and adjacent dentine was deliberately removed in a precise, controlled manner. These factors therefore qualify these teeth to be considered as examples of intentional alteration, or "active change", as opposed to incidental abrading, or "passive change" (Bocquentin et al. 2012: 386).

Reviews of the practice of dental modification in West Africa have been presented by Haour & Pearson (2004) and Finucane et al. (2008). These authors demonstrate that although a number of African populations are renowned for modifying their appearance by chipping, filing, notching or removing their teeth (Milner & Larsen 1991: 358; Finucane et al. 2008), there is proportionately little published evidence for the practice in West Africa. There is archaeological evidence from pre-colonial West Africa that teeth were modified as a sign of group affiliation (von Jhering 1882; Lignitz 1919–1920; Marshall 1946); and dental modification has also been described for West African slaves from the colonial era (Ortner 1966; Stewart & Groome 1968; Handler et al. 1982; Tiesler 2002; Price et al. 2006). Examples from prehistoric populations, however, are rare, and include those published from Kufan Kanawa, Niger (Haour & Pearson 2004), and the southern



APPENDIX 1 Visual inventory of Pekinga BAOBAB 2 (Spit 3: 60–80cm) mandible; (template after Buikstra & Ubelaker 1994: Chapter 5, Attachment 15b)



APPENDIX 2 Visual inventory of Pekinga BAOBAB 2 (Spit 3: 60–80cm) dentition; (template after Buikstra & Ubelaker 1994: Chapter 5, Attachment 14a)

FIGURE 26.4 Deciduous right mandibular canine tooth exhibiting antemortem tooth wear (Birnin Lafiya Trench 16)

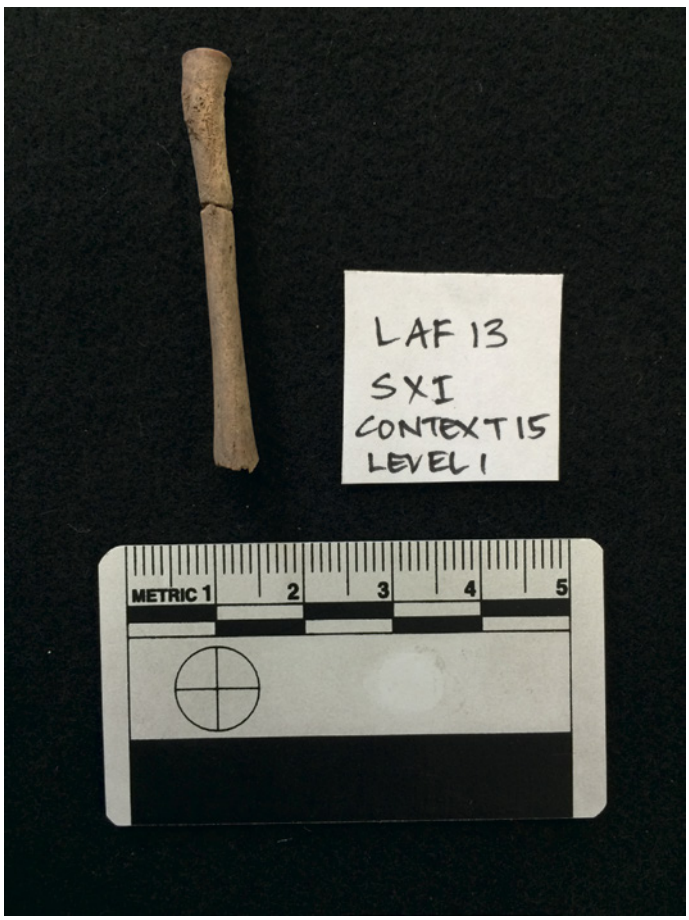


FIGURE 26.5
Fragmented right radius of a perinate exhibiting periosteal woven bone deposition on the proximal aspect (Birnin Lafiya Trench 11; Context 15: Level 1)

Tilemsi Valley of Mali (Finucane et al. 2008). As such, the material introduced here makes a valuable contribution to our understanding of this practice, particularly considering that the style of modification observed on the Benin teeth appears to be quite unique compared to those known within the literature.

The osteobiography of this individual is further extended via the description of distinct non-metric traits and morphological variations on all elements of modified dentition, described above. The right and left permanent maxillary central incisors present *tubercula dentale* (see Figures 26.6–7; Turner et al. 1991: 16). The trait expression is more pronounced on the right tooth, aligning with the "strong ridging" classification of the Arizona State University Dental Anthropology System (ASUDAS; Turner et al. 1991: 16), while the left maxillary central incisor presents "trace ridging". The right and left permanent maxillary lateral incisors also present different non-metric traits, in this case *dens invaginatus coronalis*, whereby the enamel has "folded" during ontogenesis (see Figures 26.8–9; Alt & Türp 1998: 98), creating invaginations of the cingula of both right and left teeth. These observations add a further level of interest to this individual, as the described traits are genetic in origin. If further contemporary individuals were recovered from this area, we may be able to use these and other dental traits to determine possible family relationships within the population. Regardless, even in isolation, the data derived from this individual are very important for contributing to knowledge of local and regional population dynamics in Benin, and on a broader scale, across West Africa. Although at present no absolute dates are available for the context from which these teeth were issued, as discussed above these layers are to be dated sometime in the second half of the first millennium AD or the very early part of the second millennium (between 1100 and 1500 bp). More detailed scientific descriptions and biocultural analyses of the dentition of this individual will be published in the near future.

In terms of dental pathology, carious lesions were observed on two teeth from the mandible excavated from the Pekinga Baobab site (Spit 3: 60–80cm), described above as being that of a "possible male". Here, an interproximal carious lesion occurs on the occlusal surfaces of adjoining first and second permanent mandibular premolars, extending across both teeth. The lesion is approximately circular in profile, with sharp margins and a maximum diameter of 2.76mm.

All but two of the teeth in the sample exhibit evidence of occlusal wear to a greater or lesser degree. Of the 61 teeth examined within this study, 24 (39.34%) present mild wear manifesting as facets on one or more cusps; 25 (40.98%) present moderate wear manifesting as dentine exposure on one or more cusps; and 10 (16.39%) present severe wear manifesting as the obliteration of cusps. Two teeth (3.28%) were excluded from wear analyses: one due to damage, the other as it was still in a nascent stage of development. It is noteworthy that even the juvenile teeth demonstrated similar wear to those of the adults, suggesting that the juvenile diet was comprised of similarly abrasive foods; or that cultural behaviour/s undertaken by children which may have involved the mouth (including but not limited to recreation and/or work) had a deleterious effect. We should also keep in mind that extrinsic factors can also be responsible for large-scale tooth wear, especially considering that inorganic particulate inclusions, essentially sand and grit in the diet, were often inadvertently or deliberately introduced into food through grinding and other preparation processes (Forshaw 2009).

There were no observations of dental abscesses among the sample, which is perhaps not surprising considering the low caries rate, as well as the fact that none of the observed wear was severe enough to result in pulp chamber exposure. Notwithstanding these details, it must also be borne in mind that the majority of the teeth in the sample had been exfoliated from the jaws post-mortem; this fragmentation inhibited the opportunity to assess even partially-intact maxillae and mandibles. As such, data presented here should be viewed with caution when considering incidence and prevalence rates of all forms of dental pathology within this assemblage.

Similar caution should extend to considerations of the representation of periodontal disease within this study. Thirteen teeth (21.31%) were associated with observations of periodontal disease, with nine categorised as 'slight' (resorption of the alveolar process, exposing 3–5mm of tooth root/s), and four as 'moderate' expressions (exposure of 4–5mm of tooth root/s). All observations of periodontal disease within the sample were restricted to the fragmented corpus of the 'possible male' mandible from Pekinga Baobab 2. When this evidence is viewed in conjunction with the preceding description of two carious lesions on this individual's teeth, as well as the following identification of dental calculus (calcified plaque), an image of a person with poor oral hygiene starts to emerge.

Calculus was observed among the sample, with 12 teeth (19.67%) presenting 'mild' calculus deposits. Of these, 8 pertain to the 'possible male' mandible from the Pekinga Baobab 2. Here again, it is imperative to note the possibility that the activity forces associated with post-mortem fragmentation and co-mingling of this assemblage may have been strong/focused enough to dislodge calculus

FIGURES 26.6–9 Right and left permanent central and lateral maxillary incisors, lingual view, featuring non-metric traits (11, 22: Birnin Lafiya Trench 11, Context 16 230–240cm; 12, 21: Birnin Lafiya Trench 11, Context 16)

deposits from teeth. As such, data presented here may not be a true reflection of the incidence of calculus within this sample but rather an underestimate.

There were no observations of linear enamel hypoplasia amongst the sample. This finding suggests that the individuals featured within the assemblage were not exposed to chronic nutritional or environmental stress or ill-health during the phases of the life course in which their dentition was forming (in-utero, infancy, childhood and adolescence).

The teeth were also examined for the purposes of recording non-metric traits, following the Arizona State University Dental Anthropology System (ASUDAS; Turner et al. 1991), as well as any other morphological variations. Observations amongst the sample include a Carabelli's Cusp on a permanent right maxillary first molar (Birnin Lafiya Unit 11, Context 5: Level 1), as well as the *tuberculum dentale* and *dens invaginatus coronalis* traits described on the modified teeth, above. This aspect of the research, as well as metric analyses, are part of an ongoing focal study.

Following metric and non-metric analyses and photographic recording, 27 permanent teeth (the selection included second premolars, and second and third molars) were isolated from the assemblage for the purposes of isotopic analyses. The selected teeth have been subject to chemical preparation by Power in the Dorothy Garrod Laboratory for Isotopic Analyses, Cambridge, and processed using isotope ratio mass spectrometry in the Department of Earth Sciences, Cambridge, for $\delta^{18}O$ (oxygen) and $\delta^{13}C$ (carbon) analyses. Results are pending and will be published in due course. Unfortunately, the aforementioned demineralised state of the bone makes collagen preservation unlikely, thus precluding the possibility of undertaking nitrogen isotopic analyses ($\delta^{15}N$), as well as precluding aDNA testing according to current methods.

Post-cranial fragments were also examined for non-metric traits. A small septal aperture was observed between the olecranon and coronoid fossae of the distal aspect of a fragmented left adult humerus (Pekinga Baobab 2 Spit 3: 40–60cm).

5 Concluding Remarks

The human remains excavated by the *Crossroads of Empires* Project are undoubtedly only a very small sample of the population that occupied the area during the timeframe relevant to the research. Furthermore, the highly fragmented and demineralised status of the material severely limits the broad suite of scientific analyses that are otherwise currently available in bioarchaeology. Nevertheless, these apparent obstacles were seized as an opportunity to demonstrate the utility of applying fundamental osteological and palaeopathological methodologies to even the smallest, most damaged of assemblages. We have been able to account for the lives and deaths of at least six individuals – among them, adults, children and an infant – providing a starting point upon which to build a demographic profile. We have also been able to illustrate that ill health, including infectious disease and dietary and/or metabolic stress, featured within the lived experiences of community members and in some cases, may have contributed to their demise. Finally, we have also been able to identify that at least one individual, or those around him/her, took dramatic steps to modify their body as a means to engage with culture. When these dental modifications are viewed in conjunction with this individual's epigenetic traits, we are presented with a comparatively rare opportunity to simultaneously apply considerations of corporeality and of materiality to access physical and cultural experiences of identity in this part of medieval West Africa. This report presents only an initial inventory and brief description of this assemblage. With ongoing research including isotopic, dental anthropology, material culture and geoarchaeological studies, the authors anticipate exploring our understanding of the biocultural archaeology of Benin in far greater depth and dimension.

6 Acknowledgements

Power undertook this research while engaged with the ERC-funded *Trans-Sahara Project*, under the direction of David Mattingly (University of Leicester) and in collaboration with Marta Mirazón Lahr and Tamsin O'Connell (University of Cambridge). The authors would like to thank Mirazón Lahr and Piers Mitchell (also University of Cambridge) for their comments regarding the assemblage, particularly the modified teeth; and Mirazón Lahr and Robert Foley for the use of the Palaeoanthropology Laboratory in the Leverhulme Centre for Human Evolutionary Studies, Henry Wellcome Building, University of Cambridge.

PART 5

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CHAPTER 27

Birnin Lafiya within West African Archaeology

Anne Haour and Sam Nixon

1 Introduction

The work we report in this volume concerns the large mound site of Birnin Lafiya, occupied over a period of nearly 1000 years (fourth to fourteenth centuries AD), and the dense archaeological landscape within which it sits. A key theme running through our work has been the interplay of various types of evidence: archaeological data, historical sources, oral tradition and today's technical traditions. Here, we cover the first two strands, to situate our work within the known archaeology of West Africa. Our focus is on Birnin Lafiya, the most thoroughly excavated site, with the best developed pottery sequence; but we also draw on archaeological materials from the rest of Béninois Dendi. Maps 1 and 2 show the location of sites.

One overarching concern here is the degree to which archaeology can shed light on the West African past in the absence of written records. For Dendi, as for many other regions of the world, interpretations must rest almost solely on archaeology, for what we know through historical sources is very limited. The Tarikh as-Sudan makes several mentions of Borgu and Dendi but attempts by the Songhai rulers Sunni Ali, Askia Mohammed and Askia Dawud to control the area were apparently unsuccessful (Hunwick 2003: xl). A campaign against Borgou reported around AD 1505–1506 produced many captives, including the future mother of Askia Musa (Hunwick 2003: lii, 109), while fifty years later Askia Dawud laid Bussa waste (Hunwick 2003: 148).[1] A great deal of discussion has concerned the role of Dendi as the seat of an independent Songhai force in the struggle against invading Moroccan forces in the early sixteenth century. The defeat of the Songhai army on the battleground of Tondibi in spring 1591 by mercenaries of al-Mansur, alluded to by the Timbuktu *tarikhs* as well as Moroccan and Spanish sources, "marked a turning point in the history of the Western Sudan … [eventually resulting] in Songhay's collapse and the decline of the Western trans-Saharan commerce" (Kaba 1981: 457). The resistance of Songhai against Moroccan forces seems to have been led partly out of Dendi (see Kaba 1981: 468–69 for overview) and some authors have taken this as an indication that the original Songhai heartland was in this region (Bovill 1926; Levtzion 1968; see also Dramani-Issoufou 1993). Hunwick (1994: 256) has suggested that the home of land-based Songhai speakers in the second half of the first millennium AD was in Dendi, with Kukyia at the northern limit of their territory. Delafosse (1912) has also argued for a location of a Songhai heartland around Kebbi and what is now southwestern Niger. Urvoy (1936: 36–53 & 64–70; particularly map page 45) too details a series of locations apparently relating to present-day or historical localities to the north of modern Dendi.

Beyond the above documentary historical insights, however, and barring a few mentions of places such as Muli or Yufi which we shall discuss below, it is difficult to obtain much more from the written sources. On the other hand, in archaeological terms, we are equally hampered by the lack of data in situating the sites of Béninois Dendi within the wider regional context: our work represents the only intensive study of a large settlement mound within a radius of roughly 400km. In addition, our area sits at the interface of two distinct environmental zones, forest and Sahel, which have undergone quite different trajectories of archaeological research.[2]

Large, deeply-stratified sites of a similar date in the Sahel have been both well-described archaeologically, and framed in such a way that they are known to globally-minded historians. These include Tegdaoust (Robert et al. 1970; Vanacker 1979; Devisse 1983; Polet 1985; Robert-Chaleix

1 Moraes Farias (2013) has suggested that the manner in which "Barku", i.e. Borgou, is referred to in the Tārīkh al-fattāsh as a source of kola nuts and gold (neither of which occur locally) suggests the region's role in regional trade.

2 In 1976, Posnansky and McIntosh (1976: 181) could write quite gloomily that "[t]he Sahelian region looms rich with potential, but as yet this has been depressingly short of realization", due at least in part to an overemphasis on the known historical profile (or historiography) of sites, and to a lack of emphasis of key archaeological aspects such as stratigraphy, finds and context. In a statement marking a reversal of that trend, thirty-five years later Chouin (2013: 45) estimated that Sahelian archaeology had been extremely successful at establishing a "discours historique problématisé et argumenté sur l'histoire de l'occupation humaine". For him, it is the wooded savanna areas to the south which now lag behind. Chouin (2012, 2013), like Casey (2010), feels that there remains a significant lack of archaeological research in those more vegetated regions, for reasons linked to researchers' biases rather than to the lack of intrinsic interest of the area.

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1989), Koumbi Saleh (Berthier 1997; van Doosselaere 2014), Essouk (Moraes Farias 2003; Nixon 2009, 2017), Gao (Insoll 1993, 1996, 1997, 2000; Cissé et al. 2013), and Marandet (Grébénart 1985, 1993; Bernus & Cressier 1991; S. Magnavita et al. 2007). Alongside these are sites which remain outside the realm of written history but which illuminate long-distance trade connections of the sort described by historical records. Two good examples here are Jenné-jeno (S. McIntosh 1995) and Kissi (S. Magnavita 2015). Finally, sites such as Sadia (Huysecom et al. 2015) or Oursi Hu-Beero (Petit et al. 2015), south of the Niger Bend, show how archaeology can shed light on aspects of daily life in the first millennium at sites which fall completely off the radar of historical sources.

These sites all lie to the north of Dendi. To the south of our area, coverage is much less even. Sites we can mine for comparative evidence are limited to Kirikongo in Burkina Faso, the mound sites now under Kainji Lake in Nigeria, the Nigerian savanna and forest sites such as Benin City, Ife or Oyo, and the mound sites of Ghana, such as New Buipe. The interplay of history and archaeology has been explored extensively in some regions: the studies of New Buipe, Oyo, Benin City or Ife stand out here. The history of most parts of forested West Africa prior to the fifteenth century however remains poorly understood – the tropical forest was seen as a place little conducive to the development of what archaeologists call 'complex societies', until the opening of transatlantic commerce (Chouin 2013; for more general remarks see Connah 2001).

In the following survey, we integrate data from both the Sahel and the savanna-forest regions, in order to better situate our evidence from Dendi, which lies at the frontier of these two zones. Our overview aims to provide a comparative perspective on Birnin Lafiya, discussing sites that are broadly similar in their overall nature (i.e. large mounds) or in some of their key features (e.g. architecture or pit features). This survey gives the backdrop to the wider West African landscape within which Birnin Lafiya existed.

2 Dendi within the Archaeology of the Southern Sahel and Savanna

2.1 *The Inland Niger Delta*

The Inland Niger Delta has a long history of archaeological investigation. Additionally, it has become well known since Jenné-jeno, located next to the important trading city of Djenne, provided early evidence of significant pre-Islamic urban settlement (S. McIntosh 1995a). Occupation began around the third century BC, and by about the third century AD Jenné-jeno had developed into a sizeable settlement, growing to a maximum size of 30 ha by the ninth century. The settlement declined c. AD 1100–1200 and was abandoned c. AD 1400, with a shift of population to the city of Djenne. In its mature phase, Jenné-jeno had a town wall, and there is also evidence of other architecture, including mud brick and pavements using flat-laid sherds (McIntosh 1995a).

Also located in the Inland Niger Delta, Dia is mentioned in the origin story of Wagadu (Delafosse 1912), often considered synonymous with the Empire of Ghana, as one of the earliest centres of the empire (Bedaux et al. 2005). With the decline of Ghana, Dia is said to have been one of the key points of departure for the Soninke diaspora. Gradual Islamisation may have begun at Dia from the eleventh century onwards, although the town did not fully convert to Islam until the mid-nineteenth century. Dia consists of two principal sites: Dia Mara, covering 28 ha, and Dia Shoma, covering 49 ha. The modern town of Dia (the central tell) is said to have been founded from Dia Mara, while Dia Shoma, the pre-Islamic town, is not mentioned in oral traditions (Bedaux et al. 2005: 14). Occupation at Dia Shoma is dated from 800 BC to after AD 1500 (Bedaux et al. 2005: 18, 39–40, 187–188). Three key phases are notable in relation to Dia's intermittent expansion. The site was founded by populations associated with the Tichitt ceramic tradition around 800 BC, and settlement size reached nearly 20ha at Dia Shoma only (Bedaux et al. 2005: MacDonald 2011). After a period of decline from c. 200 BC, settlement growth revived AD 500–1000 (Horizon III). Then, between AD 1000 and 1600, Dia sees its most significant and intensive period of occupation, probably across all three mounds. Satellite mounds existed in all of these periods of occupation.

The architectural remains at Dia are a significant feature of the site (see Bedaux et al. 2005). Rectilinear mud brick structures are visible on the surface to the extent that it was possible to trace the surface remains of houses over an area of 30 × 40 m. From these surface remains, the outlines of alleyways and structures with courtyards can be detected, as well as a zigzag enclosing wall in mudbrick in the north part of the site stretching over 230 m, with a likely date of the fourteenth century (Bedaux et al. 2005: 32, 117, 124). The excavated evidence has led to the very tentative suggestion that mud architecture at the site may date back to the first century BC-first century AD (Bedaux et al. 2005: 131).

There is also evidence for the use of potsherd paving at Dia. The most well-preserved and best-illustrated example is a small feature covered in worked sherds shaped into discs; while not fully described this feature does not

appear to be a paved floor surface (Bedaux et al. 2005:136, 417, Fig. 10.1.4). A range of other potsherd pavements are reported; wider survey identified at least 30 further sites featuring features identified as potsherd pavements (Bedaux et al. 2005: 522–527). However, these are not well illustrated, and it is also conceded that potsherd paving could be confused with scatters of broken potsherds (Bedaux et al. 2005: 135–136). The only other illustration of supposed potsherd paved surfaces appears to us to instead constitute a random arrangement of potsherds, rather than an intentionally created pavement (Keita 2005: 86; Fig. 3.8.2.3). No examples of pavements are reported in association with the well-preserved architecture. In terms of finds, relatively abundant slag occurs across the site, as well as stone, including carnelian, beads, and glass beads, seemingly present through all periods, except the terminal phase (Bedaux et al. 2005: 39, 263–77, 276–277). Terracotta figurines were recovered both from Dia (e.g. a single terracotta human head in the 'Djenne' style from Dia Mara dating to c. AD 1300–1400; Schmidt and Arazi 2005) and from the nearby site of Thial (including many large zoomorphic terracottas of sheep; Bedaux et al. 2005: 21).

The Méma, the arid zone northwest of the Inland Niger Delta, features widespread evidence for Iron Age sites including massive mound sites. Togola (2008) conducted extensive survey and targeted excavation within one area, recording 109 Iron Age sites of which 94 were settlement sites (Togola 2008: 13). Most were in the range of 10–20 ha, with the largest, Toladié, covering 80 ha (Togola 2008: 16). Togola defines an early period dating back to the Late Stone Age (LSA) and ending c. mid first millennium AD, and survey data suggest that 50% of the recorded sites fit into this period (Togola 2008: 15). The Middle Period (seventh to twelfth/fourteenth centuries AD) evidences the largest sites, but c. 38% were abandoned in this period. Mud/mud-brick surface structural remains were noted at a quarter of mound sites, but only seven featured clear architectural remains, in the form of rectilinear mud walls or circular house foundations (Togola 2008: 19). Abundant laterite pebbles occurred on site surfaces, considered to relate to mud-wall melt, but potentially evidence also of laterite pavements (Togola 2008). Four sites of c. 2 ha in size were surrounded by walls, perhaps compound walls.

Excavations focused on one site, Akumbu, strongly linked by oral tradition to the foundation of the Soninke polity of Wagadu, with a main c. 20 ha mound (Togola 2008: 23–35). Occupation evidence spanning the fourth to fourteenth centuries AD was uncovered, the largest mound dating to the seventh to fourteenth centuries, with over 6m of deposits. Features included curvilinear structures, associated with brick rubble including both circular and rectangular mud bricks. Burials were also recorded, one including cowrie shells, stone beads and copper bracelets (Togola 2008: 31).

This evidence points not only towards a thriving settlement network in the Méma, but also to participation in inter-regional interaction, including links with the Inland Niger Delta. The region was also clearly of great importance as a zone of large-scale intensive iron production.

2.2 *Along the Niger River from Timbuktu to Bentyia*

Moving eastwards, to the Niger Bend area, while excavations at the city of Timbuktu itself have so far produced no evidence of pre-modern deposits (Insoll 2002), survey and excavation in the surrounding area have revealed an intensively occupied landscape reaching back into the first millennium BC. This includes 'regional focus tells' in the range of 50–100 ha in size, with medium and smaller related mounds (McIntosh & McIntosh 1986a; Park 2010, 2011). These are between 3m and 9m high.

Excavations focused on the site of Tombouze, 10km from Timbuktu and 5km from the Niger River, which recovered an occupation spanning the fifth century BC to AD 1000 approximately (Park 2010: 1078–1083; Park 2011: 140). Tombouze consists of two sites divided by a seasonal stream, TBZ1 on the east bank measuring 50–75 ha and with 3.5m of deposits (Park 2011: 141), and on the west bank TBZ2, measuring 30–45 ha and with 3m of deposits (Park 2011: 143). A transfer between these two sites is evident, TBZ1 having its most significant development in the first two thirds of the first millennium but limited occupation after that, and TBZ2 seeing no occupation before AD 650, but then rapid expansion and occupation until c. AD 1000 (Park 2011: 183–86). The mud architecture recovered differs between the sites, TBZ1 featuring rectilinear, and TBZ2 curvilinear, architecture (Park 2011: 186–87). Carnelian and glass beads are recorded from first millennium AD contexts, but no earlier than the seventh century AD (Park 2011: 397–8).

Further east along the Niger is the complex of Gao. Gao was first mentioned, under the name of Kaw Kaw, in the ninth century, but it is not until the end of the tenth century that reference is made to a merchant town, as recounted in the twelfth century by Yaqut (Levtzion & Hopkins 2000: 174). Al-Bakri in c. 1068 also records the presence of two settlements at Gao, stating that one of the towns was inhabited by Muslims and that the ruler of the polity was Muslim (Levtzion & Hopkins 2000: 87). Dierk Lange and John Hunwick thoroughly debated the nature of Iron Age Gao, Lange (1991, 1994) arguing that its initial Za dynasty was of Mande origin (and indeed that the eastern Niger bend was part of the Mande world; in his

view the Songhai-speakers who inhabit the region today were latecomers, arriving from the east in the fifteenth century) while Hunwick (1980, 1994), broadly following the narrative of the Tarikh as-Sudan, believes the Za were Songhai speakers who moved to Gao in the ninth century from their previous capital at Kukyia. Most recently, demonstrating the importance of a study of the epigraphic evidence, Moraes Farias (2003: esp. Chapter 2) pointed out the need to consider the *tarikhs* as a political project; in his view, the chroniclers may have extrapolated their sparse knowledge of the Za dynasty back into mythical time, thus erasing from history any earlier rulers (Moraes Farias 2003: clxix).

In and around the modern town of Gao are archaeological components of varying ages, including Gao Ancien (under the modern city and thus difficult to investigate), Gao-Saney, and the Gao-Saney cemetery (Insoll 1996, 2000; Cissé et al. 2013). The site was first seriously investigated by Insoll (1996, 2000) who recovered a sequence of occupation dated back to the ninth century, with the first evidence for mud architecture in the ninth/tenth centuries AD. In eleventh-century deposits Insoll (1995) found a substantial cache of hippopotamus ivory, potentially destined for the trans-Saharan trade. Directly overlying this cache was mudbrick architecture likely dating to the eleventh/twelfth centuries. It was in these deposits that the bulk of items identified as trans-Saharan trade goods were recovered: glass beads, glass fragments, and glazed pottery. Overlying this horizon was a very substantial structure made of fired brick, with fired tile floors. Further exploration of this area of the site by Mamadou Cissé has provided a much better understanding of the wider structural complex – now thought to date to the eleventh century – of which this formed a part, including a large monumental pillared building made of schist (Cissé et al. 2013). These excavations also recorded further extensive evidence of trade imports.

A number of investigations have taken place over the years at the tell and cemetery of Gao Saney. The site was investigated, but never fully published, in the 1970s (Flight 1975). Moraes Farias (2003), amongst others, has investigated the inscriptions from the cemetery, which include a number referring to royal connections at the site, linked to groups with Berber names. Some debate had surrounded the likely date of the Saney sites, but Mamadou Cissé's recent work has shed significant further light on the matter. Most of the documented occupation sequence seems to fall prior to the Muslim kings and queens commemorated on the cemetery stelae. It begins ca AD 700 and ends by 1050, with possible continued activity into the twelfth century. There is extensive evidence for trade goods, with glass beads being heavily represented, mainly in eighth to tenth century AD deposits (Cissé et al. 2013: 27). The quantity of imported copper, vessel glass and glass beads supports the identification of Saney with the historical merchant town of Sarneh. There is also a much better understanding of the structures at the site.

Gao was most likely associated with riverine trade, including downriver. Of importance here is the complex of Bentyia about 125km away. Located at the Fafa and Labbezanga rapids, Bentyia lies at a strategic point in the same way as does Bussa, further south, also situated on rapids (Moraes Farias 2013: 26). Bentyia can almost certainly be equated with Koukiya, identified by some as the founding place of the Songhai dynasty (Lange 1994; Arazi 1999: map, Figure 13; Moraes Farias 2003, 2013). No excavation has taken place here, but surface survey has enabled comparison with other regional sites and ceramic assemblages. The Bentyia site extends over at least c. 33 ha (and possibly twice as much), and it is estimated to span the early first millennium AD to c. AD 1200, with possible earlier occupation (Arazi 1999: 37). Moraes Farias (2003, 2013: 8) suggests that the presence of Arabic epigraphy from the thirteenth to fifteenth centuries from the cemetery at Bentyia relates to trade activity downriver with Borgou, Yorubaland, and Hausaland. He proposes that Mande trading groups must have reached Bentyia/Kukyia no later than the fourteenth century AD, and points out that three of the earliest Bentyia inscriptions, from the closing decades of the thirteenth century AD, bear possible Manding names (Moraes Farias 2013: 73). These Manding-speaking groups must have found at Bentyia/Kukyia an already-established Songhai-speaking, Muslim, community of traders linked to the trade between Gao and the forest areas.

Less than 3km away from Bentyia, Bilimbiri Bero, covering c. 80 ha, is thought to date to approximately AD 1200–1600 and over 200 glass, semi-precious stone, and segmented clay beads were recovered here. Given their number and their similarity with items from Gao, Arazi (1999: 38) suggests that Bilimbiri Bero was a trade site linking Gao and Igbo-Ukwu; it may have grown as a new settlement associated with traders and exterior contacts, important long before the first usage of Arabic inscriptions. All in all, the wider survey of settlements around Bentyia identified 19 sites, six of which are allocated to the period of the early first millennium AD to c. AD 1200, seen therefore as "the most prolific settlement period within this survey area" (Arazi 1999: 36).

Other settlements were also identified around Ansongo slightly upriver, thought to relate to the early first millennium AD to c. AD 1200 (Arazi 1999). In short, the survey evidence, combined with the epigraphic evidence, suggests this zone was occupied in a similar time period to Birnin

Lafiya; the substantial size of the sites is a support for oral traditions identifying this as an early Songhai heartland.

2.3 *The Arc of the River Niger*

A number of sites are known from the Sahel zone lying under the broad arc of the River Niger. Kirikingo, in Burkina Faso, is situated at a similar latitude to Birnin Lafiya. Here, excavations on a cluster of 13 mounds spanning AD 100–1300 identified a range of structures. Floors of crushed laterite or a clay/laterite combination, as well as walls of sun-dried bricks or puddled mud, were recovered, including 2–2.5m diameter structures interpreted as huts, some featuring a bench or large pottery vessels, resembling the features recovered at Birnin Lafiya (Dueppen 2012). The suggestion is that Kirikongo, from beginnings as a single homestead, grew steadily until the early second millennium such that by AD 1300 (a phase called Red III), it comprised 10 mounds across a 37 ha site and included ironworking and potting specialists, mines for laterite ore, and a large communal structure (Dueppen 2012). Kirikongo then seemingly underwent a rapid population decrease and by AD 1400 it was half the size it had been 100 years earlier.

The settlement site of Sadia in central Mali consists of five adjacent anthropogenic mounds over c. 3 ha, and archaeological deposits dating to the eighth to late thirteenth centuries AD (Huysecom et al. 2015). Extensive horizontal exposure of an occupation dated AD 1010–1270 evidenced a series of curvilinear and rectilinear walls of sun-dried mud bricks, indicating the location and shape of former circular buildings and the limits of domestic spaces. With inner diameters of c. 1.5 m, most of the better-preserved structures likely did not serve as living spaces but less well-preserved circular walls exist, hinting at larger structures that may be interpreted as former houses (Huysecom et al. 2015). Sadia offers a striking parallel to the structural evidence found at Birnin Lafiya, involving a tight 'beehive' pattern of construction, through which a number of circular buildings are linked to each other by straight or curved walls forming small courtyards (Huysecom et al. 2015). Remains of buildings dating to the final phase (approximately mid-eleventh to late thirteenth centuries AD) were found amid a densely packed arrangement of features such as post-holes, pits, hearths, hardened occupation floors and burials, providing a relatively detailed insight into the spatial organisation.

The site of Tongo Maaré Diabal, northeast of Sadia, is located at the extreme eastern margin of the historic Inland Niger Delta and at the northern edge of the Bandiagara escarpment (MacDonald 1998). The site measures c. 9 ha and is the largest of a dispersed group of village-sized settlements of a similar age; 13 sites were identified in a 5km radius (Gestrich, pers. comm. May 2016). Excavations documented a sequence from c. AD 500 to 1150, with over 4m of deposits (MacDonald 1998; Gestrich & MacDonald 2018). Subsequent work by Gestrich (2013) involved a large horizontal exposure of the uppermost occupation horizon. Architectural preservation throughout the sequence is excellent, with remains of buildings standing more than 1m high in places. Over 20 buildings have been mapped, relating to five distinct periods of rebuilding. Changes in the materials used (coursed earth, mudbrick) and the shape of structures (curvilinear, rectilinear) occur over the sequence. Significant finds from the site include early textiles and an equestrian terracotta statuette, one of only two known from first millennium AD West Africa (MacDonald 1998; MacDonald & Camara 2011). The suggestion is that the site's inhabitants were involved in the production and processing of iron on a large scale, traded with urbanised areas in the Inland Niger Delta, and that they were linked into a network spanning the Middle Niger and the Niger Bend (Gestrich 2013).

Continuing clockwise geographically, one comes to the settlement mound complex of Oursi Hu-Beero, northeast Burkina Faso (Petit et al. 2011), where excavations have revealed a spectacularly preserved mud architecture complex dating to the eleventh/twelfth centuries AD, with 30 or so individual circular rooms of 3.5–4m in diameter and associated courtyards and linking spaces, as well as clusters of crushed pots. Architecture of sun-dried mud bricks with mud plaster coating was preserved to a height of 0.5–1.5m. Floors were made of trampled earth with a mud 'floor plaster', onto which was then laid a thick layer of sand, and there was clear evidence for a supporting roof, including pillars and roof timbers. Survey at the site identified at least 13 compounds, suggested by red burnt mud brick debris. Concentrations of pottery occurred in the centre of the house, especially in "Room 24" where the burnt remains of *Acacia nilotica* may suggest leather-drying activities. Accumulations of pottery on the roofs of Rooms 16 and 17 suggests storage of solid substances, whilst other vessels in Room 18 suggests liquid contents. The remains of three individuals were recovered on the living surfaces of the building, with evidence for injuries related to physical violence and to the collapse and burning of the house.

The site of Kissi nearby has provided important evidence of occupation from the first millennium and early second millennium AD, with proposed dates of the first to twelfth centuries AD approximately (Magnavita 2009). The site is best known for its fifth/seventh century AD graves including items of a trans-Saharan origin: namely glass beads (Magnavita 2009) and copper alloys (Fenn 2009), as well as carnelian and other stone beads, cowries,

textiles, and weapons. This represents the most solid evidence to date for pre-Islamic trade across the Sahara.

Less discussion has taken place concerning the associated settlements at Kissi. Around 100 sites were found in the area, most of these Iron Age settlement mounds. The studies conducted have suggested that during the fourth to the eighth/ninth centuries there was a significant rise in settlements and in the area occupied (Magnavita 2009: 83). In the ninth to twelfth centuries substantial settlement continued, although with some shifts in the area occupied. Occupation ceased after the twelfth century, while other long-term settlements in the wider region were also abandoned between the twelfth and fifteenth centuries. Magnavita (2009) has proposed that the site of Kissi might have gained access to its relatively rich collection of long distance trade goods due to its position in relation to gold sources, including that of the Sirba. She has made a similar argument concerning the (much smaller scale) excavations conducted at Garbey Korou, about 200km east-southeast (S. Magnavita 2013).

2.4 *Ghana*

The archaeology of central Ghana has a long tradition of integration with historical data. Most often this was framed as an enquiry into notions of long-distance trade, involving connections with Sahelian regions immediately to the north but also to the Hausa areas to the northeast, a route well described in the nineteenth century. Some of the archaeological sites of central Ghana bear a formal similarity to the mounds of Birnin Lafiya, and research conducted on them in the 1960s and 1970s involved a careful study of pottery and the elaboration of type series and wares. This is the case, for example, with the site of New Buipe, excavated in advance of flooding due to the building of the Volta Dam. This substantial past settlement site was identified by Goody (1968: 30) as Silima, guarding the main river crossing into central Gonja. The site consists of three mounds (A to C) aligned along the Black Volta (aka Mouhoun). Cuttings were made on one radius of each mound, yielding large numbers of intact or refittable vessels and thousands of potsherds as well as nine radiocarbon dates. The occupation comprises nine periods grouped into three phases that are widely separated in time. The first seems to have some connection with the Kintampo culture. A long time later an apparently short-lived phase, lasting no more than three centuries, developed around the eighth century AD. Centuries later began a continuous occupation, called Phase III and split into periods 4 to 8; there are six dates for periods 4 and 5, mainly from Mound C, indicating a fifteenth to seventeenth century settlement. Interestingly, however, there is evidence of clear cultural continuity with the preceding Phase II.

The material culture from New Buipe's Phase III shares some features with the Dendi evidence. For instance, a distinctive architectural style in Mound A involved the use of compacted gravel or crushed limestone floors (York 1973). The ends of Periods 7 and 8 are marked by large groups of complete pots, possibly suggesting a hurried abandonment (York 1973: 184, Plates VI, VII).

Other areas of Ghana are completely invisible in the written record. A major archaeological research project has been undertaken in the past decade in the Tong Hills (summary in Insoll et al. 2013). The explicit aim here was to study a little-understood, largely non-urban, population; among the specific objectives was to reconstruct occupation sequences and settlement patterns and obtain ceramic assemblages that could be compared with neighbouring regions, much as was the goal of our own research some 500km to the northeast. Intensive survey suggested that the Tong Hills had been intensively occupied, with a retraction of settlement in the present (Insoll & MacLean 2013: 51). Twenty-four excavation units were completed and fourteen radiocarbon dates spanning the LSA (2500 bp) to the submodern period were attained (Insoll 2013). Standing stones, apparent ritual deposits (including intact bowls) and living/kitchen areas were among the contexts recorded. Crucially, although these excavations contribute significantly to understanding settlement chronology, they cannot shed light on settlement history because of the disjuncture with historical memory; there is, in other words, a chronological cut-off point for the archaeology (Insoll & MacLean 2013: 53) – a commonality with the Dendi evidence. Trade routes are thought to have run through the region, but evidence for commodities is lacking – beads and cowrie shells, for example, are rare, a pattern replicated at other regional sites, suggesting that the outflow of goods from trade networks passing through northern Ghana was minimal for the period AD 500–1500 and/or that concepts of value and desire for items such as these was minimal – indeed historical records for the early twentieth century indicate that other goods such as shea butter or iron blooms were favoured (Insoll et al. 2013: 218).

2.5 *The Nigerian Forest*

Sites of the Yoruba and Edo heartlands such as Ife, Benin City and Oyo are important for our study area given the possibility of riverine connections along the Niger.

Situated within the Edo state of southern Nigeria is Benin City, the central area of the historical Benin kingdom, most well-known for its celebrated bronzes. The

most obvious archaeological feature of Benin City are its extensive walls, earthworks and associated ditches extending over 16,000km (Darling 1984; Connah 2000). Large-scale enclosures of this type are known through the forested area of Nigeria.[3]

Excavations have only enabled fairly restricted views of the earlier phases of Benin City, as the earlier settlement is buried below the modern city, but the focal point of the excavations and that most relevant to the discussion here is the work carried out at the museum site. Of most relevance was the discovery of pits filled with sections of potsherd pavement affixed to chunks of soil, as well as apparent mud-wall debris (Connah 1975: 13, 22, 32, 249). This evidence is dated to approximately the thirteenth/fourteenth centuries AD, based upon an associated radiocarbon date. The potsherd pavement recovered is of the edge-laid variety and the potsherds are arranged into regular abstract designs based upon a rectilinear arrangement. The sections of pavement recovered from the pits are not extensive, however. Other evidence includes a mud-brick building of nineteenth century date, potentially part of the Oba's palace (Connah 1975: 36–44), as well as various other mortuary evidence and associated bronze artefacts. Investigation of the innermost city wall yielded a date of the fifteenth century approximately (Connah 1975: 77–89).

Since the time of Leo Frobenius, the archaeology of Ife has revolved around its terracotta and bronze figurative art, which has posed serious challenges, since much of it is issued from secondary contexts (Willett 1960a; Eyo 1974; Ogundiran 2001; Ige et al. 2009; Blier 2012). Between 1930 and the late 1970s, in Chouin's reckoning (2013: 55) no less than 19 sites were test-pitted, of which 4 were published in detail and 7 yielded dates. Key here are the excavations of Willett (1959) at the Ita Yemoo site on the eastern outskirts of Ife; Garlake at Obalara's Land, 800m outside the western walls of Ife (1974), and at Woye Asiri (1977), and Eyo (1974) at Odo Ogbe Street and Lafogido.

Lafogido was thought to represent a shrine site, with terracottas seemingly in situ in a primary ritual context around a pavement, while at Odo Ogbe a series of pits with pot burials were found, dating to the eleventh century, followed by abandonment and re-establishment 500 years later as a shrine (Eyo 1974). Obalara's Land featured stone and potsherd pavements (vessels apparently broken up on the site of the pavements, and laid immediately), pits identified as latrines associated with the same buildings as the pavements, and an assemblage of complete pottery vessels, contemporary with the pavements (Garlake 1974). Best known perhaps are a series of seven castings from Ita Yemoo, discovered in 1957 by labourers levelling ground, and associated with a series of pavements made of sherds laid on edge; nearly 35m^2 of pavement were exposed (Willett 1959: Plate VIIIa). The site was interpreted as a large compound, covering c. 8 ha, possibly belonging to one of the royal families and abandoned hurriedly when the town was sacked; the bank and ditch of the mid-nineteenth century wall cuts across the site, suggesting its importance had been forgotten by then (Willett 1959: 137; see also Willett & Fleming 1976 for absolute dating of finds).

The dating of these various occurrences has recently been discussed by Blier (2012: 81). She identifies a period of 'High Florescence', at c. AD 1250–1350, during which most of the early arts – brass, stone, terracotta – appear to have been made, which she suggests is consistent with the dating for Ife and its arts as evidenced at Obalara's Land, Woye Asiri and Ita Yemoo. Sutton (1981, 1997) has identified "Yufi" (described in the Arabic sources as "Yoûfi", "one of the biggest countries of the Sūdān, and their sultan is one of their greatest sultans" – see Levtzion & Hopkins 2000: 287),[4] as Ife. Blier (2012: 82, note 39) remarks that the name "Yoûfi" is in keeping with name variants of Ife in southern Nigeria, and suggests that ibn Battuta's description of Yoûfi may reference the ritual primacy long associated with Ife, in keeping with its major manufacturing and mercantile interests, among which were iron smelting and forging, textile-production, and the manufacture of glass beads, including dichroic beads. Along a similar vein, Sutton (1981: 142) refers to the fact that Ife was built on a small alluvial gold field. This raises the question of a possible role of the early southern Nigerian kingdoms as a supplier to northward commercial networks.

Old Oyo (also known as Oyo-Ile) has also attracted archaeological attention. Capital of a powerful Yoruba state in the late second millennium AD, the site was abandoned in the mid-nineteenth century and never reoccupied. Excavations since the 1950s have uncovered a range of evidence, including persistent indications that the site was occupied much before its historically-documented heyday. Soper (1977) described evidence of an important phase of occupation concentrated among and to the

3 Sungbo's Eredo is one example (Darling 1998).

4 Ibn Battuta writes (in Levtzion & Hopkins 2000: 287) that after flowing past Kawkaw (Gao) the Nīl (Niger) descends to the village of Mūlī, then to the land of the Līmiyyūn (the last district of Mālī), then to Yūfī. Less attention has been devoted to the question of Mūlī, but Levtzion & Hopkins (2000: 415, n. 20) point out that al-Umari identified Mūlī as the easternmost province of the empire of Mali. Cooley (1841: 93) discussed the locations of Múlí, Málí, and Malla (all different places, but seemingly close to Dendi).

west of a central group of inselbergs and antedating the construction of the defensive wall system. This phase is characterised by rounded mounds, and the excavation of one of these revealed three successive levels of flat-laid potsherd pavements. This phase of settlement was dated by a charcoal sample overlying three superimposed pavements, which gave a date of the eleventh/twelfth centuries (Calvocoressi & David 1979: 20). Subsequent work (Agbaje-Williams & Onyango-Abuje 1981; Abgaje-Williams 1990) confirmed this early occupation, with four dates between the eighth and twelfth centuries from a mound (McIntosh & McIntosh 1986b: 433). The implication is that the material from c. AD 1300 segues into the Oyo kingdom. One important, albeit undated, category of artefact is the red stone ('jasper') beads found on the site surface, which Willett (1960b: 74) comments are still used by the beadmakers of Ilorin, and which also occur at Ita Yemoo.

The question of trade along the Niger has often been raised in the context of Yoruba archaeology. Calvocoressi & David (1979: 20) had suggested that the early urban phase of settlement at Oyo – evidenced at that time by the single date – might be connected with a trade route running from the Niger rapids at Old Bussa. Several Ife-style figurines were recovered at Tada, an important Niger River crossing point some 200km distant (and 70km from Old Oyo). Shaw (1973: 237) suggested that these figures may be linked to Yoruba commercial engagement along the Niger River, "marking perhaps important toll or control points of that trade"; Blier (2012: 74) has noted the recovery of copper alloy castings of an elephant and two ostriches at Tada, which she suggests likely reference the importance of ivory and exotic feathers in long-distance trade.

Recent investigations on the western side of the Yoruba-Edo cultural area (Gurstelle 2015; Gurstelle et al. 2015) have examined the deeper roots of the Shabe kingdom, one of the precolonial polities that claimed its authority through descent from the founding kings of Ife. This work has revealed evidence of flat-laid pavements – both on the surface in the modern town of Savè and from a fourteenth-century excavated context at Odo Akaba 75km north of there. This finding may suggest long-term continuity in architectural practices instead of a shift towards the edge-laid pavement style found at Ife (Gurstelle et al. 2015).

Finally, we consider the complex of Igbo-Ukwu, in southeastern Nigeria. As is well-known, Igbo-Ukwu consists of three linked sites, Igbo Richard, a burial; Igbo Isaiah, a regalia display or storage area; and Igbo Jonah, a disposal pit with possible ritual function (Shaw 1970). This site is often referred to as dating to around the ninth century based upon the initial evidence (Shaw 1970), though subsequent dating and discussion have placed this within the broader date range of eighth to eleventh centuries AD (Shaw 1995). The Igbo-Ukwu sites were all located in a modern built up area and any wider site complex is obscured by the overlying modern settlement. However, Igbo-Ukwu has produced stunning artefacts, in the form of a variety of lost-wax bronzes, including human, animal and decorative forms (Shaw 1970). The Igbo Richard burial, clearly related to an individual of immense wealth and power, features over 100,000 glass beads, alongside carnelian beads and ivory. Igbo-Ukwu has consistently been discussed in terms of its relationships to interregional trade, particularly in relation to the copper alloy and glass bead imports, as well as the evidence of ivory which might have been a key export product.

Having situated the wider background, we now pull together various themes which allow us to structure an understanding of this period, with reference to our findings at Birnin Lafiya and in the wider region.

3 Birnin Lafiya and Dendi within Emerging Themes in West African Archaeology

The study of the transition from the Later Stone Age (LSA) to Iron Age, and its attendant transition from pastoralist or hunter-gatherer cultures to sedentary living, has been a major focus of research in West Africa, charted by the study of a number of key archaeological complexes, including the Kintampo (Casey 2000; Watson 2010) and Gajiganna (Breunig 2009) culture sites, as well as those of Tichitt Walata (Munson 1971; MacDonald et al. 2003) and Nok (Breunig 2014). Our understanding of the development of early ironworking has also been supplemented by studies from a range of other sites, including in the Inland Niger Delta and the Lake Chad region. Our work in Dendi identified potential LSA sites, at the sites of Alibori 2 and Kozungu. Perhaps, as has been hypothesised for the clay plains south of Lake Chad (Brunk & Gronenborn 2004), as the environment became drier, settlement became possible on this vast inland floodplain. This dimension will be developed in future publications, which will involve a consideration of the lithics. For now, we simply note the obvious time-depth of the occupation of the Birnin Lafiya area (both Alibori 2 and Kozungu are within 5km of Birnin Lafiya). The chief focus of the Birnin Lafiya work has been to document the existence of large settlement mounds dating back to at least the mid-first millennium AD. These new data help understand parallel developments throughout West Africa (see Huysecom et al. 2015 for a recent discussion). This development of mound sites

has often been associated with the rise of central trading places or regional power centres; Birnin Lafiya provides important new data, particularly as it lies in a previously uncharted area along the Niger River, a supposed major trade axis.

The classic model for the growth of large and nucleated settlements in West Africa is that provided by Jenné-jeno, which demonstrated the existence of pre-Islamic urbanism in West Africa, sitting within a larger landscape of mound sites (McIntosh 1995). The growth of these settlements was presented in terms of the subsequent development of the Inland Niger Delta as a crucial hub of interregional trade. Subsequent studies in the Méma region (Togola 2008), at Dia (Bedaux et al. 2005), and at Tombouze (Park 2010, 2011) have shown a similar pattern of large and nucleated sites, located within a wider landscape of settlement. The spatial patterning of the Dendi sites has evidenced the existence of site clusters (Khalaf 2016). The notion that the lack of evidence for powerful elites at Jenné-jeno indicates a heterarchical model of social formation has been well discussed (McIntosh 1999). In this model, site clustering allowed the cohabitation of a large number of people of different occupational and ethnic backgrounds, without the need for coercive authority. Similar ideas have been investigated elsewhere when explaining the development of large settlement mounds and clusters, including at Tombouze (Park 2010, 2011) and some phases at Kirikongo (Dueppen 2012). This model is, however, not universally accepted (see e.g. Connah 2001 for a cautious note) and findings in the Méma for example are presented in a quite different light: this zone is posited as central to the growth of the ancient state of Ghana/Wagadu, which according to later Arabic historical texts represented a hierarchically controlled political system (Togola 2008).

As detailed above, the Sahel zone to the east of the Inland Niger Delta has provided other good case studies, including Oursi (von Czerniewicz 2004a; Petit et al. 2011), Kissi (S. Magnavita 2015), and Sadia (Huysecom et al. 2015). These are presented as rural settlements only loosely connected to regional trade networks and not tied into any larger political groupings. Nucleation may have occurred for reasons of security, both in terms of protection against neighbouring groups, or in terms of security of resources; the example of Oursi Hu-Beero (Petit et al. 2011), which saw violent destruction, is telling here. The case of Kirikongo, which consists of 13 mounds distributed over a c. 37 hectare area (Dueppen 2012), is also relevant here. This said, some small and seemingly isolated rural settlements have also been shown to be linked in to wide-ranging exchange networks: one can cite the cases of Kissi and Garbey Kourou in Niger (S. Magnavita 2013, 2015). As far as we can determine from the publications, none of these sites were defended by a perimeter wall.

The scale of the settlement mound of Birnin Lafiya and the extensive settlement evidence together indicate a densely populated landscape. The size of Birnin Lafiya (c. 26 hectares) itself places it in the range of some of the most significant mound settlements encountered within West Africa in the first millennium and early second millennium AD. We recall that the site of Jenné-jeno measures c. 33 hectares and Dia Mara 28 hectares. Moreover, the distribution of sites shows a highly structured landscape, with a preference for settlement close to rivers and evidence of clustering.

In contextualising the hitherto unsuspected density of occupation of this area, we can consider questions of regional connections. The Niger River must have been a major conduit of communication, as has been discussed in the context of sites around Gao and Bentyia to the north, and Kainji and Ife to the south (see above: Shaw 1973; Dyer 1979; Sutton 1991, 2001; Insoll & Shaw 1997; Arazi 1999; Moraes Farias 2013; also Kuba 2009). Dyer (1979) suggested that the person buried at Igbo-Ukwu may have built his wealth on trading ivory with North Africa via Gao, and that the sites now known as Yelwa RS 63/32 and Baha Mound in the Kainji area (see Haour & N'Dah, this volume) constituted staging posts on a long-distance route linking the Sahara and the coastal forests.

Twenty years ago Insoll & Shaw (1997: 21) urged: "[there is a] need for renewed archaeological investigations of the regions bordering the River Niger between Gao and Igbo-Ukwu, which in itself is a mammoth task. Detailed archaeological survey of areas such as the Borgou region in northern Nigeria will undoubtedly prove useful and contribute further to this debate". Our work in Dendi has finally begun this task. The riverine leanings of the communities at Birnin Lafiya and more widely are clear through archaeological evidence of fish and rice, and the cultural links of modern populations with areas up and downstream are obvious from modern accounts.

The site of Igbo-Ukwu (Shaw 1970) long stood alone as a demonstration of the movement of trans-Saharan products further south in significant quantities, mainly in the form of beads, but recent research is increasingly suggesting interregional trade in the mid-first millennium AD, keying into wider networks of trade across the Sahara. The settlement complex of Kissi in Burkina Faso (S. Magnavita 2009, 2015) is the most spectacular example of this, with significant mid-first millennium AD evidence of copper alloys and glass beads with a trans-Saharan origin. The majority of the evidence for trans-Saharan trade items

at Kissi originates from graves. Such funerary contexts were only very minimally recovered at Birnin Lafiya, with just two *in situ* burials recovered. Indeed, the sole solidly dated grave contained dozens of stone (chalcedony and possible bauxite) and shell (mollusc or gastropod) beads (S. Magnavita, this volume). Some trade items may well, therefore, have escaped our investigations. Marine shells were also recovered at Birnin Lafiya Trenches 4 and 13, and at Gorouberi-13 (Linseele & Wouters, this volume).

As we have mentioned, the bulk of our evidence falls within the period AD 400–1300. We have fewer radiocarbon dates relating to the end of this span, and it may well be that Dendi experienced a similar pattern to that documented elsewhere in West Africa: the apparent abandonment of large settlement mounds in the first part of the second millennium AD (Petit et al. 2011; Huysecom et al. 2015). Much of this discussion has taken place in relation to the Niger Bend and the northern Sahel more broadly, and so Birnin Lafiya's position in a different environmental and geographical zone brings important new perspectives to the debate. Possible factors which have been advanced include aridification (at Tombouze: Park 2010, 2011), or disease, leading to social disorder and breakdown (see especially Sutton 1997; Chouin 2013; Huysecom et al. 2015).

Our work at Birnin Lafiya has thus placed on the map a totally new archaeological culture. Prior to our work, passing mentions had been made for some time in the literature of large mounds along this stretch of the river (Périé & Sellier 1950; Mauny 1961; Gado 1980), while mentions of substantial polities downstream of Gao, such as ibn Battuta's Muli (Levtzion & Hopkins 2000: 287), or a part of the Songhai state (Kaba 1981) remained enigmatic. We recovered at Birnin Lafiya and at other sites of the region a wide range of evidence relating to the mid-first to early second millennium AD. Our work included building up the first dated medieval ceramic sequence for the stretch of the river downriver from Gao and a chronology underpinned by 121 dates, situating these medieval data within a broader timeline extending from 2500 bp to the present.

Our analysis of the pottery from the first documented settlements underneath the modern villages provides evidence of a level of discontinuity between the terminal occupation of the settlement mounds and the initial occupation of the sites which appear to have followed them within the landscape. The dominant decorative motif at Birnin Lafiya and at other sites of the region dating to the mid-first to early second millennium AD is folded strip roulette. A number of important minority elements also feature within the assemblage, including the highly distinctive cord-wrapped stick rouletted decorations and the highly burnished, often incised wares. Seemingly more recent decorative motifs include *blepharis*, carved roulette and geometrically painted wares (see Livingstone Smith et al., Chapter 16, and Haour et al., Chapter 17, this volume).

Research in the Seno plain of Mali (Huysecom et al. 2015: 30) indicated a decline in mound settlements followed by new ceramic cultures, equated with incoming populations; yet the ethnographic study of Dogon populations also suggested the persistence of some core ceramic traits (namely mat-impressed ceramics) between assemblages from mound sites and those linked with later populations. The Dendi evidence now provides an important parallel investigation, linking deep time archaeology with the study of modern villages and their recent past, allowing us to enhance not only our understanding of the shift away from large settlement mounds but also the subsequent cultures, and therein to improve understanding of a crucial shift in West African history. Our data on the various assemblages we excavated in Dendi (see Livingstone Smith et al., Chapter 16, and Haour et al., Chapter 17, this volume) represent a substantial contribution to our understanding of the broader ceramic zones within West Africa.

Our work has also provided a record of the dietary cultures within this region. Fish are strongly represented, mainly floodplain species, as well as a diverse suite of wild mammals (Linseele & Wouters, this volume). Domesticates are relatively rare, yet the recovery of a series of quadruped figurines nonetheless suggest the role of these animals within this culture (Tchibozo, this volume). Pearl millet (*Pennisetum glaucum*), sorghum (*Sorghum bicolor*) and African rice (*Oryza glaberrima*) are also key elements of the botanical assemblage (Champion & Fuller, this volume). These findings represent important additions to the datasets for key animal and plant domesticates within West Africa. Anthracological data indicate the presence of agroforestry parklands dominated by shea butter and other useful trees, and regular exploitation of riverside vegetation (Eichhorn, this volume). Altogether these data point to a slightly wetter environment than presently.

The various beads recovered at the site are also significant (S. Magnavita, this volume). We have already mentioned the beads recovered in a burial context at Birnin Lafiya. Lantana stone is known historically to have been a major trade item of the area, quarried and delivered downriver, to Ilorin, by Hausa traders (O'Hear 1986). After observing what seem to be lantana stones on the site of Old Oyo, Willett (1960b: 74) commented that these items may in due course be used as evidence to correlate dates of deposits "all over Yorubaland, and even further afield".

Lantana mines are found just to the north of Birnin Lafiya and were important in the recent past (see Gosselain & Haour, this volume).

Potsherd pavements provide one of the most distinctive elements of the Birnin Lafiya archaeological culture. As discussed earlier (Nixon, this volume), flat-laid potsherd pavements occur widely within Dendi. The evidence from the sites of Birnin Lafiya and Tin Tin Kanza is important, because it demonstrates the apparent absence of mud brick architecture at this period. Mud brick was in widespread use throughout the Sahel during this period, including for instance at the vast majority of sites in the Inland Niger Delta (Nixon, this volume). Its apparent absence in Dendi is therefore an important contribution to regional patterns.

4 Conclusion

Through work at Birnin Lafiya we have documented a large settlement mound from the mid-first millennium AD to the early to mid-second millennium AD, and through extensive survey and test pitting within the wider area we have elucidated settlement patterning, chronologies and material culture. This enables us to provide a number of new perspectives on some key research themes within West African archaeology.

Firstly, this has allowed us to consider afresh the key question of the development of large nucleated settlements in medieval West Africa. Not only is Birnin Lafiya in a more southerly environmental zone than the majority of large settlement mound sites previously reported in detail, it is also located on what was an uncharted stretch of the Niger River, positioned between the as yet poorly understood settlement complexes of Bentyia and Ansongo to the north and those of Kainji to the south. This lends new perspectives on settlement dynamics in the savanna zone and along the lower reaches of the Niger River in the first millennium AD, and can be set alongside other investigations of the eastern arc of the Niger River (Kuba 2009; Magnavita 2013; Moraes Farias 2013).

Secondly, this evidence has allowed us to document a new archaeological culture in an area that has previously been a blank on the archaeological map. This is particularly crucial as Birnin Lafiya sat at a position between two worlds: that of the Sahel and its well-documented trade networks and nascent state systems to the north, going back into the first millennium AD, and the emerging complexity of the forest regions to the south, evidenced most spectacularly by Igbo-Ukwu. A range of key finds, including a new ceramic sequence, rice, cotton, beads, mud architecture, and potsherd pavements, have now allowed us to begin to better understand this intermediary world and its relationships to the north and south.

Thirdly, our study has allowed us to address the crucial question of a shift in settlement in the early centuries of the second millennium AD, a phenomenon increasingly evidenced throughout West Africa. Not only have these data from a previously neglected zone significantly diversified the picture, but our analysis combining research into the archaeology of modern villages with excavation of abandoned sites will prove valuable in other zones where population and settlement continuity are significant themes.

The finds from Birnin Lafiya thus provide key insights into a range of debates, relating to architectural practice, food production and resilience, environmental variations, burial practice, iron production, trade and the role of oral tradition. Thus, we hope that the work presented in this book has not just placed Birnin Lafiya and Dendi on the West African archaeological map, but also provided routes for understanding the bigger picture of West African socio-cultural developments over the past two millennia.

CHAPTER 28

The Site within West African Political and Craft History

Olivier Gosselain and Anne Haour

This book has reported work which involved an investigation of the material culture and technical practices of the past and present people of Dendi, northern Benin. Through archaeological excavation and survey, in combination with interviews with living informants, we have hoped to provide an insight into the past connections and population movements which shaped this area.

Earlier, we already suggested the ways in which near-mythical stories related to some key sites – such as Katanga or Nooru Bangu – nonetheless include historical content (Gosselain & Smolderen, this volume). We considered how archaeology confirmed or challenged some of the chronologies and identifications proposed by our living informants (Livingstone Smith et al., Chapter 16, this volume). We examined the manner in which the archaeological materials recovered from our excavations could suggest affinities with neighbouring areas (Haour & Nixon, this volume). This final chapter brings together these various elements, with a view to outlining a better understanding of the political and craft history of Dendi.

In archaeological terms, a chief focus of our work has been to document the existence of large settlement mounds dating back to at least the mid-first millennium AD, including the recovery of a burned-down house and related architecture at the mound site of Birnin Lafiya. The wider survey (Khalaf et al., this volume) and test pitting (especially at Pekinga, Tin Tin Kanza, Gorouberi 13 and Kantoro, see Part 6, Catalogue, this volume) demonstrated an extensive settlement of the region, certainly during the period AD 900–1300 and likely with deeper roots: the occupation of very large mound sites such as Birnin Lafiya and Gorouberi 13 goes back to the first centuries of the first millennium AD. The hypothesis that by medieval times the areas near and in the Parc W were already of importance (Haour et al. 2006) is clearly borne out.

Perhaps the recovery of a hitherto unsuspected densely-packed archaeological landscape should not come as a surprise. The natural advantages offered by Dendi must have been attractive in the past as now. Suited both to the cultivation of river-irrigated rice and drier crops such as sorghum and millet, possessing access to the plateaux where wood and game would have been plentiful, and to the pasture and fishing grounds of the river, the region offered a range of productive possibilities. The water resources available are not limited to the sole Niger River – it receives major tributaries as it passes through Dendi: the Mékrou, the Alibori, and the Sota. Indeed, from Niamey to the border with Nigeria, the Niger gains 20 percent of its flow from such tributaries. This increased availability of water marks a major change as the river wends its way to the sea: since leaving the Inland Niger Delta, the river had received only negligible tributaries such as the Sirba (Andersen 2005: 43, 46).

There are good reasons, then, to suggest this would have been an attractive region for medieval settlement. This said, in terms of historical interpretation Dendi faces us with an enigma. Historical sources relating to this period are non-existent or hazy. We have some allusions to the activities of polities such as Kebbi Hausa, Borgou, or Songhai, but such accounts typically deal with periods later than the time of the mounds we have investigated. The question thus poses itself: from the point of view of the populations living in Dendi one thousand years ago, what was their known world of experience – what was the sphere within which their daily life, and their wider exchanges, were lived? What political organisation mediated and encouraged, or hindered, these exchanges? We discuss these core questions in this concluding chapter.

In archaeological terms, such questions inevitably bring us back to a consideration of artefacts. We recall here that one fundamentally important aspect of most recent archaeological studies of West Africa is that they do not consider the movement of objects independently from the movement of practices. This technological, rather than typological, approach brings to the fore people and their spatial movements. The second important point, related to the first, is the fact that these studies admit the existence of multiple networks of exchange, consumption and production, rather than a unidirectional movement from the central areas to the outskirts. Archaeologically speaking, these approaches are promising because rather than having to search for the sole exotic bead, potsherd or glass fragment, we can look for changes in the way people made objects, their diet or their funerary rites. From there, we can examine whether these changes occurred due to increased contact with outside communities, involving

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physical movement of people. Here the notions of space of experience and of space known become fundamentally important (Gosselain 2010b, 2016a; Haour 2013ab).

What evidence do we have, then, of spaces of experience in past Dendi? The easiest way to approach this is to look at a series of past craft activities. Three aspects are worth emphasising here: architecture, beads and cotton.

In terms of architecture, the flat-laid potsherd pavements provide one of the most distinctive elements of the archaeology of Dendi, best manifested at Birnin Lafiya but occurring widely in the region (Map 3). Generally, within our region these pavements seem to date to between AD 1000 and 1300. This late date contrasts with relatively similar examples known from Kainji about 200km downstream, which are some 500 years earlier (Nzewunwa 1989; Haour 2013b; also Priddy 1970). Potsherd pavements are relatively widespread in West Africa (Haour 2013b; Nixon, Chapter 15, this volume) but the stylistic similarity between the pavements recovered in the Kainji area and some of those identified within our study area – especially at Tin Tin Kanza – is compelling. At Tin Tin Kanza Trench 1 (Champion & Haour, this volume), a pavement in which pebbles were arranged in perpendicular lines to form a grid filled out with large potsherds, directly dated by a hearth in its centre to between the mid-eleventh and the early thirteenth centuries,[1] merits our attention. Problematically, the pavements at Tin Tin Kanza are poorly dated, but an early second millennium date seems likely for these structures.

Evidence for architectural techniques was recovered especially in Trench 3/10, where the use of piled earth and curvilinear walls was noted, as well as pavements made of pounded laterite and potsherds (Nixon, Chapter 15, and Part 6, Catalogue entry for Birnin Lafiya 3/10, this volume). A pit feature at Birnin Lafiya, Trench 7, which was investigated in order to determine its function, was found to contain fragments of pottery and burnished, red-coloured plaster pieces. Local informants believed these to be fragments of walls or floors because such were used in the area in the past (Champion 2012). The use of moulded plaster for house decoration was documented in the early twentieth century in Dendi (Landeroin 1911) but is of course not specific to the region. Burnt chunks of clay, almost certainly architectural fragments, were recovered in our excavation units, suggesting the use of wattle and daub; a possible such structure was identified as 'Room 3' in the main compound excavated at Birnin Lafiya (Nixon, Chapter 15, and Part 6, Catalogue entry for Birnin Lafiya 3/10, this volume).

In terms of beads, *lantana* – a Hausa name for jasper, banded agate, or chalcedony, all a form of crypto-crystalline silica – was a commodity of huge regional interest in Dendi in the recent past. It is historically attested that intensive exploitation began in Natangou (Niger) in the early twentieth century,[2] resulting in the settlement of miners from Dendi and from the Kirtachi region (see also Cuypers 2004: 16). Dendi localities such as Bogo Bogo and Loumbou Loumbou thus found themselves on the "jasper road" which linked Natangou with Kompa and along which circulated both miners and their products. We have been able to shed some light on one of the renowned starting points of this trade: historically exploited *lantana* mines were shown to us at Bonwalou, near Loumbou Loumbou, and we recorded a small number of temporary occupations close by (Part 6, Gazetteer, A025 and 026). Jasper was exported to Ilorin (Nigeria) where it was used to make beads and it is in these locations downriver that the working of stone from these sources has been best discussed (see especially Daniel 1937, O'Hear 1986).

The trade clearly had a greater antiquity. Ilorin, which had been captured by Fulani jihadists in the early nineteenth century, had become the southernmost outpost of the Sokoto Caliphate; its population expanded with Fulani, Hausa, and especially Yoruba immigrants from the disintegrating Old Oyo empire, and it became known as a major trading and manufacturing town, of which a major product was the red beads made of *lantana* (O'Hear 1986). The beadworkers, who were both male and female, were said to have come from Old Oyo (Daniel 1937: 8, O'Hear 1986: 36). By the first part of the twentieth century, in fact, it was a waning industry: the process of making the beads (by chipping and grinding) was extremely laborious and the finished article of small value, since the demand for the beads for chiefly regalia in south Nigeria had declined. By Daniel's reckoning, in 1921 there were 500 beadworkers in Ilorin, and in 1935 just 15. This 'spectacular decline' came about because the value of the beads 'no longer justified the long and tedious hours of work' (O'Hear 1986: 38) – whereas just decades before, the beads commanded high prices, and the beadmakers' income was high (O'Hear 1986).

Given the documented impact of *lantana* mining on Dendi communities in the twentieth century – a time when the industry of bead making is described as dying – we can imagine the importance of this trade to the

1 880 ± 30 bp (Beta-417594).

2 Dangazuri, 30/01/13.

region at the time when it flourished. The deeper time-depth eluded us, largely because of the insufficient level of knowledge on the geology of so-called *lantana*. In principle, many red stone beads found in West Africa may be *lantana*, or be misidentified as such (see also S. Magnavita, this volume). Several different, albeit similar-looking, raw materials might have been used for making "true" *lantana* at Old Oyo and later at Ilorin, and *lantana* imitations may have been in circulation. None of our local informants in Dendi were able to show us actual examples of *lantana* from the mines we visited at Bonwalou, so unfortunately a geological characterisation still eludes us.

Just one type of archaeological stone bead has so far been identified with any certainty, and this is carnelian. Between six and twelve beads have been recovered from our excavations, all from the dense medieval sequence (S. Magnavita, this volume; Chloë Duckworth, pers. comm.). These point to a likely Saharan origin.

For the remaining items, a lack of clarity regarding stone characteristics and geology for this part of West Africa makes it difficult to propose firm associations. We can merely note that the asymmetric form and rough or only partly smoothed surfaces of some of the Dendi stone beads (S Magnavita's Type 1 – all of which come from Birnin Lafiya) strikingly recall other known items, such as a group of beads in the collections of the Cambridge Museum of Archaeology and Anthropology (CUMAA)[3] which are likewise large, biconical discoids with roughly faceted sides but neatly drilled holes. These were acquired from Hausa traders at Obuasi (Ghana) in the early twentieth century, but reportedly originated from burials somewhere north of Kano in what is now the Republic of Niger. Sonja Magnavita's point, based on an examination of our assemblage, that perforated bead rough-outs were traded as such then refined at their final destination, is interesting here. In this context, going back to the question of *lantana*, it is also worth remembering that, at least in recent history, stone was brought unworked to Ilorin from Dendi (O'Hear 1986). In the case of the beads recovered through our archaeological work in Dendi are made of *lantana*, are we looking at a local bead-making industry, or the reimport of manufactured items (beads) made from a stone whose origin has been in the same region?

In terms of glass, the presence of dichroic beads within our survey and excavated contexts in Dendi is interesting (S. Magnavita, this volume). One[4] is a surface find from a mound off the road between Kompa and Loumbou Loumbou; the other four come from the site of Birnin Lafiya itself, two of which from the excavated compound which is well dated by fourteen radiocarbon dates to sometime between the early eleventh and the fourteenth century (Haour et al. 2016: Table S1). The production of such dichroic glass beads is currently; Nixon, this volume only known from around Ile Ife, in Nigeria, where it started perhaps at the end of the first millennium AD (Lankton et al. 2006) and continued up to more recent times. Such items appear widely in West African archaeological sites.[5] On the other hand, totally absent from our assemblage are the segmented clay beads commonly found on archaeological sites further upstream (de Beauchêne 1969; Insoll 1996; Arazi 1999; Gado 2004). As a class of artefact apparently manufactured along the Niger River, these segmented beads have attracted less scholarly attention and have been too little illustrated to permit comparisons to determine whether they might be part of the same culture. However their absence from our assemblage – and in fact, the relative rarity of clay beads in our material – is notable.

Finally, as regards cotton, today the River Niger area in Benin is a major producing area: cotton farming now contributes one-third of the national production, a figure exceeded only by Mali among countries bordering the River Niger (Andersen 2005: Table 1.1, 4). The knowledge still held locally about now disappeared techniques of spinning and weaving was outlined by Smolderen (this volume). As Champion & Fuller (this volume) point out, because cotton is primarily grown as a raw material rather than as food, an investment in its cultivation implies both surplus land and surplus labour. As it turns out, archaeobotanical evidence for cotton is quite late in our region. We also have indirect indications of its use through several possible spindle whorls, but it is extremely limited and likely submodern for the most part (Tchibozo, S. Magnavita, this volume).

Such, then, are three aspects of past craft activity: architecture, bead production and cotton textiles. Other aspects such as fish smoking, pottery firing, salt processing, or dyeing are rather difficult to identify in the archaeological record, but their presence can certainly be hypothesised. The intended use of the fired laterite or

3 CUMAA 1936.201, "String of ancient beads of various stones, including ?carnelian and various shades of quartz, and some ?glass. Miscellaneous materials and sizes, some drilled from both sides". The donor to the CUMAA was Robert Wild, and if the information he was given that these items came from graves is correct, then these items could of course be quite old.

4 SF 2014-43; but not listed in the Small Finds table in Part 6, as a surface find.

5 For example at Igbo-Ukwu in southern Nigeria, Kissi in north Burkina Faso, Garbey Kourou in southwest Niger and Gao in Mali (see e.g. Lankton et al. 2006, Babalola et al. 2018; and S. Magnavita, this volume).

clay-lined pit excavated at Birnin Lafiya ('Pit B'; see Nixon, Part 6, Catalogue, this volume) remains unexplained. C. Magnavita (this volume) notes numerous concentrations of magnetic anomalies at some of the low-lying locations at the site of Birnin Lafiya, which he suggests may have been used for seasonal living or for performing craft activities such as ironworking and, perhaps, pottery making (borrow pits). The perforated potsherds which occur regularly through the region, seemingly in association with the medieval settlement phase (Phases 3–4), were most likely linked with food processing activities. Ironworking traces for their part are easier to identify, and the remains recovered largely point to household production (Robion-Brunner, Filippini, this volume) although we did record major concentrations of furnaces regionally, for example along the Kompagourou, at Tomboutou 2 and inland towards Kandi at the site of Lollo.

Also intriguing are the pit features which occur throughout the site of Birnin Lafiya. Some seem to have remained open for a period of time, to be then rapidly filled in, likely by human hands after a phase of destruction or levelling. The existence of buried erosion channels at Birnin Lafiya (C. Magnavita, this volume) may also point to a period of abandonment of the site. At Pekinga widespread semicircular arrangements of weakly magnetic stones or the placement of stones creating a continuous paved surface may have been a means of protecting the mound's deposits against erosion (C. Magnavita, this volume). Combined with the evidence for frequent rebuilding which we noted at sites such as Tin Tin Kanza, this suggests a level of settlement instability. One surprise as far as the archaeological record at Birnin Lafiya is concerned is the absence of an enclosing wall or *birni*. Such structures are extremely common throughout West Africa at this period, and indeed were also used in Dendi in more recent times. It may well be that protection was offered by natural, perhaps intentionally favoured, vegetation; or by the wet, possible marshy nature of the environs of the site. The charcoal and, in particular, the faunal evidence (Eichhorn, Linseele & Wouters, this volume) point to a rather wet, swampy environment. Possibly, however, the challenges faced by the inhabitants of medieval Dendi were not related so much to warfare as to the high-energy fluvial environment which acted as a constraint on settlement location due to seasonal flooding risks (Laïbi et al., this volume).

As we have said, the bulk of our archaeological evidence in Dendi relates to the mid-first millennium AD to the first third of the second millennium AD – what we have called Phases 3 and 4. After this time, there may have been a settlement hiatus. What we know is that, of the 121 dates run, none fall between 557 ± 27[6] and 357 ± 28 bp,[7] and we have very many fewer dates in the sixth century bp than we have for the tenth-seventh centuries bp. It is impossible to say for sure whether this is a real gap, as for this time period radiocarbon dating is problematic[8] (see McIntosh and McIntosh 1986b for a discussion of this problem based on a case in Ghana). Further work on our radiocarbon dates may help narrow the range. What should be noted at this point is that an abandonment of large settlement mounds in the first part of the second millennium AD has been documented in the Sahel and northern Sudan (Petit 2005; Petit et al. 2011; Huysecom et al. 2015). Just to the southwest of Dendi, in the Atakora, mound settlements cease to exist around AD 1400, and an environmental argument, involving the onset of more arid conditions at this time, was invoked by the excavators (Petit 2005). The question of disease has also been advanced (see e.g. Sutton 1997; Chouin 2013; Huysecom et al. 2015).

The picture remains unclear, but as we discussed (Livingstone Smith et al., Chapter 16, this volume), pottery from the first documented levels below modern villages of Dendi demonstrates discontinuity between the terminal occupation of the settlement mounds (marked by folded strip rouletting, incisions and burnishing) and the first occupation of the sites which appear to have followed them within the landscape (which see the appearance of new decoration types such as carved roulettes, paint and *blepharis* and a clear decline in the use of folded strip roulettes). If there is indeed one hiatus of occupation here, our informants have no reports of it – and in any case it is but one of the main interruptions in the settlement of Dendi, and the challenge is to reliably reconcile archaeological and ethnographic data.

What, then, do the ethnographic data and oral traditions tell us about past population movements and their geo-historical embeddedness? Looking at the current populations of Béninois Dendi, the most obvious connections are with northern and western regions. The Dendi language belongs to the southern Songhai dialectal groupings, which spread along the Niger River valley between Djenne and Gaya, with some isolated occurrences in Béninois Borgou, Burkina Faso and Ghana (Nicolaï & Creissels 1993). While the origin and evolution of the Songhai language grouping is still widely debated (Nicolaï 2009; Souag 2012) it is most unlikely that it could have

6 OxA-31577 at Kozungu Trench I.

7 OxA-31043 at Kozungu Trench I.

8 Frustratingly, the two dates cited above calibrate to cal AD 1311–1360, 1386–1429 and cal AD 1452–1530, 1541–1635 respectively, and in each case the two date ranges are equally likely. So both might correspond to date in the first part of the fifteenth century.

developed in the southeastern part of its distribution area; that is, in the Dendi region (contra Dramani Issoufou 1993). Linguistically speaking, we are thus faced with an expansion process that essentially developed southward and eastward from the Niger Bend. The questions are 'when' and 'how'?

A north-south movement is certainly congruent with the oral traditions collected among Songhai and Zarma informants, since they point toward regions or places situated in present-day Niger as former migratory sites. And most evoke the modern Republic of Mali as an initial place of origin. Yet the migratory movements depicted in Dendi oral traditions are rather recent. The Songhai rulers whose descendants claim an affiliation with the Askias of Gao would have arrived in the Béninois Dendi not earlier than the end of the eighteenth century (see also Landeroin 1911), and the various Zarma communities would have migrated even later – from the second half of the nineteenth century onward, when the left bank became a refuge area for villagers fleeing wars then colonial rule. It is highly probable that speakers of the Songhai language grouping were present in Dendi at a much earlier date, but despite what has been written about the area since the beginning of the century, we still lack conclusive evidence of this. While the Tārīkh as-Sūdān evokes Dendi as a province of the Gao Empire, whose governor lived in the court of Gao, it provides no geographical or socio-historical details. All we can conclude from this document is that "Dendi" mainly meant "the south" by the mid-seventeenth century (when the text was written), and that it started south of the Bentyia-Kukyia area. As to how far it extended southward, we have no clues at all. The Tārīkh al-fattāsh, a pastiche dating from the early nineteenth century, provides more details and gives the name of a locality – Lôlo – that could possibly correspond to that of a present-day village on the right bank of the River.[9] But given the date at which the text was written, we should remain very wary of claims such as that the Gao kings ruled the area currently known as "Dendi" by the fifteenth century. All in all, it remains extremely difficult to connect the people claiming a Songhai or Zarma ancestry to the available archaeological or historical data. And even if we accepted the idea of an ancient province of the Gao Empire extending as far as the Béninois Dendi, the timeframe is wrong for it to be associated with the bulk of our archaeological evidence, which dates from the mid first millennium AD to the first third of the second millennium.

What, then, of the more ancient population segments – the so-called "autochthones"? As has been consistently highlighted since the early twentieth century, two populations would fall in such category on both banks of the river: Tyenga and Gulmanceba (Gourmantche). The first formerly spoke a language belonging – with Bo'o and Busa – to the Southeast grouping of the Mande language family, further underlining a connection with regions situated north and west of our research area. Although the study of the southeastern Mande languages remains superficial, lexicostatistics indicates that it separated from the North Mande language grouping – which is associated with the Mali Empire – at an early date, and probably well before the apogee of Mali (Grégoire & de Halleux 1994; C. Grégoire, pers. comm., 1998). It seems unlikely, therefore, that its current location could be the relic of a former province of that empire (the famous "Mûli" mentioned by ibn Battuta). But given the antiquity of their separation from the Mande "core", southeastern Mande speakers such as Tyenga are potential candidates for the creation of our large settlement mounds. Provided, of course, that one could argue that they have remained in the area for nearly a millennium … The C14 dates available for the archaeological sites associated with the Tyenga village of Birnin Lafiya tend to corroborate such a hypothesis, since they range nicely from one site to the next (between the fourteenth and twentieth centuries), and follow the chronological sequence given by the oral tradition. However, and completely at odds with the linguistic data, most Tyenga oral traditions collected in the field (see also Jones 2010; Nicholson 1926; Platiel 1982; Walther 2006) claim an eastern origin. Even if the widespread adoption of the "Kisra legend" may account for such an assertion, available data suggest that some Tyenga clans were probably settled a little further east from our area, and migrated westward at the turn of the nineteenth century (or even later), perhaps in relation with the development of the Sokoto Caliphate. As far as the modern Tyenga population is concerned, and beyond the notable exception of Birnin Lafiya, it is once again difficult to associate oral traditions with archaeology.

The other "autochthone" population, Gulmanceba, confronts us with an even more problematic situation. Our work has shown that most of their present-day villages in Dendi were created no earlier than the first half of the nineteenth century, by hunters and farmers originating from Burkina Faso. Two other Gulmanceba settlements – Karimama and Kargui – are probably older, but the oral and archaeological data available so far suggest an

9 Although, as pointed by Moraes Farias (2013: 5, 44), it could instead correspond to the Lollo archaeological site, some 40 km north of Niamey (Niger). A third Lollo lies further inland, near Kandi – we discovered in our survey in 2011 that it features extensive archaeometallurgical remains (Guemona 2015).

eighteenth-century date (see Part 6, Catalogue entries for KAR and KG1). We are thus not able to project this western connection with the Gurma region into a very distant past.

It is when considering the oral traditions of other population segments that potentially older, and more explicit, connections start to appear. While they do not help us interpret our large settlement sites, they open new avenues for the historical reconstruction of Dendi and, crucially, reveal connections with other regions than those evoked so far. This is notably the case of a corpus of tradition collected among Mulanche/Kumate, who generally claim a Zarma origin but may have been present in Dendi well before other members of this group.

One of their most striking traditions concerns the presence of Yoruba in the ancient site of Katanga, with which they are unanimously associated (Gosselain & Smolderen, this volume). Given the limited number and proximity of the villages where such a tradition was collected, one would be tempted to view its occurrences as resulting from a recent diffusion process, the association between Katanga and the Yoruba perhaps corresponding with a "neo-tradition" based on an homology between the Dendi Katanga and the Katunga of the Yoruba (Gosselain & Smolderen, this volume). The fact that some Yoruba apparently returned to carry out ceremonies in Katanga in recent decades would go in this direction. However, the hypothesis of a neo-tradition is doubly unsatisfactory. First, it does not explain why people from a series of villages in Dendi today would establish a link with the Yoruba, via a site which only partially (or not at all) concerns their history.[10] And it relegates to the background a series of elements which make the presence of the Yoruba in Dendi less fanciful than it first appears.

The most obvious feature is the linguistic relationship between the Yoruba and the Mokole, a population of Dendi and Borgou which is associated with the creation of Guene[11] and the history of a series of chiefdoms located between this town and Kandi. There is a fairly marked difference between the two languages (Kluge 2011b: 164, 166), reflecting an ancient separation – certainly before the nineteenth century – but the proximity between Yoruba and Mokole languages is systematically emphasised by our interlocutors, and Bio Bigou (1987: 236) and Walther (2006: 125) are among the authors suggesting a kinship between Yoruba and Mokole. While the traditions gathered among Mokole[12] are still limited, they systematically report a link with Yoruba country and especially with Oyo, from where the first Mokole would have emigrated well before the nineteenth century.[13]

An interesting aspect of our investigations in Dendi localities founded or inhabited by Mokole is the presence of many clan names and/or patronyms also found among the Mulanche and the Tyenga. "Kumate", "Traore" and "Mako" families are thus identified, indicating links with linguistically unaffiliated communities situated along the river. We also collected other clan names or surnames among Mokole communities, one of which, "Malu", deserves all our attention, for it hints at another link between Dendi and Yoruba country. At Guene, several informants attributed the founding of the town to Malu people.[14] Those who consider themselves as such claim that their ancestors came from Mali, but they vehemently deny that they might be linked to Mulanche. They add that Malu were "sacrifice specialists" and that the founding ancestor of Guene gave them this name before sending them "to the Mokole region".[15] In another, not necessarily contradictory, version, the Malu are described as experts in sacrifice, but are explicitly associated with Mokole.

In the Malu, we are thus faced with a population whose identity is mainly defined by its religious activity, and which is linked both to "Mali" and to Mokole and Yoruba regions. These elements are reminiscent of a population with a name that is singularly close – the "Malè" or "Imale" – which is encountered further south, in Fon and Yoruba country (Maupoil 1943; Peel 2000). These Malè/Imale are Muslims, generally said to have come from Mali, who specialise in geomancy, which they are said to have introduced into the southern areas (Maupoil 1943). The connection with Mali, and more specifically the Songhai linguistic area, is reflected in the religious lexicon of Yoruba Muslims: although most words have an Arabic origin, their form often indicates a previous borrowing by Songhai speakers (Reichmuth 1988). This is also true of the vocabulary relating to the harnessing of horses and to various commercial products (Peel 2000: 194). Peel (2000: 190–191) suggests that the imports may have occurred as early as the late sixteenth century, while the Oyo rulers were in exile and closely involved with Borgou to the

10 We saw (Gosselain & Smolderen, this volume) that this link is not even systematic among the Mulanche/Kumate, despite the fact they are the foremost group to be concerned with Katanga: Nooru Bangu constitutes for them a much more operative identity resource.

11 Guene, 12/02/14 and 20/02/15.

12 Today Mokole communities reside in Goungou, Fiafufu, Bangou, Guene, Boïfo, Issene, Torozougou, Kantoro, Kwara Tegui Sambo Kwara, Ferekire, Monkassa, Kouberi, Madekali and Bodjekali.

13 Guene, 12/02/14 and 20/02/15; Goungoun, 24/02/15; Fiafufu 25/02/11.

14 15/02/13, 12/02/14, 19/02/15 et 20/02/15.

15 Guene, 12/02/14.

north. The few travellers' accounts cited by Maupoil (1943: 77–8; see also Brégand 1998a: 41–3) do indicate that the Malè were indeed present on the Atlantic coast as early as the seventeenth century. Some of these Muslims were captured among the "Baribas" and practiced divination. At the end of the eighteenth century, the Malè are described as Muslim traders who traded in particular in European glass beads, but whose practices differed from those of the Dyula because they did not travel along predetermined routes and had religious education and charm-making as their main activities. Such a relation between commerce and religion is of course also characteristic of the well-discussed Wangara (Brégand 1998ab; Levtzion 1961; Lovejoy 1978), and it suggests the existence of a professional network of traders linking the Middle Niger and the Borgou with coastal regions. This network is thought to be ancient (sixteenth–seventeenth centuries) and to have initially been associated with Songhai, Dendi or Zarma speakers, gradually supplanted by Wangara Hausa during the eighteenth century (Lovejoy 1978: 190).

What we have here is an extremely interesting historical indication which, if it does not settle the question of a possible Yoruba presence at Katanga, indicates that Dendi – and not just Borgou (Adenkule 1993, 2004) – was likely connected with the Yoruba world well before the beginning of the nineteenth century, when cities such as Kaiama or Djougou played the role of "commercial hubs" where communities of Yoruba, Hausa and Borgou Wangara merchants coexisted (Adekunle 1993: 277–8; Parrinder 1947: 122). Lovejoy (1980: 35) dates the origin of Hausa settlement in the region between Borgou and the Volta as early as the AD 1700s; he suggests that it was in the first half of the eighteenth century that a community of Muslims, including Hausa, established a settlement at Djougou. Yet the focus on Hausa traders – who dominated long-distance exchanges in the nineteenth century – might have obscured some of the earlier trade networks. The fact that the Dendi language was (and is still) spoken in the old caravanserais of Borgou and even in Salaga (Nicolaï & Creissels 1994; Zima 1994) tends to accredit the hypothesis of a pre-Hausa trading network operated by Dendi/Songhai merchants. Furthermore, Kuba (2009) and Sutton (1981, 1997) postulated the existence of ancient connections between the Middle and Lower Niger areas, notably through the gold trade. Such relations would date back to the first half of the second millennium AD.

Another set of elements further strengths the hypothesis of a connection with coastal regions: we return here to the question of the cowrie pond, Nooru Bangu, discussed earlier (Gosselain & Smolderen, this volume). Indeed, a body of stories relating to the slave trade in the Gulf of Benin evokes cowrie fishing at sea or in a "big pond" using the body (or the body parts) of a slave (Brivio 2008: 72; Iroko 1988: 199; Ogundiran 2002: 443–4; Verdier 1982: 104). As in the tradition collected in Dendi, cowries would bind to the flesh. More than the meaning to be given to such stories in their contexts of enunciation (compare, for example, Austen 1993 and Brivio 2008), what matters here is that they correspond in almost all regards to the account given to us by Kumate informants at Tui and Banikoara (Gosselain & Smolderen, this volume) and, except for the reference to the body of a slave, to all other stories related to Nooru Bangu.[16]

How can we explain this shared legendary repertoire? Apart from Béninois Dendi, the only such mentions we have outside the coastal region comes from Kabye country, in Togo, where Verdier (1982: 104) suggests that this legend was introduced along with cowries by slave merchants supplying the trading ports. The same explanation seems plausible in the case of Dendi: the link with traditions of populations involved in the Atlantic slave trade, the explicit reference to a large slave market at Nooru Bangu,[17] and other aspects discussed above evoking old connections with southern areas, all point in this direction. We believe that Béninois Dendi was involved in slave trading with the Atlantic coast in the eighteenth century – and perhaps earlier – and that the legend of Nooru Bangu is a persistence of that era, of which the memory was gradually forgotten because of the wars that ravaged the region and caused the collapse of former trade routes in the nineteenth century.

The routes and the identity of those involved in this trade remain to be explored in more detail. Here we can lean partly on the account of Heinrich Barth in the mid-nineteenth century (see Gosselain & Smolderen, this volume). He states that Borgou is not crossed by the trail to Salaga; it branched directly west after Kompa. He gives no indication of the identity of merchants – although most of them were probably Hausa by that time (Lovejoy 1980) – but he reports that one of the staging posts in Gurma is a large market called Sudo-Melle. Barth believes that it must be a Wangara community, because the locals typically named the merchants 'Wangara-Melle'[18] (Barth 1859: 645), a name oddly close to the 'Malè' which we just discussed.

16 Perhaps the mention of a black ox rather than a slave results from a Dendi adaptation of a legend that seems specific to populations of the Gulf of Benin: black oxen, as indeed the idea of the 'required' death of a girl, are reminiscent of other traditions encountered in Dendi.

17 Tui, 25/02/15.

18 "Sudo" means "inhabited place" in Fulani (Barth 1859: 645).

But the connection between the Béninois Dendi and eastern trade routes does not end here. If we accept, as the oral traditions invite us to do, that the role played by Kompa in the early nineteenth century is the result of a takeover of an older crossing, linking Katanga to Turuwe/Torouwey (Gosselain & Smolderen, this volume), one cannot but wonder about these Mulanche/Kumate who are said to have lived there, and whose name is reminiscent of Malè or Melle. "Mulanche" literally means "people of Mali", and it may be a strain of "Malinke". Bako-Arifari (1989: 30) thinks that their distant origins are in ancient Mali, and that "Kumatè" would be a distortion of the clan name of Malinke Konate. In common with Bako-Arifari (1989: 58, 64), but without adopting his historical scenario, we think that the Kumate of the right bank were involved in long distance trade, and the slave trade, before the diversion of the main caravan routes in the 1840s.

We want to conclude this chapter with at least two factors which, in addition to all references to trade and interregional relationships discussed so far, argue in favour of this hypothesis. The first relates to merchants' identities, and the second to craft identities, specifically to the question of indigo dyeing.

The link between surnames and the caravan trade has already been examined in detail by Brégand (1998ab; see also Moraes Farias 2013). It shows that dendiphone groups bearing Mande *dyamuw*[19] occur systematically in former caravanserais of Borgou. Among them are Kumate and Traore, but also Cisse, Sylla, Ture, Mande (or Manna) and Fofana. Their common features are that they are considered as foreigners by the Baatombu, that they have long practiced Islam (and count marabouts in their family), that they are involved in commercial activities, that they share the same forms of joking relationship, and that they practice cross-cousin marriage preferentially (Brégand 1998b: 251–2). These characteristics may prove a distant Soninke origin, and may situate these groups within the diaspora of professional Wangara traders who spread throughout West Africa since the days of the Empire of Ghana.

In Borgou, the case of the Kumate is the most clear-cut: the ancestors of our informants at Banikoara[20] are said to have come from Sokoto, trading salt and kola between the Hausa country and Kintampo and counting marabouts among their number. In addition to trade and religion, another of their specialties was indigo dyeing. Furthermore, "Dendi Kumate" were allegedly connected to them, and their specialty was trading smoked fish. As for the Traore, they were associated with commercial, religious, and military activities. Originating from Mali, some specialised in the salt trade (explaining their passage through Dallol Fogha) and others in the slave trade (Brégand 1998b: 254–6). The dates given by Brégand are the seventeenth-eighteenth centuries for the arrival of Traore merchants in Borgou, and the fourteenth century for Kumate. However, she relies for the Kumate on the work by Bako-Arifari (1989), whose historical scenario is based on erroneous data (Gosselain & Smolderen, this volume). Brégand (1998b) also reports an occasional alliance between the Kumate and the Traore in Borgou, which translates by the name "Tarawere Kumate". We also collected several mentions of such an alliance in Dendi, where the Traore are sometimes designated as "Sirifi",[21] a ethnonym of which we find no trace in Borgou but which is also associated with the nebula of Wangara traders.[22] An emblematic example of such alliance concerns the site of Katanga, where Mulanche/Kumate are said to have sought the support of Sirifi/Traore from Timbuktu to protect their community.[23] In northern Ghana, Wilks (1989: 85, 99) found similar mentions of a joint settlement of "Kunatay" and "Tarawiri" migrants originating from the regions of Dia and Timbuktu in the course of the seventeenth century. These migrants were both warriors and marabouts.

We thus find similar patronyms, activities, and alliances over a large region that includes Dendi, Borgou and northwestern Ghana, in association with important trade routes linking the Niger Valley to the coastal and forest zones. The involvement of Dendi merchants operating along these roads accounts for the scattered occurrences of the Dendi language in Borgou caravanserails

19 If we consider the term as a "family name" or "name of honor", Brégand (1998b: 250) prefers not to provide translation. However, she believes that it is the closest thing to a clan name.

20 Quartier Alfagou, 23/02/15.

21 This is the pronunciation in Dendi, Songhai and Zarma of the name "Sherifi" or "Sharifai".

22 In Kano and Katsina, the Sharifai were traders and Koranic teachers who claimed a family link with the Prophet (Piga 2006: 89; Lovejoy 1982: 265). Forming important communities in some Hausa cities and in Borno in the eighteenth century, they are said to have initiated or strengthened trade links with the Volta basin and the Ashanti country in the second half of the eighteenth century: According to Lovejoy (1980: 58), the availability of gold in the Volta markets attracted merchants associated with the trans-Saharan traffic, and in the eighteenth century some gold reached the Mediterranean via the Hausa states. Sharif Imhammad, from whom Europeans in North Africa first learned about the trade to Asante, travelled overland from Katsina to northern Asante in the 1780s in an apparent exploratory expedition to examine the possibility of a more permanent relationship with the Volta basin, and there he purchased kola as well as gold on behalf of his patron, the ruler of Fezzan.

23 Torozougou (05/02/13) and Kwara Tegui Sambo Kwara (31/01/14).

and Ghana (Salaga) as we saw above; but besides language propagation, we propose that it was the population segments currently known as Mulanche/Kumate and Traore, and associated with the ancient sites of Katanga, Nooru Bangu and Turuwe, who were the main operating agents within this sphere. As discussed above, they might also have been implicated in another set of connections with the Fon and Yoruba countries.

Future archaeological studies are likely to shed some light on these matters. We mentioned above that archaeologists are increasingly examining not just the movement of objects but also the movement of practices. In the case that preoccupies us here, this ties in well with a longstanding interest in the study of trade routes known historically, and the road between the Hausa and the Ashanti areas, which we have just alluded to, is one such example. Archaeological investigations have been carried out at several sites critical to the history of these trade routes into the Ghanaian forest (see Casey 2010 for a brief overview). The interconnection between historical and archaeological data was attempted for example at the site of Kitare, which lies in the savanna woodlands of east-central Ghana, now flooded by the Volta dam. The site is composed of three concentric banks and ditches; within the central area are large mounds that yielded evidence of three periods of occupation. This site is explicitly read in relation to the historical sources on the Hausa trade route between what is now northern Nigeria and central and southern Ghana; the division of the site into 'zongo-like' quarters, and the provision of watering places for caravans, are hypothesised on the basis of the material evidence (Mathewson 1965). The site is thought (despite the "complete absence of foreign imports", Mathewson 1965: 24) to be linked with the trade route to the Hausa states. Willett (1971: 364) sees it as a trading post, probably founded in the late fifteenth century by Hausa traders in kola and gold, but eventually losing importance in competition with Yendi by the end of the seventeenth century. Staying in this area we can mention that indeed the predecessor of Yendi, 100 km away from it and said to have been abandoned sometime in the second half of the seventeenth century, is remarkable for the recovery of a possible landlord and strangers house – a large, rectangular, possibly two-storey building with narrow rectangular rooms, and a walled and floored enclosure, "quite alien in style to anything known in the area today" (Shinnie & Ozanne 1962: 118). Tobacco pipes recovered suggest a date in the late seventeenth century and surface indications suggested there existed more structures such as these in the immediate area. A similar reasoning applies to the site of New Buipe (see Haour & Nixon, this volume, for discussion), a substantial archaeological site identified by Goody (1968: 30) as Silima, guarding the main river crossing into central Gonja.

But in such cases, one wonders whether the historical record is leaning too heavily on the interpretation of the archaeological data. In the case of Kitare, Mathewson (1965) – and later Willett (1971) – are clearly reading the site as a trading place on a major Hausa trade route, based on historical models. But in the same way that one of us (Haour 2007) argued that the link made by oral tradition between the archaeological site of Marandet (Republic of Niger) and the Hausa people may represent an after-the-fact attempt to make a logical link between a reputed former trading place and a modern trading group, we wonder if this may hold true of Dendi and its neighbours. The connection made between the Hausa and places such as Marandet or Kitare may simply reflect the economic activity of this group in recent – historically-recorded – periods and thus represent a manner of keeping alive the memory of archaeological sites' former trade activity. In the case of Dendi, has this obscured the earlier trade groups of the region?

Returning to our research area, all that survives nowadays of the ancient implication of Dendi inhabitants in long distance trade are a handful of patronyms, some references to a former warrior or religious specialisation, and the evocation of an ancient economic power. As far as the legend of Nooru Bangu is concerned, we believe we should see here the reflection of a time when trading activities, the exploitation of local raw materials (still unidentified), and the control of river crossing contributed to the production of wealth. The importance of the area was probably reinforced by the proximity of the Dallol Bosso and Dallol Fogha salines, from which soda and rock salt were exported in all directions (Barth 1859: 639–640; Lovejoy 2002; Monteil 1895: 234). After the reorientation of trade routes in the first half of the nineteenth century and the economic marginalisation of Dendi, the mercantile segment of the Mulanche may have moved to other regions – notably Borgou – to continue its activities. One could even interpret the many traditions relating to a movement of Kumate and Traore to the region of Guene as a fallback to a trade route that remained active throughout the nineteenth century.

We mentioned above that there were at least two factors which, in addition to all references to trade and inter-regional relationships discussed so far, argued in favour of the hypothesis of an involvement of the Kumate in long distance trade before the diversion of the main caravan routes in the 1840s. We have discussed merchant identities and now turn to the second aspect, craft identities, and

specifically to the question of indigo dyeing. This aspect has been curiously neglected in works relating to Dendi, despite the fact that it opens up interesting perspectives and even allows us to reopen the question of the Wangara "phenomenon", too often reduced to a simple association between commerce and religion.

Mulanche/Kumate informants speak of indigo dyeing as one of the main craft activities of their ancestors, and some believe that the inhabitants of Katanga practiced it too.[24] They are said to have imported this technique from Mali, and to have dug dyeing pits everywhere they settled.[25] Symptomatically, all villages founded or populated by Mulanche/Kumate possessed one or more dyeing workshops.[26] However, Mulanche/Kumate are not the only dyers who officiated in the Béninois Dendi. And with the exception of Gulmanceba centres,[27] whose history seems unrelated to that of the Mulanche/Kumate centres, the other craft communities brings us back to the professional traders which we have mentioned above. At Guene, for example, it is to the Malu that the introduction of indigo dyeing is attributed. If former dyers say they are not related to Mulanche/Kumate, they stress the Malian origin of their ancestors and claim that they formerly lived in Guene zeno – a site that Mulanche/Kumate also claim as one of the stages in their migration after the destruction of Katanga and Turuwe. At Mokole,[28] it is to the Traore that the introduction and practice of indigo dyeing are attributed. The link between Traore and indigo dyeing is also mentioned in some dyeing centres in the region of Banikoara,[29] where other family names are also found, including the "Ture"[30] whom Brégand (1998ab) mentions in her list of surnames of Soninke origin that are associated with the Wangara diaspora.

The geographical distribution of dyeing centres confirms the association with trade. It is indeed along the tracks used by merchants and, particularly, in the halts and near major markets, that workshops were implanted. To the west of Guene, this was the case of Karimama and Mamasi Gurma, situated along a trade route active until the early twentieth century; this route crossed the Park "W" and came out at Fonogo, to head towards Banikoara. The dyeing centres of Bogo Bogo, Loumbou Loumbou and Kompanti, which are located a little further west, appear to sit away from trading routes, but this was probably not the case in the past. On the one hand, Bogo Bogo and Loumbou Loumbou were on the road leading to the *lantana* mines. On the other hand, the villages of Loumbou Loumbou and Kompanti were created by refugees from the old town of Bwayeri/Boyeri, which according to oral tradition was burnt down in the second half of the nineteenth century by the army of the Saka of Kandi, a narrative confirmed by archaeology (See Part 6, Catalogue entry for BOY). Bwayeri/Boyeri was located on the old caravan route connecting Koulou (on the left bank of the river) to Banikoara, via Kompa, Kofounou and Fonogo. Several testimonies emphasise that the locality experienced a greater economic prosperity than Kompa, due to its location on the edge of a pond and the fact that dyeing was practiced there (Gosselain & Smolderen 2016). As for the other dyeing centres that we have mentioned, they are located either in the area around Guene – which was a caravan stage in the nineteenth century – or along the trade route to Kandi, where a dyeing workshop was also set up, and from where the road forked towards Banikoara or continued to Parakou and Nikki. Just as some legends or some surnames – to which it is also associated – the practice of dyeing, which survived in Dendi until the 1970s, appears as a persistence of the involvement of certain population segments in Dendi in the caravan trade.

A quick review of the literature relating to regions with which Dendi could have developed relations strengthens this hypothesis and brings elements that can help refine our understanding of the phenomenon. We summarise here the essential aspects. For regions further north, Roberts (1996: 58) notes, for example, that "Throughout the nineteenth century, the trading towns of the Middle Niger Valley and the desert edge became centres of production and trade in indigo-dyed cloth". To the east, Hausa merchant cities – especially Kano – had major indigo-dyeing workshops (Kriger 1993; Nast 2005: 74–5; Shea 1976), but the craft was also practiced outside the borders of the Caliphate, as at Dogondoutchi (Savineau 1938: 17–8) or Argungu (Cazemajou 1900: 46). In the south, we have already discussed the relationship between merchants and dyers that was observed in the Borgou caravanserails. Drot (1904: 278) also found that the most important textile production centres carried a "*ouangara*, ou *wangara*, village de notables et de marchands, étrangers (teinturiers haoussas) ou autochtones". To the west, the association with trade is also obvious. Thus one saw intense dyeing activity in the market towns of Ouagadougou, Bobo-Dioulasso and Sia in Burkina Faso (Binger 1892: 370; Sambaré 2012) and, in general, Moose and Kurumba dyers from Yatenga and Lurum belonged to Marãse group of professional

24 Kwara Tegui Sambo Kwara, 12/02/12; Torozougou, 05/02/13.
25 Kwara Tegui Sambo Kwara, 12/02/12.
26 This is the case at Bogo Bogo, Kwara Tegui Sambo Kwara, Kantoro, Tondibanda, Torozougou and Issene.
27 Loumbou Loumbou, Kompanti, Mamasi Gurma and Karimama.
28 21/02/15.
29 Mondoukoka, 11/02/13; Simperou, 22/02/15.
30 Toura, 13/02/13.

traders (Izard 1985, 2003; Sambaré 2012). Still further west, as in the north of Ghana (Binger 1892: 49–50) or the towns of Kong and Bondoukou in Ivory Coast (Binger 1892: 297; Etienne-Nuge & Laget 1985: 187; Kodjo 2006: 196), indigo dyeing is also inseparable from the presence of traders.

If the Hausa dominate this activity in the Sokoto Caliphate, and are mentioned here and there in Senufo country (Delafosse 1908: 260) and in the Kong region (Binger 1892: 297; Kodjo 2006: 196), they are far from being the only players and may even have arrived late in this business (e.g. Kodjo 2006: 196). From Burkina Faso to Côte d'Ivoire, major dyeing workshops were in the hands of other merchant populations, to which the introduction of the technique is generally assigned: Soninke, Sarakole, Marka, Dyula, Marãse (Binger 1892: 370; Delafosse 1908: 260; Izard 1985, 2003; Marty 1922: 405). Most of these populations relate to the Mande sphere and to the Wangara diaspora, but one group at least – the Marãse – are said to have a Songhai origin (Ogot 1998: 256) and still speaks a Songhai dialect (Nicolaï 1993). Given our hypotheses about the Mulanche/Kumate, these Marãse are of particular interest to us. They are, indeed, said to originate from Mali (Sambaré 2012: 116), which they would have left by the end of the sixteenth century to establish themselves first in the Lurum area of northern Burkina Faso, then in Yatenga, where they mixed with another group of professional traders, the Yarse[31] (Dassetto et al. 2006: 32–33). The Lurum area was criss-crossed by caravan trails and Marãse merchants specialised in the salt trade.[32] They associated with the Yarse in the major trading cities of the Moore kingdom during the eighteenth century (Izard 1985: 27, 30). Heuler-Neuhaus wrote in this regard:

"Déjà au XV^{e} et XVI^{e} siècle, de nombreuses routes de commerce de sel avaient traversé le bassin de la Haute Volta et le commerce était sous le contrôle des Marãse, un groupe de Songhay, qui s'étaient assimilés à la société des Fulse/Kurumba. Au Yatenga des Moose, les Marãse perdirent petit à petit leur importance en faveur des commerçants Yarse et, perdant au cours du XVII^{e} siècle également le contrôle du commerce du sel, un grand nombre d'entre eux se décida à devenir des Yarse (Sana-Yarse). Les Marãse restants commencèrent à s'occuper surtout de coloration à l'indigo".

HEULER-NEUHAUS 2001: 13

We are here just touching on a question that will require much more systematic research, but it seems plausible that our Mulanche/Kumate are linked to Marãse and, perhaps, to other communities of dyer-traders from the Niger Bend. Probably possessing a distant Mande origin, they have long been associated with Songhai communities – of whom they adopted the language – before settling further south to expand their business networks. Even if our own information remains limited, it is not impossible that the salt trade was also a driver of Mulanche/Kumate expansion, which would explain their links with populations operating the salines of Dallols Fogha and Bosso, and their installation at the mouth of the Dallol Bosso (Katanga/Turuwe), at a port on the Niger from where departed an old caravan route to the kola country. Unfortunately we do not have the capacity to assess the dates associated with Marãse migrations, and it would in any case be dangerous to project them as such on the Mulanche/Kumate. However, available data suggest that the Mulanche/Kumate networks developed in Dendi no later than the eighteenth century, and perhaps earlier. During the eighteenth century, the salt trade might have been supplanted by that in slaves, as new connections developed toward the Atlantic coast. It is this connectedness to the coastal regions, in the context of the Atlantic slave trade, which may explain the emergence of the legend of Nooru Bangu and its association with a population of "warrior-dyers" who today fiercely denies any involvement in commercial activities.

31 They were specialised in the commerce of salt and kola nuts, but also weaving (Izard 2003: 75). Some Yarse allude to a place of origin named "Male" or "Mande" which would lie in Guinea Conakry (Duperray 1985: 192).

32 The sources we consulted unfortunately do not specify where they obtained this salt.

PART 6

Catalogue

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Sites in this Catalogue are listed from upriver to downriver (see Map 6, page 784, for site locations)

CATALOGUE A

Pekinga (PEK)

Abubakar Sule Sani

1 Location

Pekinga is situated c. 2–3 km south of the Niger River. The site is c. 250 m further southeast of the Pekinga Primary School, lying on the outskirts of the modern Pekinga settlement.

2 Discovery

The mound was discovered by Doulla Sindy. The location of the trench was decided on the basis of the density of surface materials. The aim of the excavation was to offer a first snapshot of the settlement of the Pekinga area, in view of oral histories that tell of waves of successive immigrants. Informants in modern Pekinga – which shares a historical connection with Sokoto and the nineteenth century Jihad waged by Othman Fodio – point to a series of precursor sites to modern Pekinga, two of which were visited by the team, but they have no living memory of the site excavated as PEK 12.

In 2013, the site was surveyed with a magnetometer by Carlos Magnavita.

3 Destruction Risks

The site is affected by human activities such as farming and grazing and the mound has been exposed to gradual degradation due to rain-washing.

4 Site

The site vegetation remains dominated by sparse distribution of *Balanites egyptiaca, Tamarindus indica* and a remarkably large baobab tree to the east of the test pit. The southwestern area of the site is sparsely dotted with trees. A gallery of trees runs southwards towards a hilly upland which is approximately 500 m away (surveyed 29/01/12).

5 Excavation

A 2 × 1 m trench was set up (longest axis running north-south). At a later stage the size of the trench was narrowed to 1 × 1 m due to time limitations. The excavation was supervised by Abubakar Sule Sani and Anne Haour with participation from Paul Adderley and Mossi Wahabou, as well as workmen engaged from the Pekinga settlement. Archaeological contexts were separated and sieved and then bagged separately. All sediment was sieved with a 5 mm mesh.

6 Layers and Contexts

Context 1 constituted the topmost 5 cm of the site surface and was thought to have been disturbed by modern activities, and is therefore considered contextually insecure. The soil was generally fine, hard and predominantly yellowish-brown in colour, except for a zone around a rock at the eastern section which was surrounded by a more yellowish-brown soil over a 5 cm thick layer of whitish area extending towards the northern wall.

Context 2 spanned 5–20 cm in depth. Two similar features occurred here at both ends of the trench. On the southern side, the whitish deposit which had been observed earlier continued, and was stony. The white deposit was situated around a reddish-orange, fine silt sediment to the east, with a boulder close to it which became more pronounced later.

The second feature identified at the same depth in the northern part of the trench was a thin layer, which was spread neatly on a fine-grained, orange layered deposit beneath it, around the northeast corner. This feature was associated with a 15 cm sized boulder which was situated c. 25 cm south of the northeast corner. The soil colour became orange and the size of the sand particles was finer than above, where it had been characterised by coarse grain sands and many pebbles, in places. This change of colour and texture may suggest the presence of a hearth, a supposition given some credence by the recovery of a grinding stone nearby. A pottery pavement (Context 5) was encountered around the centre of the trench (Figure A.2).

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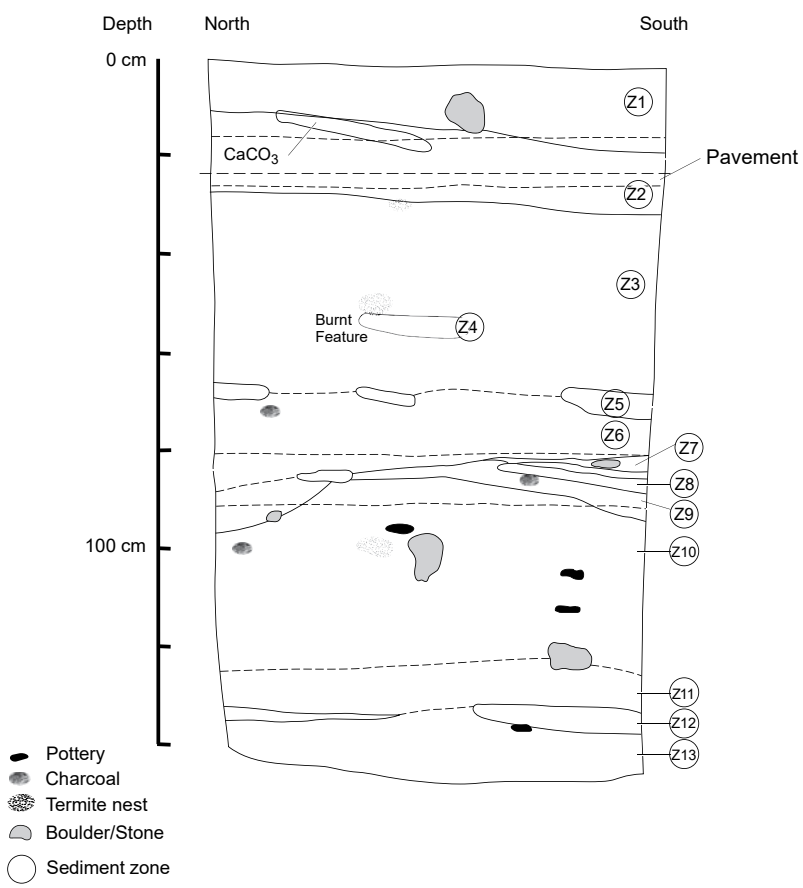
FIGURE A.1 Overall scene

FIGURE A.2 Pavement (Context 5).

FIGURE A.3 East section approaching completion



Zone descriptions (Texture; Munsell Colour; Features)

Zone 1. [Gritty] Sandy loam; 5YR 3/2 Dark Reddish Brown; few pottery sherds;
Zone 2. Loamy Sand; 7.5YR 4/3 Brown; rare small CaCO3 nodules; common pottery sherds;
Zone 3. Sand; 5YR 5/6 Strong Brown; Common pot sherds; rare [ca. 1cm diameter] CaCO3 nodules;
Zone 4. Sand; 5YR 4/6 Yellowish Red [Rubified materials];
Zone 5. [Fine] Sandy loam; 10YR 3/2 Very dark grayish brown; [ash materials];
Zone 6. Sand; 7.5YR 4/4 Brown; rare small CaCO3 nodules;
Zone 7. [Gritty] Sand; 7.5 Y/R 4/3 Brown with common mottles 5 YR 4/1 Dark gray;
Zone 8. [Fine] Sand; 5 YR 4/6 Strong brown;
Zone 9. Sand; 10YR 5/4 Yellowish Brown; Rare small charcoal fragments; Rare pottery sherds;
Zone 10. Sandy Loam; 7.5YR 5/4 Brown; Rare small sub-rounded/sub-angular stones;
Zone 11. [Fine] Sand; 7.5YR 5/4 Brown; Rare very small charcoal fragments; rare pottery sherds;
Zone 12. Sand; 7.5YR 4/4 to 7.5 YR 3/3 Brown to Dark brown; rare pottery sherds.
Zone 13. Sand; 10YR 4/3 Brown; to base of exposed profile.

FIGURE A.4 Pekinga east section at completion

A charcoal sample was dated at the base of this context, in proximity to the grindstone and the pavement. The region around the northeast corner yielded a considerable number of sherds, including a thick perforated one.

Context 3 consisted of an almost circular pit, c. 20 cm in diameter, situated at the southeastern corner of the excavation. It was bordered by a hard red soil to the northeast and the powdery white substance, mentioned above, to the southwest. The depth of the pit was c. 30 cm and its fill was made up of very loose, ashy soil. It yielded small bone and potsherds.

Context 4 was a poorly defined ashy deposit near the northeast corner of the trench. Of irregular shape and close to a termite hole, this feature may not have been of anthropogenic origin. It yielded sherds and fish bone. A soil sample was taken from the main concentration.

In Context 5, at c. 22 cm BD, a pottery pavement was encountered around the centre of the trench, dominating its western edge. This was the major feature of the southern half of the trench and extended c. 20 cm into the northern half.

The pavement was made of flat-laid potsherds with their external surfaces facing up. On-site assessment showed that the majority of the sherds featured folded strip roulette decoration.

In addition, seven rocks came out of this context. Excavation of the southern half of the trench stopped at this level. The area around the pavement and the southwestern corner showed a hard, dark brownish colour soil. Excavation proceeded more swiftly in the northern half of the unit only which, with the exception of Context 4, showed less differentiation than the other half of the trench.

Context 6 was defined as the northernmost section of the trench, 1 m wide (east-west) and adjacent to the 70 cm long (north-south) section that was originally isolated and subsequently excavated in bulk. This context had a damp brown soil. Excavation cut through the pavement, though preserving the majority of it. The fine ashy deposit was enveloped by a light orange soil near the centre of the square, with a dense occurrence of ceramic materials within it.

The soil was loose, fine and ashy and continued to produce a good number of cultural materials, including a grindstone at c. 40 cm BD. At approximately 45 cm BD, a concentration of artefacts was encountered which was defined as Context 7. Two dark brown soil areas within an orange deposit at 77 cm BD yielded further materials.

Fairly preserved tiny bones were recovered, but rootlets and clay balls resulting from insect burrowing became a prominent feature of this layer. The quantity and size of potsherds decreased as depth increased and the occurrence of fish bone ceased. As excavation through Context 6 proceeded, the soil became gradually harder, but without colour change. Ceramics became almost absent. A handful of tiny sherds and some charcoal were recovered at c. 129 cm BD.

Context 7 was a concentration of material in the northwest corner of the trench, including sherds, burnt earth fragments, slag and charcoal. This was a narrow region contained in the northwest corner, at c. 45 cm BD and with a dark brownish soil. However, this and the preceding context are somehow related.

Context 8 was a linear arrangement of stone boulders running roughly east-west at 103 cm BD, thought initially to be a house foundation oriented east-west. It was on a natural orange soil deposit, with only a few isolated sherds likely to be intrusions.

Context 9 was defined in recognition of minor changes, starting at 130 cm BD. As excavation through Context 6 proceeded, the soil became gradually harder, and though colour change was not marked there was a general tendency towards a browner shade.

By 155 cm BD, no further cultural materials were being encountered, and the soil became hard and orange. Splints of whitish sandy granules dotted the orange basal layer, especially the western half of the excavation. Excavation was terminated at this point.

7 Stratigraphy and Finds

The PEK 12 test pit revealed nine contexts, which included two possible pits and a pottery pavement. The only small finds recovered were three metal fragments, none of which could be identified (A. Filippini, pers. comm.).

8 Interpretation and Cultural Attribution

The pottery pavement, though limited in extent, suggests the test pit sampled a living area.

9 Radiocarbon Dates

Beta 321057	610	30	Context 2	Phase 4
Beta 321058	1040	30	Context 6	Phase 3–4

TABLE A.1 Desampling

Context	Number
Con 1	80
Con 2	98
Con 3	3
Con 4	7
Con 5	53
Con 6	250
Con 9	102
Total	**593**

Analysis in the field by Mossi Wahabou and at UEA by Anne Haour

TABLE A.2 Category 4

Context	Undec	Illegible
Con. 1	133	4
Con. 2	170	4
Con. 3	4	
Con. 4	5	1
Con. 5	87	2
Con. 6	351	7
Con. 7	0	1
Con. 8	0	2
Con. 9	74	2
Total	**824**	**23**

This work was carried out at an early stage of fieldwork, when transport was an issue. As a result, the material had to be massively reduced in the field, which was done by discarding undecorated sherds. This work was carried out in the field by Amour Ayibatin and Claude Howanou. A small number of further, indistinct, sherds were then identified at UEA by Anne Haour.

TABLE A.3 Category 3

Context	#	Burn	Dec 1	Dec 2	Dec 3	Dec 4	Dec 5
Con. 1	6		rfp-1a				
	2		roul				
	1	ext/int	plain				
	3	int	indis				
	2	ext/int	plain				
	3	int	rfp-1a				
	1		ch	ch	rc-1a		
	1		rfp-1b				
	1	ext	indis	undec			
	1		mch-n	rfp-1a	undec		
	1		ch	rc-1a			
	1	ext	plain				
	1	int	mch-n	indis			
Con. 2	10	int	indis				
	5	int	roul				
	7		rfp-1a				
	2		rfp-1b				
	7	int	rfp-1a				
	1		mch-n	roul			
	1		sl-n	rfp-1a			
	1	int	mch-n	rfp-1a			
	2	ext/int	plain				
	1	int	plain				
	1	ext/int	indis				
	1		indis				
	1	int	ch	rfp-1a			
	1	ext	mch-n	mch-n	sp3	undec	
	1	ext	mch-n	indis	paint	rc	sp1
	1	ext	mch-n	paint	undec		
	2	ext	plain				
	2		rfp-1a				
	1	int	mch-n				
	1	ext/int	sl-n	rfp-1a	undec		
	2		roul				
	1	int	undec				
	1	int	rfp-1b				
	1	ext/int	plain				
	1		is-geo 4				
	1	int	plain				
	1	ext	ch	rfp-1a			
	1		undec	rfp-1b			
				inside			
Con. 3	1	int	indis				
Con. 4	1	int	indis	plain			
	1	int	rfp-1a				
Con. 5	2	int	rfp-1b				
	7	int	indis				

TABLE A.3 Category 3 (*cont.*)

Context	#	Burn	Dec 1	Dec 2	Dec 3	Dec 4	Dec 5
	1	int	plain				
	4		rfp-1a				
	1	int	plain	rfp-1a			
	1		rfp-1a	perf			
	1	ext	plain				
	1	ext/int	plain				
	1		indis				
	1	ext	ch	ch	indis	undec	
Con. 6	22		rfp-1a				
	15	int	indis				
	1		indis	rfp-1a			
	1		roul	roul			
	1	int	sl-n	roul			
	25	int	rfp-1a				
	5		roul				
	1	ext	ch	sp1	sp1		
	1	ext	mch-n	sp1			
	5	int	roul				
	5	int	rfp-1b				
	1	ext	sx-n	sl-n			
	4	ext/int	plain				
	2	ext	indis	plain			
	1	ext/int	sl-n	indis	plain		
	1	int	paint				
	2	ext/int	plain				
	1	int	indis				
	1	ext/int	sl-n	indis	plain		
	3		plain				
	1	ext	sp4	sp4			
	1	int	indis	plain			
	1	ext/int	ch	indis	rfp-1a		
	1	ext	is-geo 5				
	1	ext	mch-n	plain			
	1		sl-n	sl-n	rc-1a		
	3		rfp-1a				
	1	ext/int	sl-n				
	3		rfp-1b				
	1	int	sl-n	rfp-1a			
	1	int	sl-n	indis	plain		
	1		sl-n	rc-1a			
	1		sl-n	rfp-1b			
	1	ext	sl-n	plain			
	1	ext	plain				
	1	int	rfp-1a	perf			
	1		sl-n	rfp-1a			
	1	ext/int	indis				
	1		indis	rfp-1b	perf		
	1	ext	indis				

TABLE A.3 Category 3 (*cont.*)

Context	#	Burn	Dec 1	Dec 2	Dec 3	Dec 4	Dec 5
	1	ext/int	sl-n	sl-n	rfp-1a	undec	
	1	ext	sl-n	roul	undec		
	1	ext	mch-n	plain			
	1	int	plain	rfp-1a			
	1		plain	rfp-1a			
	1	int	smth	roul			
	1	ext/int	mch-n				
	1		smth	rfp-1a			
	1	ext	plain				
	1	ext/int	mch-n				
	1		ch	rfp-1b			
	1		ch	rfp-1a			
	1	int	undec				
	1	ext/int	roul				
	1		rc-1a				
	1	ext/int	sl-n	plain			
	1		plain	rfp-1a			
	1	ext/int	ch	plain			
	1	int	mch-n	plain	rfp-1a		
	1	int	sl-n	plain			
	1	int	rc-1a				
	1	int	ch	rfp-1a			
Con. 7	1	int	roul				
Con. 8	1	int	rfp-1a				
	1	ext/int	plain				
	1		rc-1a				
	1		rfp-1a				
	1		roul				
	1	ext/int	mch-n	ch	sp3		
Con. 9	1	ext/int	sl-n	plain	rfp-1a		
	4	int	indis				
	1	ext/int	sl-n	plain			
	1	ext	undec				
	4		rfp-1a				
	3	ext/int	undec				
	1		rc-1b				
	2		rfp-1b				
	1		ch	ch	indis		
	1	ext	plain	rfp-1a			
	1	ext/int	undec				
	1	int	sl-1	indis			
	1	int	undec				
	1	ext/int	mch-n	plain	rfp-1a		
	2	int	rfp-1a				
	1		roul				
Total	**282**						

Analysis by Anne Haour

TABLE A.4 Rims

Context	#	R. Type	Brn	Dec1	L1	Dec2	L2	Ang.	Diam.	Mx. thick
Con. 1	1	S4	ext	indis	m			3	14	0.6
	1	S4		indis	m					0.7
	1	S1	ext/int					4		0.6
	1	S1	ext/int	indis	m			3		1.0
Con. 2	1	E4	ext/int					4		0.7
	1	S4	ext/int	mch	u int			4		1.1
	1	S4	ext/int	mch	u int			4		0.9
	1	S1	ext/int	mch	m					0.6
	1	S4	ext/int					3		0.7
Con. 5	1	E32	ext/int					4		1.3
	1	E4	int					4		1.0
	1	E4						5		1.1
	1	S1	int	ch	u					0.9
Con. 6	1	S4	int	indis	m					0.8
	1	E32						4		0.9
	1	E6	ext/int					4		0.7
	1	S4	ext/intc	indis	m			3		0.8
	1	S1	ext/int	indis	m			2	14	0.8
	1	S1	ext/int	rfp-1b	m			3		0.8
	1	E11	ext/int	indis	m			4		0.8
	1	S4	int	rfp-1b	u+m	ch	u			1.0
	1	S6	ext/int	rfp-1b	u			4		1.0
Con. 8	1	S1		rfp-1b	m					0.7
Con. 9	1	S4		rfp-4	u					1.0
	1	S4	ext/int	rfp-1b	m					0.7
	1	S1	ext							?
	1	S4						3		0.8
	1	E4	ext	sl7+	?			3		0.7
	1	S4	ext/int	sp1-l	?	sl-1+				0.7
Total	**29**									

Analysis by Sam Nixon

CATALOGUE B

Toutokayeri (TTO-14-SI, II & III)

Nicolas Nikis, Alexandre Livingstone Smith and Anne Haour

1 Location

Toutokayeri is a former settlement of Loumbou Loumbou, located just south-southeast of the present village. This settlement is said to have been abandoned sometime during the nineteenth century. It is located on a small plateau overlooking a humid valley, stretching south and east towards the Niger and feeding into the Kompagorou.

2 Geographical Coordinates

LAT: 12,2372830007225 LONG: 2,90778899565339 (WGS84).

3 Discovery

TTO-14-SI, II & III were identified and excavated by Nicolas Nikis and Alexandre Livingstone Smith on 27 January 2014 on the basis of local information.

4 Destruction Risks

The site is ploughed and part of it is on an eroding slope. It is not under any specific threat and mitigation measures are not urgent.

5 Site

Toutokayeri was a former village. The initial survey yielded a lot of ceramic material, among which we found folded strip roulette (rfp-1) decoration in some parts of the site, some *blepharis* decorated pottery, and a lot of undecorated material. The precise extent of the site is unknown but it covers the crest overlooking the valley to the north and the south. While the core of the site – as designated by the villagers – only yielded medium to low density pottery scatters, several concentrations were located on the crest overlooking the valley and below it, as well as on the opposite side of the valley. All were associated with rfp-1 decorated pottery.

6 Excavation

Toutokayeri had never been excavated before. Three test pits were excavated, all of them 1 × 1 m and excavated in spits of 10 cm, except for the superficial layer which was excavated in one spit of 20 cm. Within each spit, archaeological contexts were separated, sieved and bagged separately. All the spits were sieved down to 5 mm. Test pit SI was interrupted at 70 cm, 10 cm into sterile soil (compact yellow sand).

7 Stratigraphy

The stratigraphy of TTO-14-SI is shallow and simple, probably representing a single occupation event. It consists of a shallow feature of loose grey brown sand overlaying a pit filled with loose grey brown sand.

TTO-14-SII is located on the ridge overlooking the valley. The stratigraphy consists of three layers below the plough layer. The first is a layer of grey loose sand with charcoal fragments and artefacts fragments, mainly of pottery. This context overlays a unit of compact red silt (Context 2) with abundant rounded gravel, potsherds and charcoal. Below, at c. 45 cm, we found a layer of compact yellow sandy silt within which was a pottery pavement.

The stratigraphy of TTO-14-SIII is also shallow and simple, probably representing a single occupation event. It consists of a shallow layer of loose grey brown sand. Alternating layers of yellow and brown sand are visible in some parts of the southern profile.

TTO-14-SI and SIII are probably related to same horizon (late modern?). TTO-14- SII was, on the basis of the deposits and finds excavated, thought likely to be related to the medieval horizon already identified in most of the large tells of the valley, though, interestingly, it represents a much smaller area of occupation. This hypothetical date was subsequently borne out by ceramic analysis (Kay, pers. comm.) and by the radiocarbon date which yielded a Phase 4 age for level 20–30 (Beta-417596).

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FIGURE B.1
Site under excavation

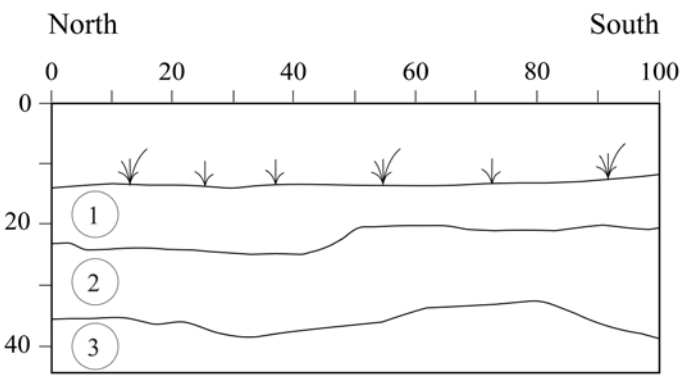

FIGURE B.2
TTO-14-SIII, East section
1 Grey brown sand with - top layer disturbed by ploughing
2 Loose grey-brown sand (pottery, faunal remains and charcoal)
3 Compact yellow sand (natural substratum)

8 Finds

As noted above, surface finds include potsherds displaying rfp-1 decoration on the crest and downslope as well as in SII, as well as perforated pottery, rfp-4 and rfp-5, and stabbed impressions. Small finds include a clay bead or possible spindle whorl and two cowries from SI (SF 2014-78, SF 2014-25 and SF 2014-26 respectively), a piece of glass from SII (SF 2014-37), and a strange item which we provisionally identified as metal from SIII (SF 2014-163). The pottery from the site as illustrated on Plate 3 clearly reveals the major differences between SI/SIII and SII: # 4 and 5 which are from SII show folded strip roulette, stabbed decoration and appliqué nodules. # 1–3 and 6–9, which are from SI 0–20 and SIII above 30cm respectively, show painted decorations.

9 Interpretation and Cultural Attribution

The rather shallow deposits indicate a short span of occupation (perhaps one or two generations) for SI & III. SII, while slightly deeper than the other test pits, does not display the long stratigraphy seen at other sites. Oral testimonies, supported by the presence of newer types of pottery, may indicate a post-thirteenth century occupation.

Yet the presence of rfp-1 pottery concentrations on the surface, the pavement in SII and the single radiocarbon date also support the hypothesis of an older occupation in the area. The glass from SII is from the surface level (0–20) and does not put into question the identification of this layer as medieval. It is interesting to note this site is located far from the Niger River. At current conditions, the road heading west from the Niger River leaves the rather verdant riverside to cross a relatively arid-seeming flat plateau and reach the parklands around Loumbou Loumbou.

10 Radiocarbon Dates

Beta-417596	630	30	TTO-14-SII-178 Toutokayori, SII. Shallow stratigraphy with one horizon 20–30 BD	Phase 4

11 TTO 14 SI

TABLE B.1 Desampling

Level	#
0–20	445
20–30	72
30–40	11
Fosse Con. 2, 30–40	17
Total	**545**

Analysis by Anne Haour in the field and David Kay at UEA

TABLE B.2 Category 4

Context/spit	Undecorated	Illegible
0–20	55	
20–30	19	
30–40	1	
Pit Con. 2, 30–40	4	
Total	**79**	**0**

Analysis by David Kay

TABLE B.3 Category 3

Context	#	Burn	Dec 1	Dec 2	Dec 3	Dec 4	Dec 5	Dec 6	Dec 7
0–20	12	ext							
	1	ext/int							
	1		pnt-rc						
	1		pnt-rc	indis					
	2	ext	pnt-rc	plain					
	1		pnt-r (int)						
	2	ext	plain	pnt-rb					
	3		plain	pnt-rb					
	1		plain	pnt-rb	pnt-rb				
	1		pnt-rc	pnt-BlB	pnt-rc	pnt-rb			
	1	ext	plain	pnt-r					
	1	ext	plain	pnt-rp	pnt-r				
	1	ext/int	undec						
	2	ext/int	plain	pnt-rb					
20–30	7	ext							
	1		pnt-r						
	1	ext	plain	pnt-r					
	2		plain	pnt-rc					
	1		pnt-or-B	pnt-4-Br	pnt-4-Bl	pnt-Br-T	pnt-Br-L3	pnt-Bl-L-2	pnt-Bl-T
30–40	1		plain	rfp-1a					

TABLE B.3 Category 3 (*cont.*)

Context	#	Burn	Dec 1	Dec 2	Dec 3	Dec 4	Dec 5	Dec 6	Dec 7
	1		rc-1a	indis					
	1	int	plain	sp1-l	sl-6	st-4			
Pit C 2, 30–40	4	ext							
	1	ext	plain	pnt-rb					
Total	**50**								

Analysis by David Kay

TABLE B.4 Rims

Context	#	R. type	Brn	Dec 1	Loc 1	Dec 2	Loc 2	Ang	Diam	Mx. Thick
0–20	1	E4	ext/int							0.6
	1	E4						4		0.6
	1	E4								0.6
	1	E4		pnt-r	L					0.3
	1	E4	ext/int	pnt-r	L	pnt-r	U(int)	4		0.7
	1	E1								0.6
20–30	1	E4						4		0.5
	1	E5						4		0.6
	1	E32						4		0.9
	1	S4								0.7
	1	S1	ext/int					3	20	0.6
Total	**11**									

Analysis by David Kay

12 TTO 14 SII

TABLE B.5 Desampling

Spit	#
0–20	408
20–30	71
30–40	32
40–50	58
50–60	51
60–70	15
Total	**635**

Analysis in the field by Anne Haour and Edith Anagonou Ahouéfa and at UEA by David Kay

TABLE B.6 Category 4

Context	Undecorated	Illegible
0–20	13	21
20–30	5	7
30–40	3	5
40–50	2	4
50–60	2	4
60–70	1	3
Total	**26**	**44**

Analysis by David Kay

TABLE B.7 Category 3

Context	#	Burn	Dec 1	Dec 2	Dec 3	Dec 4
0–20	18		roul			
	1	int				
	1	int	indis			
	1	ext				
	1	ext/int				
	2		rc-1b			
	1		rc-1a			
	3		rfp-4			
	1		rfp-1a	sl-1		
	2		rfp-1a	indis		
	2		rfp-1a			
	1		rfp-1b	indis		
	2		rfp-5			
	1		roul	sl-2	sl-1	
	1		roul	sc-3		
	2		sl-3			
	2		sl-4			
	1	ext	plain	indis	sl-2	
	1		plain	sl-2	is-geo 10	
	1		plain	roul	sl-2	
	1		sl-1			
	1	ext	plain	sl-1	roul	
	1		roul	sl-1		
	1		plain	rfp	sl-2	
	2		sl-2			
	1		sl-3	indis		
	1		sl-5	indis		
	1		sl-7	indis		
	1		peigEL-13			
	2	int	rfp-4			
	3		perforated	roul		
20–30	3		rfp-4			
	1		rfp-1a			
	1		rfp-1b			
	1		rfp-1a	indis		
	3		rfp-1b	indis		
	1		rc-1b	indis		
	1		sl-1			
	1		plain	sl-1	indis	
	2		roul			
	1		plain	roul		
	1	ext	mch-8 int			
	1		perforated			
30–40	6		roul			
	4		rfp-4			
	1	ext				
	1		rfp-1a	indis		

TABLE B.7 Category 3 (*cont.*)

Context	#	Burn	Dec 1	Dec 2	Dec 3	Dec 4
	2		rfp-1b			
	2		rfp-1a			
	1		plain	rfp	sl-2	
	1		plain	sl-1	rfp-1a	
	1		sl-1			
	1		sc-4			
40–50	1	int	rfp-1a	indis		
	4	ext				
	1	int				
	9		roul			
	11		rfp-4			
	1		plain	rfp-1a	indis	
	9		rfp-1a	indis		
	2		rfp-1a			
	1		rfp-1b	indis		
	1		plain	sl-1	roul	
	1	int	plain	sl-3	roul	
	2		rfp-1b	sl-1		
50–60	1	int				
	1	ext	rfp-1a	sl-1	plain	
	2	int	roul			
	1		rfp-4			
	1		roul	sl-1		
	6		roul			
	1	ext	plain	sl-2	rc-1a	
	4		rfp-1a	indis		
	1	ext	plain	sl-1	sp4-v or sp4-l	
60–70	5		roul			
	2		rfp-4			
	2		rfp-1a	indis		
	1		rfp-1b	indis		
	1		rc-1a	indis		
	1	ext				
	1	ext	plain	sl-1	rfp-1a	indis
	1	ext	plain	sl-1	rc-1a	
	1	ext/int				
	1	ext/int	rpf-1a	indis		
	1	int	roul			
	1	int	indis			
Total	**176**					

Analysis by David Kay

TABLE B.8 Rims

Context	#	R. Type	Brn	Dec 1	L 1	Ang	Diam	Mx. Thick
0–20	1	E4						0.6
	1	S4		sl-1	U	4		0.8
	1	E4						0.7
	1	S4		sl-1	U(int)	3		0.9
	1	S1	ext/int			4		0.7
	1	S1				4		0.7
	1	E10				4		0.8
	1	S1	ext			2	17	0.5
	1	S1	ext/int			2	10	0.6
	1	E11		sl-1	U	2		0.5
	1	S4				4		1.0
20–30	1	E1	ext					0.5
	1	E4				4		0.7
	1	E10						0.7
	1	S4						0.9
	1	E4						0.7
	1	S4						0.6
	1	E1	int			5		0.7
30–40	1	C1	ext	sl-2	U	2	17	0.7
	1	E22				4		0.7
	1	E4				4		0.7
	1	S1		sl-2	U	3		0.8
40–50	1	C1	ext/int	sl-1	U	2	10	0.5
	1	C1	ext/int	sl-1	U	2	13	0.6
	1	S4				4		0.9
	1	S4				4		0.7
	1	S4	ext	sl-2	U	4		0.7
50–60	1	E32	ext/int					0.5
50–60	1	S4	ext	ch	U	2	23	0.7
	1	S4	ext/int			4		0.6
60–70	1	E4	ext/int			4		0.8
	1	S4	ext/int			4		0.6
Total	**32**							

Analysis by David Kay

13 **TTO 14SIII**

TABLE B.9 Desampling

Context	#
0–20	329
20–30	70
30–40	14
Total	**413**

Analysis in the field by Anne Haour and at UEA by David Kay

TABLE B.10 Category 4

Context	Undecorated	Illegible
0–20	43	
20–30	7	
30–40	1	
Total	**51**	**0**

Analysis by David Kay

TABLE B.11 Category 3

Context	#	Burnish	Dec 1	Dec 2	Dec 3	Dec 4
0–20	1	ext/int				
	15	ext				
	1	ext/int	sl-3			
	1		roul			
	2	ext	pnt-rc			
	1	ext	pnt-rc	plain		
	1		pnt-r	plain		
	1	ext/int	pnt-nl-1	plain		
	1	int	pnt-rb	plain		
	1	ext	pnt-rb	plain	pnt-rb	
	4		pnt-rb	plain		
	4	ext	pnt-rb	plain		
20–30	1		pnt-rb	plain		
	1	ext	pnt-rc			
	1		pnt-rc			
	1		sl-1			
	4	ext				
	1	ext	sl-1			
	1	int	roul			
	1	ext/int	pnt-r	plain		
	1	ext/int	undec			
30–40	1		rfp-1a	erod		
	1	ext/int				
	4	ext				
Total	**51**					

Analysis by David Kay

TABLE B.12 Rims

Context	#	R. type	Brn	Dec 1	L1	Dec 2	L2	Dec 3	L3	Ang	Diam	Mx. Thick
0–20	1	S1								3		0.4
	1	S1	ext/int							4		0.7
	1	S6	ext/int	plain	U	roul	U	sl-1	U-int	3	13	0.6
	1	S2								2		0.5
	1	E1								4		0.7
	1	E4	ext/int	pnt-rc	C-int	plain	C-int	plain	C	5		0.6
	1	E4	ext/int	pnt-rc	C-int	plain	C-int	plain	C	4		0.5
20–30	1	E4	ext/int							4		0.6
	1	E1	ext	pnt-r	L	plain	C	pnt-rb	C	4		0.7
	1	S6								3	20	0.6
Total	**10**											

Analysis by David Kay

CATALOGUE C

Kompa Dune (KOD)

Anne Haour and Nadia Khalaf

1 Location

The site of Kompa Dune is located northeast of the town of Kompa. A low rocky hill runs perpendicular to the Niger River and then curves to be parallel to it, forming a sort of natural arena within which sits not only this site but also the modern village of Kompa and a range of archaeological occurrences. Archaeological survey identified over 50 archaeological occurrences, including pottery concentrations and three iron production sites. They seem established on a ridge running parallel to the Niger River at c. 170 m above sea level.

Two distinct locales were investigated: Kompa Dune, a settlement mound, and Kompa Moussekoubou, a smelting site. The name 'Dune' was given to the site merely to reflect the fact it is a prominent elevation on the landscape, rather than as a technical term relating to aeolian deposition.

2 Geographical Coordinates

12.23645 3.01351 (WGS84)

3 Discovery

The site was discovered on 15–16 February 2011 by Anne Haour, Alexandre Livingstone Smith, Didier N'Dah and a local guide. It was chosen for test pitting because it evidenced both ironworking remains and scattered pottery – a relatively rare occurrence. The settlement remains (Kompa Dune) and the smelting remains (Kompa Moussekoubou) are c. 500 m apart (Figure C.1). A seasonal stream cuts through the area, allowing a quick assessment of the *in situ* stratigraphy. The results of the archaeometallurgical work at Kompa Moussekoubou have been published in Robion-Brunner et al. (2015), and that paper also includes a brief consideration of the settlement evidence from Kompa Dune.

4 Destruction Risks

The site is affected by human activities such as farming and grazing. A hamlet was implanted close to the site during the time between our visits of 2011 and 2013, and the amount of modern refuse on the site surface had noticeably increased. Moreover, the seasonal stream was observed to have widened between our two visits, eroding away part of the archaeological site.

5 Site

The site of Kompa Dune is a series of low mounds with relatively dense pottery scatters. The test pit was situated on a small elevation featuring concentrations of lateritic nodules and pottery; once the area was brushed back, the lateritic nodules appeared very dense and it was thought that they may represent the remains of melted brick walls. The area was uncultivated at the time and featured a few trees dominated by *Balanites aegyptiaca*.

FIGURE C.1 Site overview. The Kompa Dune site is in the foreground, Kompa Moussekoubou at the foot of the hill in the background.

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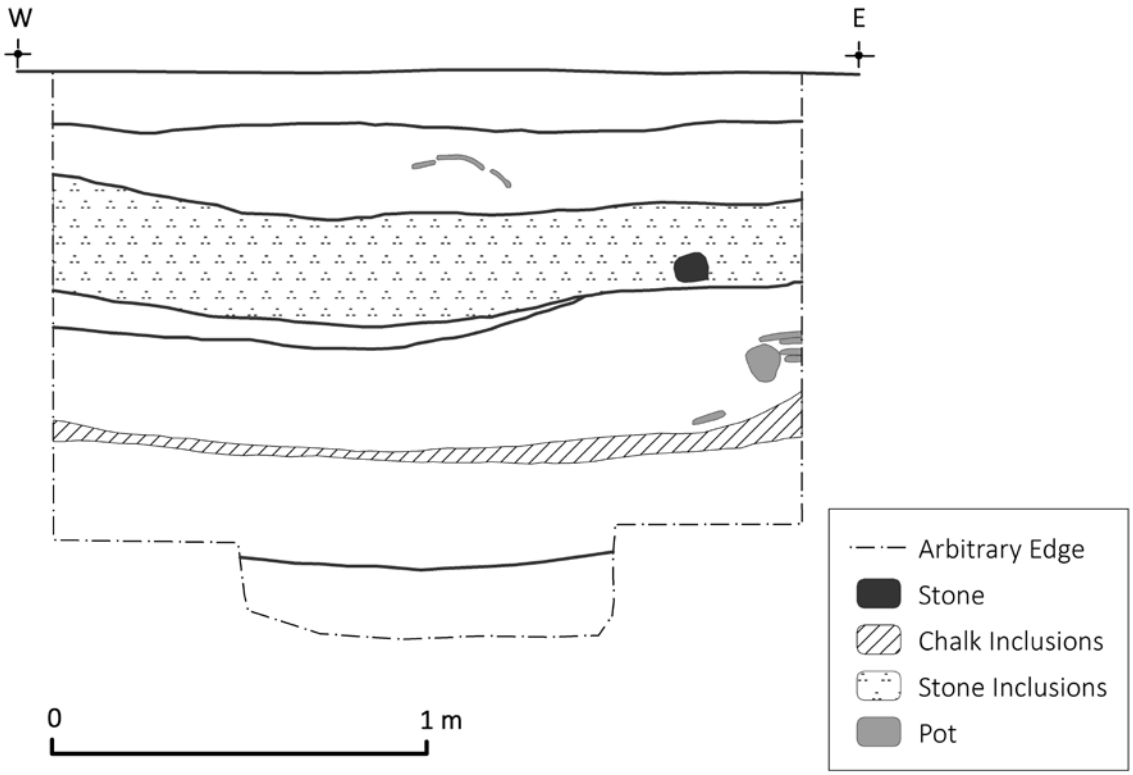

FIGURE C.2 North section at completion. Note the complete pot (see Pottery Catalogue, Plate 4.7), later extracted

6 Excavation

A 2 × 1 m trench was set up (longest axis running east-west); at a later stage the size of the trench was narrowed to 1 × 1 m due to time limitations. The excavation took place between 14 and 18 January 2013 and was supervised by Anne Haour and Nadia Khalaf with participation from Louis Champion and Abass Diallo, as well as workmen engaged locally. Excavation proceeded in arbitrary levels, numbered 1–6, and all sediment was sieved using a 5 mm mesh.

7 Stratigraphy

Context 1 constituted the topmost part of the site surface. Pottery was recovered, including a near-complete lid. The soil was brown and dry.

Context 2 spanned c. 10–38 cm in depth. The soil was slightly more orange than previously, being brown-orange; it was dry, sandy in feel, but hard, and with no stratigraphic features apparent. This level included charcoal, pottery, and a few large black stones which could be chipped with the edge of a hoe. The interface with Context 1 subsequently showed up clearly in the north section, evidenced by a brown-orange gradation and the presence of burrowing spiders.

Context 3 was begun at 38 cm BD, not because of a stratigraphic discontinuity but with a view to retaining spatial information on the provenance of artefacts. It consisted of homogeneous orange-brown soil. It featured pottery, and the first charcoal was found at the interface of Contexts 2 and 3; up to this point no organics had been recovered. Several charcoal samples were recovered from Context 3, including a concentration of sizeable fragments, apparently relatively undisturbed, which returned a date of 910 ± 30 bp (Beta-348771). After an overnight rain shower, a curvilinear orange feature, possibly a pit cut, and the lowest part of which included a cluster of potsherds with associated charcoal, became apparent in the north section. Part of this pottery concentration was freed when the section was cleaned, and associated charcoal yielded a date of 910 ± 30 bp (Beta-348772).

Context 4 spanned 65–80 cm in depth. The western side of the unit featured a high concentration of pottery.

Context 5 spanned 80–120 cm in depth. The soil became harder to excavate, and more clayey. An area of hard white deposit appeared in the westernmost part of the unit, within which were very small potsherds and a charcoal fragment which yielded a date of 1190 ± 30 bp (Beta-348773). About 30 cm away was a good amount of pottery, including fairly large sherds, but there was no indication that these were *in situ*. A possible brick fragment and a red

FIGURE C.3
Trench at completion, showing north section. Compare Figure C.2.

stone were noted. At the close of the excavation a near-complete, heavily sedimented vessel was retrieved from the north section (Plate 4.7).

Context 6 spanned 120–126 cm in depth. At the end of this level, the size of the trench was reduced to the central 1 × 1 m.

Context 7 was a 1 × 1 m excavation. The soil was orange, looser and sandier than previously. Excavation was terminated at 165 cm BD, when sterile ground was reached.

8 Finds

The only small finds were three worn, slightly shaped sherds (SF 2013–107 to 109) from Contexts 2, 4 and 6, which were only identified during post-excavation analysis and seem to have been intentionally abraded, for instance through usage as a scraper.

9 Interpretation and Cultural Attribution

Pottery was highly fragmented, badly eroded and often highly concreted, to the extent that decoration could often not be observed. It was the only find, and charcoal and bone were rare. No major stratigraphic features were apparent; the section was marked by gradual shifts in colour and texture as excavation progressed, rather than by any clear demarcations. The only feature was a possible pit in the north side of the trench, which was suggested by a more orange colour and a greater concentration of pottery.

The 1 × 2 m test pit yielded three dates, which after calibration spanning the mid-eighth to the very early thirteenth century AD. Two dates from Kompa Moussekoubou place the ironworking activity in broadly the same time range (Robion-Brunner et al. 2015: Table 1; Robion-Brunner, this volume).

Despite the pottery and lateritic nodules on the surface, which appeared organised enough to indicate possible features, excavation at this site failed to reveal any definite *in situ* materials. The lack of stratigraphic features and finds suggests that our trench did not sample a living area. However, the small size of our excavation and the extreme degree of erosion of the finds raise the possibility that we missed structural features or that they decayed away post-depositionally. It should be noted that a clean of one side of the gully bisecting the site, and shovel tests around the ironworking area, failed to identify subsurface deposits. This fact, and the poor condition of the artefacts, suggest that this site has seen considerably degree of reworking through natural factors such as wind and water runoff.

10 Radiocarbon Dates

Beta-348773	1190	30	Context 5, from a white, hardened soil, associated with potsherd	Phase 3
Beta-348772	910	30	Context 3, Charcoal directly associated with fragmented pot	Phase 4
Beta-348771	910	30	Context 3	Phase 4

TABLE C.1 Desampling

Level	Number
Surface	21
1	407
2	115
3	111
4	51
5	200
6	54
Total	**959**

Analysis in the field by Louis Champion, Abbass Diallo, Nicolas Nikis, Anne Haour and Amoussou Durand

TABLE C.2 Category 4

Level	Undec	Illegible
1	13	30
2	0	13
3	9	45
4	9	20
5	16	25
6	11	6
Total	**58**	**139**

Analysis by Anne Haour

TABLE C.3 Category 3

Context	#	Burn	Dec1	Dec2	Dec3	Dec4
Context 1	1	int	roul			
	1		sp1			
	16		rfp-1b			
	1		sh-n	sl-1	roul	
	1		sh-n	sl-n	plain	
	1		plain	sl-n	plain	
	1		indis	mch		
	1		ch	mch	plain	
	1		ch	plain		
	1		sl-n	plain		
	1		roul	ch		
	1		sl-1	sp4	plain	
	1		plain	sp4		
	9		roul			
	1		rfp-1b	plain		
	3	int	indis			
	2		indis			
	1		perf	indis		
	1		perf	undec		
	1		perf	roul		

TABLE C.3 Category 3 (*cont.*)

Context	#	Burn	Dec1	Dec2	Dec3	Dec4
	7		rfp-1a			
	2	ext	rfp-1b			
	1		roul	sl-1	sw-1	
	1		plain	sl-n		
	1		mch			
	2	int	rc-1a			
	1	int	rfp-1b			
	1	ext	sc-1	sl-n	indis	
	1	ext	sl-1			
	1		sp3	sl-1	plain	plain
	1	ext	undec			
Context 2	1		sl-1	roul		
	1		ch	roul		
	1	int	sl-n	sl-1	roul	
	3		rfp-1b			
	1	ext	mch	indis		
	1		CB1	sl-n	plain	
	5		roul			
	1		plain	sl-n	roul	
	1		rfp-1a			
	1		ch	indis	sl-1	plain
	1	ext/int	undec			
Context 3	2		rfp-1b			
	1		sl-n	rfp-1a	plain	
	4		roul			
	1		indis			
	1		CB1	plain	sl-1	roul
	1	ext	undec			
	1		perf	indis		
	1	int	undec			
Context 4	1		roul	sl-n		
	1		ch	roul	plain	
	1		sp3-v	roul	plain	sl-1
	2		rc-1b			
	1	int	rfp-1a			
	2		rfp-1a			
	1		ch	plain	rfp-1a	plain
	7		rfp-1b			
	2	int	undec			
	3	ext/int	undec			
	1	ext/int	indis			
	1	int	ch	rfp-1b		
	1		perf	undec		
	1		perf	rfp-1b		
	1	ext/int	plain	sl-1		
	1	int	plain	sl-1	plain	rfp-1b

TABLE C.3 Category 3 (*cont.*)

Context	#	Burn	Dec1	Dec2	Dec3	Dec4
	1	int	rfp-1b			
	1		rfp-4			
	1	ext	undec			
Context 5	4	ext/int	mch			
	3	ext	mch			
	1	ext	sl-n			
	8		rfp-1b			
	13	int	rfp-1a			
	4	int	rfp-1b			
	1	ext	rfp-1a	sl-1	plain	rfp-1a
	3	ext	sl-1	rfp	plain	
	1	ext	sl-n	plain	rfp	
	3		roul			
	12		rfp-1a			
	1		rc			
	2	int	rfp			
	1	int	sl-n	rfp-1a		
	4	int	roul			
	2		rfp			
	13	ext	undec			
	1	int	undec			
	1		perf	indis		
	4		perf	undec		
	1	int	indis			
	13	ext/int	undec			
	2	ext/int	pa4			
	1		rfp-1a	sl-1		
	1		rfp-1a	sl-1	sl-1	
	1	int	rfp-1a	sl-n		
	3	ext	plain	sl-1		
	1		rce			
	1		sl-1	rfp-1a		
	1		CB2	undec		
	4		CB2	undec		
	1		CB2	undec		
	1		CB1	undec		
	2		CB1	plain	sl-1	rfp-1a
	1		CB1	mch	plain	
	1		CB1	sl-1	plain	
	1		CB1	rfp-1b	sl-1	plain
Context 6	3		rfp-1a			
	1		rc-1a			
	1		rfp	smth		
	1		ch	plain	rfp-1a	
	1	ext	mch	roul	plain	
	1	ext	roul			

TABLE C.3 Category 3 (*cont.*)

Context	#	Burn	Dec1	Dec2	Dec3	Dec4
	1		sh-n	plain		
	1		rce			
	1	ext	rfp-1a	ch	plain	
	1		ch	plain		
	1	ext	plain	ch		
	1	int	rfp-1a			
	1	int	ch	rfp-1a		
	2	ext	undec			
	1	ext/int	undec			
Total	**260**					

Analysis by Anne Haour

TABLE C.4 Rims

Context	#	R. type	Dec1	Dec2	Dec3	Ang	Diam
Context 1	1	S4	plain	rfp-4		0	
	2	S4	undec			0	
	1	S6	plain	rfp-1b		0	
	1	S4	roul	plain	ch	0	
Context 2	1	S4	plain	sl-1	plain	0	
Context 3	1	T5	indis			3	23
	2	S4	indis			0	
	1	S1	rfp-1a	indis		0	
	1	S4	undec			0	
Context 4	1	S4	undec			4	32
	1	T5	undec			0	
Context 5	1	E	indis			0	
	1	E1	plain	sl-n		2	15
	1	S6	sl-n			0	
	1	S4	undec			3	20
	1	S6	roul	plain	rfp-1a	0	
	1	S1	plain	indis		3	18
	1	E	undec			0	
	1	S4	undec			5	23
	1	E	undec			0	0
	1	T13	undec			0	
	1	E	plain	sl-1		2	17
	1	C1	plain	roul		2	20
	3	E4	undec			5	20
	2	E4	undec			5	18
	1	E1	undec			0	
	1	E4	undec			0	
	1	S6	roul			0	
	1	S4	undec			0	
	1	S4	undec			4	12

TABLE C.4 Rims (*cont.*)

Context	#	R. type	Dec1	Dec2	Dec3	Ang	Diam
	1	S2	undec			0	
	1	E	undec			0	
	1	E4	undec			5	22
	1	E4	undec			0	
Context 6	1	E4	undec			4	24
	1	S4	undec			2	20
	2	S4	undec			2	16
	1	E	undec			0	
	1	E37	indis			4	10
	1	S4	plain	rfp-1a		4	32
	1	S1	undec			2	22
	1	S4	undec			2	14
Total	**48**						

Analysis by Anne Haour
The notation 'E' relates to everted rims insufficiently preserved to be classified within our typology.

CATALOGUE D

Torouwey (TRO-14-SI)

Alexandre Livingstone Smith and Olivier Gosselain

1 Location

Torouwey is one of the former settlements of the area of Kompa, and its existence and history are linked to that of Kompa and Katanga. This site, said by almost all informants to have been founded by the Mulanche/Kumate, is located in the flood plain near Kompa, but some debate surrounds the exact location of the past site described by oral traditions as a major port (Gosselain, this volume; de Moraes Farias, pers. comm. June 2016). Oral traditions collected at Kompa, Bogo Bogo, Garbey Kwara and Birni Lafia evoke an ancient village on the right bank, located south of Kompa, along the Kompagorou waterway. Gosselain noted that a visit of the site revealed few traces of human activity, unlike other abandoned villages in the region: a few scattered sherds, some baobabs and possible slag fragments. Bako-Arifari (1989: 62) – who seemingly locates it in the same place – estimates its size at 5 hectares and reports the remains of an ancient fortification wall. It is not impossible that the absence of archaeological remains is due to agricultural activities, but it may also be that the village was located closer to the river, east of the place that was indicated to us.

2 Geographical Coordinates

LAT: 12,1910340059548 LONG: 3,04361295886337 (WGS84)

3 Discovery

The site was identified and excavated by Alexandre Livingstone Smith and Nicolas Nikis on 25 January 2014.

4 Destruction Risks

The site is not prominent. It is ploughed for cultivation, but is not under any specific threat. Mitigation measures are not urgent.

5 Site

The site of Torouwey appears as a flat expanse of land with a few scattered baobabs in the Niger flood plain. The land is used for agriculture and archaeological material is

FIGURE D.1
Site under excavation

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visible as a medium- to low- density scatter of pottery. The extent of this site is unknown.

6 Excavation

Torouwey had never been excavated before. This test pit was 1 × 1 m in size and was excavated by spits of 10 cm (except for the superficial layer which was excavated in one spit of 20 cm). Within each spit, archaeological contexts (i.e. distinct units) were separated and sieved and bagged separately. All spits were sieved down to 5 mm. The test pit was completed at 50 cm, 10 centimetres into sterile yellow sandy soil.

7 Stratigraphy

The stratigraphy of TRO-14-S1 displays three contexts. The first is the ploughzone. The second is a layer of compact brown grey sand overlying the substrate of sterile yellow sand. A slight depression filled with burnt earth and loose brown grey sand (a possible pit) seems to begin towards the bottom of Context 2. This shallow depression was not distinguished as a separate context during the excavation.

8 Finds

Blepharis roulette decorated pottery was found during the survey and during the excavation. Finds consists essentially of pottery, with bone and slag. The two contexts seem to be dominated by undecorated pottery and very fragmented pieces. *Blepharis* roulette is present as well as two possible carved roulette-decorated sherds. The only small find was a possible pipe fragment in layer 20–30, with a polished rim and the exterior incised with parallel lines (SF 2014-07). We found no indications of modern pollution such as glass or plastic.

9 Interpretation and Cultural Attribution

The absence of settlement mound, the position in the landscape (flood plain) and the absence of folded strip roulette-decorated pottery could indicate a post-thirteenth century occupation. The rather shallow deposits indicate a short span occupation (one or two generations). There is a single, recent, radiocarbon date (Beta-416121) suggesting a post-1690 age, but considering relative chronology markers the site can be attributed to a period prior to 1850 AD. Although, as we noted above, it is not absolutely certain that the site excavated corresponds to the historically-reported location, the archaeological evidence fits well with the early nineteenth century date which Gosselain infers based on historical mentions that this port declined once the Songhai leader Arigani took power in Kompa.

10 Radiocarbon Dates

Beta-416121	70	30	TRO S1, 40–50	Phase 5

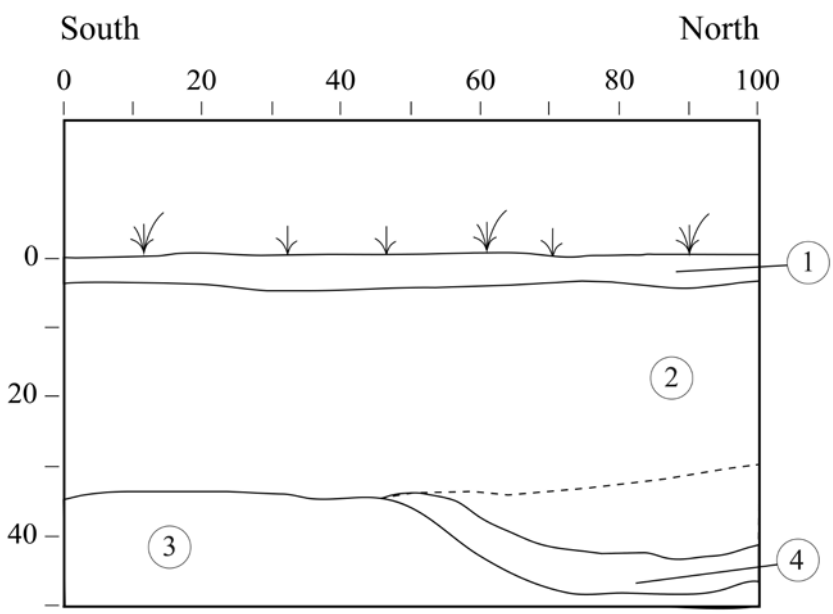

FIGURE D.2
TRO-14-S1, West section
1 Grey brown sand – top layer disturbed by ploughing
2 Compact grey-brown sand
3 Compact yellow sand (natural substratum)
4 Depression with burnt earth

TABLE D.1 Desampling

Level	**#**
0–20	174
20–30	73
30–40	18
40–50	3
Total	**268**

Analysis in the field by Anne Haour

TABLE D.2 Category 4

Context	Undec	Illegible
0–20	20	0
20–30	18	0
30–40	6	0
40–50	1	0
Total	45	0

Analysis by David Kay

TABLE D.3 Category 3

Context	**#**	**Burn**	**Dec1**	**Dec2**
0–20	1		pnt-r b	
	1		blepharis	sl-1
	1		blepharis	
	2		rc-1a	
	2		rbt	
	1	ext	sl-1	
	1		rc-1a	sl-1
20–30	1	ext		
	2		blepharis	
30–40	1	ext/int		
	2	ext		
Total	**15**			

Analysis by David Kay

TABLE D.4 Rims

Context	**#**	**R. type**	**Dec1**	**L1**	**Dec2**	**L2**	**Diam**	**Ang**	**Mx thick**
0–20	1	T4	undec				0		1.3
	1	E10	undec				0	4	0.6
	1	E4	undec				0	3	0.5
20–30	1	S1	blepharis	u	sl-1	u	+16	2	0.8
30–40	1	S1	undec				0	2	0.9
	1	S4	undec				0		0.55
Total	**6**								

Analysis by David Kay

CATALOGUE E

Kompanti (PTI-14-S1)

Alexandre Livingstone Smith and Nicolas Nikis

1 Location

Kompanti is a modern settlement located a few kilometres south of Kompa. It was described to us as a place founded by people from Boyeri after the sack of that locality by the *Saka* of Kandi towards the end of the nineteenth century (see Gosselain & Haour, this volume). It is located on the edge of the floodplain.

2 Geographical Coordinates

LAT: 12,1623470261693 LONG: 3,06278597563505 (WGS84)

3 Discovery

The site was identified and excavated by Alexandre Livingstone Smith and Nicolas Nikis on 26 January 2014.

4 Destruction Risks

The site is not prominent and is under a modern village. It is not under any specific threat and mitigation measures are not urgent.

5 Excavation

Kompanti had never been excavated before. This test pit was 1 × 1 m and excavated by spits of 10 cm (except for the superficial layer which was excavated in one spit of 20 cm). Within each spit, archaeological contexts (i.e. distinct units) were separated, sieved and bagged separately. All the spits were sieved down to 5 mm. The test pit was finished at 50 cm, 20 centimetres into sterile yellow sandy soil.

6 Site

Kompanti is a modern village. The main road cuts through the village and a new ditch following the track yielded some ceramic material during the initial survey. The test pit was positioned near the main road next to one of the oldest houses of the village.

7 Stratigraphy

The stratigraphy of PTI-14-S1 displays only one archaeological context below the disturbed layer. It is a light brown compact sand layer overlaying the substrate of sterile yellow sand.

8 Finds

Material recovered included a cowrie shell fragment (SF 2014-16; 0–20), a plastic sheath (SF 2014-13; 0–20), a broken ceramic figure (SF 2014-03), and (in level 20–30) an opaque pale pink glass bead of Magnavita's Type 2 (SF 2014-76; S. Magnavita, this volume). The majority of the pottery consisted of very small fragments, with only a few dozen identifiable sherds.

9 Interpretation and Cultural Attribution

The absence of settlement mound, the position in the landscape (flood plain) and the absence of folded strip roulette decorated pottery could indicate a post-thirteenth century occupation. The rather shallow deposits indicate a short span occupation (one or two generations?) which is consistent with the idea advanced by oral tradition that Boyeri (Kompanti's predecessor) was sacked in the late nineteenth century.

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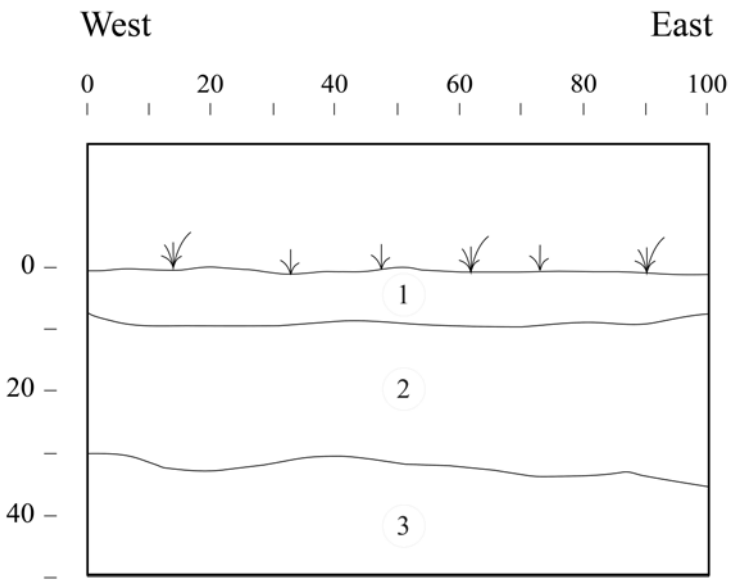

FIGURE E.1
PTI-14-SI, North section
1 Grey brown clayey sand with undecorated pottery fragments – top disturbed by modern activities
2 Light brown clayey sand with pottery fragments
3 Compact yellow sand (natural substratum)

TABLE E.1 Desampling

Level	Number
0–20	103
20–30	27
30–40	17
40–50	12
Total	**159**

Analysis in the field by Anne Haour and at UEA by David Kay

TABLE E.2 Category 4

Context	**Undecorated**	**Illegible**
0–20	2	2
20–30	3	0
30–40	1	1
Total	**6**	**3**

Analysis by David Kay

TABLE E.3 Category 3

Context	**#**	**Burnish**	**Dec1**	**Dec2**	**Dec3**	**Dec4**
0–20	2	ext/int				
	1	ext	indis			
	1	int				
	3	ext				
	1	int	undec	sl-1	roul	
30–40	1	int	rc-1a	indis		
40–50	1	ext/int	roul			
	1	ext/int				
	1	ext/int	roul	indis		
Total	**12**					

Analysis by David Kay

TABLE E.4 Rims

Context	#	R Type	Brn	Dec1	L1	Ang	Diam	Mx thick
0–20	1	S1	ext			3	21	0.8
Total	**1**							

Analysis by David Kay

CATALOGUE F

Tin Tin Kanza

Louis Champion, Nadia Khalaf and Anne Haour

1 Location

The site of Tin Tin Kanza is located on the southern bank of the Niger River near the small hamlet of Tintin. The site is along the road between Guene and Pekinga and seven kilometres northwest of Karimama. It consists of a small mound, backed by a cliff to the south and opening on the Niger River in the north. It lies at a point at which the floodplain is very narrow compared to other stretches of the river. It is situated close to two places of current and past ceremonial significance (Kanza cave and 'Nooru Bangu', the cowry marsh).

2 Geographical Coordinates

LAT: 12.121144 LONG: 3.142991 (WGS84)

3 Discovery

The site was discovered on 8 February 2012 during a survey by Olivier Gosselain, Lucie Smolderen, Nicolas Nikis, Doulla Sindy, Alhassane Abderamine and Louis Champion, in the context of a visit to a sacrificial cave in the cliff above the mound. The presence of potsherds and ground stone on the ground surface below the cliff was noted at this point. In 2013, the site was revisited by Anne Haour, Caroline Robion-Brunner, Nadia Khalaf and Louis Champion and locations chosen for the implantation of two test pits, S1 and S11. The results of these excavations have been partly published (Champion and Haour, 2013, concerns S1; Khalaf and Haour, 2013, concerns S11).

4 Destruction Risks

The lower part of the site is currently used as a field and is regularly ploughed. During April 2013, after our excavations, a part of the lower part of the site was destroyed by works to widen the Guene-Kompa road. The site is also at risk in case of major floods of the Niger River.

5 Site

The open-air site of Tin Tin Kanza is a large settlement mound of c. 20 m high, overlooking the Niger River. The extent of the mound is approximately 16,000 m^2. The land is under cultivation and features dispersed shrubs and trees. At the top of the mound is an escarpment of relatively steep elevation and dense vegetation. The mound presents moderate to very high concentrations of pottery sherds, and other evidence of past settlement – such as the presence of grindstones – was noted.

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Tin Tin Kanza, TTK-13-S1

Louis Champion and Anne Haour

1 Excavation

Excavation took place under the supervision of Louis Champion and Anne Haour from 21 January to 5 February 2013. The core team consisted of Djimet Guemona and two local workmen, with periodic assistance from other members of the *Crossroads* team.

TTK-13-S1 consisted of a 1 × 2 m test pit. Within each spit of 10 cm, archaeological contexts were separated and sieved (at 5 mm mesh) and bagged separately. In the southern part of the test pit sterile was encountered at 140 cm BD, while in the northern side sterile was reached at 390 cm BD. Figure F.1 shows the location.

2 Layers and Contexts

The excavation of Trench 1 at Tin Tin Kanza revealed 26 archaeological contexts, including 12 distinct levels of occupation (seven ceramic pavements and five destruction layers) over a depth of just 110 cm.

2.1 *Destruction Layers*

Such layers are defined as resulting from the destruction of the previous occupation level. It seems that the remains of such destruction episodes were levelled to be used as a new base for the next occupation.

Context 4 was a very hard yellow-red layer consisting of burnt soil.

Context 7 was a very compact red layer with charcoal inclusions.

Context 9 was a very compact and hard red layer that was a result of thermo-hardening.

Context 12 was an indurated red layer containing high quantities of charcoal.

Context 15 was a very thin layer consisting of a compact yellow burnt soil with red nodules.

2.2 *Pits*

Context 1 was a pit containing very soft grey-brown ashy soil, which included a few gravel inclusions and a high concentration of charcoal.

Context 6 was a small pit consisting of homogeneous brown soil of medium compaction.

Context 17 was a heterogeneous pit with a soft brown filling. The bottom of the pit comprised a very compact ashy pocket with alternating grey and red micro-layers.

Context 19 was a deep pit that could be divided into two parts. The upper part (levels 13 to 17) was a midden with a very soft grey homogeneous filling. The second part was a succession of thin grey layers which became greener as depth increased; its final levels involved a round cavity

FIGURE F.1 Site location

of 60 cm diameter excavated directly in the rock, with its base at around 390 cm BD. From the level 17 to the last level (390 cm BD), the sediment composition is very similar: a succession of thin grey deposits and greenish layers. Moreover, the archaeobotanical remains from those levels have a specific nature, being formed principally of African rice (*Oryza glaberrima*), pearl millet (*Pennisetum glaucum*) and sorghum (*Sorghum bicolor sp.*) with an absence of the nuts and baobab (*Adansonia digitata*) found from other samples in the trench (Champion & Fuller, this volume). The two parts of Context 19 may constitute two different contexts. The distinction was not noted during excavation, but only became clear while drawing the sections; nonetheless, thanks to the principle of excavation by spits, material can be confidently attributed.

2.3 *Hearth*

Context 14 was a circular hearth within Context 16, a pavement. The filling was very soft and ashy, containing abundant charcoal. The layout of the pavement, radiating out of the hearth, suggests that these structures are contemporary (Figure F.2).

2.4 *Pavements*

Several pavements, formed of a mosaic of ceramic sherds, were recovered.

Context 3 was a pavement covering c. 1 m^2 and sloping to the north. The sherds composing the pavement were very largely undecorated (perhaps 80%), while the remainder were decorated by roulette or incision, and a number were perforated. This pavement featured two

FIGURE F.2
At 100 BD: Pavements 7 (to north) and 6 (to south) and hearth associated with Pavement 7. A later stage of the excavation revealed further parts of Pavement 7 as described above

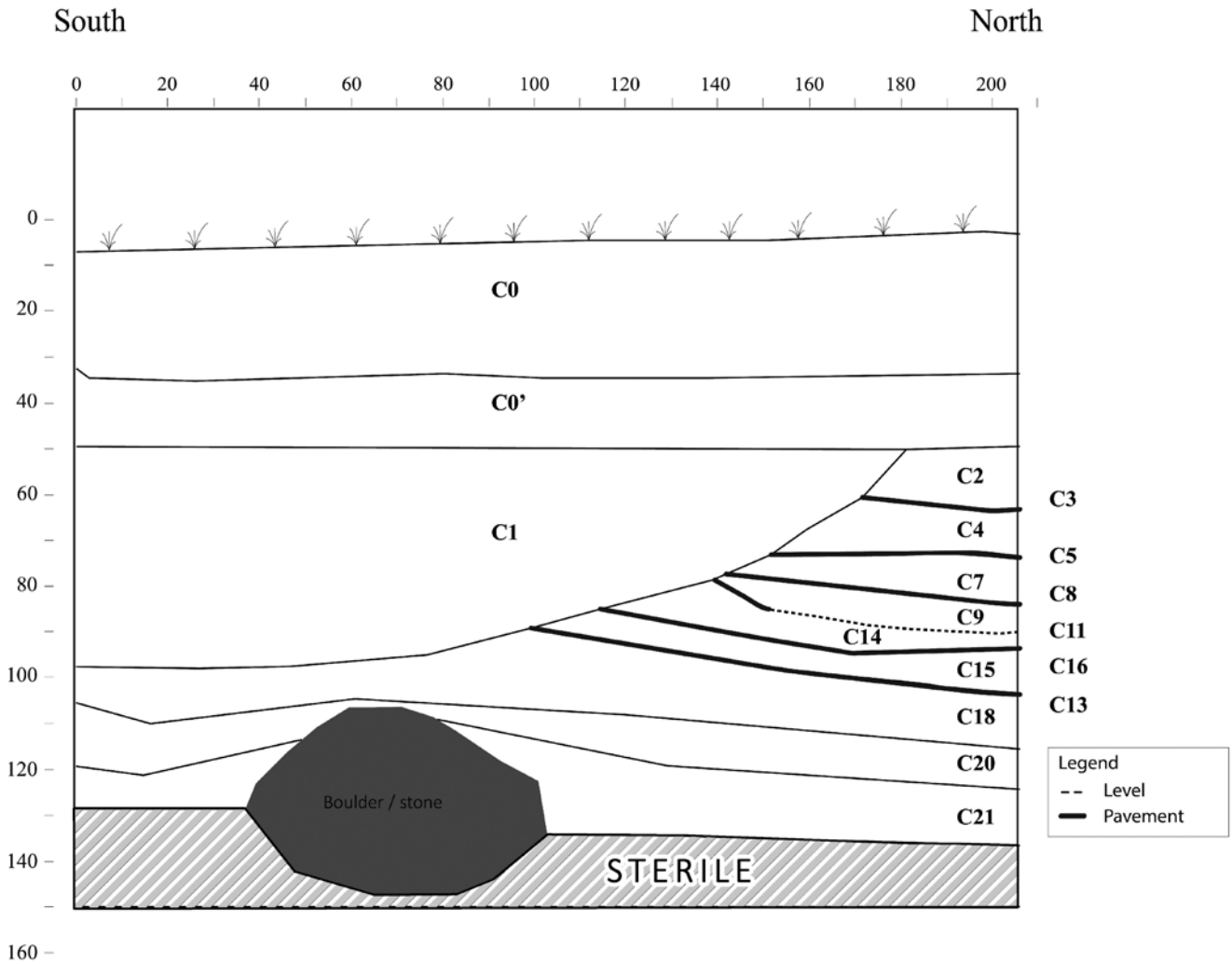

FIGURE F.3 West section at completion

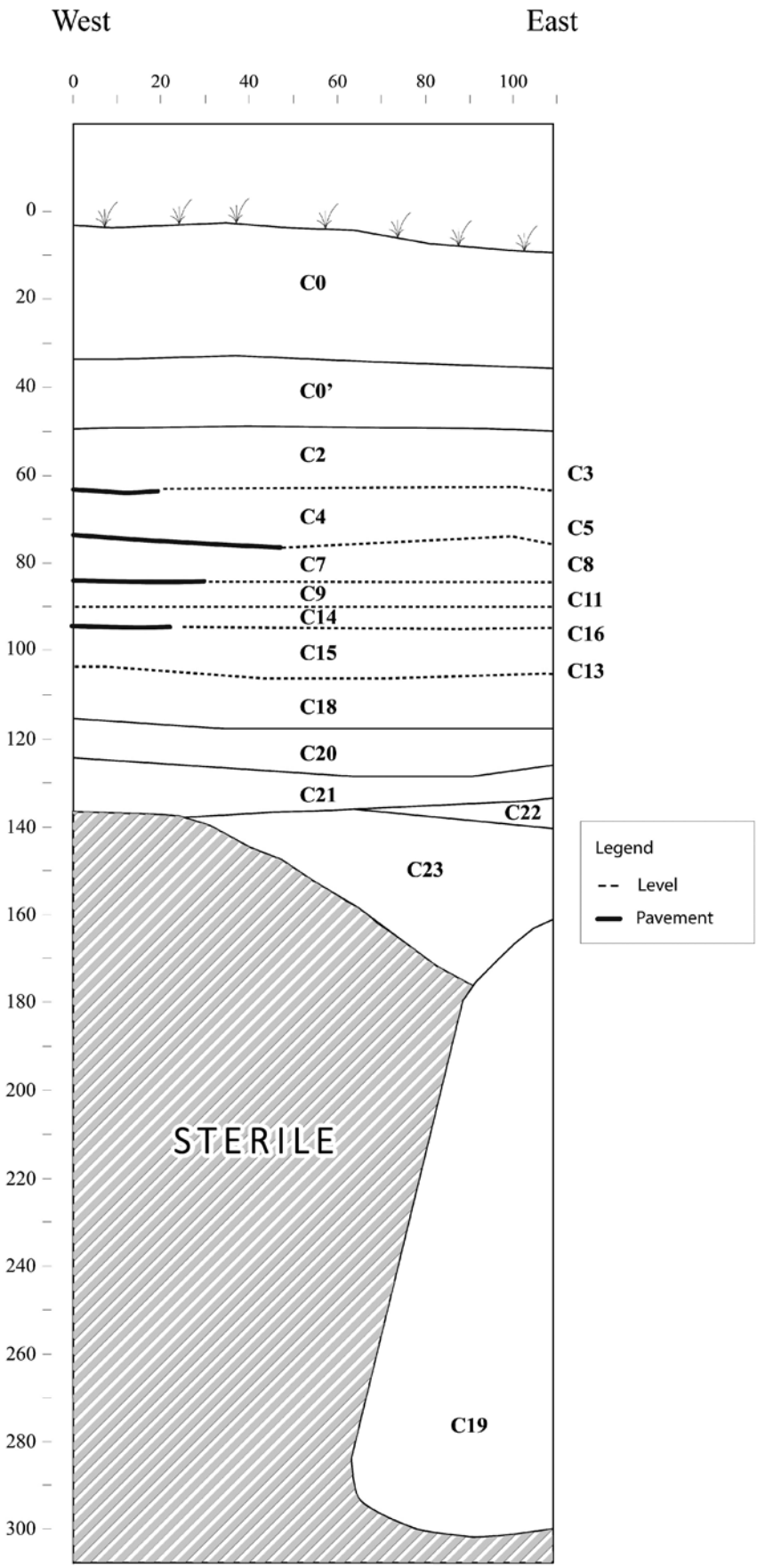

FIGURE F.4 North section at completion

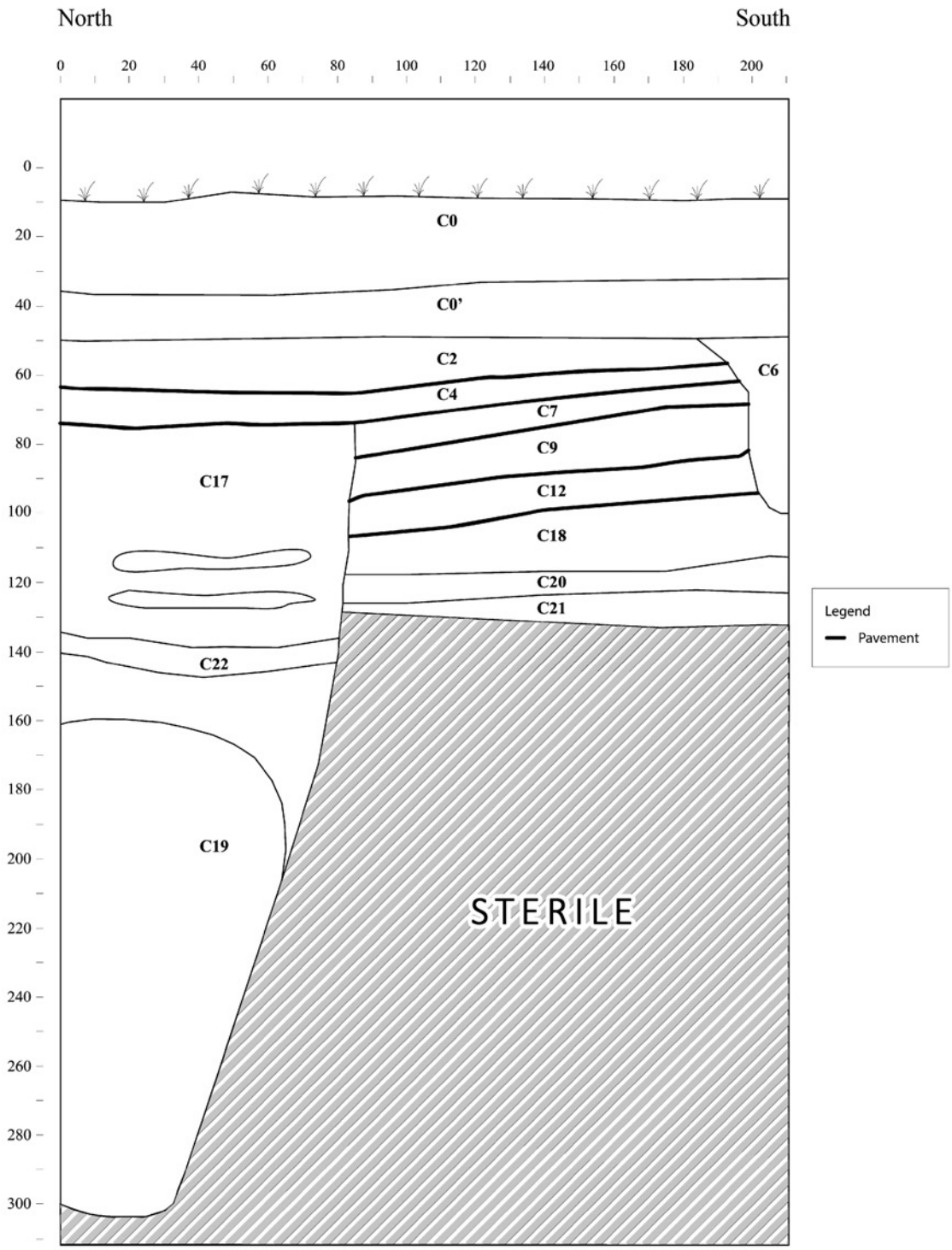

FIGURE F.5 East section at completion

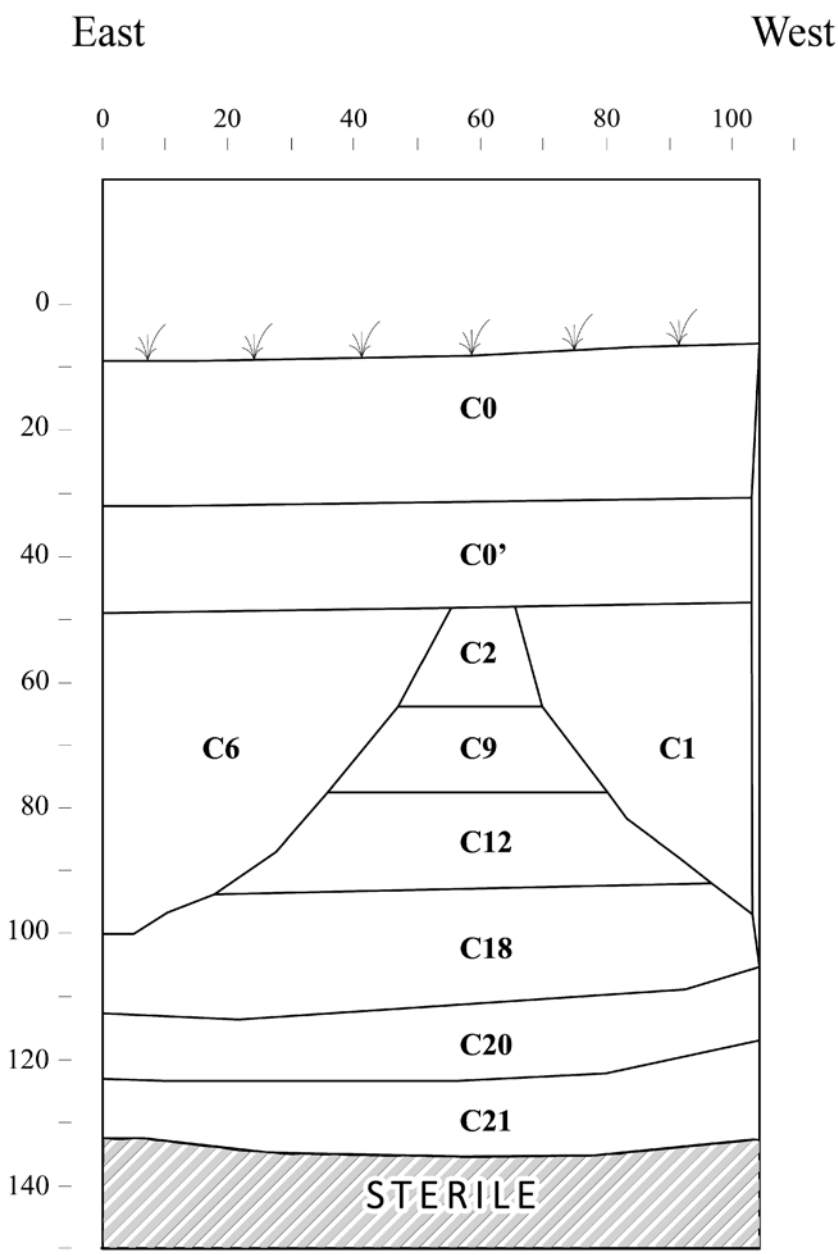

FIGURE F.6 South section at completion

FIGURE F.7
North section at completion. Compare Figure F.4.

sections, one formed of very small and eroded sherds and the second composed of larger sherds, some of which refitted into even larger sherds.

Context 5 was another pavement, in which the majority of sherds were decorated (roulette and incision were noted; perforation also featured). The sherds tended to be larger than those of Context 3. The Context 5 pavement also includes some small pebbles arranged in linear alignments.

Context 8 was a pavement composed in roughly equal parts of potsherds and pebbles, haphazardly arranged. The sherds were mainly decorated (roulette and incision) or polished.

Context 10 was a small area of pavement, in a roughly triangular shape over c. 50 × 40 × 70 cm. Though this pavement was badly preserved, it was possible to follow its 'ghost' in the soil. The sherds constituting it were very small, eroded, and fragile.

Context 11 was a very small area of pavement (20 × 30 × 30 cm) in the northwest part of the excavation. The sherds were large and refitted into larger sherds. They were decorated by rouletting or red polish. The southern edge of the pavement rose up to touch the pavement in Context 8.

Context 13 was a ceramic pavement composed of large, fragmented, mainly decorated potsherds and few small pebbles.

Context 16 was a pavement constituted by large sherds and pebbles. It had a more complex organisation, in which pebbles were arranged in perpendicular lines to form a grid filled out with potsherds.

2.5 *Deposition Layers*

Context 0 was a brown layer of medium compaction with much bio-perturbation, e.g. roots.

Context 0' was a soft yellow sandy layer.

Context 2 was a very thin and compact brown-yellow deposit.

Context 18 was a horizontal deposit that covered the entire surface of the test pit. It was constituted of compact brown-yellow layers with some red nodules. It was the base of the succession of pavements.

Context 20 was a very soft black layer, mainly formed of charcoal.

Context 21, the lowermost layer in the south part of the excavation, was very compact and red and contained few artefacts. It appeared to be natural soil or bedrock.

Context 22 was a soft brownish layer with some ashy content.

Context 23 was a soft green-grey ashy layer formed by a succession of small greenish layers. Contexts 22 and 23 were the earliest contexts in the stratigraphy.

Context 24 was a very small ashy deposit in the centre of Context 19.

3 Finds

The finds consist essentially of pottery, including some very large and refitting fragments. Small finds include three iron fragments. One double-edged blade fragment (SF 2013-77) may belong to the weaponry category. A rod (SF 2013-76) seems to represent hardware, and may be a nail; finally, one plaque (SF 2013-75) remains undetermined. A ceramic knob (SF 2013-93) and a shaped sherd (SF 2013-114) were also recovered.

4 Interpretation and Cultural Attribution

The presence of seven successive pavements in such a short time period, as indicated by the radiocarbon dates, suggests a very quick succession of building episodes.

The different occupations of the site can be summarised as follows:

1) Context 0 was the current level of occupation, mainly used for agriculture.
2) Context 0' was the former level of agricultural occupation.
3) Context 2 included two pits (Contexts 1 and 6).
4) Context 3 (pavement), constituted a living surface.
5) Context 5 (pavement) was built on the levelled remains of Context 4 (destruction layer), the result of the collapse of the house elevation and the pit Context 17.
6) Context 8 (pavement), built on the levelled remains of Context 7 (destruction layer).
7) Context 10 (pavement), built on the levelled remains of Context 9 (destruction layer).
8) Context 11 (pavement), built on the levelled remains of Context 12 (destruction layer).
9) Context 16 (pavement), Context 15 (destruction layer) and Context 14 (hearth within Context 16).
10) Context 13 (pavement).
11) Contexts 20 and 21 (horizontal deposit).
12) Contexts 22 and 23 (horizontal deposit).

Context 19 is difficult to link with any of the occupations. Because this presumed pit presented in the form of a sloping cylinder running face-on into the side of the trench, the interface between its upper and lower sections could not be determined. The final part of the pit, which involved a round cavity of 60 cm diameter excavated directly in the bedrock, appeared to have been intentionally excavated in the past; the reasons for this intensive labour remain unclear, as the result was too shallow to serve as a well. Charcoal samples included a range of taxa, including different *Combretum* species, *Prosopis Africana, Cola spp.* and *Sapotaceae/Mimusops* type (Eichhorn, this volume). The feature likely served as a rubbish disposal pit.

5 Radiocarbon Dates

There are ten dates for TTK S1. Initially three dates were run from this trench. A sample from the base of Context 19 (level 34, approx. 350cm BD) yielded a date of 1060 ± 30bp (Beta-348770). Context 18, a horizontal deposit at the base of the sequence of pavements, yielded a date of 610 ± 30bp (Beta-348769) while Context 2, a thin deposition layer at the top of the sequence of pavements, yielded a date of 1010 ± 30bp (Beta-345502). Clearly, some of these relate to intrusions.

Additional dates were run to help solve this enigma. The three dates on destruction layers (Beta-417589, Beta-417591, Beta-417592) raise even more questions. While the destruction levels 7 and 9 (lying in between Pavements 2 and 3, and 3 and 4, respectively) appear separated by as much as 350 years, destruction level 12, under pavement 4, is of a similar age to destruction level 7. The most likely scenario is that Units 17 and 22, both of which are soft, brought intrusive material which has confused the base of the sequence of pavements. Alternatively, the date on level 9 is too old.

A further four dates were run to help choose between these options.

Two of these were chosen explicitly to clarify the outlying Beta-348769: they came from Context 21 Level 12 and from Context 18 Level 10. They returned near-identical ages of c. 900 bp (Beta-417593 and Beta-417595). A hearth in Pavement 7 which overlies both of these gave a slightly younger date (Beta-417594). A date from charcoal inside a pot from Context 1 gives a good end-date for the site, of c. 620 bp (Beta-417590).

Further dating, on material from contexts 19, 22 and 23, will help clarify the issue.

The dates, in stratigraphic order, are as follows:

Beta-417590	620	30	TTK-SI-11, Level 5, Context 1, from inside a pottery vessel (Plate 9.17)
Beta-345502	1010	30	TTK-13-SI / Cont: 2, Level 6, -62 cm, direct association with a pavement
Beta- 417589	570	30	TTK-SI-18, Associated with destruction level 7
Beta- 417591	930	30	TTK-SI-26, Associated with destruction level 9
Beta- 417592	560	30	TTK-SI-28, Associated with destruction level 12
Beta- 417594	880	30	TTK-SI-60, Hearth in middle of pavement
Beta- 417595	900	30	TTK-SI-62, Context 18, Level 10
Beta-348769	610	30	TTK-13-SI, Level 11 Context 18
Beta- 417593	910	30	TTK-SI-31, Level 12 Context 21
Beta-348770	1060	30	TTK-13-SI Level 34 Context 19, one of the lowest levels in the unit, about 3.5m BD

TABLE F.1 Desampling

Level	Number
0–10	100
10–20	601
20–30	400
30–40	425
40–50	436
50–60	189
60–70	627
70–80	592
80–90	203
90–100	408
100–110	245
110–120	217
120–130	13
130–140	29
140–150	13
150–160	1
160–170	16
170–180	0
180–190	15
190–200	9
200–210	16
210–220	6
220–230	5
230–240	6

TABLE F.1 Desampling (*cont.*)

Level	Number
240–250	25
250–260	11
260–270	5
270–280	11
280–290	6
290–300	12
300–310	15
310–320	7
320–330	19
330–340	6
340–350	14
350–370	61
Total	**4764**

Analysis in the field by Louis Champion and Nadia Khalaf and at UEA by Louis Champion

TABLE F.2 Category 4

Level	Undecorated	Illegible
0–10	12	2
10–20	15	8
20–30	12	5
30–40	20	10
40–50	19	14
50–60	23	3
60–70	36	6
70–80	76	22
80–90	37	7
90–100	65	15
100–110	46	13
110–120	16	8
120–130	6	14
130–140	35	22
140–150	10	4
150–160	3	4
160–170	6	2
170–180	0	0
180–190	3	0
190–200	6	3
200–210	7	6
210–220	3	1
220–230	2	2
230–240	2	1
240–250	2	4
250–260	0	0
260–270	3	1
270–280	1	0
280–290	3	1
290–300	0	0
300–310	2	3
310–320	1	0
320–330	5	1
330–340	1	1
340–350	2	1
350–370	9	1
Con. 9	3	0
Con. 18	3	0
Total	**495**	**185**

Analysis by Louis Champion

TABLE F.3 Category 3

Context	#	Burn	Dec1	Dec2	Dec3
Con. 0	1	ext	rfp		
	1	ext	rfp-1a		
	18		rfp-1c		
	4		rfp	mch	
	1	ext	mch		
	6		rfp-1b		
	1		mch		
	1	int	roul		
	1		rc		
	5	int	rfp-1b		
Con. 0’	3		roul		
	2		rc-1b		
	2	ext	rfp-1a		
	3		rfp-1b		
	3		rfp-1c		
	1		handle	undec	
	2		rfp	mch	
Con. 1	1		mch		
	6		roul		
	1	int	rfp		
	7		rfp-1b		
	1		perforated	rfp-1c	
	13		rfp-1c		
	1		bouton	roul	
	1		rc-1b		
	8		rfp	mch	
	1	ext	rfp-1b		
	1	ext	ch		
	1		ch		
Con. 2	3	ext	mch		
	3		roul		
	9		rfp-1b		
	1	ext	rfp-1b		
	9		rfp-1c		
	5		rc		
	1		handle		
	1		rfp-1a		
	2		rfp	ch	
Con. 4	2		rfp	ch	
	1		mch		
	1		sl-3		
	2		rc		
	2		rfp-1a		
Con. 6	5		mch		
	2	ext	roul		
	4		rc		
	11		rfp-1b		

TABLE F.3 Category 3 (*cont.*)

Context	#	Burn	Dec1	Dec2	Dec3
	13		rfp-1c		
	1	int	sl		
	3		perforated	rfp-1	
	1		perforated	rfp-1	
	3		perforated	rfp-1	
	1		bottle	groove	stab
	1		rfp		
	6		rfp	mch	
	1		sl		
	2		rc-1b		
Con. 7	3		mch		
	1	ext	sl		
	2		roul		
	1		bottle	undec	
	1		perforated	rfp-1	
	1		bottle	SP2	
	1		bottle	groove	
	8		rc		
	7		rfp		
	3		rfp-1a		
	7		rfp-1b		
	1	ext	rfp-1c		
Con. 9	7		mch		
	1	ext	roul		
	3		rc-1		
	6		roul		
	5		rc-1b		
	1		rfp		
	2		rfp-1b		
	1	ext	rfp-1c		
	4		perforated	rfp-1	
	1		perforated	undec	roul
	1		bottle	groove	mch
	3		rfp	mch	
	1	ext	sl		
Con. 12	1		ch		
	3		rfp-1c		
	3		rfp	mch	
Con. 14	1		mch		
	2		roul		
	1		perforated	roul	
	1		bottle	undec	
	11		rfp-1b		
	2		rfp	mch	
Con. 17	1		roul		
	2		rc		
	1		rc-1b		

TABLE F.3 Category 3 (*cont.*)

Context	#	Burn	Dec1	Dec2	Dec3
	2		rfp-1a		
	1		perforated	undec	rfp
	2		rfp-1b		
	1		rfp-1c		
	4		rfp	mch	
	2		mch		
	1		sl		
	2	ext	roul		
Con. 18	3	ext	mch		
	2		rc		
	1		rfp-1a		
	2		rfp-1b		
	1		bottle	undec	
	1		perforated	undec	
	3		perforated	rfp	
	1		rfp-1c		
	6		rfp	mch	
	1		rc-1b		
	2		roul		
Con. 19	1		perforated	rfp-1c	
	2		perforated	rfp	
110–120	1		rfp	mch	
	1		sl		
	5		roul		
	1		rc-1b		
	1		rfp-1b		
	3		rfp-1c		
120–130	5		rfp-1c		
	2		rfp-1b		
	2		rfp		
	3		rc		
	2		roul		
	2		sl		
	3		rfp	mch	
130–140	7		mch		
	1		sl		
	10		roul		
	2		rc		
	2		rfp		
	2		rfp-1a		
	2		rfp-1b		
	3		rfp-1c		
	3		rfp	mch	
140–150	2		mch		
	1		roul		
	2		rc		
	1		rfp		

TABLE F.3 Category 3 (*cont.*)

Context	#	Burn	Dec1	Dec2	Dec3
	2		rfp-1b		
	3		rfp-1c		
	2		rfp	mch	
150–160	3	ext	mch		
	2		roul		
	2		rc-1b		
	1	ext	rfp		
	1		rfp-1b		
	5		rfp-1c		
	2		rfp	mch	
160–170	2		mch		
	1		roul		
	1		rfp-1b		
	1		rfp-1c		
	1		rfp	mch	
170–180	9		rfp		
180–190	1		mch		
	1		sl		
	1		rc		
	1		rc-1b		
	5		rfp		
	1		rfp-1a		
	1		rfp-1b		
	2		rfp	mch	
190–200	2	ext	mch		
	2		rc		
	1		rfp		
	7		rfp-1b		
	1		rfp-1c		
200–210	1		sl		
	3		rc		
	1	ext	rfp-1a		
	1		rfp-1b		
	3		rfp	mch	
210–220	1		mch		
	2		rc-1b		
	1		rfp	mch	
220–230	4		rfp		
	1		rfp-1a		
	1		rfp-1b		
	4		rfp-1c		
230–240	4		rfp		
240–250	2		mch		
	25		rfp-1b		
	1		roul	sl-4	sc-3
	3		rfp	mch	
250–260	1	ext	mch		

TABLE F.3 Category 3 (*cont.*)

Context	#	Burn	Dec1	Dec2	Dec3
	2		rfp-1a		
	10		rfp-1c		
260–270	2		rfp-1a		
	15		rfp-1b		
	3		rfp	mch	
270–280	2		mch		
	6		rfp-1a		
	1		rfp-1b		
280–290	1	ext	mch		
	5		rfp	mch	
290–300	4		rfp	mch	
300–310	3		mch		
	3		rfp		
	3	int	roul		
	6		rfp-1a		
	3		rfp-1b		
	2		rfp-1c		
310–320	2		mch		
	2		rfp-1b		
	2		rfp	mch	
320–330	5		mch		
	5		rc		
	6		rfp-1a		
	1	ext	rfp-1a		
	3		rfp-1b		
	3		rfp-1c		
	2		rfp	mch	
330–340	2	ext	mch		
	5		rc		
	1		roul	rc	sl-1
	1		roul	rc	
	1	int	roul	sl-2	
	2		roul	sl-2	sl-2
	1		roul	sl-3	
	4		roul		
	1		roul	sl-1	
	1	ext	roul	sl-7	sl-2
	1	int	roul		
	4		rfp	mch	
340–350	2	ext	mch		
	4		rfp-1a		
	15		rfp-1b		
	1		rfp	mch	
350–370	1	ext	mch		
	2		roul	rc	
	5		rc		
	5		rfp-1a		

TABLE F.3 Category 3 (*cont.*)

Context	#	Burn	Dec1	Dec2	Dec3
	30		rfp-1b		
	31		rfp-1c		
	21		plain	ch	
	1	ext	roul	sl-3	sl-2
	10		rfp	mch	
	2		rc-1b		
	3		roul	rc-1b	
Con. 20	1		mch		
	1		rfp-1b		
Con. 21	1	ext	mch		
	1		rfp		
	1	ext	rfp-1c		
	1		rfp	ch	
	1	ext	mch		
	1		roul		
	1		rc		
	1	ext	rfp		
	2		rfp-1b		
	5		rfp-1c		
Con. 22	1	ext	rc		
	3		rfp	mch	
Con. 23	1		rc		
	1	ext	rfp		
	1		rfp-1a		
	1		rfp-1b		
Unlabelled	1		rc		
Total	**812**				

Analysis by Louis Champion

TABLE F.4 Rims

Context	#	Rim type	Burn	Dec1	Dec2	Rim Angle	Rim Diam	Mx. Thick
Context 0	3	S		undec		4		
	1	T		rfp-1c		2		
	2	S		rfp-1c	plain	4		
Context 0'	1	S		rfp-1c		4		
	1	S		undec		4		
	1	S		undec		3		
	1	S		rfp-1b	ch	4		
	1	S	ext	undec		4		
	1	T	ext	undec		2		
	1	Base	ext	undec				
Context 1	1	S	ext\int	plain	perforated	4		
	3	S	ext\int	undec		4		
	2	S		undec		5		

TABLE F.4 Rims (*cont.*)

Context	#	Rim type	Burn	Dec1	Dec2	Rim Angle	Rim Diam	Mx. Thick
	1	T		undec		3		
Context 2	1	S		undec		4		
	1	Base		undec				
	2	S	ext\int	undec		4		
Context 4	1	T		rfp-1b ext/int	sl-20	2		
	2	S	ext\int	undec		4		
Context 6	1	S	ext	undec		4	16	
	1	S		undec		4	22	
	1	S		rfp-1b				
Context 7	1	T		undec		2		
	2	S		undec		3		
	3	S		undec		4		
	1	S		undec		5		
	1	E		undec		3		
	1	T		roul		2		
Context 9	1	S	ext/int	rfp-1b		4		
	2	S	ext/int	undec		4		
	1	S	ext/int	undec		5		
	1	S	ext/int	undec		4		
	2	T	ext/int	undec		4		
	1	S	int	undec		4	14	
	1	S	ext/int	mch 8	plain	4		
Context 14	1	T		undec		3		
Context 17	1	S		undec		3	20	
	1	Base	ext	undec				
Context 18	1	E		undec		2	18	
	1	S		undec		2	18	
	1	E		undec		2	20	
	1	E		mch	rfp-1b	2		
	1	S		mch	plain	5	14	
	1	S		undec				
Context 19	1	E	int	plain	mch	3	22	
	1	T		plain	rfp	3	18	
	1	S		undec		3	12	
	1	S	int	rfp-1c		3		
	1	S		plain	rfp-1b	2		
	1	S		undec		3	14	
	1	E		undec		4	18	
	1	T	ext/int	plain	rfp-1b	3	16	
	1	E	ext/int	plain		4	22	
	1	E	ext	plain		4	22	
	1	S	int	plain	rfp-1b	3	14	
	1	S	int	plain	rfp-1b	3	18	
	1	E		undec		5	18	
	1	S	ext/int	plain		3	16	
	1	S		undec		4	22	
	1	E		undec		4	20	

TABLE F.4 Rims (*cont.*)

Context	#	Rim type	Burn	Dec1	Dec2	Rim Angle	Rim Diam	Mx. Thick
	1	E		undec		4	22	
	1	S	ext/int	plain		5		
	1	E	ext/int	plain		5	28	
	1	E	ext/int	plain		4	24	
	1	T	ext/int	plain	mch	3	26	
	1	S	int	paint red	rfp-1b	3	20	
	1	S	int	plain		4	30	
	1	S	int	plain		3	32	
	1	E	int	plain		5	20	
	1	S	ext	plain		4	22	
	1	S	int	rfp-1c		3	26	
	3	S	ext	plain		4		
	1	T	ext	plain		5		
	1	S	ext	plain		4		
	1	E	ext	is-geo		5		
	1	S		rfp-1c		4		
	1	T		ind		3		
	1	S		mch 10	plain	4		
	1	S		rfp-1c	perforated	3		
	1	S		rfp-1c	perforated	5		
	1	S		rfp-1b	roul	5		
	1	E		rfp-1b	ch2	3		
	1	E		rfp-1b	ch2	4		
	1	S	ext	roul		4		
	1	S	ext	plain		3		
	1	E	ext	plain		4		
	1	S	ext	rfp	ch	4		
	1	S	ext	rfp-1b		5		
	2	S		undec		4		
	1	T		plain	rfp	4		
	2	E4	ext			4		0.6
Total	**108**							

Analysis by Louis Champion
This analysis was carried out in 2013, as part of Champion's Masters thesis, and was intended to give an initial sense of the assemblage. It predated the development of a detailed rim typology (see Haour et al., Chapter 17, this volume) and the rim categories used are only broadly defined.

Tin Tin Kanza (TTK-13-S11)

Nadia Khalaf and Anne Haour

1 Excavation

The excavation unit measured 2 × 1 m and was located on the lower half of the mound, aligned north-south. Its location was chosen to sit midslope, close to a large quern stone. It was c. 50 m away from Unit S1. This excavation was the first to be carried out on the site and was undertaken between 22 January and 6 February 2013. The core team consisted of Nadia Khalaf and Anne Haour, with two local workmen and periodic assistance from other members of the *Crossroads* team.

This trench was excavated in contexts, rather than spits. Each context was sieved and the finds were separated. The test pit reached a depth of 140 cm before the excavation had to be abandoned due to lack of time. At this level, an intricate potsherd pavement separated into two areas by a wall stump had been brought to light. Findings from this trench, including the pottery, are published in detail elsewhere (see Khalaf & Haour 2013), so are not repeated here.

2 Stratigraphy

Context 1, the topsoil (the uppermost 25 cm) was a mid to dark brown sandy silt, loose in compaction, with pottery, bone and shell.

Context 2 was mid to dark orange brown sandy silt, more compact than the topsoil and featuring pottery, bone and shell inclusions. These two contexts, Contexts 1 and 2, had been subjected to varying degrees of disturbance due to cultivation, so were removed quickly.

Context 3 was a mixed deposit with red, clay-like inclusions and dark charcoal deposits.

Context 4 was very loose, light grey orange, sandy silt with charcoal inclusions. A cowrie shell was recovered within this deposit.

Context 5 was loose grey-brown sand, sealing a red floor. It was disturbed by a tree throw and pottery was present.

Context 6 was a thin, fragile red floor layer, which showed up clearly in the trench section.

Context 7 consisted of hard whitish grey material with pottery inclusions, possibly a destruction layer.

Context 8 included a number of large potsherds lying on a pavement. The potsherds, mainly decorated with folded strip roulette, were recovered lying on top of one another, which seems more consistent with intentional disposition than with an accidental crushing of a vessel. The pavement included both decorated and undecorated potsherds as well as some pebbles. The deposit was a mid to dark reddish brown.

Context 9 was an arbitrary sondage at the northern end of test pit. This was excavated separately because a hearth feature appeared in this area, which was not present in the rest of the trench.

Context 10 was a pottery pavement underneath a large fragmented vessel centred in the middle of test pit with a grey circular feature, possible building material.

Context 11 underlay the pavement and contained large fragments of pottery; the deposit was reddish brown, moist, and friable in compaction, sitting on top of a chalk layer. The fragmentary remnants of a large vessel were recovered in this context.

Context 12 lay underneath Context 9 in the smaller sondage in the northern part of test pit. The deposit was mid to light greyish brown, and very friable in compaction. Pottery, charcoal, and ashy inclusions that may be the fill of a separate cut feature were noted.

Context 13 was a circular chalk floor with pottery on its surface, thin (5 mm) and cut by five post holes. There was a hardened clay surface abutting the floor on the northern edge.

Contexts 14–23 were the cuts and fills of five postholes. The cuts were circular in plan with steep vertical sides and concave bases. The fill deposit was reddish brown sandy silt, apart from one posthole (Context 22) which contained pottery inclusions.

Context 24 refers to a layer of mixed events, rather than a single deposit. This included a potsherd pavement in the trench at the north end of the test pit, evidencing charcoal and slag inclusions.

Context 25 was under the chalk floor (Context 13). This context refers to a level of the trench where a potsherd pavement and a red floor were identified.

Context 26 was a mottled surface with white, red and grey colours. Pottery inclusions were present throughout.

Context 27 was the cut of a floor filled by Contexts 13, 25 and 26.

FIGURE F.8
Working shot at initial stages of excavation

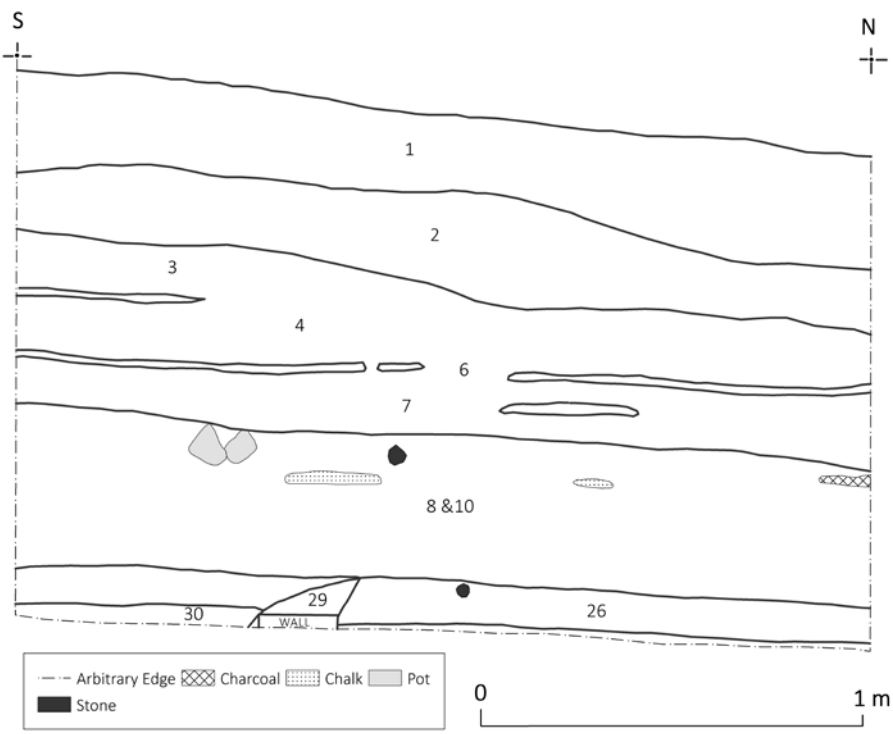

FIGURE F.9 West section of unit at completion

Context 28 was the fill of a hearth within which a metallic iron blade, charcoal and a small, crudely made intact pot (not illustrated) were recovered.

Context 29 was mid to light grey-brown sandy clay with large stone inclusions.

Context 30 was a potsherd pavement in the south of the test pit.

Context 31 was a potsherd pavement in the north of the test pit, separate from Context 30.

Overall the stratigraphy at TTK-13-S11 is quite complex. Each of the sections display a variety of layers and floors which are not homogeneous throughout. The south-facing section shows evidence of a hearth at its base. Above this is variety of red floors and pottery pavements. The

stratigraphy in the east-facing section (Figure F.9) also features an assortment of different floor layers: the red layer (Context 6) is prominent midway down the section, and we interpret it as a floor. Indeed a local excavator commented his grandfather had had a similar floor. A half-complete pottery vessel protrudes from it. At the base of the section in the north is the red, grey, white mottled layer (Context 26). The north-facing section presents evidence for three red floors, and the uppermost (Context 6) is the most prominent. This section is visible on F.10 which also shows the chalk floor and postholes.

3 Finds

The finds consist essentially of pottery. As noted above, Context 8 included a number of large potsherds recovered lying on top of one another. During post-excavation work, it was possible to refit some of these 192 sherds to form a single pot (Plate 8.15). A vessel excavated from the east-facing section (visible in Figures F.9 and F.11) has also been refitted (Plate 9.20). Small finds include an iron blade (SF 2013-74, illustrated by Filippini, Figure 19.4, top, this volume) which was found sitting in the hearth feature. It seems to be a dagger or a large knife, but oxidation is too substantial to determine whether there were

FIGURE F.10
One of the authors (NK) exposing Context 13. Photo taken from north end of trench looking south

FIGURE F.11
West section of trench; compare Figure F.9 which shows the same section. The complete pot at the southern end, seen here, was later removed, and is illustrated in the pottery catalogue, Plate 9.20.

one or two cutting edges. Its dimensions – 19.3 cm length, even with the fitting, and 2.7 cm wide – show it to be a large item. Also recovered were a rod which may be a nail (SF 2013-73), and a cowrie shell with its dorsum removed. This is one of two cowries of possible Phase 4 date which has been recovered during our work (Christie & Haour, this volume). Unfortunately, we cannot be certain that it definitely relates to this early period: Contexts 1–5 were disturbed and given the fact that the site is under intense cultivation, it is possible that this shell might have worked its way down in the sequence.

4 Interpretation and Cultural Attribution

Trench 11 at Tin Tin Kanza allowed us to expose a well preserved set of wall stumps, pavements and other features, and to excavate them on a context by context basis. The nature of the remains clearly indicates this was a living context, although the small size of some of the structures raise questions as to their use. The excavation was left incomplete due to time constraints, and one obvious question is how far down the sequence will extend, and what was the initial date of settlement of the site. The architectural remains recovered in Trench 11 mirror those recovered slightly higher up the settlement mound. At a first assessment, Tin Tin Kanza seems to share similarities with sites of the Kainji area some 200 km downstream (Nzewunwa 1983: 42–43), as well as with other sites excavated by our team, most notably Birnin Lafiya and Pekinga (on this see also Nixon; Gosselain & Haour, both in this volume); it thus holds unique promise for an archaeological understanding of West African pavement cultures.

5 Radiocarbon Dates

1.	Beta-345503	1010	30	TTK-13-SII / Cont: 28. Taken from hearth with associated blade (SF 2013-74)	Phase 3–4
1.	Beta-348774	920	30	TTK-13-SII / Context 11. Direct association with a pavement	Phase 4
2.	Beta-348775	1120	30	TTK-13-SII / Context 25	Phase 3

Beta-348774 and Beta-348775 were incorrectly reported in Khalaf & Haour (2013) as being from Contexts 8 and 11 respectively, instead of 11 and 25.

CATALOGUE G

Boyeri (BOY-14-S1 & II)

Nicolas Nikis, Alexandre Livingstone Smith and Olivier Gosselain

1 Location

Boyeri (Bwayeri) is a former settlement located a few kilometres southwest of Kompanti (PTI), of which it is said to have been a predecessor site. Boyeri is said to have been destroyed by the *Saka* of Kandi towards the end of the nineteenth century (Gosselain & Haour, this volume). It is located on a small rocky eminence. One of the striking features of the site is a large white ashy deposit (c. 15–20m in diameter) related to the dyeing pits which made the place famous – and caused its destruction as it is said that it is precisely the wealth of the dyers which attracted the wrath of Kandi (Gosselain & Smolderen, 2016).

2 Geographical Coordinates

LAT: 12,111542969942 LONG: 3,01247402094304 (WGS84)

3 Discovery

The site was identified and excavated by Nicolas Nikis, Olivier Gosselain and Alexandre Livingstone Smith on 26 January 2014.

4 Destruction Risks

The site is ploughed. It is not under any specific threat and mitigation measures are not urgent.

5 Site

Boyeri is a former village. It is located on a low eminence inland from the Niger, near a seasonal water source – a gully. The initial survey yielded a lot of ceramic material (among which no folded strip roulette decoration, but much undecorated material and some *blepharis* roulette decorated pottery). The extent of the site is unknown, but it is at least 200 by 300 m.

6 Excavation

Boyeri had never been excavated before. Two test pits were excavated. Both were 1 × 1 m and dug in spits of 10 cm (except for the superficial layer which was excavated in one spit of 20 cm). Within each spit, archaeological contexts (i.e. distinct units) were separated, sieved and bagged separately. All spits were sieved down to 5 mm. Test pit S1 was interrupted at 80 cm, 15 cm into sterile yellow sandy soil. Test pit S11 reached natural substrate at 40 cm, but was dug to 80 cm to investigate a pit structure dug into said substrate.

7 Stratigraphy

The stratigraphy of S1 displays a thick layer of destruction with several layers of grey to white ash mixed with chunks of burnt earth. This stratigraphy may be related with oral traditions mentioning the destruction of Boyeri by the *Saka* of Kandi. The lower unit of compact brown sand may be related to Unit 3 in S11.

The stratigraphy of S11, located some 20 meters north of S1, is more classic. It consists of three contexts below the plough layer (Unit 1). A first context (2) is a layer of grey loose sand with abundant charcoal fragments and artefacts fragments (pottery). This Context 2 overlays a unit of brown to light brown loose to compact sand (Context 4). A pit (Context 3) is dug into that layer. The upper part of its filling shows laminations typically related to rain and stagnation in the stabilisation level of the pit.

8 Finds

Surface finds include potsherds displaying tamper marks on their internal surface, as well as pottery displaying *blepharis* roulette decoration. Two metal items (SF 2014-76 and 77) were recovered: an unidentified iron object, discovered in the upper part of the trench, and an open ring bracelet of 9.5 cm diameter. The site yielded two cowrie shells (SF 2014-01 and -02a) (Christie & Haour, this volume).

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FIGURE G.1
Site under excavation

FIGURE G.2
BOY-14-S1, West section at completion

FIGURE G.3
BOY-14-SII, North section at completion

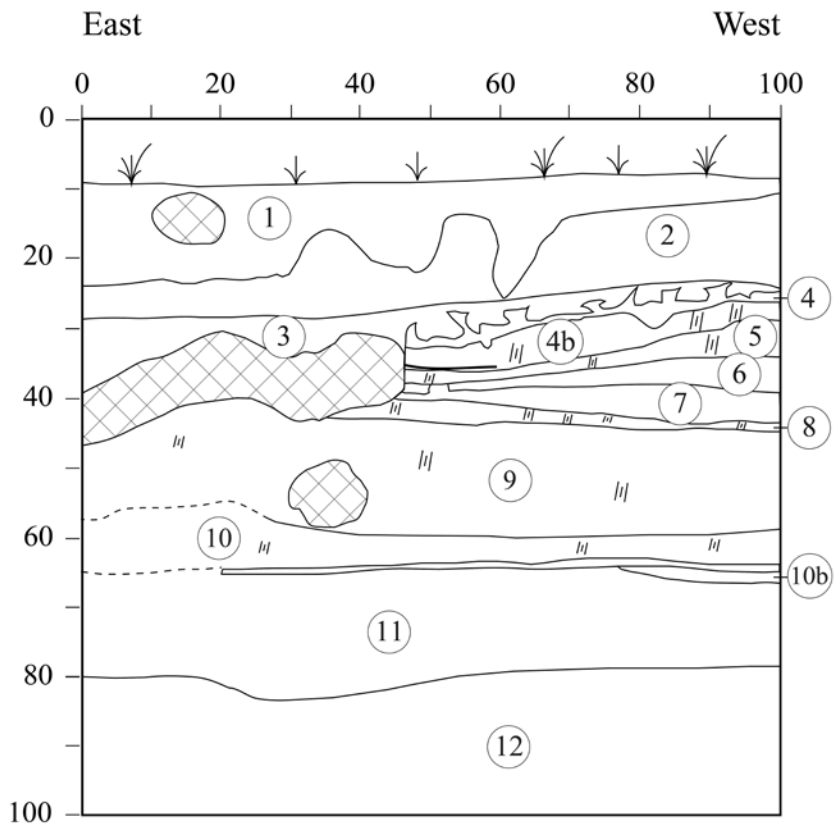

FIGURE G.4
BOY-14-SI, South section

1 loose grey ash/sand with slag fragments and pottery. Top is disturbed by ploughing
2 compact red-orange burnt earth
3 loose yellow brown sandy ash with pottery, charcoal and burnt earth fragments. This unit is separated from unit 2 by a thin compact red line
4 loose whitish grey ash with pottery and abundant charcoal. This unit is very thin
4b loose grey ash with pottery and abundant charcoal
5 loose grey ash with pottery and abundant charcoal. This unit is irregularly separated from the previous one by a thin level of red gravels and pottery fragments
6 compact bright red burnt earth with blocky burnt earth fragments
7 compact brown burnt earth
8 loose grey ash with pottery and abundant charcoal
9 red-brown sand with charcoal and burnt earth fragments. This unit is separated from the previous one by a thin line of loose white ash
10 compact grey ash with charcoal
10b compact grey ash with pottery, charcoals and burnt earth, separated from the previous one by a thin line of compact grey ash
11 compact brown-grey clayey loam with pottery and slag fragments (one iron bracelet)
12 compact brown-yellow clayey loam (natural substratum)

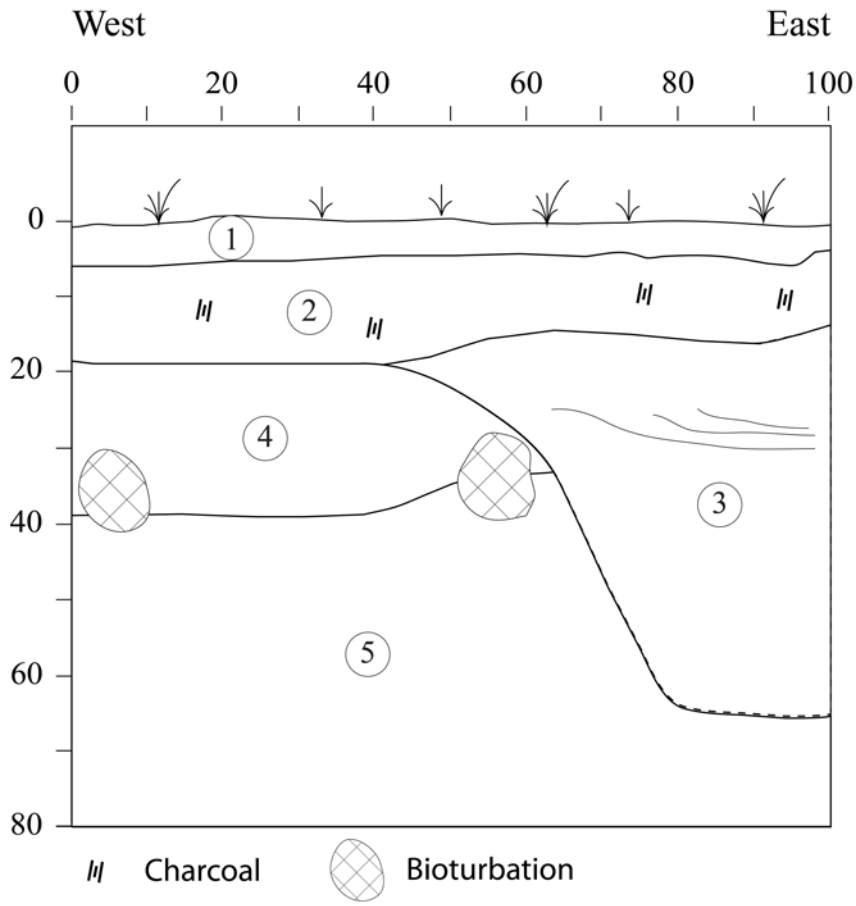

FIGURE G.5
BOY-14-SII, North section
1 loose grey ash/sand disturbed by ploughing
2 loose grey ash/sand with abundant charcoal and pottery
3 pit dug into layer 4. The upper part of its filling shows laminations typically related to rain and stagnation in the stabilisation level of the pit
4 brown to light brown loose to compact sand
5 compact brown-yellow clayey loam (natural substratum)

9 Interpretation and Cultural Attribution

We have no radiocarbon dates for the site. Oral testimonies, supported by the presence of new types of pottery and the absence of folded strip decorated pottery could indicate a post-thirteenth century occupation, probably concluding during the nineteenth century. The rather shallow deposits indicate a short span occupation (one or two generations?). The thick levels of destruction observed at BOY-14-SI are noteworthy. They echo oral traditions reporting the burning of the settlement by the *Saka* of Kandi. According to those, Boyeri, known as Bangou Yesa by the Zarma of Dendi, would have been founded after 1850 and destroyed in the 1880s. Informants in Kompanti and Loumbou Loumbou state that just two successive leaders ruled the town, which is consistent with a short occupation.

10 BOY SI

TABLE G.1 Desampling

Context	#
0–20	64
20–30	23
Con.1 30–40	11
Con. 2 30–40	5
Con. 3 30–40	3
40–50	37
50–60	6
60–70	6
70–80	10
80–90	6
90–100	4
Total	**175**

Analysis in the field by Anne Haour and at UEA by David Kay

TABLE G.2 Category 4

Context	Undecorated	Illegible
0–20	12	1
20–30	6	0
Con. 1, 30–40	10	1
Con. 2, 30–40	1	0
Con. 3, 30–40	1	0
40–50	14	2
50–60	1	0
60–70	2	0
70–80	2	2
80–90	2	1
90–100	2	0
Total	**53**	**7**

Analysis by David Kay

TABLE G.3 Category 3

Context	#	Burn	Dec1	Dec2	Dec3
0–20	2	ext			
	1		ch	blepharis	indis
	1		blepharis	indis	
	1		sl-2	rc-1a	
Con. 2 30–40	4	ext			
Con. 3 30–40	1	int			
	1		undec	pnt-r-b	pnt-r-r
40–50	4	ext			
	1	ext/int			
	2	ext	undec	pnt-r-b	
50–60	1		pnt-r-c		
	1	ext/int			
60–70	1		rfp-1a		
70–80	1	ext			
	1		roul		
80–90	1		sl-5		
	1	ext			
90–100	1		rce-8		
Total	**26**				

Analysis by David Kay

TABLE G.4 Rims

Context	#	R. type	Brn	Dec1	L1	Ang	Dia	Mx. thick
0–20	1	S1	ext					0.5
Con. 1 30–40	1	S1	ext/int					0.7
40–50	1	S4				5		0.6
	1	E1	ext/int			4		0.6
70–80	1	E4	ext/int			3	19	0.7
Total	**5**							

Analysis by David Kay

11 BOY SII

TABLE G.5 Desampling

Level	Number
0–20	101
20–30	30
Con. 1, 30–40	5
Con. 1, 40–50	4
Con. 1, 50–60	3
Con. 2, 30–40	15

TABLE G.5 Desampling (*cont.*)

Level	Number
Con. 2, 40–50	5
Con. 2, 50–60	13
Con. 2, 60–70	2
Total	**178**

Analysis by Anne Haour in the field and David Kay at UEA

TABLE G.6 Category 4

Context/spit	Undecorated	Illegible
0–20	26	2
20–30	14	0
Con. 1, 40–50	1	0
Con. 1, 50–60	0	2
Con. 2, 40–50	1	0
Con. 2, 50–60	6	1
Con. 2, 60–70	2	0
Total	**50**	**5**

Analysis by David Kay

TABLE G.7 Category 3

Context	#	Burn	Dec 1	Dec 2	Dec 3	Dec 4
0–20	9	ext				
	2	ext/int				
	1	ext/int	sl-1			
	1	ext/int	sl-1	roul	erod	
	1		rc-1a			
	1	ext/int	undec	roul	sl-2	
	1		rbt			
20–30	4	ext				
	1	ext/int				
	1	ext/int	undec	sl-1	rc-1a	pnt-r
	1		undec	rbt	undec	
	1		pnt-r-l-5	pnt-bl-b-3	ont-or-b-1	
Con. 1, 40–50	1		sl-3	erod		
	2		roul	erod		
Con. 2, 40–50	6	ext				
	1		blepharis			
Con. 2, 50–60	1	int	erod			
	4	ext				
	1	ext/int	undec	sl-1	rc-1a	pnt-r
	1	ext	undec	pnt-r-b		
Con. 2, 60–70	3	ext				
	1	ext	blepharis	erod		
Total	**45**					

Analysis by David Kay

TABLE G.8 Rims

Context	#	R. type	Brn	Dec 1	L1	Dec 2	L2	Dec 3	L3	Ang	Dia	Mx. thick
0–20	1	S4								4		0.5
	1	E4								4		0.8
	1	E1								4		0.7
	1	E4								4		0.7
	1	E1										0.7
	1	E4										0.8
20–30	1	E4	int									0.5
	1	E18	ext/int	undec	U	sl-1	U	roul	U	5	27	1.0
	1	E26								4		0.7
C 1, 40–50	1	E4								4		1.0
	1	S1	ext/int	undec	U	erod	U			3	16	0.5
C 2, 40–50	1	E11								4		0.5
C 2, 50–60	1	E4	int							4		0.9
Total	**13**											

Analysis by David Kay

CATALOGUE H

Bogo Bogo (GOG-14-SI)

Nicolas Nikis and Alexandre Livingstone Smith

1 Location

Bogo Bogo is a modern village situated away from the Niger River on a plateau northwest of Gorouberi. Its position is interesting as it is in the middle of a dry plateau, but the core of the village is slightly elevated. According to oral history, the foundation of this settlement is lost in time, at the very least preceding the foundation of Boyeri, whose inhabitants had asked the chief of Bogo Bogo for permission to settle their land.

2 Geographical Coordinates

LAT: 12,1029479987919 LONG: 3,10428704135119 (WGS84)

3 Discovery

GOG-14-SI was identified and excavated by Nicolas Nikis and Alexandre Livingstone Smith on 30 January 2014.

4 Destruction Risks

The site is a village and the locus of excavation is a trash midden. It is not under any specific threat and mitigation measures are not urgent.

5 Site

The initial survey yielded a few potsherds and a great deal of modern trash scattered on a large mound of ashy material (plastic, glass, human and animal faeces, etc.). The extent of the site is unknown. Modern houses appear to be built on it.

6 Excavation

Bogo Bogo had never been excavated before. A single test pit was dug in a trash midden located just on the side of the oldest concession of the village (between the house and the reported position of the former *birni*). The test pit was 1 × 1 m in size and was excavated by spits of 10 cm (except for the superficial layer which was excavated in one spit of 20 cm). Within each spit, archaeological contexts (i.e. distinct units) were separated, sieved and bagged separately (except towards the bottom where Contexts 5, 6 and 7 were missed due to the restricted size of the trench and poor light). All spits were sieved down to 5 mm. The trench was interrupted at 190 cm, 5 cm into the sterile soil, a compact yellow sand.

7 Stratigraphy

The stratigraphy in this trench extends down to 190 cm. It can be divided in three main horizons. The first, from 0 to 40 cm, consists of a series of modern trash accumulation, mainly ash mixed with objects such as plastic beads and discs, glass fragments, cloth, and bones (Contexts 1, 2 and 3). This horizon contains little pottery. The second horizon (Context 4), extending from 40 to 100 cm, also consists of a layering of trash, but with a different set of artefacts. While a handful of plastic beads were recovered, and glass fragments occurred, pottery became the dominant artefact. Slag fragments and one cowrie shell (SF 2014-06a, possibly part-ground, see Christie & Haour, this volume) were retrieved. At least seven fragments of glass bracelets were recovered, distributed between 0 and 90cm (SF 2014-11, -17, -18, -19, -20, -38 and 39 (see Catalogue for TOU, Figure AC.2, for images of four of these).

The first two horizons overlie two final contexts, which are probably two refuse pits. Context 5 (pit 1) is covered by Context 4 and sealed by a deposit of burnt earth. Context 5 is dug into another, completely refilled, trash pit labelled Context 6 (pit 2), which in turn is dug into the natural soil. This means that Context 6 had to be filled completely before Context 5 was dug into it, indicating that a significant stretch of time separated these events.

It is interesting to note that the layering of Contexts 1 to 4, which can be associated with today's surrounding spatial organisation, extends from 0 to 100 cm. The two previous horizons may indicate a slightly different spatial organisation (pre-*birni*?).

Combining the various elements, we can divide the stratigraphy as follows. From Context 1 to 3: sub-present layers. Context 4: contemporary (or "post *birni*"). Contexts 5

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FIGURE H.1
Site under excavation

FIGURE H.2
GOG-14-SI, West section at completion

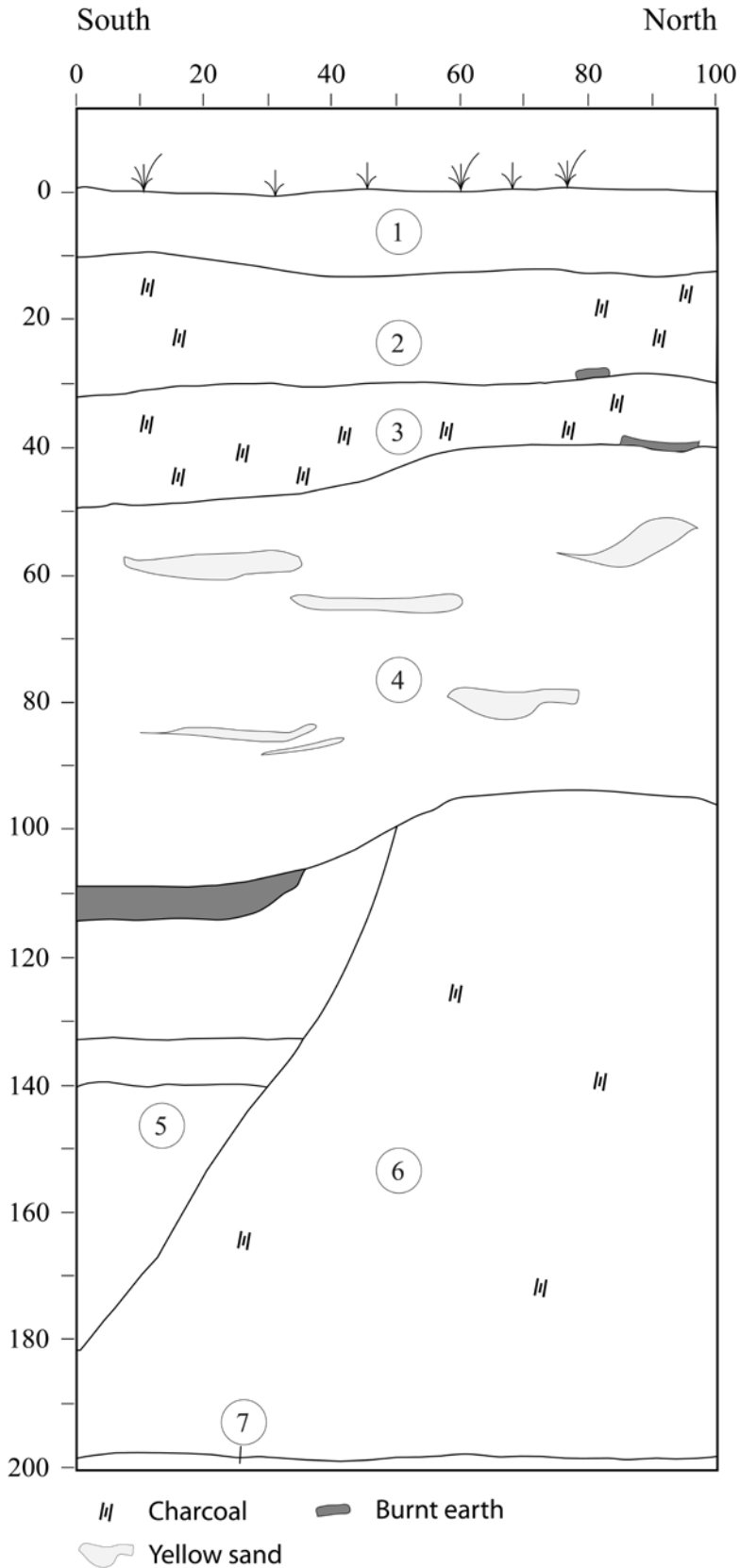

FIGURE H.3
GOG-14-S1, West section

1 Loose grey ash layer with cloth, plastic, glass, pottery, charcoal (top layer of trash midden)
2 Loose grey brown ashy sand with pottery and burnt earth fragments
3 Organic rich (glossy black) clayey sand with very abundant charcoal
4 Loose heterogeneous brown to yellow sand
5 Pit 1, filled with organic rich (glossy black) clayey sand with abundant charcoal. This unit is interrupted in the middle of the filling by a layer of yellow to red clayey sand and toped by a layer of burnt earth. Unit 5 cuts unit 6
6 Pit 2, filled with heterogeneous dark to yellow sand with abundant charcoal
7 Compact brown to yellow sand (natural substratum)

and 6: modern to contemporary (or post-medieval to "pre-*birni*").

Unfortunately, Contexts 5 and 6 were not distinguished during excavation. However, they were subsequently sampled for archaeobotanical data, directly from the profile. These yielded abundant vegetal remains – this was particularly true of Context 5 – which were dominated by *Pennisetum* but also featured nut fragments (Champion & Fuller, this volume).

8 Finds

The second horizon yielded pottery decorated with twisted cord roulette as well as sherds with red paint designs. The pits at the bottom yielded *blepharis* and twisted cord roulette decorated pottery. Glass was frequent and occurred down to 130–140 cm (SF 2014-65, a clear iridescent fragment).

Seven metal objects from the site of Bogo Bogo were studied (see Filippini, Figure 19.1 for some of these). It seems that the objects discovered in the upper 50 cm of the trench correspond to modern occupation, or at any rate to disturbed layers, the context of which is difficult to determine. These objects include a coin made from an unidentified metal (SF 2014-03) and seemingly used as a pendant, a steel cylinder, the function of which remains unclear (SF 2014-04); a brass eyelet (SF 2014-02), and a small decorated disc resembling an item of adornment (SF 2014-01), also made from an unidentified metal. An iron rod is also included in this collection. Only two iron objects seem to belong to the archaeological context. These are a plaque in several fragments and a small rod, possibly a nail shank (SF 2014-05 and SF 2014-06, the latter comprising two fragments).

9 Interpretation and Cultural Attribution

The thickness of the deposits indicates a long occupation (more than one or two generations).

Oral testimonies, supported by the presence of new types of pottery, may indicate a post-thirteenth century occupation. The upper horizon is clearly modern (plastic & glass), the middle horizon could be nineteenth to early twentieth century (glass, painted pottery, cowrie), while the lower horizons are characterised by the presence of *blepharis* roulette decorated pottery. Here pre-contemporary deposits could possibly be divided into two. The radiocarbon dates fail to capture the earlier occupations at the site.

10 Radiocarbon Dates

OxA-X-2605-39	183	38	GOG 14 SI, context 5	Phase 5
OxA-31581	136	25	GOG 14 SI, 70–80	Phase 5
OxA-31582	129	25	GOG 14 SI, context 6	Phase 5

TABLE H.1 Desampling

Level	Number
0–20	11
20–30	9
30–40	25
40–50	47
50–60	26
60–70	54
70–80	64
80–90	33
90–100	33
100–110	31
110–120	21
120–130	31
130–140	29
140–150	25
150–160	15
160–170	14
170–180	7
180–190	0
Total	**475**

Analysis in the field by Anne Haour and Jennifer Wexler and at UEA by Sam Nixon

TABLE H.2 Category 4

Level	Undecorated	Illegible
0–20	1	1
20–30	1	0
30–40	5	0
40–50	17	2
50–60	2	0
60–70	0	0
70–80	12	1
80–90	7	0
90–100	12	0
100–110	6	0
110–120	4	0
120–130	14	1

TABLE H.2 Category 4 (*cont.*)

Level	Undecorated	Illegible
130–140	5	0
140–150	11	0
150–160	3	0
160–170	4	0
170–180	0	0
180–190	2	0
Total (108)	**106**	**5**

Analysis by Sam Nixon

TABLE H.3 Category 3

Context	#	Burn	Dec1	Dec2	Dec3	Dec4	Dec 5	Dec 6
0–20	2	ext						
	1	int	plain	sl-1	roul			
	1	int	rc-1a					
	1	int	roul					
	1	int	plain	sl-1	rc-1a	sl-1	plain	
	1		plain	ch-1	roul			
	1	ext/int	plain	sl-1	roul	sl-1		
20–30	2	ext						
30–40	1	ext						
	1	int						
	1		rc-1b					
	1	ext	roul					
	1		pnt-r-l-1	n/a				
40–50	9	ext						
	1	int						
	1	ext/int						
	1		indis					
50–60	4	ext						
	1		pnt-r-c					
60–70	1		pnt-r					
	2	ext						
	1	ext/int						
	1	int	rc-1b					
70–80	6	ext						
	1	ext	sl-1					
	1		pnt-bl-c					
	1		pnt-r-c					
	2		pnt-r					
	1		pnt-r-l-1					
	2	int						
	1	int	sl-5	rc-1b				
	1	ext	pnt-r-c	pnt-bl-b				
	1	ext	pnt-r-c	pnt-bl-b	pnt-r-c			

TABLE H.3 Category 3 (*cont.*)

Context	#	Burn	Dec1	Dec2	Dec3	Dec4	Dec 5	Dec 6
	1		rc-1b					
	1		pnt-r-l-1	n/a				
80–90	1		pnt-r-l-1					
	2	ext						
	1		pnt-r-c					
	1		pnt-r					
	1		pnt-r-b	pnt-r-l-3	pnt-or-b	pnt-bl-c	pnt-or-l-3	pnt-bl-l-3
	1		plain	roul				
	1	ext/int	plain	rc-1a				
	1	int	blepharis					
90–100	1	int						
	1		pnt-r-c					
	1	ext	plain	blepharis				
	1		pnt-r		ext			
100–110	3	ext						
	1	int						
	1	ext/int						
	1		pnt-r-l-1					
	1	ext	pnt-r-l	plain	pnt-bl-l	pnt-r-c		
	1	ext	pnt-r-l	sl-3	rc-1a	pnt-r-b	sl-3	rc-1a
	1	int	pnt-bl-l-1	ext	pnt-r-l-1	ext		
	1		plain	blepharis				
110–120	2	ext/int						
	1	ext						
	1		pnt-r-c					
	1		pnt-r					
120–130	4	ext						
	1	int						
	1		rc-1a					
	1	ext/int	sl-6	rc-1b	plain			
	2	ext/int						
	1		pnt-r-l-1	ext				
130–140	2	ext						
	1		rc-3					
	2	ext/int						
	1	int	plain	rc-1a				
140–150	2	ext/int						
	2	ext						
150–160	2	ext						
	1		pnt-r-c					
160–170	2	ext						
	2		blepharis					
Total	**111**							

Analysis by Sam Nixon and Anne Haour

TABLE H.4 Rims

Context	#	R. Type	Brn	Dec1	L1	Dec2	L2	Dec3.	L3	Ang	Diam	Mx. thick
0–20	1	E4	ext									0.9
20–30	1	S1										1.1
30–40	1	S1	ext							2	28	1.3
40–50	1	S1	ext/int									0.9
	1	E32	ext/int							4	16	0.9
	1	S6	ext/int									1.0
60–70	1	E										
	1	E4	ext									0.9
	1	E38	ext/int									0.7
70–80	2	E	ext									
	1	E	int	pnt-br-c	n/a							
	2	E	int									
	1	Rim	Y									
	1	Rim										
	1	E	ext/int									
	1	E	int									
	1	E37								5	20	0.8
	1	S1	ext									0.7
	1	E1										0.8
80–90	1	Rim	ext/int									
	1	E										
	1	S6										0.8
90–100	1	E1	ext/int							4		0.6
	1	E	int									
	1	E1		pnt-bl-l-1	lip	pnt-r-l-1	c int	pnt-r	upp body			0.6
	1	S6		pnt-bl-c	lip							0.7
	1	E35	ext/int									1.4
100–110	1	E	ext									
	1	E		pnt-r	lip							
	1	E1		pnt-bl-l-1	lip	pnt-r-l-1	C ext	pnt-r-c	C int	4	14	0.5
110–120	1	S4	int							4		1.2
	1	E11	ext/int									0.9
	1	E37	ext/int									0.5
130–140	1	S2	ext/int									1.0
	1	E6	ext/int									0.7
	1	E9	ext	rc-1a	u	sl-1	u	sl-1	n			0.45
140–150	1	E4								4		0.6
	1	S6		pnt-w	u							0.4
150–160	1	S1										0.8
	1	S1										0.6
160–170	1	E4								4		0.55
80–90	1	S1										0.65
	1	E10								4		0.7
Total	45											

Analysis by Sam Nixon and David Kay
E indicates a portion of the lip of a rim which is clearly everted but is not sufficiently complete to be classified within the typology.

CATALOGUE I

Kwara zeno (KAZ-14-SI & II)

Pascal Gnankpo Amoussou, Inès Corolin Amoussou, Nicolas Nikis, Olivier Gosselain and Alexandre Livingstone Smith

1 Location

Kwara zeno is a former settlement of Bogo Bogo (GOG-14-SI) and Gorouberi (GOB-14-SI). It is located slightly to the east of Bogo Bogo away from the Niger river on a plateau northwest of Gorouberi. According to informants, the settlement was created following the dispersal of people from Torouwey (TRO).

2 Geographical Coordinates

LAT: 12,1053230110555 LONG: 3,11230600811541 (WGS84)

3 Discovery

KAZ-14-SI and SII were identified and excavated by Pascal Gnankpo Amoussou, Inès Corolin Amoussou and Alexandre Livingstone Smith on 30 January 2014.

4 Destruction Risks

The site is a former settlement and is ploughed for cultivation. It is not under any specific threat and mitigation measures are not urgent.

5 Site

The initial survey yielded abundant potsherds (including very large fragments). The extent of the site is unknown. It is very close to its supposed modern day counterpart, as Bogo Bogo is only a few hundred metres to the west.

6 Excavation

Kwara zeno had never been excavated before. Two test pits were made in the centre of the area. The test pit was 1 × 1 m and excavated by spits of 10 cm (except for the superficial layer which was excavated in one spit of 20 cm). Within each spit, archaeological contexts (i.e. distinct units) were separated, sieved and bagged separately. All the spits were sieved down to 5 mm. Test pit SI and SII were completed at 50 cm, 10 to 20 cm into sterile soil (compact yellow sand).

7 Stratigraphy

The stratigraphy of KAZ-14-SI & II are simple and shallow.

SI displays 4 contexts, which could be related to two horizons. The first consists of a compact brown grey sand (top disturbed by ploughing). The second consist of an accumulation of loose grey sand and ash mixed with burnt earth and pottery overlaying a unit of charcoal-rich brown sand. The natural substrate consists of compact yellow sand.

SII consists of a charcoal-rich grey brown unit (top disturbed by ploughing), overlying a shallow depression dug into the natural soil. The filling of this depression consists of mixed brown and grey sand. Sandy laminations are apparent at the bottom.

8 Finds

The site is clean of modern pollution such as cloth or plastic. Various types of pottery were found but the striking feature is the abundance of undecorated potsherds and the presence of *blepharis* roulette-decorated pottery. Also, some potsherds collected during the survey and the excavations exhibit tamper marks on their internal surface. Excavations at Kwara zeno yielded a large glass bead (SF 2014-77) at 30–40 in SI and two pipe fragments (SF 2014-05 and -06, both at 20–30, one in each trench). Also recovered were an iron rod with worked extremities (SF 2014-89) which can be likened to a tool, and a metal ring belonging to the hardware category (SF 2014-88) (see Filippini, Figure 19.1).

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FIGURE I.1
Site under excavation

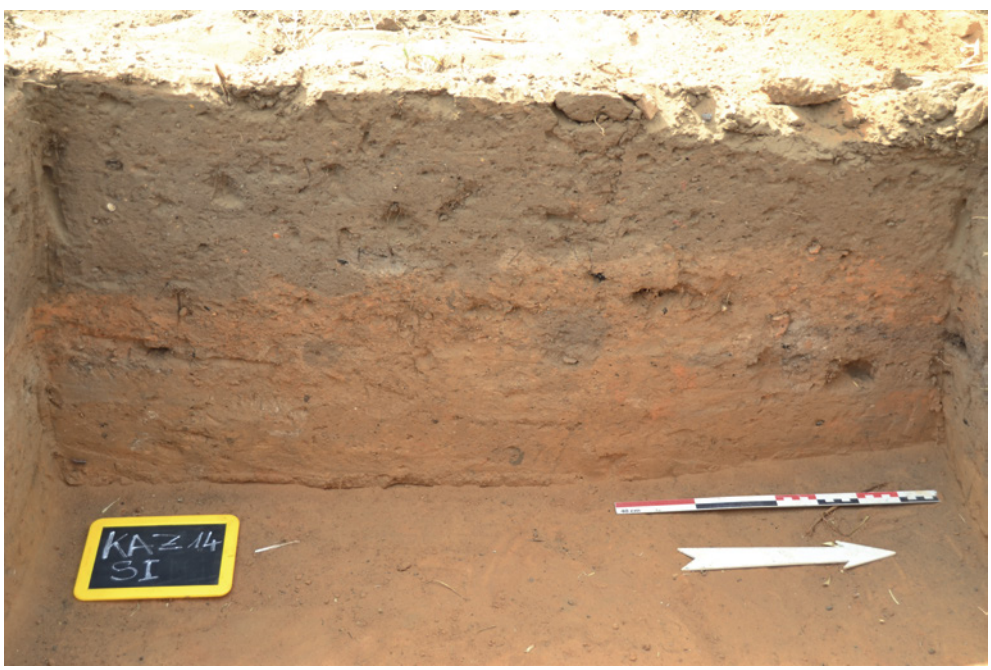

FIGURE I.2
KAZ-14-SI, West section at completion

9 Interpretation and Cultural Attribution

Informants explained that this site was the first occupation of Bogo Bogo and is also related to the history of Gorouberi. The rather shallow deposits indicate a short span occupation (a few generations?) in both SI and SII. The presence of *blepharis*-decorated pottery and possibly of pounding on a concave mould connects this site with other shallow occupation sites of the area – such as Torouwey (TRO), Boyeri (BOY) and Toutokayeri (TTO).

Considering the absence of sub-present items on the site and oral testimonies attributing the site to an early settlement phase of Bogo Bogo, this occupation can reasonably be attributed to pre-colonial times. Folded strip rouletted sherds occurred consistently though the SI sequence whereas loose folded strip-rouletted predominated in SII. Yet considering the radiocarbon dates and the presence of the pipe fragments this site on the whole argues for a post-medieval date. The links made by oral histories between Kwara zeno and Bogo Bogo, and, indirectly, to Torouwey, Gorouberi, Boyeri and Kompanti must be factored in.

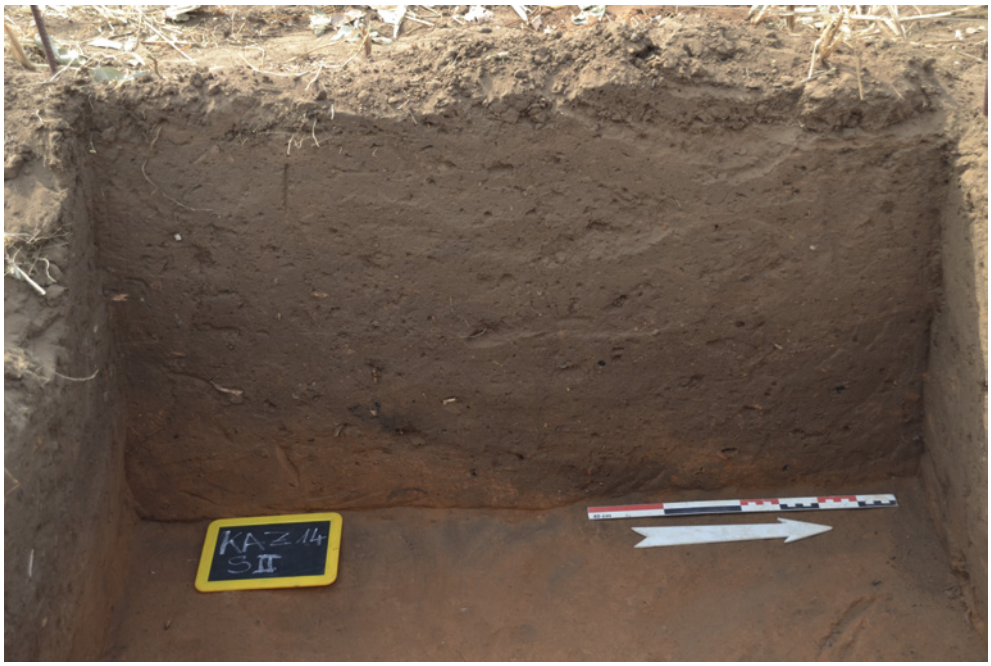

FIGURE I.3 KAZ-14-SII, West section at completion

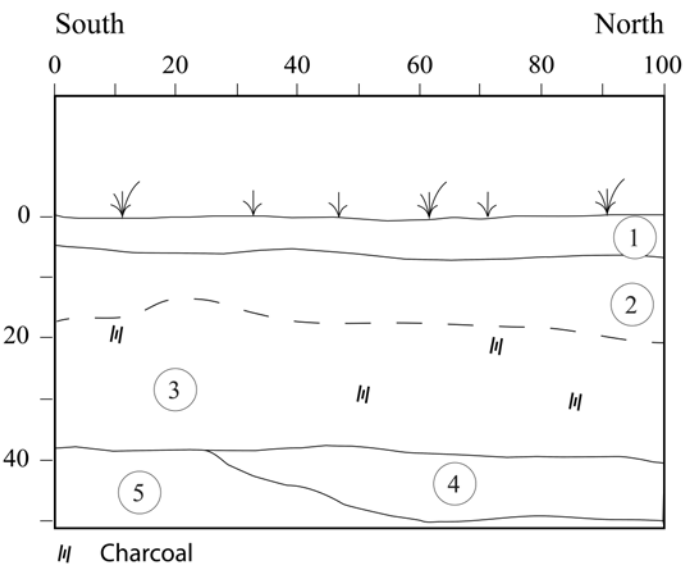

FIGURE I.4
KAZ-14-SII, West section
1 loose brown grey sand partially disturbed by ploughing
2 loose grey ashy sand with burnt earth, charcoal and pottery
3 brown sand
4 Depression filled with brown to light grey sand (with possible very fine humid stabilization layers)
5 Compact yellow sand (natural substratum)

10 Radiocarbon Dates

Beta-416119	120	30	KAZ SI, 30–40	Phase 5
Beta-416120	280	30	KAZ SII, 40–50. Within small pit feature	Phase 5

11 KAZ SI

TABLE I.1 Desampling

Level	Number
0–20	56
20–30	8
30–40	7
Total	**71**

Analysis in the field by Alexandre Livingstone Smith and Amoussou Inès Corolin

TABLE I.2 Category 4

Context	Undecorated	Illegible
0–20	106	23
20–30	16	
30–40	6	3
Total	**128**	**26**

Analysis by Ali Livingstone Smith, Amoussou Inès Corolin and David Kay

TABLE I.3 Category 3

Context	#	Burn	Dec1	Dec2	Dec3	Dec4
0–20	5	ext				
	1		rbt			
	1		undec	rbt		
	1	int	rfp-4			
	2		roul			
	1		undec	rc-1a		
	1		rc-1a			
	1		rfp-1b			
	2	int	undec	rfp-1b		
	3		undec	rfp-1b		
	1		rfp-1a			
	2	ext/int				
	3	int				
20–30	1	ext				
	1	ext/int	sl-1	undec	indis	
	1	ext/int	undec	sl-2	rc-1a	
	1	ext/int	undec	sl-2	rc-1a	st
	1		rfp-1b			
	1	int	rfp-1b	indis		
	1	ext	undec	rfp-1c		
	1		undec	rfp-1b	indis	
30–40	5	ext				
	1	ext	undec	rfp-1b		
Total	**38**					

Analysis by David Kay

TABLE I.4 Rims

Context	#	R. Type	Brn	Dec1	L1	Dec2	L2	Dec3	L3	Ang.	Diam.	Mx. thick
0–20	1	S1								3	16	1.0
	1	S1	ext/int							3	17	0.5
	1	S1								4		1.0
	1	S1	ext/int	undec	u	sl-3	u			3	15	0.7
	1	S1	ext/int							4		0.6

TABLE I.4 Rims (*cont.*)

Context	#	R. Type	Brn	Dec1	L1	Dec2	L2	Dec3	L3	Ang.	Diam.	Mx. thick
	1	S6		undec	u	sl-1	l			4		0.8
	1	S4		undec	u	rc-1a	u	indis	u	3	12	0.6
	1	S4								4		0.7
	2	T13								4		0.9
	2	T13	ext/int							4		0.7
	1	E4								4		0.8
20–30	1	T13								4	14	0.9
	1	E4	ext							4		0.8
	1	S1	ext/int							5		0.7
	1	E26								5		0.7
30–40	1	TIII	ext/int							3	11	0.6
Total	**18**											

Analysis by David Kay

12 KAZ SII

TABLE I.5 Desampling

Context	#
0–20	61
20–30	36
30–40	16
40–50	12
Total	**125**

Analysis in the field by Alexandre Livingstone Smith, Carolin Amoussou, Alidou Abdou Dramane, Xavier Grégoire Olesegun, Franck N'Po Takpara and at UEA by David Kay

TABLE I.6 Category 4

Context	Undecorated	Illegible
0–20	49	1
20–30	26	1
30–40	4	1
40–50	5	1
Total	**84**	**4**

Analysis by David Kay

TABLE I.7 Category 3

Context	#	Burn	Dec 1	Dec 2
0–20	6	ext		
	4	ext/int		
	1		rce-8	
	1		rfp-5	
	1		undec	rfp-5
	1	ext	sl-4	
	1		undec	rbt
20–30	6	ext		
	3	int		
	3	ext/int		
	2		undec	rfp-5
	2		rfp-5	
30–40	4	ext/int		
40–50	1	ext	st-1	sl-1
	1	ext	sc-1	
	1	ext	sl-2	
Total	**38**			

Analysis by David Kay

TABLE I.8 Rims

Context	#	R. type	Brn	Dec 1	L1	Ang	Diam	Mx. Thick
0–20	1	S6				2	17	0.8
	1	S4				3		0.6
	1	E1				4		0.7
	1	E4		Sl-1	U	4		0.8
	1	E4						0.7
	1	E10				4		0.6
	1	E21				4		0.9
	1	E26				4		0.9
	1	E14	int			4		0.8
20–30	1	S1				4		0.7
	1	S4						0.8
	1	S1				4	20	0.6
	1	S1	ext/int			3	16	0.5
	1	E1				4		0.5
	1	E4	ext			4	27	0.9
	1	E1				4	13	0.8
	1	E26				5		0.8
	1	E10						0.9
30–40	1	S1				3	14	0.7
Total	**19**							

Analysis by David Kay

CATALOGUE J

Gorouberi (GOB-13-SII)

Caroline Robion-Brunner

1 Location

Gorouberi is one of the settlements discovered along the Niger River. It is located a few hundred metres northeast of the modern village of Gorouberi (also test pitted, see Nikis et al., Part 6, Catalogue entry K this volume). Its history is not linked to the modern inhabitants of the village.

2 Geographic Coordinates

LAT: 12,09834 LONG: 3,16894

3 Discovery

The site was identified by Olivier Gosselain, Anne Haour, and Alexandre Livingstone Smith in 2011 during survey. Caroline Robion-Brunner, Nicolas Nikis and Carlos Magnavita identified the excavation locus in January 2013.

4 Destruction Risks

The road had cut a small part of the archaeological site, and the inhabitants of the present day village of Gorouberi cultivate its lands. Mitigation measures are not urgent.

5 Site

The site of Gorouberi appears to be big settlement mound overlooking the Niger flood plain. The land is used for agriculture and archaeological material is visible, such as pottery and a medium density of iron slag. The concentration of slag is not high enough to label the site as a smelting site. The extent of the site is about 2.5 ha.

6 Excavation

The site of Gorouberi had not been excavated before. The first test pit, GOB 13 SI, 2 × 2 m in size, revealed a medium density of iron slag. We found slag and pottery but no trace of furnaces, and so terminated the excavation, which is not discussed further here.

The location of the second test pit was decided in order to investigate a magnetic anomaly recorded on that part of the site (Figure L.1). This test pit was 2 × 4 m to begin with, though at 15 cm deep (once the modern ploughsoil was removed) it was narrowed to 2 × 2 m. A 60 × 60 cm square was created in the southwest corner of the unit in Spit 9, extended in Spit 15 to about half of the length of the west wall. The unit was excavated between 27 January and 5 February 2013. The excavators were Caroline Robion-Brunner, Nestor Labiyi, Nicolas Nikis and three inhabitants of the modern village. The trench was excavated in 15-cm spits and all spits were sieved down to 5 mm. All slag finds from each context were weighed to estimate the frequency of each type of slag. The test pit was terminated at 260 cm when the substratum was reached.

7 Stratigraphy

Level 1, constituted of Context 1, was a dark brown loam. It is the modern plough zone.

Level 2 is a succession of several deposits of domestic and metallurgical remains. It is concentrated in the west part of the unit, up to a depth of ca. 2m. Two contexts are recognised here, Contexts 2 and 6. Context 2 is a brown and very compact loam and Context 6 a sandy loam with burnt clay.

Level 3 corresponded to a series of several features (Features 1–5), associated with several vertical pits (Contexts 3 [split into 3a and 3b based on colour differences – brown-grey and brown-yellow respectively], 4 and 5) with horizontal infilling. Context 3 was a loose brown loam; Context 4 was a brown and very compact loam, and Context 5 was a loose loam with a green colour (Figure J.2). These three contexts are certainly linked. The green tinge of Context 5 likely indicates the presence of organic deposits, which may have leached in not just from this context but also from contexts 3 and 4. A clear stone cylinder, both ends rounded, possibly a labret (SF 2013-88), and a fragment of an ivory bracelet (SF 2013-05) were recovered from Context 3a, Spits 9 and 6 respectively. There was little archaeological material in Contexts 4 and 5.

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FIGURE J.1
Atmosphere shot.

FIGURE J.2
South section at completion.

FIGURE J.3 Inside of Feature 3

FIGURE J.4 Feature 5

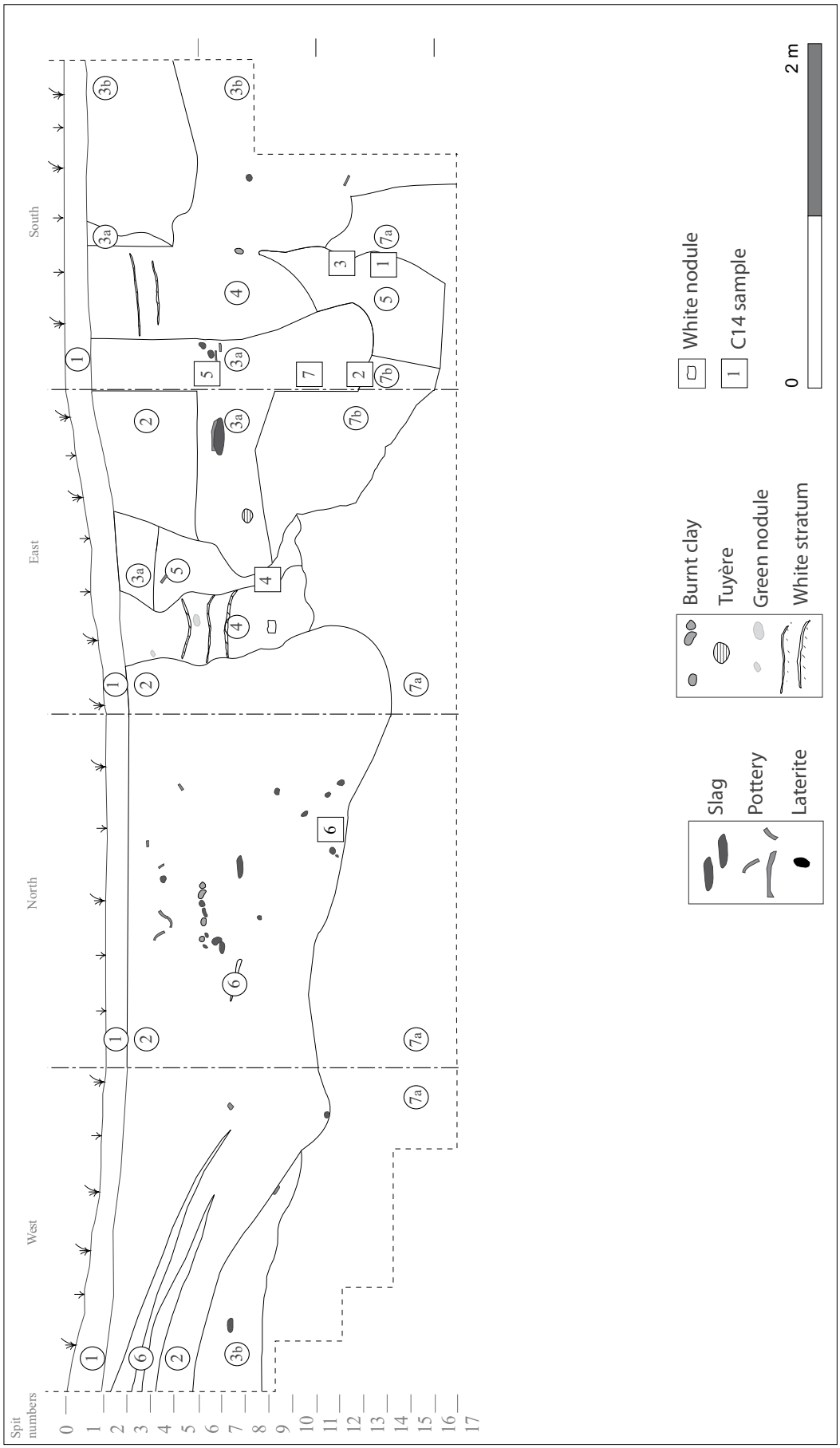

FIGURE J.5 Sections at completion

Feature 1 is a small circular pit, extending through spits 3–5, containing fragments of burnt clay, tuyères, and iron-rich slag. It may have been a hearth or a pit linked to the refining of bloom. A restricted possible continuation of this feature, termed Feature 2, was noted in the same position in the trench at spit 8. Feature 3 for its part is a crushed in situ vessel with charcoal and bone near its opening (Figure J.3), recovered in spits 9 and 10. Feature 4 is a concentration of large potsherds in the southern part of the trench, in spits 9 to 13. A marine bivalve was recovered during excavation from Spit 10 in this feature. Finally, Feature 5 (Figure J.4) is a small whole pot containing bones, recovered in the northeast corner of the trench, in Context 3a, spits 12–13.

The relationship between levels 2 and 3 is unclear.

Level 4 represented the natural substratum on which the different layers and remains of the settlement accumulated over the years. It was distinctive in its absence of artefactual material. It was grey-brown in colour (Context 7).

8 Finds

The finds consist essentially of pottery and slag. Slag was discovered in each context. Most of these slag finds are very oxidised. As far as we understand at present, they may relate to the smelting process or to the purification of the bloom. They are very numerous in Contexts 2 and 3. The magnetic anomaly targeted by excavation at Gorouberi may have originated from a lighting strike (see Haour et al., Chapter 11, this volume).

A polished axe (SF 2013-79) was recovered during cleaning the east section. Its context of deposit cannot be pinpointed.

9 Interpretation and Cultural Attribution

Levels 2 and 3 may date to before the tenth century. The beginning of the settlement was certainly much earlier, perhaps at the beginning of the first millennium AD. Spits 6 to 13 of Context 3a correspond to this early phase of occupation, Context 5 being roughly contemporary. Context 6 appears to be slightly younger.

There are six dates from Level 3 and one from Level 2. Three dates relate to the early occupation of the site: 1880 ± 30 bp (Beta-345500) from Context 3a (spit 12) and two dates from Feature 4, which was in the lower part of this same context 3a. These two dates (1930 ± 30 bp [Beta 345501] and 1550 ± 30 bp [Beta 345497]), which are on samples some vertical distance apart in the stratigraphy, are also some centuries apart, perhaps suggesting a slow infill of the feature. Context 3a is thus the oldest pit recognised at this site, dating back to the first two centuries AD. The filling of Context 3a seems to have been completed around the ninth century AD, judging by dates Beta-345495 and Beta-345498 (albeit with a stratigraphic inversion). Context 5 is contemporary with this later infill (Beta-345496). A date from Spit 11 in Context 6, Beta-345499, which lies in Level 2, suggests an age slightly younger than the Level 3 features. The relationship between Contexts 6 and 4 is thus unclear.

As noted by Linseele & Wouters (this volume), Gorouberi mainly yielded unidentifiable mammal bones. The absence of fish is at odds with other assemblages, but the sample size is too small to make definite statements. The marine bivalve from Feature 4 and the ivory bracelet fragment from Context 3a suggest some level of special items was present.

10 Radiocarbon Dates

					Number on Figure J.5
Beta-345501	1930	30	GOB 13 SII, 168–183 cm. From a concentration of ceramics, 'Feature 4'.	Phase 2	1
Beta-345500	1880	30	GOB 13 SII, 168–183 cm. From Context 3a. A small intact pot came from this level.	Phase 2	2
Beta-345499	1130	30	GOB 13 SII, 153–168 cm. From Context 6	Phase 3	6
Beta-345498	1080	30	GOB 13 SII, 138–153 cm. From Context 3a	Phase 3	7
Beta-345497	1550	30	GOB 13 SII, 135–153 cm. From 'Feature 4'	Phase 2	3
Beta-345496	1280	30	GOB 13 SII, 108–123 cm. From Context 5	Phase 3	4
Beta-345495	1150	30	GOB 13 SII, 78–93 cm. From Context 3a	Phase 3	5

TABLE J.1 Desampling

Context/Feature	Level	#
Con. 2	48–63	80
	63–78	111
	78–93	68
	93–108	7
	108–123	57
	123–138	18
	138–153	3
	183–198	6
Con. 3a	48–63	11
	63–78	48
	93–108	18
	108–123	124
	123–138	33
	138–153	54
	168–183	25
	183–198	12
Con 3b	78–93	0
Feature 1	63–78	13
	78–93	0
Con. 5	138–153	9
	183–198	3
	198–213	5
	213–228	1
	228–243	5
	243–258	2
Con. 6	78–93	6
	93–108	15
	125–138	4
	138–153	36
	153–168	49
	168–183	19
	183–198	8
	198–213	5
Feature 2	108–123	62
Feature 4	138–153	27
	168–183	36
	183–198	14
Con. 7a	198–213	37
	213–228	56
	183–198	14
Total		**1101**

Analysis in the field by Nicolas Nikis, Amoussou Durand, Franck N'Po Takpara, Samson Tokannou, Mossi Wahabou, Djimet Guemona, and Nestor Labiyi and summarised by Nicolas Nikis

TABLE J.2 Category 4

Context	Level	Undecorated	Illegible
Con. 2	48–63	9	3
	63–78	26	15
	78–93	10	10
	93–108	12	5
	108–123	9	6
	138–153	0	1
	168–183	2	0
	183–198	0	3
Con. 3a	48–63	11	7
	63–78	4	3
	78–93	6	6
	93–108	8	6
	108–123	8	11
	123–138	12	10
	138–153	9	2
	153–168	0	5
	168–183	1	2
	183–198	1	2
Con. 3b	78–93	0	3
Feature 1	63–78	1	2
Con. 5	153–168	0	7
	183–198	0	0
	198–213	0	3
	228–243	0	0
Con. 6	78–93	0	2
	93–108	5	3
	123–138	0	1
	138–153	1	2
	153–168	13	1
	168–183	3	0
	183–198	0	0
Feature 2	108–123	1	0
Feature 4	135–153	0	2
	168–183	5	0
	183–198	0	0
	213–228	0	0
Con. 7a	198–213	1	0
	213–228	0	0
Total		**158**	**123**

Analysis by David Kay

TABLE J.3 Category 3

Context	#	Burn	Dec1	Dec2	Dec3	Dec4	Dec5
Con.2	1		undec	sl-1			
48–63							
	2		rce-8				
	1		rfp-1				
	1		rc-1				
	1	Y					
	1		undec	perf			
Con.2	1		mch				
63–78			10+				
	1		mch 4+				
	3		mch 2+				
	1		mch 3+				
	10		rfp-1				
	1		herb				
	1		inc				
	12		rfp-4				
	2	Y					
	1		rfp-1a	mch 4+	undec	CB2	
	1		rc-1				
	1	Y	mch 4+				
	1		roul				
Con.2	2		rce-8				
78–93							
	1	Y	rfp-1	ch			
	1		mch 2+				
	1		mch 7+				
	1		mch 4+				
	1		mch 4+	curved			
				ch			
	1		rfp-1	sp3-v			
	1		rc-1				
	1		rc-1				
	1		rfp-4	sl-1			
	1		rfp-4				
	3		rfp-1				
	2		mch 5+				
	1		sl 5+				
	1	Y	undec	sl 3+			
	1		mch 3+	sl-1			
	1		undec	mch-4			
	1		roul	perf			
Con.2	2		roul				
93–108							
	4		rfp-1				
	2		rfp-4				
	1	Y					

TABLE J.3 Category 3 (*cont.*)

Context	#	Burn	Dec1	Dec2	Dec3	Dec4	Dec5
	1		ch 4+				
	1		rfp-1	ch			
Con.2	2		rfp-4				
108–123							
	2		rfp-1				
	1	Y					
	2		roul	perf			
	1		ch-1	roul			
	1		undec	mch-4	roul		
	1		rfp-1				
	2		roul				
	1		rc-1a				
Con. 2	1		rfp-1	ch 2			
168–183							
	1		rfp-1a				
Con. 2	1		rc-5				
183–198							
	1		ch 3+	indis			
	1		rfp-1				
	1		rfp				
	1		mch-4+	undec			
	1		rfp-4	sc-1	sl-1		
	1		undec	sc-2	sl-1	rfp-1a	sl-2
Con.3a	3		roul				
48–63							
	1		mch 7+				
	1		rfp-4				
	2		rfp-1				
	1		indis	perf			
	1		rfp				
	1		CB2	undec			
Con.3a	1		rc-1	mch 3+			
63–78							
	5	Y					
	1	Y	curved				
			mch 3+				
	1		rfp-4	mch 2+			
	1	Y	rfp-4	mch 3	ch		
	1		rfp-4	ch			
	1		rfp				
	2		rfp-1b				
	1		indis				
Con. 3a	1		CB2				
78–93							
	1		rfp-4				
	1		rfp-4	sl-1			

TABLE J.3 Category 3 (*cont.*)

Context	#	Burn	Dec1	Dec2	Dec3	Dec4	Dec5
	3		rfp-1				
	1		rfp-1	sc-1	undec		
	1		sl-1	undec			
	1		mch 7				
	1	Y	undec				
	2		rfp-4	perf			
Con. 3a 93–108	2		rfp-4				
	1		mch 3+				
	1		mch 2+				
	1		mch 4+	rfp-4			
	1		sl-3	sc-3			
	9		rfp-1				
	1		undec	sl-2	rfp-1		
	1		pa-4				
Con. 3a 108–123	1		rfp				
	1		rfp-4				
	1		sl-1	undec			
	1		sc-1				
	1		mch 4+				
	1		mch 5+				
	1		mch 6+				
	6		rfp-1				
	1		sl-1	sh-4			
	1		sl-1	undec	sl-1	sh-7	
	1		rfp-1b	sc-1	sl-7+		
	1		undec	roul			
Con. 3a 123–138	9		rfp-1				
	2		rce-8				
	1		sl-1				
	1		mch 4+				
	3		mch 5+				
	1		mch 13+				
	1		mch 9+				
	2		rc-1a				
	5		rfp-4				
	4	Y	undec				
	1		undec	rfp-1b			
	1		sp-1l	sp-1l	mch-4+		
	1		undec	sp-4s	sp-4s		
Con. 3a 138–153	1		undec	sl-1	sh-4+	sl-1	
	5		rfp-4				
	4		rce-8				

TABLE J.3 Category 3 (*cont.*)

Context	#	Burn	Dec1	Dec2	Dec3	Dec4	Dec5
	1		rfp-1	sc-1	undec		
	1		mch 3+				
	1		rfp-1	sl-2			
	3		rfp-1				
	1		rfp-1	undec			
	2	Y					
	1		indis	perf			
	1		mch-5				
	1		mch-4	undec			
	1	ext/int	plain	roul			
Con. 3a 153–168	6		rfp-1				
	1		rfp-1	ch			
	3		rfp-1b				
	1		mch 7+	sp-5l	rfp-1b		
	1		roul	perf			
	1		undec	sl-3	roul		
	1		undec	mch 6+	roul		
Con. 3a 168–183	1		rfp-1				
	7		rce-8				
	5	Y					
Con. 3a 183–198	1		rfp-1				
	1		sl-2	rfp			
	1		rce-8				
	1		undec	perf			
Con.3b 78–93	1	Y					
	1		rfp-1				
	1		rfp-4				
	1		rfp-4	sl-2			
	1	ext/int	undec	sl-5	sc-1	undec	
Feature 1 63–78	5		rfp-1				
	1		rfp-4				
	1		mch 8+	roul			
	1		undec	CB2			
	1		rfp-1b				
Con. 5 153–168	1		rc-1				
	4		rfp-1				
	5		rfp-4				
	3	Y					
Con. 5 183–198	1		rfp-1				

TABLE J.3 Category 3 (*cont.*)

Context	#	Burn	Dec1	Dec2	Dec3	Dec4	Dec5
Con. 5 228–243	1		rfp-1				
Con. 6 93–108	4		rfp-1a				
	1		rfp-1a	undec			
Con. 6 123–138	1	Y	undec				
Con. 6 138–153	2		rfp-4				
	1		sl-1	rfp			
	2		rc-1				
	2	Y	undec				
	1		pa-4				
Con. 6 153–168	1		mch 4+				
	1		mch 5+				
	1		mch 6+				
	3		rce-8				
	1	ext					
	1	Y	undec				
	4		rfp-4				
	17		rfp-1				
	1		rfp-1	inc			
	1		rc-1a				
	1		mch 2+	roul	undec		
Con. 6 168–183	1		rc-1				
	2		rfp-1				
	1	Y	mch 4				
	1		mch 3	roul			
	8	Y	undec				
	2		rfp-4				
	2	Y	CB1	undec			
	3	Y					

TABLE J.3 Category 3 (*cont.*)

Context	#	Burn	Dec1	Dec2	Dec3	Dec4	Dec5
Con. 6 183–198	1	Y					
	1		mch 3	roul			
Feat 2 108–123	1	Y	rfp-1	undec			
	1		CB1	mch-3			
Feat 4 135–153	1		rc-1	rc-3	mch 3		
	2		rc-1	mch 3			
	8		rc-1				
	4		rfp-1				
	1		rce-8				
	2		rfp-1	mch 3			
	1		rfp-4				
Feat 4 168–183	3		rfp-1				
	4		rce-8				
	2		rfp-1	mch 3			
	1		mch 7+	sp-5l	rfp-1b		
	4		rfp-1b				
	1		mch 8+	sp-5l	rfp-1b		
Feat 4 183–198	1		rfp-1	mch 4			
	1		rfp-4				
	1		rfp-1b				
Feat 4 213–228	12		rfp-4				
	1		rfp-4	undec			
Con. 7a 198–213	1		rfp-1				
Con. 7a 213–228	1		rfp-1				
	2		rce-8				
Total	**407**						

Analysis by Anne Haour and Sam Nixon

TABLE J.4 Rims

Context	#	R. Type	Brn	Dec1	L1	Dec2	L2	Ang.	Diam	Mx. thick
Con. 2 48–63	1	E10		rfp-1b	l			5		0.7
	1	E4	ext/int							0.7
Con. 2 63–78	1	E4								0.7
	1	E32	ext					4		0.6
	1	E33						5		0.7
	1	S4	ext/int					2	10	0.8
	1	E35	ext/int							1.0
	1	E4	ext/int					4		0.8
	1	E4						4		0.7
	1	S4								0.6
	1	S4								0.7
	1	S4	ext/int							0.7
Con. 2 78–93	1	E32						4	20	0.8
	1	S6		rfp-1b	u					1.2
	1	S4						4		0.7
	1	E4	int					4		0.6
Con. 2 93–108	1	S1								0.8
	1	T10		indis	u					1.1
Con. 2 108–123	1	S1						3		0.7
	1	E4	ext					4		1.1
	1	E4	ext/int					5		0.7
	1	S1	ext/int							0.8
	1	S4	ext							0.7
Con. 2 168–183	1	S4	ext/int					3		0.7
Con. 3a 48–63	1	S1		CB3				2		0.5
	1	S1	ext	CB1				2		0.5
Con. 3a 78–93	1	E10	ext					4		0.7
	1	E4	ext					4		0.7
	1	E1	ext					5		0.7
	1	E1	ext							0.7
	1	E4						4		0.6
	1	E4	ext							0.7
	1	S4	ext/int					4		0.4
	1	E35	ext							0.8
	1	E4	ext							0.6
Con. 3a 93–108	1	E4	ext/int					5		0.8
	1	S6	ext	CB1						0.7
Con. 3a 108–123	1	E10						4		0.8
Con. 3a 123–138	1	E38		sl-3	n	indis	upper			0.8
	1	E47		roul	upper			4		1.0
	1	E39	int							0.8
	1	E38	ext	ch	n					0.8
	1	E1	ext							0.8
	1	E4	ext/int					4		0.9
	1	E4	ext/int					5	12	0.7
Con. 3a 138–153	1	E11						4	10	0.7
	1	E9	int							0.5

TABLE J.4 Rims (*cont.*)

Context	#	R. Type	Brn	Dec1	L1	Dec2	L2	Ang.	Diam	Mx. thick
	1	S4		CB3				2		0.5
Con. 3a 153–168	1	E38		sl-1	n			4	18	0.9
Con. 3a 168–183	1	S4	ext/int	CB1	u			2	18	0.6
Con. 3a 183–198	1	E1						4		0.8
	1	S6		roul	u					1.0
Con. 5 198–213	1	S4		roul	u	smth	u	4		
Con. 6 93–108	1	S4						2	8	0.8
	1	S4	ext/int					2		0.6
Con. 6 138–153	1	E11	ext	sl-12	u					0.7
Con. 6 153–168	1	S6		sp5-l	m	peig el-4	u	3		0.6
	1	E4	ext/int					4		0.9
	1	E11	ext					4		0.7
	1	S6								0.7
	1	S4								0.6
Struct.2 108–123	1	E12	ext/int	sl-3+	u			2		0.7
Struct. 4 135–153	1	E38		sl-3+	n			4		0.9
	1	S3	int	indis	u int			5	20	0.7
Struct.4 183–198	1	S4						4		0.5
Total	**65**									

Analysis by Sam Nixon

CATALOGUE K

Gorouberi (GOB-14-SI & II)

Nicolas Nikis, Alexandre Livingstone Smith, Anne Filippini and Anne Haour

1 Location

Gorouberi is a contemporary village on the Niger River just north of Karimama. According to oral history, the foundation of this settlement is ancient (Gosselain pers. comm. 2014). Its predecessor is said to have been Kwara zeno (KAZ). Gorouberi is said to have been surrounded by a *birni*.

2 Geographical Coordinates

LAT: 12,0930629689246 LONG: 3,16706296987831 (WGS84)

3 Discovery

GOB-14-SI and SII was identified and excavated by Nicolas Nikis, Pascal Gnankpo Amoussou, Inès Corolin Amoussou and Alexandre Livingstone Smith on 2 and 3 February 2014.

4 Destruction Risks

The site of GOB-14-SI is a contemporary settlement, while GOB-13-SII is a much older settlement on the northern side of the town (Robion-Brunner, this volume) GOB-14-SI lies in a modern village and is not under any specific threat and mitigation measures are not considered.

5 Excavation

Gorouberi had never been excavated before. We placed the test pit in the location which informants stated lies inside the oldest concession of the village. The test pit was 1 × 1 m and excavated by spits of 10 cm (except for the superficial layer which was excavated in one spit of 20 cm). Within each spit, archaeological contexts (i.e. distinct units) were separated, sieved and bagged separately. All the spits were sieved down to 5 mm. The test pit was interrupted at 140 cm into sterile soil (compact yellow sand).

6 Site

The extent of the site is unknown as it lies under the modern village. The large mound site at the northern side of the town covers most of the first millennium AD and thus seems to represent an early settlement (see discussion of GOB-13-SII).

7 Stratigraphy

The stratigraphy at Gorouberi is varied. SI displays at least 5 contexts, which appear to be related to 2 or 3 horizons. The first consists of a series of horizontal deposits which can be correlated with the accumulation of sediments in a village – this layering of floors and trash deposits continues down to 45 cm below the surface. This layering of deposits appears to reflect the spatial organisation of this compound backyard. The fact that it is found down to 45 cm can be taken as a reflection of the age of this part of the house. The second horizon may be correlated to the levelling of the area. It overlays a small mound of slag and charcoal indicative of iron being worked or smelted nearby (the deposit is slightly convex). Finally, h 3 may be related to Horizon 2 but its nature is not clear.

8 Finds

Surface finds were very poor, a very worn potsherd decorated with folded strip roulette being the most diagnostic potsherd (but it should not be considered as directly related to the deposits). The striking element in this test pit is the abundance of charcoals and slag, probably related to ironworking activities nearby. A magnetic plate (SF 2014-86), possibly reduced slag, from levels 0–20, would support this hypothesis. Plastic, including a pill blister, occurred at 20–30 (SF 2014-14), and plastic beads occur up to 40 cm. Glass was rare, with just one fragment (SF 2014-10, at 0–20cm). There were two cowrie shells (SF 2014-04 and 05). *Blepharis*-decorated pottery is present at 40–50 cm and pottery decorated with twisted string roulette is also present. There were ceramic pipe bowls at 100–110 (SF 2014-08a) and 110–120 (SF 2014-10a). Metal objects were

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FIGURE K.1
Site under excavation

fairly abundant. The site yielded eight metal objects (SF 2014-80-87), of which six are iron, one is modern steel and one is of an unidentified metal. Three objects were discovered in the upper part of the trench: the magnetic plate mentioned above (SF 2014-86); a modern bottle cap (SF 2014-87), and a complete carpentry nail (SF 2014-85). Among the rest of the objects, one chainlet (SF-2014-82) has been classed among hardware, formed of five links with a figure of eight shape. The remainder (two rods, one plaque and one sheet) have been classed as indeterminate.

9 Interpretation and Cultural Attribution

The deposits indicate a medium span occupation. The abundance of charcoal could be indicative of ironworking nearby. The pottery is indicative of post-medieval contexts. The two radiocarbon readings indicate a Phase 5 date.

FIGURE K.2
GOB-14-SI, West section at completion

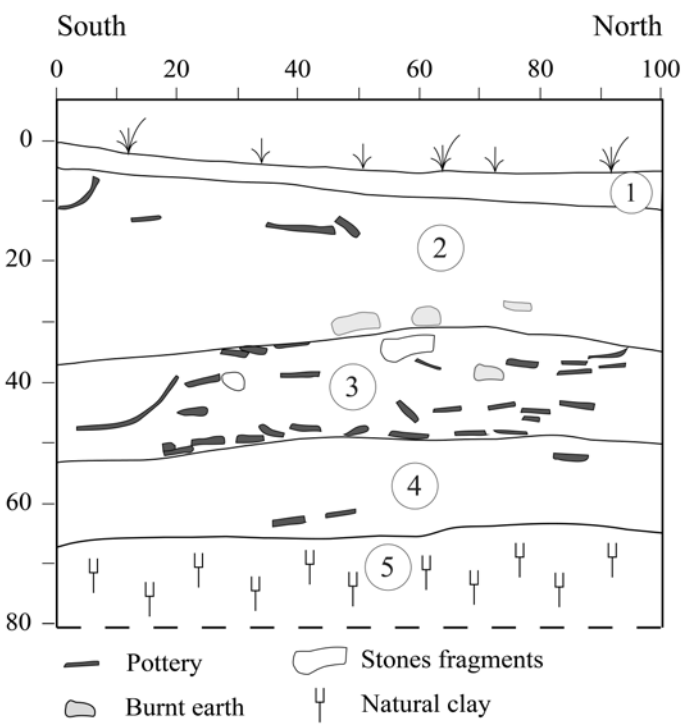

FIGURE K.3
GOB-14-SI, West section
1 Grey sandy topsoil
2 Yellow brown compact sandy clay with burnt earth fragments and pottery
3 Dark brown sandy clay with gravel, burnt earth fragments, animal bones, stones fragments and abundant pottery
4 Yellow brown compact sandy clay with pottery
5 Yellow compact sandy clay (natural substratum)

10 Radiocarbon Dates

Beta-402969	170	30	GOB 14 SI, 60–70	Phase 5
Beta-402970	100	30	GOB 14 SI, Context 3, 80–90	Phase 5

TABLE K.1 Desampling

Context	Number
0–20	197
20–30	16
30–40	46
40–50	34
50–60	48
60–70	29
Con. 2 70–80	69
Con. 3 80–90	21
Con. 3 90–100	18
Con. 3 100–110	14
Con. 3 110–120	10
Total	**501**

Analysis in the field by Jennifer Wexler and at UEA by David Kay and Anne Haour

TABLE K.2 Category 4

Context	Undecorated	Illegible
0–20	1	
20–30	1	
30–40	4	
40–50	7	
50–60	14	
60–70	15	
Con. 2 70–80	27	
Con. 3 80–90	9	
Con. 3 90–100	8	
Con. 3 100–110	3	
Con. 3 110–120	1	
Total	**90**	**0**

Analysis by David Kay

TABLE K.3 Category 3

Context	#	Burn	Dec1	Dec2	Dec3	Dec 4	Dec 5
30–40	1	ext/int	undec	pnt-r			
	1	ext/int					
	1	ext					
	1		pnt-bl-b	pnt-r-b	pnt-bl-b	pnt-r-b	
	1	ext	pnt-bl?				
40–50	1	ext	indis				
	2	ext/int					
	2	int					
	1		blepharis				
	1	int	sl-2	sl-1			
	1		undec	pnt-r-c			
	1	ext					
	1	ext	is-geo 26				
50–60	4	ext					
	1	ext/int					
	1		rc-1a				
60–70	1	int					
	3	ext					
	1	ext/int					
	1	ext/int	indis				
	1	int	undec	pnt-r-b	pnt-bl-b		
	1	int	undec	rc-1a	pnt-rc		
	1	ext/int	undec	sl-1	pnt-r		
	1		sp3-v				
	2		undec	pnt-r-b			
Con. 2 70–80	2	ext					
	2	ext/int					
	1		undec	sl-2			

TABLE K.3 Category 3 (*cont.*)

Context	#	Burn	Dec1	Dec2	Dec3	Dec 4	Dec 5
	1	ext	undec	sc-4			
	1		undec	pnt-r-b			
	1		rfp-4				
	1		rc-1a				
	1		blepharis				
	1		indis	rfp-1a			
	1	ext/int	undec	pnt-r			
	2		sl-2				
Con. 3 80–90	1	ext					
	1	ext/int	sp1	sl-1	roul	pnt-r	sp1-l
	1		rfp-1a	indis	smth		
	3	ext					
Con. 3 90–100	1	ext	undec	sl-1	rc-1a		
	2	ext					
Con. 3 100–110	1	ext					
Con. 3 110–120	1	ext/int					
Total	58						

Analysis by David Kay

TABLE K.4 Rims

Context	#	R.Type	Brn	Dec1	L1	Dec2	L2	Dec3	L3	Motif 4	L4	Ang.	Diam.	Mx. thick
30–40	1	S1	ext/int									2		0.7
	1	E20	ext/int									4		0.7
40–50	1	S1	ext/int	sp4-l	L									0.7
	1	E19	ext/int									4		0.8
50–60	1	S1										3		0.7
	1	S1	ext/int	undec	U	rg	U					4		0.7
	1	S4	ext/int									4		0.8
	1	E18	ext/int	undec	C	roul	U	pnt-r	U	undec	U	4		0.8
60–70	1	S1												0.8
	1	E32	ext									4		0.8
Con.2 70–80	1	S1	ext	undec	U	roul	U	sl-1	U			3	20	0.6
	1	E1	ext/int									5		0.6
	1	E21	int									5		0.8
	1	E4												0.8
	1	E4												0.6
	1	S2												0.7
Con. 3 80–90	1	S1										3	15	0.7
	1	E23										5		0.5
	1	E30												0.9
Con. 3 90–100	1	S1	ext/int											0.8
Con. 3 100–110	1	S4	int									4		0.6
Con. 3 110–120	1	E9	ext/int									5		0.8
Total	22													

Analysis by David Kay

CATALOGUE L

Karimama (KAR-14-SI)

Alexandre Livingstone Smith and Nicolas Nikis

1 Location

Karimama is a modern town on the Niger River and the regional district capital. We located our test pit in the part of town that our informant identified as the oldest Gourmantche area of Karimama, located inside the former *birni*.

2 Geographical Coordinates

LAT: 12,067614 LONG: 3,183170976 (WGS84)

3 Discovery

The site was identified and excavated by Nicolas Nikis and Alexandre Livingstone Smith on 5 February 2014.

4 Destruction Risks

The site of KAR-14-SI is a contemporary settlement but it is not under any specific threat, and mitigation measures are not considered.

5 Excavation

Karimama had never been excavated before. One test pit was excavated. It was 1 × 1 m in size and dug by spits of 10 cm (except for the superficial layer which was excavated in one spit of 20 cm). Within each spit, archaeological contexts (i.e. distinct units) were separated, sieved and bagged separately. All spits were sieved down to 5 mm. The test pit was completed at 70 cm into sterile yellow sandy soil.

6 Site

KAR-14-SI is situated in a compound in the city of Karimama. It said to be the oldest Gourmantche *windi* of the old *birni* of Karimama. Some ceramics potsherds showed on the surface.

7 Stratigraphy

The stratigraphy displays under the compact top soil (Context 1) a first layer of a heterogeneous compact sandy sediments (Context 3) with fragmented artefacts and ecofacts (slag, pottery and animal bones). A pit (Context 2) had been dug into this layer. It was filled in with grey silty sand sediment with stone fragments, gravels and ceramics. A fourth unit is a layer of loose yellowish sandy sediment (Context 4) mixed with charcoal and ceramics fragments. A thin red compact ashy layer (Context 5) occurred within Context 4, perhaps evidence of a fire. A darker yellow loose sandy sediment layer (Context 6) with a larger amount of charcoal than the context above is likely related to the preceding context. The last unit above the natural yellowish clayey substratum is a brown grey compact sandy sediment, with few artefacts or charcoal.

8 Finds

Surface finds include potsherds displaying *blepharis* roulette and double twisted cord roulette decoration, but the excavations yielded a new type pottery (black polished, red painted decorations and everted rims). The occurrence of *blepharis* roulette is common in the excavated layers. The only two small finds were two metal items (SF 2014-78 and 2014-79), the latter a copper alloy piece that was possibly a chain ring or earring (see Filippini, this volume, Figure 19.1).

9 Interpretation and Cultural Attribution

The excavation has yielded new types of pottery (i.e. those not found on the mounds of medieval date). As the upper part of the stratigraphy is a modern compound one may reason that the pottery is post-medieval. A layer of ash may possibly be related to a destruction episode often mentioned by oral traditions. The only date available is associated with a layer before that, but it is not the earliest occupation at the site.

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FIGURE L.1 Site under excavation

FIGURE L.2 KAR-14-SI, West section at completion

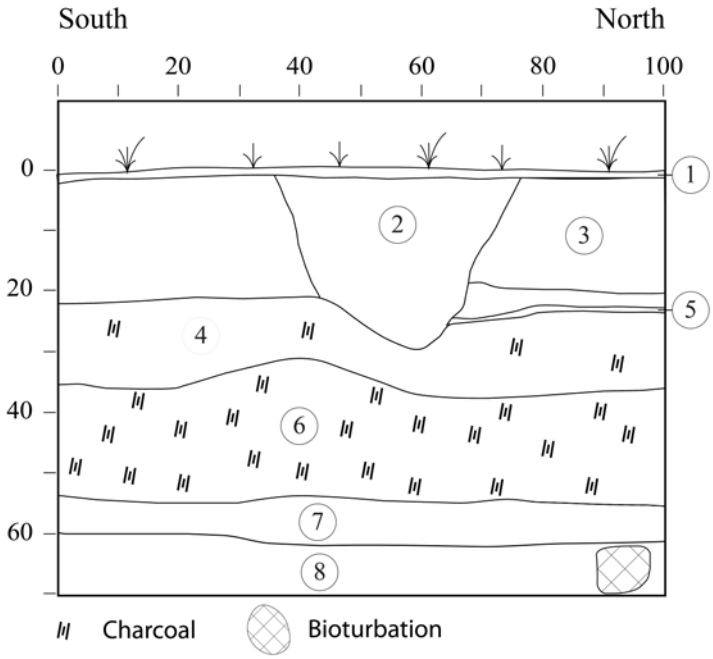

FIGURE L.3
KAR-14-SI, West section
1 Compact sandy sediment. Top soil disturbed by domestic activity
2 Pit dug into layer 3. Grey silty sand sediment with stones and ceramics fragment and gravels
3 Compact yellow grey sandy sediment with fragment of ceramics, slags and animal bones
4 loose yellowish sandy sediment with pottery and abundant charcoal
5 thin compact ashy red line in layer 4
6 loose yellow brown sandy sediment with pottery and abundant charcoal
7 Compact grey brown sediment
8 Compact brown-yellow clay (natural substratum)

10 Radiocarbon Dates

Beta- 417598	100	30	KAR 14 SI, 50–60	Phase 5

TABLE L.1 Desampling

Level	Number
0–20	107
20–30	39
30–40	51
40–50	133
50–60	41
60–70	5
70–80	7
Total	**383**

Analysis in the field by Xavier Grégoire Olesegun and at UEA by David Kay and Anne Haour

TABLE L.2 Category 4

Context	Undecorated	Illegible
0–20	30	2
20–30	8	
30–40	10	
40–50	42	
50–60	7	
60–70	1	
70–80	1	1
Total	**99**	**3**

Analysis by David Kay and Anne Haour

TABLE L.3 Category 3

Context	#	Burnish	Dec1	Dec2	Dec3
0–20	14	ext			
	1		mch-2	undec	ch
	1		pnt-bl-c	pnt-r-b	pnt-r-c
	1		undec	blepharis	
	6	ext			
20–30	3	ext			
	1	ext/int			

TABLE L.3 Category 3 (*cont.*)

Context	#	Burnish	Dec1	Dec2	Dec3
	1		undec	blepharis	
30–40	5	ext			
	2	ext/int			
	1	ext	undec	blepharis	indis
	1	ext/int	undec	sh-10	
	1	ext/int	undec	rc-1a	pnt-r
	1	ext/int	roul	indis	
40–50	1	int			
	8	ext			
	1		undec	sl-1	
	1	ext	undec	sl-1	
50–60	2	ext			
	1	ext/int	perf	undec	
Total	**53**				

Analysis by David Kay

TABLE L.4 Rims

Context	#	R.Type	Brn	Dec1	L1	Dec2	L2	Ang	Diam	Mx thick
0–20	1	S1	ext/int					2	24	0.9
	1	S1	ext	undec	u	blepharis	u	3	25	0.5
	1	S4						4		0.5
20–30	1	E37						5		1.1
	1	E40	ext					4	24	0.8
30–40	1	E21						3	33	0.7
40–50	1	S1						4		0.6
	1	S1	ext/int							0.8
	1	S1						4		0.5
	1	E26						5		0.6
	1	E26						4		0.6
	1	E16	ext					4	30	0.7
	1	E2						4		0.9
	1	E37								0.9
	1	E37						5		1.1
50–60	1	E37								1.0
	1	E22						4		0.7
Total	**17**									

Analysis by David Kay

CATALOGUE M

Kusulabu (KUS-14-SI & SII)

Alexandre Livingstone Smith, Nicolas Nikis and Barpougouni Mardjoua

1 Location

Kusulabu is a settlement mound located west of Karimama. It was first surveyed by Mardjoua (2013: 63) in April 2013; he records it as KAR-13-33 and estimated its size at 1.29 ha. It is known locally as the oldest historical Gourma settlement of Karimama, known as *Kusu Gourma*. According to informants, a smallpox epidemic forced the inhabitants to leave (Mardjoua 2013). A sanctuary is located 500 m east of the site: it is materialised by a pierced baobab (Mardjoua 2013: 66).

2 Geographical Coordinates

LAT: 12,06132296 LONG: 3,169889012 (WGS84)

3 Discovery

The site was identified by Barpougouni Mardjoua in April 2013, who carried out a surface collection of pottery and studied it as part of his Masters thesis (Mardjoua 2013: 148–153). The site was subsequently test pitted by Alexandre Livingstone Smith and Nicolas Nikis on 4 February 2014.

4 Destruction Risks

The site is in a field. It is ploughed regularly. The site is near a river called "Goru" and its water runoff affects certain parts of the site.

5 Excavation

Kusulabu had never been excavated. Two 1 × 1 m test-pits were excavated by spits of 10 cm (except for the superficial layer which was excavated in one spit of 20 cm). Within each spit, archaeological contexts (i.e. distinct units) were separated, sieved and bagged separately. All spits were sieved down to 5 mm. The excavation was ended respectively at 30 cm (SI) and 45 cm (SII) in the natural substrate.

6 Site

Kusulabu is a low intensity settlement mound complex. It consists of several very low settlement mounds surrounding a higher rock outcrop. The test-pits were located on the slope leading north from the rock outcrop to a little watershed flowing east. The initial survey yielded some ceramic material (mainly pottery decorated with folded strip roulette).

7 Stratigraphy

The stratigraphy of KUS-14-SI consists of settlement rubble, with a pavement recovered in SII, visible on the left side of the east section. Both test-pits displayed very shallow occupations.

8 Finds

The material excavated at Kusulabu is very fragmentary and consists mainly of pottery decorated with folded strip roulette. Knotted twisted cord features several times. A single metal object was retrieved, in SII. It is a fragment of a ring (SF 2014-127), almost certainly a bracelet fragment.

9 Interpretation and Cultural Attribution

Kusulabu was identified to us as a former Gourmantche settlement. The excavation revealed a low intensity, likely medieval, occupation. The presence of a pottery a pavement points to parallels with Birnin Lafiya and other sites of this type.

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FIGURE M.1 Kusulabu site view

FIGURE M.2 Pavement recorded in KUS-14-SII

FIGURE M.3
Kusulabu SII east section at completion

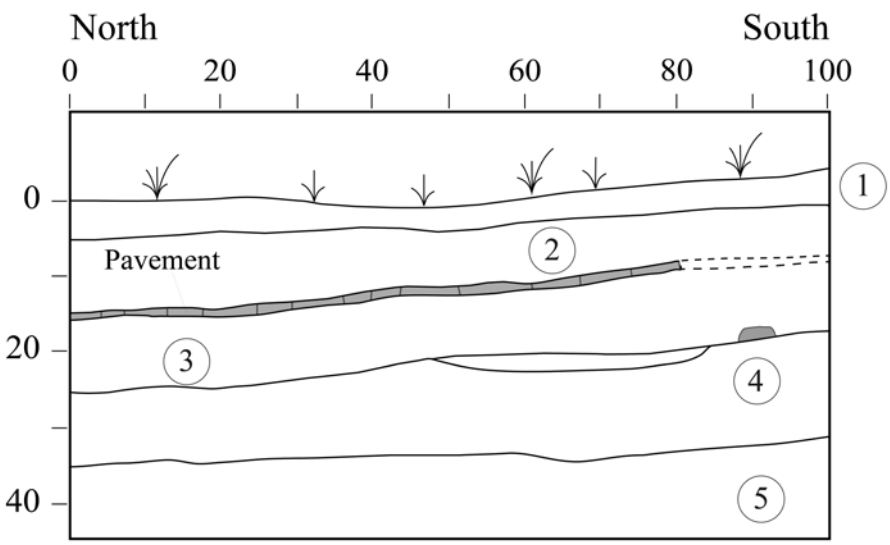

FIGURE M.4
KUS-14-SI, East section
1 Ploughed topsoil
2 Compact brown silty sand
3 Compact orange silt
4 Compact orange clayey silt
5 Orange clay (natural substratum)

10 KUS SI

TABLE M.1 Desampling

Level	#
0–20	320
20–30	21
Total	**341**

Analysis in the field by Barpougouni Mardjoua and at UEA by Sam Nixon

TABLE M.2 Category 4

Level	Undecorated	Illegible
0–20	31	34
20–30	6	0
Total	**37**	**34**

Analysis by Sam Nixon and David Kay

TABLE M.3 Category 3

Context	#	Burn	Dec1	Dec2	Dec3	Dec4	Dec5
0–20	6	ext/int					
	6	ext					
	9		rfp-1b				
	4		roul	ch			
	1		sp1-l	sp1-l	sp1-l	sp1-l	sp1-l
	1		rfp-1b	mch-2			
	1		rfp-1b	mch-2-t			
	1		rfp-1c				
	2		rfp-1b	sl-2			
	1		rfp-1b	plain			
	5		rfp-5				
	2		rfp-5	sl-2			
	6		roul				
	1		rc-1b				
	3	ext/int					
	1	int					
20–30	2		rfp-5				
	4		roul				
	1	int	plain	ch	sx-13		
Total	**57**						

Analysis by Sam Nixon and David Kay

TABLE M.4 Rims

Context	#	R. Type	Brn	Dec1	Loc1	Ang.	Diam.	Mx. thick
SI 0–20	1	S4				5		0.7
	1	E4				4		0.9
	1	E4				4		0.8
	1	E4						0.9
	1	E4				4		0.7
	1	E38	ext/int					1.2
SI 20–30	1	S1	ext			2		0.4
Total	**7**							

Analysis by David Kay

11 KUS SII

TABLE M.5 Desampling

Level	Number
0–20	1188
20–30	112
30–40	14
40–50	2
Total	**1316**

Analysis in the field by Barpougouni Mardjoua and at UEA by Sam Nixon

TABLE M.6 Category 4

Level	Undecorated	Illegible
0–20	73	39
20–30	7	11
30–40	2	1
40–50	0	0
Total	**82**	**51**

Analysis by Sam Nixon

TABLE M.7 Category 3

Context	#	Burn	Dec1	Dec2	Dec3	Dec4	Dec5
0–20	12	ext/int					
	16	ext					
	1	int					
	8		roul				
	2		indis	sl-1			
	1	ext	indis	sl-1			
	1	int	rc-3				
	1		rc-3				
	2		rc-1b				
	1		rfp-1b	indis			
	1		plain	sp1-l	sl-4	sp1-l	sl-1
	1	ext	sl-2				
	1		indis				
	1		peigEL-5+				
	16		rfp-1b				
	1		rfp-5	sl-1			
	10		rfp-5				
	1	int	perf	roul			
	1		rfp-5	sl-3			
20–30	3	ext/int					
	1	int					
	1		rc-3	rfp-1b			
	1	int	roul				
	4		roul				
	1	ext	roul	ch	rc-3		
	1		sl-2				
	1		sl-3				
	4		rfp-1b				
	3		rfp-5				

TABLE M.7 Category 3 (*cont.*)

Context	#	Burn	Dec1	Dec2	Dec3	Dec4	Dec5
30–40	2	ext/int					
	1	ext					
40–50	1		rfp-5				
Total	**102**						

Analysis by Sam Nixon and Anne Haour

TABLE M.8 Rims

Context	#	R. Type	Brn	Dec 1	L1	Ang	Diam	Mx. Thick
0–20	1	S1				2		0.6
	1	S1				4		1.0
	1	S1	ext/int					0.7
	1	S4	ext					0.8
	1	E4	ext/int					0.9
	1	E4				4		1.0
	1	E4	ext/int			4		0.8
	1	E4						0.7
	1	E4				4		0.8
20–30	1	E4				4		1.2
	1	E4	ext/int			4		0.9
	1	S2						0.7
Total	**12**							

Analysis by David Kay

CATALOGUE N

Kozungu (KOZ-14-SI & SII)

Alexandre Livingstone Smith and Nicolas Nikis

1 Location

Kozungu was described to us as a place occupied by people who were unseated by those who subsequently founded Birni Lafia. Kozungu refers to the forest of baobabs for which the place is known, and the site is located a few hundred metres east of the modern village.

2 Geographical Coordinates

LAT: 11,98057003 LONG: 3,226440037 (WGS84)

3 Discovery

Researchers of the project visited the site in 2012 (Julien Jourand) and 2013 (Nadia Khalaf). Alexandre Livingstone Smith and Nicolas Nikis identified the excavation locus on 24 January 2014.

4 Destruction Risks

The site is ploughed regularly by a farmer from Birni Lafia and thus is probably subject to erosion. Mitigation measures are not urgent.

5 Excavation

The site had never been excavated before. The test pits were 1 × 1 m in size and excavated by spits of 10 cm (except for the superficial layer which was excavated in one spit of 20 cm). Within each spit, archaeological contexts (i.e. distinct units) were separated and sieved and bagged separately. All the spits were sieved down to 5 mm.

6 Site

The site of Kozungu appears to be a large settlement mound overlooking the Niger flood plain. It appears as an open sandy mound with baobabs scattered on a crest. The land is used for agriculture and archaeological material is visible as a medium density scatter of pottery. The extent of this site is unknown.

7 Stratigraphy

7.1 *KOZ-14-SI*

The stratigraphy at KOZ-14-S1 displays three or four units beneath the ploughed layer:

Level 1 is a layer of compact brown grey sand overlaying a layer of brown grey loose sand.

Level 2 consists of compact grey sand overlaying a layer of loose grey sand. Part of the compacted layer is in fact a floor made of compacted and hardened laterite (north-east corner of the square).

The third level is probably a pit, sealed by a thin layer of sand overlaying its stabilisation layers (i.e. the last filling of the pit).

The fourth level is barely visible at the bottom of the trench, and appeared to be either a part of Pit 1 or a distinct level. Taking the situation in KOZ-14-SII into account, we consider this as a distinct level (Level 3). It is a layer of loose brown sand.

The test pit was interrupted at 120 cm for logistical reasons, although archaeological layers were still yielding material.

7.2 *KOZ-14-SII*

The stratigraphy at KOZ-14-SII displays three levels and a pit below the ploughed layer:

The first level (Level 1) is made of a layer of compact brown sand overlaying loose grey brown sand (Contexts 1a and 1b to Context 3). It is similar to Level 1 in KOZ-14-S1, but it includes a thick layer of compact red sand (Context 2).

Level 2 consists of a layer of loose grey sand, much thinner than its equivalent in S1.

The third level (Feature 1) is a pit, possibly cutting in part through Levels 1 and 2.

Level 3 consists of a thick layer of loose brown sand. It is probably the same as that observed in S1.

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FIGURE N.1 Site under excavation

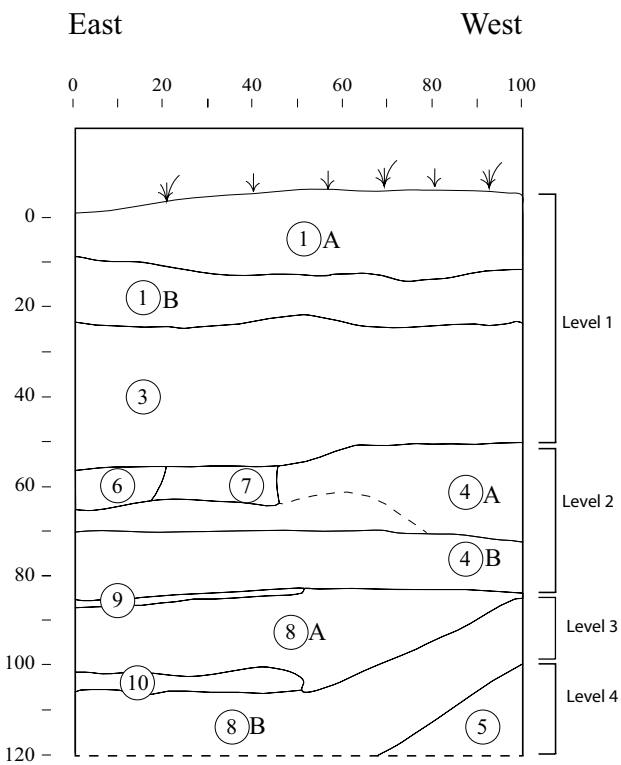

FIGURE N.2
Kozungu S1, South section.
1A Ploughing zone. Loose dark grey sand with pottery and charcoal. Abundant roots and rootelets
1B Dark brown compact sand, with pottery, charcoal and bone
3 Grey brown sand, with pottery, charcoals and bones
4A Indurated grey sand pottery and abundant charcoal
4A Loose grey sand pottery and abundant charcoal
6 Hard orange clay sand (burnt?)
7 Indurated grey brown sand
8A loose brown sand with pottery and charcoal
8B loose dark brown sand with pottery
9 Orange sediment (burnt surface?)
10 Orange sediment (burnt surface?)

8 Finds

White on red painted pottery was found during the survey. Regarding S1, the two upper levels seem to be dominated by pottery decorated with loose folded strip roulette. Two iron objects were recovered from this unit (SF 2014-95 and 96): one rod fragment, and one elongated and curved plaque fragment belonging to the indeterminate category.

In S11 the two upper levels also seem to be dominated by pottery decorated with loose folded strip roulette. Level 3 seems to be associated with a distinct style of pottery. In this test pit two ring fragments were recovered representing items of very different sizes(SF 2014-98 and -99), and an item (SF 2014-97) which appears to be a metal hinge or pendant.

FIGURE N.3
Possible floor in Kozungu SI

FIGURE N.4 Kozungu SII, east section at completion

9 Interpretation and Cultural Attribution

Levels 1 and 2 may be post-thirteenth century. Level 3 is probably much earlier (Early Iron Age or Neolithic, dated in SII). Radiocarbon dates show the long time span of the occupation at the site.

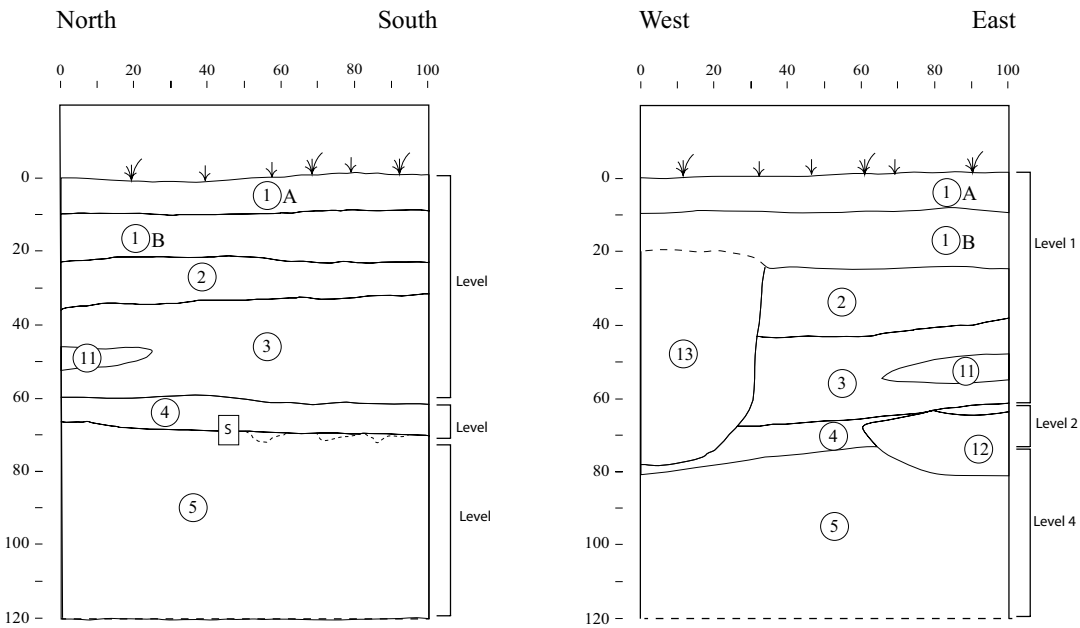

FIGURE N.5 Kozungu SII, east and north sections
1A Ploughing zone. Loose dark grey sand with pottery and charcoal. Abundant roots and rootelets
1B Dark brown compact sand, with pottery, charcoal and bone
2 Red indurated sand, with pottery, charcoal and bone.
3 Grey brown sand, with pottery, charcoal and bone
4A Indurated grey sand pottery and abundant charcoal.
4A Loose grey sand pottery and abundant charcoal
5 Loose brown sand with abundant pottery and charcoal
11 Black sand, very abundant charcoal.
12 Bioturbation
13 Compact dark grey sand (pit structure starting in 1B)

10 Radiocarbon Dates

OxA-31042	351	27	KOZ 14 SI, 20–30	Phase 5
OxA-31043	357	28	KOZ 14 SI, 20–30	Phase 5
OxA-31580	609	25	KOZ 14 SI, 30–40	Phase 4
OxA-31577	557	27	KOZ 14 SI, Context 4, 80–100	Phase 4
OxA-31578	607	25	KOZ 14 SI, Context 4, 80–100	Phase 4
OxA-31579	339	26	KOZ 14 SI, Context 5, 110–120	Phase 5
OxA-31044	605	27	KOZ 14 SII, Context 4, 60–70	Phase 4
OxA-x-2600–42	601	30	KOZ 14 SII, 80–90	Phase 4
Beta-411136	2920	30	KOZ 14 SII, 110–120	Phase 1
Beta-411137	2910	30	KOZ 14 SII, 120–130	Phase 1
Beta-411138	2860	30	KOZ 14 SII, 130–140	Phase 1

11 KOZ SI

TABLE N.1 Desampling

Level	Number
0–20	379
20–30	72
30–40	49
40–50	59
50–60	61
60–80	76
80–90	51
90–100	95
100–110	92
110–120	64
Total	**998**

Analysis in the field by Alexandre Livingstone Smith, Xavier Grégoire Olesegun, Agathe Choukpin, Carolin Amoussou and Nicolas Nikis and at UEA by Sam Nixon

Levels 60–70 and 70–80 were recorded together as 60–80 because of a labelling error

TABLE N.2 Category 4

Context	Undecorated	Illegible
0–20	63	
20–30	43	
30–40	48	
40–50	31	
50–60	36	
60–70	44	
60–80	32	
80–90	9	
90–100	5	4
100–110	8	1
110–120	5	1
Total	**≤ 324**	**≥ 6**

Analysis in the field by Ali Livingstone Smith and Nicolas Nikis, and at UEA by Sam Nixon.
Above 90cm, analysts in the field made no distinction between undecorated and illegible sherds

TABLE N.3 Category 3

Context	#	Burn	Dec1	Dec2	Dec3	Dec4
0–20	1		rfp-1c			
	1	ext	mch-3	plain		
	1	int	plain	sl-1	sh	sl-1
	1	ext	sl-3	plain	sc-4	plain
	1		sx-7			
	27		rce-8			
	5		rc-1			
	40		rfp-1			
	13	Y	undec			
	1	ext/int				
	1	ext/int	rfp-1b	undec		
20–30	1	ext	plain	rc-3	plain	
	1	ext/int	plain	ch-1	rc-1a	plain
	9		rce-8			
	2		rc-1			
	26		rfp-1			
	9	Y	undec			
	5		incision			
30–40	2		rce-8			
	2		rc-1			
	29		rfp-1			
	8	Y	undec			
	2		incision			

TABLE N.3 Category 3 (*cont.*)

Context	#	Burn	Dec1	Dec2	Dec3	Dec4
	1		roul			
40–50	1	ext	plain	sl-6 over rfp-1a		
	4		rce-8			
	3		rc-1			
	33		rfp-1			
	7	Y	undec			
	1		roul			
50–60	2	ext				
	1	ext	plain	rc-3	ch-1	rfp-1b
	1	ext/int	plain	rc-1a		
	1	ext	plain	sl-2	plain	indis
	1		sl-4	rfp-1a		
	1	ext	plain	sl-1	rc-1a	
	1	ext	plain	rc-3		
	2	ext/int				
	1		rfp-1b			
	3		rce-8			
	3		rc-1			
	32		rfp-1			
	10	Y	undec			
	1		roul	undec		
60–70	9		rce-8			
	1		rc-1			
	28		rfp-1			
	6	Y	undec			
60–80	1	ext/int				
	1		plain	rc-3		
	1	ext	plain	rc-3	roul	
	1	ext	plain	sl-1	rc-1a	sl-1
	1	ext	sl-7	sc-4		
	1	ext/int	plain	herb	roul	
	1	ext	sl-4	roul		
	1	ext	plain	ch-1	roul	sp4-v
	1	ext	plain	st over rc-1a	sl-1	
	1		plain	roul		
	1	int	roul	sx over roul		
	1	ext	plain	mch-3		
	4		rce-8			
	2		rc-1			
	19		rfp-1			
	12	Y	undec			
	1	ext	roul	undec		
	1		rfp-1b			
	1		rfp-1b	undec		
	1	ext/int	indis	sx	undec	
80–90	1	ext/int				
	1	int	roul			

TABLE N.3 Category 3 (*cont.*)

Context	#	Burn	Dec1	Dec2	Dec3	Dec4
	1	int	rc-1a	rce-8		
	2		roul			
	1	int	plain	rc-3		
	1		plain	sh over sl-2		
	4		rce-8			
	16		rfp-1			
	2	Y	undec			
	19		indis			
90–100	1	ext/int	plain	rfp-1b		
	1	ext/int	sp4-v over roul			
	1		rc-1a			
	2	ext	plain	ch-1	rc-3	
	1	ext	sl-5 over roul	roul		
	1	ext	roul			
	1		plain	ch-1 over roul		
	1	int	roul			
	14		rfp-1			
	3	Y	undec			
	3		rce-8			
100–110	1		sl-2	rfp-1b		
	1	ext/int	plain	rc-3	rc-1b	plain
	1		indis			
	1		rce-8			
	9	Y	undec			
	15		rfp-1			
110–120	1	int	rc-3			
	1		rce-8			
	3	Y	undec			
	12		rfp-1			
Total	**517**					

Analysis by Sam Nixon and Anne Haour
Levels 60–70 and 70–80 were recorded together as 60–80 because of a labelling error

TABLE N.4 Rims

Context	#	R. Type	Brn	Dec1	L	Dec2	L2	Dec3	L3	Dec 4	L 4	Ang.	Diam.	Mx. thick
0–20	1	S1										4	9	0.6
	1	S1												0.6
	1	S4		sl-1	u	roul	u							0.5
	1	E21	ext/int	is-geo 21	u	sl-1	u	indis	u	undec	c	4		0.45
20–30	1	T21	ext/int									4	18	0.95
40–50	1	E10		rc-1a	c	sl-2	c							0.65
60–80	1	S1	ext/int											1.05
	1	E4	ext/int											0.9
90–100	1	S3	int	su	u									1.2

TABLE N.4 Rims (*cont.*)

Context	#	R. Type	Brn	Dec1	L	Dec2	L2	Dec3	L3	Dec 4	L 4	Ang.	Diam.	Mx. thick
	1	S1	ext	rfp	u							3		0.75
	1	S1	ext/int											0.7
	1	S1		roul	u							3	10	0.8
	1	S1	ext/int									5		0.8
	1	E41	int	rc-1a	u							4	16	0.55
100–110	1	T7	ext/int									4	11	1.1
	1	S1										3	17	0.5
110–120	1	E11	ext/int											1.1
	1	E4	int	rc-1b	u									0.7
	1	E4	ext/int									4		0.8
	1	E32	int									5		0.7
	1	E1	ext/int											0.6
Total	**21**													

Analysis by David Kay

12 KOZ SII

TABLE N.5 Desampling

Level	#
0–20	404
20–30	295
30–40	183
40–50	250
50–60	243
60–70	99
70–80	5
80–90	151
90–100	106
100–110	206
110–120	237
120–130	415
130–140	345
Total	**2939**

Analysis in the field by Alexandre Livingstone Smith, Xavier Grégoire Olesegun, Agathe Choukpin, Amoussou Inès Carolin, Nicolas Nikis, and Alidou Abdou Dramane and at UEA by Sam Nixon

TABLE N.6 Category 4

Context	Undecorated	Illegible
0–20	40	1
20–30	66	0
30–40	90	11
40–50	19	22
50–60	22	3
60–70	6	7
70–80	18	14
80–90	4	3
90–100	7	3
100–110	7	13
110–120	11	14
120–130	69	25
130–140	70	16
Total	**429**	**132**

Analysis in the field by Nicolas Nikis, Jennifer Wexler and Agathe Choukpin, and at UEA by Sam Nixon

TABLE N.7 Category 3

Context	#	Burn	Dec1	Dec2	Dec3	Dec4
0–20	1	ext/int	plain	sl-2	roul	
	1		plain	sx		
	12		rfp-1			
	4	Y	undec			
	13		rce-8			
	2		rc-1			
20–30	1		sx	plain	sl-1	sx
	1	ext	plain	ch		
	3		rce-8			
	4		rc-1			
	33		rfp-1			
	6	Y	undec			
30–40	1	int	rfp-1b			
	1	int	rfp-1c	smth		
	2		rce-8			
	1		roul			
	1		rc-1			
	3		rfp-1			
	5	Y	rc-1			
40–50	1	ext/int	undec			
	1	ext/int	ch			
	1	int	perf	roul		
	2	ext/int	undec	roul		
	1	ext/int	is-geo 12			
	1		roul			
	1		is-geo 13			
	23		rfp-1			
	1		rce-8			
50–60	1	ext	plain	rc-3	rfp-1a	
	1	ext/int	is-geo 12			
	1		plain	rc-3		
	1		plain	roul		
	1	ext/int	plain	rc-1a		
	1	ext/int	ch	plain	ch	sl-5
	1	ext/int	sl-7	sx		
	1		rce-8			
	32	Y	rfp-1			
	3		rc-1			
60–70	1		roul			
	1	int	plain	roul		
	1		plain	sh-17		
	1	int	perf	roul		
	1		roul			
	3	Y	undec			
	12		rfp-1			
	1		rc-1			
	2		rce-8			

TABLE N.7 Category 3 (*cont.*)

Context	#	Burn	Dec1	Dec2	Dec3	Dec4
70–80	1	ext/int	is-geo 11			
	4	Y	undec			
	9		rfp-1			
	3		rc-1			
80–90	1	Y	undec			
	2		rfp-1			
	1		rc-1			
90–100	2		rce-8			
100–110	2		rfp-1			
	1		rce-8			
	2		rc-1			
110–120	1	int	rfp-1a	roul		
	1		rfp-1			
	1		rc-1			
	12		rce-8			
	1		sl-2 over rfp-1b			
120–130	1		plain	sl-5 over roul		
	1	int	roul			
	1	int	plain	sl-1 over roul		
	1	ext	plain	is-geo 11		
	1	Y	undec			
	1		rfp-1			
	14		rce-8			
130–140	1		sl-5 over rc-1a			
	1		plain	sl-2 over rc-1a		
	1		plain	sl-3 over roul		
	1		is-geo 7			
	1	int	plain	roul		
	1		rc-1			
	5		rce-8			
Total	**268**					

Analysis by Sam Nixon and Anne Haour

TABLE N.8 Rims

Context	#	R.Typ	Brn	Dec1	L1	Dec2	L2	Dec3	L3	Dec 4	L44	Ang.	Diam.	Mx. thick
0–20	1	E4	ext/int									5		0.8
	1	S1										3	20	0.6
	1	S1		rc-1b	u	sl-2	u					1		0.6
20–30	1	E11										4		0.7
	1	E37	int									4		0.9
	1	S1	ext/int									4		0.8
	1	T21	ext/int									4		1.2
	1	T21	ext									4		1.4

TABLE N.8 Category 3 (*cont.*)

Context	#	R.Typ	Brn	Dec1	L1	Dec2	L2	Dec3	L3	Dec 4	L44	Ang.	Diam.	Mx. thick
30–40	1	S1	ext/int									4		0.6
	1	E8		roul	u	undec	c					4		0.7
	1	T19		rfp-1b	u	rfp-1b	l					3	19	0.9
40–50	1	T19		rfp-1b	u	rfp-1b	l					3	40	1.3
	1	S1	int	is-geo 22	u							3		0.5
	1	T23	ext/int	roul	u	sl-1(hor)	u	sl-4 (vert)	u			3	25	0.9
	1	T23	ext/int	roul	u	sl-3 (hor)	u	sl-1 (vert)	u			3		0.7
	1	E4	ext/int											0.8
50–60	1	T22	ext/int	rc-3	u							2		1.1
60–70	1	S1	ext/int											0.6
70–80	1	S1		is-geo 23	u							2		0.6
	1	S1		is-geo 23	u	sp4-v	u					2		0.5
80–90	1	S4		roul	u	undec	u							0.8
	1	T11		sh-13	l							3	12	1.0
90–100	1	S4		roul										0.5
	1	S4		roul								2		0.7
	1	E12	ext/int	indis	u	sl-3	u	sx-4	u	undec	c	4		0.4
100–110	1	S1		rc-1a	u	undec	u	rc-1a	u					0.5
	1	S1	int	peigEl-10	u	peigEL-1	u					3	20	0.7
110–120	1	E51		sh-8	l							3		0.7
	1	S4		roul	u							3	21	0.5
	1	S4	ext/int	is-geo 21	u	sl-2	u	undec	u			2		0.6
	1	E12		rc	u	sl-1	u	sh-4	u	undec	c	4		0.5
	2	E12		is-geo 21	u	undec	c	roul	u			4		0.5
120–130	1	S4		rc-1a	u	sl-1	u	undec	u			2		0.5
	1	S4		rc-1a	u	undec	u					2	11	0.5
	1	S4		roul	u									0.5
	1	S4		roul	u							3	21	0.6
	1	S1		sl-1	u	sx-9	u	undec	u					0.7
	1	S1		sl-1	u	indis	u					2		0.5
	1	E2	ext/int									3		0.6
	1	E7	ext/int	rc-1a	c/u	undec	c	sl-2	u			3		0.7
130–140	1	E11	ext/int									2	9	0.3
	1	S4		sl-1	u	sh-7	u							0.6
	1	S4		rc-1a	u	undec	u	rc-2a	u	sl-2	u	2		0.6
	1	S4		roul	u	sl-5	u					3	25	0.8
	1	S1	ext/int	roul	u	sl-1	u	undec	u			3		0.4
	1	S1		is-geo 23	u									0.8
	1	S1		is-geo 23	u							2	21	0.6
	1	S1		is-geo 23	u							2		0.6
	1	S1		is-geo 23	u							2	25	0.5
	1	S1		is-geo 23	u							2	18	0.5
Total	**51**													

Analysis by David Kay

CATALOGUE O

Tondo windi (TOW-14-S1)

Louis Champion and Anne Haour

1 Location

The test pit TOW-14-S1 was situated in the middle of the modern village of Birni Lafia. The location was determined after consultation with informants, and placed near one of the oldest compounds of the village. The aim was to determine the time-depth of occupation of the village and examine whether there was any continuity with other archaeological sites known in the area. The initial intention was to undertake two test pits, one inside the compound and one outside, but we were only granted permission to work on the outside. The owner of the house, the brother of the '*chef de terre*', indicated a place in the middle of a modern rubbish area, where cows are penned at night. The test pit was placed at the top of a small midden between two granaries.

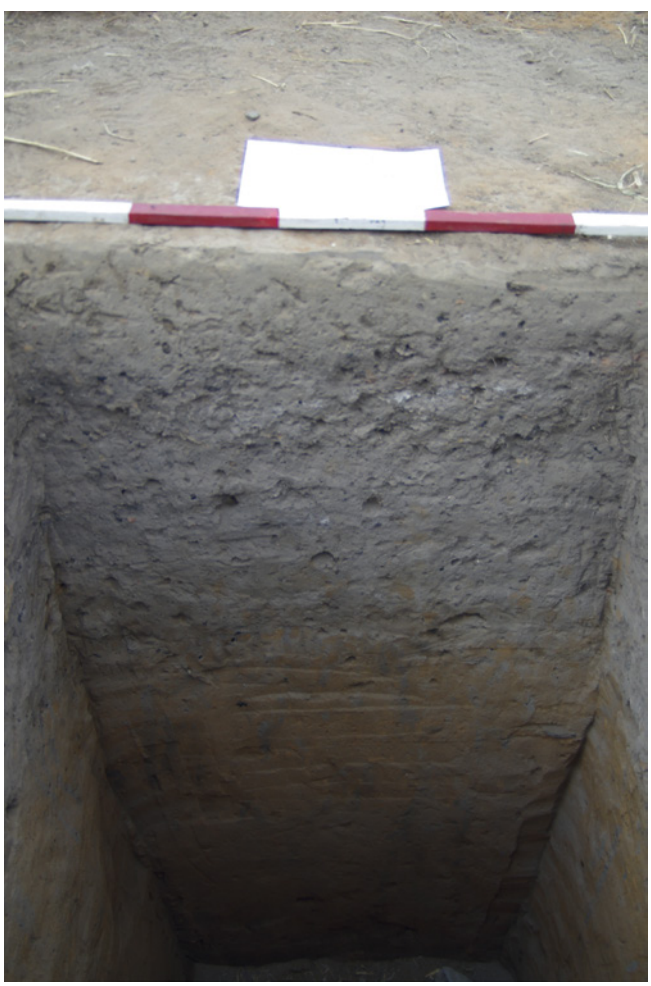

FIGURE O.1 South section at completion

2 Excavation

The excavation took place on 29–30 January 2014. The team comprised Louis Champion and three workers: Anou Mamed, Ana Adi, and Harouna Alamou.

The test pit, a 1 × 1 m unit, was excavated in 10 cm spits, except for the first spit which was set at 20 cm, as it clearly consisted of recent refuse such as plastic bags and cow dung. All sediment was sieved at 5 mm. It was necessary to terminate the excavation c. 170 cm BD due to the risk of collapse, although archaeological layers were still yielding material.

3 Layers and Contexts

Three main contexts were revealed. Context 1 was composed of mud brick and burnt clay while the others were composed of a gradient of different sands, from a soft grey to a very soft yellow-orange. Barring this gradient, all the spits were very similar in appearance and presented comparable material. Exceptions were spits 3 and 4 (30–50 cm BD) which was divided into two contexts: one constituted of very soft sand to the north (Context 2) and one of mud brick and burnt clay with a yellow-red colour to the south (Context 1). No artefacts were recovered in Context 1, suggesting it may have been an old burnt wall. Context 3 began at 75 cm BD.

4 Finds

Concerning the ceramics nothing significant was noticed, except for spit 18, where four sherds were significantly different from the others, being entirely red (possibly red-slipped). The rest of the sherds were very small, fragmented and eroded. Three glass beads (S. Magnavita's Type 2 glass) were recovered (SF 2014-57, -60 and -61). Three cowrie shells (SF 2014-22 to -24) were recovered at level 80–90. There was a dark green and white glass bracelet in 0–20 (SF 2014-45) (see Catalogue entry for Tomboutou, Figure AC.2, where it is at the far right in the middle row).

Metal artefacts were also recovered. Three fishhooks came from the upper part of the sequence (SF 2014-152

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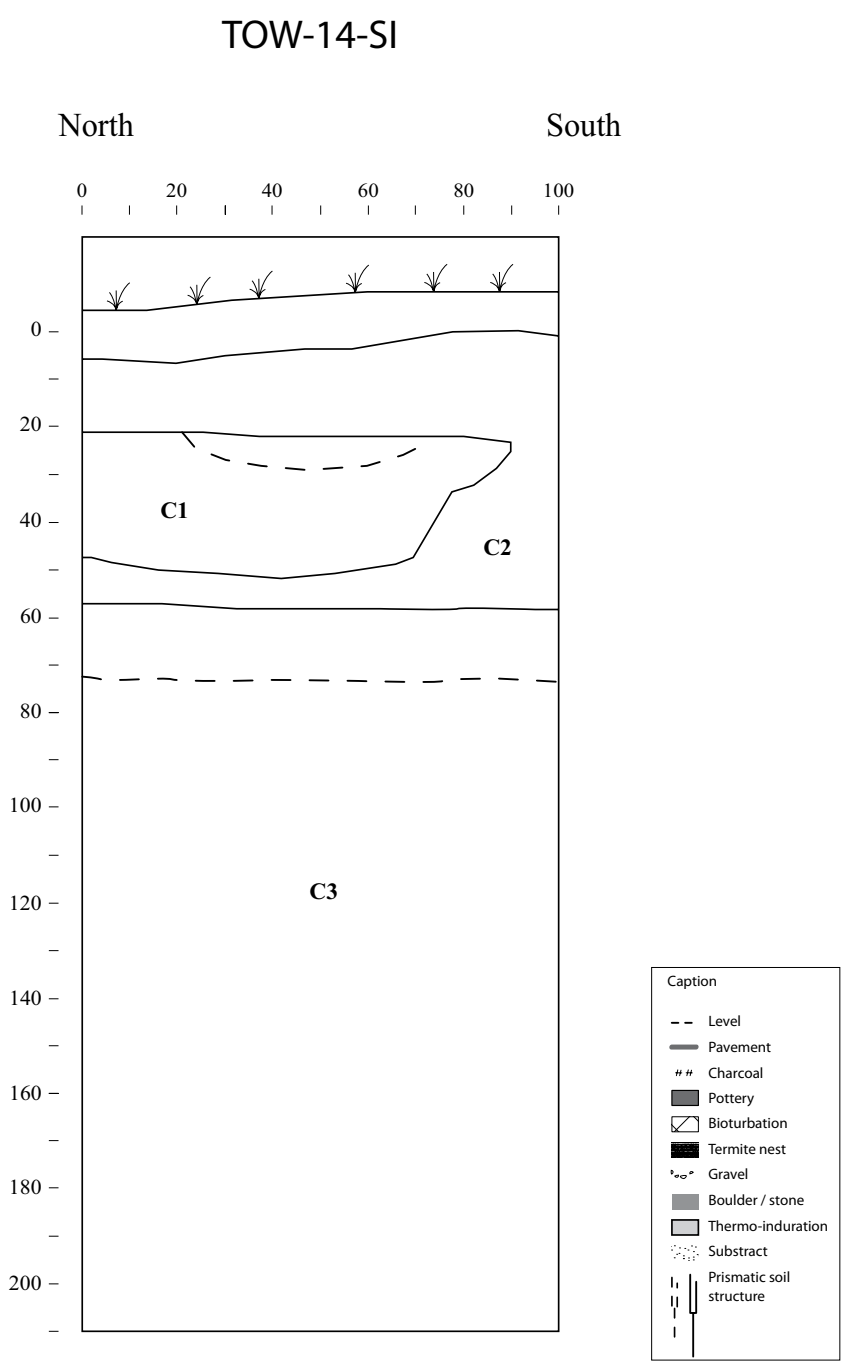

FIGURE 0.2
East section at completion. See text for description of layers.

to -154) and there was a possible blade fragment (SF 2014-155). Charcoal was scarce.

5 Interpretation and Cultural Attribution

This stratigraphy seems to reflect the presence of a settlement site, with Context 1 resembling a wall. The three dates taken collectively suggest the bottom part of the trench – Context 3, below about 70cm – formed before AD 1700. The two other dates, which were taken at the same depth of 60–70 but one in the presumed wall and one in the surrounding matrix, both seem younger than that for Context 3, as is to be expected. In addition, it would make sense for the wall to be older than the debris which built up around it, and the dates could be read in a way that supports this story, though this cannot be said for definite. The former *birni* passed close to here.

6 Radiocarbon Dates

Beta-397868	110	30	60–70, Context 2	Phase 5
Beta-397867	270	30	120–130, Context 3	Phase 5
Beta-397869	200	30	60–70, Context 1	Phase 5

7 TOW SI

TABLE 0.1 Desampling

Context	Number
0–20	25
20–30	19
30–40	17
40–50	7
50–60	14
60–70	29
70–80	10
80–90	31
90–100	11
100–110	5
110–120	6
120–130	4
130–140	2
140–150	4
150–160	6
160–170	11
170–180	10
180–190	9
190–200	7
Con. 2 50–60	5
Con. 2 60–70	6
Con. 3 70–80	4
Con. 3 80–90	4
Con. 3 90–100	5
Total	**251**

Analysis in the field by Amour Agbra and Xavier Gégoire Olusegun, and at UEA by David Kay

TABLE 0.2 Category 4

Context	Undec	Illegible
0–20	1	
20–30	4	
30–40	8	
40–50	2	
Con. 1 60–70	3	
100–110	11	
110–120	4	
150–160	1	
160–170	1	
170–180	2	1
180–190	6	2
190–200	2	
Con. 2 50–60	3	
Con. 2 60–70	8	
Con. 3 70–80	13	
Con. 3 80–90	23	
Con 3. 90–100	27	1
Total (123)	**119**	**4**

Analysis by David Kay

TABLE 0.3 Category 3

Context	#	Burnish	Dec1	Dec2	Dec3	Dec 4
0–20	1	int				
	5	ext/int				
	5	ext				
20–30	1	int				
	1	ext/int	sl-4	indis		
	1		pnt-bl c	pnt-rb/undec	pnt-rc (int)	
30–40	2	ext/int				
	3	int				
	1	ext				
40–50	2	ext				
	1		plain	sl-1		
	1		rfp			

TABLE 0.3 Category 3 (*cont.*)

Context	#	Burnish	Dec1	Dec2	Dec3	Dec 4
Con.1 60–70	1	ext/int				
	3	int				
	1		rc	indis		
	1	ext	plain	rc-1a	5l-1	ST-1
100–110	3	ext				
	1	int				
110–120	1	ext/int	plain	sl-4		
	1	ext				
	1		rfp-1a	rfp-5	mch-3	
120–130	1		rfp-1b			
160–170	1		rfp-5			
170–180	1		rce-8			
Con 2. 50–60	1			indis	sl-2	
	1	ext	indis	sl-1		
	1		pnt-blc	pnt-rc		
	1		pnt-blc	pnt-r		
	1	int				
	1	ext	plain	sl-2		
	1	ext				
	1	int	indis			
	1		rc	st-3	sl-2	
Con 2. 60–70	1	ext				
	1	ext/int				
	1		plain	sl-2		
	1	ext/int	sl-1/plain	sl-3	st-2	
Con 3. 70–80	2	ext/int				
	4	ext				
	1	ext	plain	sc-1		
	1	ext/int	mch-2	roul	pnt-rc	
	1		rc-1a			
	1	ext	sl-1	smth	sl-1	
Con 3. 80–90	4	ext/int				
	3	ext				
	3	int				
	1	ext	roul			
	1	ext/int	plain	pnt-r		
	2	ext/int				
	1	ext	plain	sl-3		
	1		rc	sl-2	st-1	
Con 3. 90–100	4	ext				
	1	int				
	1	ext	plain	pnt-r		
	1	ext/int	sl-7			
Total	**86**					

Analysis by David Kay

TABLE 0.4 Rims

Context	#	R.Type	Brn	Dec1	L1	Dec2	L2	Dec3	L3	Ang.	Diam.	Mx. thick
0–20	1	S1	int							5		0.7
	1	S3	ext/int	pnt-bl	l	pnt-r	u-int			3	23	0.7
	2	S4	ext/int							4		0.4
20–30	1	E43								4		0.9
40–50	1	S4	ext/int									0.6
100–110	1	S1	ext/int							4		0.8
	1	E22								4		0.7
160–170	1	S4										0.6
Con. 2 60–70	2	E4								4		0.6
	1	S1	ext/int							3	26	0.7
Con. 3 70–80	2	E1	ext/int							4		0.6
	1	S1										0.7
	1	S1	int							5		0.7
Con. 3 80–90	1	S1	ext/int							3	11	0.8
	1	S1								2		0.7
	1	S1	int							3	>30	0.5
	1	T1	ext/int	sl-2	l					4		0.7
	1	T17								3		0.9
Con. 3 90–100	1	E22		ch	l					4		0.7
	1	E22								4		0.7
	1	E26								4		0.6
	1	S4										0.9
180–190	1	E11										0.5
Total	**26**											

Analysis by David Kay

CATALOGUE P

Bokorobu (BOK)

Franck N'Po Takpara

1 Location and Discovery

Bokorobu, a former occupation site, is currently occupied by the people of Birni Lafia and is at the edge of that modern settlement (Figure R.1). Bokorobu is said to be the name of an ancient and illustrious inhabitant. The other name for this site is Tékuarakombo. It had not been previously excavated. There was some debate as to whether we had been shown the 'correct' location.

2 Destruction Risks

This site is entirely inconspicuous. As Birni Lafia grows it is encroaching on this area. The site we excavated is surrounded by houses.

3 Excavation

The site was excavated between 28 January and 22 February 2014 under the supervision of Franck N'Po Takpara.

The trench began as a 2 × 2 m, reduced to 2 × 1 m at 80 cm BD, then again to 1 × 1 m at 170 cm BD in the interests of speed and given that the quantity of artefacts was diminishing. The datum was 30 cm above the current land surface. The trench was excavated in spits of 10 cm. After cleaning the surface, we excavated a total of 19 levels.

4 Stratigraphy

The first spit (30–40 cm BD) consisted of fine grey very friable sand and was not sieved as it was considered disturbed.

The second spit (40–50 cm BD) consisted of fine grey very friable sand. It yielded sherds and bone.

The third spit (50–60 cm BD) consisted of fine very friable sand, a mix of orange and grey in colour. It yielded sherds, bone and charcoal.

The fourth spit (60–70 cm BD) consisted of fine friable sand, mainly orange in colour. It yielded sherds, bone and charcoal.

The fifth spit (70–80 cm BD) consisted of fine friable sand, mainly orange in colour. It yielded fewer sherds, bone and charcoal, compared to previous levels.

The sixth spit (80–90 cm BD) consisted of fine friable orange sand. It yielded fewer artefacts, compared to previous levels.

The seventh spit (90–100 cm BD) consisted of fine friable orange sand. It yielded fewer artefacts, compared to previous levels. At this stage the trench was reduced to 2 × 1 m.

The eighth spit (100–110 cm BD) consisted of fine friable orange sand. It yielded very little pottery and no charcoal.

The ninth spit (110–120 cm BD) consisted of fine friable orange sand. It yielded very few pottery fragments and no charcoal.

The tenth spit (120–130 cm BD) consisted of fine compact yellow sand. It yielded very few pottery fragments and no charcoal.

The eleventh spit (130–140 cm BD) consisted of fine compact dark orange/yellow sand. It yielded some charcoal and more abundant pottery than the previous spit.

The twelfth spit (140–150 cm BD) consisted of fine compact yellow sand. It yielded some pottery.

The thirteenth spit (150–160 cm BD) consisted of fine compact yellow sand. It yielded some pottery.

The fourteenth spit (160–170 cm BD) consisted of fine compact yellow sand. It yielded some pottery. The soil was very damp on the southern part of the unit. At the close of this level the trench was reduced to 1 × 1 m.

The fifteenth spit (170–180 cm BD) consisted of fine compact yellow sand. It yielded charcoal.

The sixteenth spit (180–190 cm BD) consisted of fine compact yellow sand. It yielded charcoal and a few very eroded potsherds.

The seventeenth spit (190–200 cm BD) consisted of fine compact yellow sand. It yielded one potsherd, small and eroded. Termite perturbations were noted.

The eighteenth and nineteenth spits (200–220 cm BD) consisted of fine compact yellow sand. They yielded no artefacts. Excavation was terminated at 220 cm BD. Figure R.2 shows the northwest corner at completion of excavation.

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FIGURE P.1 Location shot

FIGURE P.2 Northwest corner on completion of work

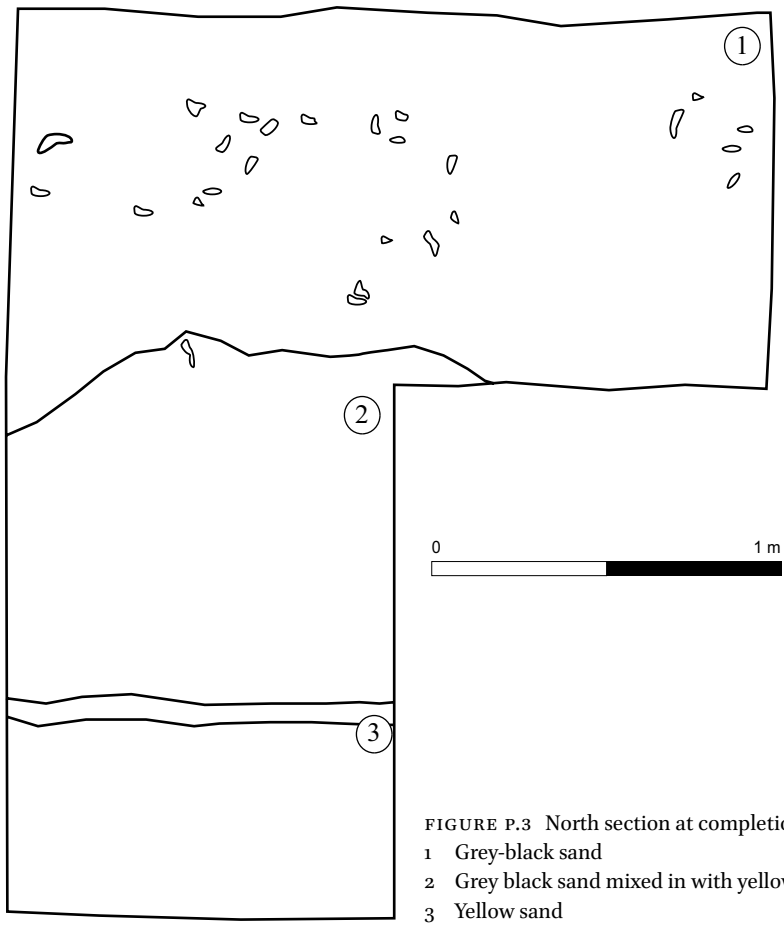

FIGURE P.3 North section at completion.
1 Grey-black sand
2 Grey black sand mixed in with yellow sand
3 Yellow sand

5 Interpretation and Cultural Attribution

There were no small finds from Bokorobu which might allow a comment on date. Despite the depth of the sequence, with potsherds occurring in some number up to 180cm, this site seems to have seen rather slender occupation. The sandy nature of the sediment and the lack of discernible stratigraphy may indicate that artefacts have moved vertically through the sequence. For this reason, too, no charcoal dates were run. The ceramic material was rather non-diagnostic, though a handful of unique decorations (such as incised circles or chevrons) were recovered (Plate 19.3–11). The fact that the pottery is mixed, featuring some folded strip roulette, some multiple-stick cord roulette, some incisions and some painted designs, gives further reasons to think that this stratigraphy was disturbed.

TABLE P.1 Desampling

Level	Number
0–40	unrecorded (soil was not sieved)
40–50	41
50–60	89
60–70	37
70–80	37
80–90	11
90–100	10
100–110	18
110–120	32
120–130	20
130–140	63
140–150	48
150–160	21
160–170	27
170–180	13
180–190	1
Total	**468**

Analysis in the field by Anne Haour and Agathe Choukpin

TABLE P.2 Category 4

Context	Undecorated	Illegible
40–50	20	0
50–60	58	0
60–70	10	1
70–80	8	0
80–90	6	1
90–100	0	1
100–110	2	0
110–120	0	1
120–130	1	0
130–140	3	7
140–150	1	1
150–160	4	2
160–170	2	4
170–180	5	1
180–190	1	2
190–200	1	0
Total	**122**	**22**

Analysis by David Kay

TABLE P.3 Category 3

Context	#	Burn	Dec1	Dec2	Dec3	Dec4	Dec5
40–50	1	int	rc-1a	sl-2			
	1	ext/int	rc-1a	sl-1			
	2		blepharis				
	1		is-geo 17				
	1	int	is-geo 18	plain			
	1	ext/int	is-geo 18	plain			
50–60	3	ext/int	sl-3				
	4	int					
	1	int	sl-3	pnt-r			
	1		sc-1				
	1		sl-4				
	2	int	rfp-1b				
	2		blepharis				
	2		is-geo17				
	1	int	is-geo 18				
	1		plain	sl-1	sp1	sp1	sp1
	1		is-geo 17	rbt			
	1		herb				
	1	ext	undec				
	1		sl-1	roul			
60–70	2	ext					
	1	int	is-geo19				

TABLE P.3 Category 3 (*cont.*)

Context	#	Burn	Dec1	Dec2	Dec3	Dec4	Dec5
70–80	2	ext					
	1		rfp-1b				
	1		roul	perf			
	1	ext/int	rc-1a	pnt-r			
80–90	1		is-geo20				
	1		roul				
	1	ext	perf				
90–100	1		rfp-1a				
	2		rfp-1b				
110–120	1	ext/int					
120–130	1		sl-2	indis			
130–140	1	int	indis				
140–150	2			rce-8			
160–170	1			rce-8			
	1	ext/int					
170–180	1	int					
Total	**51**						

Analysis by David Kay and Anne Haour

TABLE P.4 Rims

Context	#	R. Type	Brn	Dec1	Loc1	Ang.	Diam.	Mx. thick
40–50	1	E4				4		0.7
	1	E13				4		0.9
	1	S4						0.95
	1	S1						0.6
	1	E6	ext					0.65
	1	E6	ext/int					0.7
	1	S1				3		0.6
50–60	1	S1				3		0.6
	1	S1						0.9
	1	E32				4		0.7
	1	S1						0.7
	1	EI4				4		0.9
	1	S1						1.15
	1	S1				5		0.8
	1	E16		sl-1	l	4		0.5
	1	S4						0.7
	1	E6				4		0.85
	1	S1				3	19	0.7
	1	S1	ext/int			4		0.6
	1	S1		sl-1	l			0.65
60–70	1	S1						0.4
70–80	1	E9	ext/int					0.7

TABLE P.4 Rims (*cont.*)

Context	#	R. Type	Brn	Dec1	Loc1	Ang.	Diam.	Mx. thick
80–90	1	E6						0.9
90–100	1	S1						0.5
130–140	1	S1						0.55
Total	**25**							

Analysis by David Kay

CATALOGUE Q

Birnin Lafiya (S1)

Anne Haour

1 Location

Blaf S1 was a 2 × 1 m trench (narrowed to 1 × 1 m at 0.75m BD) oriented east-west close to the top of the main mound at Birnin Lafiya. It was excavated at the time that the research team first discovered and investigated this large mound site, in 2011.

2 Discovery

The site was discovered as part of a systematic survey along the Madekali-Pekinga line. The excavation locus was chosen by Alexandre Livingstone Smith and Didier N'Dah.

3 Destruction Risks

The site is ploughed regularly by a farmer from Birni Lafia and is likely subject to erosion. Mitigation measures are not urgent.

4 Excavation

Excavations were carried out over a three-day period. The trench was excavated in artificial spits of 25 cm. Finds consisted of potsherds, charcoal and bone fragments throughout the stratigraphy. The excavation was ended at 125 cm due to lack of time, but archaeological layers appeared to continue below that level – a supposition strongly supported by subsequent work at the site which demonstrated that stratigraphies extended for over 3 m in places. The contexts as defined are listed below.

Context 1 = 0–25 cm
Context 2 = 25–50 cm
Context 3 = 50–75 cm
Context 4 = 75–100 cm
Context 5 = 100–125 cm

5 Interpretation

The excavation confirmed the existence of subsurface archaeological evidence in the form of artefacts, although no specific features – barring a discrete but small concentration of bone about 47cm BD – were uncovered. Despite its proximity to extensive areas of pottery pavement no such features were uncovered. This part of the site was, in subsequent field seasons, extensively investigated, and the 2014 excavations of an architectural compound (Trench 3/10) reached a point very close to the unit that had been excavated three years previous.

6 Radiocarbon Dates

Beta-305221	1300	30	BLAF 11 S1, 25–50 cm, 47 cm.	Phase 3
Beta-305220	1420	30	BLAF 11 S1, 75–100 cm.	Phase 3
Beta- 305219	1260	30	BLAF 11 S1, 120 cm.	Phase 3
Beta-305217	1350	30	BLAF 11 S1, 125 cm.	Phase 3

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FIGURE Q.1
Excavation team at completion of work

FIGURE Q.2
West section at completion

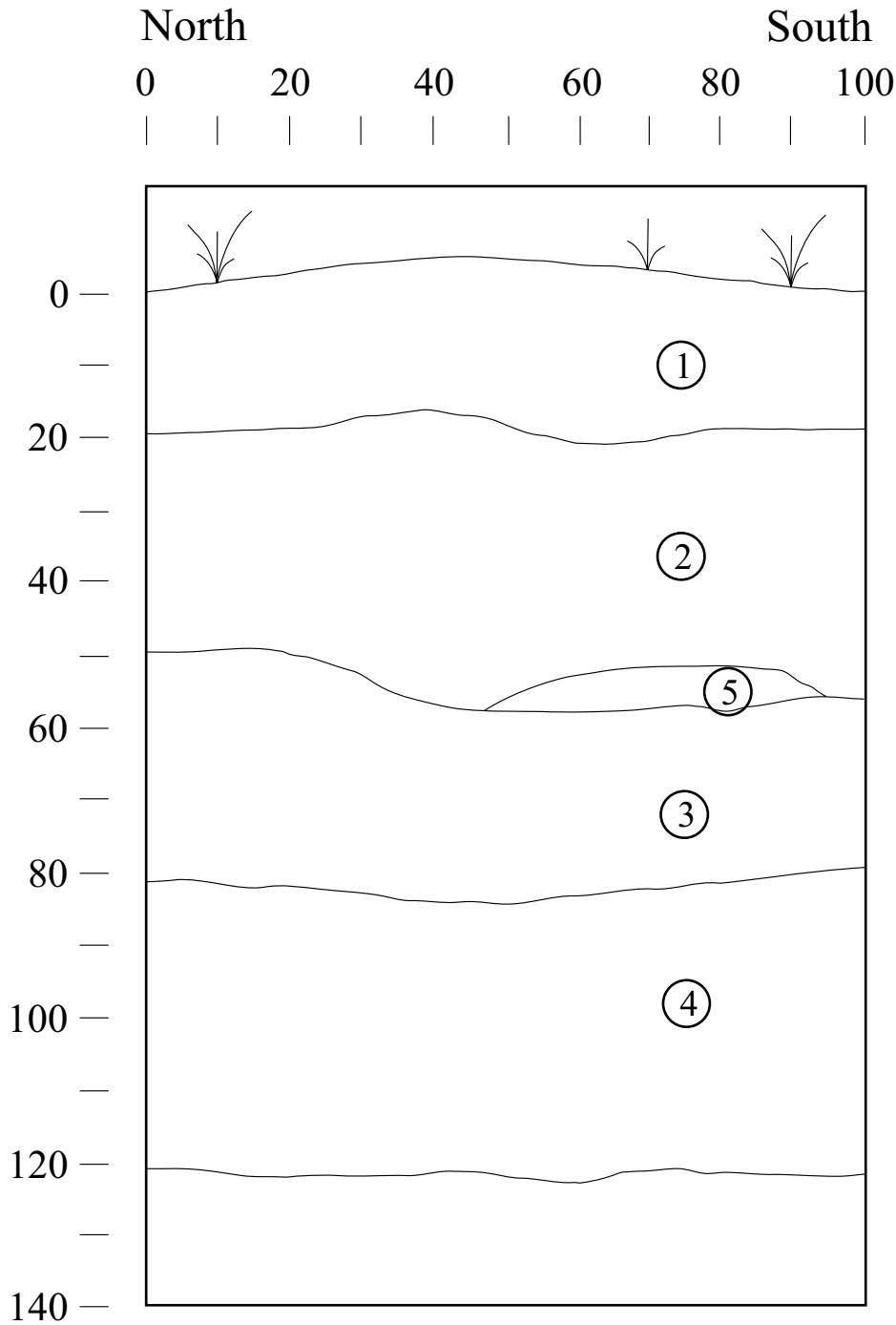

FIGURE Q.3 East section at completion

1 Loose grey sand
2 Compact brown red gravelly layer
3 Compact clayey yellow layer, with very abundant potsherds, charcoal and occasional bones
4 Compact clayey beige layer
5 Ash lense

TABLE Q.1 Desampling

Context	#
1	295
2	410
3	312
4	104
5	41
Total	**1162**

Analysis by Alexandre Smith, Oumarou Banni Guene, Anne Haour and Didier N'Dah

The desampling criterion was a 50 cfa coin (rather than 25cfa as became established later)

TABLE Q.2 Category 4

Context	Undecorated	Illegible
1	21	14
2	14	31
3	11	11
4	4	2
5	2	5
Total	**52**	**63**

Analysis by Anne Haour

TABLE Q.3 Category 3

Context	#	Burn	Dec 1	Dec 2	Dec 3	Dec 4	Dec 5
Context 1	2		inc				
	1		rfp-1	inc			
	1		chann				
	25		rfp-1				
	2	int	rfp-1	rfp-1			
	1		rfp-1	smth			
	3	int	rfp-1	rfp-1	rfp-1		
	1		rc-1				
	5		roul				
	2	int	undec				
	1	int	roul				
	10	int/ext	undec				
	1	ext	undec				
Context 2	1		sl-1				
	30		rfp-1				
	1	int	rfp-1	smth			
	1		rfp-1	inc	smth		
	1	int	rfp-1				
	1	int	rfp-1	rfp-1	rfp-1	smth	inc
	1		rfp-1	rfp-1			
	1		rfp-1	rfp-1	rfp-1		
	2		rce-8				
	2		rc-1				
	1		eroded rfp-1	eroded rfp-1	perf		
	1		roul		perf		
	6		roul				
	1		undec	perf			
	1	int	undec	perf			
	3	int/ext	undec				
	1	ext	undec				

TABLE Q.3 Category 3 (*cont.*)

Context	#	Burn	Dec 1	Dec 2	Dec 3	Dec 4	Dec 5
	1	int	inc				
	2		rfp-1	inc			
	1	ext	inc	inc	stab	inc	
	1	int/ ext	inc				
	1	int/ext	rc-1	inc			
	1		inc				
	1	ext	sp1				
Context 3	2		rfp-1	inc			
	2	ext	inc	inc	pa-4		
	1	int/ ext	stab	inc			
	1	ext	rfp-1	inc			
	2	int	inc	inc			
	1		inc				
	1		inc	chann			
	1	int/ ext	inc				
	1	ext	rfp-1	plain			
	2	ext	rfp-1	smth			
	1		rfp-1				
	1	int	rfp-1	rfp-1			
	1	ext	rfp-1	smth			
	1		rfp-1	rfp-1			
	1	int	rfp-1	plain			
	1		rfp-1	plain			
	1		rfp-1	inc	smth		
	1		rfp-1	rfp-1	smth		
	1		rfp-1	rfp-1	perf		
	1	int	roul		perf		
	44		rfp-1				
	1	int	rfp-1				
	1		rce-8				
	2		rc-1				
	1	int	rc-1				
	1	ext	rc-1	inc			
	3		rc-1	rc-1			
	8		roul				
	1		indis				
	1		indis	perf			
	5	int/ ext	undec				
	2	int	undec				
	18	ext	undec				
Context 4	1	ext	pa-4				
	1	ext	rfp-1				
	8		rfp-1				
	1		rce-8				
	1	int	rc-1				
	4		rc-1	inc			

TABLE Q.3 Category 3 (*cont.*)

Context	#	Burn	Dec 1	Dec 2	Dec 3	Dec 4	Dec 5
	1		rfp-1	undec	rfp-1		
	1	ext	rc-1	SC-*n*	inc		
	1		roul				
	3	int/ ext	undec				
Context 5	1		rc-1	rc-1	inc		
	3	int/ ext	inc				
	1	ext	inc				
	1	int/ ext	rfp-1	plain			
	3		rfp-1				
	1	ext	rfp-1				
	1		rfp-1	perf			
	1		rfp-1	rfp-1			
	2		rc-1	inc			
	1		rc-1	rc-1	inc	inc	
	1	ext	rc-1	SC-*n*	inc	inc	
	1		roul	inc			
	1	ext	rc-1	inc			
	1	int	rc-1				
	7		rc-1				
	1		rc-1	inc			
	7		roul				
	2	int/ ext	undec				
	4	ext	undec				
	1		undec				
	1	ext	rfp-1	smth			
Total	294						

Analysis by Anne Haour

TABLE Q.4 Rims

Context	R.Type	Brn	Dec1	Dec2	Dec3	Diam
Context 1	E	int	undec			
	S		mch-4			
	S		mch-4			26
	S	int/ext	undec			
	S		rc-1	sl-2		
	S		roul			
	S		undec			
	S	int	undec			
	S	int	undec			
	S		channel			
	S	int	inc			
	S	int/ext	undec			
	S	int	inc	ic-1		22

TABLE Q.4 Rims (*cont.*)

Context	R.Type	Brn	Dec1	Dec2	Dec3	Diam
	E	ext	undec			
Context 2	S		pa-1	pa-1	pa-1	
	S	int/ext	undec			
	S	int/ext	undec			
	S	int/ext	undec			
	S	int	undec			
	S		rfp-1	perf		26
	S	int/ext	inc			
	E	ext	undec			20
	S	int/ext	undec			
	S	ext	roul			
	S	ext	undec			
	E	int	undec			
Context 3	E		sl-10	sp1 x 7		
	S	int	sl-7			
	S		undec			
	S	int/ext	undec			30
	S	int/ext	rc-1 (int)	rc-1		11
	S	int	undec			
	S	int/ext	undec			26
	S		indis			
	S		ic-1	rc-1		
	Carinated		sl-4	sp5-l		
	S	int/ext	inc			
	bottle neck		undec			5
	bottle neck		undec			
	E		roul			
	E		roul			12
	S	int/ext	undec			20
Context 4	S	int/ext	undec			
	S		roul			
	S		undec			
	S	int	undec			
Context 5	S	int/ext	undec			
	S	int/ext	undec			
	S	int/ext	ch			
	S	int/ext	sc-1	sh-4		
	E	int/ext	undec			
TOTAL	**51**					

Analysis by Anne Haour

This analysis was carried out in 2011, at an early stage of the ceramic treatment and was intended to give an initial sense of the assemblage. Consequently, rim categories are only broad.

CATALOGUE R

Birnin Lafiya (S4)

Anne Haour and Barpougouni Mardjoua

1 Discovery

This trench was on the part of the Birnin Lafiya site examined in survey work in 2011. Carlos Magnavita identified the excavation locus in January 2012.

2 Destruction Risks

The site is liable to some level of erosion. Mitigation measures are not considered to be urgent as the depth of the archaeology is beyond that likely to be damaged.

3 Site

The area selected for excavation was the northeastern part of the Birnin Lafiya site, downslope of an area in which fragments of pottery pavement and possible mud brick structures has been noted during the 2011 fieldwork. In 2012 excavation had begun in earnest on these areas, and as a result locations close by were thoroughly examined and the site of Trench 4 chosen due to the presence there of several dense scatters of pottery, potentially former pits.

4 Excavation

The area chosen had not previously been investigated. Excavation proceeded in several phases. First, a raised feature, visible on the site surface as an ashy mound close to the ongoing investigation of a nearby architectural complex (Trench 3/10), and interpreted as an inverted pit, was sectioned. Five contexts were defined within this raised pit, which was excavated in 10cm spits. Secondly, a surface scouring was made of the area around this, which was referred to as Context 6 and which revealed the outline of several possible pit features; a 2.5 × 3 m area was cleared with a view to sectioning and sampling these various pits. These were emptied in turn and, as excavation became increasingly complicated, a 2 × 1 m trench was finally opened to encompass the main pits that were visible. Finally, the raised pit first investigated was fully excavated. It should be noted that this final phase of the excavation, the levelling of the raised pit, was excluded from the pottery analysis in order to keep the assemblage manageable. Small finds are however included in our appendix: these are three beads (SF 2012-23, 2012-24 and 2012-43) and a clay cylinder (SF 2012-136).

The main stratigraphic information came from the excavation of the 2 × 1 m trench which is referred to here as S4-B. The section drawings refer to this excavation. The excavation of the raised pit, and the subsequent emptying of pits traced out from their surface imprint, is called S4-A.

All levels were sieved at either 2 mm or 5 mm. Excavation was carried out by Barpougouni Mardjoua, Simon Agani and Adamou Batagnaki under the supervision of Carlos Magnavita, Anne Haour, Alexandre Livingstone Smith, Obarè Bagodo and Sam Nixon.

The datum was set at 60cm above the existing top of the protruding pit during the excavation of that feature (S4-A). When excavation shifted to the 1 × 2 m unit (S4-B), the datum became the soil surface at the southwest corner, 92cm below the previous datum.

5 Contexts

5.1 *S4-A Excavation* (*Figure R.1*)

Context 1 spanned the top 10 cm of the protruding pit feature. This was a grey, sandy, ashy soil in which ceramics, bone, charcoal and lithics were recovered. It was sieved at a mesh of 5 mm.

Context 2 spanned 10–20cm in the protruding pit feature. This was a greyish, sandy, ashy soil in which ceramics, slag, bone, a bead (SF 2012-25) and charcoal were recovered. This layer was sieved at 2 mm given the nature of the deposit. A pottery pounder was removed from the section.

Context 3 spanned 20–30cm in the protruding pit feature. This was a greyish, sandy, ashy soil in which ceramics, bone, and charcoal were recovered. This layer was sieved at 2 mm given the nature of the deposit, and a flotation sample was taken. The base of Context 3 was at the same level as the present land surface surrounding the raised pit.

Context 4 spanned 30–40cm in the protruding pit feature and extended below the present day land surface. Ceramics, bone, and charcoal were recovered, as well as two nested pottery vessels. This layer was sieved at 2 mm.

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FIGURE R.1
Setting up the raised pit excavation

Context 5, which spanned 40–50cm, involved the final emptying of the protruding pit feature. Ceramics, bone, and charcoal were recovered. This layer was sieved at 2 mm.

At this stage the surface around the pit feature was scoured over an area of 2.5 × 3 m (north-south/east-west). This was called Context 6. Ceramics and bone were recovered and this layer was sieved at 2 mm. At the conclusion of this cleaning, the outlines of several new potential pits became visible: a large pit, called Pit 2, with a small, ashy pit, Pit 5, nested in its southern edge; and two small pits, Pits 3 and 4, in the northern half of the unit. The decision was taken to section the larger Pit 2; to this end, a line was set up bisecting the feature north-south (Figure R.2).

Excavation of Pit 2 began. Context 7, underlying Context 6, represented the upper fill (95–105cm BD) of the pit feature, Pit 2. Ceramics, slag and bone were recovered. This layer was sieved at 2 mm.

Context 8, the fill (105–120cm BD) of Pit 2, underlying Context 7, was clayey and hard, difficult to excavate with the trowel. Ceramics (including a pottery knob, SF 2012-126), bone, charcoal and tooth were recovered. This layer was sieved at 2 mm. The outline of the pit was quite difficult to follow, as the surrounding context resembled the pit fill.

Context 9 (110–126cm BD) was made up of greenish deposits and was a well-defined, discrete context. It cut Context 8, but appeared not to sit within Pit 2. Ceramics and bone were recovered. This layer was sieved at 2 mm.

Context 10 represented the upper fill (95–120cm BD) of a pit feature, Pit 5, within the larger Pit 2. This context underlay Context 6. The soil was sandy and ashy. Ceramics, an iron artefact (SF 2012-123), charcoal and bone were recovered. This layer was sieved at 2 mm.

Context 11 represented the lower fill of Pit 5 (120–140cm BD). This, like Context 10 which lay above it, was a clear, well defined context, although an apparent animal burrow disturbed one part of it. Ceramics, bone and charcoal were recovered. This layer was sieved at 2 mm.

Context 12 spanned 120–140cm BD and constituted the continuation of the fill of Pit 2. In stratigraphic terms it lay below Context 8 and, like it, followed the shape of the pit. Ceramics, an iron artefact (SF 2012-96), charcoal and bone were recovered. This layer was sieved at 2 mm.

Context 13 spanned 140–160cm BD. This constituted the same context as Context 12, the continued fill of Pit 2, but it was excavated in a 20cm spit and allocated a separate context number for better stratigraphic control. Ceramics, charcoal, shell, a clay bead (SF 2012-29) and bone were recovered. This layer was sieved at 5 mm.

Context 14 spanned 160–175cm BD and, as the continued fill of Pit 2, its nature was the same as that of Contexts 12 and 13. Ceramics, shell and bone were recovered. This layer was sieved at 5 mm. At the close of Context 14 it became apparent that, contrary to previous belief, the bottom of Pit 5 had not been reached.

Context 15 spanned 175–185cm BD. This context was created to reflect the reappearance of Pit 5 once Context 14 had been cleaned. It is thus the third and final spit within

FIGURE R.2 Bisecting of protruding pit seen on Figure R.1 has been completed. Scouring of the area within the strings (called Context 6) has revealed the outline of several pits. Work begins to empty the largest of these, Pit 2, visible in the foreground. The unit is 3m east-west and 2.5m north-south. The shorter string at the middle of the image is placed in order to bisect the pit.

this feature. The soil was greenish and less hard than previously. Ceramics, bone, a terracotta fragment (SF 2012–139) and charcoal were recovered and it was noted that artefacts had a greenish tinge. This layer was sieved at 2 mm. Despite the fact that the sediments of Context 15 were very different from those of Contexts 10 and 11, and that ca. 35cm separated Contexts 10/11 and 15, it seemed clear, from their position within the unit, that they belong to the same feature, that is, Pit 5.

Context 16 spanned 175–195cm BD, continuing the fill of Pit 2. This was yellow, hard clay. Ceramics, bone and charcoal were recovered. This layer was sieved at 5 mm.

Context 17 spanned 195–215cm BD. This was yellow, hard clay, the continuing Pit 2. This constituted the same context as Context 16 which it underlay, but it was excavated in a 20cm spit and allocated a separate context number. Ceramics, an iron bar (SF 2012-105), and bone were recovered. This layer was sieved at 5 mm.

Context 18 spanned 215–250cm BD. It underlay Context 17 and like it represented the continued fill of Pit 2. Ceramics, bone and charcoal were recovered. This layer was sieved at 5 mm. While up to this point excavation has involved tracing and emptying pit features (the very extensive Pit 2, and the smaller Pit 5), given the increasing complexity of the subsurface remains the decision was taken at this stage to set up a 2 × 1m trench.

5.2 *S4-B Excavation*

A new datum was set up.

Excavation proceeded swiftly as this unit was created, and soil was not sieved or artefacts retained since they were issued from a range of contexts, although the soil was checked for extraordinary finds before being put onto the spoil heap. The soil was removed from the level of the surface down to 98cm BD. Between 98 and 119cm BD, the soil, similar to the sediments of Pit 2, was sieved and items were bagged separately.

During the creation of this 2 × 1 m unit, two inverted pots in the south section, c. 1 m below the surface, became apparent. The various pit features also became visible in the sections. A step was created in the north section.

Context 19 spanned 119–158cm BD. This was an ashy context, likely a pit fill (Pit 3), identified in the corner of the newly-developing 2 × 1 m unit. Ceramics, bone and charcoal were recovered, as well as four terracotta fragments including a relatively complete quadruped (SF 2012-148) and an anthropomorphic figurine (SF 2012-149). This layer was sieved at 2 mm.

Context 20 spanned 158–178cm BD. This yellow, medium-hard soil was the final layer of Pit 2. In stratigraphic terms it lay below Context 18. Ceramics, a metal object (SF 2012-93) and a worked bone (SF 2012-138) were recovered. This layer was sieved at 5 mm.

Figure R.3 shows progress at this stage.

FIGURE R.3
Excavation of 1 × 2 m unit in progress. The inverted pots can be seen in the section while the architectural compound, Trench 3/10, under investigation can be seen at the background.

Context 21 spanned 178–195cm BD. This was a discrete pit context, Pit 6, which appeared in plan at the base of the trench. It was characterised by ashy and sandy sediments and ceramics and bone were recovered. The soil surrounding the pit was a yellow clay, also containing material, albeit less. This layer was sieved at 5 mm. It was unfortunately clear during the drawing of the sections that Pit 6 had begun at a much higher level and that this was missed.

Context 22 spanned 195–218cm BD and was the continuation of Pit 6. Soil was loose and reddish. Bone and small finds, including a thin bead, possibly tortoiseshell (SF 2012-28) and a terracotta foot (SF 2012-62), were recovered. This layer was sieved at 2 mm.

Context 23 spanned 218–228 cm BD and this number was given erroneously to materials from that depth, regardless of whether they came from Pit 6 or from the nearby Pit 7. Soil was grey, ashy and very loose. Ceramics were recovered. This layer was sieved at 5 mm. During drawing of the section it was clear that Pit 7 does seem to have begun at the level at which it was first identified, and to have been cut into the yellow clay surface.

Context 24 spanned 228–270cm BD. Soil here was grey, ashy, but harder than the contents of Pit 6. This was Pit 7. This layer was sieved at 5 mm.

Context 25 was the surrounding matrix, yellow soil, hard and somewhat damp, clayey. A metal point, SF 2012-89, was recovered. This layer was sieved at 5 mm.

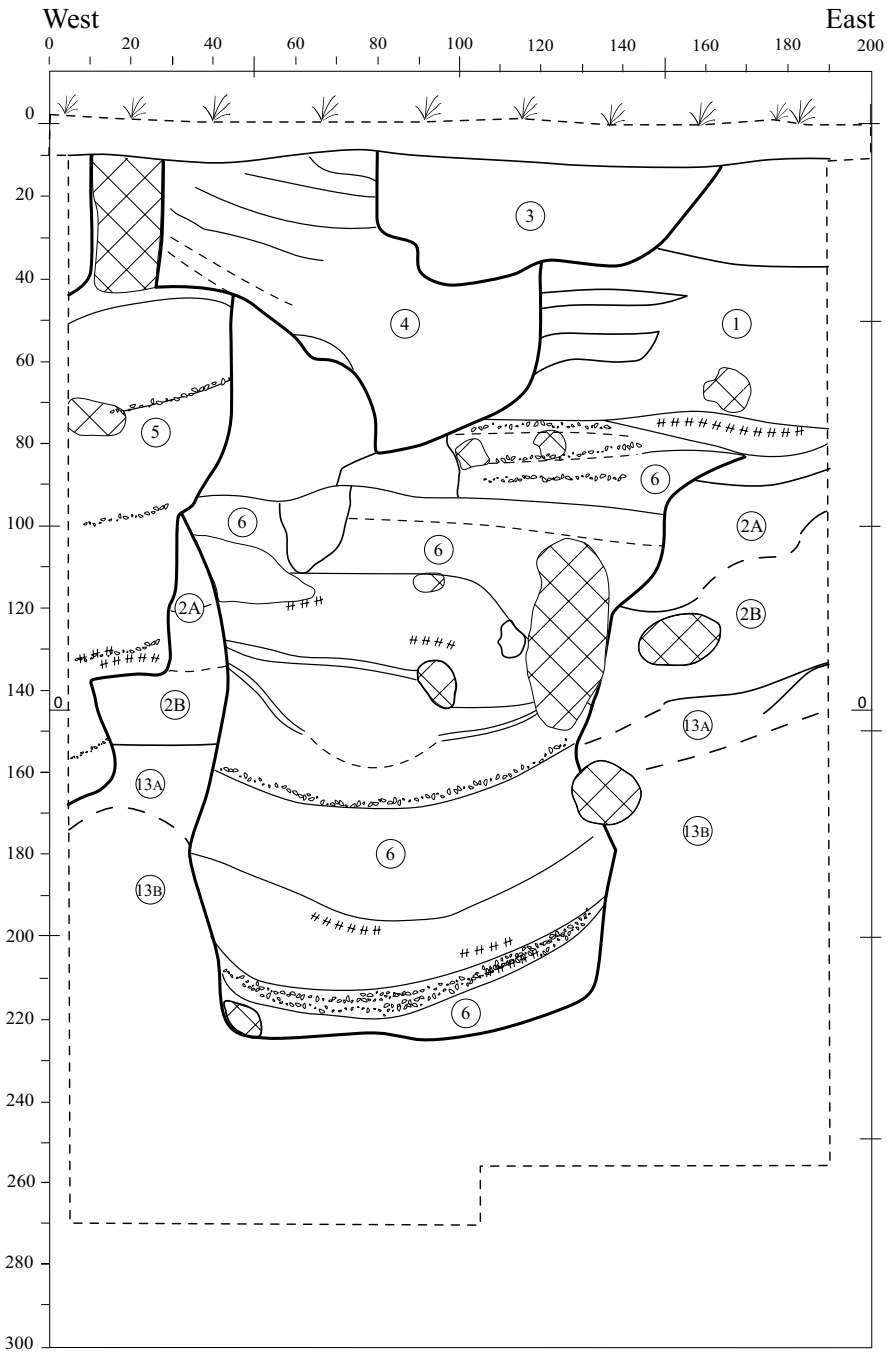

FIGURE R.4 North section at completion

1 Yellow compact clay with occasional horizontal lamination or ash lenses. Pottery and occasional charcoal

2A Dark brown sandy clay with pottery and very abundant charcoal

2B Dark brown sandy clay with pottery and occasional charcoal

3 Grey ash with pottery, bones and charcoal (Pit structure 1)

4 Beige grey with sandy lamination with pottery fragments, bones and charcoal (Pit structure 2)

5 Yellow to orange sandy clay with gravel and charcoal lamination (Pit structure 3)

6 Black to dark brown, ranging to vivid green, sandy clay and ash with gravel and charcoal lamination (pit structure 4)

7 Yellow sandy clay (Pit structure 5)

8 Black to dark brown, ranging to vivid green, sandy clay and ash with gravel and charcoal lamination (Pit structure 6–7). It is not clear whether one or two pit structures are present.

9 Grey ash with pottery, bones and charcoal (Pit structure 8)

10 Black to dark brown, ranging to vivid green, sandy clay and ash with gravel and charcoal (Pit structure 9)

11 Grey ash with pottery, bones and charcoal (Pit structure 10)

12 Beige to yellow sandy clay with pottery and charcoal (Pit structure 11)

13 A. Yellow clay substratum with abundant laterite gravel. B. Yellow to grey clay substratum

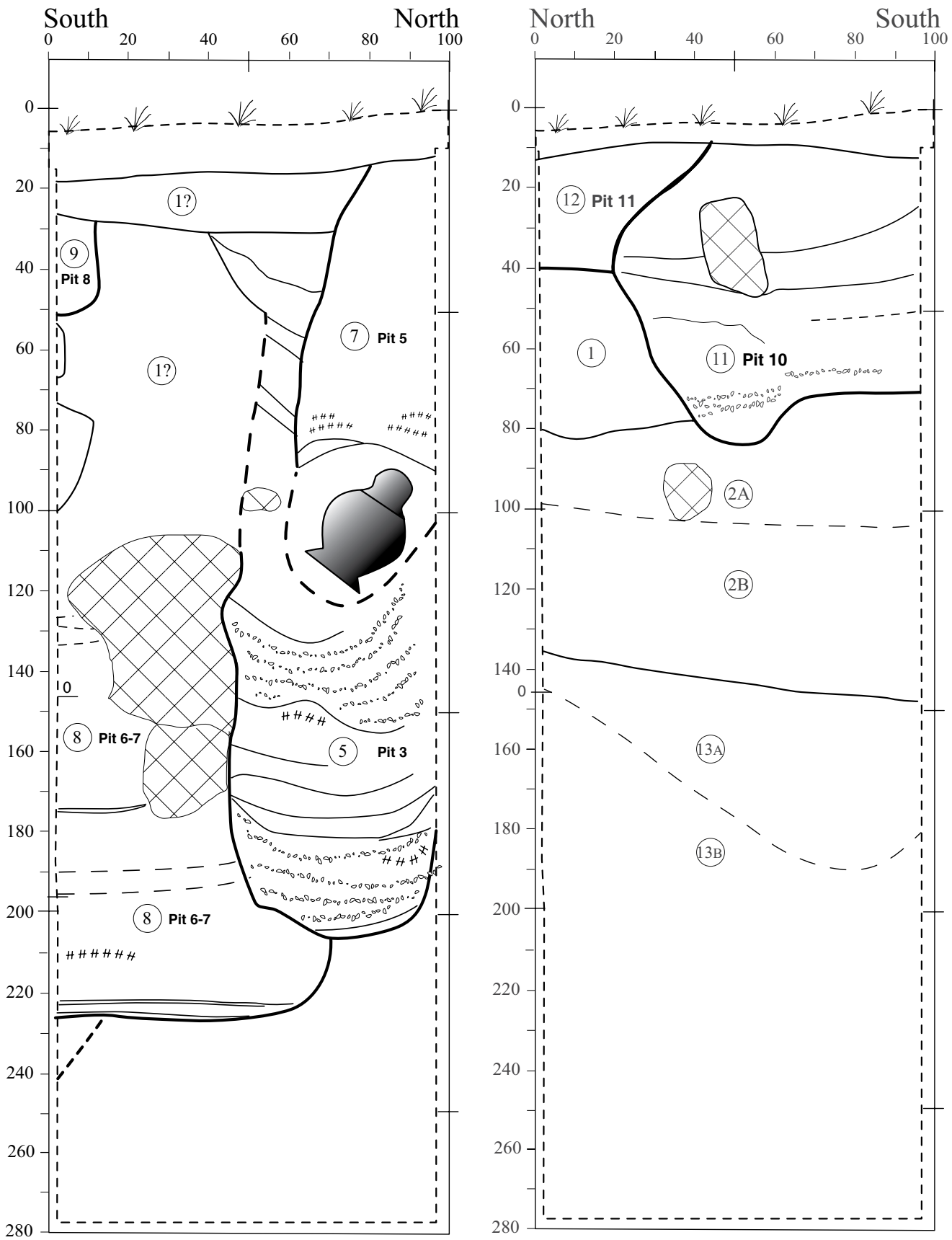

FIGURE R.5 Left: west section at completion; compare Figure R.3. Right: east section at completion. See caption to Figure R.4. for description of layers.

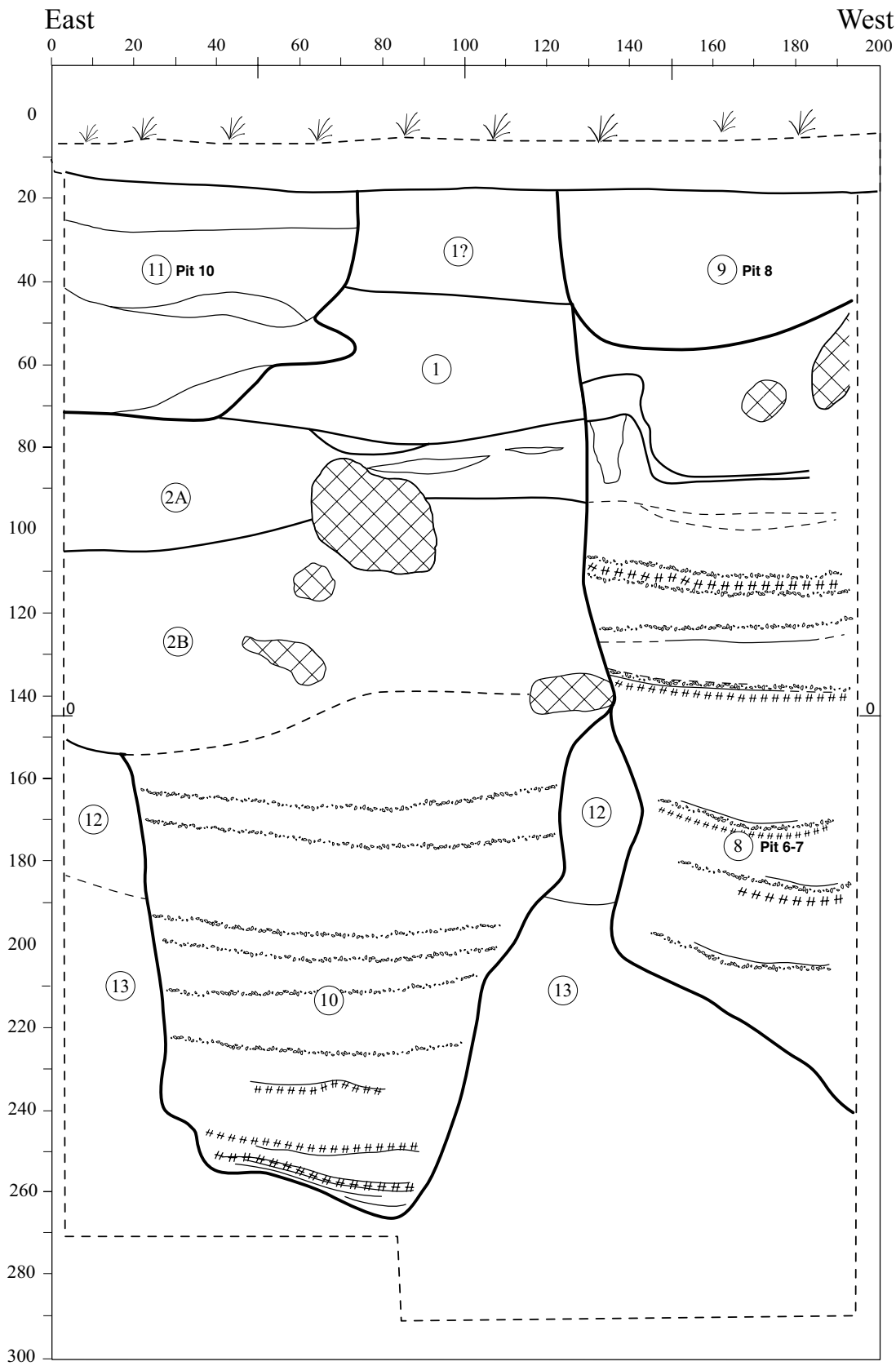

FIGURE R.6 South section at completion. See caption to Figure R.4. for description of layers.

6 Radiocarbon Dates

320520	1540	30	BLAF 12 S4. south profile, Pit 9, a well-sealed and very deep pit (oldest structure??). Near base of pit (depth abt 250 cm) and with archaeobotanical sample	Phase 2–3
320519	1210	30	BLAF 12 S4. South profile, Pit 5, at the base of which were two stacked pots, and which cuts into Pit 3. But in a poorly differentiated layer within it. Abt 90 cm depth	Phase 3
320518	1650	30	BLAF 12 S4. West profile, Pit 4, a well-sealed and deep pit. In black layer with archaebotanical sample VEG2. Abt 200cm depth	Phase 2

7 Interpretation

Trench 4 was excavated at an early stage of the investigation of Birnin Lafiya, at a time when the depth and complexity of the mound's stratigraphy had not yet been fully realised. The unit began as a relatively simple exercise intended to familiarise students with the principles of excavation of pit features, largely through the process of surface cleaning, identifying possible pit outlines and then bisecting them and excavating one half. It only became clear late in the day that the pit features visible close to the unit surface were underlain by an extremely complicated tangle of pits below the surface. Moreover the excavation suffered from the lack of overall supervisory oversight.

The section drawings (by Alexandre Livingstone Smith and Louis Champion) are reliable, as are the dated charcoal samples, since they were extracted from the sections at the conclusion of the work. The numbering of features such as pits in the section drawings is not intended to be matched to the numbers of the features described in the present text. Some correspondences can be suggested: for instance, Pits 5 and 3 in the west section are clearly the same feature as that called "Pit 2" during excavation. Because of these problems the ceramic material from Trench 4 was not drawn, except for a conical pot from Context 4 in the raised pit S4-A, due to its distinctive shape (Plate 20.1).

This trench was important in giving a first indication of the depth and complexity of the stratigraphy on Birnin Lafiya mound. It yielded a broad suite of modelled clay objects, beads, and a marine bivalve (Tchibozo; S. Magnavita; Linseele & Wouters, this volume)

TABLE R.1 Desampling

Context	#
1	157
2	248
3	226
4	49
5	5
6	84
7	9
8	56
9	9
10	19
11	4
12	27
13	113
14	80
15	4
16	0
17	0
18	69
19	58
20	72
21	5
22	2
23	13
Total	**1309**

Analysis in the field by Anne Haour, Emma Lord, Nicolas Nikis, Julien Jourand, Barpougouni Mardjoua, Amour Aybatin, and Wahabou Mossi, and at UEA by Anne Haour

TABLE R.2 Category 4

Context	Undecorated
1	1
2	10
3	18
6	2
7	1
12	3
13	1
14	3
16	3
17	1
18	1
19	3
20	5
Total	**52**

Analysis by Anne Haour. Data on illegible sherds were lost.

TABLE R.3 Category 3

Context	#	Burnish	Dec1	Dec2	Dec3	Dec4	Dec5
1	8	int	rfp-1a				
	1		rfp-1b	plain	rc-3	plain	rc-3
	7	ext/int	plain				
	7		indis				
	3		undec				
	2	int	indis				
	1		plain	indis			
	1		rfp-1a	ch-1			
	1	ext/int	sx-n	indis	sl-n		
	1		rc				
	3	ext	plain				
	7		rfp-1a				
	1		undec	ic-2	rfp-1c	ic-2 over smth	rfp-1c
	1		rfp-1b	mch-n			
	1		rfp-1b				
	1		rfp-1a	plain			
	1	int	plain				
	1	int	rfp				
	1	ext	rfp-1a	smth			
	1	ext/int	undec				
	1	int	undec				
	1		sl-n	rfp-1a			
	1	ext/int	ch				
	2	int	rfp-1b				
	1	ext	indis				
	1	ext	rfp-1b				

TABLE R.3 Category 3 (*cont.*)

Context	#	Burnish	Dec1	Dec2	Dec3	Dec4	Dec5
	1	ext/int	indis				
	1		indis	plain			
	1	ext	rc	ch-n			
2	16		rfp-1a				
	8	int	plain				
	6	int	rfp-1a				
	8		rfp-1b				
	5	ext/int	plain				
	1	ext/int	smth	rfp-1b			
	1	ext	ch	rfp-1a			
	1	ext	roul				
	10		roul				
	4	ext	plain				
	1		rc-1b	plain			
	1	ext/int	roul	plain			
	1		smth	rfp-1a	mch-n		
	1	ext	pnt-rb	rfp-1b	pnt-rb over rc-3	rfp-1b	
	4		rc-1a				
	1		smth				
	4	int	roul				
	1	int	rfp				
	3	int	indis				
	1	ext	rfp-1b	smth			
	1	int	rfp-1a	plain			
	2		smth	rfp-1a			
	1		rfp-1b	plain			
	4	int	rfp-1b				
	1		ch-n				
	5		undec				
	1	ext	rfp-1a				
	1	ext	indis	roul			
	1	int	rfp-1b	smth			
	1	ext/int	rfp-1a	plain			
	1	ext	plain	indis			
	1		roul	rc-3	plain		
	1	int	indis	sl-n	plain		
	1	ext/int	sl-n	sl-n	sl-n		
	1	int	rc-1a				
	1		sl-n	rfp-1a			
	1		mch	rfp-1a	ch	mch	
	1		indis				
	1	ext/int	Sl-2	undec			
	1	ext/int	undec	rfp-1a			
3	1	int	herb				
	1		plain	rfp-1b			
	2	ext/int	plain				
	5		rfp-1a				

TABLE R.3 Category 3 (*cont.*)

Context	#	Burnish	Dec1	Dec2	Dec3	Dec4	Dec5
	1	int	rfp-1b				
	2		indis				
	1	int	indis				
	1	int	roul				
	1		roul				
	2	int	rfp-1a				
	1	ext/int	smth	smth	rfp-1a	ch	
	1	ext	plain				
	1		rc-1a				
	2		undec				
	1	ext	rfp-1b	plain			
	2	ext/int	plain				
	1	ext/int	sl-n	plain			
4	7		rfp-1a				
	2	int	roul				
	3		rfp-1b				
	2	ext	plain				
	1	int	plain				
	1		is-geo 2				
	1		rfp-1a	plain			
	1	int	plain	roul			
	1		smth	roul			
	2	int	herb				
	1	int	rfp-1c				
	1	int	rc-1b				
	2		indis				
	1		rc-1a				
	5	int	rfp-1a				
	1	int	rfp-1a	plain			
	4		roul				
	2	int	rfp-1b				
	1	int	indis				
	1	int	roul	plain			
	3	ext/int	plain				
	1		rfp-1b	mch			
	1		undec				
	1	ext/int	indis				
	1	ext	rfp-1a	plain			
5	1	int	plain				
	1	int	roul				
	1	ext/int	ch	plain	indis		
	2		roul				
	2		rfp-1a				
	1	int	rfp-1a				
	1		indis				
	1	ext/int	roul				
6	8		rfp-1a				
	1		rfp-1b	smth			

TABLE R.3 Category 3 (*cont.*)

Context	#	Burnish	Dec1	Dec2	Dec3	Dec4	Dec5
	1		rc-1a				
	1		rfp-1a	sl-n			
	2	int	rfp-1a				
	1	ext	smth	rfp-1a			
	7	ext/int	plain				
	1	int	rce-8				
	2		indis				
	6		rfp-1b				
	1	ext	herb				
	2	int	indis				
	1	int	rce				
	1		ch	rfp-1a			
	2		roul				
	1		smth	rfp-1b			
	1	ext/int	rfp-1b	smth			
	1	int	plain				
15	1	int	rc-1a				
	2		rfp-1a				
16	1	int	rce-10				
	1		rc-1a				
	1	int	rce-8				
	1	ext/int	plain				
	1	int	roul				
	1	int	rc-1a				
17	1	ext	rc-1b	smth			
	1	ext/int	sp1	ch	sl-n	smth	
	1	int	rc-1a				
	3	int	indis				
	2		rc-1a				
	3	int	rc-1b				
	1		indis				
	1	int	rfp-1a	smth			
	1	ext/int	plain				
18	2	int	undec				
	1	ext/int	rc-1b	smth			
	2		roul				
	2	int	roul				
	1		rfp				
	1	int	rc-1a				
	3		rce-8				
	2		rc-1a				
	1		roul	smth			
	1		smth				
	1	ext/int	ch	plain			
19	1	int	rfp-1a	smth			
	3		rfp-1a				
	4	ext/int	plain				

TABLE R.3 Category 3 (*cont.*)

Context	#	Burnish	Dec1	Dec2	Dec3	Dec4	Dec5
	2	int	indis				
	1	int	undec				
	1	int	roul				
	3		roul				
	1	int	rce-8				
	1		indis				
	2	ext	plain				
20	1	int	roul				
	1	ext/int	plain				
	1	ixt/int	sl-n				
		ext	SP1				
	1	int	rc-1a				
	2		rc-1a				
	1	ext/int	rc-1a				
	1	ext	rc-1a	smth			
	1	ext/int	roul				
	1	ext	smth	mch			
21	1	int	rc-1b				
22	2	int	roul				
	1		indis				
	3	int	rce-8				
	3	int	undec				
	1	int	rfp				
10	1		roul				
	1	ext	plain				
	1		rfp-1a	plain			
	1	ext/int	plain				
	1		rc-1a				
	1	int	indis				
	1	int	plain				
	1		undec				
7	1	int	plain				
8	1	int	plain				
	1	ext/int	plain				
	1		rfp-1b				
	1		rfp-1b	rfp-1b			
	1	int	rc-1a				
	1	ext	rc-1a	smth	ch		
9	1	int	rc-1b				
	1	int	plain				
12	1	int	rfp-1a				
	1	int	indis				
13	1	ext	rc-1a	plain			
	1		undec				
	1	ext	plain	rfp-1a			
	1	ext	plain				
	1		rc-1b				

TABLE R.3 Category 3 (*cont.*)

Context	#	Burnish	Dec1	Dec2	Dec3	Dec4	Dec5
13	1	int	plain	roul			
10	1	ext	plain				
	1	ext	sl-n				
	1		rfp-1a				
11	1	ext	plain	rfp-1a			
	1	ext	undec				
	1	int	roul				
	1		rc-1a				
	1	ext/int	rfp-1a	smth			
14	2	ext/int	plain				
	1	int	herb				
	1	int	indis				
	1	int	roul				
	1		rc-1a				
	1	int	plain				
	1	int	rc-1a				
2	2		rc-1				
	1		rc-1a				
	1	ext/int	plain				
3	1	ext	plain				
	1	int					
21	1	int	rc-1b				
Total	**417**						

Analysis by Anne Haour

TABLE R.4 Rims

Cont	R. Type	Brn	Dec1	L1	Dec2	L2	Dec3	L3	Dec 4	L4	Dec 5	L5	Dec 6	L 6	Ang.	Diam.	Mx. thick
1	S6	ext/int	undec	u	sl-1	u	rfp-1a	u	sl-2	u	sl-2	u			3	15	0.6
	S1	ext													4		0.6
	S1	int													3		0.5
	S4																0.8
	S6														4		0.7
	S4	int													5		0.7
	S6	ext/int	undec	u	rfp-5	u									3		0.6
	S6	ext/int	undec	u	sl-1	u	rfp-1a	u	sl-2	u	sl-2	u			3	15	0.6
	S1	ext/int													4		0.6
	S4	int													5		1.0
	S4		undec	u	rc-1b	u											1.1
	T14	ext/int													4		0.7
	T16		undec	u	indis	u									2		0.9
	T16	ext	undec	u	rfp-1a	u	indis	u							2		0.9
	T16																0.6

TABLE R.4 Rims (*cont.*)

Cont	R. Type	Brn	Dec1	L1	Dec2	L2	Dec3	L3	Dec 4	L4	Dec 5	L5	Dec 6	L 6	Ang.	Diam.	Mx. thick
	E9	ext/int	undec	c	sl-1	u	rfp-1a	u	sl-2	u	sl-1	u	SP1-l x 2	inside l	4		0.6
	E9	ext/int	undec	cu	roul	u									4		0.7
	E2														4		0.7
	E4		undec	u	sl-2	u	rfp-1a	u	sl-2	u	sl-2	u			4		1.0
	E3	int													4		0.7
	E40	int													4		1.0
	E48														4		1.0
2	E40	int	undec	c	rfp-1a	u									4		1.0
	E37		undec	c	rfp-1b	u											0.9
	S1	ext/int													4		0.8
	T27	ext/int	undec	u	rfp-1b	u	rfp-5	u							2	21	1.0
	T3	ext/int	undec	c	mch-3	u	SP1-cl	u	SP1-cl	u					2	10	0.4
	T3																0.5
	S2	ext/int	rfp-1a	u	rfp-5	u									2	18	0.6
	S6	int													4		0.6
	S1	ext/int													4		1.0
	E4		undec	c	rfp-1b	u									4		1.1
	E2	int													4		0.7
	E2														4		0.8
	E3														4		0.8
	T11	int	indis	u											3		0.8
	E46	ext/int	undec	c	roul	u	sl-2	u	sl-2	u					4		0.9
	E26	ext/int													4		0.6
3	S1		undec	u	rfp-1b	u	rfp-5	u							2	31	0.8
	S4														3		0.8
	E40														4		1.2
	T7	ext/int													2		0.7
	E11	ext/int													2	17	1.0
	E38	ext/int													4		0.9
	E10		undec	c	rfp-1a	u									4		1.1
4	T26		undec	u	rc-1b	u									2		1.3
	E4	ext													4		0.6
	E4	ext/int													4		0.6
	T19	ext/int													4		0.7
5	E37		undec	c	undec	u	rc-1b	u	indis	u							1.1
6	S3																0.6
	T10	ext/int													3	15	1.0
	T19																0.6
	E1	ext/int													4	8	0.6
	E3	ext/int													4		0.7
	E4	ext/int															1.8
7	S4	int													2	9	0.7
10	E3														4		0.7
11	E3	ext/int													4		0.6
13	E4	ext/int													5		0.5
	E48	int	undec	c	rc-1a	u									4		1.5

TABLE R.4 Rims (*cont.*)

Cont	R. Type	Brn	Dec1	L1	Dec2	L2	Dec3	L3	Dec 4	L4	Dec 5	L5	Dec 6	L 6	Ang.	Diam.	Mx. thick
14	E38	ext	rfp-5	u	undec	c	rfp-5	u							4		0.6
16	E6	ext													4		0.6
	E3	ext/int															0.6
	E4	ext/int													4		0.7
	E4	int													4		0.7
	E3	ext/int													5		0.7
17	E4		undec	u	sl-3	u	sp6-l	l									0.3
	E24	ext													4		0.6
	S1		roul	u	undec	u									4		0.6
	E6	ext/int													4		0.6
18	E26	int													4		0.6
	E46	ext/int	undec	c	rc-1a	u									4		1.8
	S6	int	sl-16	u	sp1-l	u	sp1-l	u	sp1-l	u	rfp-5	u			3	23	0.7
19	S4		rc-1a	u	indis	u									2		0.8
	E23	ext/int	sl-6	c-int											5		0.5
20	E4	int															1.2
	E4	ext															0.5
	E42		undec	c	rfp-5	u									4		0.6
Total	**79**																

Analysis by David Kay

CATALOGUE S

Birnin Lafiya (S5)

Alexandre Livingstone Smith, Nicolas Nikis, Louis Champion and Anne Haour

1 Location

This test pit is located on the northern end of the large settlement mound of Birnin Lafiya. The locus was called by our informants "La poubelle du Roi", the king's rubbish heap.

2 Discovery

The site was identified by Didier N'Dah in 2001 and surveyed by Didier N'Dah, Anne Haour and Alexandre Livingstone Smith in 2011. The excavation of S5 was carried out in 2012. The area was surveyed sporadically over the years, as it lies in the main Birnin Lafiya site.

3 Destruction Risks

The site is ploughed and this area is eroding. Villagers collect potsherds nearby and herders regularly pass on its summit. This part of the site of Birnin Lafiya is disappearing fast.

4 Site

Roughly oriented south-north, this unit is essentially a huge heap of ash held in place by a hardened floor. Remnants of a pavement were visible some 30 m south of S5 and superimposed hardened layers indicate that activities, besides trash disposal, may have taken place within the unit. Many surface finds were made in the vicinity including items such a finely incised fragments of a small bowl with internal folded strip roulette decoration, beads and a miniature pot.

5 Excavation

The test pit was excavated on top of this ash midden. It was 1 × 1 m in size and excavated in spits of 10 cm. Within each spit, archaeological contexts (i.e. distinct contexts) were separated, sieved and bagged separately. All spits were sieved down to 5 mm.

6 Stratigraphy

The stratigraphy displays a superimposition of ash with abundant finds. The deposition process must have been interrupted at least twice, as two layers of compacted burnt earth are visible in the stratigraphy. The two radiocarbon dates obtained show the overall process of accumulation must have been rather short compared to the history of the settlement mound.

7 Finds

This locus displayed excellent conditions of preservation. Besides the usual pottery finds, decorated with incision and folded strip roulette impression, organic remains were abundant. Hardened areas, which may represent floors, were observed on the surface and during the excavation. A horse mandible (*Equus caballus*) was found at 50–60 cm, the only definite occurrence within the entire site (Linseele & Wouters, this volume).

8 Interpretation and Cultural Attribution

Oral testimonies report this place to be "La poubelle du Roi". This locus was clearly a trash disposal area. The two radiocarbon dates obtained give a thirteenth century AD date, showing that this structure was created towards the end of the occupation of the mound.

9 Radiocarbon Dates

320521	900	30	BLAF-12-S5, 60–70 cm. Pooled fragments of charcoal	Phase 4
320522	920	30	BLAF-12-S5, 110–120 cm. Pooled fragments of charcoal	Phase 4

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FIGURE S.1 Location of Birnin Lafiya Trench 5 2012

FIGURE S.2 Aerial view of Trench 5. The darker, ashy, elevated spit on which it is situated stands out in clear contrast to the surrounding brown soil and the fields in the distance.

FIGURE S.3 South section at completion

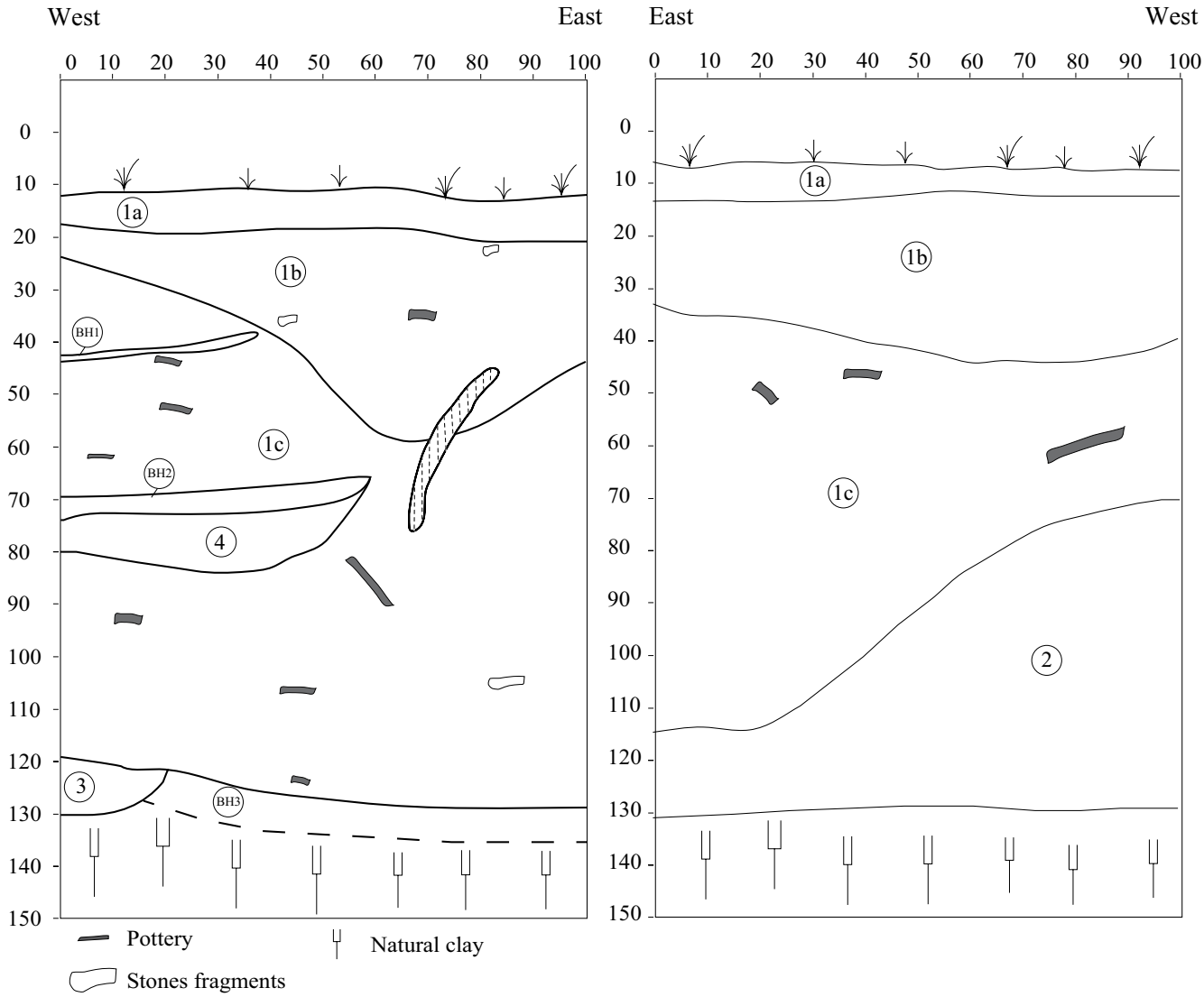

FIGURE S.4 Birnin Lafiya Trench 5, North and South sections at completion

1a Compact grey ash layer with pottery and charcoal

1b Pulverulent grey ash layer with pottery and charcoal

1c Pulverulent grey ash layer, compacted below burnt earth with pottery and charcoal

2 Very compact yellow clay with red nodules

3 Yellow clay

4 Compacted grey ash below earth

BH1–2–3 Very compact burnt earth and grey ash

Desampling data not recorded.

TABLE S.1 Category 4

Level	Undecorated	Illegible
0–10	2	7
10–20	1	4
20–30	2	10
30–40	10	10
40–50	10	7
50–60	3	2
60–70	7	6
70–80	1	2
80–90	3	7
90–100	5	5
100–110	2	3
110–120	4	8
Total	**50**	**71**

Analysis by Sam Nixon

TABLE S.2 Category 3

Context	Num.	Brn	Dec1	Dec2	Dec3	Dec4	Dec5
0–10	1	ext	undec				
	1	ext/int	undec				
	1	int	undec	ext. indis			
	1		rce-8	sl-2	indis		
	1		rfp-4				
	1		rfp-1b				
	1		rfp-1b	undec	pnt-rp	pnt-rb	
	1		perf	rfp-1b			
	1	int	perf	roul			
	1		perf	undec			
10–20	2	ext	undec				
	3	ext/int	undec				
	8		rfp-4				
	5		roul				
	1		rfp-1b	undec			
	7		rfp-1b				
	1		rfp-1a				
	1	ext/int	is-geo 10	undec			
	1	ext/int	sl-2	undec			
	1		sc-5				
	1		perf	undec			
20–30	1	ext	rfp-1c (int)				
	3	ext/int	undec				
	2	ext					
	2	int	undec				

TABLE S.2 Category 3 (*cont.*)

Context	Num.	Brn	Dec1	Dec2	Dec3	Dec4	Dec5
	2	ext	undec				
	1		rce-8				
	1		rc-1a				
	1		roul	undec	sl-1		
	3		roul				
	1		rfp-4	undec			
	6		rfp-4				
	1	ext	rfp-1b	undec			
	6		rfp-1b				
	1	int	rfp-1a				
	1	int	perf	rfp-5			
	1	ext	undec	sl-2	sh-14		
30–40	1	ext	rfp-1b (int)				
	5	ext/int	undec				
	1	int	undec				
	5		roul				
	1		roul	undec			
	5		rfp-1b				
	2		rfp-1b	undec			
	11		rfp-4				
	1	int	rfp-1b				
	1	int	rfp-1a				
	1		perf	undec			
	1	int	rc-1a				
40–50	3	int	undec				
	14	ext/int	undec				
	1	int	rc-1b				
	1		rc-1b				
	9		roul				
	1		rfp-4	undec			
	10		rfp-4				
	5		rfp-1b				
	1		rfp-1b	sl-2			
	1		rfp-1b	undec			
	1		rc-5				
	2	ext/int					
	2		perf				
50–60	1	ext	is-geo 10	undec			
	1		rc-1b				
	4		rfp-1b				
	1		rfp-1b	undec			
	1		rfp-4	undec			
	4		rfp-4				
	4		roul				
	1	ext	rfp-1b (int)				
	2	ext	undec				
	1	int	undec				

TABLE S.2 Category 3 (*cont.*)

Context	Num.	Brn	Dec1	Dec2	Dec3	Dec4	Dec5
	3	ext/int	undec				
	2		rfp				
	1	ext/int	undec	is-geo 10	undec		
	1	ext	undec	is-geo 3	undec		
60–70	3		rfp-1b				
	1		rfp-1b	undec			
	7		rfp-4				
	2		roul				
	1	int	undec				
	1	ext	undec				
	9	ext/int	undec				
	2	int	perf				
	2		perf				
	1	ext/int	undec	sh-8	sh-12		
70–80	1	int	undec				
	4	ext/int	undec				
	1		sc-3				
	3		rfp-1b				
	2		rfp-4				
	1		roul				
	1	int					
	1	ext	is-geo 27				
80–90	4	ext/int	undec				
	1	ext	undec				
	1	ext/int	indis	sl-1			
	4		rfp-1b				
	4		rfp-4				
	5		roul				
	1		sl-6				
	2		rfp				
	2	ext/int					
	1		undec	sl-1	sl-10	sh-21	rfp-1b (int)
	1		undec	rc-3	rfp-1b		
90–100	3	ext	undec				
	1	int	undec				
	2	ext/int	undec				
	4		rfp-1b				
	1	ext/int	rfp-1b	undec			
	1		rfp-1b	sc-1			
	5		rfp-4				
	1	ext	perf				
	9		roul				
	1		undec	rfp-1c	smth	rfp-1c	
100–110	1	int	undec				
	4	ext/int	undec				
	1		rfp-1b				
	1		rfp-1b	pnt-r-b			

TABLE S.2 Category 3 (*cont.*)

Context	Num.	Brn	Dec1	Dec2	Dec3	Dec4	Dec5
	3		rfp-4				
	1		rfp-4	undec			
	5		roul				
	1	ext	undec	sc-4	sh-23	sl-5	sh-20
110–120	6	int	undec				
	2	int	indis				
	3	ext/int	undec				
	2	ext	undec				
	1		rc-1b				
	2		rfp-1b				
	11		rfp-4				
	6		roul				
	2		comb				
Total	**336**						

Analysis by David Kay

TABLE S.3 Rims

Context	#	R. Type	Brn	Dec1	L1	Dec2	L2	Ang.	Diam	Mx. thick
0–10	1	E35		rfp-1b	c			4		1.6
	1	S4								1.1
	1	S4	ext/int					5		1.1
	1	S6	ext/int					4		0.8
	1	S4	ext/int					3	12	0.5
	1	T6	ext/int					3		0.6
	1	E46						4		1.1
	1	S1	ext/int					4		0.7
	1	S1	ext/int					3	14	0.6
	1	S4								1.1
	1	S4						4		0.9
20–30	1	E32						4	30	1.0
	1	E45						4	22	1.6
	1	S4	int					4	20	0.8
	1	E9	ext/int	peigEL-12+	u			2		0.4
	1	S4	ext/int					3		0.6
	1	S4								0.9
	1	S6						4		0.8
	1	S3	int							0.9
	1	E11	ext	sl-1	?					0.6
30–40	1	S6	ext/int					5		1.0
	1	S1	int					4		0.8
	1	S6	ext/int					5		1.0
	1	E38	ext/int					4	18	1.0
	1	S4								1.2
	1	S4						4		0.8

TABLE S.3 Rims (*cont.*)

Context	#	R. Type	Brn	Dec1	L1	Dec2	L2	Ang.	Diam	Mx. thick
	1	S4	ext			is-geo 14	u	3		0.7
40–50	1	E47	ext/int					5	26	1.2
	1	E38	ext					4	26	1.0
	1	E38	int					4		1.0
	1	E5		ch	l					0.8
	1	S4	ext/int					4		1.0
	1	E11	ext/int					4		1.0
	1	S4						4		1.0
	1	E4	ext/int							0.6
	1	S1								0.7
	1	S4	ext					4		1.0
	1	S6	ext/Int	is-geo 10	u					0.7
	1	T20								0.7
50–60	1	S1		rfp-1a	u					0.8
	1	S4	ext/int	is-geo 10	u					0.6
	1	S4	ext	is-geo 10	u			3	14	0.6
	1	S4						4		0.8
	1	S1	ext/int					3		0.6
	1	E38	ext/int					4		0.9
	1	S4	ext/int							0.8
	1	S1	int							0.8
	1	S4								1.1
	1	S6								0.8
60–70	1	S3		rc1-b	u					1.1
70–80	1	T6								
	1	S4	ext/int							1.2
	1	S4	int							1.1
	1	S4						4		0.8
	1	S1	ext/int	is-geo 10	u	rfp-1b	u int			0.4
	1	T6	int	is-geo 16	u					0.6
	1	E14	ext/int							0.8
	1	E9	ext/int	plain	u	rfp-1b	u	3	10	0.6
80–90	1	S4		is-geo 10	u	smooth	u+m			0.6
	1	S1	ext/int	is-geo 10	u			3	10	0.4
	1	S1	ext					4		0.8
	1	S1		smooth	u	roul	u	4		1.0
	1	S1	ext/int					5	14	0.6
	1	T10								0.9
	1	E11	ext/int							1.0
	1	S3								0.7
	1	E11	ext/int					3		0.6
90–100	1	T11								1.0
	1	S4	ext/int					5		1.0
	1	E9		sl-1	u	roul	u	4		0.7
	1	S4								1.0
100–110	1	E38	ext/int					4	20	1.2
	1	E46		smooth	u	rfp-1b	u	4		0.9

TABLE S.3 Rims (*cont.*)

Context	#	R. Type	Brn	Dec1	L1	Dec2	L2	Ang.	Diam	Mx. thick
	1	E4	ext/int	roul	u	sl-2	u			0.7
	1	S1						4		1.1
110–120	1	S6								1.1
	1	S1						3		0.7
	1	S4	ext/int							0.7
	1	S4						3	12	0.4
	1	S1	ext/int					4		0.8
	1	S4	ext/int					3		0.7
	1	S6	ext/int					2		0.7
	1	E4	int							0.7
	1	S1	int					4		0.4
	1	S4	int							1.1
	1	S4	int/ext					5		0.9
	1	S4	ext	is-geo 15	u					0.5
120–130	1	S4	ext/int							0.8
Total	88									

Analysis by Sam Nixon

CATALOGUE T

Birnin Lafiya (S8)

Richard Lee

1 Location

This unit is located on the mound of Birnin Lafiya.

2 Discovery

Several researchers had visited this site during general survey work in 2011 and 2012 and had noted a relatively high occurrence of multiple-stick cord-wrapped roulette among the surface material, unusual on the site and possibly indicative of a different phase of occupation. Alexandre Livingstone Smith and Richard Lee identified the excavation locus in January 2013.

3 Destruction Risks

There was no immediate threat perceived to this area. It was not arable land and therefore not threatened by ploughing. Cattle passing across the site on their daily migratory route were the primary cause of any impact to the ground surface.

4 Site

The location chosen was characterised by its ground level convex shape with a grey, soft ashy deposit clearly visible in its central area (Figure V.1).

5 Excavation

This excavation was a further test of this particular area, as a brief trial trench (Trench 7) excavated here during the 2012 field season had indicated the existence of subsurface deposits but had not been completed to sterile due to lack of time. The excavation of Trench 8 was therefore undertaken to gain more detailed data and results. This test pit was 2 × 2 m in size and was excavated between 13 and 18 January 2013 in spits of 10 cm. The excavation was supervised by Richard Lee with participation from Samson Tokannou, Nestor Labiyi, Barpougouni Mardjoua and two workmen, Inoussa Munkaila and Ide Hairou. Within each spit, archaeological contexts were separated and sieved and bagged separately. All spits were sieved down to 5 mm.

FIGURE T.1
Site location

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FIGURE T.2 Drawing the final section

6 Contexts

Context 1 was a dry, compacted crumbly, orange sand, with some small gravels.

Context 2 was an ash deposit, loose and lightly compacted, mixed with quantities of bone, pottery and burnt clay.

Context 3 was a hard, orange crumbly sand, including some powdery ash.

Context 4 was a soft, dark sand, with a small quantity of ash and organic deposits.

Context 5 was highly organic and grey-green in colour, with a high charcoal and faunal content.

7 Stratigraphy

The stratigraphy of Trench 8 displayed five levels. The upper contexts, 1–3, were layers of sandy deposits mixed with light ash from the upper levels of a presumed rubbish pit. Below this, Contexts 4–5, a pit, evidenced a significantly higher charcoal and faunal remains indicating a highly organic content, which was grey-green in colour. The ash may have been the residue of burnt the waste deposited in the pit. The pit appeared to mushroom out from the top down, as if the ash was collecting around an upper flue. The pit appeared to expand beyond the designated 2 × 2 m square that was selected for the excavation. Approximately 50% of Contexts 4–5 were excavated with the rest of those deposits being outside the 2 × 2 m square. As the trench deepened it was necessary to cut a step into it, to assist with access.

8 Interpretation and Cultural Attribution

This test pit sampled what appears to have been an area of pit-digging and refuse disposal. The single date available suggests an age consistent with the early phases of Birnin Lafiya.

FIGURE T.3
East section at completion

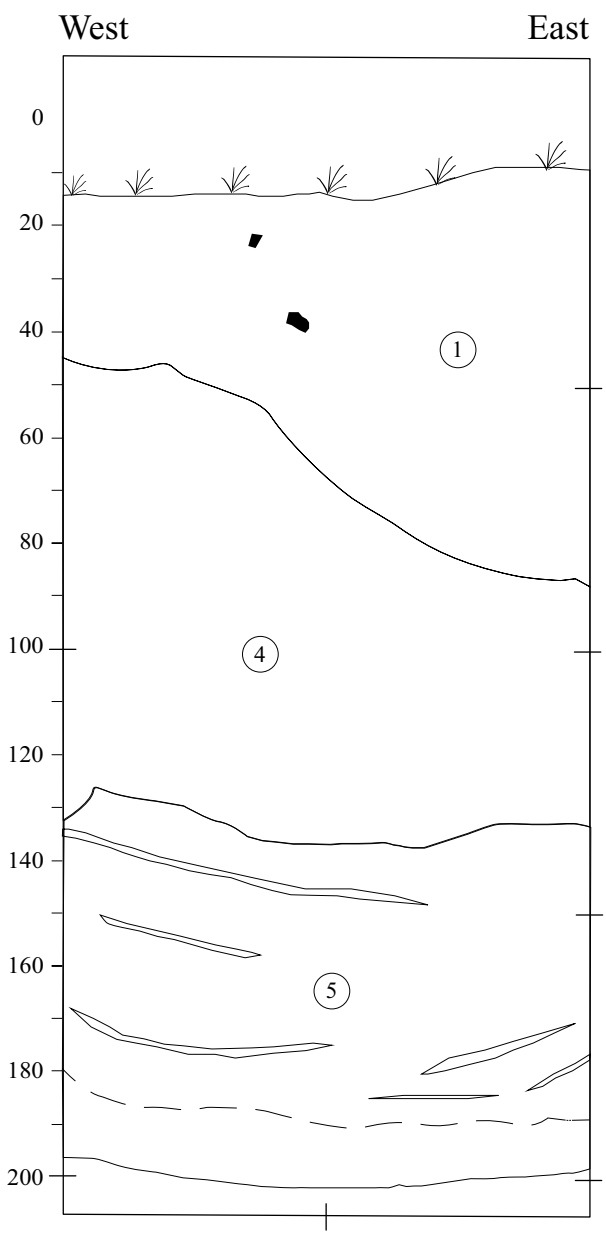

FIGURE T.4
North section at completion. Context 1: compacted dry, crumbly orange sand, some gravels. Context 4: soft dark sand, small amounts of organics and ash. Context 5: grey-green, high organic content

9 Radiocarbon Dates

Beta 345491	1620	30	Context 4	Phase 2

TABLE T.1 Desampling

Context	Number
Con 1	488
Con 2	246
Con 3	138
Con 4	16
Con 5	13
Total	**901**

Analysis in the field by Nicolas Nikis, Richard Lee, Samson Tokannou, Nestor Labiyi, and Mossi Wahabou, and summarised by Nicolas Nikis; and at UEA by Anne Haour and David Kay

TABLE T.2 Category 4

Level	Undecorated	Illegible
Con 1	182	20
Con 2	18	17
Con 3	106	11
Con 4	6	4
Con 5	15	7
Total	**327**	**59**

Analysis in the field by Samson Tokannou, Nestor Labiyi, and Mossi Wahabou and summarised by Nicolas Nikis, and at UEA by Anne Haour and David Kay

TABLE T.3 Category 3

Context	#	Burnish	Dec1	Dec2	Dec3	Dec4
Con 1	5	ext/int				
	6	int				
	6	ext				
	1	int	indis			
	1	int	roul	undec		
	1	ext	roul	undec		
	17		roul			
	2		rfp-4			
	1		rfp-5	undec		
	7		rfp-5	indis		

TABLE T.3 Category 3 (*cont.*)

Context	#	Burnish	Dec1	Dec2	Dec3	Dec4
	18		rfp-5			
	1	int	rfp-5			
	1	ext	rfp-1a	undec		
	11		rfp-1a			
	18		rfp-1b			
	1	int	rce-8			
	1		rfp-1a	sl-1	undec	rfp-1a (int)
	1	int	sl-5	undec		
	1		roul	sl-3		
	1		sl-1	sl-5	rfp-1a (int)	
	2	ext	undec			
	2		rc			
	2		rfp-1b	rfp-5		
	5	ext/int	undec			
	1	int	undec			
	1	ext/int	perf			
	1		rc-1b			
	1		rfp-2			
Con 2	11	ext/int				
	11	ext				
	2	int				
	24		roul			
	18		rfp-4			
	6		rfp-1a	indis		
	1	ext	roul	sc-5	undec	
	8		rfp-5	indis		
	10		rfp-5			
	3		rfp-1b	rfp-5		
	6		rfp-1b			
	2		rce-8			
	1		roul	sc-3		
	1		sl-1			
	2	int	rfp-5			
	1		rfp-1a	undec		
	1		rfp-1b	undec		
	5		rfp-1a			
	1	ext	undec			
	1	ext	sl-3	undec		
	1	int	undec			
	1		roul	perforation		
	13		possible			
			knotted			
			strip			

TABLE T.3 Category 3 (*cont.*)

Context	#	Burnish	Dec1	Dec2	Dec3	Dec4
	1		undec	possible		
				knotted		
				strip		
	1		undec	roul		
Con 3	2	int	indis			
	1		roul			
			(int)			
	4	int	roul			
	7	ext/int				
	3	ext				
	1	ext	sl-2	undec		
	2	ext/int	roul	undec	sl-1	
	21		roul			
	2	ext	roul			
	11		rfp-5			
	6	int	rfp-5			
	2		rfp-5	indis		
	1		rfp-5	undec		
	2		rfp-1a			
	5		rfp-1b			
	1		rfp-1b	indis		
	1		rfp-1a	undec		
	1		rfp-1b	sw-1	smth	
	1		rfp-1b	mch-2		
	1		rfp-1b	smth		
	5		rc-1a			
	2	int	rc-1a			
	1	ext/int	rc-1a			
	1		rc			
	1		rc	indis		
	3		rc-1b			
	1	int	rc-1b			
	1		rce-8	indis		
	1	ext	rfp			
	1	int	peigel-7			
Con 4	3	ext/int				
	1	ext	indis			
	4	ext				
	2	int				

TABLE T.3 Category 3 (*cont.*)

Context	#	Burnish	Dec1	Dec2	Dec3	Dec4
	1	ext	roul	undec		
	6	int	roul			
	7		roul			
	1		rfp-5			
	2		rfp-1a			
	1		rfp-1a	undec		
	3		rc-1a			
	1		rc-1a	indis		
	2	int	rc-1a			
	1	int	rc-1a	indis		
	2	int	rce-8			
	2	int	rce-8	indis		
	1		rce-8			
	1	ext	undec	sp5-l	sl-4	
Con 5	1	ext	indis			
	2	int	indis			
	4	ext/int				
	3	int				
	1		roul	sl-1		
	3		roul			
	7	int	roul			
	3		rfp-5			
	2		rfp-5	indis		
	2		rc			
	1	int	rc-1a			
	1	int	rc-1b			
	1	int	rc-1b	indis		
	7		rc-1a			
	2		rc-1a	indis		
	3		rce-8			
	1	int	rce-8		rce-8	
	1	ext/int	sc-6			
Total	**426**					

Analysis by David Kay

TABLE T.4 Rims

Context	#	R.Type	Brn	Dec1	L1	Dec2	L2	Ang.	Diam.	Mx. thick
Con 1	1	S4	ext/int					4	25	0.7
	1	E1						4		0.8
	1	S1								1.0
	1	S1	ext/int					4		0.9
	1	S1		rfp-1b	u			4		0.6
	1	S1	ext					4		0.6
	1	S4	int							0.7
	1	S4	ext/int					4		0.7
	1	S6	ext/int					4		0.6
	1	S1	ext/int					3	20	0.5
	1	S4	int							0.8
	1	S4	ext/int					4		0.8
	1	S4	ext/int					4		0.4
	1	E4	int					4		0.7
	1	E4						4		0.7
	1	E4	ext					4		0.8
	1	E4	ext/int	indis	u	undec	c	4		0.8
	1	E4	ext/int					4		0.6
	1	E2	ext/int					4		1.0
	1	E34						4		0.9
	1	T14	ext/int	pnt-rl1	u	undec	u	4		0.8
	1	T20	ext/int					3	15	1.4
Con 2	1	S4						3	34	1.2
	1	S1						3		1.0
	1	S1						3	32	1.0
	1	E38		rfp-1b	u	undec	c	4		0.9
	2	E4	ext/int					4		0.6
	1	S1						4		0.6
	1	S4	ext/int							0.8
	2	S4	ext/int							0.7
	1	S4								0.8
	1	E1						4		0.5
	1	S4								0.7
	2	S1	ext/int							0.6
	1	S4	int							0.7
	1	S1	ext/int					3	7	0.4
	1	S4		rfp-1a	u	undec	u			0.7
	1	S1		rfp-1b	u	undec	u	3		0.7
	1	S4	ext/int					5		0.7
	1	S1	int							0.6
	1	E4	ext/int					5		0.7
	1	E2	ext/int					4		1.0
	1	E4	ext/int					5		0.6
	2	E4	ext							0.6
	2	E4	ext					4		0.6
	1	E4	ext/int					4		0.5
Con 3	1	S6	ext/int					2		0.9
	1	S6						4		1.0

TABLE T.4 Rims (*cont.*)

Context	#	R.Type	Brn	Dec1	L1	Dec2	L2	Ang.	Diam.	Mx. thick
	1	S1								0.6
	1	S1	int	sp4-v-7	l	undec	u			0.7
	1	S4						4	5	0.6
	1	S1		rfp-1b	u	undec	u	3	30	0.6
	1	S1	ext/int					4		0.7
	1	S2						4		0.6
	2	S1						4		0.7
	1	T12						3		1.0
	1	E2	ext/int					4		0.8
	1	E2	int							0.5
	1	E9	int	roul	u	undec	c	4		0.5
	1	E9	ext/int					4		0.4
	1	E9	ext/int							0.4
	1	E2	int					5		0.9
	1	E4	ext	pnt-rc	u					0.7
1		S1	int					4		0.6
1		E4	ext					5		0.9
1		E4						3		0.9
1		E4								0.8
1		E4	int					4		0.5
1		E1	int							0.7
1		E4								0.6
1		E38	int	indis	u	undec	c	4		1.5
1		E38		indis	u	undec	c			0.9
1		E10		indis	u	undec	c			1.0
2		E9						4		0.6
1		S4								0.8
Con 4	1	S1	int	roul	u			2	8	0.4
	1	S1	int					3		0.5
	1	S6	int	rc-1a	u	smth	u (band)	2	8	0.6
	1	S6	int					4		0.7
	1	S1	int	sp1-l-3	l					0.7
	1	E1	int					5		0.6
	1	E4	ext					5		0.8
Con 5	1	E48	int	rc-1b	u	undec	c	4		1.8
	1	E15	ext/int							0.8
	1	E37	ext/int					4		0.8
	1	E5						4		0.8
	1	E5	ext/int					4		0.9
	1	E32								0.8
	1	S6	int					2		0.6
	1	S4						4		0.7
Total	97									

Analysis by David Kay

CATALOGUE U

Birnin Lafiya (S9)

Alexandre Livingstone Smith and Nicolas Nikis

1 Location

Birnin Lafiya *Tombo* is located just southwest of the modern village of Birni Lafia. Trench 9 samples a part of the site that is noted for its prevalence of surface structural remains.

2 Discovery

This trench was set up and excavated by Alexandre Livingstone Smith and Nicolas Nikis in January 2013.

3 Destruction Risks

The trench is set on the edge of the settlement mound of Birnin Lafiya. It is in a part of the site subjected to heavy erosion and regular trampling by herds of cows and goats.

4 Excavation

This test pit was 2 × 2 m in size and excavated by spits of 10 cm. Within each spit, archaeological contexts (i.e. distinct units) were separated, sieved and bagged separately. All the spits were sieved down to 5 mm. After 1 m of excavation a series of steps were left on the south side of the excavation for security reasons and to allow access.

5 Site

This test-pit was excavated to open a window on the stratigraphy of the Birnin Lafiya settlement mound next to the architectural complex S3/10 (Nixon, this volume.). It was excavated between 15 and 31 January 2013. It was set-up as a prolongation of S1 and S2, very small test-pits excavated in 2011, with the aim of determining whether the subsurface sequence of pottery pavements continued.

6 Stratigraphy

The stratigraphy displays a continuous succession of superimposed living surfaces and pits. Living floors are mainly visible on the eastern side of the pit (toward the architectural complex), while all the other profiles display superimposed pit structures. Trench S9 displays at least 4 main phases of pit creation, and we propose the following grouping of contexts interpreted as pit structures.

Group 1 includes Contexts 2, 3 and 4. They close the top of the stratigraphy, just below the pavements that had been identified in Trench 2. They can be assigned to ca. AD 1100–1200.

The next group includes Contexts 5, 6, 7, and 8. This group is dated around AD 900–1000. Two contexts, 9 and 10, are isolated between this group and the next.

Group 3 includes Context 8–10 (with Contexts 14 and 15, which are not distinct contexts, but the prolongation of C8–C10), Context 11, and Context 12. These are dated around AD 800–900.

Finally, Contexts 13 and 16 belong to the lower group and appear to be set in a remnant of the original soil of the mound. They are dated to AD 600–800, with an outlying date going back to 400–500 AD for Context 13. This later date is probably background noise from an earlier occupation and should not be seen as reliable date for Context 13's end of use.

This sequencing should not be seen as firmly set. Radiocarbon dates on the different structures may give the impression of distinct occupation phases, but the succession of occupation layers on the eastern side seems continuous and links the different groups mentioned above.

7 Finds

The finds vary from one context to the next, but the pottery assemblage is dominated by folded strip roulette-decorated pottery. Some of the pit structures yielded substantial vegetal and animal remains (Linseele & Wouters, Champion & Fuller, this volume). A carnelian bead (SF 2013-07) came from Context 8, a Type 3 stone bead from Context 1 (SF 2013-08), and a Type 4 stone bead from 30–40 (SF 2013-23). There were metal rods, wires

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FIGURE U.1 Excavation atmosphere at Trench 9. Work can be seen ongoing on Trench 3/10 in the background.

FIGURE U.2 Northwest corner at completion

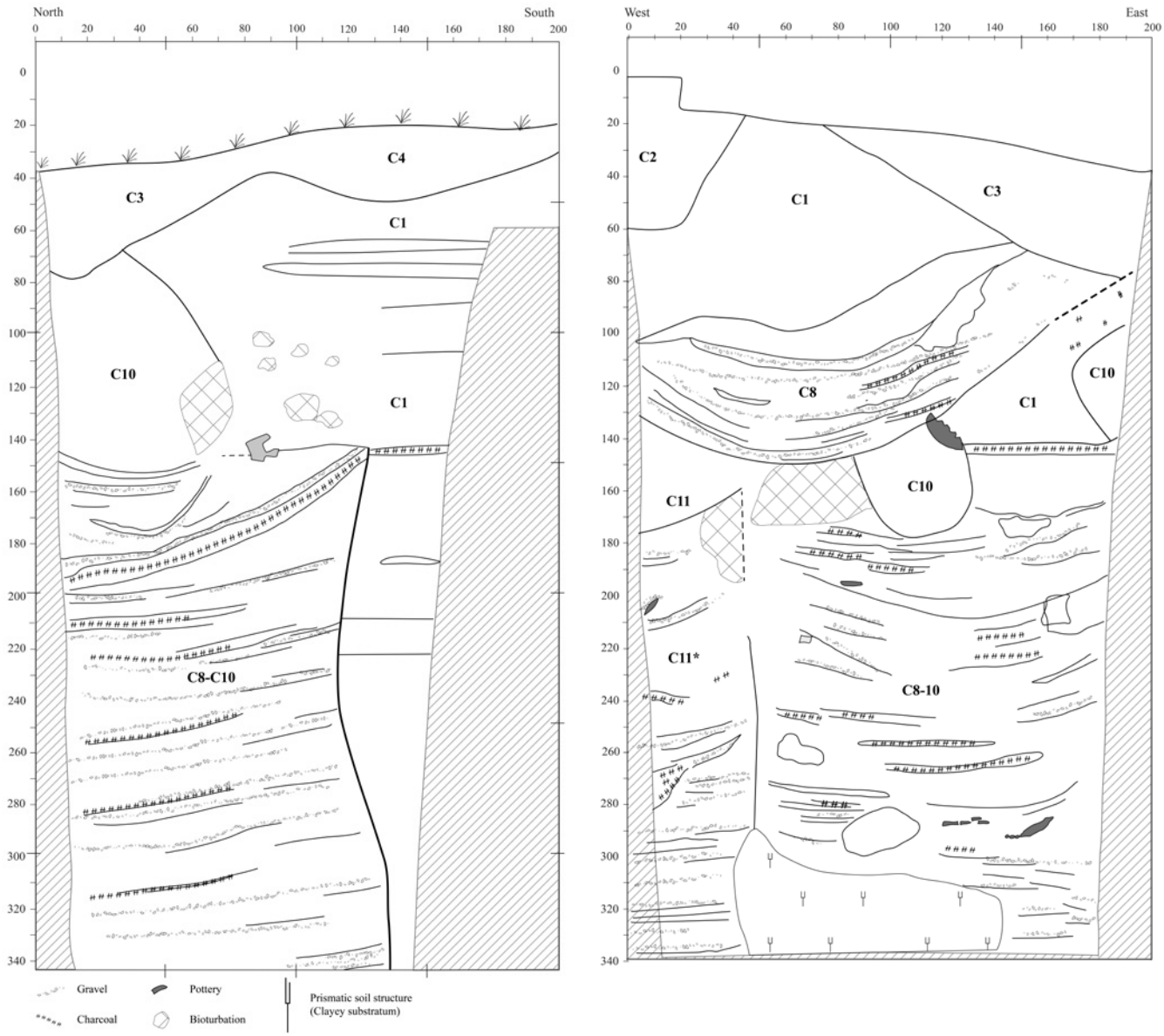

FIGURE U.3 East and north sections at completion. Refer to Figure U.4. for description of layers

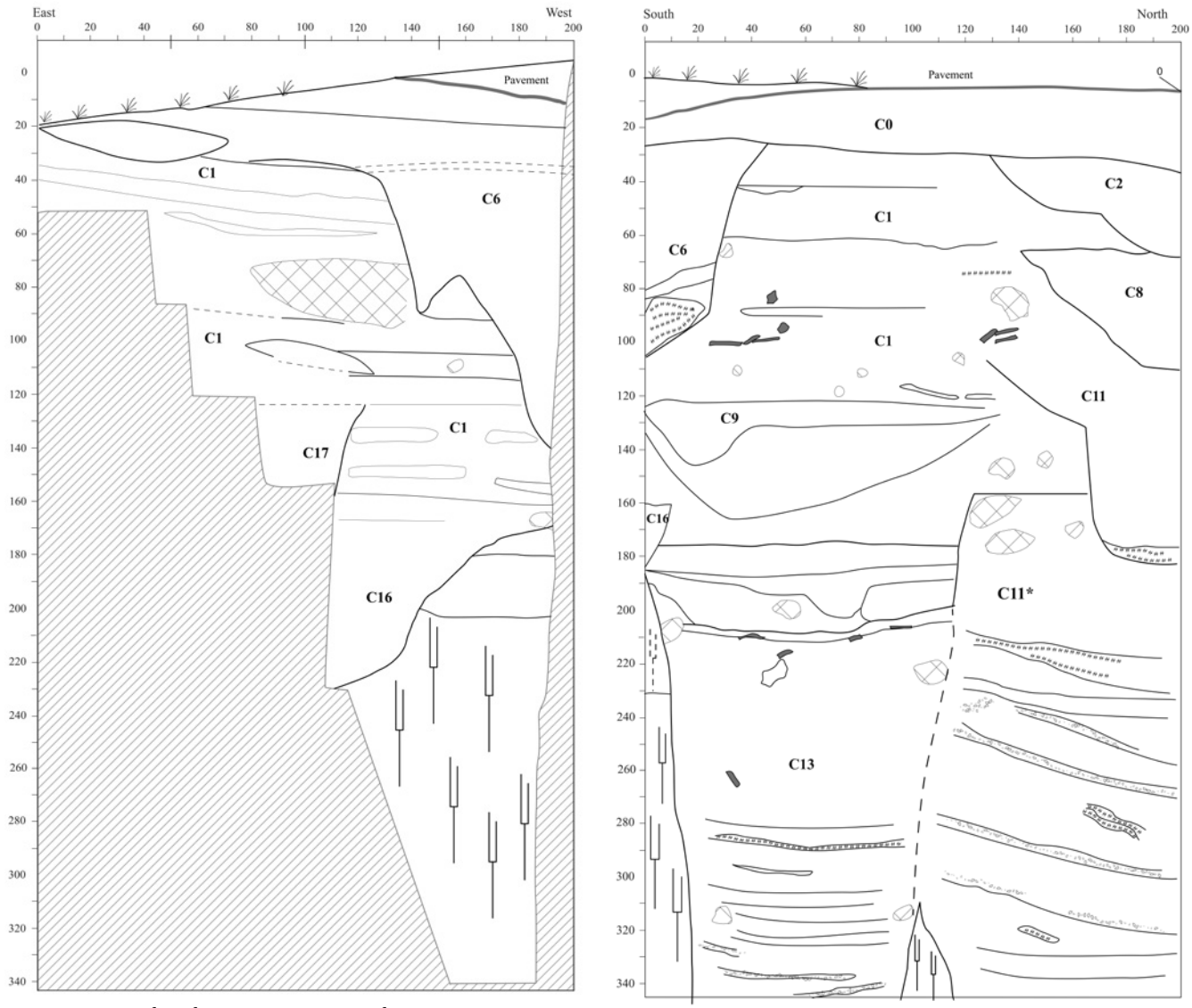

FIGURE U.4 South and west sections at completion

1 Yellow to light brown clay with bedding level. Ceramics and charcoal, regularly oriented with soil
2 Pit. Yellow clay. Large quantity of ceramics
3 Pit or manuring? Loose grey ash with ceramics
4 Pit or manuring? Loose grey ash with ceramics, associated with C3, could be discard for hearth remains
5 Pit? Compact grey to brown sediment. Large quantity of ceramics and charcoal
6 Pit. Loose grey ash
7 Pit. Loose grey ash with ceramics. Linked to C12?
8 Pit. Grey-brown ashy to green sandy sediment with pronounced bedding
9 Pit. Grey to white sediment, oriented toward a stabilisation level, visible in south and east section
10 Pit. Grey ashy sediment with large quantity of charcoals
8-10 Large pit bellow C8 and C10. Grey-brown to green sediment with pronounced bedding
11 Pit. Loose grey and sediment. Alternate bedding of grey-brown to green loose sandy sediment and loose grey ash level with large quantity of charcoal
12 Pit (shaft?). Alternate bedding of grey, brown and green sediment
13 Pit. Yellow-grey to grey brown and green sediment. Bedding at the bottom of the pit
14 Pit? Perhaps part of the irregular bottom of C8-C10
15 Continuation of C8-C10
16 and 17 Pit.

and blade fragments through Contexts 1, 3, 4, 5, 8–10, 9, 11 and 13. An anthropomorphic figurine (SF 2013-203) was found in Context 11 inf.

8 Interpretation and Cultural Attribution

The stratigraphy and finds reflect the continuous occupation of this northeastern part of the Birnin Lafiya-settlement mound. It shows the time depth of occupation below the architectural complex investigated in Trench 3/10. The radiocarbon dates show that the stratigraphy falls within Phases 2, 3, and 4.

9 Radiocarbon Dates

Beta-360210	880	30	BLAF 13 S9, Context 3, 45–60 cm	Phase 4
Beta-360211	850	30	BLAF 13 S9, Context 7, 90–100 cm	Phase 4
Beta-360212	1080	30	BLAF 13 S9, Context 8, 150–160 cm	Phase 3
Beta-360213	1110	30	BLAF 13 S9, Context 8–10, 220–230 cm	Phase 3
Beta-360214	1620	30	BLAF 13 S9, Context 13, 260–270 cm	Phase 2
Beta-360215	1390	30	BLAF 13 S9, Context 13, 320–330 cm	Phase 3
Beta-360216	1270	30	BLAF 13 S9, Context 16, 185 cm	Phase 3

TABLE U.1 Desampling

Context	Level	#
Con. 1	10–20	93
	20–30	174
	30–40	22
	40–50	38
	45–60	71
	60–70	211
	70–80	123
	80–90	161
	90–100	105
	100–110	125
	110–120	121
	120–130	136
	130–140	97
	140–150	77
	150–160	28
	160–170	22
	170–180	34
	180–190	31
	190–200	14
	200–210	15
	210–220	4
	220–230	7
	230–240	2
	240–250	6
	250–260	0
	260–270	4
	45–60	7
Con. 2	20–30	16
	30–40	19
	40–50	7
	45–60	8
	60–70	4
Con. 3	20–30	0
	30–40	24
	40–45	7
	45–60	53
	60–70	55
	70–80	0
Con. 4	10–20	0
	20–30	0
	30–40	57
	40–45	0
	45–60	31
Con. 3–4	20–30	6
	30–40	12
	40–45	58
	45–60	31
Con. 5	40–50	19
	45–60	96
Con. 6	60–70	23
	70–80	16
	80–90	12
	90–100	6
Con. 7	70–80	22
	80–90	88
	90–100	72
	100–110	54
	110–120	58
Con. 9	130–140	1
Con. 8	120–130	6

TABLE U.1 Desampling (*cont.*)

TABLE U.1 Desampling (*cont.*)

Context	Level	#
	130–140	4
	140–150	4
	150–160	30
	160–170	17
	170–180	0
Con. 8–10	180–190	3
	190–200	12
	200–210	7
	210–220	7
	220–230	13
	230–240	15
	240–250	0
	250–260	4
	260–270	4
	270–280	8
	280–290	7
	290–300	3
	300–310	4
Con. 10	150–160	12
	160–170	5
Con. 11	170–180	3
	180–190	2
	190–200	4
	200–210	17
	210–220	6
	220–230	11
	230–240	6
	240–250	5
	250–260	1
	260–270	4
	270–280	8
	280–290	10
	290–300	5
	300–310	7
	310–320	3
	320–330	2
	330–340	8
	340–350	4
Con. 12	180–190	5
	190–200	8
	200–210	4
	210–220	1
	220–230	?
	230–240	?
	240–250	1
	250–260	0
	260–270	12

TABLE U.1 Desampling (*cont.*)

Context	Level	#
	270–280	9
	280–290	8
	290–300	4
	300–310	11
	310–320	7
Con. 13	250–260	0
	260–270	7
	270–280	5
	280–290	not stated
	290–300	3
	300–310	not stated
	310–320	0
	320–330	0
	330–340	5
	340–350	0
Con. 14	310–320	7
Con. 15	310–320	17
	320–330	5
	330–340	18
	360–370	1
	370–380	0
	380–390	0
Total		**≥ 2992**

Analysis in the field by Nicolas Nikis, Alexandre Smith, Samson Tokannou, Nestor Labiyi, and Franck N'Po Takpara

TABLE U.2 Category 4

Context	Level (cm)	Undecorated	Illegible
Con. 1	10–20	45	
	20–30	63	
	30–40	4	2
	40–50	0	
	45–60	6	1
	60–70	6	10
	70–80	3	
	80–90	4	4
	90–100	9	13
	100–110	13	14
	110–120	0	23
	120–130	1	6
	130–140	7	7
	140–150	0	
	150–160	6	2
	160–170	2	

TABLE U.2 Category 4 (*cont.*)

Context	Level (cm)	Undecorated	Illegible
	170–180	3	4
	180–190	4	
	190–200	0	
	200–210	2	
	210–220	3	1
	220–230	1	
	230–240	0	
	240–250	0	
	250–260	0	
	260–270	0	
	45–60	0	
Con.2	20–30	0	1
	30–40	2	
	40–50	0	1
	45–60	0	1
	60–70	0	
Con.3	20–30	0	
	30–40	0	6
	40–45	0	13
	45–60	7	11
	60–70	2	2
	70–80	0	
Con.4	10–20	0	
	20–30	0	
	30–40	12	12
	40–45	0	
	45–60	5	9
Con.3+4	20–30	10	
Con.3–4	30–40	5	
	40–45	43	1
	45–60	0	
Con.5	40–50	5	
	45–60	12	
Con.6	60–70	3	
	70–80	0	
	80–90	1	1
	90–100	0	1
Con.7	70–80	5	2
	80–90	5	3
	90–100	6	3
	100–110	24	3
	110–120	3	1
Con.9	130–140	0	
Con.8	120–130	0	
	130–140	1	
	140–150	4	

TABLE U.2 Category 4 (*cont.*)

Context	Level (cm)	Undecorated	Illegible
	150–160	0	
	160–170	0	
	170–180	0	
Con.8–10	170–180	1	
	180–190	0	
	190–200	3	
	200–210	3	
	210–220	2	
	220–230	4	
	230–240	3	
	240–250	1	
	250–260	0	
	260–270	3	
	270–280	0	
	280–290	0	
	290–300	3	
	300–310	0	
Con.10	150–160	0	
	160–170	5	
Con.11	170–180	1	
	180–190	0	
	190–200	0	
	200–210	1	
	210–220	3	
	220–230	5	
	230–240	1	
	240–250	0	
	250–260	0	
	260–270	3	
	270–280	2	
	280–290	1	
	290–300	0	
	300–310	6	
	310–320	1	
	320–330	1	
	330–340	2	1
	340–350	0	
Con. 12	180–190	1	
	190–200	3	3
	200–210	0	
	210–220	0	
	220–230	0	
	230–240	0	
	240–250	0	
	250–260	0	1
	260–270	1	

TABLE U.2 Category 4 (*cont.*)

Context	Level (cm)	Undecorated	Illegible
	270–280	1	
	280–290	6	
	290–300	0	
	300–310	0	15
	310–320	0	7
Con. 13	250–260	0	
	260–270	0	
	270–280	0	
	280–290	0	
	290–300	0	2
	300–310	0	
	310–320	0	
	320–330	0	
	330–340	0	
	340–350	0	
Con.14	310–320	3	
Con.15	310–320	3	
	320–330	0	
	330–340	0	
	360–370	0	
	370–380	0	
	380–390	0	
Total		**410**	**187**

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TABLE U.3 Category 3

Context	#	Brn	Dec1	Dec2
Con. 1 10–20	21		rfp-1	
	4	int	rfp-1	
	2		rfp-1	inc
	1		rfp-1	inc, rfp-1 (int)
	1	ext/int	inc	
	2		roul	
	10	int		
	22	ext/int		
20–30	3	ext		
	15		rfp-1	
	1		rce-8	
	36		rfp-1	
	3		roul	
	2		inc	
	1	int	inc	
	1		inc	rfp-1

TABLE U.3 Category 3 (*cont.*)

Context	#	Brn	Dec1	Dec2
	1	ext/int	inc	indis
	1	ext/int	indis	
	1	ext	pnt-br-l-2	
30–40	15	ext/int		
	3		rfp-1	
	5	int	rfp-1	
	1		rfp-1	inc
	1	ext/int	inc	
	5	ext/int	indis	
	2		rc-1	
40–50	3	ext/int		
	2		rfp-1	
	1	int	rfp-1	
	3	ext/int	inc	
	1		rc-1	
45–60	3		rc-1	
	5		rfp-1	
	2	ext/int		
60–70	27	ext/int		
	1	int	rfp-1	inc
	5		rc-1	
	2	ext		
	1	int		
	13	int	rfp-1	
	29		rfp-1	
	3		rfp-1	inc
	1	int	inc	
	2	ext	rfp-1	
	1	int	perf	
	1	ext	inc	
70–80	8		rfp-1	
	3	int	rce-8	
	1	int	rc-1	
	2	ext/int		
	1	int		
	3	ext		
80–90	68		rfp-1	
	3	int	rce-8	
	7	ext		
	3	ext	roul	
	1	ext/int		
	5	int	rfp-1	
	4		rfp-1	inc
	1	int	rce-8	
	1	int	roul	
90–100	3	int	rce-8	

TABLE U.3 Category 3 (*cont.*)

Context	#	Brn	Dec1	Dec2
	2	int	rfp-1	inc
	30		rfp-1	
	6	int	rfp-1	
	3	ext/int	rfp-1	
	1	ext/int		
	1	int	perf	roul
100–110	3		rce-8	
	11		rfp-1	
	4	int	rfp-1	
	8	ext/int		
	10		rc-1	
	6	ext		
110–120	18		rc-1	
	4	ext/int	rfp-1	
	1	ext/int	indis	
	2	ext/int	rc-1	
	5	int	rce-8	
	2	int	rfp-1	
	4		rfp-1	
	1	ext/int	ind	
	20	int	rc-1	
	4	ext/int	inc	
	44	ext/int		
	18	int	indis	
	1	int	inc	
	1	ext		
120–130	12	ext/int		
	4	ext		
	7	int	rc-1	
	8		rc-1	
	9	int	rfp-1	
	2	ext/int	inc	
	1	ext/int	inc	rfp-1
	5	int	rce-8	
	5		rfp-1	
	1	int	indis	
	2	int	inc	rfp-1
	1		inc	pa-2
130–140	3	int	rce-8	
	1	ext/int		
	3	int	indis	
	5	int	rfp-1	
	11	int	rc-1	
	6		rfp-1	
	1		rfp-1	inc
	8		rc-1	

TABLE U.3 Category 3 (*cont.*)

Context	#	Brn	Dec1	Dec2
	1		rc-1 (ext/ int)	
140–150	1	int	inc	indis
	1	int	inc	
	7	int	rc-1	
	16		rc-1	
	2	int	rfp-1	
	2		rfp-1	
	10	ext/int		
	1	int	indis	
150–160	1	int	inc	
	1		inc (ext)	rfp-1 (int)
	2	int	rfp-1	
	2		rfp-1	
	1		rfp-1	inc
	8		rc-1	
	18	int	rc-1	
	8	ext/int		
	1	int	rce-8	
160–170	2	ext	indis	
	1	ext/int	inc	sp1
	1	ext	inc	sp1
	1	ext/int	inc	
	8	ext/int		
	3		rfp-1	
	1	ext		
	12	int	rc-1	
	2	int	rfp-1	
	11		rc-1	
170–180	7		rc-1	
	6	int	rc-1	
	6	ext/int		
	4		rfp-1	
	1	int	rfp-1	
	1		inc	pa-2
	3	int		
180–190	5	int	rc-1	
	3		rc-1	
	2	ext		
	6	ext/int		
	1	int	indis	
	1		rfp-1	inc
	5		rfp-1	
	3	int	rfp-1	
	1	ext	inc	
	2	ext/int	inc	
190–200	5	ext/int		

TABLE U.3 Category 3 (*cont.*)

Context	#	Brn	Dec1	Dec2
	2		rc-1	
	2	int	rc-1	
	1	int	rfp-1	
	2		rfp-1	
	2	int		
	4	int	indis	
	1	int	roul	
	1	int	rce-8	rc-1
	1		rce-8	
200–210	2	int	rc-1	
	3		rc-1	
	2	int	rce-8	
	3		rce-8	
	1	ext/int	rfp-1	
	3	int	rfp-1	
	3		rfp-1	
	1	ext/int		
	1	ext		
	3	int	indis	
210–220	2	ext		
	3		rc-1	
	1		rce-8	
	1	int	roul	inc
220–230	1	int	roul	
	1	int	inc	
	1	int		
	1	ext		
230–240	2		rfp-1	
	1		roul	
	2	int	roul	
240–250	3	ext/int		
	2		rc-1	
	2	int	indis	
	1		rfp-1	
	3	int	rce-8	
	1	int	rfp-1	
250–260	4		rc-1	
	2	int	rce-8	
	1	int	rfp-1	inc
260–270	1		rbt?	
	1	int	indis	
	1	int	roul	
	1		roul	
45–60	5		roul	
Con.2 20–30	18		rfp-1	
	11	ext	rfp-1	
30–40	7		rfp-1	

TABLE U.3 Category 3 (*cont.*)

Context	#	Brn	Dec1	Dec2
	2	ext/int	rfp-1	
40–50	1		rfp-1	
	1	ext	rfp-1	
	1	ext/int		
45–60	7	ext/int		
	3		rfp-1	
	1	ext/int	sp1	
60–70	1		rfp-1	
Con.3 20–30	18		rfp-1	
	1		rfp-1	perf
	2	ext	rfp-1	
	1	ext/int	rfp-1	
	7	ext/int		
	4	ext		
	1	ext/int	inc	
	1	int		
	2		rc-1	
30–40	2	ext/int	inc	sp1
	1	ext/int	rfp-1	
	17		rfp-1	
	1	int	rfp-1	
	1		roul	inc
	3	ext/int		
	2	ext		
	2	int	indis	
	3	ext/int	inc	rfp-1
	1	ext/int	indis	
40–45	1		rc-1	
	1	int	rfp-1	
	25		rfp-1	
	6	ext/int		
	2	ext		
	2		rfp-1	inc
	1	ext/int	inc	
	1	int	rfp-1	inc
	5	ext/int	rfp-1	inc
45–60	1	ext/int	inc	
	2		inc	
	11	int		
	23	ext/int		
	2	int	rfp-1	
	11		rfp-1	
	1	ext	rc-1	
	3	int	rc-1	
	6		rc-1	
	1		perf	indis
60–70	1		inc	

TABLE U.3 Category 3 (*cont.*)

Context	#	Brn	Dec1	Dec2
	1	ext/int	inc	
	4	ext/int		
	1	ext	indis	
	4	ext		
	3		rc-1	
	6		rfp-1	
70–80	2	ext/int		
	1	ext		
	2	int	rfp-1	
Con 3–4 20–30	1		perf	rfp-1b
Con.3–4 40–45	6	ext		
	12	ext/int		
	3		rfp-1	
	2	ext	rfp-1	
	1	ext/int	inc	
	1	ext/int	inc	rc-1
	2	int	indis	
	1		inc	
Con.4 30–40	5	ext/int	inc	
	4	ext		
	13	ext/int		
	26		rfp-1	
	1	ext/int	rfp-1	inc
	1	ext	rfp-1	
	6	int	rfp-1	
	1		perf	
	4	int		
	1	int	rfp-1	inc
45–60	13	ext/int		
	5	int	rfp-1	
	27		rfp-1	
	2	ext		
	1		com	inc
	2	ext/int	rc-1	inc
	1	ext/int	inc	
	1	ext/int	rfp-1	inc
	1	ext/int	rfp-1	
	1	int	indis	
Con.5 40–50	4		rfp-1	
45–60	3		rfp-1	
	6	ext/int		
	4	ext	(rfp-1 int)	
	1		rc-1	
	1		rce-8	
	1		Inc	
Con.6 60–70	4		rfp-1	
	1	ext	peig	inc

TABLE U.3 Category 3 (*cont.*)

Context	#	Brn	Dec1	Dec2
	3	int	rfp-1	
	1	ext	rfp-1	inc
	1	ext		
	1		rc-1	
	2	ext/int		
70–80	4		rfp-1	
	1	int	rfp-1	
	1		perf	
80–90	1	ext		
	1		rfp-1	
	1		inc	
Con 7 70–80	1		perf	
80–90	3		rfp-1	
	1	int	rfp-1	
	2	ext		
	2	ext/int		
90–100	1	ext/int		
	1	ext		
	3		rfp-1	
100–110	1	int	rfp-1	
	7		rfp-1	
	4	ext/int		
	1		rfp-1	perf
	1	int		
	1	ext		
110–120	9		rfp-1	
	1		rfp-1	inc
	1	int	rfp-1	
Con.8 120–130	1	int	rfp-1	
	3	ext/int		
130–140	2		rfp-1	
140–150	1		rfp-1	
	1	int	rc-1	
	2	int		
	2	ext/int	rfp-1	
	5	ext/int		
150–160	9	ext/int		
	5	int	rfp-1	
	21		rfp-1	
160–170	6		rfp-1	
	4	int	roul	
	3	int	rfp-1	
	1	ext/int		
160–170	7		rfp-1	
	1	int	rfp-1	
Con.9 130–140	1	ext/int	rfp-1	
Con.10 150–160	21	ext/int	rfp-1	

TABLE U.3 Category 3 (*cont.*)

Context	#	Brn	Dec1	Dec2
	4	ext/int	rfp-1	
	1		rfp-1	
160–170	9		rfp-1	
	2		rfp-1	
	1	int	rfp-1	
Con.8–10	7		rfp-1	
170–180				
	3	int	rfp-1	
	4		rfp-1	
	3	ext/int		
170–180	9		rfp-1	
	1	int		
180–190	1		rc-1	
	9		rfp-1	
190–200	11		rfp-1	
	2	ext/int		
	1		rce-8	
	1		rc-1	
200–210	4		rfp-1	
	4	int	rfp-1	
	2		rc-1	
	3	ext/int		
	1		rc-1	
			rfp-1	
210–220	1	int	rc-1	
	2	int	rfp-1	
	1		rfp-1	
	1	ext/int		
	1	int	roul	
	1		perf	
220–230	3		rfp-1	
	2		rc-1	
230–240	1	int	rce-8	
	8	int	rc-1	
	3	ext/int	sp1	
	3		rfp-1	
240–250	2	ext/int		
	1	int	rc-1	
	1		rfp-1	
250–260	1	int	rc-1	
	1		rc-1	
	1	ext/int		
	4		rfp-1	
	1	int	rfp-1	
260–270	2		rce-8	
	2	ext/int		
	1		inc	
	1	int	rfp-1	

TABLE U.3 Category 3 (*cont.*)

Context	#	Brn	Dec1	Dec2
270–280	4		rce-8	
	1	ext/int	rc-1	
	2	ext/int		
	1	int	rfp-1	
	1		rfp-1	
280–290	2		rfp-1	
290–300	3	ext/int		
	2		rce-8	
300–310	1	ext/int		
	9		rfp-1	
Con.11 170–180	2		rfp-1	
	1	ext/int	rfp-1 (ext), inc (int)	
180–190	1	ext/int		
	2	ext/int	inc (ext), rfp-1 (int)	
	2		rc-1	
	1		indis	
-170	2		rfp-1	
190–200	1		rc-1	
200–210	4	ext/int		
	6		rc-1	
	1		inc	sp1
	1		rce-8	
210–220	5	int	rc-1	
	1	ext/int	sp1	inc
	1	ext	inc	
	1		rfp-1	
	2		rce-8	
220–230	2		rfp-1	
	1		inc	
	1	int		
	4		rc-1	
	2	int	rce-8	
	1	ext/int	peig	
230–240	1		rce-8	
	1		rc-1	
	1		rfp-1	
240–250	2	int	rce-8	
	1	int	rc-1	
250–260	3		rfp-1	
	2	ext/int		
	1		inc	
	3		rce-8	
260–270	6		rfp-1	
	1	int	rce-8	
270–280	3	ext/int		
	5		rfp-1	
	1	int	rfp-1	
	1		rce-8	

TABLE U.3 Category 3 (*cont.*)

Context	#	Brn	Dec1	Dec2
	2		rc-1	
280–290	1		roul	
	1		rc-1	
	2		rfp-1	
	1		rce-8	
290–300	1	int	rce-8	
	2	ext/int		
	1	int	roul	
300–310	4	int	rc-1	
	1	ext/int		
310–320	1	int	inc	
	1	int	rce-8	
	4	int	rc-1	
	1		rc-1	
320–330	1		rc-1	
	1	int	rfp-1	
330–340	9		rc-1	
340–350	1		rc-1	
Con.12 180–190	3	ext/int	inc	
	1		rc-1	
190–200	3		rce-8	
	1	int	rce-8	
	4	ext/int	rc-1	
	1		rfp-1	
	1		inc	peig
200–210	1		rc-1	
	1		rfp-1	
250–260	0			
260–270	2	ext/int		
	1	int	rce-8	
	2		rce-8	
270–280	1	int	roul	
	3	int[1]		
	10	ext/int		
	1	int		
280–290	3		rfp-1	
	2	ext/int		
	2	ext		
	9	int		
290–300	1	ext/int		
	1	int	rfp-1	
300–310	18		rfp-1	
	7		roul	
310–320	1		rc-1	
	2		roul	
Con.13 260–270	1	ext/int	rc-1	
	2		rce-8	
	1	ext	inc	
	1		roul	
270–280	2	int	rce-8	
	1	ext/int		
	1	int		
280–290	1		rfp-1	
	1	int	rfp-1	
290–300	2	ext	rfp-1	
	2		rfp-1	
	1		roul	
	3		rfp-1	
	1	ext	roul	
300–310	2		rc-1	
	1	int	roul	
	2		roul	
	1		sp1	
	3	ext	rc-1	inc
320–330	1		rfp-1	
330–340	2		rfp-1	
340–350	1		roul	
Con.14 310–320	18		roul	
Con.15 310–320	2		roul	
	1		rc-1	
	3		rce-8	
	1	ext	inc	
	1	ext	inc	rc-1
	1		inc	rc-1
320–330	1	int	rce-8	
	2	ext		
330–340	3	ext	inc	
	2		rfp-1	
	1	int	rfp-1	
	9		rce-8	
	2	int	indis	
	1		rc-1	
360–370	1	ext/int		
	2	int		
	1		rc-1	
	2	int		
370–380	1	ext/int	inc	
	1	int	rfp-1	
Total	**1967**			

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TABLE U.4 Rims

Context		R.Type	Brn	Dec1	L1	Dec2	L2	Dec3	L3	Dec4	L4	Ang.	Diam.	Mx. thick
Con. 1 10–20	1	S1	ext									4	28	0.9
	1	S1	ext/int									4		0.8
	1	S4												1.0
	1	S4	ext/int											1.2
20–30	1	S3	ext	sh-6	c int									
	1	E4	ext									5		0.8
	1	S1	ext/int									4		1.1
	1	E38		rfp-1b	u							5		1.1
	1	T6	ext/int	is-geo 10	u	plain	u					3		0.6
	1	S1	ext/int											0.5
	1	S1												0.7
	1	S4		roul	u	plain	u					4		0.8
	1	S1	ext											1.0
	1	E9	ext/int	is-geo 10	u	plain	u							0.5
	1	T11												1.1
	1	E12	ext/int											0.7
	1	S6												0.8
30–40	1	S4										4		0.8
	1	S1	ext/int											0.7
	1	S4	ext/int	ch	u	sl-1	u	roul	u	plain	u			0.7
	1	S4	ext/int									5		0.7
	1	S4										2		0.7
40–50	1	E42										4		0.7
45–60	1	E2										4		0.8
	1	E4	int											1.0
	1	T12	ext/int									3		0.8
	1	S1	ext/int											0.7
	1	S4	int											0.8
	1	S1										4		0.4
	1	E4	ext			sp-5	u int							0.5
60–70	1	T20										5		0.7
	2	T20												0.8
	1	E4	ext/int									5		0.6
	1	T10	ext											1.0
	1	S4	ext/int											0.9
	1	S1		roul	u									0.8
	1	S6		rfp-1b	u	sl-4	u							0.8
	1	T20												0.7
	1	E37	int									4		0.7
	1	E10												0.8
	1	S1										4	10	0.5
80–90	1	S6										4		0.7
	1	E38	ext											1.0
	1	E3												0.8
	1	S6	ext/int											0.7
	1	E2	ext/int											0.8
100–110	1	S4	int											0.7

TABLE U.4 Rims (*cont.*)

Context		R.Type	Brn	Dec1	L1	Dec2	L2	Dec3	L3	Dec4	L4	Ang.	Diam.	Mx. thick
	1	E4	int									5		1.0
	1	S6	int	ch	u									1.5
	1	E38												0.6
	1	E1												0.4
	1	S1	int	rc-1b	u									0.7
110–120	1	E4	int											1.0
	1	E26	ext/int											1.0
	1	T7	ext									3		0.8
120–130	2	E4	int									4		0.8
	1	E4	int											0.8
	1	E11										4		0.6
	1	E4	ext/int									4		0.6
	1	E4	ext/int											0.7
130–140	1	E3										4		1.1
	1	E4	ext/int									4		0.6
	1	T18	int	rfp-4	u	plain	u					4		0.7
	1	T8	ext/int											0.6
	1	S1												0.9
	1	T10	ext/int											0.7
	1	E4	int									3	14	0.6
	1	E4	ext/int											0.8
140–150	1	E50	int	plain	c	rc1-b	u					5		1.0
	1	E4	int									4		1.0
	1	E2												0.7
	1	E4												0.7
	1	E9												0.7
150–160	1	S4	ext/int									3		0.5
	1	S4	int	sl-6	u							2		0.6
160–170	1	E2	ext									4		0.7
170–180	1	S6										4		0.7
	1	T10	ext/int											0.7
180–190	1	S4	int									4		0.8
190–200	1	S1	ext/int									4		0.6
220–230	1	S1	int	roul	u	plain	u							0.7
	1	E9	int											0.5
230–240	1	E1	int									4		0.8
	1	E2	int									5		0.8
	1	S4		roul	u	plain	u					4		0.8
	1	E2	int											0.8
	1	S4		rfp-4	u	plain	u					4		0.9
250–260	1	E2	int									4	18	0.9
	1	S1	int	roul	u	plain	u							0.7
	1	S4	int	sp-6	l							4		0.6
Con. 2 20–30	1	S1	ext									4		0.8
	1	S1	ext											0.8
45–60	1	S1	ext											0.9
Con. 3 30–40	1	T22												0.8

TABLE U.4 Rims (*cont.*)

Context		R.Type	Brn	Dec1	L1	Dec2	L2	Dec3	L3	Dec4	L4	Ang.	Diam.	Mx. thick
	1	S6	ext/int											0.9
	1	T7	ext/int	roul	u	sl-3+	u	plain	u			3		1.0
40–45	1	S1										5		0.7
	1	S1												0.9
	1	S4												0.8
	1	T7	ext/int											0.5
	1	S4	int											0.8
	1	S1												0.7
	1	S1	ext/int									4		0.8
45–60	1	E37	ext									4		1.3
	1	E37	ext/int									4		0.7
	1	E10				plain	c	roul	u					1.0
	1	T11												0.8
	1	S1	ext/int	is-geo 10	u									0.6
	1	E37	ext/int			plain	c	rfp-1b	u			4		1.0
	1	S4	ext									4		0.8
	1	S1												0.8
	1	S6	ext/int									3		0.5
	1	E37	ext/int									4		0.6
60–70	1	S6	ext/int									5		0.6
	1	E5												0.8
Con. 3–4 20–30	1	S1	ext/int									4	24	0.8
	1	S4	ext/int									3		0.7
	1	T12	ext/int									2		0.7
20–30	1	S4	ext/int											0.9
40–45	1	E1	ext	plain	c+u	roul	m					4		0.8
	1	E2	ext/int									4	14	0.8
	1	S4	ext/int											0.6
	1	S4	int											0.9
	2	S4	ext/int											0.8
	1	S4												0.8
	1	S4	ext/int											0.9
Con. 4 30–40	1	S1	ext/int									5		0.6
	1	S1	ext/int									3		0.7
	1	S4	ext/int											1.0
	1	S1	ext/int											0.8
	1	S4	ext/int											0.8
	1	S1	int									4		0.8
	1	E37										4		1.5
	1	S4	int									5		1.0
Con.5 40–50	1	S4	int									4		1.1
	1	S4	int									4		1.0
	1	E38	int	roul	u							4		0.9
	1	S4												1.2
	1	S4												0.9
	1	E11	ext/int	roul	u	sl-3	u					3		0.7

TABLE U.4 Rims (*cont.*)

Context		R.Type	Brn	Dec1	L1	Dec2	L2	Dec3	L3	Dec4	L4	Ang.	Diam.	Mx. thick
	1	E4		plain	u	roul	u					3		1.1
	1	S4												0.9
45–60	1	S4	ext/int									5		1.0
	1	E4	ext/int											0.9
	1	E4	int											0.9
Con. 6 60–70	1	T3	ext/int											0.6
	1	S6	ext/int									3		0.6
70–80	1	S4	ext/int	plain	u	roul	m							0.7
Con. 7 70–80	1	S4	ext									4	28	1.2
	1	S6										4		0.5
	1	E4	ext/int											0.9
	1	S6												0.9
90–100	1	E11	ext/int											0.5
	1	S6	ext	is-geo 10	u	sl-3								0.9
100–110	1	E11	ext/int	plain	u	is-geo 10	u							0.5
	1	E46		plain	u	sl-1	u	roul	u			3		0.6
	1	E4										4		1.5
Con. 8 120–130	1	S4	ext/int	indis	u							3		0.4
140–150	1	E4	int											0.8
	1	E4	int									4		0.6
	1	T1	ext/int											0.7
150–160	1	E4										4		0.6
	1	E1										4		0.5
	1	E1	ext									5		0.5
	1	S1												0.8
160–170	1	T18	int											1.0
Con. 8–10	1	S1	int	sp-6	l									0.6
170–180														
180–190	1	E5										5		0.6
190–200	1	E11	ext/int									4		0.7
200–210	1	S4	ext									2		0.5
220–230	1	E4	ext/int									4		0.7
230–240	1	S1										4		0.7
260–270	1	E41	ext/int									4	24	0.8
290–300	1	E1	ext											0.6
	1	S4										4		0.5
	1	E4												0.9
300–310	1	T24	ext/int									2	18	0.7
Con. 10 150–160	1	E4	int									5		1.1
	1	E4	int											0.7
Con. 11 170–180	1	S1	ext/int	plain	u+u int	rfp-1b	u+u int	sl-2	u					0.4
230–240	1	E4	ext/int									4		0.7
	1	E24										4		0.7
	1	S4										4		1.0
	1	S1												0.6
260–270	1	S1	int									4	18	0.7

TABLE U.4 Rims (*cont.*)

Context		R.Type	Brn	Dec1	L1	Dec2	L2	Dec3	L3	Dec4	L4	Ang.	Diam.	Mx. thick
270–280	1	E1	ext/int									4		0.7
290–300	1	E4	ext/int									4		0.7
300–310	1	S1	int									4		0.8
320–330	1	E38	int	roul	u									0.9
340–350	1	S1												0.8
Con. 12 180–190	1	E41	ext									4		0.7
250–260	1	E11	ext/int									3	16	0.6
Con. 15 310–320	1	S4	ext/int											0.6
330–340	1	S1	int											0.6
Total	**197**													

Analysis by Sam Nixon

68 diagnostic potsherds from this unit were scheduled for illustration but were mistakenly archived and thus do not feature in the above tables or on Plates 23–24 in the Pottery Catalogue, which however shows intact and near-intact vessels recovered from this trench.

CATALOGUE V

Birnin Lafiya (S3/10)

Sam Nixon

This appendix provides a supplementary account of the excavation of the various zones together treated as Trench 3/10, the building complex with potsherd and laterite pavements (Nixon, this volume). It includes additional commentary on the definition of the structural remains, a summary account of the deposits excavated, details on the *in situ* pottery clusters recovered, as well as discussion of the radiocarbon samples collected and analysed. Finally, the text outlines the various other areas of Trench 3/10 excavated which were not treated in detail in Nixon, this volume.

1 Location

Trench 3/10 was located in the northeast of the site, at the edge of the site where the ground begins to slope down towards the road (see Map 7 and Figure V.1).

2 Discovery

Explorations in this area of the site first commenced in 2011 when a brief test trench (Trench 1) was excavated here, revealing the presence of intact paved surfaces and some evidence for preserved mud architecture (Figure V.2). Trench 3/10, expanding excavations in the same area, was then commenced from 2012.

3 Destruction Risks

The area is under threat from a range of factors. Archaeological remains are located right at the edge of a slope which is gradually being eroded by water flowing in the rainy season. This is also one of the areas focused on by women from the village of Birnin Lafiya who come to sweep up fragments of pottery from the surface to use for making house floors. These processes are linked as erosion from water action reveals intact potsherd pavements which then become a prime target for potsherd collection by local women. While many areas of the site are ploughed, this area does not appear to have been ploughed in recent years. Given the well-preserved remains recovered in this excavation unit, of all areas of the site where mitigation measures are necessary this is the most urgent.

FIGURE V.1 Trench 3/10 under excavation during the 2013 season

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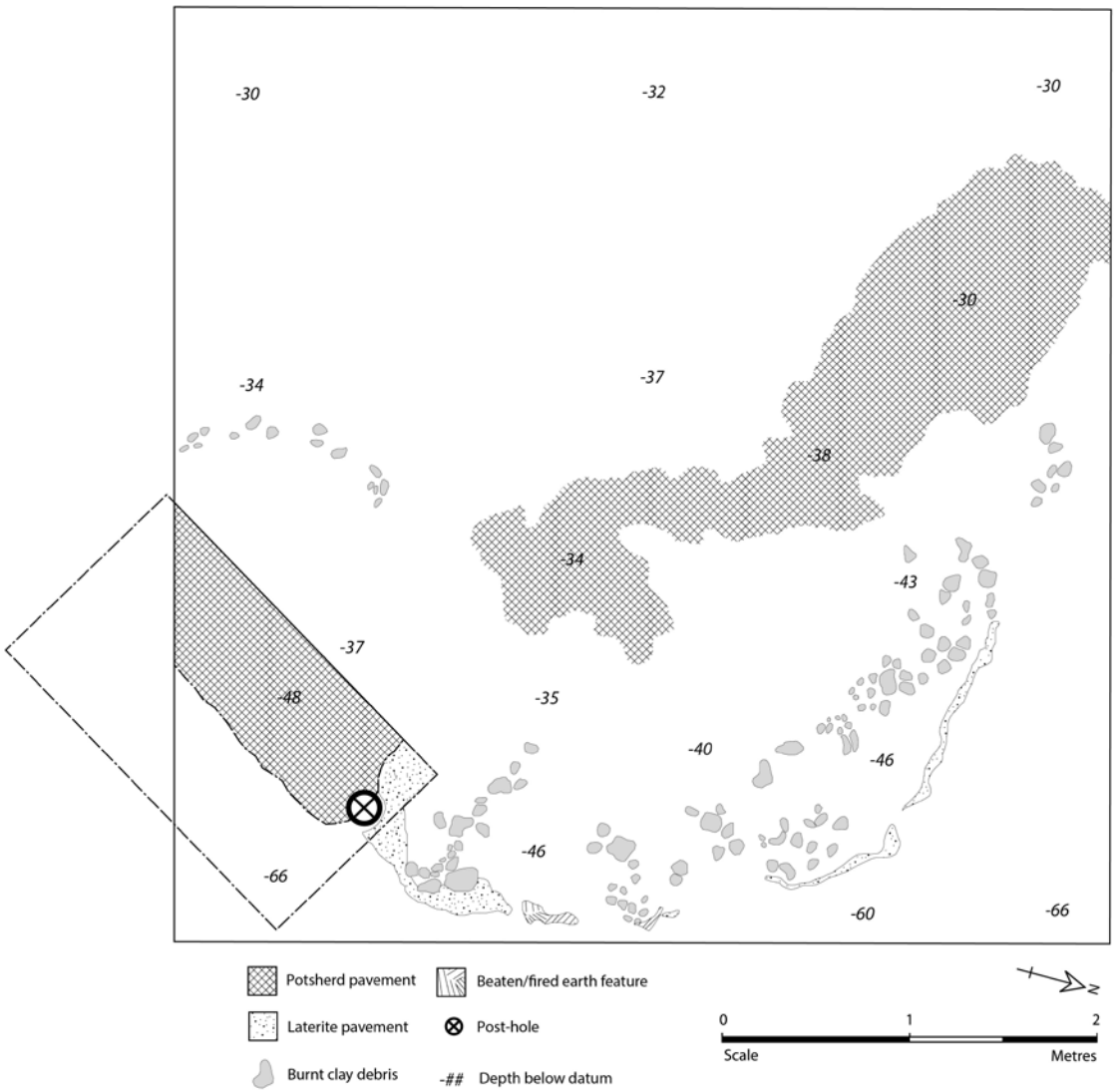

FIGURE V.2 Plan of Trench 3/10 area at the beginning of the excavations, showing eroded potsherd pavements and other evidence of architectural remains – plan also shows dimensions of Trench 1 and the portion of the middle layer of potsherd pavement it revealed.

4 Method, Calendar, and Personnel

The Trench 3/10 excavations were undertaken with the main objective of recording shallow-buried architectural features, at a depth of between ca 5 and 35 centimetres below the surface. Excavations followed natural stratigraphy throughout where possible. Detailed recording was made of all revealed features. Deposits overlying the structural remains were studied and described, though recording of deposits was clearly recognised as a secondary concern to be balanced against the main priority of revealing the complex architectural remains. In Phase 1 (2012) all deposits were sieved and artefacts bagged. In Phase 2 (2013) initial removal of the ploughsoil and deposits from test slot trenches were not sieved and certain areas were sample-sieved due to the large extent of deposits. In Phase 3 (2014) no sieving was carried out on the deposits, as the primary aim of this investigation was to gauge the extend of features and pavements, and the initial deposits were considered to have offered sufficient sampling. Sampling for radiocarbon dating, archaeobotany (Champion & Fuller, this volume), and micromorphology was carried out during all phases.

All phases of the work were directed by Sam Nixon. Phase 1 investigations were carried out in January and February 2012, supported by Louis Champion and Nicolas Nikis. Phase 2 was carried out in January and February 2013, supported by Franck N'Po Takpara and Nestor Labiyi. Phase 3 investigations were carried out in January and February 2014, supported by Nestor Labiyi.

5 Excavation

5.1 *Summary of Excavation Process and Overview of Excavation Zones*

The excavations over three seasons revealed a mud-walled building complex with potsherd and laterite pavements, as well as providing a sampling of the surrounding areas and some limited explorations of the deposits below this building complex (Figures. V.1, V.3, V.4, V.5). Following the excavation of Trench 1 in 2011, it was clear that there existed at least three layers of occupation with associated pavements (Figure V.2). The upper layer was almost completely eroded but the middle layer clearly featured intact remains. Given that this middle layer was relatively easy to access through the removal of the upper pavement and the overlying destruction layer, it was chosen as a focus of the work.

In Phase 1 (2012) of the Trench 3/10 excavations the work was commenced by laying out an excavation area (Zone A) with direct reference to the area excavated in 2011 (Trench 1), in order to expose the structural remains known to exist there (see Figure V.3 for placement of Zone A area). It was decided that a 5 × 5 metre excavation area could gain a sufficiently broad exposure for an initial assessment and exploration and would be manageable within the course of a single field season. The majority of the collapsed structural remains seen on the surface were located within this 5 × 5 metre excavation area. During this phase the excavations revealed intact potsherd and laterite pavements (portions of Rooms 3 and 4) as well as the curved wall of what would come to be revealed as Room 1 [Wall 1].

During Phase 2 (2013) we completed exploration of the structural remains in Zone A and extended the excavations (see Figure V.3). Zone B enabled us to fully record the remains of Room 4. Zone C enabled us to fully record the remains of Room 5. In order to enable the full exposure of Room 1, as well as to test for the potential of further remains to the east, we developed a new 10m × 5m exposure, Zone D, laid out parallel to Zones A, B, and C. This enabled the recording of Room 1, and identified Room 2. The full recording of Room 2 and the revealing of portions of the associated Room 6 was enabled by a further extension southwards, Zone E. Further explorations in Phase 2 involved the recording of a possible compound wall [Wall 9], as well as a small test extension to the east [Zone F] to attempt to explore this in section. Excavations below Room 1 during this phase of the work also revealed a burial. The Phase 2 excavations were also conceived alongside the excavation of Trench 9, designed to provide an archaeological sequence of the deposits predating the Trench 3/10 building complex (see Figure V.3 for Trench 9 location).

The final season of excavations, Phase 3, involved further extensions to the north and south, to explore whether further well-preserved structural remains could be found (see Figure V.3). A major new area was opened to the north, Zone G. While evidence for living surfaces and other features were recovered here, the remains here proved less easily detectable than those recorded previously. Zone H was created to further explore the pavements of Room 6, and this also recorded a new space, Room 7. The final area excavated was Zone I, where we undertook an exploration of the structural remains underlying Rooms 2, 6, and 7.

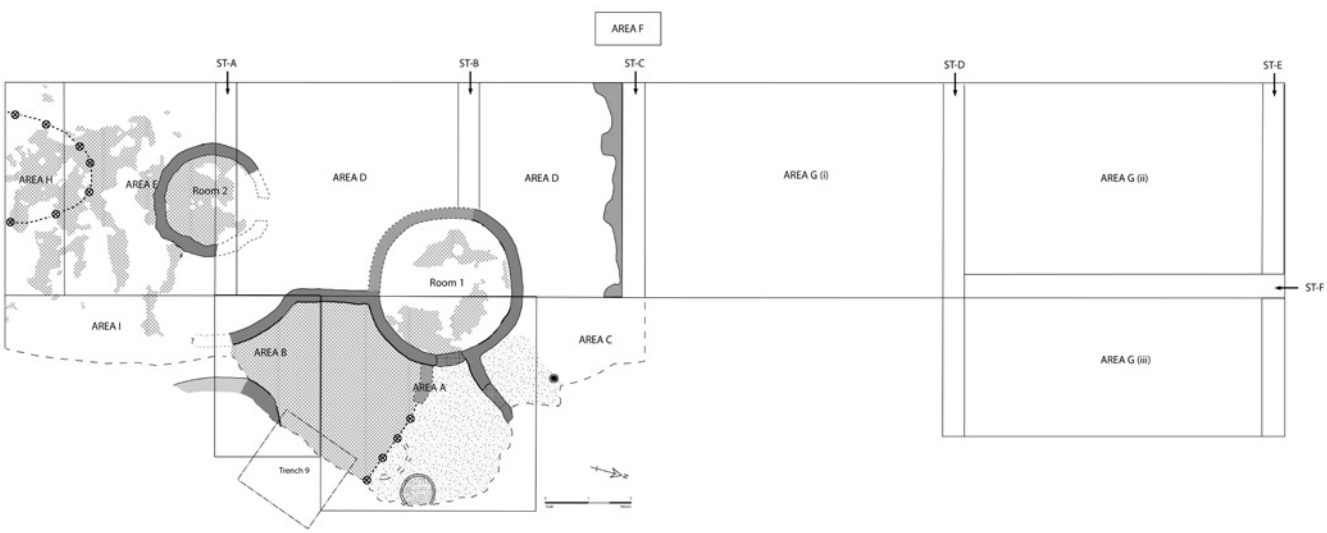

FIGURE V.3 Plan of Trench 3/10 excavation area, indicating excavation zones and principal architectural remains (see Figs. 4, 5 for more detailed plans)

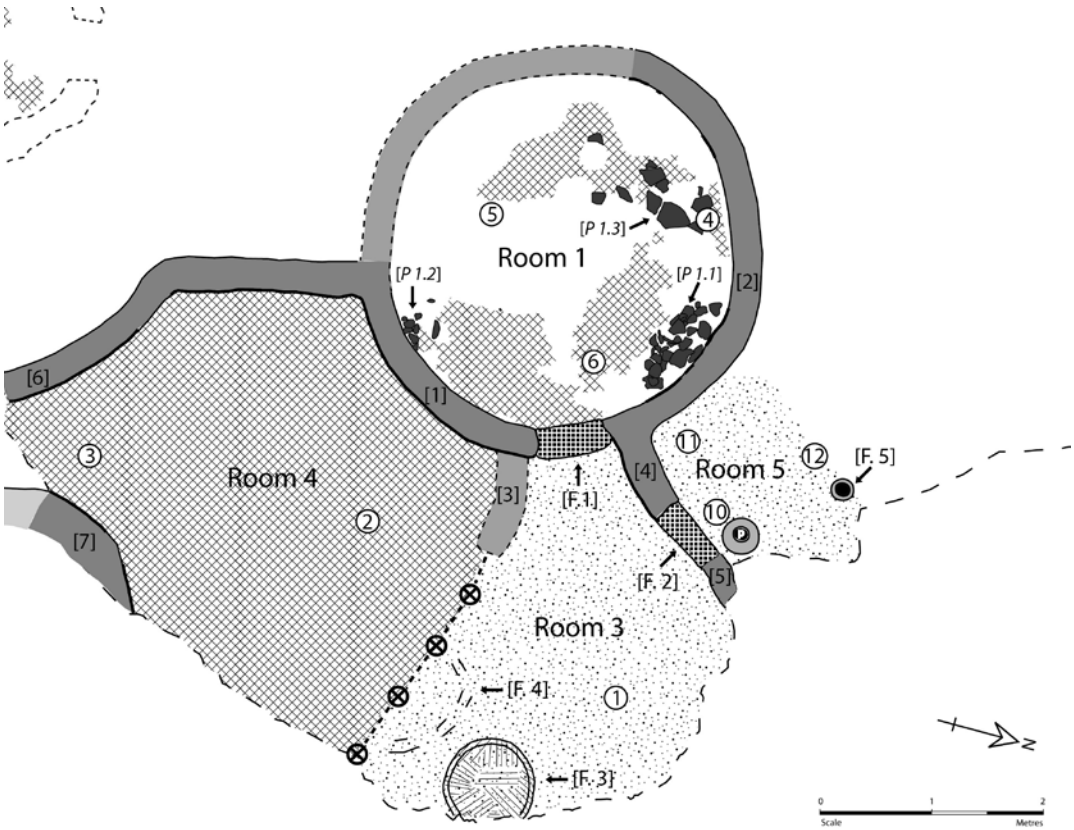

FIGURE V.4 Plan of Room 1 and adjoining areas, indicating ceramic cluster locations and radiocarbon sample locations

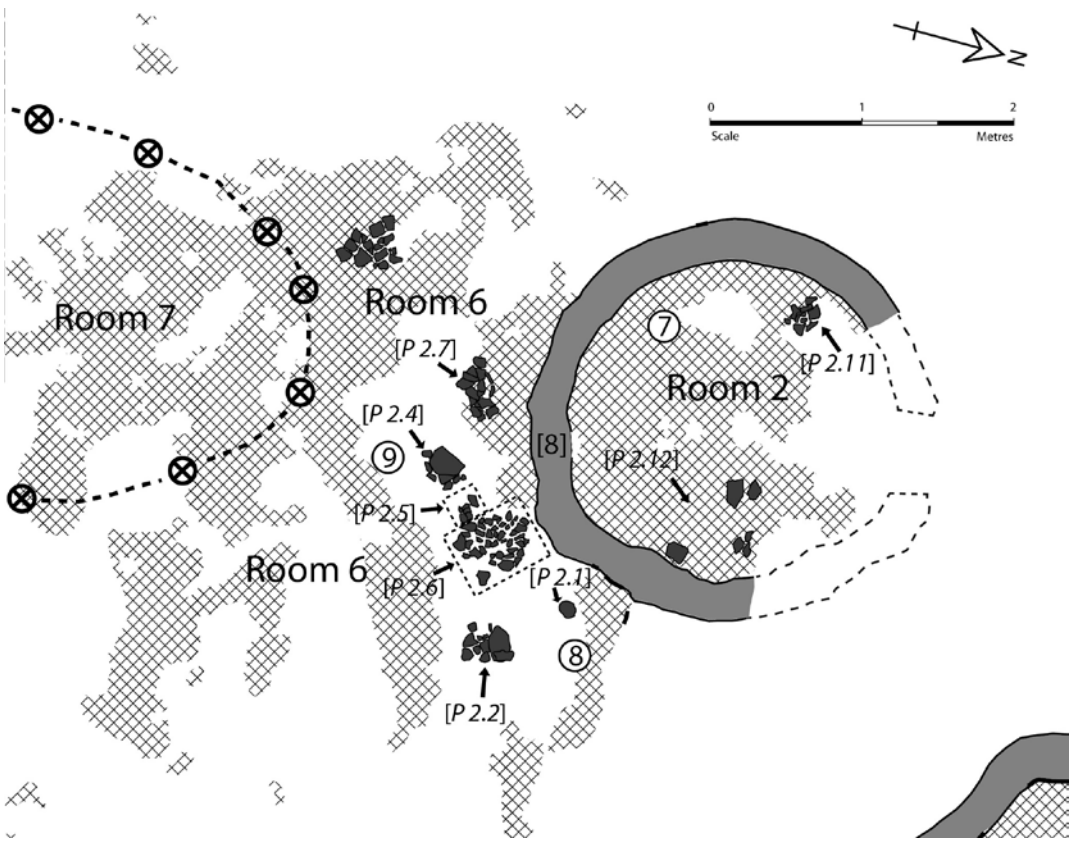

FIGURE V.5 Plan of Room 2 and adjoining areas, indicating ceramic cluster locations and radiocarbon sample locations

5.2 *Cleaning and Removal of Upper Level of Pavement*

As the main aim was to target the middle pavement and its associated structural remains, it was necessary to remove the overlying eroded potsherd pavement seen on the site's surface (Figure V.2). This was only present in patches and there was no evidence of asssociated structural remains preserved. Prior to removing these patches of pavement we cleaned and planned them. While the patches of pavements were not continuous with each other, the assumption is that they relate to the same phase of building. In the area between the various patches of potsherd pavements we noted small traces of laterite pebbles. Given this, it is possible that a laterite floor once existed here, though this is not recorded alongside the potsherd pavement fragments in the plan illustration given the very tentative ideas concerning this. Having drawn the pavement we removed a section (A3 size) which was brought back to the UK to be reconstructed (see Nixon & Haour 2014: 6 for illustration of this section).

5.3 *Excavation of the Principal Structural Remains of the Building Complex*

Having removed the fragmented upper pavement, we then proceeded to remove the deposits overlying the targeted middle pavement and its associated structural remains. The deposits overlying the pavement ranged between ca 5–35cms in thickness. Broadly speaking these deposits were a mixture of loose earth, burnt earth/mud wall fragments, and fragmentary cultural materials (principally potsherds, bones, and charcoal). In the following we provide a commentary and discussion of the revealed remains for each room space and excavated zone.

5.3.1 Room 1

The most well-preserved structural element within the excavations was the broadly circular Room 1 paved on its interior with potsherds, as described in Nixon, this volume (see Figure V.4).

The clearest element defining the structural remains of this room was a wall with an exterior mud-plaster surface fired orange by the burning event which destroyed the building [Wall 1]. Importantly, the top of this wall stump was very clearly identifiable thanks to the presence of the burnt orange mud plaster, evidenced at c. 35 cms above the pavement surface along its length. What this clearly showed us was the height at which the structural remains had been reduced to prior to building in the overlying construction horizon. While we were able to define another wall forming the other side of the circular space [Wall 2] this was not simple as it did not feature a similar orange fired surface, although very limited areas of its interior surface had indeed been fired to an orange colour. One strategy that was adopted to help us define this wall was digging a slot trench [ST-B] east-west across Zone D towards the room to attempt to identify its foundations in section. While we assumed that the room was a complete circle with one entrance, we were not able to clarify this beyond doubt due to the fact that it was not possible to trace the walls in their entirety, and the fact that the pottery pavement surface was quite fragmented. In analysing the floor surface, we did detect some burnt areas in the centre of the room, and it was considered this might possibly relate to a pillar supporting a roof. This was not sufficiently well-defined to establish anything clearly however.

The deposits removed were of relatively loose earth rich with inclusions of cultural materials, including potsherds and bone. There was little evidence of burnt mud fragments (in contrast with deposits removed in Rooms 3 and 4, see below). While isolated potsherds were encountered throughout, three distinct clusters of potsherds were encountered both on the potsherd paved surface and on the areas of floor lacking potsherds [Pot Clusters 1.1, 1.2, and 1.3]. While from their grouping these clusters appeared to relate to distinct pottery vessels broken *in situ*, these clusters related to a range of different pots and there were not sufficient potsherds to reconstruct entire vessels. Some of the fragments were from very large vessels and the arrangement of Pot Cluster 1.1 in particular, positioned against the wall, did not appear to represent a random collection of potsherds thrown into the space as part of the covering of the remains of the destroyed building prior to rebuilding in the next occupation phase.

The floor surface in the centre of the room was rather fragmented. While it was thought this might represent the location of a central pillar, we were also mindful of the practice of burying objects or people in the centre of rooms, and indeed excavation during the 2014 field season uncovered a child burial lying on its side, facing to the west (see Power & Haour, this volume, for full discussion). We were not able to arrive at a definitive conclusion concerning the chronological relationship between the burial and the room. Given the very minimal depth below the floor surface and the central position of the burial, it is most likely the burial was made into the floor either during the use-life of the room or right at the end of its use. The alternative scenario is either that the floor was built right on top of a burial with no foundation layer separating it from the burial, or that the burial was excavated in this area from a later period and is coincidentally in the centre of the room and coincidentally located immediately below the floor surface.

Three radiocarbon samples were analysed from the room: Samples 4, 5, and 6 (see Figure V.4 for locations and Part 6, Table of Radiocarbon Dates).

5.3.2 Room 3

Accessible from the Room 1 space to the east through the doorway indicated by the paved step [Feat. 1] is Room 3, an irregularly shaped paved laterite area (see Figure V.4 and Nixon, this volume for description). The parameters of the preserved space can be interpreted due to the detection of Walls 4 and 5 and the paved step [Feat. 2] on the northwest side, and the fact that the adjoining Room 4 to the south is paved in a different material, potsherds. The nature of the division between Room 3 and the potsherd paved area of Room 4 was however very difficult to define in the archaeology. Some form of wall is clearly evident at the point where the potsherd- and laterite-paved surfaces meet [Wall 3], though the continuation of this wall is less certain and it is possible this was some form of combination of a mud wall with inset poles, or a mat and pole division. Evidence for post-holes, post-supports of burnt clay, and very high concentrations of charcoal were recorded along this dividing line between the two paved surfaces. While the raised disc feature was easily detectable (see Figure 15.9), next to this was some form of feature represented by anomalies in the laterite surface [Feat. 4] which was far less easily detectable and remains uninterpreted.

The deposits excavated within this space (see Figure V.7, left side) contained numerous chunks of burnt clay, clearly relating to burnt collapsed mud architecture. These were found mostly towards the lower levels of the deposit, immediately overlying the paved surface. Significant evidence of charcoal was also found throughout, likely related to the burning of organic materials from a collapsed roof. While similar levels and distribution of cultural inclusions such as potsherds and bones were recorded in the Room 3 deposits as in Room 1, there were no discreet clusters of pottery recorded on the paved surface. One radiocarbon sample was analysed from this space, Sample 1.

5.3.3 Room 4

Room 4, an irregularly shaped potsherd-paved space adjoining Room 1 and Room 3 (see Figure V.4 and Nixon, this volume for description), is the largest intact continuous paved space recorded during the excavations. The parameters of the preserved space are very clear due to the detection of Walls 1, 6, and 7 and the fact that the adjoining Room 3 is paved in a different material, laterite. The difficulty of detecting the nature of the divider between Rooms 3 and 4 was covered in the Room 3 text above.

The deposits were fairly similar to those encountered in Room 3, with significant amounts of burnt mud fragments and charcoal recorded close to the floor surface, as well as relatively abundant cultural materials. Specifically, we recorded evidence of burning and charcoal close to Wall 1, potentially relating to posts once in position close to this wall. In addition, we also encountered clumps of soil covered in potsherds, clearly related to some form of potsherd-paved features (see e.g. Figure V.7, right side) – not being flat and being very fragmentary and quite chaotic they were clearly not part of a pavement, nor did they appear to be part of intact *in situ* features. Having subsequently seen images of displaced clumps of earth with attached portions of potsherd pavements from pits at Nigerian sites (Connah 1975), the most likely explanation is that these are portions of destroyed potsherd-paved features in a secondary context. Again, no discreet clusters of pottery were recorded on the paved surface. Two radiocarbon samples were analysed from this space, Samples 2 and 3.

5.3.4 Room 5

To the other side of Room 3 and accessible via the paved step between Walls 4 and 5 [Feat. 2] we recorded a small portion of another laterite paved space, Room 5 (see Figure V.4 and Nixon, this volume for description). Given the erosion processes in this area, it was difficult to determine the original extent of the space this formed a part of. Importantly we detected the only intact vessel in Trench 3/10 here (see Figure V.9). This vessel was covered by deposits thick with fragments of burnt mud. A significant feature recorded in this area was a ceramic cylinder buried up to its neck (see Figure 15.9). Fragments of the protruding rim of this vessel had broken off and were lying nearby, suggesting this upper portion was smashed during the building's destruction. Importantly when we excavated the interior of this vessel the upper levels of the interior were also filled with deposits heavily composed of fragments of burnt mud. This area was rich in charcoal remains. Three radiocarbon samples were analysed from this space, Samples 10, 11, and 12.

5.3.5 Room 2

The initial removal of topsoil in the Zone D area excavated to the west of Zones A, B, and C did not reveal anything obvious to direct further excavation. Accordingly, it was decided to dig a slot trench [ST-A] east-west across the south end of this zone to attempt to identify a pavement and/or structural remains that could be investigated horizontally. Some 40cms below the surface we recorded a potsherd pavement that was the first evidence of Room 2,

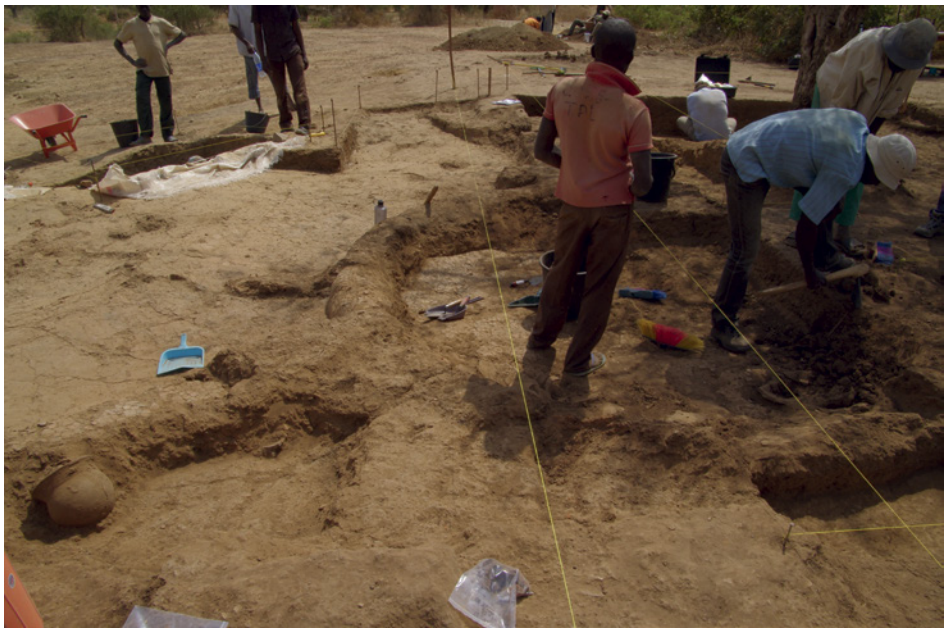

FIGURE V.6 Excavation in progress on interior of Room 1 (figures standing to right are within interior of Room 1) – paved areas [Rooms 3 and 4] and smaller paved laterite area [Room 5] can be seen to left side of image (note complete pot in bottom left corner of image, illustrated in Plate 27.11).

FIGURE V.7 Illustration of excavation of deposits overlaying pavement surfaces: left, excavation of deposits covering pavement in Room 3; right, remains of destroyed (and displaced) potsherd feature excavated within destruction deposits in Room 4

the second of the distinct circular room spaces recorded in Trench 3/10 (see Figure V.5 and Nixon, this volume for description). In order to fully explore this room it was necessary to expand a further 2.5m southwards, Zone E.

Unlike the room spaces described above, the deposits overlying the pavement and structural remains of Room 2 consisted of earth with material culture inclusions but did not feature burnt fragments of mud, in keeping with the fact that the wall stumps here also did not show signs of burning. Two distinct pottery clusters were recorded on the potsherd pavement surface, one of which was almost completely refitable and clearly related to a pot crushed *in situ* during the building's destruction (see Figure V.9). Only limited charcoal remains were found throughout. One radiocarbon sample was analysed from this space, Sample 7.

5.3.6 Rooms 6 and 7

The excavation of Zone E to record the extent of the Room 2 space also demonstrated the existence of further potsherd paved areas to the south (see Figure V.5). Room 6 is a relatively extensive area of fragmented potsherd pavements surrounding the south side of Room 2. No further structural remains or features was recorded in this area. Further extension of the excavation area southwards into Zone H recorded the continuation of potsherd pavements. Within this area anomalies noted in the arrangements of potsherds within the floor surface formed

FIGURE V.8 Exterior of mud wall of Room 1 [Wall 1] seen from Room 4 – note the orange-coloured surface of the mud wall resulting from burning during destruction. The wall stumps were reduced to a height of c. 35cms prior to the building of the paved structure that was created in the next building horizon.

FIGURE V.9 Pottery from Trench 3/10. Top left: whole pot from Room 5 (Plate 27.11); top right: Room 1 Pot cluster 1; bottom: Room 2 Pot 11 before and after reconstruction (Plate 25.4)

FIGURE V.10 Possible mud compound wall with buttresses [Wall 9], recorded to the northwest of Room 1. This feature was cut through by an exploratory slot trench which destroyed a significant portion of the feature. Towards the top of picture see additional small exploratory trench [Zone F] designed to trace the possible extension of the feature to the west.

a broadly semi-circular shape, seemingly indicating a distinct living space, defined as Room 7. No clear wall was recorded but apparent postholes would appear to indicate that this either featured a wall with inset posts, or a mat and pole structure. The deposits overlying Rooms 6 and 7 were similar to those recorded in Room 2, namely earth with material culture inclusions but no burnt fragments of mud. Six potsherd clusters were encountered in the Room 6 area relating to refittable vessels, one of which was almost completely refitted (see Plate 25.5). Two radiocarbon samples were analysed from Room 6, Samples 8 and 9.

5.4 *Excavation of Other Areas*

5.4.1 Other Areas of Zone D

In addition to exposing the eastern portion of Room 1 and helping locate Room 2, Zone D revealed a feature tentatively identified as a compound wall, located at the northernmost area of Zone D (see Figure V.10 and Nixon, this volume for description).

While one side of the hypothesised mud wall could be traced (south side), it was not possible to define the other side of this. Part of the problem was that the slot trench we had cut at the extremity of this end of the 10m × 5m exposure [ST-C] had cut through the area where we might have hoped to find the rear of the wall. Investigation of the section at each end of the slot trench and comparison between the north section of the trench and the hypothesized section through the mud wall did show distinct differences, appearing to confirm the existence of a wall. One additional test undertaken to try to get clear evidence of a cross-section of the wall was a small trench just outside the limits of Zone D to the west, Zone F. This was not conclusive however. This structure and the surrounding soil were sampled with the hope that this would provide definitive evidence of mud architecture.

What could not be clearly worked out in this area of the excavations was the relationship between this 'compound wall' structure and the main building complex described above. It was not possible to discern a relationship either between this wall and Room 1, or with the laterite paved area to the northeast of Room 1. Partly this was also difficult to determine as the depth of the base of the hypothesised compound wall was unclear – if one observes similar examples in current use it seems that the base of such compound walls are not vertical or finely finished, either due to wall melt and erosion at the base, or due to the addition of mud at their base as support. Certainly though we can say that we were excavating near the base of this

wall. All we can say at present is that if this is indeed some form of compound wall then it is either contemporaneous to the main building or immediately anterior.

In addition to this, excavations elsewhere in Zone D did not reveal immediately obvious archaeology to pursue. Slot Trench B did not detect much of significance. In the remaining areas between Slot Trenches A, B, and C little else was observed, except for a pit feature [Pit A]. As with the excavation of the area containing Room 2, 6, and 7, the deposits in this area did not feature significant evidence of burnt mud fragments. As there was only so much time for excavation it was felt that these other areas of Zone D offered limited potential for recovering further structural remains. Consequently, these remaining areas were not excavated much beyond the initial removal of the topsoil. The presence of a tree in the southern area of Zone D was a further factor acting against excavations here. One further exploration conducted in Zone D was a slot trench between Rooms 1 and Room 2 [ST-G], undertaken to attempt to establish the chronological relationship between these two zones of the building complex. The deposits observed in section here did not however provide a definitive answer to this. No radiocarbon samples were taken from this area.

5.4.2 Zone G

This zone extending to the north of the area where we recorded the possible compound wall, a 10 × 5m area continuous with Zone D (see Figs. V.3, V.11). In addition to the presence of the compound wall, this area was also considered the most profitable area for investigation as the deposits here appeared to be quite deep relative to those which we had uncovered in Phases 1 and 2, and therefore it was considered that there might be good preservation here, less subject to erosion.

The stripping off of *ca* 10–20cms of top-soil over this area revealed various portions of pottery pavements, as well as smaller portions of laterite pavements. These were however not associated with any detectable structural remains. Accordingly we decided to pursue the strategy of cutting exploratory slot-trenchs [ST-D, E, F] in order to try to detect remains in section which could then be explored horizontally. These slot trench did produce clear evidence of intact living surfaces. The first evidence to draw attention to was what appeared to be living surfaces of orange/red clay and laterite pebbles, seen within the northern section of ST-D and the eastern section of ST-F (Figure V.12). Given that these had been encountered in the areas adjoining Room 1 and were in that context clearly floor surfaces of houses, the same assumption was made here. We attempted to follow these floor surfaces in order to reveal the larger preserved living spaces we assumed to be present, but we found that the compact orange-red surfaces did not continue in a totally consistent manner (Figure V.12). It was also difficult to detect any walls or other associated structural remains. What was concluded was that these were indeed living surfaces, but that they were not originally orange-red, nor as compact, and that they were transformed in colour and compactness by fire; and indeed were only transformed in patchy areas by a random and accidental process of burning which was restricted to certain parts of the surface. It was deemed that these living floors were going to be very difficult to follow and would possibly yield only limited further results. One potsherd pavement was also identified at depth in ST-D, but this was of a limited extent and no associated structural remains were clearly identifiable.

One further form of evidence revealed by the slot trenches was a very heavily-fired clay/laterite surface of a similar level of compaction to that recorded in Room 3. What this eventually yielded was evidence which we are assuming to be a clay-lined pit [Pit B: Figure V.13], rather than being a floor surface.

The final thing to comment on was the detection of a burial, and possibly two, close to the surface at the north extreme of the excavated area. The example which was obviously identifiable as a burial was quite poorly preserved and it was anyway not seen to be significant enough to warrant detailed investigation. This was cleaned and some teeth taken. Another long bone was also identified not far from here, seen to be *in situ*, and possibly relates to another burial, though this is unconfirmed (see Power & Haour this volume).

5.5 *Excavations below Rooms 2, 6, and 7*

When investigating the area around Rooms 2, 6, and 7 we identified an expanse of potsherd pavement which appeared to undercut these structural remains and therefore related to an earlier building phase [Zone I]. In addition to exposing the area of this potsherd pavement outside of the perimeter of the Zones E and H where Rooms 2, 6, and 7 were located, we excavated a slim trench under the Room 6 area to clearly demonstrate it belonged to an earlier building phase and to provide a snapshot of its nature and intactness in the buried deposits (see Figure 15.3). What this demonstrates is the existence of some form of intact and extensive architectural evidence below Room 2 and its associated paved areas.

FIGURE V.11 Extension of Trench 3/10 area to the north in 2014 [Zone G]. See portion of Room 1 at the left side of image.

FIGURE V.12 Exploration of laterite and clay floors in Zone G. Left: laterite and clay floors seen in section; right: attempt to trace laterite floor horizontally

FIGURE V.13 Laterite/clay pit feature [Pit B] recorded in 2014 northwestern trench extension

6 Radiocarbon Dates

Preliminary dating of the compound was undertaken in 2011 and 2012, with two dates processed by Beta Analytic using charcoal (conventional radiocarbon dating). In 2011 a sample was taken from a posthole (Beta-305218) which dated to 740 ± 40 bp and in 2012 one was taken from the floor of the house (Beta-320517) which dated to 880 ± 30 bp). These preliminary readings were designed to provide a broad sense of the chronology of the compound.

Using samples collected in 2012 and 2013, 12 samples were submitted to the Oxford Radiocarbon laboratory for AMS dating. All samples were identified by Dr Barbara Eichhorn prior to analysis. The results of these are listed in Part 6, Table of Radiocarbon Dates, which also provides full details on these samples, including context, sampling method, and identification. The sample collection points are also located on Figures V.4 and V.5. The results provide a very clear grouping of dates, all falling with the date range 781–921 BP.

7 Other Sampling

In addition to radiocarbon sampling, archaeobotanical sampling and soil sampling was carried out. Archaeobotanical sampling was conducted on a number of deposits (Champion & Fuller, this volume). A series of micromorphology soil samples were also collected by Paul Adderley, using Kubeina tins, both from the destruction layer overlying the Room 2 space, as well as from the possible compound wall and associated contexts. In terms of pottery, only intact pots and distinct potsherd clusters were recorded and analysed.

8 Interpretation and Cultural Attribution

The main element of the remains uncovered in the Trench 3/10 excavations was the building complex. Interpretation and notes on cultural affiliation are provided in Nixon, this volume.

The deposits overlying the building clearly result not from accumulated use of the building but rather from dramatic destruction related to fire. The extensive remains of burnt mud fragments throughout Rooms 3, 4, and 5 suggest this area was one of the focal areas of the burning event which terminated the use life of this building. There was very little evidence of discernible *in situ* living surfaces throughout the complex, and this accords well with a building which had paved floors, as these would have been swept clean.

The only *in situ* material culture that could be clearly detected on the floor surfaces were pottery vessels, amongst which one was complete and intact (see Plate 27.11), and several were almost fully reconstructable, evidence of their having been crushed *in situ*. Other clusters of pottery were likely also crushed *in situ*, even though not

all fragments were recovered during excavation and thus it was not possible to fully reconstruct them. Certain of the other clusters of ceramics were more difficult to interpret. In certain cases for example, such as Pot Cluster 1 in Room 1, distinct groupings of potsherds were retrieved which do not entirely refit, but which do not appear to be a random result of imported soils during the covering over of the house remains. They likely relate to the dramatic destruction event, or to the process of levelling the building afterwards. The Room 1 pottery clusters in particular are important to interpret as they relate to very large vessels which can help hypothesise about the nature of the building. While random pottery fragments could have been brought into this area together with soils during the covering over of the destroyed building remains in preparation for the construction of the subsequent building, the extremely large and unwieldy fragments of pottery vessels found in Room 1 would almost certainly not have been randomly introduced in this manner and it is almost certain they relate to pots which once functioned within the building. Based upon the form and size of the intact and reconstructed vessels recovered, and the fragments of very large pots, we appear to be dealing with a range of container or water vessels, distributed throughout the building.

While various elements of other material culture were recovered throughout the remains we would suggest extreme caution in attributing any significant cultural context to these, as almost certainly significant elements of soil containing such cultural materials would have imported into the house to cover over the destroyed remains of the building prior to the construction of the overlying building which was subsequently constructed. While in certain ideal archaeological circumstances it is possible to detect and distinguish materials which were previously stored on roofs of buildings and collapsed down to the floor level during a destruction event – as was the case at Oursi (Petit et al. 2011) – the scenario in Trench 3/10 did not enable such levels of interpretation and we cannot say therefore whether some of the excavated materials were once *in situ* in hypothesised roof storage areas. The only other materials we have great confidence in contextually are the relatively large clusters of charcoal found throughout the building on the floor surfaces. Almost certainly these relate to organic structural elements of the building which burnt and collapsed during the burning event which destroyed the building. The very tight grouping of radiocarbon dates generated from these carbonised remains certainly also seems to bear this out.

Beyond the central area of well-preserved structural remains we also recorded a range of evidence for living surfaces and other features over multiple occupation levels in Zone G, almost certainly contemporary with at least one of the multiple building horizons recorded in Zones A–F, H–I. While the remains were not as easily detectable in Zone G, the similar evidence of potsherd and laterite pavements over multiple levels is evidence of similar building processes in this adjoining area. Most likely larger exposure of this area at depth would reveal clearer structural remains.

CATALOGUE W

Birnin Lafiya (S11)

Richard Lee

1 Location

Trench 11 is an excavation unit on the mound site of Birnin Lafiya.

2 Discovery

Several researchers had visited this site during general survey work in 2011 and 2012. Alexandre Livingstone Smith and Richard Lee identified the excavation locus on 12 January 2013.

3 Destruction Risks

The site is ploughed regularly by a local farmer from Birni Lafia and thus is probably liable to some level of erosion. Mitigation measures are not considered urgent as the depth of the archaeology is thought to be beyond that susceptible to damage by relatively shallow ploughing activity.

4 Site

The area selected for excavation was the most southerly part of the Birnin Lafiya site examined. The location was a flat millet field, previously harvested, with a marginal downward incline to its southern extent. The trench (Figure W.1) was located randomly within the field, c. 100 m away from a notable rise on the landscape which was characterised by an extremely high density of surface ceramics and several stands of *Balanites aegyptiaca*.

5 Excavation

The field chosen had not previously been excavated. This test pit was 2 × 2.5 m in size and was excavated between 21 January to 10 February 2013 in spits of 10 cm. The excavation was supervised by Richard Lee with participation from Samson Tokannou, Nestor Labiyi and two workmen, Inoussa Munkaila and Ide Hairou. Within each spit, archaeological contexts were separated and

FIGURE W.1 Location of trench

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sieved and bagged separately. All spits were sieved down to 5 mm.

6 Trench 11 West Section Contexts

The top soil was removed to a depth of c. 15 cm without finds being produced. The contexts described below were visible in the west section of the excavation (shown in Figure W.3). Contexts in *italics* were not visible in the west section, but were apparent in the other sections.

Context 1 was a hard-packed, dry, orange-coloured soil with a slightly burnt texture. This context was found across the entire square with a variable depth of c. 15 cm. The context included charcoal, pottery and iron slag. A single, heavily corroded iron artefact was found and removed.

Context 2 was a compacted, dry, dark brown, clayish-soil. There was less pottery but more bone fragments. Within the matrix were patches of fired or burnt clay resembling a floor or surface. The deposit had the quality of wet clay that had been discarded and driedout. This surface at 68 cm occurred in the central southern limit of the test pit and extended west, representing the clearest example of a living surface encountered within the test pit.

Context 3 was largely a continuation of Context 2, but the colour changed to a lighter yellow-red/brown, still compacted. Context 4 occurred as a discrete deposit within Context 2. A large iron implement (SF 2013-204), resembling an agricultural tool or a shovel, was found lying face down centrally in Context 3, and, though corroded, it was largely intact (see Filippini, this volume). As with Context 2 there was less pottery and more bone fragments. Small quantities of iron slag were also found here.

Context 4. This ashy pit was a thin lens within Context 3. This was a context of very fine powdery ash that included burnt bone, burnt pottery and a single bead (*SF 2013-21*).

Context 5 was very similar to Context 3. It was a yellow-red/brown colour with less compaction but still firm. Within the matrix were human teeth, pottery and a further single bead. This context was intermixed with Context 3 and it was at the interface of these two contexts that the iron implement mentioned above was found.

Context 6 was an oval pit full of ash, with a large quantity of disarticulated human bone from at least two individuals and large fragments of pottery. This context cut through Context 2 and was therefore a chronologically later feature.

Context 7 appeared to be a compacted, thin, pavement or floor surface. Its ephemeral nature made it difficult to draw a definite conclusion, and it was not visible in any of the sections. However its characteristics are consistent with those of a pottery pavement (*Figure W.2*).

Context 8 was very similar to Context 3, almost forming a continuation of it. It consisted of a thin brown-orange layer.

Context 9 was a small pit with a green-grey ashy and faunal mix, indicating a high organic content. Some pottery and a small deposit of charcoal were found. Lower down the colour became greyer and small fragments of bone and burnt pottery were found.

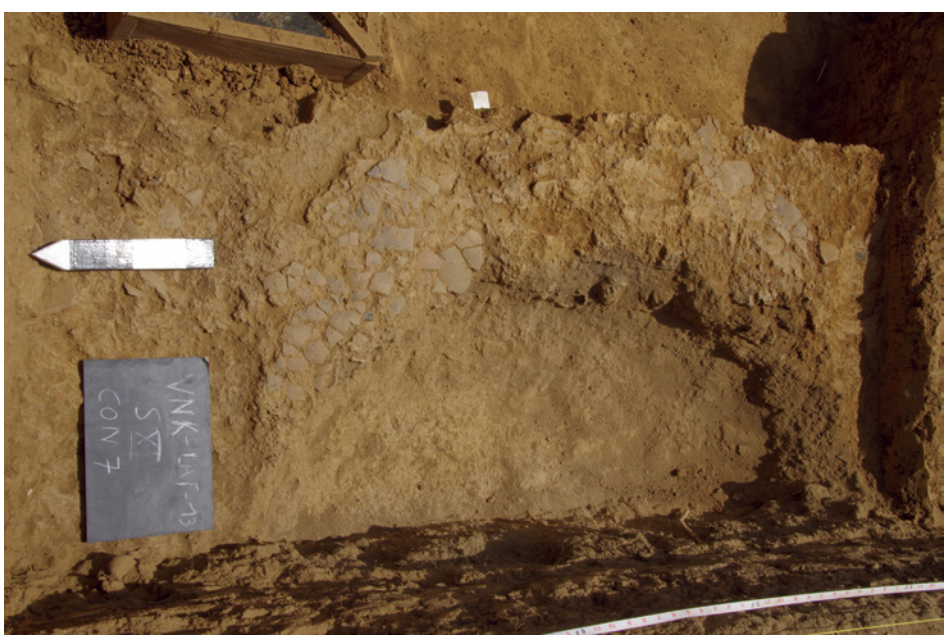

FIGURE W.2 Pottery pavement. Under the sieve to the left is SF 2013-204.

FIGURE W.3 West section at completion

Context 10 was a discrete lens of soft grey ash in the west section.

Context 11 was a soft sandy, light brown deposit of varying depth which occurred across the test pit.

Context 12 broadly constituted an extension of Context 11. This was a very hard, compacted grey-brown soil.

Context 13 was a small pit filled with a green-grey, ash-like loose soft deposit.

Context 14 was a deposit of extremely hard, compacted burnt clay mixed with ash, visible only on the south side of the test pit. With a thickness of c. 80 cm in places, this level had the consistency of a scattered discarded industrial deposit of mixed clay, soil, ash and gravel. This feature cut through Contexts 15 and 16.

Context 15 was a reddish-brown, crumbly deposit mixed with charcoal and fragments of human bone.

Context 16 was a yellow coloured, hard-packed clay including pottery and human teeth.

Context 17 was a small pit with mixed blue/grey/green, ashy-organic fills within it. The fills were very soft and silty and were difficult to define other than in section.

Context 18 was a deep band of compacted orange-brown clay containing charcoal, bone, beads, shell, burnt mudbrick and burnt pottery. In the northwest corner of the test pit this feature yielded an almost intact ceramic vessel and a cluster of human bone. There was also a considerable amount of scattered disarticulated human bone and cranial fragments. This was the first context to retain any moisture within the deposit.

Context 19 was a small ash pit on the north side of the test pit.

Context 20 was a continuation of Context 9, with a green-grey organic ashy matrix with a fine ashy texture which occurred on the west side of the test pit.

Context 21 contained a cluster of mud-brick, ash, beads, metalwork, human bone, teeth and an intact ceramic vessel with burnt soil below it. Lower down, a small area of mud-brick covered another intact ceramic vessel. This layer occurred at the bottom of Context 18 but was a distinctive and discrete context.

Context 22 was the pit continued from Contexts 9 and 20. The fill was a green, silty, organic deposit with a very strong smell of latrines. The lowest level of the fill was a very fine silty green colour. Below this was natural at 333 cm BD.

Context 23 was a human burial. No grave cut was noted, but the grave may have been truncated by Context 22. The upper part of the skeleton was well preserved, but the lower part was decayed, evidently eroded by the organic deposit from Context 22 seeping down onto it. The skeleton was lying on its back, fully flexed, with the skull on its right side facing west. The burial did not show any evidence of a shroud. There was a line of ash around the body, and placed within the skull and inside the mouth. Two small metal objects (SF 2013-202) were found near the neck, and a presumed necklace of stone and organic beads was lying across the neck area (SF 2013-27 and SF 2013-28). Two clusters of non-diagnostic ceramic sherds were placed on each side of the body, parallel to the pelvis. The placing seemed intentional. Below the pelvis was

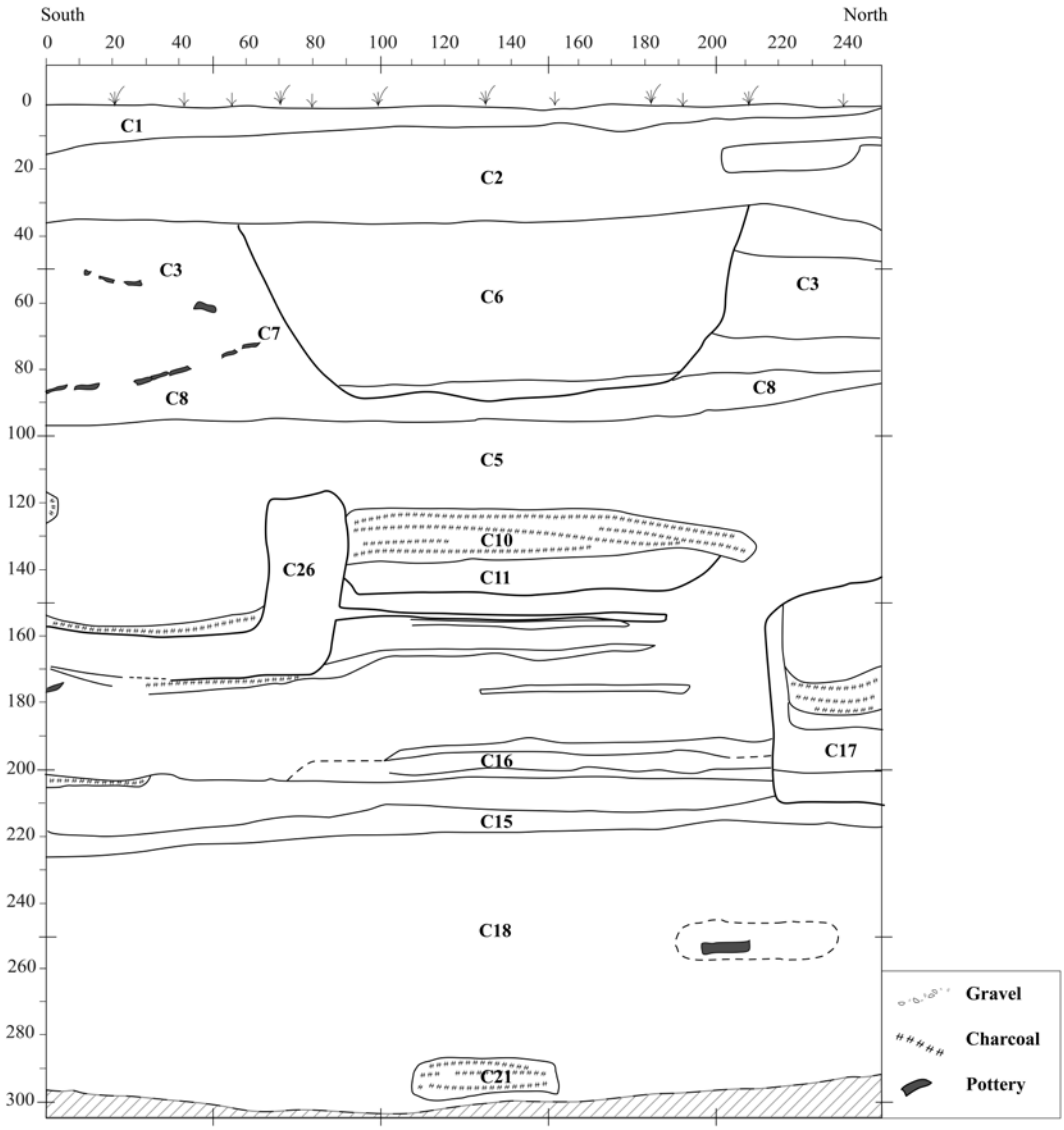

FIGURE W.4 West section at completion

a rectangular metal object resembling a large belt buckle (SF 2013-200 and SF 2013-201) as well as further beads (SF 2013-29). A substantial quantity of orange-yellow clay was noted on and around the body as if it had been placed there at the time of burial, or had fallen into the grave afterwards. Other human and animal bones occurred around the skull.

Context 24 was a small pit located in the east section with an ashy organic fill. Possibly this was a continuation of Context 9, created as the latter began to overflow.

Context 25 consisted of a deposit of collapsed mudbrick. This was a dense, hard packed deposit that had the appearance of separate pieces of mudbrick collapsed onto one another, forming a solid block over time.

Context 26 was further mudbrick related to the collapse or deposit of Level 25, albeit not quite as densely concentrated as Level 25.

7 Stratigraphy

The stratigraphy within Trench 11 was indicative of constant change and activity. Activity of different types appeared to have occurred within all four sections of the

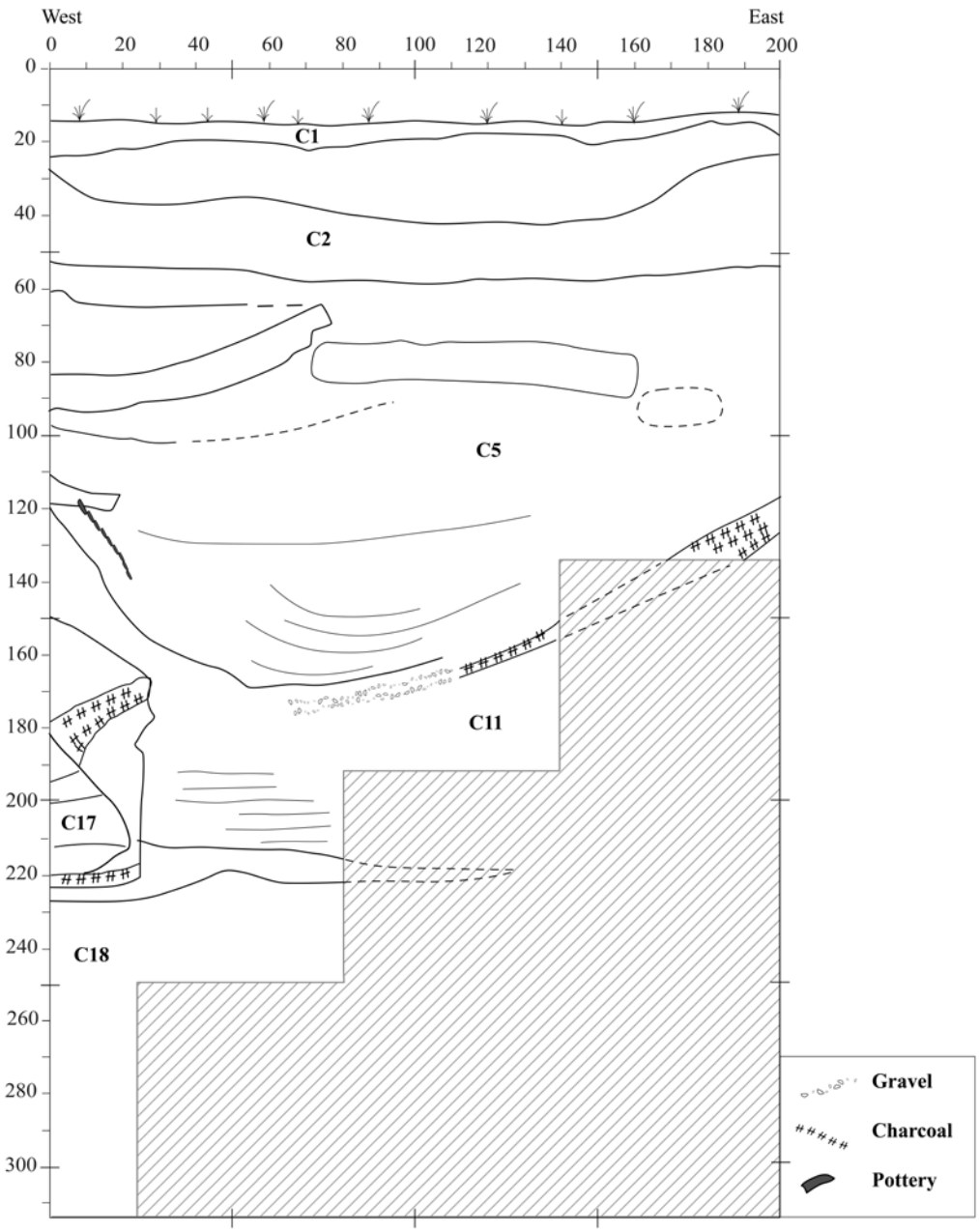

FIGURE W.5 North section at completion

test pit, but abutting or truncating somewhere within the trench. Each stratigraphic section in the test pit illustrated this sense of constant activity and the west section, shown in Figure W.4, was a good example. Context 22 probably formed the basic level over which everything else occurred. The finds confirmed the impression of considerable activity over an extended period of time. Large quantities of ash and charcoal occurred throughout all contexts, as well as significant amounts of pottery and human bone. Overall the impression was of a mix of industrial activity, residential settlement and a place of burial.

The west section of the Trench 11 stratigraphy showed Contexts 1 and 2 as thin bands of hardened soil across the upper levels of the whole test pit. Context 3 also extended across the full width of the pit but had greater depth, and on the west section was cut by a pit (Context 6). Context 3 featured fragments of pavement, burnt clay and pieces of ceramics within its matrix. Context 6 was a pit filled with fine ash and large amounts of human bone, suggestive of a crouched burial, and it cut through Context 7 which included fragments of pottery and what appeared to be a pottery pavement. Context 5 was a softer matrix found across the test pit with a mixed fill of pottery, human bone, a single bead and large iron implement (SF 2013-204). Context 8 was a the first of a continuous band of thin horizontal contexts (Contexts 8–15). The Context 5 deposit re-occurs, suggesting that Context 8 may have been an intrusive deposit related to Context 6. Context 10 was a very loose lens of light grey ash. Immediately below it was Context 11, a soft sandy deposit which was also visible elsewhere in the trench, for example in the north section. Thin lenses of this sand could be seen within other contexts, perhaps representing aeolian drifts. The contexts below this were quite homogeneous and interspersed within one another and could only be differentiated by their colour. Context 26 on the south side of the west section appeared to consist of collapsed mudbrick from a wall or building, and it extended into the south section adjacent to Context 14. Small deposits of ash were found above and below the mudbrick. Context 16 was a mixed deposit of compacted clay featuring pottery, human bone and teeth. Context 15 was similar to Context 16, if somewhat looser in compaction, but still mixed with human bone and pieces of charcoal. On the north side of the west section, Context 17 was a small ephemeral pit with a mixed but distinctive grey-green ashy-organic fill. Context 18 was a substantial deep band of compacted orange-brown hardened clay. This deposit included quantities of pottery, human bone, beads, shell, an intact ceramic vessel and a heavily corroded metal object. Context 21 was a cluster of mud-brick with ash, beads, metalwork, human bone and teeth and an intact ceramic vessel (Plate 33.57). Context 21 may have been an intentional deposition over or above Context 23, a human burial. Other than proximity there is nothing that conclusively links them, but the placement of Context 21 seems too close to be accidental. It was very distinct and may have been some form of grave marker, or may be the only remains of a layer that originally covered the grave and was removed for some reason.

This burial is discussed more fully in Power & Haour, this volume. Artefacts included with the skeleton included a stone and shell necklace (S. Magnavita, this volume), possible metal belt/fastening (Filippini, this volume), and human and animal bone.

8 Finds

Finds were abundant and include clay or stone beads (SF 2013-19 to 22, 24, 25 and 211) as well as the dozens recovered with the burial; metal objects, among which the most noteworthy are potential items of adornment associated with the burial (SF 2013-200 to 202) and a large implement (SF 2013-204); fragments of modelled clay, and worked bone.

9 Interpretation and Cultural Attribution

The upper four contexts (1–3 and 5) across the 2 × 2.5 m test pit were densely packed orange-brown earth with a slightly burnt texture. Below these contexts the character of the test pit can be summarised as comprising numerous banded horizontal layers of compacted soil and clay; pits filled with highly organic deposits; substantial amounts of grey ash; collapsed mudbrick and human remains. Context 18, a significant deposit of compacted orange-brown clay containing charcoal, pottery, animal and fish bone, was apparent across the width of the trench. This deep band of soil sealed a human burial and may therefore be one of the most significant stratigraphic sequences in the matrix. All contexts above Context 18 appeared to cut into it, and were therefore later than it, including Context 14, involving compacted burnt clay, and Contexts 9, 20 and 22, consisting of grey-green highly organic fills.

The north and west sections of the test pit were dominated by highly compacted contexts of orange-brown soil

and hardened clay, whilst the south section was dominated by highly organic deposits. Clearly at least two distinct sets of activities took place here, the divide between them occurring within the width of the test pit. East and south sections present one series of events, whilst west and north present another. The order of deposition suggests that the north and west areas of the test pit were laid down earlier whilst the east and south areas were later and cut or truncate the earlier features. The tops of both sets of features were at roughly the same stratigraphic level and appeared to have been sealed by the upper contexts (1–5) at roughly the same time.

Contexts 14, 25 and 26 seem to be related and to have been created by the same type of event, some form of destruction, causing them to be deposited in this form. They were probably destroyed wall features. It was possible that much of the ash and burnt soil or mudbrick recovered in this trench was also a result of this destruction.

The organic deposits – Contexts 9, 20 and 22 – appear to have been created over a period of time as opposed to a single event. Both the colour and texture of the grey-green contexts varied. This suggested that the pits were open for a prolonged period and gradually filled up. These may have been latrines given the nature of deposition and the ammonia smell. The base of Context 22 was sterile natural – a very dense compacted surface. This was the lowest point excavated in the test pit, at 333 cm BD.

It is possible that the smaller pit with its organic fill (Context 17) was created at the same time, as its elevation in the loci demonstrated.

Opening a randomly chosen 2 × 2.5 m test pit in the centre of a field and excavating down 2 m directly onto a human burial suggests more than just chance. It is quite possible that this was one of many other burials in this area, with Context 18 sealing it. The interface of the upper surface of Context 23 and the bottom of Context 18 could have been the ground surface at the time that the human remains (Context 23) were interred. Within Context 18, directly above the burial, there was no evidence of a grave-cut for the body, suggesting that this deep deposit was indeed later. This raises two possibilities: either Context 18 was intentionally laid down to seal the burial(s), or possibly, the upper edge of the grave was truncated by later activity before Context 18 was deposited. Context 18 evidenced considerable activity or disturbance; a jumble of soil, human bone, burnt mudbrick, shell, beads, iron objects, etc., all occurred within its matrix. As the skeleton could not be removed, and was re-covered and buried again in-situ, the ground surface could not be excavated down to sterile natural below the grave. It is likely that the natural here was at 330 cm BD as with Context 22.

10 Radiocarbon Dates

Beta-345492	1560	30	BLAF-13. Context 23 Inside skeleton cranium	Phase 2–3
Beta-412224	1460	30	BLAF13, Context 18, *Anogeissus*	Phase 3
Beta-412223	920	30	BLAF13, Context 3, *Sapotaceae Vitellaria* Hoe and pavement	Phase 4
Beta-412222	890	30	BLAF13, Context 1	Phase 4

11 Pottery

This was a very large assemblage and Contexts 1, 2 and 7 (surface layers, plus a pottery pavement) were not analysed due to time and labour constraints.

TABLE W.1 Desampling

Context	#
Con. 1	293
Con. 2	197
Con. 3	330
Con. 4	26
Con. 5	164
Con. 6	66
Con. 7	11
Con. 8	87
Con. 9	16
Con. 10	0
Con. 11	76
Con. 11/12	11
Con. 12	62
Con. 13	0
Con. 14	2
Con. 15	21
Con. 16	128
Con. 17	0
Con. 18	235
Con. 18	88
Con. 19	0
Con. 20	3
Con. 21	3
Con. 22	20
Total	**1839**

Analysis by Richard Lee, Samson Tokannou, Franck N'Po Takpara, Nicolas Nikis, and summarised by Nicolas Nikis; and by Anne Haour at UEA

Con 11/12 relates to bags with inconsistent labelling. It is not certain from which of the two contexts the material originated.

TABLE W.2 Category 4

Level	Undec	Illegible
Con. 3	66	112
Con. 5	64	17
Con. 4	4	17
Con. 6	28	49
Con. 8	24	48
Con. 9	3	4
Con. 11	13	18
Con. 11/12	4	7
Con. 12	6	7
Con. 14	1	3
Con. 15	1	5
Con. 16	6	18
Con. 18	18	36
Con. 20	0	2
Con. 21	0	0
Con. 22	1	15
Total	**239**	**358**

Analysis by Anne Haour, Sam Nixon and Sylvia Cockburn
Con 11/12 relates to bags with inconsistent labelling. It is not certain from which of the two contexts the material originated.

TABLE W.3 Category 3

Con.	#	Burn	Dec1	Dec2	Dec3	Dec4	Dec 5
Con. 2	1		rfp-1c				
Con. 3	44	Y	undec				
	100		rfp				
	4		rc				
	1		plain	rfp			
	27		rfp-4				
	2		sl-5+				
	1		sl-2+	roul			
	3		rce-8				
	1		rfp-1c				
	1		sl-1				
	1	Y	sl-3+				
	1	Y	sl-4+				
	1	Y	sl-5+				
	1	int	rfp				
	1		sl-1	rfp			
	1		plain	sl-1	rfp		
	1	ext/int	sl-6	sl-2			
	18		rfp-1c				
	1	int	rfp-1c				
	2	Y	undec	rfp-1a			

TABLE W.3 Category 3 (*cont.*)

Con.	#	Burn	Dec1	Dec2	Dec3	Dec4	Dec 5
	1	ext	sh-n over sl-3	undec	sh-n over sl-3	undec	
	4		rfp-1				
	1	ext/int	plain				
	2		is-geo 37				
	2		roul				
	1		sl-1	is-geo 20	sh-n over sl-2		
	4	Y	undec	rfp-1a			
	1		perf	undec			
	1	int	rc				
	1	int	sl-3	undec			
	1		is-geo 38				
	1	ext	plain	peig-B over sl-3			
	3		rfp-1a				
Con. 4	16		rfp-4				
	2	int	plain				
	7		rfp-1				
	1		sl-8+				
	1		sl-5+	rfp			
	1		sl-6+	roul			
	6	ext	plain				
	1		mch-2 over rfp-1c				
	3		rfp				
	1	int	plain	rfp-1b			
	1	ext/int	plain	sl-2 over rfp-1b			
	1	ext/int	plain	rfp-1b			
Con. 5	18	ext/int	plain				
	6	int	plain				
	12	ext	plain				
	1	Y	plain				
	29		rfp-4				
	30		rfp-1				
	9	Y	undec	rfp-1b			
	3	Y	undec				
	5		rfp-1a				
	1		undec	rc-1a			
	1		rc-1a				
	1		rce-8				
	1		rfp				
	1	Y	undec	rfp-1a	sl-3		
	2	Y	undec	sl-3			
	1		mch 3+				
	1	Y	undec	sl-4			
	1	Y	undec	sl-5			
	1	int	indis				
	1	ext	sl-1	plain			
	1	int	sl-2	plain	sl-6		
	1	ext/int	plain	sp1-l over pa-5	sl-2		

TABLE W.3 Category 3 (*cont.*)

Con.	#	Burn	Dec1	Dec2	Dec3	Dec4	Dec 5
	1		plain	sp1-l over pa-4	sp1-l	sp1-l	indis
	2		rfp-1c				
	1		plain	ch	rfp-4		
	1	ext/int	plain	peig-B over sl-4			
	2		rc-1c				
	1	int	pnt-br-b	undec			
	3		rfp-1b				
Con. 6	11		rfp-4				
	19		rfp-1				
	15	ext/int	plain				
	13	ent	plain				
	9	ext	plain				
	12		rfp				
	1		plain	roul			
	2		plain	rfp-1a			
	1		plain	rfp-4			
	1		rfp	knotted twisted cord roul			
	1	int	rfp-1b				
	1		rfp-1b				
	1	Y	plain	mch-3+			
	2		rce-8				
	1	int	plain	indis			
	1	ext	plain	rfp-1b			
	3	Y	plain				
	1	ext/int	sl-1	is-geo 10			
	1	ext/int	is-geo 36				
	1	ext/int	sc-4	is-geo 10			
	1		plain	knotted end of rfp-1b	rfp-1b		
	1		rfp-1c				
Con. 8	27	Y	undec				
	3		rc-1a				
	33		rfp				
	1		perf	plain			
	1		rce-8				
	1		odd strip 2	ch			
	2		plain	rfp			
	1	Y	plain	rfp			
	1	Y	plain	rfp	sl-1		
	1		roul	sl-1			
	2		plain	sl-3+			
	1		plain	mch-2+			
	1		plain	sl-3+	sh		
	1		sl-5+	sh			
	4		rc				
	21		rfp-4				

TABLE W.3 Category 3 (*cont.*)

Con.	#	Burn	Dec1	Dec2	Dec3	Dec4	Dec 5
	1		odd strip 2				
	1		roul				
	2	ext/int	plain				
	1		plain	roul			
Con. 9	1	ext	plain	rfp-1b			
	1	ext	plain	is geo 10	plain	is geo 10	
	3	ext/int	plain				
	1		rfp-1a	indis			
	8		rfp-1b				
	1	int	sl-7	roul	plain		
	1		rfp-5				
	2	int	rc-1b				
	1	int	roul				
	1		roul				
	1		rfp-4				
	1		rfp-4	pa-2			
	1	ext	plain	rc-1b			
	1	ext	plain	roul (int)			
Con. 11	7	int	rfp-1b				
	2		rfp-1c				
	9	ext/int	plain				
	1	ext/int	plain	is geo 10			
	1	ext/int	plain	roul			
	1	int	pa-1	ind			
	1	int	rc-1a	1 perf			
	2	int	rc-1a				
	6		rc-1b				
	10	int	roul				
	1	int	plain	rfp-1b	sl-3		
	1	int	rfp-1b	sl-2			
	1	int	plain	roul			
	22		rfp-1b				
	5		plain	rfp-1b			
	2		rfp-5				
	1	int	rfp-5				
	5	int	plain				
	1	ext	plain	rc-1a			
	4	int	rc-1b				
	1		plain	indis			
	1	ext/int	sp1-c	sp1-c	sp1-l	plain	
	11		roul				
	1	int	rfp-1a				
	2		plain				
	1	ext/int	plain	sl-3			
	2	int	indis				
	1	int	plain	1 perf			
	1	ext	plain				

TABLE W.3 Category 3 (*cont.*)

Con.	#	Burn	Dec1	Dec2	Dec3	Dec4	Dec 5
	1	ext	plain	rfp-1b			
	1		rfp-1c	roul			
	1	ext	rfp-1b	sl-2	plain	sl-1	roul
	1	int	plain	rc-1c			
Con. 11/12	6	int	rfp-1b				
	6		rfp-1b				
	4		rfp-1c				
	1	ext/int	indis				
	3	int	rc-1b				
	1	ext/int	plain				
	5		rfp-5				
	2		roul				
	8	int	roul				
	4	int	rfp-4				
Con. 12	1	int	plain	rce-8			
	1		plain	rfp-1b			
	1	ext	sp4-v	sl-9	sp4-v		
	1	ext/int	rc-1b	plain			
	1	int	rc-1b				
	3	int	rfp-1b				
	3		rfp-1b				
	3	int	plain	rfp-1a	sl-1		
	1	int	sl-1	plain	rfp-1b		
	1	int	plain	rfp-1a			
	10	ext/int	plain				
	4	int	roul				
	1	int	rfp-5				
	1	int	rfp-4				
	2		rfp-4				
	2		rc-1b				
	1		rc-1a				
	1		sl-1	sp1-l	sp1-l	sp1	
	1		sl-6	sp1-l	sp1-l	plain	
	1		rfp-1c				
	4	ext	plain				
	1		roul				
	1		rfp-5				
Con. 14	3	ext/int	plain				
	1		rfp-1c				
	4		rfp-4				
	1		rfp-1b				
	1		rc-1b				
	2	int	roul				
	1	int	rfp-1b	plain			
Con. 15	2	int	rfp-5				
	3		rfp-5				

TABLE W.3 Category 3 (*cont.*)

Con.	#	Burn	Dec1	Dec2	Dec3	Dec4	Dec 5
	1	ext/int	sl-5	plain			
	1	int	rce-8				
	2		rce-8				
	2	int	rc-1b				
	3		rc-1b				
	1	int	rc-1c				
	1		rc-1c				
	4	ext/int	plain				
	2	ext	plain				
	3	int	ind				
	6		roul				
	3		rfp-1b				
	1	int	rfp-1b				
	1	int	plain	rfp-1b			
	1		plain	rfp-1b			
	1	ext	sl-1	plain	sl-1	sx-8	
	1	ext	sl-1	plain	sx-3	sh-7	
	1	ext/int	plain				
Con. 16	9	ext/int	plain				
	1		plain	rfp-1b			
	10	int	indis				
	2	ext	plain	roul			
	3	int	rc-1b				
	1	ext	plain	rc-1b			
	1	int	ch	rfp-1b			
	3	int	rfp-1b				
	3	ext/int	plain	rfp-1b			
	1	int	rfp-4				
	3	ext	plain				
	1	int	sl-1	roul			
	3		rfp-5				
	1	int	rfp-5				
	1		rc-1a				
	6		rc-1b				
	6		roul				
	2		rfp-1c				
	3		rfp-1b				
	1	int	perf	roul			
	1		rfp-4				
	4	int	rce-8				
	4	int	roul				
	1	ext/int	sl-7				
	1	ext/int	sl-4				
	1	ext/int	mch-10				
	1		sl-5				
Con. 18	9	int					

TABLE W.3 Category 3 (*cont.*)

Con.	#	Burn	Dec1	Dec2	Dec3	Dec4	Dec 5
	19	ext/int					
	6	ext					
	9		roul				
	13	int	roul				
	1	ext/int		1 perf			
	1	int	rfp-4				
	1		rfp-4				
	1		plain	roul			
	30	int	indis				
	10		rce-8				
	19	int	rce-8				
	3	int	rfp-1b				
	1		rfp-1c				
	1	int	rfp-1c				
	6		rfp-1b				
	1	ext	plain	mch-3			
	1	ext	plain	sl-1			
	1	ext	plain	sl-3			
	1	int	rc-1b	1 perf			
	16	int	rc-1b				
	10		rc-1b				
	1	int	rc-1b	bottle neck			
	2	int	plain	rc-1b			
	2	ext	plain	rc-1b			
	1		plain	rc-1b			
	1	int	rfp-1b	rce-8			
	2	ext/int	plain	roul			
	2	ext	plain	roul			
	3	int	plain	rfp-1b			
	2	ext/int	plain	ch-1	rfp-1b		
	1		plain	rfp-1b			
	2	ext	plain	rfp-1b			
	1	int	plain	mch-2	rfp-1b		
	1	int	mch-2 over roul				
	1	ext/int	sl-1	plain			
	1	ext	plain	sl-1	sp4-v		
	1	ext/int	plain	sp1-l	mch-5		
	1	ext	plain	sl-1	sx-11	sc-1	
	1	int	rfp-5	rce-8			
	1	ext/int	plain				
	1	int	plain	bottle			
	1	int	plain	rfp-5			
	1	int	plain	sl-1	rfp-1b		
	1	ext/int	plain	rfp-1b	ch	plain	
	1		mch-13				
	1	ext/int	sl-11				
	1	int	mch-5				

TABLE W.3 Category 3 (*cont.*)

Con.	#	Burn	Dec1	Dec2	Dec3	Dec4	Dec 5
	1	ext/int	plain	ch	roul		
	1		pnt-r-l1				
	30		rc-1a				
	1		rfp-5				
	1	int	rfp-5				
Con. 20	1		rc-1b				
	1		plain	rfp-1b			
	2		rfp-1b				
	2	int	indis				
	1	int	sl-4	sl-1			
	1	ext	sh-8	sl-1	plain	sl-1	sh-12
Con. 21	1	int	indis				
	3	ext/int	plain	rc-1b			
	8	int	rc-1b				
	1		rc-1b				
	1	int	rce-8				
	2	int	roul				
	1		roul				
	2	int	rfp-5				
Con. 22	5	int	roul				
	14	int	indis				
	7	int	rfp-1b				
	1	int	rc-1b				
	1		roul				
	2	ext	plain				
	1	ext/int	plain				
	1	int	plain				
	1		rfp-1b				
Con. 23	1		plain	rc-1b			
Total	**1254**						

Analysis by Anne Haour, Sam Nixon and Sylvia Cockburn. Con 11/12 relates to bags with inconsistent labelling. It is not certain from which of the two contexts the material originated.

TABLE W.4 Rims

Context	#	R.Typ	Brn	Dec1	L1	Dec2	L2	Dec3	L3	Ang	Diam	Mx. thick
Con. 3	1	E38								4	30	1.3
	1	E4										0.9
	1	E37										0.7
	1	E4	ext/int	plain	u	rfp-1b	u					
	1	S6	ext	plain	u	rfp- 1b	u+m			2	8	0.5
	1	E11	ext/int							3		0.8
	1	S3	ext							4		0.7
	1	E4	int									0.8
	2	S4	int							4		1.0
	1	T7	ext/int	sp4v	c int	sp4v	c int			4		1.2

TABLE W.4 Rims (*cont.*)

Context	#	R.Typ	Brn	Dec1	L1	Dec2	L2	Dec3	L3	Ang	Diam	Mx. thick
	1	S4	ext	plain	u	sx	u	rfp-1b	u int	4		0.7
	1	S4										0.8
	1	S4								4		0.6
	1	S4	ext/int							2		0.7
	1	E4										0.8
	2	E4										0.7
	3	S4	int									0.9
	1	S3	ext/int							4		0.6
	1	S4										0.5
	1	S4	int							4	30	1.0
	1	S4	int									0.8
	1	S4	int									1.0
	1	S4								4		0.8
	1	S4										0.9
	1	S4								4		1.0
	1	S4	ext/int									0.7
	1	S4	int							4		0.7
	1	S4										0.6
	1	S4										0.6
	1	S4										0.6
	1	S1								4		0.7
	1	S1	ext							4		0.6
	1	S1										0.5
	1	T23								4		0.9
	1	E25	ext							4		0.6
	1	E39	ext									0.8
	1	E39	ext							4		0.9
	1	E38								4		0.7
	1	E39				plain	c	roul	u			0.8
	1	S4	ext/in							4		0.7
	1	S6	ext							4		0.5
	1	S6	ext/int							5		0.7
	1	E4	ext									0.7
	1	E38	ext/int									1.0
	3	E38	ext/int							4		1.0
	1	E4										0.8
	1	S3	ext									0.7
	1	S4								4		0.7
	1	E4	int							4		0.8
Con. 4	1	E12								3	6	0.5
Con. 5	1	S6										0.7
	1	S6	ext/int									0.5
	1	S6								3	8	0.6
	2	E2	ext/int									0.5
	1	S4										0.7
	1	S4		di	u+m							1.0
	1	S3	int									0.7

TABLE W.4 Rims (*cont.*)

Context	#	R.Typ	Brn	Dec1	L1	Dec2	L2	Dec3	L3	Ang	Diam	Mx. thick
	1	S4										0.9
	1	E24	int							4		0.7
	1	S4	int									0.8
	1	E37	int							4		0.8
	1	E40								4		0.4
	1	E50	ext/int							4		0.8
	1	E27	ext/int							5	20	0.9
	1	E43	int	plain	c	mch 4+	u			5		0.6
	1	E3	ext/int									0.5
	1	E3	ext/int							4		0.6
	1	S3										1.0
Con. 6	1	S4	ext/int	plain	u	sx	u			2	12	0.5
	1	S4	ext/int									0.7
	1	S1	ext/int									0.6
	1	S4	ext									0.8
	1	S4										0.8
	1	S1	int							3	8	0.6
	1	E15	ext/int							3		0.5
	1	E4	int									0.6
	1	E9	ext/int							5		0.5
	1	T22										0.6
	1	T6	ext	roul	u	sl-3	u					0.6
	1	S1								2		0.7
	1	S4	ext/int									0.8
	1	S1	int									0.8
	1	S1	ext/int									0.4
	1	S4	int									1.0
	1	S6	ext/int									0.8
	1	S1	ext/int							4		0.7
	1	S4	ext/int							3		0.4
	1	E2	ext/int							5		0.8
	1	B1	ext									0.4
	1	S4	ext/int									0.9
	1	S4	ext	is-geo 24	u	indis	u int			2	12	0.7
	1	T6	ext/int	is-geo 10	u							0.7
Con. 8	1	E1	int									0.7
	1	S1								4		0.8
	1	S6	ext									0.5
	1	E4	ext									0.9
	1	E4	ext							4		0.9
	1	E4	ext/int									0.7
	1	S1										0.4
	1	E4										0.9
	1	S6	int									0.8
	1	S4										0.4
	1	E3	ext							4	20	0.7
	1	E3	ext/int							4		0.7

TABLE W.4 Rims (*cont.*)

Context	#	R.Typ	Brn	Dec1	L1	Dec2	L2	Dec3	L3	Ang	Diam	Mx. thick
	1	E3	int									0.7
	1	E3	ext/int									0.8
	1	E3	ext							4		0.7
	1	E3	ext/int							5		0.7
	1	E3	ext/int							4		0.6
	1	S3	int									0.7
	1	S3										0.7
	1	S3								4	18	0.7
	1	E4	ext/int							4		0.8
	1	E4				ch	l					0.8
	1	E2										0.5
	1	S6										0.4
	1	E2										0.6
	1	E43	ext/int	sl-2	n					4		0.9
	1	E39	ext									0.8
	1	E24	ext/int							4		0.7
	1	E39										0.9
	1	S4	ext/int									0.8
	1	S4	int									0.6
	1	S6								5		0.4
	1	S4	ext/int	mch	l							0.6
	1	T6	ext							3	6	0.4
	1	S6		roul	u					3		0.6
	1	S4	ext	is-geo 10	u	indis	u int					0.5
	1	S4										0.9
	1	E5		indis	u	undec	c			4		0.5
	1	E5										0.5
Con. 9	1	S6	ext/int									0.8
	1	E2										0.8
Con. 11	1	S4	ext							4		0.7
	1	E2	ext/int							4		0.7
	1	E2	int							4		0.7
	1	S1	ext/int							5		0.7
	1	S1										0.6
	1	E1	int									0.7
	1	S4	ext/int							4		0.7
	2	E4										0.9
	1	E26	int							5		0.7
	1	E49	ext/int							4		1.0
	1	E49	int			plain	c	rfp	u			1.0
	1	E24	ext/int							4		0.6
	1	E11								3	6	0.8
	1	E32								4	6	0.4
	1	E40		plain	c	indis	u					0.9
	1	E3								4		0.9
	1	E3										0.7
	1	S4								4		0.8

TABLE W.4 Rims (*cont.*)

Context	#	R.Typ	Brn	Dec1	L1	Dec2	L2	Dec3	L3	Ang	Diam	Mx. thick
	2	E43	ext/int							4		0.8
	1	E4	int									0.8
	1	E5										0.7
	1	E5										0.9
Con. 12	3	E4										0.9
	1	S4	ext/int							2		0.5
	1	E3	int							5		0.6
	1	T19										0.9
	1	E37								3	6	0.6
	1	S4	ext/int									0.8
	1	S6								4	20	0.7
	1	E2										0.7
	1	E3										0.8
	1	S4	ext/int							3	16	0.6
	1	S4		rfp 5	u							0.7
	1	S3										1.0
Con. 14	1	S1	ext/int							2	8	0.5
	2	S4	ext/int									0.5
	1	S4	ext/int							2		0.5
	1	S3								4		0.6
	1	E5		indis	u	undec	c			4		0.6
	1	E3	ext/int							5		0.7
Con. 15	1	E2								5		0.7
	2	S3	ext/int							4		0.6
	2	S3	int							5		0.6
	1	S3	int									0.7
	1	S3	int							4		0.6
	1	E24	int							4		0.5
	1	E26	ext/int							4		0.8
	1	S3	int									0.4
	1	E4										0.8
	1	E4										0.6
	1	S3	ext/int							2		0.4
	1	S6		roul	u					4		0.5
	1	E2								4		0.5
	1	S1		sp4-v	l	undec	u					0.6
	1	B2										
Con. 16	1	S4	int							3		0.8
	1	S4	int							3		0.7
	1	E3								3		0.6
	1	E3	ext/int							3		0.5
	1	E49	ext/int	rfp-1a	u	undec	c					1.1
	1	E14	int	indis	u					3		0.7
	1	T17										0.8
	2	E4	int							5		0.8
	3	E2	int							5		0.5
	1	E2	int									0.8

TABLE W.4 Rims (*cont.*)

Context	#	R.Typ	Brn	Dec1	L1	Dec2	L2	Dec3	L3	Ang	Diam	Mx. thick
	1	E2	ext							4		0.8
	1	S4	ext/int	rfp-1b	u					4		0.7
	1	S3	int							4		0.6
	1	S6								2		0.6
	1	E2	int							5		0.6
	1	E4	int							4		0.7
	1	E4	int./ext							4		0.6
	2	E3	int							4		0.7
	1	E43	int							4		0.6
	1	T3		sl-1	u	sp4-v	l			4		0.4
Con. 18	1	E25								4		0.6
	1	E26	int							4		0.8
	1	E26	ext/int									0.8
	1	E38	ext/int	rc-1a	u	undec	c			4		0.6
	1	E38	int							4		0.9
	1	E38	ext/int							4		0.7
	2	E2								4		0.8
	1	E2	int							4		0.7
	1	E2	ext							4		0.8
	1	E1	int							4		0.8
	2	E4	ext/int							4		0.5
	1	E4								5		0.6
	1	E32		sp4-v	l	sp4-v	l			4		0.6
	1	E28										0.8
	1	S1		rfp-5	u	undec	u					0.7
	1	S1		rfp-1b	u					4		0.6
	1	S1		rfp-5	u					3	18	0.5
	1	S4								4		0.5
	1	S6	int							4		0.6
	1	S3	int									0.6
	1	T19	int	sp4-v	l					3		0.6
	1	T3								4		0.5
	1	T3	ext/int	sl-14	u					2		0.5
	1	E4	ext/int	sp4-v	l							0.4
	1	S1	int	sp4-v	l							0.5
	1	S1		sp4-v	l							0.5
	1	S4										0.4
	1	E36	ext	sp4-v	l					4		0.7
	1	E34	ext							4		0.6
	1	T25	ext/int	spi-l	u	sp1-l	u	sp1-l	u	2	17	0.6
	1	S1										0.7
	1	S1		sp4-v	l					3		0.7
	1	T18	int							2		0.8
	1	S6								4		0.6
	1	S6	ext/int							3	16	0.6
	1	E2	ext/int							5		0.6
	2	E46	ext/int							4		0.9

TABLE W.4 Rims (*cont.*)

Context	#	R.Typ	Brn	Dec1	L1	Dec2	L2	Dec3	L3	Ang	Diam	Mx. thick
	1	E38	ext/int							4		0.8
	2	T18	int							4		0.8
	1	E4	int							4		0.6
Con. 20	1	S6	ext									0.6
Con. 21	1	E4	int									0.8
	2	E4	int							5		0.8
Con. 22	1	E4										0.6
Total	275											

Analysis by Sam Nixon and David Kay

CATALOGUE X

Birnin Lafiya (S13)

Jennifer Wexler and Nestor Labiyi

1 Location

Trench 13 was a 2 × 2 m excavation unit located on the site of Birnin Lafiya. It was situated on a slope at the presumed western edge of the site, midway down from the high point of a mound and below a distinctive red baobab tree. Archaeological material was visible as a high-density scatter of pottery in the area surrounding the unit. No other obvious surface features were present and the unit's location was chosen in order to examine the deposition history near the as yet untested western edge of the mound.

2 Discovery

Trench 13 was part of the systematic investigation of the large habitation mound of Birnin Lafiya.

3 Destruction Risks

The site is ploughed regularly by a farmer from Birni Lafia and is likely subject to erosion. Mitigation measures are not urgent.

4 Excavation

The trench was 2 × 2 m and was excavated between 3 January and 5 February 2014. The excavation was supervised by Jennifer Wexler and (for part of the work) Nestor Labiyi, with Samson Tokannou assisting for the first period of excavation and Alidou Abdou Dramane assisting during the second part, as well as participation from local workmen. Excavation proceeded in spits of 10 cm starting at the ground surface, which was at 40 cm BD. Within each spit, archaeological contexts (i.e. distinct units) were separated, and sieved and bagged separately. All material was sieved down to 5 mm, except for the first excavated level (Level 1, 40–50 cm), removed without sieving as it appeared to have been disturbed by agricultural activities. The trench was ended 390cm BD upon reaching sterile soil.

5 Layers and Contexts

Level 1 was a hard, crumbly brown loamy soil with mixed gravels and potsherds, and grey sandy soil appearing in the southeast corner at base of the level. A bead (SF 2014-12) was recovered in this level, which was otherwise not sieved; the bead, with a red exterior and black interior, was initially thought to be plastic or ceramic but was later identified as possible ore or reworked slag (Chloë Duckworth, University of Leicester, pers. comm).

Level 2 featured a brown, hard, clayey soil (Context 2) with small gravels and mixed sherds found throughout most of the trench, and a loose, grey, sandy and ashy soil occurring in the southern portion of the trench (Context 3), concentrated in the southeast and southwest corners and suggesting the presence of a pit.

Level 3 was split into five contexts. Context 2 continued to be present throughout most of the trench, but four new contexts were also noted: Context 4, a pit with grey sandy soil in the southeast corner; Context 6, a pit with grey sandy soil in the southwest corner; Context 5, a mixed sandy area in southern portion of trench between Contexts 4 and 6, and finally Context 7, a small sandy pit in the northeast quadrant of the trench.

Level 4 was a brown, compact silty soil with mixed gravels and pottery, and it occurred throughout most of the trench (Context 8), replacing the hard clayey soil (Context 2), while the sandy pit continued in southeast corner (Context 4). Contexts 5–7 disappeared.

Level 5 saw a brown, compact silty soil with mixed gravels and pottery occurring throughout most of the trench (Context 9), with the pit (Context 4) shrinking in the southeast corner, and two small sandy pits (Contexts 10–11) appearing in the southeast quadrant of the trench.

In Level 6 a brown, compact silty soil with mixed gravels and pottery was found throughout the entire trench (Context 12).

Level 7 saw the continuation of Context 12 with the addition of some slag and an increase in small lateritic nodules in the soil.

Level 8 saw the continuation of same context.

Within Level 9, at 130cm BD, a step of 50 cm width was cut along the northern portion of the trench to

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FIGURE X.1 Location of Trench 13 at Birnin Lafiya, dominated by a large baobab

reduce overburden and ease access. The soil continued to be of the same type found in the previous levels but was renamed Context 13 to reflect the changed dimension of the trench.

Level 10 saw the continuation of Context 13.

Level 11 saw the continuation of Context 13, with slightly more clay inclusions.

Level 12 featured the beginning of another pit structure with grey, sandy soil in the southeast side of the trench (Context 14), with compact yellowish-brown silty soil found in the rest of the trench (Context 15). A clay line was visible at the interface of Contexts 14 and 15, probably the edge of the pit.

Level 13 saw the continuation of Contexts 14 and 15, with the pit structure now concentrated in the southeast corner again.

Level 14 saw further continuation of Contexts 14 and 15, although Context 14 was shrinking to concentrate in the southeast corner. A natural crack in the soil appeared, running across the trench northeast/southwest, and remained a feature of the trench to a depth of 260cm BD.

Level 15 saw Context 14 continue to shrink, while compacted yellowish/reddish-brown silt (Context 15) occurred throughout rest of trench with small gravels, ferrous rocks, and widespread charcoal throughout.

Level 16 marked the end of Context 14, indicating the bottom of this pit, and the continued presence of Context 15.

Level 17 featured sandy lenses continuing in the southeast corner (Context 16). Context 15 also continued, and a second step was cut down at 160cm into the existing step. Part of a large animal mandible, likely cattle (Linseele & Wouters, this volume), was found along the northwest wall of the trench next to the step, which was sectioned lengthwise (west/east) in order to trace the extent of the bones, taking out intervening soil down to around 200cm. From this level (200cm), this section was sieved as a separate context (Context 15a) from Context 15 (the rest of the trench). In Context 15a, instead of following the standard 10 cm levels, we hand-troweled and hand-picked from c. 205–215cm searching for any notable faunal remains, but it became clear that while there were many mixed bones found throughout, no *in situ* skeleton was present. At 210cm the mandible was removed largely as a complete specimen and bagged separately. It is most likely that Context 15a represented the remains of another pit; such a feature was suggested in the wall profile. The soil between

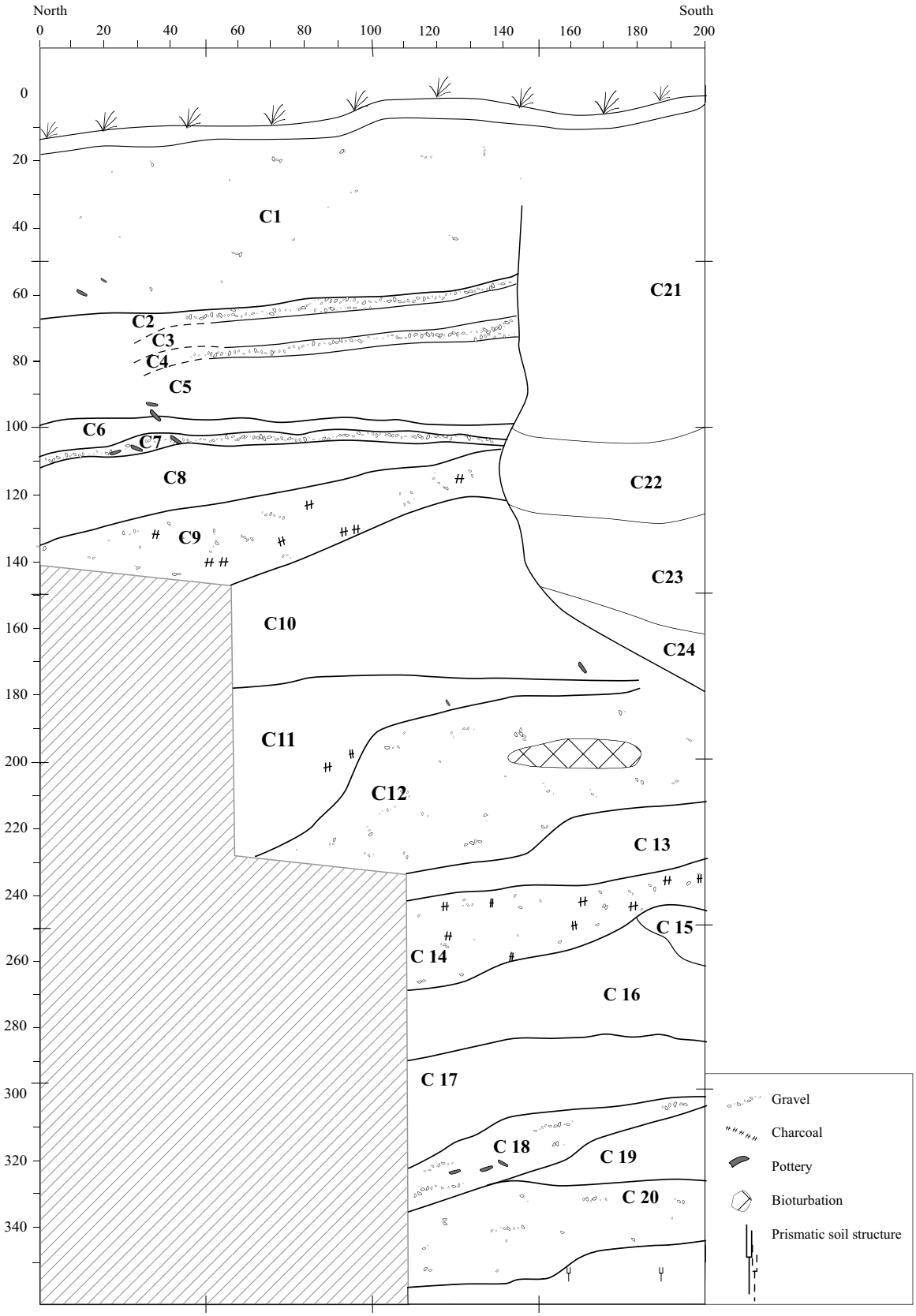

FIGURE X.2 East section at completion

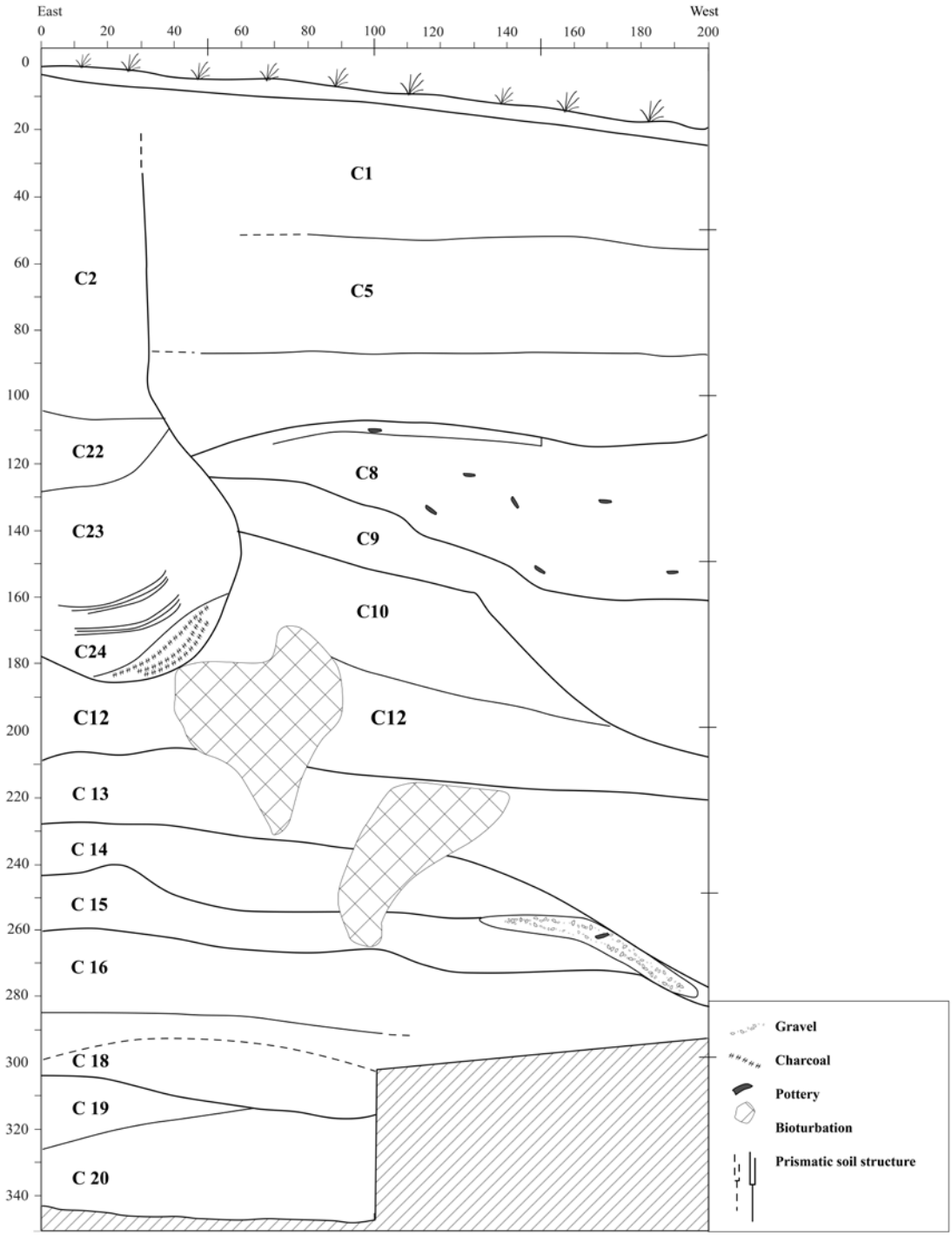

FIGURE X.3 South section at completion. Compare Figure X.4.

200 and 220cm BD in Context 15a and in the area directly south featured chunks of burnt clay and contained burnt wood, charcoal, laterite pebbles, and burnt pottery, and some ashy/sandy lenses.

Level 18 saw the continuation of Contexts 15, 15a and 16.

Level 19 saw the continuation of Contexts 15, 15a and 16, with more compact soil and numerous pebbles in the northwest section of the trench.

Level 20 was marked by the appearance of dark yellowish-brown compact clayey silt across the entire trench (Context 17), with a continued presence of the pebbles in the northwest section of the trench.

Level 21 saw the continuation of Context 17, with increasing pebbles in the northwest. For safety reasons the size of the trench was decreased to 1 × 2 m, and excavation continued in the southern portion in 10 cm spits, allow-

FIGURE X.4 South section at completion. Compare Figure X.3.

ing us to section both the northwest and southeast areas, while the northern half (1 m) was closed.

Level 22 saw the continuation of Context 17.

Level 23 saw the continuation of Context 17, with visible new soil layers at the base of the level.

Level 24 revealed a pit structure (Context 19) of approximately 73 × 105 cm, which appeared in the southeast corner with grey, very compacted, ashy soil, apparently bordered by baked earth fragments. The pit continued to a depth of c. 360cm. The rest of the trench (Context 18) had dark brown, very compact, clayey silt with lots of pottery, bone, large pieces of charcoal, and some small finds.

Level 25 saw the continuation of Contexts 18 and 19. Context 19, the pit structure, encompassed the entire southeast quarter of the trench. It was partially outlined, as indicated in the previous level, and contained many daub or piled wall mud debris.

Level 26 saw the continuation of Contexts 18 and 19. Soil was increasingly compact with many pebbles, especially in the northwest corner. Context 19 continued to expand to the entirety of the southeast quadrant of the trench, and a large partial pot was found at 300cm BD.

Level 27 featured the continuation of Contexts 18 and 19, with the soil becoming increasingly ashy in the southeast corner. At the base of this level at the northern edge of the two contexts, a dark brown ashy stain of c. 82cm in width appeared. This feature, which was sampled for flotation and yielded millet, rice and sorghum (Champion & Fuller,

this volume, Table 23.2), had a depth of c. 10cm and was very ashy. At the base of this ashy deposit there was some harder soil with baked clay and charcoal, suggesting the possible remains of a hearth or another pit. Remains of another possible small pit appeared in the northwest corner of Context 18, with part of a broken pot.

From Level 28 the trench was reduced to 1 × 1 m focusing on the southeast corner in order to trace the end of the Context 19 pit feature. Excavation continued in 20cm spits for the sake of speed, given the depth of the trench. This was a quite a rich and very ashy level and we found an almost complete animal figurine, and at least eight other terracotta objects (SF 2014-19 and 2014-20b to -27). The level also contained a quantity of daub fragments, slag, pottery, and bone. All in all, an increase was noted in the number of small finds recovered towards the bottom of the pit, but whether this is a reflection of post-depositional factors, or represents phases of deposition, remains uncertain.

Level 29 was marked by the continuation of the rich deposit with very ashy, loose soil, and finds include some very large sherds. We also found a worked bone (SF 2014-06b) near some large sherds, a possible ceramic figurine fragment (SF 2014-24), and bone throughout.

Level 30 continued these artefact-rich layers with a large amount of pottery, bone (including large teeth), daub fragments, charcoal, and various small finds, including a stone bead (SF 2014-06), a polished tooth, two partial ceramic figurines, and a miniature pot (SF 2014-25 to -27). The soil became increasingly less sandy/ashy, and at the base of this level we came upon a lighter brown, compact, clayey soil type.

From the beginning of Level 31 it was clear that sterile soil had been reached. The soil became very heavy, with chunks of grey and yellow-brown clay and large, angular rocks but nothing to indicate an archaeological layer. These levels were excavated in two 10 cm spits (370–380cm and 380–390cm), in order to confirm that we had indeed reached sterile levels. A few small sherds and one small piece of bone were recovered in these levels, probably in relation to the transition between the soils and movement of objects through animal burrowing rather than any archaeological deposition. The trench was closed at 390cm BD.

6 Stratigraphy

The first excavated level was started 40cm below the datum point. This first level was not sieved. The soil at this level was fairly uniform with mixed sherds and pebbles. A grey, sandy, artifact-rich soil began to appear at 50cm depth in the southeast corner and eventually extended across part of the southern portion of the trench.

As we continued to excavate through the next two levels (50–60cm and 60–70cm), this area of grey sandy soil centered in the southeast (Context 4) and southwest (Context 6) corners of the trench. Particularly in Context 4, the soil became very soft and ashy, and contained substantial quantities of burnt bone, shell, iron and ceramics, indicative of a sizeable pit. Context 6 appeared to be a smaller, shallow pit and it disappeared by around 70cm BD. Context 4 however continued (albeit as a gradually shrinking feature) in the southeast corner until around 90cm BD, thus extending over a depth of some 40cm.

Between c. 90–150cm BD a fairly consistent soil was encountered across the trench (Context 12), with compact, hard soil with gravels, abundant sherds, and slag/iron pieces. At 130cm, a step 50 cm wide was cut along the northern quarter of the trench.

At 150–160cm, another pit feature (Context 14) appeared in the southeast portion of the trench. The pit was composed of grey, sandy/ashy soil which is clearly visible in the wall profile. By 170cm, this feature seemed concentrated in the southeast corner, in a similar position to the earlier Context 4, while the remainder of the trench featured a fairly uniform compact yellowish-brown silty soil. A large amount of pottery and charcoal was found both inside and outside the pit feature. Contexts 4 and 14 may represent two phases of filling up of the same deep pit going to c. 260cm.

By 190cm, the pit (Context 14) had shrunk to only a small area directly in the southeast corner, and it came to an end by 200cm with a clear bottom visible in the wall profile. Sandy lenses continued in this part of the trench (Context 16), excavated separately in order to assess their relationship to the overlying pit structure. The rest of the trench continued to feature consistent compacted yellowish-brown silt. The depth of the trench made it necessary to cut a second step at 160cm BD into the existing step along the northern portion of the trench.

At 200cm part of a large animal mandible was encountered along the northwest wall of the trench; a new context was defined (15a) and excavation proceeded slowly with the hope of recovering an *in situ* skeleton. This did not happen, but excavation suggests that Context 15a represented a pit, as is visible in the wall profile. The quantities of fired earth/baked clay, charcoal, laterite pebbles, burnt pottery, and ashy/sandy lenses recovered in the soil between 200 and 220cm BD in Context 15a and in the area directly south of it, together with chunks of burnt clay and

daub fragments containing burnt wood, suggest a specific depositional feature, probably a pit, as became clear subsequently on inspection of the wall profiles.

By around 230–240 cm, the soil throughout the trench became more uniform again with very compact clayey silt (Context 17), although more compacted in the northwest corner and more sandy in the southeast. At 250cm, the trench was sectioned further and excavation continued only in the southern 1 × 2 m portion of the trench. Large amounts of bone, pottery, and charcoal continued to be found throughout the trench.

At 270cm, another pit structure (Context 19) appeared in the southeast corner. Unlike the previous pit occurring at a higher level in this general location, Context 19 appeared to be constituted of compacted ashy clay, rather than loose sandy ash, and seemed outlined by tan baked clay or daub. This pit structure continued to broaden out to c. 105 × 73 cm, encompassing the entire southeast quarter of the trench. Although Context 19 is situated in the same general area as Contexts 4 and 14, which are also pit features, these seem quite distinct. This relationship was very clear in the southeast corner wall profile. There was a very obvious gap of c. 20 cm between the bottom of the "upper pit" (Contexts 4 and 14) and the "lower pit" (Context 19). This boundary suggests that these are two separate pits, particularly since the depositional composition and histories seem quite different. The pit continued to a depth of c. 360cm.

At 310cm, a dark brown ashy stain appeared at the boundary between Contexts 18 and 19 and was sampled for flotation. At the base of this deposit there was some baked clay and charcoal with another possible small pit in the northwest corner of Context 18.

After 310 cm, the trench was reduced to 1 × 1 m in the southeast corner, and excavation proceeded in 20 cm spits, with a view to determining the base of the trench. This level featured ample finds of artefacts. We encountered artefact-rich deposits until 370cm BD, and the pit appeared to continue. We then came upon a lighter brown, clayey compact soil type, suggesting that were reaching sterile levels. These were investigated by two further spits and no significant artefacts or indications of archaeological deposits were found.

7 Interpretation and Cultural Attribution

The pottery from this trench is under analysis in Benin and thus data are not provided here.

Trench 13 is a deep trench with a series of depositional episodes. Rather than representing specific occupational layers, the trench appears to contain a sequence of settlement debris and pits seemingly typical to its downslope position at the edge of the main habitation areas of Birnin Lafiya. Despite its lack of clear occupation structures or layers, the excavated sequence recorded in this trench plays a key role in understanding the overall stratigraphy, morphology and site formation, and artefact sequences at the site. The key features are the series of repeating pits cutting in and out of the southeast corner, and to a lesser extent in the middle section along the western wall. Notable finds include numerous modeled clay objects (Tchibozo, this volume) as well as two marine bivalves (Linseele & Wouters, this volume).

Radiocarbon dates indicate that this trench has a date range of cal AD 600–900. The three samples submitted were chosen from Contexts 14 and 19 with the hope of better dating the earliest phase of Birnin Lafiya (0–500 AD), but they turned out slightly more recent. Priorities for future dating will be the bottom of Context 19, in order to clarify the depositional history at the base of the trench.

8 Radiocarbon Dates

Beta-411139	1210	30	BLAF-S13-234. Context 14, 150–160. To date large pit (Context 14, c. 150–190cm depth) in SE corner.	Phase 3
Beta-411140	1320	30	BLAF-S13-15. Context 14, 180–190. From base of grey, ashy, sandy pit (Context 14) in SE corner of the trench.	Phase 3
Beta-411141	1300	30	BLAF-S13-232. Context 19, 280–290. Sample taken from daub-lined pit in SE corner. Pit has compacted grey, ashy soil.	Phase 3

CATALOGUE Y

Kargui (KG1-14-S1)

Alexandre Livingstone Smith and Anne Filippini

1 Location

Kargui is a contemporary settlement located on the road from Guene to Karimama. Oral traditions report that this settlement escaped destruction by the armies of Issa Korombe towards the end of the nineteenth century, but its foundation date is uncertain. A key element of its history is that it was a long-time ally of Karimama against Birnin Lafiya (Gosselain pers. comm.).

2 Geographical coordinates

LAT: 11,93655398 LONG: 3,230812959 (WGS84)

3 Discovery

The site was identified and excavated by Alexandre Livingstone Smith on 11 February 2014.

4 Destruction Risks

The site is a contemporary settlement. The test pit is in the middle of a courtyard.

5 Site

Kargui is located on the edge of the modern floodplain. The initial survey yielded no material. The extent of the site is unknown, as it lies under the contemporary village.

6 Excavation

There has been no prior excavations carried out at Kargui. The test pit, a standard 1 × 1 m, was set up in the middle of a courtyard in the settlement. It was excavated in spits of 10 cm (except for the superficial layer which was excavated in one spit of 20 cm). Within each spit, archaeological contexts (i.e. distinct units) were separately sieved and bagged. All spits were sieved down to 5 mm. The excavation was interrupted at 170 cm when reaching the natural substratum.

7 Stratigraphy

The stratigraphy consists in settlement rubble with a pit structure, apparently partly re-excavated.

8 Finds

The material excavated at Kargui consists mainly of black polished incised pottery, with twisted cord rouletted and single impressions and some *blepharis* roulette decoration (present between 40 and 90 cm). Pottery decorated with folded strip rouletting is infrequent and very eroded. It should be considered as a background noise. Three glass bracelets were recovered (SF 2014-27, 29 and 30; see Tomboutou entry, Figure AC.2 for an illustration of two of these), all between 60 and 80 cm, and glass fragments at 80–90 and 90–100 (SF 2014-63 and 2014-28). Three cowrie shells (SF 2014-09 to 11) were recovered, as well as four rather intriguing metal objects. These were an indeterminate object of copper alloy (SF 2014-90) and two iron objects (SF 2014-91 and -92). Finally, a fragmentary plaque of an unknown metal (SF 2014-166) was discovered in the upper layers of the trench. See Filippini, Figure 19.1 for an illustration of these.

9 Interpretation and Cultural Attribution

Kargui may be related to the history of Karimama. Oral historical data put its development around the turn of the nineteenth century. The excavation shows that the site is not a settlement mound and that indeed the pottery is different from the pottery found on the medieval settlement mounds. A post-thirteenth century date was considered likely and subsequently confirmed by two radiocarbon dates. These are both unfortunately marred by a high offset value between the stable isotope of carbon measured on the mass spectrometer compared with that done on the AMS, but they are nonetheless considered likely accurate, and place the layers excavated in the period between the late seventeenth century AD and the modern day.

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FIGURE Y.1 Excavation atmosphere

FIGURE Y.2 North section at completion

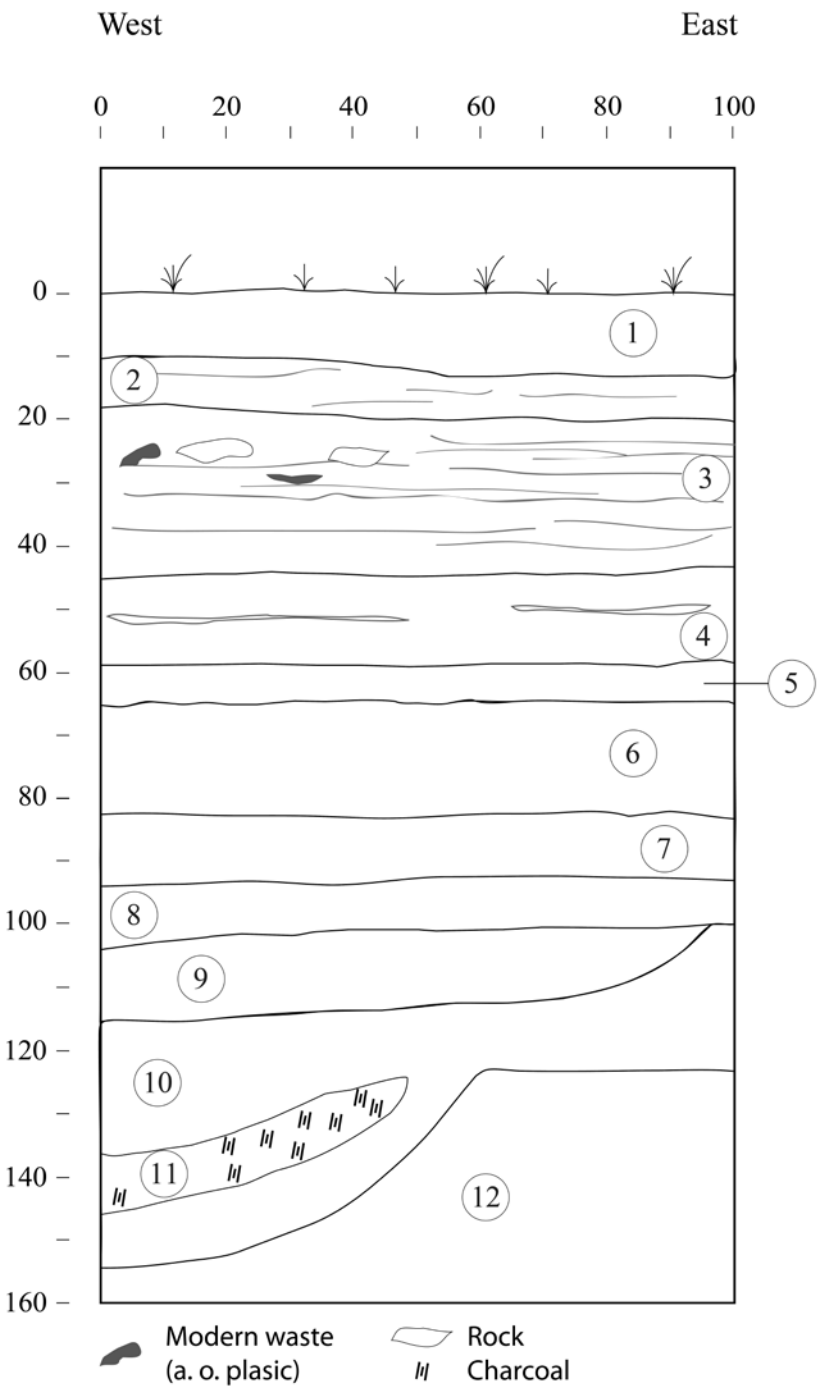

FIGURE Y.3
KGI-14-SI, North section at completion
1 Grey beige compact sand
2 Yellow sand
3 Light beige sand with lamination
4 Yellow sand
5 Light beige with lamination
6 Yellow sand
7 Black "greasy" clay
8 Dark brown sand
9 Yellow orange sand
10 Black "greasy" sand
11 Black sand with very abundant charcoal and carbonised organic material
12 Yellow orange sand (substratum)

10 Radiocarbon Dates

OxA-30957	138	29	KGI 14 SI, Context 7	Phase 5
OxA-30958	168	29	KGI 14 SI, Context 11	Phase 5

TABLE Y.1 Desampling

Level	Number
0–20	16
20–30	5
30–40	8
40–50	13
50–60	0
60–70	7
70–80	5
80–90	16
90–100	14
100–110	21
110–120	15
120–130	0
130–140	5
140–150	2
Total	**127**

Analysis in the field by Alexandre Livingstone Smith and at UEA by Sam Nixon and Anne Haour

TABLE Y.2 Category 4

Level	Undecorated	Illegible
0–20	0	0
20–30	1	1
30–40	3	1
40–50	3	1
50–60	3	0
60–70	1	1
70–80	9	0
80–90	13	0
90–100	16	0
100–110	16	0
110–120	7	0
120–130	9	0
130–140	4	0
140–150	2	0
Total (91)	**87**	**4**

Analysis by Sam Nixon

TABLE Y.3 Category 3

Context	#	Burn	Dec1	Dec2	Dec3	Dec4	Dec 5	Dec 6
0–20	3	ext/int						
	2	ext						
	1		rfp-1b					
	1	int	roul					
	1	int	undec					
20–30	1	ext/int						
	1	int	indis					
	1		roul					
30–40	1	int						
	3	ext/int						
	3	ext						
	1		indis					
40–50	3	int						
	1	ext/int						
	1		indis					
	1		blepharis					
50–60	1	Y						
	1		rc-1a					
60–70	1	ext						
	1		sl-1	blepharis				
	1		rc-1a					
70–80	3	ext						
	6	ext/int						

TABLE Y.3 Category 3 (*cont.*)

Context	#	Burn	Dec1	Dec2	Dec3	Dec4	Dec 5	Dec 6
	1		plain	rc-1a				
	1	ext	plain	ch	plain	mch-3	rc-1a	ch
80–90	2	ext/int						
	1	int						
	3	ext						
	1	ext	sl-1	rc-1a				
	1	ext	plain	sl-3 roul	plain			
	1	ext/int	sl-3	sh-11				
	1		undec	blepharis	sl-1	sx		
	1	ext/int	rc-1a on inside lip					
90–100	1		rfp-1b					
	4	ext/int						
	8	ext						
	1	int						
	1		ic-1					
100–110	3	ext						
	1	ext/int						
	1		plain	rc-1b				
	1		herb					
	1	ext	plain	sp3-l	rc-1a			
	1	ext	plain	sl-1				
110–120	7	ext						
	1	ext/int						
	1		rc-1a					
	1	ext/int	plain	rc-1a				
	1		plain	ch	rc-1a			
	1		perf					
120–130	1	ext						
	1	int						
130–140	1	ext						
140–150	1	ext						
Total	**91**							

Analysis by Sam Nixon and Anne Haour

TABLE Y.4 Rims

Context	#	R Type	Brn	Dec1	L1	Dec2	L2	Ang	Diam	Mx thick
0–20	1	S4	ext/int					4		0.7
	1	S6						4		0.6
20–30	1	S1	ext/int	undec	u	sl-1	u	3	27	0.8
30–40	1	E4						3		0.6
40–50	1	E32	ext/int	undec	c	sl-1	n	4		0.6
	1	E17	ext/int					4		0.9
60–70	1	S1								0.6
	1	T17						2	16	0.9
70–80	1	E9	ext/int					4		0.8
80–90	1	S3	ext							0.7
	1	S1						3		0.8
	1	E37	ext/int					4		0.9
	1	E9	ext/int					4		0.8
100–110	1	S1								1.0
	1	T13	ext/int	sl-4	u			2		1.3
120–130	1	E21	ext/int					4		0.7
130–140	1	E37						4		0.5
Total	**17**									

Analysis by David Kay

CATALOGUE Z

Alibori 1

Didier N'Dah

1 Location

Alibori 1 (ALB-14-1) is located south of Kargui Bridge at the Place known as Goulabo on the edge of a garden, on the right bank of the Alibori, a tributary of the Niger River. The site is located 150 m from the riverbed, and its surface is covered with pottery sherds in very high concentrations.

2 Geographical Coordinates

11° 55.428' N; 3° 13.205' E

3 Discovery

The site was discovered in 2001 during a survey carried out by Didier N'Dah and was the subject of a survey in 2011 by Anne Haour, Alexandre Livingstone Smith and Didier N'Dah. Nadia Khalaf conducted an intensive survey on the site in 2014 which involved surface collections.

4 Destruction Risks

The site is eroded each year by runoff. The nearby road towards Bontassi brings with it the threat of destruction by traffic. Mitigation measures are urgent.

5 Site

While most sites located in the area and identified as featuring a surface concentration of potsherds appear to be settlement mounds, we noticed that some sites that were not mounds but instead were flat, located along the Alibori, also had high surface concentrations of potsherds. Alibori 1 is one such site. It is flat with a very high concentration of pottery (Figure Z.1). Research conducted here aimed to understand the nature of these types of sites and what links they have with settlement mounds in the area.

6 Excavation

Excavation was conducted in 10 cm spits, while respecting contexts and structures. The depth during excavation was taken from the northwest corner and all sediments were sieved with a 5 mm mesh.

Trench 1 was of 2 × 1 m in size and was later extended by 1 × 1 m (we called the extension Trench 2). The test pit was established taking in account a concentration of pottery visible in section, also being uncovered by erosion in the east of the site. The trench was oriented north-south and parallel to the pottery concentration noted in the exposed stratigraphy.

7 Stratigraphy

The first level, 0–10 cm, featured a high concentration of potsherds. A large piece of pottery was found in the northern part of the trench after the first 5 cm of excavation. The concentration of fragmented sherds in this level was denser in the south of the test pit. The soil was very compact and yellowish.

Level 2, 10–20 cm, revealed more sherds of broken pottery. Excavation identified a large concentration of pottery sherds in the southeast of the test pit. This concentration was considered a feature. Soil texture was less compact and the colour changed from yellow to reddish. This feature, measuring 30 × 80 cm, was retained, while excavation of the rest of the test pit continued.

Level 3, 20–30 cm, was where the feature was most prominent. Level 4, 30–40 cm, contained very little pottery and the soil colour became completely red. Levels 5 and 6 (40–50 cm and 50–60cm) were sterile.

To better identify the feature, the test pit was extended eastward by 1 × 1 m. Levels 1 and 2 (0–10 cm and 10–20 cm) were identical to those excavated before. Potsherds were recovered and at 20 cm feature appeared and was excavated. It consisted of large pieces of pottery sherds and belonged to the same feature as identified earlier (Figures Z.2, Z.3).

In summary, the stratigraphy featured three layers. The first layer was brownish yellow, the second layer mottled yellowish brown, and the third layer was light yellowish.

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FIGURE Z.1 Concentration of potsherds on the surface of Alibori I site

FIGURE Z.2 Partial view of the feature uncovered by Trench 2, an extension of Trench 1. The feature consists of a dense concentration of potsherds

FIGURE Z.3 Feature during excavation

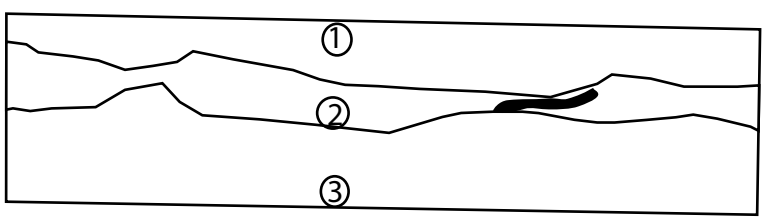

FIGURE Z.4 Alibori Site 1: east section. Context 1: brownish yellow layer. Context 2: mottled yellowish brown layer. Context 3: Light yellowish mottled layer.

8 Interpretation and Cultural Attribution

The dates show that the site was occupied at the same time as the final occupation of the main site of Birnin Lafiya, during Phase 4. Our excavation at Alibori suggests that these sites were settlement mounds that erosion has destroyed. Erosion being very strong at the edge of rivers, in this case the Alibori river, the sediments would have been washed away until the mounds became flattened. This hypothesis is all the more plausible given that we have identified near the site another mound at risk of destruction, and several other intact mounds are located a little further away. Pottery pavements similar to those at the site of Birnin Lafiya were also identified at Alibori 1.

9 Radiocarbon Dates

Beta-378260	750	30	ALB 14 Site 1, SII Context 3, 20–30 cm. From a concentration of large potsherds.	Phase 4
Beta-378256	710	30	ALB 14 Site 1, SI, 0–10 cm. Upper part of the stratigraphy	Phase 4

CATALOGUE AA

Alibori Site 2

Didier N'Dah

1 Location

Alibori Site 2 is located 1.5 km north of the village of Bontassi on the left bank of the Alibori River. Two test pits, S3 and S4, were excavated at the site.

2 Geographical Coordinates

11° 56.713' N; 3° 11.237' E

3 Discovery

The site was discovered in 2013 during a survey carried out along the Alibori by Nadia Khalaf and Didier N'Dah, accompanied by a team of students from the University of Abomey-Calavi.

4 Destruction Risks

The site is ploughed and part of it is on an eroding slope. It is not under any specific threat and mitigation measures are not urgent.

5 Site

The site presents as a slight elevation of 700 m^2 littered with lithic débitage and concentrations of pottery. Pottery pavements were found in places. It is the combination of lithic material and pottery which led us to place the two test pits there. In fact, it was noted that some other sites along the rivers in the area featured a similar mixture of potsherds and lithic débitage on the surface. We supposed that these types of sites may well belong to transition periods from Stone Age to Iron Age, which are under-studied periods in West Africa in general, and in Benin in particular. According to some researchers, the first millennium BC was marked by continuity in the passage from final Stone Age to Iron Age, while for other researchers this was a period of discontinuity during which crises and fundamental changes were noted in the human occupation of West Africa. The lack of data for the period requires further investigation, and the site of Alibori 2 seemed appropriate for this. Accordingly, the aim of the two excavations here was to help establish a deep chronological sequence in order to elucidate the question of continuity or discontinuity of settlement in the Niger valley, and to further understanding of the transition process from the final Stone Age to the Iron Age in this region.

6 Excavation

The first test pit (Trench 3), 2 × 1 m in size with its greater length oriented north-south, was laid on the east part of the site (Figure AA.1). Prior to starting the excavation, surface material was collected from a grid of 2 × 1 m.

The first spit, 0–10 cm, consisted of relatively compact yellowish sediment. Sherds of pottery, lithic débitage and charcoal were collected. At the beginning of Level 2 (10–20 cm), the sediment took on a reddish colour and the southern part of the test pit was harder than the northern half. Gradually, as Level 2 continued, the sediment was less hard and the density of artefacts decreased. At the end of Level 2 there still occurred a mixture of lithics and pottery, but the pottery was more concentrated in the southern half of the test pit, and lithic finds more concentrated in the northern half.

Levels 3, 4 and 5 (20–30 cm, 30–40 cm and 40–50 cm) confirmed this distribution of artefacts. As for the colour of the sediments, the southern half was reddish while the northern half was yellowish. Pottery was concentrated in the southern part, and the lithic finds in the northern part.

Level 6 (50–60 cm) evidenced a clear separation in the distribution of artefacts and sediments. The north side of the trench was yellowish with only lithic débitage, while the southern half was reddish with pottery sherds essentially and some lithic pieces. An ashy layer was identified near the south wall, and collected for archaeobotanical flotation.

Levels 7 and 8 (60–70 cm and 70–80 cm) conclusively confirmed the spatial distribution of artefacts. The northern half of the test pit consisted only of lithic débitage without any pottery sherds or charcoal, while the southern half contained mostly pottery sherds and charcoal, with few lithics.

At Level 9 (80–90 cm) the trench became sterile (at 85 cm BD). Excavation concluded at 90 cm (Figure AA.2).

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FIGURE AA.1 Université Abomey-Calavi students setting out Trench 3

FIGURE AA.2 South section of Trench 3

To verify the distribution of artefacts noted, a second test pit of 1 × 1 m (Trench 4) was set out at the top of the site where pavements had been identified (Figure AA.3). To better document the pavements, a grid of 5 × 3 m was laid out covering the entire surface of the pavements. This area was then subdivided into squares of 1 × 1 m to which we assigned letters (A, B, C, D, E) and numbers (1, 2, 3). The pavements were planned, photographed and partly removed.

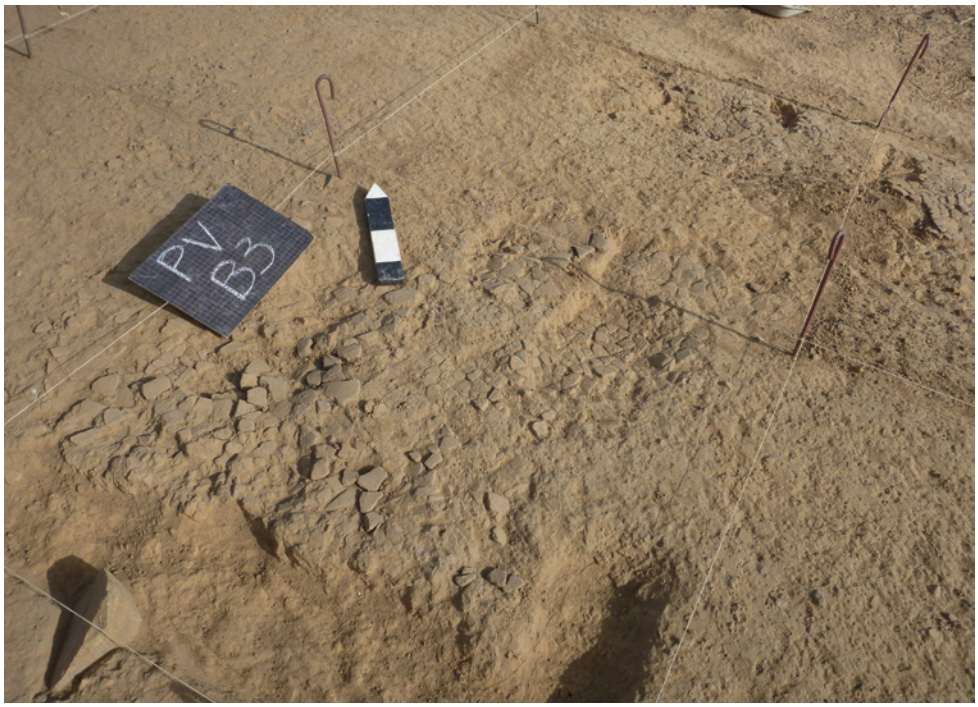

FIGURE AA.3 Pottery pavements visible on the surface of the site, prior to their dismantling to set out Trench 4

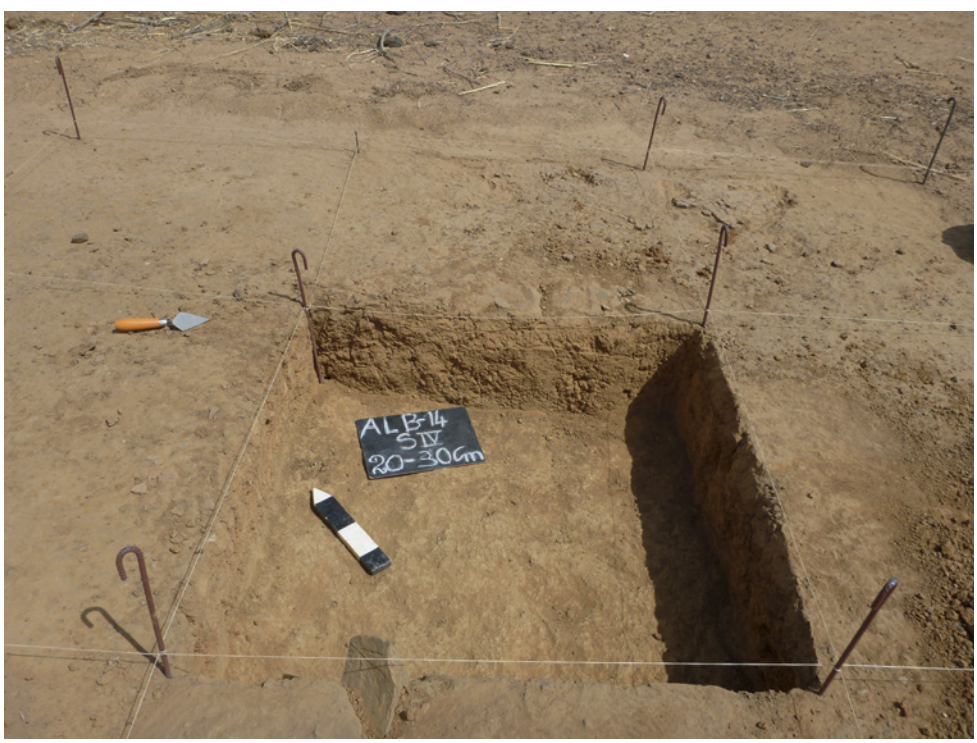

FIGURE AA.4 Trench 4 in the early stages of excavation

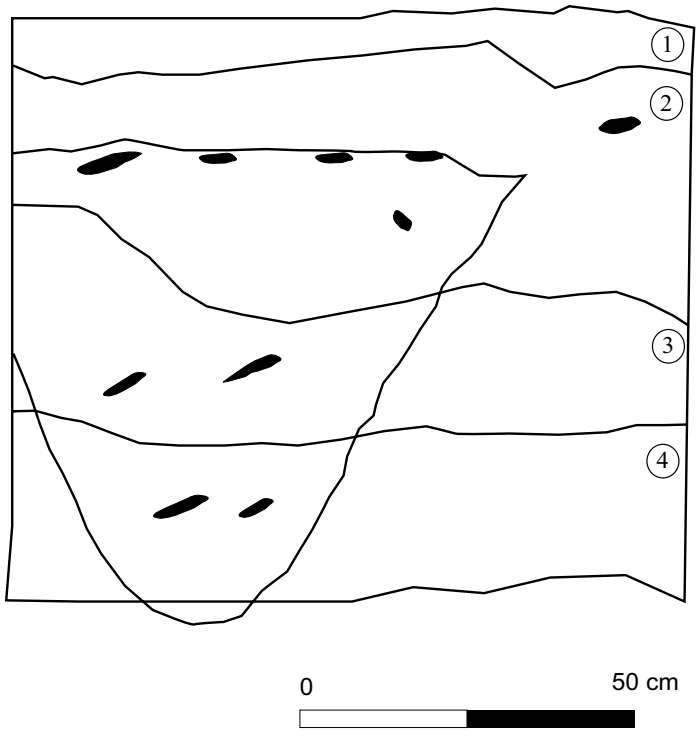

FIGURE AA.5
Trench 3, south section at completion. Compare Figure AA.2
1 Yellowish brown, 10 yr 5/4
2 Strong brown, 7.5 yr 5/6
3 Very pale brown, 10 yr 7/4. Mottled with a few lateritic granules
4 Yellow, mottled with reddish lateritic granules 10 yr 7/6

It is the pavements of square B3 that were dismantled to establish Test pit 4. The first levels of 0–10 cm, 10–20 cm and 20–30 cm belonged to the same context, which consisted of reddish-yellow sediment. In this context were very few lithics, and mainly pottery sherds. Level 4 (30–40 cm) showed a marked change in the colour of sediments, becoming yellowish-tan. This layer did not contain lithics and featured very few pottery sherds. Levels 5–7 (40–50 cm to 60–70 cm) showed a mixture of lithic material and pottery sherds. The last two levels (70–80 cm and 80–90 cm) revealed a total lack of potsherds. Sediments from level 4 to 9 remained yellowish-tan in colour.

7 Stratigraphy

Four stratigraphic layers were identified in Trench 3. The first layer was yellowish brown (10yr 5/4), the second layer bright brown (7.5YR 5/6) while the third layer was very pale brown (10yr 7/4). The final layer was a light yellowish soil with reddish lateritic gravel (10yr 7/6).

In Trench 4, three layers were identified. The first layer was reddish yellow (7.5YR 6/6), the second light yellowish brown (10yr 6/4) and the final one a light yellowish soil with reddish lateritic gravel (10yr 7/6).

8 Interpretation

The dates show that last occupation of the site occurred at the same time as the end of the occupation of the main site of Birnin Lafiya. This is also suggested by the presence of pavements on the site surface. The people who occupied this region between the eleventh and thirteenth centuries AD belonged to a culture that can be called 'the Pavement Culture'.

During the excavation of Trench 3, we found that level 50–60 cm marked a clear separation of the distribution of artefacts and sediments. The north side of the test pit was yellowish, with only lithic material and without pottery sherds, while the southern half was reddish with mainly pottery and some lithics. The southern reddish section revealed itself as a pit (Figure AA.2) that contained a thick ashy layer of charcoal. It was from this pit that the dated charcoal and archaeobotanical samples were taken. We must clarify that no separation of lithics and pottery were noted in Trench 4; instead there was a mixture of pottery and lithics until the end of the excavation and no charcoal was found below 20cm so dating was impossible.

Trenches 3 and 4 are 6m from one another.

The dates obtained from Trench 3 show that in the fifth century BC the site was occupied by people who still worked stone and used pottery. The sherds associated with this occupation are fine and little decorated.

9 Radiocarbon Dates

Beta-378258	2440	30	ALB 14 Site 2, SIII 70–80.	Phase 1
Beta-378259	2440	30	ALB 14 Site 2, SIII 50–60.	Phase 1
Beta-378257	730	30	ALB Site 2, SIII 10–20.	Phase 4

Molla (MOL-14-S1)

Inès Corolin Amoussou, Nicolas Nikis, Alexandre Livingstone Smith and Anne Haour

1 Location

Molla is a contemporary village on the Niger river, north of Guene. We placed the test pit (S1) in what informants described as the oldest part of the village.

2 Geographical Coordinates

LAT: 11,890000 LONG: 3,260000 (WGS84)

3 Discovery

The site was identified by Nicolas Nikis, Alexandre Livingstone Smith, Olivier Gosselain and Anne Haour. It was excavated by Carolin Amoussou, on 6 February 2014.

4 Destruction Risks

The site is a rubbish dump. It is not under any specific threat and mitigation measures are not urgent.

5 Site

The test pit was situated in the oldest part of actual Molla according to oral history.

6 Excavation

Molla had never been excavated before. One test pits was excavated. It was 1 × 1 m and excavated by spits of 10 cm (except for the superficial layer which was excavated in one spit of 20 cm). Within each spit, archaeological contexts (i.e. distinct units) were separated, sieved and bagged separately. All the spits were sieved down to 5 mm. The test pit was interrupted at 110 cm into sterile yellow sandy soil.

7 Stratigraphy

The stratigraphy of MOL-14-S1 displays two major phases of occupation. From the modern surface down to -50 cm, there are several layers which include modern rubbish such as plastic bags. A compact yellow sandy layer (Context 7), with no plastic, would represent an older occupation as well as the thick layer (Context 8) which it overlays.

8 Finds

This investigation generated a huge number of small finds. Surface finds include mainly modern plastic and other refuse. Excavated materials include two cowries (SF 2014-07 and 08, at 60–70 cm and 50–60 cm respectively; the latter featured linear incisions on the collumellar and labial sides of the aperture, see Christie & Haour, this volume), a shell bead (SF 2014-64, at 80–90 cm), a modern glass bead (SF 2014-71; S. Magnavita's 'Type 1'), and numerous plastic beads, including one in the shape of a rose (SF 2014-10) and another in the shape of a cowrie (SF 2014-12). A stitched and folded textile (SF 2014-03), very numerous metal fragments including a reworked robar fragment (SF 2014 136-9) and a reworked blue and white painted packaging fragment (SF 2014 136-6), are some of the likely modern materials retrieved. Glass fragments, including a reddish bracelet fragment (SF 2014-34) and a complete clear bottle (SF 2014-32; see Figure AB. 4, left), also figure. Pottery was abundant, with incisions and twisted cord roulette predominating, but painted motifs and *blepharis* also featuring. Three sherds featured what may be a type of untwisted cord roulette. As regards the metal artefacts, 28 items were studied by Anne Filippini but archaeological and contemporary materials are indistinguishable.

9 Interpretation and Cultural Attribution

The upper part of the test pit is clearly a witness of the modern occupation of Molla – a trash midden. The lower part may attest to an older occupation. These can

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FIGURE AB.1
Molla west section at completion

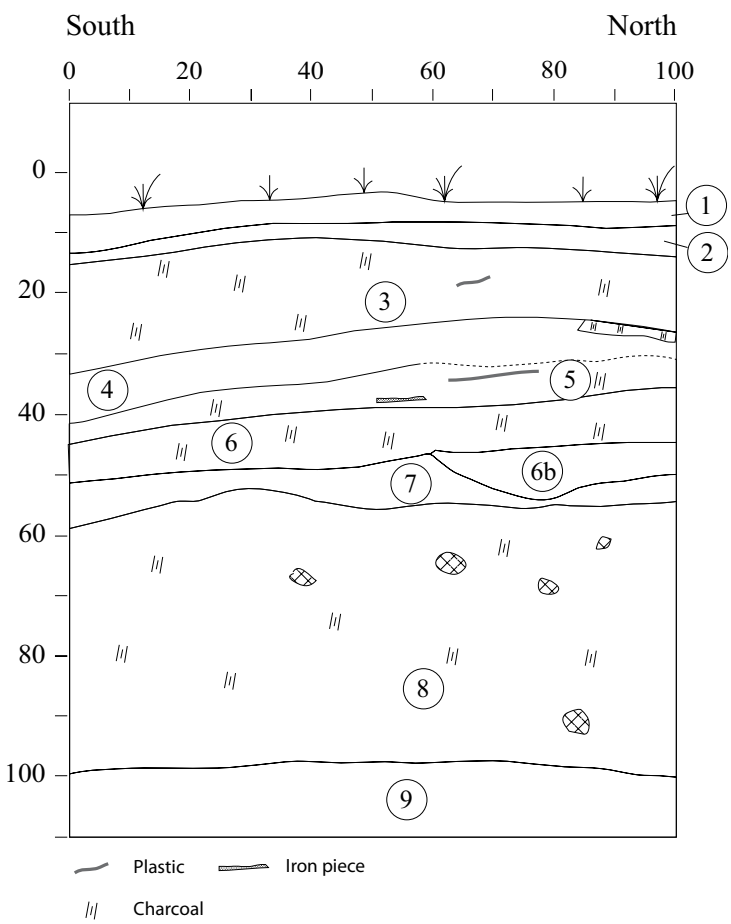

FIGURE AB.2 Molla west section at completion

1 Loose dark grey sandy sediment. Top soil
2 Loose grey sandy sediment with plastic
3 Grey sandy sediment with charcoal and plastic residues
4 Loose grey sandy sediment with plastic. A thin layer of darker sandy sediment with charcoal occurred at a top corner of the layer.
5 loose silty sediment with charcoal, plastic residues and iron fragments
6 Grey sandy sediment with charcoal
6b Small pit dug into layer
8 Grey sandy sediment
7 Yellow compact sandy sediment
8 Compact dark grey sandy sediment
9 Compact yellow sand (natural substratum)

FIGURE AB.3
Glass bottles (left: MOL-14-SI, SF 2014-32; right: GAR-14-SI, SF 2014-09)

tentatively be attributed to the eighteenth or nineteenth century because of the presence of glass and cowrie shells. The plastic disc at 70–80 cm can be considered intrusive, especially given that there were many plastic beads higher up in the stratigraphy Alternatively the presence of *blepharis* and black pottery are background noise in a recent, post-1950 AD midden.

TABLE AB.1 Desampling

Level	Number
0–20	1
20–30	0
30–40	4
40–50	2
50–60	30
60–70	93
70–80	71
80–90	25
90–100	15
100–110	5
Total	**246**

Analysis in the field by Anne Haour and at UEA by David Kay

TABLE AB.2 Category 4

Context	Decorated	Illegible
0–20	4	0
20–30	4	0
30–40	2	0
40–50	7	0
50–60	9	1
60–70	27	0
70–80	63	0
80–90	9	0
90–100	5	0
100–110	1	0
Total	**131**	**1**

Analysis by David Kay

TABLE AB.3 Category 3

Context	#	Burn	Dec1	Dec2	Dec3	Dec4
0–20	2	int				
	1		mch-4			
	1	ext/int	plain			
	1		rfp-1b			
20–30	1		rc-1a			
30–40	1	ext				
	1		undec	ch-2	ch-2	sp1
	1	ext/int	undec	sl-3 over rc-1a	undec	
40–50	1	ext	rc-1a			
50–60	1		pnt-r l-i			
	1		sl-1			
	1		sl-2			
	2	ext/int				
	1		ch-2	ch-2	blepharis	
	1	int	rc-1b			
	1		sl-1	undec	roul	
	1	ext/int	sl-4 on inside and outside			
	1		rc-1a			
	1		rc-1b			
60–70	1		blepharis			
	1	ext/int	pnt-r c			
	1	int	rc-1a			
	3	ext				
	1	ext/int	sl-1			
	1	ext/int	indis			
	1	ext	cl-1	indis		pnt-r
	2		sl-3			
	2		rc-1a			
	1		sl-1	indis		pnt-r
	1		sl-2			
	2	int	herb			
	2		roul			
	1	ext/int	undec			
70–80	4	ext				
	3	ext/int				
	1		blepharis			
	1		rc-1b			
	1		pnt-r c			
	2	ext	sl-1			
	1	ext/int	rc-1a			
	1		sl-1			
	1		sl-1			
	1	int	rc-1a			
	1	int	rc-1a	sl-1		
	1		sl-1	undec	sl-2 bracketing sp1-l	undec
80–90	4	ext/int				
	1	ext				
	1	int	rc-1a	sl-1		

TABLE AB.3 Category 3 (*cont.*)

Context	#	Burn	Dec1	Dec2	Dec3	Dec4
	1		rc-1a	pnt-r		
	1	int	rc-1a	pnt-r		
	1	int	rc-1a			
	1		rc-1a			
	1		herb			
90–100	1	int				
	1	ext	blepharis			
100–110	1		rc-1b			
	1	ext/int				
Total	**74**					

Analysis by David Kay and Anne Haour

TABLE AB.4 Rims

Context	#	R.Type	Brn	Dec1	L1	Dec2	L2	Dec3	L3	Ang.	Diam	Mx. thick
0–20	1	E38	ext/int									1.1
30–40	1	S4	ext/int									1.5
40–50	1	E4	int							5		0.9
50–60	1	S4	int							4		0.7
	1	T17	ext/int									0.9
	1	E6	int									1.0
	1	E21	ext/int							4		0.9
60–70	1	S1	ext/int							4	13	0.5
	1	S4	ext/int							3		0.5
	1	S1	ext/int							2		0.7
	1	T1	ext/int							4		0.8
	1	T11	ext							2		1.4
	1	E37										0.7
	1	E4	ext/int							4		0.8
	1	E10	ext	sl-1	c-int					5		0.6
	2	E32	ext/int							4		0.7
70–80	1	S1	ext/int	undec	u	sl-1	m	rc-1a	m	2	27	0.6
	1	S1	ext/int							2	18	0.7
	1	S6	ext/int							4		0.5
	1	T13		undec	u	indis	u			2		0.9
	1	T4	ext							2		1.6
	1	E37	ext/int	undec	c	pnt-r	u					1.0
	1	E32	ext/int							4		0.7
	1	E2	ext							5		0.9
	1	E24	int							4		1.0
80–90	1	S1	ext/int							3	20	0.7
	1	T3								4		0.5
	1	E18	ext/int									0.9
	1	E18	ext/int							5		0.8
90–100	1	S6	ext/int							2		0.6
Total	**31**											

Analysis by David Kay

Tomboutou (TOU-14-S1)

Pascal Gnankpo Amoussou, Alexandre Livingstone Smith, Nicolas Nikis and Anne Haour

1 Location

Tomboutou is a contemporary village on the Niger river north of Guene. The test pit (S1) was located on a street in the oldest part of the village.

2 Geographical Coordinates

LAT: 11,855500 LONG: 3,287900 (WGS84)

3 Discovery

The site was identified by Anne Haour, Alexandre Livingstone Smith and Olivier Gosselain. It was excavated by Pascal Gnankpo Amoussou, on 6 February 2014.

4 Destruction Risks

The test pit is located on the verge of the street in the modern village. It is not under any specific threat and mitigation measures are not urgent.

5 Site

The test pit was situated in the oldest part of present-day Tomboutou according to oral history, close to a former wall of the *birni*. Survey in the wider vicinity of the modern village identified a series of mounds to its south (see Gazetteer).

6 Excavation

Toumboutou had never been excavated before. One test pit was excavated. It was 1 × 1 m in size and excavated by spits of 10 cm (except for the superficial layer which was excavated in one spit of 20 cm). Within each spit, archaeological contexts (i.e. distinct contexts) were separated, sieved and bagged separately. All the spits were sieved down to 5 mm. The test pit was completed at 110 cm into sterile yellow sandy soil.

7 Stratigraphy

The stratigraphy of TOU-14-S1 displays two major phases of occupation. Until about -40 cm, several layers of modern rubbish occur, such as plastic bags, plastic beads and modern glass. The layers are crossed by remains of modern masonry. The lower part of the test pit seems to represent an older occupation. It yielded glass fragments and cowrie shells but no plastic.

8 Finds

This investigation generated a huge number of small finds. Surface finds include mainly modern plastic and other refuse. A corroded French 5-centimes coin, issued likely in 1925, was recovered in the top layer, 0–20 cm (SF 2014-56) (S. Magnavita, this volume). Also from this layer was a glass fragment bearing the letters 'GDK', 'Gold', and 'ail Poli' (SF 2014-47), which is in all formal respects similar to a 7 ml bottle of nail polish by the Nigerian brand GDK which according to its website has operated for at least 20 years in Nigeria and 30 years in Côte d'Ivoire.

Two glass beads of Magnavita's Type 2 – one black, one cobalt blue – came from 40–50 cm (SF 2014-58 and 2014-62). There were four cowrie shells, one in each spit between 40 and 80 cm (SF 2014-17 to 2014-20). Four glass bracelet fragments were recovered – two green (SF 2014-40 and 2014-59), one black and white (SF 2014-41) and one silver while (SF 2014-60), all from layers above 50 cm (Figure AC.2). The unit also yielded multiple metal objects, including one of copper alloy (SF 2014-162). They can be attributed to recent periods. Finds include fragments of knife blades, connected to cooking activities; iron fittings such as a nut, two rings, five rods, a rivet and two nails; and a number of indeterminate objects (Anne Filippini, pers. comm.).

Ceramics were plentiful. Incisions dominate, followed by twisted cord roulette and painted motifs. A sherd with six parallel wavy lines at 30–40 cm is worthy of a mention as an unusual occurrence in the archaeology of the region.

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FIGURE AC.1
TOU-14-SI, North section at completion

9 Interpretation and Cultural Attribution

The upper part of the test pit is clearly a witness of the present-day occupation of Tomboutou. The lower part represents an older occupation, probably nineteenth century judging by the presence of cowrie shells, glass fragments and glass beads.

TABLE AC.1 Desampling

Level	Number
0–20	25
20–30	62
30–40	69
40–50	27
50–60	50
60–70	48
70–80	35
80–90	11
90–100	4
100–110	2
Total	**333**

Analysis in the field by Alexandre Livingstone Smith and Pascal Gnankpo Amoussou, and at UEA by David Kay

TABLE AC.2 Category 4

Context	Undec	Illegible
0–20	8	2
20–30	8	
30–40	29	
40–50	32	2
50–60	17	
60–70	18	
70–80	8	
80–90	4	
90–100	1	
Total (129)	**125**	**4**

Analysis in the field by Alexandre Livingstone Smith and Pascal Gnankpo Amoussou, and at UEA by David Kay

TABLE AC.3 Category 3

Context	#	Burnish	Dec1	Dec2	Dec3
0–20	1	int			
	2	ext			
	1	ext	sl-2		
	1		sl-4		
	1	int	st	sl-1	rc-1a
	1	ext/int	peig el-9		
	1	ext	indis		
20–30	5	int			
	1	ext			

FIGURE AC.2 Glass bracelets from Dendi sites. The Tomboutou (TOU) items are SF 2014-40 (bottom, fourth from left), SF 2014-59 (top, first from left), SF 2014-60 (top, third from left), SF 2014-41 (top, fourth from left).

Other items featured in this photo are, from left to right and top to bottom, from Kargui (SF 2014-29), Bogo Bogo (SF 2014-11), Kargui (SF 2014-27), Molla (SF 2014-34), Tondo windi (SF 2014-45), Bogo Bogo (SF 2014-19), Bogo Bogo (SF 2014-38), Bogo Bogo (SF 2014-20)

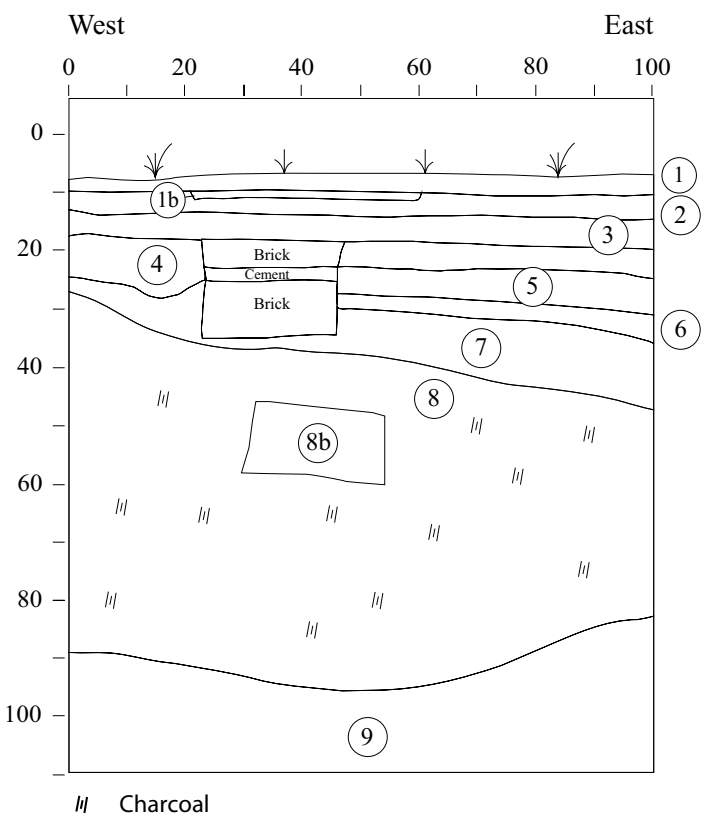

FIGURE AC.3 TOU-14-SI, North section

1 Top soil (street)
1b Thin compact ashy layer with glass and plastic remains
2 Compact sandy layer with glass and plastic remains
3 Compact sandy layer with gravels and glass and plastic remains
4 Compact sandy layer with laterite gravels
5 Loose grey sandy layer
6 Loose yellow sandy layer
7 Loose grey sandy layer with plastic beads and glass remains
8 Loose yellow sandy layer with charcoal and a loose darker sandy area (8b) with glass remains
9 Compact yellow sand (natural substratum)

TABLE AC.3 Category 3 (*cont.*)

Context	#	Burnish	Dec1	Dec2	Dec3
	1	ext/int	sl-2		
	1	ext	sl-2	indis	
	1	ext	sl-1	rc-1a	plain
	1	ext/int	rc-1b	plain	
	1	ext/int	sl-1		
	1	ext	plain	sl-2	indis
	1		plain	pnt-rl-1	
30–40	6	ext			
	4	int			
	3	ext/int			
	1	ext/int	plain	st	rc-1a
	1		plain	peigEW-6	peigEW-6
	1	ext	sl-1	rc-1a	plain
	2	ext	indis		
	1	ext/int	sl-6		
	1	ext/int	indis		
	1		sl-2		
	1		rc-1a		
	1		pnt-rc	plain	
	1		pnt-rc	pnt-bl-b	plain
	1	ext	sl-3	roul	plain
40–50	5	int			
	3	ext/int			
	11	ext			
	1	ext/int	indis		
	1	ext/int	sl-2		
	1	ext	plain	indis	
	1	ext	sl-3		
	1		sl-1		
	1	ext/int	sl-1	sl-1 (int)	
	1		sl-2		
	1	ext	sl-2		
	1	ext/int	sl-1	indis	
	1	int	indis		
	1	ext/int	sl-3	sl-1	
	1	ext	sp1-14		
	1		peigEL7		
50–60	8	ext/int			
	3	ext			
	1	int	rc-1a	indis	
	1		rc-1a		
	1		pnt-r-b	plain	pnt-r-b
	1	ext/int	st-3	sl-1	rc-1a
	1	ext	sl-2	indis	
	3	ext/int	roul		

TABLE AC.3 Category 3 (*cont.*)

Context	#	Burnish	Dec1	Dec2	Dec3
60–70	5	int			
	10	ext/int			
	9	ext			
	1	int	plain	indis	pnt-r
	1		sl-1		
	1	ext/int	plain	rc-1a	
	1	ext/int	sc-1	rc-1a	pnt-r
	1	ext/int	sl-1	roul	pnt-r
	1	ext/int	sl-1		
	1	ext	sl-2		
	1	ext/int	indis	pnt-r	
	1	ext	plain	pnt-rc	
	1	ext	plain	perforated	
70–80	4	int			
	6	ext/int			
	6	ext			
	1	ext	plain	rc-1a	
	1	ext	plain	rc-1a	plain
	1	ext/int	sl-1	rc-1a	indis
	1	ext/int	plain	sl-2	rc-1a
	1		plain	pnt-rb	
80–90	1	ext			
	1		sl-2	sl-1	indis
	1		sl-1	rc-1a	pnt-r
	2	int			
90–100	1		rc-1b		
100–110	1	ext/int			
Total	**159**				

Analysis by David Kay

TABLE AC.4 Rims

Context	#	R.Type	Brn	Dec1	L1	Dec2	L2	Dec3	L3	Dec 4	L4	Ang.	Diam.	Mx. thick
0–20	1	S1	ext/int	plain	u	sl-4	u					3	10	0.9
	1	E19	ext/int											0.9
	1	E7	ext/int									4	11	0.7
20–30	1	S1	ext/int	sl-1	l	plain	u	indis	u			2	14	0.8
	1	E4												0.7
	1	E4		sp-6	l							4		0.6
	1	E36	ext/int									4		0.9
30–40	1	S1	ext	plain	u	sl-3	u	indis	u	sl-1	U	2	19	0.8
	1	S1										4		0.8
	1	S1	ext									2		0.9
	1	S1												0.8
	1	S1										3	14	0.6
	1	E4												0.5
	1	E1										5		0.9
40–50	1	S1	ext/int									3	24	0.7
	1	S6										3		1.0
	1	E11	ext/int									4		0.7
	1	E4				plain	c	pnt-rc	c			4		0.6
	1	E4												0.6
	1	E9	ext											0.5
	1	E29										4		1.2
	1	E10	ext/int									4		0.6
50–60	1	S1	ext									2		0.7
	1	S1	int									5		0.6
	1	S1	int									3	13	0.5
	1	E1										4		0.8
	1	E37	ext/int									4		0.6
60–70	1	B3												
	1	S1	ext/int	pnt-r	l	sl-1	u	plain	u					0.9
	1	S1	ext/int									4		0.7
	1	S1	int	sp-6	l									0.6
	1	S1		plain	u	ch	u					4		0.8
	1	S1	ext											1.0
	1	E4										4		0.8
	1	E26	ext/int									4		0.6
	1	E19	ext/int	plain	c	plain	u	roul	u					0.7
	1	E19	ext/int	plain	c	plain	u	pnt-rl-1	u			4		0.9
	2	E31	ext/int											1.0
70–80	1	E37										4		0.9
	1	S1	ext/int									4		0.6
	1	E11	ext/int	plain	c	plain	u	roul	u	pnt-r	U	4		0.9
Total	**42**													

Analysis by David Kay

CATALOGUE AD

Kantoro (KRO-14)

Louis Champion

1 Location

The site of Kantoro is situated just off the main Guene-Karimama road, and lies halfway between the modern villages of Kantoro and Sakawan. The site is formed by two settlement mounds, A and B, which are approximately 6 m high. To the north and west, the site is delimited by two small rivers with the road bordering the site to the east. Figure 18.5 in Robion-Brunner, this volume, gives a plan of the site.

2 Discovery

The site had been identified by Didier N'Dah during his survey in the region in 2001, and recorded as VNK-01/3 I–X (N'Dah 2006: Table 1). It was revisited in 2013 by Anne Haour, Didier N'Dah, Alexandre Livingstone Smith, Caroline Robion-Brunner and Nadia Khalaf, at which point it was identified as a priority for excavation the following year. In 2014, Caroline Robion-Brunner, Nicolas Nikis and Louis Champion identified the excavation locus.

3 Destruction Risks

The site is ploughed regularly by the owner of the field. Water erosion is also an important factor due to the presence of the two rivers.

4 Site

The two mounds at Kantoro presented settlement remains (pottery fragments, grind stones, etc.) and several concentrations of slag including at least nine areas of smelting slag and two areas of forging slag. Judging by their topography, these slag concentrations seem to be related to two settlement zones. The site covers approximately one hectare.

5 Excavation

The site had never been excavated before. On each of the two settlement mounds, a 1 × 1 m test pit was excavated. Each was positioned within a surface concentration of forging slag. The excavators were Pakou Haréna, Séverin Bakrobéna and Djimet Guemona under the supervision of Louis Champion. Within each spit of 10 cm, archaeological contexts were sieved at 5 mm mesh and bagged separately. In both test pits it was necessary to terminate excavation at c. 170 cm BD due to the risk of collapse, although archaeological layers were still yielding material.

A 15 litre soil sample was taken from each spit for archaeobotanical analysis (in total 19 samples for Trench 1 and 16 samples for Trench 2).

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KRO-14-SI

Louis Champion and Anne Filippini

Trench 1 was excavated on Mound B, the northern mound at the site.

1 Layers and Contexts

Context 1 spanned 1–155cm and was an extremely soft grey layer rich in ash. This context included a series of small horizontal stabilisation layers with no notable difference between them.

Context 2 spanned 155–170cm and was a very soft yellow layer formed of sand.

For safety reasons the excavation was terminated at 170cm BD.

2 Interpretation, Finds and Cultural Attribution

The presence of ceramics and both forging and smelting slag suggest that the trench sampled a settlement area, but the presence of such a considerable layer of ash at c. 155 cm is still unexplained. A high number of metal artefacts (N = 16) was recovered from this unit, as was from Trench 2. We note the presence of one arrowhead (SF 2014-124). Apart from that, few items are diagnostic, and many are too oxidised to be identified. Some may be nail stems, but could equally be smithing offcuts, while others may represent forge waste. Illustrative here is SF 2014-125, a rod, seemingly of quadrangular section and of variable width. It could be the tip of a harpoon or arrow that was damaged or reused. Equally, in the context of a forge, it could be a failed or test artefact.

3 Radiocarbon Dates

Currently, no radiocarbon dates exist for this test pit. The ashy, sandy nature was such that it was considered likely charcoal fragments would have moved through the stratigraphy.

TABLE AD.1 Desampling

Context	#
0–10	255
0–10	142
10–20	187
20–30	101
30–40	Not stated
40–50	393
50–60	206
60–70	74
70–80	100
80–90	101
Total	**≥ 1559**

Analysis in the field by Nicolas Nikis

TABLE AD.2 Category 4

Context	Undecorated	Illegible
0–10	50	53
10–20	40	23
20–30	9	4
30–40	0	0
40–50	52	17
50–60	27	21
60–70	17	16
70–80	8	20
80–90	7	6
90–100	23	10
100–110	14	10
110–120	8	2
120–130	20	6
130–140	11	1
140–150	5	2
Con. 1 150–160	6	1
Con. 2 150–160	2	1
Total	**299**	**193**

Analysis by Louis Champion and Nicolas Nikis in the field and by David Kay at UEA

FIGURE AD.1
View of Trench 1 at Kantoro

FIGURE AD.2
North section at completion

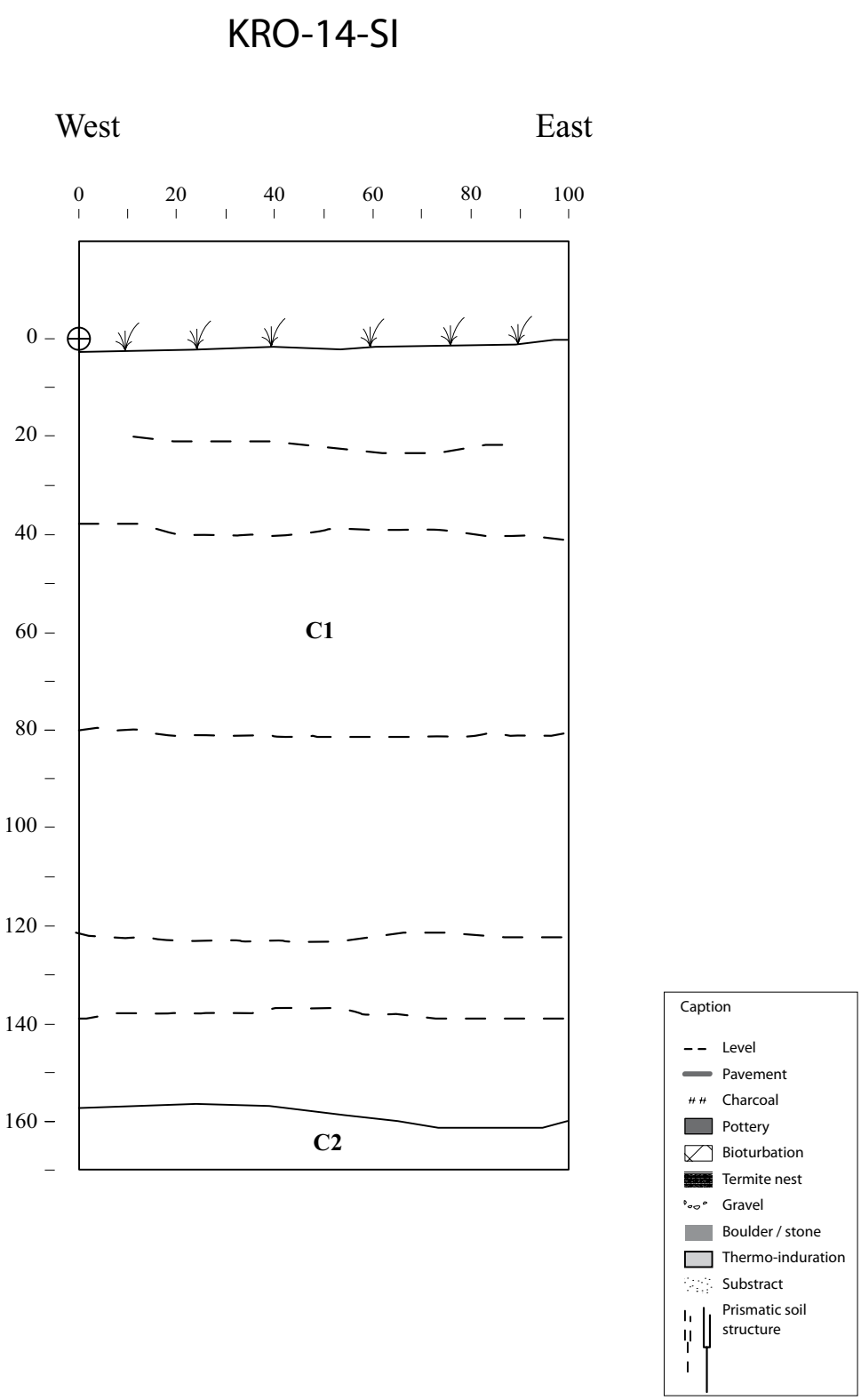

FIGURE AD.3
North section at completion. Compare Figure AD.2. See text for description of contexts

TABLE AD.3 Category 3

Context	#	Burn	Dec 1	Dec 2	Dec 3	Dec 4	Dec 5
0–10	1	ext	indis	undec			
	4	int					
	2	ext/int					
	2	ext					
	1	ext/int	ch				
	1	int	rfp-4				
	1		rfp-4				
	2		rfp-1b				
	1		undec	rfp-1a			
	1	ext	rfp-1a (int)				
	1		rfp-2				
	51		rfp-1				
	1		undec	rfp-2			
	3		rc-1b				
	1		rc-1a				
	1	int	sl-1	sc-1	undec	rc-1a	
	2		roul				
	1	ext	sl-4	indis			
	1	ext	sl-2	indis			
	1	ext	sl-6				
	1		sl-2				
	1		rfp-1b	pnt-rc			
	1		rfp-1b	pnt-rl-1	undec		
	1		undec	pnt-rl-1	roul		
	1		rfp-1b	undec	pnt-p-8		
	1	int	perf	rfp-1a			
	1	int	perf	undec	rfp-1b		
	2			rc-1a			
10–20	1	ext	is-geo 28	pnt-r			
	4		rfp-2				
	34		rfp-1				
	1		undec	rfp-2			
	2		rc-1b				
	1	ext/int	undec	sl-1	rfp-1a		
	1	ext/int	undec	rfp-2			
	2		undec	rfp-1b			
	3		rfp-1b				
	2		rfp-5				
	1		rfp-1a				
	1	ext/int	undec	rfp-1a	rfp-5		
	1	ext	undec	roul	st-2	roul(int)	
	2	ext	sl-2	sh-4	spi-2		
	2	ext/int	undec	is-geo 10			
	1		sl-6	indised			
	1		sl-3	indised			
	1	ext/int	undec	rfp-1a	sl-1	sl-3	
	1	ext/int	undec	rfp-1a	sl-2		

TABLE AD.3 Category 3 (*cont.*)

Context	#	Burn	Dec 1	Dec 2	Dec 3	Dec 4	Dec 5
	1	ext/int	indis	roul	sl-1	sl-3	
	2	int	perf				
	1	ext	undec	CB3	rc-1a		
	1		undec	sc-1			
	1			rfp-2			
	1	ext		rfp-1a	undec		
	1			rfp-5	indis		
20–30	1		undec	rfp-2			
	7		rfp-1				
	1	ext/int					
	1	ext	undec	indis	sl-2	sl-1	
	1		sp4-l				
	1	ext		rfp-1a	undec		
	1	int	undec	rc-1b			
40–50	3	ext/int					
	1	int					
	25		rfp-1				
	1	int	undec	indis			
	3		roul				
	3	int	roul				
	2		rc-1a				
	1		rc-1b				
	2		rc-1c				
	1		rfp-2				
	1	ext	undec	rfp-2			
	1		rfp-2(int)				
	2		rfp				
	1	int	undec	rfp-1a			
	1	ext	rfp-1a(int)				
	1	int	indis				
	1	ext/int	rfp				
	1	ext/int	undec	rfp-1a			
	1		rfp-5				
	1		rfp-1a				
	1		undec	rfp-1b			
	2		rfp-1a	indis			
	1	ext/int	undec	sl-2	sh-6	st	indis
	1	ext/int	undec	rc-1a	sl-5		
	1	ext	sl-8				
	1	ext	sl-1				
	1	ext/int	undec	sl-4	roul		
	1		undec	sl-1	roul	sl-2	
	1	ext/int	sp5-l	sl-1	sp5-l	undec	
	1	ext	undec	sl-6	rc-1a		
	1	ext/int	undec	roul	sl-3	sx-1	
	1	ext/int	roul	sl-5			
	1	ext					

TABLE AD.3 Category 3 (*cont.*)

Context	#	Burn	Dec 1	Dec 2	Dec 3	Dec 4	Dec 5
	1		CB1	is-geo 10			
	1				rfp-4		
	1			rc-1a	sl-3(int)		
	1			rfp-5			
	1	int		undec	rc-1b		
50–60	2	int					
	2	ext/int					
	1	ext	undec	indis			
	1	int	rfp-2				
	1		rfp-2				
	22		rfp-1				
	1	ext	undec	rfp-1b			
	1	ext/int	undec	rfp-1b			
	1		rfp-4				
	1		rfp-5				
	3		rfp-1a	rfp-5			
	4		rc-1a				
	1	ext/int	undec	is-geo 10			
	1		sl-3	indis			
	1	ext	sl-1				
	1	int	undec	sl-1	indis		
	3	int	perf	undec			
	1	ext/int	st	sx-13	is-geo 10	undec	
	1			rfp-1a	sl-3		
	1	int	undec	rc-1b			
60–70	1	int					
	1		rc-1a				
	1	ext/int	sl-5				
	1	ixt	rfp-1b	smth			
	1	ext	rfp-1a	rfp-5(int)			
	1		rfp				
	1		rfp-2				
	16		rfp-1				
	1		rfp-4				
	1		rfp-1a	rfp-5			
	1		rfp-1b				
70–80	1		rfp-2				
	2	ext	rfp-1a(int)				
	2		rfp-4				
	1	ext/int					
	11		rfp-1				
	1	ext	rfp-1a	smth			
	1		rfp-1b(int)				
	1	ext/int	rc-1a				
	1	int	rfp-5				
	1	ext/int	undec	st	sl-1	sh-6	
	1		perf	undec			

TABLE AD.3 Category 3 (*cont.*)

Context	#	Burn	Dec 1	Dec 2	Dec 3	Dec 4	Dec 5
	1	ext	is-geo 33				
	1			rfp-2			
80–90	1	ext					
	1	ext/int	sp5-l				
	1		rfp-2				
	1		roul				
	5		rfp-1				
	1	int	roul				
	1	ext/int	rc-1a	sl-3	ic-2		
	3		rc-1b				
	1	ext	rfp-1b	smth			
	2		rfp-4				
	2		rfp-5				
	1		mch-8	ch-2	Sp1-cl over roul	Sp1-cl over roul	Sp1-cl over roul
	2		perf	undec			
	1	ext/int	undec	sl-1	rfp-1a		
	1	ext/int		is-geo 35			
	1			rfp			
90–100	8	int					
	5	ext					
	9	ext/int					
	2	ext/int	indis				
	1	ext	indis				
	1	ext	indis(int)				
	1		rc-1a				
	2		roul				
	1	ext	rfp-1b(int)				
	1	ext	rfp-5(int)				
	1		rfp-4				
	1		undec	roul			
	1	int	rfp-1a				
	1			roul			
	7		rfp-1a				
	1		undec	rfp-4			
	4		rfp-5				
	3		rfp-1a	indis			
	2		rfp-1b	indis			
	1	ext	undec	sl-1	rfp-1a		
	1		undec	sl-1	rfp-1a		
	1			rfp-1a			
	1	ext	rfp-1b	indis			
	1	ext	undec	rfp			
	1	ext/int	undec	rfp-1a			
	1		is-geo 30				
	1	int	perf	roul			
	1		perf	undec			

TABLE AD.3 Category 3 (*cont.*)

Context	#	Burn	Dec 1	Dec 2	Dec 3	Dec 4	Dec 5
	1	ext	sl-2	sp1-l	sp1-l	sp1-l	
	1			rfp-1b			
100–110	1	int	indis				
	5	int					
	5	ext					
	8	ext/int					
	1	ext/int	undec	indis			
	1	ext/int	undec	rfp-1a	sl-3		
	1		undec	indised	sl-3		
	1		rfp-2				
	1	ext	roul				
	9		roul				
	2		rfp-4				
	1	ext	rfp-1a	smth	sl-3	sl-2	
	1	int	rfp-4				
	3		rfp-1b				
	4		rfp-1a				
	1		rfp-5				
	1	int	rfp-5				
	1	ext	rfp-1a	rfp-5			
	1	ext	undec	rfp			
	1	int	rfp				
	1		rfp				
	1	ext/int	undec	rc-1a			
	3			rc-1a			
	1	ext	undec	sl-1	Sp1-cl with sets of incised lines radiating out		
	2			rc-1b			
110–120	1		roul				
	1		rfp-1a(int)				
	1	int	roul				
	1		rc-1a				
	1		rc-1b				
	1	ext	indis	undec			
	2	int					
	5	ext					
	4	ext/int					
	2		rfp-2				
	1		undec	rfp-1a			
	2		rfp-5				
	3		rfp-1a	indis			
	1		rfp-1a				
120–130	5		roul				
	1	int					
	7	ext/int					

TABLE AD.3 Category 3 (*cont.*)

Context	#	Burn	Dec 1	Dec 2	Dec 3	Dec 4	Dec 5
	7	ext					
	1	ext	roul	smth			
	1		rfp-2	st-1			
	1		indis	st-1			
	1	ext/int	undec	rc-1a	sl-1	sp1	
	1		rfp-2				
	1		rfp-2	indis			
	1	int	rfp-1a				
	5		rfp-1a				
	4		rfp-1a	indis			
	1		rfp-1b				
	1		rfp	indis			
	2			roul	indis		
	1	ext	undec	rfp-1b			
	1		rc-1a				
	1			rfp-1b			
	5		rc-1a	indis			
	1	int		rfp-1a			
130–140	1	int	rfp-1b	sl-2			
	1	ext	sl-1				
	1	ext/int	undec	roul	sl-1	st-1	
	1	int	indis				
	1	int					
	5	ext					
	10	ext/int					
	1	int	roul				
	1	ext	rfp-1b(int)				
	1		rfp-2				
	1		rfp-1a				
	2		rfp-1a	indis			
	3		rfp-1b	indis			
	1		rfp-5				
	2		rc-1a	indis			
	2		rc-1b	indis			
	1	int	perf	roul			
	1			rfp-2			
	1	int	rc-1b	indis			
140–150	1	ext/int	sl-1				
	2	int	roul				
	2	ext					
	5	ext/int					
	1	int	rfp-5				
	2		roul				
	1		rfp-1b				
	1		rfp				
	1		rfp-2				

TABLE AD.3 Category 3 (*cont.*)

Context	#	Burn	Dec 1	Dec 2	Dec 3	Dec 4	Dec 5
150–160 con. 1	2	int	indis				
	1	ext/int	indis				
	1	ext/int	sl-1				
	1	ext/int	roul				
	4	ext/int					
	3	ext					
	3	int					
	1	int	rfp-4				
	1	ext	undec	rfp-1a			
	1	int	rfp-1a				
	3		rfp-1a	indis			
	1		rfp-1a				
	1		rfp				
	1	ext	undec	rc-1a			
	1		rc-1a				
	1		rc-1a	indis			
150–160 con. 2	1	int	rc-1a				
	1	ext	sl-1				
	1	int	rfp-2				
	1	int	rc				
	1		rfp				
150–160 unspecified	1	ext	rfp-1b	smth	pnt-rb		
	1	int	rfp-4				
	1		rfp (possible rfp-2)				
Total	**651**						

Analysis by David Kay at UEA.

TABLE AD.4 Rims

Con.	#	R. type	Brn	Dec 1	L 1	Dec 2	L 2	Dec 3	L 3	Dec 4	L 4	Ang	Diam	Mx. Thick
0–10	1	E4	int									4		1.0
	2	E1										4		0.7
	1	E2										3		0.7
	1	E4	int									4		0.7
	1	E4	int									4		0.9
	1	E4	ext/int											0.7
	1	E4		rfp	U									0.5
	1	E3	int									5		0.8
	1	E46	ext/int	undec	U	sl-1	U	roul	U			4		0.6
	1	E46	ext/int	undec	U	roul	U					4	11	0.9
	1	E34	ext/int									4		0.7
	1	E10	int									4		0.9

TABLE AD.4 Rims (*cont.*)

Con.	#	R. type	Brn	Dec 1	L 1	Dec 2	L 2	Dec 3	L 3	Dec 4	L 4	Ang	Diam	Mx. Thick
	1	E10	ext/int											0.7
	1	E37	ext/int	sl-1	N							5		0.7
	1	E10	ext/int	sl-1	N							4		0.9
	1	T11	ext									2		1.0
	1	T5	int	undec	U	rfp-1a	U					2		1.7
	1	E11	ext/int									3		0.8
	1	S1	ext/int											0.8
	1	S4	ext/int	sp5-l	U(int)	sp5-l	U(int)	sp5-l	U(int)					0.6
	1	S6	ext	rfp-1a	U	st-4	U	rfp	U(int)			3	8	0.5
	1	S1	ext/int									5		0.7
	1	S1	ext/int									4		0.7
	1	S4	ext	is-geo 10	U	rfp-1b	U(int)					3		0.4
	1	S6	ext/int	undec	U	rfp-1a	U					3	10	0.5
	1	S4	ext/int											1.0
	2	S1	ext/int									4		0.7
	1	S4		undec	U	indis	U							0.6
	1	E1												0.9
	1	S4	ext/int	is-geo 10	U									0.5
	1	E4										4		0.7
	1	S4	int											0.8
	1	S1										5		0.7
	1	S1	ext/int	undec	U	rfp-1a	U					3	12	0.5
	1	S1	ext/int	sl-5	U	indis	U					2	14	0.4
	1	S4	ext	undec	U	rc-1a	U	sl-2	U	rfp	U(int)	3	10	0.5
	1	S1	ext	undec	U	sl-1	U	roul	U	indis	U(int)	3		0.6
	1	S1												0.4
	2	T13		rfp-1b	U	undec	U					3	25	1.1
	1	S3		sl-1	U	undec	U	rc-1a	U			3		1.1
	1	S3	ext/int									3		1.0
	1	S3	ext/int									4		0.7
10–20	1	T13	ext/int									3	16	0.5
	1	E4		undec	U	rc-1b	U					4		1.1
	1	E38	int									4		1.4
	1	E22	ext/int									4		0.8
	1	S6	int	is-geo 10	U							3		0.4
	1	T6	ext	is-geo 10	U									0.7
	1	S4		undec	U	rc-1a	U					4		0.9
	1	S4	ext/int									3		0.3
	1	S1	ext/int									4		0.7
	1	S1	ext/int									3	14	0.4
	1	E10		rfp-1a	U(int)	indis	U(int)					4		0.6
	1	E9	ext/int											0.6
	1	S1	ext/int									5		0.5
	1	E1										4		0.6
	1	S4	int									4		0.7
	1	E4	ext/int									4		0.9
	1	S1	int									4		0.6

TABLE AD.4 Rims (*cont.*)

Con.	#	R. type	Brn	Dec 1	L 1	Dec 2	L 2	Dec 3	L 3	Dec 4	L 4	Ang	Diam	Mx. Thick
	1	S1	ext									3	17	0.5
	1	E9	ext/int	undec	C	sl-1	U	rfp-1a	U			4		0.5
	1	E6	ext/int									3	17	0.7
	1	E6	ext/int	undec	U	is-geo 10	U							0.5
	1	T26		undec	U	sl-1	U	rfp-1a	U			2	20	1.2
20–30	1	E9	ext/int									3	15	0.5
	1	E11	ext/int	undec	U	rfp-1a	U	undec	U			3	15	0.5
	1	E4	ext									4		0.7
	1	E1	ext/int									4		0.5
	1	E4		undec	C/U	rfp-1b	U					4		0.8
	1	E4	ext/int	undec	C/U	rfp-1a	U					3	23	0.9
	1	E4	ext/int	undec	C/U	rfp-1b	U					3		1.2
	1	S4	ext/int											0.8
	1	T18	ext/int									4		0.9
	1	S3	ext/int									4		0.7
40–50	1	E38	int									4		1.2
	1	E4	int									4		1.0
	1	E4										4		0.7
	1	E4		rfp-2	U							4		1.0
	1	E4	ext/int									4		0.7
	1	E4	int	rfp-2								3		0.9
	1	E5										3	3	1.0
	1	E4	int									4		0.8
	1	E22	int									4		0.8
	1	E4	int	undec	U	indis	U					4		0.7
	1	E26	int									4		0.5
	1	E1	ext/int									4		0.5
	1	E11	ext/int	undec	U	rfp-1a	U	sp5-l	U(int)	sp5-l	U(int)	3	14	0.6
	1	E11	ext/int	undec	U	roul	U					3		0.5
	1	S1	ext/int	undec	U	rc-1a	U	sl-2	U			4	14	0.4
	1	S1	ext/int									4		0.6
	1	S1		pnt-rb	L							5		0.5
	1	S3	int											0.9
	1	S3												0.8
	1	S3		undec	U	indis	U					2		0.8
	1	S3	ext/int									4		0.7
	1	S4	ext/int	sl-6	U	spi-l	U					4		0.4
	1	S6	ext	rfp-1a	U	indis	U	rfp-5	U(int)			2	8	0.6
	1	S4	ext											0.6
	1	S1	ext/int									3		0.6
	1	E11	ext	undec	U	is-geo 10	U					3		0.5
	1	S6	ext/int	is-geo 34	U							3		0.5
	1	B4										N/A	N/A	N/A
	1	S3	ext/int	mch-4	sp5-l	sp5-l	sp5-l	sp5-l				4		0.7

TABLE AD.4 Rims (*cont.*)

Con.	#	R. type	Brn	Dec 1	L 1	Dec 2	L 2	Dec 3	L 3	Dec 4	L 4	Ang	Diam	Mx. Thick
50–60	1	E14	ext/int	undec	U	rfp-1a	U	undec	U			4	15	0.5
	1	E4	int	undec	U	rfp-1a	U					4		0.8
	1	E4	ext/int									3		0.5
	1	S4												0.6
	1	S4										4		0.7
	1	S4		undec	U	rfp-1a	U					3		0.7
	1	S1										3		0.5
	1	S1	ext/int									4		0.6
	1	S1										4		0.6
	1	S4		rfp-2	U							4		0.8
	1	S3												0.7
60–70	1	S1	ext									4		0.9
	1	S1										4		0.7
	1	E4	ext/int	undec	C/U	roul	U					4		0.9
	1	E1	ext/int									4		0.8
	1	S2	ext/int	undec	U	rc-1a	U	sl-4	U			2		0.5
	1	S1	ext/int	undec	U	rfp-1a	U	sl-3	U			2		0.5
	1	S1		undec	U	rc-1a	U					4		0.5
	1	T18	ext/int	undec	U	rfp-1a	U	indis	U			3		0.6
	1	E37										4		1.1
	1	E26	ext/int									4		0.5
	1	S6	int	is-geo 10	U							3	7	0.5
	1	E4	ext/int									4		0.6
	1	S4										5		0.6
	1	E2												0.9
	1	E4												0.6
	1	S1										3	18	0.7
	1	E37	ext									5		1.4
	1	E11	ext/int	undec	U	is-geo 10	U					3		0.4
	1	T3		undec	U	rc-1a	U					2		1.1
	1	E11	ext	undec	U	rfp-1a	U							0.5
	1	S4		undec	U	rc-1a	U					3		0.8
	1	E15	ext/int	undec	U	sl-1	U	Sp1-cl over roul	U	Sl-1	U	3		0.5
	1	E11												0.8
	1	E11	ext	undec	U	rfp-5	U	rfp-1b	U(int)			3		0.6
70–80	1	E4	int									4	20	1.0
	1	E14	ext/int	undec	U	rfp-5	U	undec	U			3	14	0.7
	1	E14	ext/int	undec	U	indis	U					3		0.6
	1	S1	ext/int									4		0.5
	1	S4		undec	U	indis	U					3		1.0
	1	S1	ext/int									4		0.6
	1	S4		undec	U	indis	U					3		0.7
	1	T8	ext/int									2	15	0.8
	1	E11										4		0.9

TABLE AD.4 Rims (*cont.*)

Con.	#	R. type	Brn	Dec 1	L 1	Dec 2	L 2	Dec 3	L 3	Dec 4	L 4	Ang	Diam	Mx. Thick
	1	S1		undec	U	rfp-1a	U							0.6
	1	E14	ext/int	undec	U	rfp-1a	U					3	9	0.6
	1	T18		rc-1a	U	undec	U(int)	rc-1a	U(int)			3	8	0.6
	1	E4		rfp-2	U							3	20	0.9
	1	S1										3		0.4
	1	E4		rfp-2	U							4		0.7
	1	S6	int											0.8
	1	E4	int	rfp-2	U							4		0.7
	1	E4	int									4		0.8
80–90	1	E11	ext/int	undec	U	sl-1	U	roul	U			2		0.7
	1	E1		roul	U							4		0.4
	1	E4	ext											1.1
	1	E4										3		0.9
	1	E4	ext/int									4		0.9
	1	S1	ext									3	21	0.6
	1	E4	ext/int											0.5
	1	S1	ext/int	undec	U	roul	U	sl-3	U	sl-1	U	3		0.4
	1	E35	ext/int									4		1.0
	1	E11	ext/int	undec	U	sl-2	U	rc-1a	U	st-2	U	3		0.5
	1	E11	ext/int	undec	U	is-geo 10	U	undec	U					0.5
	1	S1	ext/int	rfp-5	U	sl-2	U	undec	U			3		0.6
90–100	1	S6	int	rc-1a	U							3	17	0.4
	1	E14	ext/int									4		0.7
	1	S4	ext/int	undec	U	rc-1a	U							0.6
	1	S6	ext	undec	U	rfp-1a	U	rfp-1a	U(int)					0.5
	1	E2										4		0.8
	1	S3	int									4		0.6
	1	S4	ext/int									5		0.6
	1	E4		rfp-2	U							4		0.7
	1	E4										3		0.5
	1	E4	int											0.9
100–110	1	S1	ext/int									2	9	0.4
	1	E4	int	undec	U	rc-1a	U					3		1.0
	1	E4	int	rfp-2	U							4		0.6
	1	E4	ext/int											0.6
	1	S1	int	sl-1	U(int)							4		0.5
	1	T3	int											0.7
	1	S6	ext	rfp-1a	U(int)	indis	U(int)					3		0.6
	1	S1	int									3		0.9
110–120	1	E4	int									4		0.6
	1	S1	ext	undec	U	roul	U	undec	U(int)	roul	U(int)	3	9	0.5
	1	E11	ext/int	undec	U	rc-1a	U	undec	U			3		0.8
	1	E6	ext/int									3	11	0.6
	1	E46	ext/int									4		1.1
	1	E14	ext/int	undec	U	sl-2	U	rfp-5	U	st-2	U	3		0.9
	1	E15	ext/int	undec	U/C	rc-1a	U	sl-6	U			4		0.5
	1	S4	ext/int											0.6

TABLE AD.4 Rims (*cont.*)

Con.	#	R. type	Brn	Dec 1	L 1	Dec 2	L 2	Dec 3	L 3	Dec 4	L 4	Ang	Diam	Mx. Thick
120–130	1	E4	int									4		0.8
	1	E11	ext									3	15	0.6
	1	S4		undec	U	rfp	U	indis	U	sl-1	U(int)	3		1.1
	1	E1												0.8
	1	S4	int	rc-1a	U									0.7
	1	S4	ext	undec	U	rc-1a	U	sl-3	U	rfp-1b	U(int)	3		0.6
	1	S4	ext											0.6
	1	E11	ext/int	undec	U	rfp-1a	U	undec	U			3		0.7
130–140	1	E1										4		0.5
	1	S1	ext	rfp-1a	U	undec	U	rfp-1a	U(int)	indis	U(int)	3	7	0.5
	1	S4	ext/int									3		0.6
	1	T18	ext/int	rfp	U	indis	U					3	12	0.6
	1	S1	ext/int	rc-1a	U	sl-1	U	undec	U			4	25	0.6
140–150	1	E4	ext/int											0.7
	1	S1	ext/int									3		0.5
	1	S4	ext									4		0.7
	1	S1	ext/int											0.7
150–160 con 1	1	T12	ext/int									2	17	0.7
	1	E4	ext/int									4		0.6
	1	S6		rfp-1a	U	undec	U(int)	rfp-1a	U(int)			3	12	0.5
	1	S4												0.9
	1	S1		rfp-1b	U							4		0.6
	1	S1	ext/int	sl-4	U									0.4
150–160 con 2	1	E37	ext/int											1.6
	1	E4	ext/int									3	32	0.5
Total	222													

Analysis by David Kay

KRO-14-SII

Louis Champion and Anne Haour

Trench 11 was excavated on Mound A, the southern mound at the site.

1 Layers and Contexts

Context 1 spanned 1–55cm BD and was a very soft, grey ashy layer.

Context 2 spanned 55–80cm BD and was similar to Context-1, but browner in colour and more compact.

Context 3 spanned 80–90cm BD and was more compact than Contexts 1 and 2. Its colour was yellowish/brown with grey shadings.

Context 4 spanned 90–130cm BD and was heterogeneous, formed by a mix of yellowish/brown and dark brown areas.

Context 5 spanned 130–170cm BD and was very compact. It was yellowish in colour and composed of very compact clay nodules, with a mix of sherds and charcoal.

2 Stratigraphy and Finds

The stratigraphy of KRO-14-SII consists of a succession of five horizontal deposit contexts. A high number of metal artefacts – 13 – was recovered from this unit, as was from Trench 1. Few items are diagnostic, and many are too oxidised to be identified. Some may be nail stems, but could equally be smithing offcuts, while others may represent forge waste.

3 Interpretation and Cultural Attribution

This stratigraphy seems to reflect a former settlement site, as indicated by the existence of five distinct contexts.

4 Radiocarbon Dates

Three radiocarbon dates exist for this test pit. These are Beta-397866 from spit 11 in Context 4, Beta-397871 from spit 15 in Context 5, and Beta-397870 from spit 8 in Context 2. After calibration, these readings suggest that these layers accumulated over a period of at least three centuries.

Beta-397870	890	30	KRO 14 SII, 70–80	Phase 4
Beta-397866	960	30	KRO 14 SII, 110–120, Context 4	Phase 4
Beta- 397871	1050	30	KRO 14 SII, 150–160, Context 5	Phase 3

TABLE AD.5 Desampling

Level	Number
0–20	138
20–30	17
30–40	13
40–50	10
50–60	11
60–70	15
70–80	12
80–90	12
90–100	8
100–110	12
110–120	19
120–130	35
130–140	27
140–150	34
150–160	7
Total	**370**

Analysis in the field by Nicolas Nikis

FIGURE AD.4
North section at completion

FIGURE AD.5
Atmosphere shot

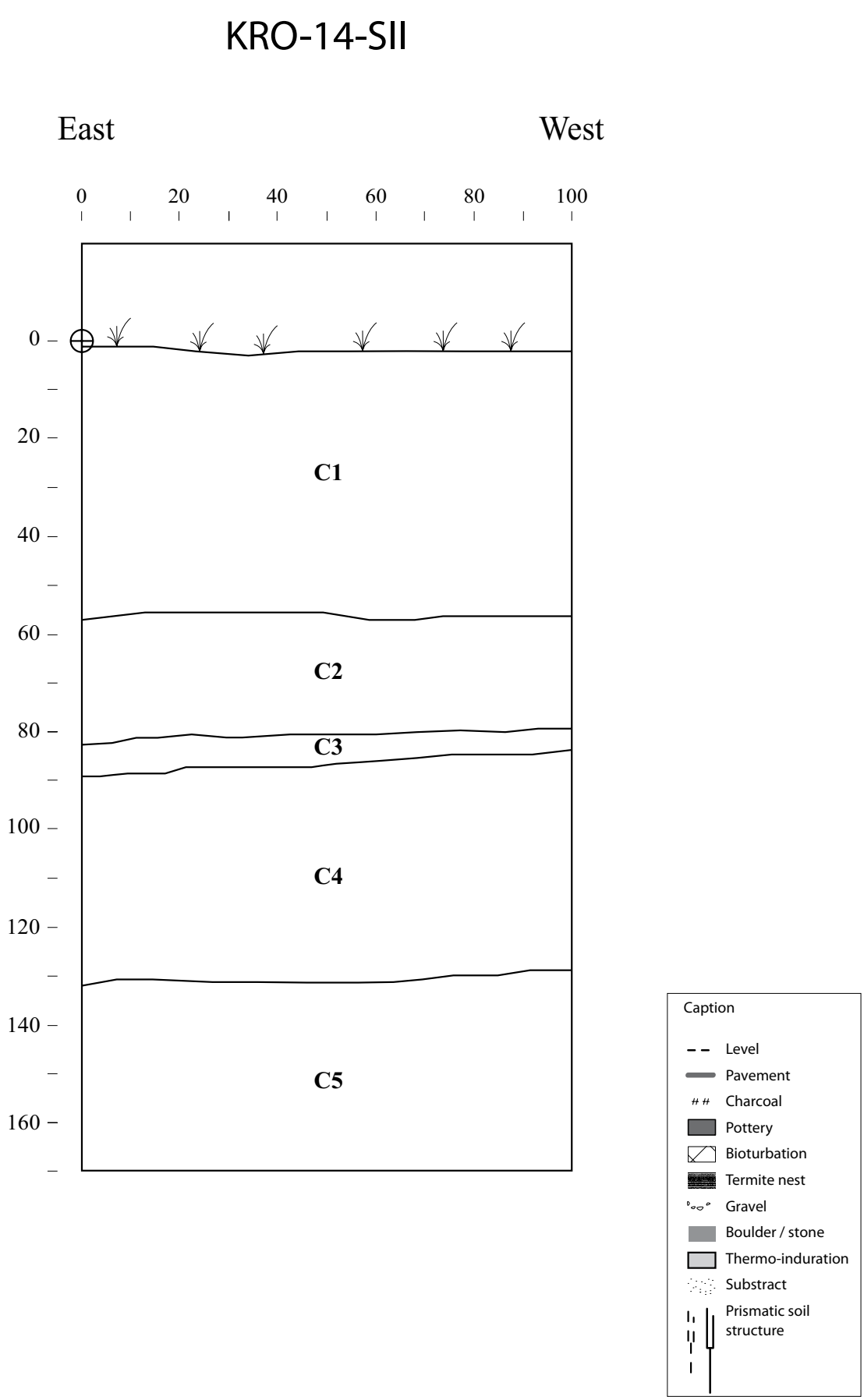

FIGURE AD.6 North section at completion. See text for description of layers.

TABLE AD.6 Category 4

Level	Undec	Illegible
0–20	53	37
20–30	10	7
30–40	17	4
40–50	12	9
50–60	9	5
60–70	7	0
70–80	25	4
80–90	3	3
90–100	6	4
100–110	22	7
110–120	22	5
120–130	24	8
130–140	19	5
140–150	23	8
150–160	13	7
Total	**265**	**113**

Analysis by Louis Champion and Nicolas Nikis in the field, by Héloïse Meziani at RMCA, and by Anne Haour at UEA

TABLE AD.7 Category 3

Context	#	Burn	Slip	Dec1	Dec2	Dec3	Dec4
0–20	7			rc-1			
	42			rfp-1			
	1			perf	undec		
	3	Y	black	inc			
	1	Y	brown	rfp-1			
	1			rfp-1	rfp-1 internal		
20–30	2			rc-1			
	14			rfp-1			
30–40	18			rfp-1			
40–50	2			rc-1			
	1	Y	black	inc			
	13			rfp-1			
	1			rfp-1	paint		
50–60	1			rc-1			
	15			rfp-1			
	1	Y	black	inc			
60–70	1	Y	red	inc			
	15			rfp-1			
70–80	1	Y	red	inc			
	1			rfp-1	paint		
	1	Y	black	inc			
	2			rc-1			

TABLE AD.7 Category 3 (*cont.*)

Context	#	Burn	Slip	Dec1	Dec2	Dec3	Dec4
	17			rfp-1			
80–90	1			rc-1			
	20			rfp-1			
90–100	7			rfp-1			
	1	Y	black	inc			
100–110	4			rc-1			
	13			rfp-1			
	1	Y	black	rc-1	inc		
110–120	4			rc-1			
	23			rfp-1			
	1			perf	undec		
	1			rfp-1	rce		
	1	Y	black	rc-1	inc		
	1	Y	black	rfp-1	inc		
120–130	8			rc-1			
	17			rfp-1			
	1			perf	undec		
	1			perf	roul		
	1	Y	black	inc			
	1	Y	black	rc-1	inc		
130–140	8			rc-1			
	1			perf	undec		
	20			rfp-1			
	2			perf	roul		
	2	Y	black	rc-1	inc		
	3	Y	black	rfp-1	inc		
140–150	3			rc-1			
	15			rfp-1			
	1			perf	rfp-1		
	2			rfp-1			
	1			rc-3			
	4	Y	black	inc			
	1	Y	black	rc-1	inc		
150–160	5			rc-1			
	1			rfp-1	inc		
	2	Y	black	rfp-1	inc		
	1			rfp-2			
	14			rfp-1			
	1	Y	red	rfp-1	inc		
Total	**355**						

Analysis by Louis Champion and Nicolas Nikis in the field, by Héloïse Meziani at MRAC and Anne Haour at UEA

TABLE AD.8 Rims

Context	#	R. type	Brn	Dec 1	L1	Dec 2	L 2	Dec 3	L 3	Dec 4	L 4	Dec 5	L 5	Ang	Diam	Mx. Thick
0–20	1	E4	int	rfp-2	U									5		0.7
	1	S6	ext/int	is-geo 10	U									3	15	0.5
	1	S1	ext/int	undec	U	rfp-5	U	sl-2	U					3	15	0.6
	1	S4	ext/int	sl-3	U									2		0.7
	1	E11	ext/int	sl-3	U									2		0.5
	1	E15	ext/int	undec	U	is-geo 10	U							4		0.4
	1	E15	ext/int	is-geo 29	U											0.7
	1	S4	ext/int											4		0.6
	1	S1	ext/int											4		0.7
	1	S1		undec	U	rc	U							3	26	0.7
	1	S4														0.6
	1	S1	ext/int											4		0.5
	1	S4												5		0.5
	1	S4		rc-1a	U	erod	U									0.8
	1	S4	ext/int	sl-8	U									3	10	0.5
	1	E26												4		0.9
	1	E32												3		0.9
	1	E23	ext											5		0.9
	1	E22	ext											4		0.5
	1	E32	ext/int											4		0.8
	1	S4	ext/int											3	17	0.6
	1	E11	ext/int	pnt-r	U-int									3	16	0.5
	1	E4		ch	L									4		1.1
	1	E1												4		0.5
20–30	1	T12												2		0.8
	1	S1	ext/int	rc-1a	U	sl-2	U							3		0.6
	1	S1	ext/int	is-geo 10	U	undec	U							3	13	0.6
	1	S4	ext	pnt-r	U									4		0.6
	1	S1												4		0.7
	1	E4		undec	U	rfp-1a	U	erod	U					4		0.6
	1	E1		undec	U	rc-1b	U	erod	U					4	18	0.8
	1	E4												3		0.6
	1	E37												4		0.8
	1	E10	ext/int											4		0.8
30–40	1	S1	ext/int	rc-1a	U	sl-8	U							3	15	0.5
	1	S1	int											5		0.7
	1	S4	ext/int											4		0.8
	1	S4												4		0.8
	1	E4		undec	U	rfp-5	U	erod	U					4		0.6
	1	E14		undec	U	rfp-1a	U							3	38	1.1
40–50	1	S4	ext/int	rc	U	sl-6	U	undec	U					3	18	0.7
	1	S4		undec	U	erod	U									0.7
	1	S3		undec	U	rc-1b	U							2		1.0
	1	E12		undec	U	rfp-1b	U									0.9
50–60	1	B4	ext	rc-1a	B											
	1	S1														0.6

TABLE AD.8 Rims (*cont.*)

Context	#	R. type	Brn	Dec 1	L1	Dec 2	L 2	Dec 3	L 3	Dec 4	L 4	Dec 5	L 5	Ang	Diam	Mx. Thick
60–70	1	E11	ext/int											4		0.5
	1	E32	int											4		0.7
	1	E4	ext/int											4		1.1
	1	E4		undec	U	rfp-1a	U							3	15	0.9
70–80	1	T12	int											3		0.6
	1	S6	ext/int	is-geo 10	U	undec	U							3	15	0.5
	1	E1		undec	U	rfp-1b	U							3	21	0.7
	1	S1	ext/int											4		0.7
	1	S4		erod	U									4		0.6
	1	S4														0.6
	1	S4	ext											3		0.9
	1	E37												4		1.0
	1	E38	ext/int											4		0.7
80–90	1	E9	ext/int	is-geo 30	U									4	14	0.4
	1	E9	ext/int	is-geo 31	U									4	17	0.4
	1	C2	ext	undec	c/u	rc-1a	U							4		
	1	E4		undec	U	rfp-1b	U							4		0.7
	1	E4												4		0.5
90–100	1	T7	ext/int													0.6
	1	E4												3		0.5
	1	S1	ext/int											5		0.7
	1	E1		undec	U	rfp-1a	U									0.8
	1	E14	ext/int											4		1.0
100–110	1	E4	ext/int											4		0.8
	1	S1	ext/int											4		0.8
	1	E4	int											4		0.5
110–120	1	S4	ext	is-geo 25	U	roul	U-int							3	8	0.4
	1	S1	ext/int											4		0.6
	1	S6	ext/int	erod	U	sl-7	U	undec	U					3		0.4
	1	S4	ext/int											4	18	0.6
	1	S1	ext/int											4		0.7
	1	S4	ext											5		0.7
	1	S6	ext/int											4		0.4
	1	S1	ext/int											4	23	0.6
	1	E1	ext/int	undec	U	rfp-1a	U							3	18	0.6
	1	E1												4		0.6
	1	E4		undec	U	rfp-1b	U							3		0.6
	1	E14	int											4		0.9
	1	S4		undec	U	rfp-1b	U							3	20	0.8
	1	S4		undec	U	rfp-1a	U									0.7
120–130	1	S4	ext/int	rc-1a	U	sl-1	U	rc-1a	U	sl-2	U			2	9	0.5
	1	E11	ext/int	roul	U	sl-8	U	undec	U					4	11	0.4
	1	S1	ext/int	rc-1a	U	sp1-l	U	sl-2	U							0.7
	1	S6	int	is-geo 32	U									3	15	0.5
	1	S4	ext/int											4	20	0.6
	1	S4		undec	U	rc	U	erod	U					3		0.7

TABLE AD.8 Rims (*cont.*)

Context	#	R. type	Brn	Dec 1	L1	Dec 2	L 2	Dec 3	L 3	Dec 4	L 4	Dec 5	L 5	Ang	Diam	Mx. Thick
	1	S1	ext/int											4		0.7
	1	S4												4		0.6
	1	E22	ext/int											5		0.5
	1	E4														0.8
	1	E11		undec	U	rc-1a	U									0.5
	1	E4	ext/int											4		0.7
130–140	1	E9	int	undec	U	sp1-l	U	rc-1a	U	sl-4	U			4	9	0.4
	1	S6		erod	L									3		0.9
	1	S4	ext/int											4		0.4
	1	E4												4		0.6
	1	E4		rfp-1b	U									4		0.7
	1	E10		undec	C	rc-1a	U									1.1
140–150	1	E26	ext/int	undec	C	erod	U							4		0.5
	1	E14	ext/int	undec	U	rfp-1a	U							3		0.7
	1	E15	ext/int	undec	C	roul	U	sl-1	U	undec	U			4		0.7
	1	T1		undec	U	is-geo 10	U							3	16	0.7
	1	S4	ext/int											4		0.6
	1	S1	ext/int											4	15	0.5
	1	E4		undec	U	roul	U							4		0.7
	1	E4		undec	U	erod	U							3		0.9
	1	E4	ext/int											4		0.7
	1	E12												4		0.6
150–160	1	E11	int	undec	U	rc-1b	U	erod	U					3	35	0.9
	1	S4	ext/int	undec	U	sl-1	U	rc-1a	U					1	10	0.5
	1	T22	ext	undec	U	sl-1	U	rfp-1a	U	sl-1	U	rfp-1b	U-int	3	11	0.6
	1	T24	ext/int											2		0.5
	1	S4	ext/int	is-geo 10	U											0.7
	1	S1												2	14	0.5
	1	E4		undec	U	erod	U	roul	U							0.9
	1	E1														0.8
	1	E1												4		0.5
	1	E4	ext/int											5		0.6
Total	**124**															

Analysis by David Kay

CATALOGUE AE

Garou (GAR-14-SI)

Alexandre Livingstone Smith

1 Location

Garou is a contemporary settlement located to the south east of Malanville, on the road between Guene and Madekali. Aerial imagery showing the layout of the village clearly indicates the position of a now disappeared *birni*.

2 Geographical Coordinates

LAT: 11,79778101 LONG: 3,477044022 (WGS84)

3 Discovery

The site was identified and excavated by Alexandre Livingstone Smith, Olivier Gosselain and Lucie Smolderen on 13 February 2014.

4 Destruction Risks

The site is a contemporary village. It is still expanding.

5 Site

Garou is a settlement site. The extent of the site is unknown, but the analysis of satellite images allows for precise outline of the perimeter of the former *birni*.

6 Excavation

Garou had never been excavated. A 1 × 1 m test pit was set-up under a tree, on the street near the oldest house of the village. It was excavated by spits of 10 cm (except for the superficial layer which was excavated in one spit of 20 cm). Within each spit, archaeological contexts (i.e. distinct units) were separated, sieved and bagged separately. All the spits were sieved down to 5 mm. The excavation was stopped at 80 cm in the natural substratum.

7 Stratigraphy

As elsewhere in living settlements, the upper layers of the stratigraphy are disturbed by contemporary activities, but the lower levels reveal substantial occupation layers.

8 Finds

The material excavated at Garou consists mainly in contemporary artefacts, very fragmented pottery among which pottery decorated with incised lines and twisted cord roulette, as well as a large fragment of pottery decorated with a rocked blade. Pottery decorated with folded strip roulette is present at the bottom of the excavation. A cowrie was recovered from level 20–30 cm.

9 Interpretation and Cultural Attribution

Garou is described as an old settlement by oral traditions. It architectural layout certainly attests to existence of an old core settlement, probably constrained by some sort of wall system – a *birni* in oral testimonies. The stratigraphy displays a sandy layer of settlement debris sandwiched between medieval and contemporary layer/material. Although there is no layer of trace of a classic settlement mound, folded strip rouletted pottery is present as a background noise at the bottom of the stratigraphy. The main unit (Context 4) is consistent with a post-medieval deposit – an estimate confirmed by the radiocarbon date.

10 Radiocarbon Dates

Beta- 417597	340	30	GAR 14 SI, 60–70	Phase 5

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FIGURE AE.1
GAR-14-S1, location view

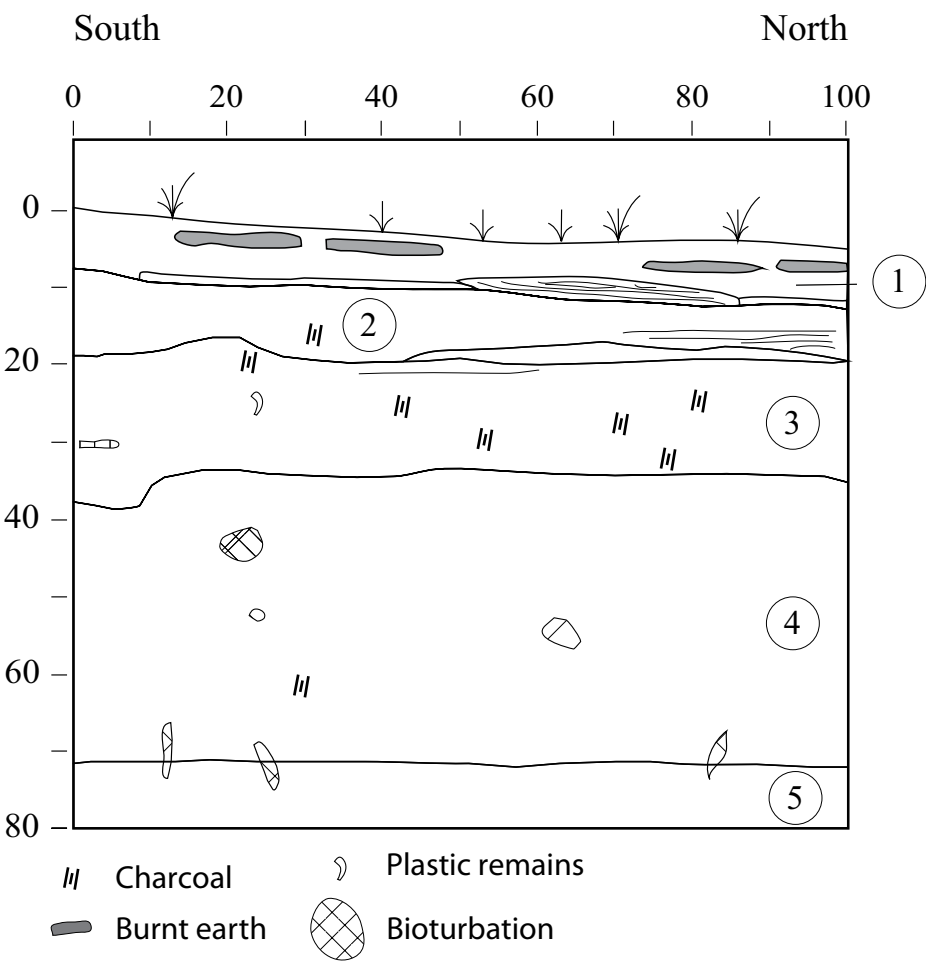

FIGURE AE.2
West section at completion
1 Compact sandy top soil with slabs of burnt earth and sand lamination
2 Loose grey sand with sand lamination
3 Loose grey sand, with plastic fragment
4 Brown to yellow sand
5 Yellow sand (natural substratum)

TABLE AE.1 Desampling

Context	#
0–20	61
20–30	61
30–40	34
40–50	15
50–60	9
60–70	5
Total	**185**

Analysis in the field by Ali Livingstone Smith and at UEA by David Kay

TABLE AE.2 Category 4

Context	Undecorated	Illegible
0–20	6	2
20–30	2	0
30–40	11	0
40–50	5	0
50–60	3	1
60–70	1	2
Total	**28**	**5**

Analysis by David Kay

TABLE AE.3 Category 3

Context	#	Burnish	Dec1	Dec2	Dec3
0–20	1		sl-2		
	1	ext/int	sl-1		
	1	ext	sl-2	sl-1(int)	
	1	int	indis		
	3	int			
	3	ext/int			
	2	ext			
	2		sl-1		
	1	int	sl-3	sl-2	
	1	ext/int	sl-3		
	1	ext/int	sl-4		
20–30	4	ext			
	2	int			
	1	ext/int	sh-37	sl-3	sx-3
30–40	1	int	roul		
	1	ext/int	roul		
	1	ext			
	1	ext	undec	rc-1a	
40–50	2	int			
	2	ext			
	1	ext	undec	rc-1a	indis
	1	ext	rc-1b	sl-2	
	1	ext	sl-2	sl-1	
50–60	2	ext/int			
	2	ext			
	1		roul		
60–70	1	ext	sl-2	sl-1	
	1		rfp-1b	indis	
	1		rfp-1b	ch	
	1		rfp-1b	indis	
	1	int	rfp-5		
	1	int	roul		
Total	**46**				

Analysis by David Kay

TABLE AE.4 Rims

Context	#	R.Type	Brn	Dec1	L1	Dec2	L2	Dec3	L3	Ang.	Diam.	Mx. thick
0–20	1	E25										1.2
	1	S1	ext/int							4		0.6
	1	S6								4		0.7
	1	S6	ext/int	rc-1a	u	sl-3	u			3		0.7
	1	E4	ext/int							4		0.6
	1	E4	ext/int									0.6
20–30	1	S1								5		0.7
	1	S1	ext/int							3	29	1.0
	1	S2	ext/int							2		0.8
	1	S4	int							5		0.7
	1	E31	ext/int							5		1.0
	1	E9	ext/int	undec	c	smth	u	roul	u	5		0.8
	1	E9								4	10	0.5
	1	E4	ext/int							4		0.9
30–40	1	S4		undec	u	sl-1	u	ch	u	2	22	0.8
	1	S1	ext/int							4		0.6
	1	S4								4		0.8
	1	T8								4		0.7
40–50	1	E1	ext/int	sl-1	l					4		0.6
	1	S4	ext/int							5		0.8
50–60	1	S1	ext/int	rc-1a	u					4		0.6
	1	E2	ext/int							4		0.7
	1	E12		indis	u					4		0.7
60–70	1	S1		rfp-1b	u	indis	u			2	13	0.7
Total	**24**											

Analysis by David Kay

CATALOGUE AF

Guene zeno (ENE-14-SI & II)

Alexandre Livingstone Smith

1 Discovery

The site was identified and excavated by Alexandre Livingstone Smith on 8 February 2014.

2 Geographical Coordinates

LAT: 11,74724802: LONG: 3,227268001 (WGS84)

3 Destruction Risks

The site is ploughed. It is not under any specific threat and mitigation measures are not urgent.

4 Site

Guene zeno is an ancient settlement located a few kilometres north of Guene. It is considered by our informants to be the most ancient location of Guene (another informant pointed out that although GUE was very old, Kouboukoukourou (ROU-14-SI) is the oldest settlement of Guene). Guene zeno (ENE) is located in a field, just south a hill reputed for the presence of a cave, and near a seasonal water source. It is said to have been founded by princes coming from Kandi and to have been inhabited by Mulanche and Tyenga, and abandoned due to lack of water.

The initial survey yielded some ceramic material (among which no folded strip roulette decoration, but a great deal of undecorated material and some *blepharis* decorated pottery). The extent of the site is unknown, but it is at least 50 by 100 m.

5 Excavation

Guene zeno had never been excavated. Two test pits were excavated. Both were 1 × 1 m and dug by spits of 10 cm (except for the superficial layer which was excavated in one spit of 20 cm). Within each spit, archaeological contexts (i.e. distinct units) were separated, sieved and bagged separately. All the spits were sieved down to 5 mm. Both test pits were shallow.

6 Stratigraphy

The stratigraphy of ENE-14-SI and SII displays a single layer of grey sand below the plough layer and overlaying the yellow sand substrate.

7 Finds

Surface finds include potsherds displaying *blepharis* roulette decoration. There were no small finds from the excavation.

8 Interpretation and Cultural Attribution

Oral testimonies, supported by the presence of new types of pottery and the absence of folded strip roulette decorated pottery could indicate a post-thirteenth century occupation. Informant says this was a short lived occupation founded by princes coming from Kandi. The rather shallow deposits indicate a short span occupation (one or two generations?).

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FIGURE AF.1
Site location

FIGURE AF.2
S1, West section at completion

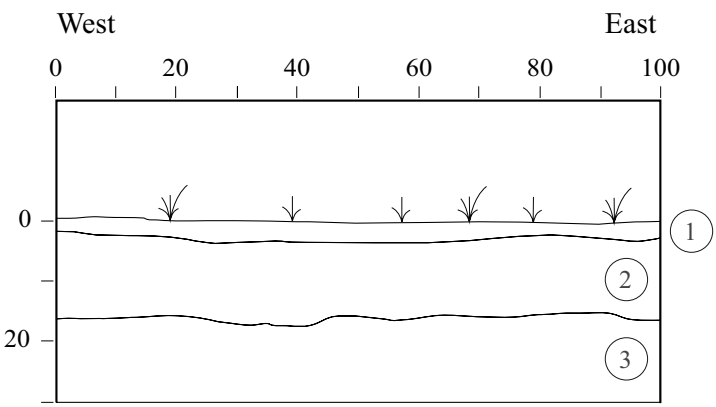

FIGURE AF.3
S1, North section
1 Ploughed top soil
2 Grey sand
3 Compact yellow sand

9 ENE SI

TABLE AF.1 Desampling

Level	Number
0–20	24
Total	**24**

Analysis in the field by Alexandre Livingstone Smith and Amoussou Inès Carolin

TABLE AF.2 Category 4

Context	Undecorated	Illegible
0–20	65	**0**
Total	**65**	**0**

Analysis in the field by Alexandre Livingstone Smith and Amoussou Inès Corolin, and at UEA by David Kay

TABLE AF.3 Category 3

Context	#	Burn.	Dec1	Dec2
0–20	2	ext		
	1	ext/int		
	1	int		
	1	ext/int	sw-2	
	1		sl-2	sl-1
Total	6			

Analysis by David Kay

TABLE AF.4 Rims

Context	#	R. type	Dec1	Diam	Ang	Mx thick
SI 0–20	1	S6	undec			0.6
	1	E4	undec			0.65
	1	S2	undec			0.7
Total	**3**					

Analysis by David Kay

10 ENE SII

TABLE AF.5 Desampling

Level	Number
0–20	30
20–30	0
Total	**30**

Analysis in the field by Alexandre Livingstone Smith and Amoussou Carolin

TABLE AF.6 Category 4

Context	Undecorated	Illegible
0–20	46	8
20–30	2	0
Total	**48**	**8**

Analysis in the field by Alexandre Livingstone Smith and Amoussou Inès Corolin, and at UEA by David Kay

TABLE AF.7 Category 3

Context	#	Burnish	Dec1	Dec2
0–20	1		rc-1a	undec
	1		sl-1	
	1		rfp-1b	
Total	**3**			

Analysis by David Kay

TABLE AF.8 Rims

Context	#	R. type	Dec1	Diam	Ang	Mx. thick
SII 0–20	1	S3	undec			0.6
	1	S1	undec			0.9
	1	E32	undec			0.8
Total	**3**					

Analysis by David Kay

Guene (GUE-14-SI)

Alexandre Livingstone Smith

1 Location

Guene is a contemporary settlement south of Malanville. The place is an important crossroad as the track leading north up to Birni Lafia, Karimama and Pekinga starts here. The test-pit we excavated is located between the dyeing pits and the oldest compound in Guene (Ganda windi), according to our informants. Informants also told us this lay just inside the former *birni*, in the northern part of the old village.

2 Geographical Coordinates

LAT: 11,7275190353393: LONG: 3,22187399491667 (WGS84)

3 Discovery

The site was identified and excavated by Alexandre Livingstone Smith on 8 February 2014.

4 Destruction Risks

The site is used as a mudbrick clay extraction site. It is heavily impacted.

5 Site

Guene is a modern city. The initial survey yielded some ceramic material (among which no folded strip roulette decoration, but many undecorated sherds and some *blepharis* roulette decorated pottery). The extent of the site is unknown.

6 Excavation

Guene had never been excavated. One test pit was excavated. It was 1 × 1 m in size and excavated by spits of 10 cm (except for the superficial layer which was excavated in one spit of 20 cm). Within each spit, archaeological contexts (i.e. distinct units) were separated, sieved and bagged separately. All the spits were sieved down to 5 mm. This test pit was shallow.

7 Stratigraphy

The stratigraphy of GUE-14-SI displays a single layer of grey sand above a layer of hard clayey silt. The site is heavily exploited for clay and one may wonder at the integrity of the material in the test-pit.

8 Finds

Surface finds include potsherds displaying *blepharis* roulette decoration. During the excavation pottery, one glass fragment and one bead were found (SF 2014-26 and SF 2014-45, both in the upper 20 cm), along with modern plastic. The pottery from the excavation is very scarce and largely consisted of undecorated sherds.

9 Interpretation and Cultural Attribution

Oral testimonies, supported by the presence of new types of pottery and the absence of folded strip roulette decorated pottery likely indicate a post-thirteenth century occupation.

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FIGURE AG.1
Location of Guene SI test pit

FIGURE AG.2
West section at completion

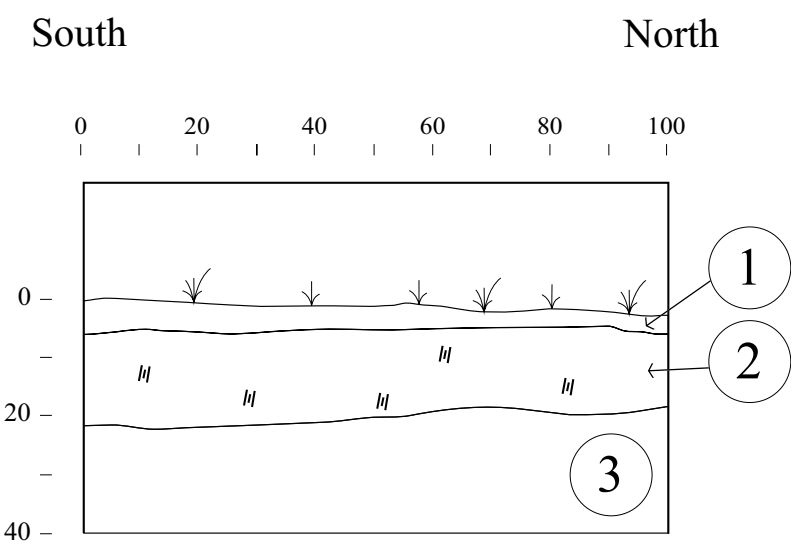

FIGURE AG.3
Guene SI, West section
1 Ploughed top soil
2 Grey sand
3 Compact orange clay

TABLE AG.1 Desampling

Level	Number
0–20	39
20–30	16
30–40	3
Total	**58**

Analysis in the field by Alexandre Livingstone Smith and Amoussou Carolin, and at UEA by David Kay

TABLE AG.2 Category 4

Context	Undecorated	Illegible
0–20	42	3
20–30	18	9
30–40	5	2
Total	**65**	**14**

Analysis in the field by Alexandre Livingstone Smith and Amoussou Carolin, and at UEA by David Kay

TABLE AG.3 Category 3

Context	#	Burn	Dec1	Dec2	Dec3
0–20	2	ext/int			
	2	int			
	3	ext			
	1		undec	sl-1	indis
	1		rfp-5		
20–30	1	ext	indis		
	2		rc-1a	indis	
Total	**12**				

Analysis by David Kay

TABLE AG.4 Rims

Context	#	R.Type	Brn	Dec1	L1	Ang	Diam	Mx thick
0–20	1	S1	ext/int					0.7
	1	E32	ext/int			4		0.7
	1	E4	ext			5		1.1
	1	E12	ext/int					1.1
20–30	1	E37	ext/int			5		0.8
Total	**5**							

Analysis by David Kay

Kouboukoukourou (ROU-14-SI)

Alexandre Livingstone Smith

1 Location

Kouboukoukourou is a settlement mound located west of Guene (the names derives from a tree *Koubou* [*Combretum micranthum*, Jourand 2013: 77] that was abundant in the area). It was referred to us as the oldest historical settlement of Guene. According to our informant his ancestor, Sama, founded this settlement. There are abundant traces of metallurgy around the mound, which were surveyed by team member Robion-Brunner. The test-pit is located on top of the settlement mound.

2 Geographical Coordinates

LAT: 11,72741996 LONG: 3,206691016 (WGS84)

3 Discovery

The site was identified and excavated by Alexandre Livingstone Smith on 9 February 2014.

4 Destruction Risks

The site is ploughed. It is not under any specific threat and mitigation measures are not urgent.

5 Site

Kouboukoukourou is a settlement mound. Unlike other settlement mounds such as Birnin Lafiya, this site is located away from the flood plain, but at the confluence of two temporary watercourses. The initial survey yielded some ceramic material (mainly pottery decorated with folded strip roulette). The extent of the site is unknown, but it is at least 100 m long by 50 m wide.

6 Excavation

Kouboukoukourou had never been excavated. One 1 × 1 m. test pit was setup on top of the mound and excavated in spits of 10 cm (except for the superficial layer which was excavated in one spit of 20 cm). Within each spit, archaeological contexts were separated, sieved and bagged separately. All the spits were sieved down to 5 mm. The excavation was interrupted at 110 cm without reaching the natural substrate.

7 Stratigraphy

The stratigraphy of ROU-14-SI consists in settlement rubble with a pit structure, apparently partly re-excavated.

8 Finds

The material excavated at Kouboukoukourou consists mainly of pottery decorated with folded strip roulette. The single small find was a possible bead with a green patina (SF 2014-47).

9 Interpretation and Cultural Attribution

Kouboukoukourou is related to the settlement history of Guene in oral traditions. The type of settlement mound and the pottery indicate that the site of Kouboukoukourou is a classic settlement mound. The dates show that its abandonment must have been near contemporaneous with the abandonment of other such mound sites of the valley.

10 Radiocarbon Dates

OxA-31047	849	29	ROU-14-SI, 40–50	Phase 4
OxA-31045	852	27	ROU-14-SI, 70–80	Phase 4
OxA-31046	851	29	ROU-14-SI, 70–80	Phase 4
OxA-31048	860	27	ROU-14-SI, 80–90	Phase 4

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FIGURE AH.1 Site view

FIGURE AH.2 West section at completion

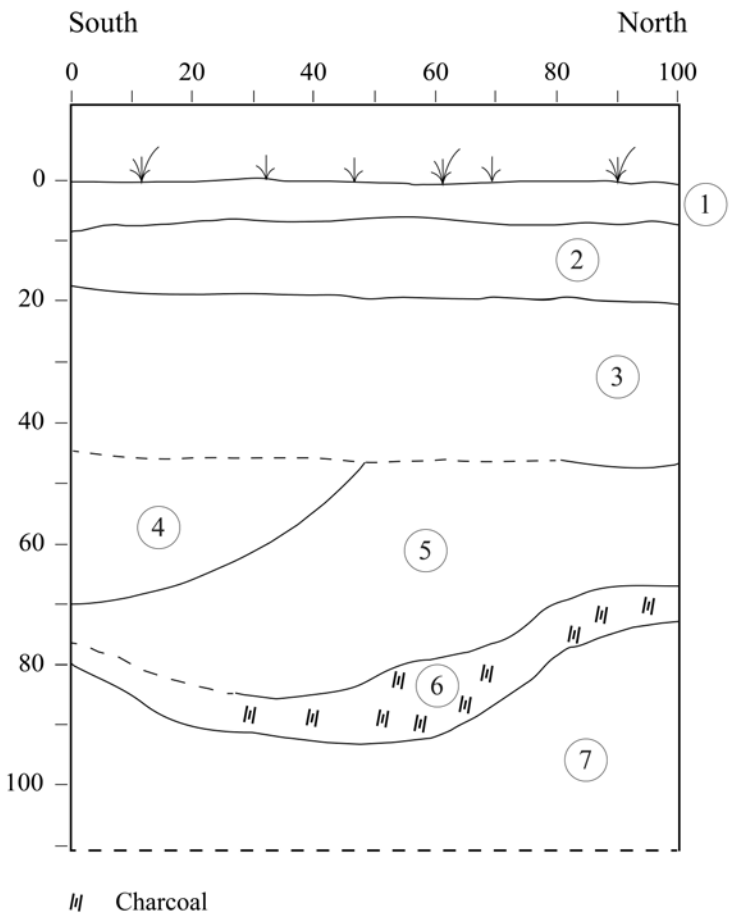

FIGURE AH.3
ROU-14-SI, West section at completion
1 Ploughed top soil
2 Compact dark grey sand
3 Brown compact silty clay
4 Dark ashy sand (possible pit)
5 Brown silty clay (possible pit)
6 Brown red silty clay.
7 Brown orange silty clay

TABLE AH.1 Desampling

Level	Number
0–20	107
20–30	127
30–40	140
40–50	78
50–60	115
60–70	82
70–80	67
80–90	169
Total	**885**

Analysis in the field by Anne Haour and Jennifer Wexler and at UEA by Anne Haour and David Kay

TABLE AH.2 Category 4

Level	Undecorated	Illegible
0–20	4	0
20–30	6	0
30–40	15	6
40–50	17	2
50–60	23	7
60–70	24	5
70–80	8	2
80–90	29	1
Total	**126**	**23**

Analysis by Sam Nixon

TABLE AH.3 Category 3

Context	#	Burn	Dec1	Dec2
0–20	2		rfp-1b	
	2		rfp-1c	
	1		roul	
	1		indis	
20–30	2		rfp-1b	
	1		indis	
30–40	1	int	rfp-1b	
	1	ext		
	7		rfp-1b	
	1		rfp-1c	
	3		roul	
	1		plain	rfp-1b
40–50	1	ext/int		
	1	ext		
	2	int		
	11		rfp-1b	
	2		roul	
	1		perf	plain
50–60	10		rfp-1b	
	1	int		
	1	ext/int		
	1	ext		
	3		roul	
	1		rc-1b	
	1		rfp-1a	
	1		plain	roul
	1		perf	plain
60–70	3	int		
	1	ext/int		
	15		rfp-1b	
	1	int	roul	
	3		rc-1b	
	1		roul	
	1		rc-1a	
70–80	1	int	roul	
	1		rfp-1b	
	2		roul	
	1		rfp-1c	
80–90	1	ext/int		
	2	ext		
	1		rfp-1c	
	1		plain	rfp-1c
	1		rfp-1a	
	2		roul	

TABLE AH.3 Category 3 (*cont.*)

Context	#	Burn	Dec1	Dec2
	1	int	rc-1a	
	1		rfp-1c	
	4		rfp-1b	
	1	ext	sh-21	sl-3
Total	**106**			

Analysis by Sam Nixon and Anne Haour

TABLE AH.4 Rims

Context	#	R.Type	Brn	Dec1	L1	Dec2	L2	Dec3	L3	Ang.	Diam.	Mx. thick
0–20	1	S1										1.0
	1	S4										0.8
	1	S4								4		0.9
	1	T1		indis	u							0.9
20–30	1	S4										1.5
	1	T22								4		0.8
30–40	1	S1		indis	u					4		0.9
	1	T1		indis	u-int							1.0
	1	E21		indis	u	sl-3	u	plain	c	5		0.7
40–50	1	S1										0.6
	1	S1								2		0.6
	1	S1	ext/int							4		0.6
	1	S1								4		0.7
	1	S3								4		0.9
50–60	1	S1		rfp-1b	u					4		0.8
	1	T3								2	19	1.0
	1	E37		indis	u	indis	c			4		1.1
	1	E4								5		0.7
	1	E4								4		0.7
	1	E26								4		0.8
60–70	1	E4		plain	u	rfp-1b	u			4		0.7
	1	S1		plain	u	sl-1	l			2	18	0.7
	1	S4		plain	u	sl-1	u			4		0.8
	1	T14								5		0.6
	1	T5		roul	u					3	14	0.7
	1	E50								4		1.1
70–80	1	S1								4	11	0.7
	1	S4								4		0.9
80–90	1	S6		is-geo 10						3		0.5
Total	**29**											

Analysis by David Kay

CATALOGUE AI

Madekali (KLI-14-SI & RC1)

Alexandre Livingstone Smith, Louis Champion and Nicolas Nikis

1 Location

Madekali is a modern town south of Malanville. It is located on a small plateau overlooking the modern flood plain. We excavated at a place said to have been an entrance of the former *birni* that later became a trash mound. Today it is a pathway inside the city.

2 Geographical Coordinates

LAT: 11.70455396, LONG: 3.548894031 (WGS84)

3 Discovery

KLI-14-RC1 and KLI-14-SI were identified and excavated by Alexandre Livingstone Smith on 14 February 2016.

4 Destruction Risks

The site is in the middle of a modern settlement and RC1 is a road cut. The site has been partly destroyed by roadworks. Sections of the site are exposed on the side of the road. Extensive survey and excavations are needed.

5 Excavation

Madekali had never been excavated. One test pit was excavated 9 m east of the road-cut RC1. The road-cut was straightened, cleaned, photographed and drawn (RC1). Samples of pottery material and charcoal (including archaeobotanical samples) were taken directly from the profile. KLI-14-SI was excavated 9 m east of RC1. The test pit was 1 × 1 m and excavated by spits of 10 cm (except for the superficial layer which was excavated in one spit of 20 cm). Within each spit, archaeological contexts (i.e. distinct contexts) were separated, sieved and bagged separately. All the spits were sieved down to 5 mm. Test pit SI was interrupted at 140 cm into the compacted silt that could reasonably be related to the uppermost layer in RC1.

6 Site

Madekali is a living village. The extent of the site is unknown, but our informants walked us around the supposed *birni* enclosure that encloses the centre of the modern city. A smelting site was found eroding in the middle of the city.

7 Stratigraphy

The combined stratigraphy of RC1 and SI shows that the modern city of Madekali is built on a medieval settlement mound similar to that of Birnin Lafiya. RC1 displays a series of interconnected anthropic structures overlain by a layer of building rubble. This same layer constitutes the bottom of SI (Context 19). In SI this context is overlain by a series of ash deposits confirming the use of the area as trash midden. The presence of glass at a depth of 1 metre seems to indicate a rather late date of use. The analysis of the stratigraphy combined with the radiocarbon dates indicates a gap between the Medieval and Modern/Contemporary occupations.

8 Finds

Finds include very different kinds of pottery, three clay or stone beads (SF 2014-22 to 24, the first possibly a spindle whorl) in the upper part of the sequence, fine ceramic fragments (SF 2014-04 and 2014-35, the latter a pipe fragment), and metal fragments: a trapezoidal mass with a small point (SF 2014-93), which might be possibly included with the functional category of tools, and a metal rod (SF 2014-94). Faunal and botanical remains were very abundant. Sampling in a rich organic sandy layer in lower part of RC1 (Context 6) yielded mainly pearl millet (*Pennisetum glaucum*) and African rice (*Oryza glaberrima*) but also a few remains of sorghum (*Sorghum bicolor*), unspecified nuts, *Adansonia digitata, Elaeis guineensis, Canarium schweinfurthii, Vigna unguiculata* and *Digitaria*.

Three others grey sandy layers (Context 8, Context 16, Context 18) have been sampled in the lower half of SI. The

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FIGURE AI.1 Atmosphere

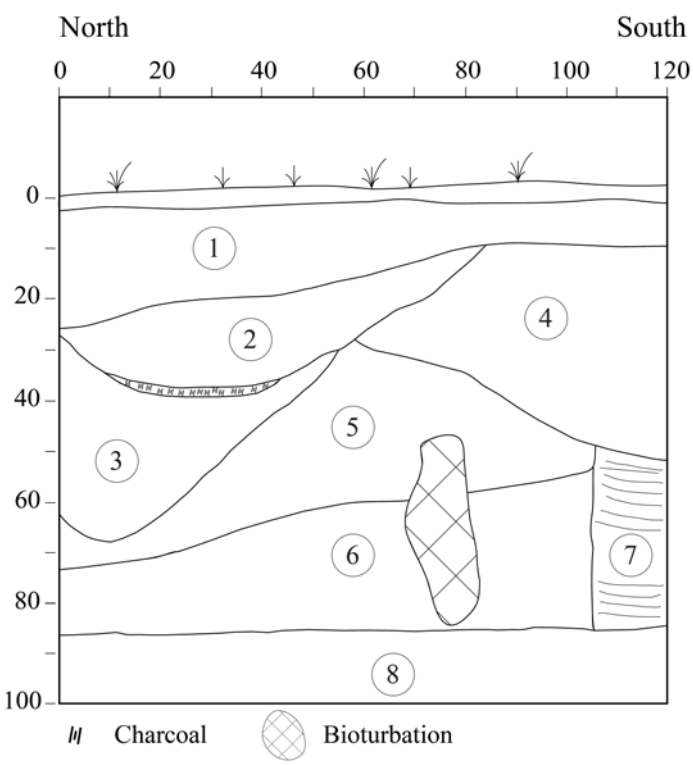


FIGURE AI.2
KLI-14-RC1, East section
1 Compact grey to orange sand (very fragmented pottery)
2 Loose grey sand
3 Loose grey sand with abundant charcoal
4 Compact orange sand
5 Compact grey brown sand
6 Compact 'greasy' black sand (rich organic content)
7 Sand lamination
8 Natural substratum

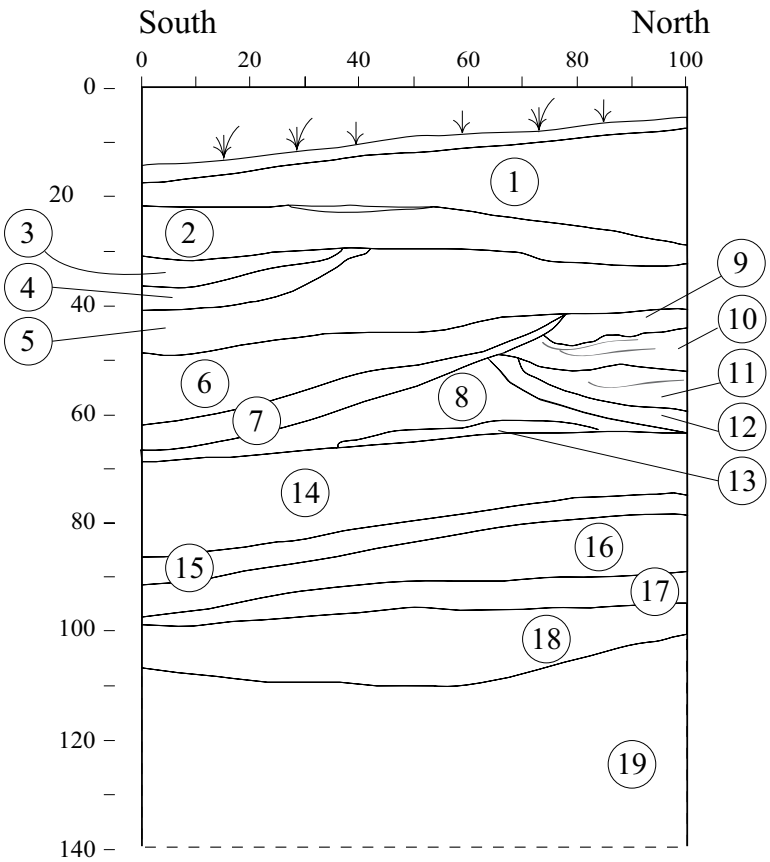


FIGURE AI.3
KLI-14-S1, West section
1 Loose grey sand and ash
2 Grey to white ash
3 Grey sand
4 White sand
5 Grey to white sand and ash
6 White ash
7 Green sand
8 Compact 'greasy' black sand
9 White ash
10 Laminated green sand
11 Grey sand
12 Laminated white and black sand
13 Burnt earth (orange)
14 Compact grey beige to yellow sand
15 Whitish grey sand
16 Whitish grey sand
17 Grey sand
18 Grey to whitish beige sand
19 Compact yellow to orange grey sand (fragmented pottery), probably the same as RC1 Context 1

FIGURE AI.4 KLI-14-S1, West section at completion

FIGURE AI.5
KLI-14-RC1, East section at completion

main point is the absence of African rice (*Oryza glaberrima*), *Vigna unguiculata* and *Digitaria*. Pearl millet is still present but in lower quantities. Sorghum (*Sorghum bicolor*) is present in Context 8 and 16. Nuts (indeterminate), *Adansonia digitata, Elaeis guineensis, Canarium schweinfurthii* have been identified in the three contexts while *Gossypium sp*. which (not present in Context 6 sample of RC1) is identified in Context 8 and 18 and *Acacia* only in Context 8.

9 Interpretation and Cultural Attribution

The sequence is indicative of a long history, although trash middens tend to grow quickly. The presence of a sequence above the settlement mound deposits, oral testimonies, supported by the presence of new types of pottery, indicate a post-thirteenth century occupation. Although the chronological hiatus may indicate a break in the settlement, we think this can be related to the location of the test-pit. Indeed, it was not located in the most ancient neighbourhood of the village, but at one of the gates of the *birni*.

10 Radiocarbon dates

TABLE AI.1

OxA-30959	160	29	KLI-14-SI-U18	Phase 5
OxA-31049	143	27	KLI-14-SI-U8,	Phase 5
OxA-31050	162	27	KLI-14-SI-80-90	Phase 5
OxA-31051	970	28	KLI-14-SI-120-130	Phase 4
OxA-31353	1045	29	KLI 14 RC1 Unit 2	Phase 3-4
OxA-31584	1030	27	KLI 14 RC1 Unit 5	Phase 3-4
OxA-31583	992	26	KLI 14 RC1 Unit 2	Phase 3
OxA-31585	1093	27	KLI-RC1-U6	Phase 3

11 KLI SI

TABLE AI.2 Desampling

Level	Number
0–20	40
20–30	3
30–40	34
40–50	54
50–60	27
60–70	41
70–80	86
80–90	84
90–100	54
100–110	18
110–120	252
120–130	114
Total	**807**

Analysis in the field by Alexandre Livingstone Smith and at UEA by Sam Nixon and Anne Haour

TABLE AI.3 Category 4

Level	Undecorated	Illegible
0–20	15	0
20–30	9	0
30–40	9	0
40–50	3	0
50–60	10	0
60–70	11	0
70–80	19	1
80–90	12	2
90–100	4	0
100–110	1	1
110–120	12	0
120–130	27	6
Total	**132**	**10**

Analysis by Sam Nixon and Anne Haour

TABLE AI.4 Category 3

Context	#	Burn	Dec1	Dec 2	Dec 3	Dec 4	Dec 5
0–20	7	ext/int					
	5	int					
	10	ext					
	1		pnt-r-c				
	1		blepharis				
	2		rc-1b				
	1	ext	rc-1a	plain			
	1	int	sl-1	rc-1a			
	1	ext/int	plain	rc-1a	plain		
	1		rfp-1a int				
	1		roul				
	1	ext	plain	sl-1	roul		
	2		rc-1a				
	1	ext	ch-1	roul	ch-1	roul	
	1	ext/int	plain	sl-1	sx over roul		
	1	int	roul				
	1	ext/int	undec.	rc-1a	pnt-rb	undec.	
	1	ext/int	undec.	sl-1			
20–30	6	ext/int					
	1		roul				
	1	ext/int	plain	rc-1a			
	1	int					
	1	ext					
	1	ext/int	undec.	sl-3			
	1		undec.	sl-1 (int)			
30–40	9	ext/int					
	4	ext					

TABLE AI.4 Category 3 (*cont.*)

Context	#	Burn	Dec1	Dec 2	Dec 3	Dec 4	Dec 5
	1	int					
	3	ext	pnt-r-c				
	2		roul				
	1	ext	roul				
	1		sw-1	rc-1a			
	1	ext/int	plain	pnt-rc overrc-1a	plain		
	2		rc-1a				
	1		mch-4				
	2		pnt-r-c				
	1	ext/int	undec.	sl-2			
40–50	3	ext/int					
	1	ext	plain	roul	sl-3	sw-1	sl-2
	1	ext	herb				
	1	int	roul	sl-2	plain	sp4-t	roul
	1		rc-1a				
	1	ext/int	underlying rc-1a	sl-1	sx	sl-1	
	1		roul				
	1	ext/int	plain	roul			
	1		rc-1a	herb			
50–60	3	ext	pnt-r-c				
	4	ext					
	2	ext/int					
	1	ext	plain	sh	plain	sl-1	roul
	1		ch-1	rc	ch		
	1	ext/int	roul				
	1	ext	plain	sl-1			
	2	int					
60–70	5	int					
	7	ext/int					
	1		rc-1a	plain			
	1	ext/int	plain	sl-2	sx over rc-1a	sl-2	
	1	ext	plain	roul			
	1		mch-3				
	1	ext/int	sl-1	ind	st-2		
	1	ext/int	plain	sl-8			
	3	ext					
	1	ext					
	1	ext/int	indistinct	sx	sh-1	sl-1	undec
	1		su	blepharis			
70–80	1		rfp-1b				
	9	ext					
	5	ext/int					
	2	int					
	2		roul				
	1	int	plain	pnt-r-b over rc-1a			
	1	ext/int	plain	roul	mch-2	sx over rc-1b	
	1	int	rc-1b				

TABLE AI.4 Category 3 (*cont.*)

Context	#	Burn	Dec1	Dec 2	Dec 3	Dec 4	Dec 5
	1		plain	blepharis			
	1		pnt-bl-c				
	1	ext/int	sl-8	plain			
	1		pnt-r-c				
80–90	9	ext					
	1	ext/int	plain	sl-1	roul		
	1		plain	sl-1			
	1	int	rc-1b				
	1	ext	plain	sl-1	rc-1a		
	2	int					
	1	ext	sl-6	rc-1a			
	1		rc-1b				
	1		plain	roul	sl-1		
	1	ext/int	plain	sl-4			
	2	ext/int					
90–100	1	ext/int					
	2	ext					
	1		rc-1a				
	1		rc				
	1	int	roul				
	1	ext	plain	sl-5 over roul	st over roul		
	2		roul				
	1	int	fpr-1b				
100–110	1	int	plain	sl-3	sh-12		
	1		roul				
	1		rfp-1b				
	1	ext					
110–120	2	int					
	1	ext/int	sl-10				
	3		roul				
	1	int	rfp-4				
	3		rfp-1b				
	1		plain	sl-1	rc-1b		
	1	ext/int	plain	ch-1	roul		
	1		plain	sl-1	roul		
	1	int	ch-1	sl-1	rfp-1c	sl-1	
	2	ext					
120–130	5	ext					
	1	int	rfp-1a	rfp-1b			
	1	int	rc-1b				
	1		plain	ch-1	roul		
	1		rfp-1b				
	2		rc-1a				
	1		rc-1b				
	3	ext	roul int				
	4	int	roul				
	1		roul				

TABLE AI.4 Category 3 (*cont.*)

Context	#	Burn	Dec1	Dec 2	Dec 3	Dec 4	Dec 5
	1	ext	plain	sl-5			
	1		roul	roul			
	1		rfp-1b				
	1		perf	undec			
Total	**230**						

Analysis by Sam Nixon, Anne Haour and David Kay

This assemblage appeared to contain a variety of roulette types which, due to erosion, could not always be precisely identified but the overall impression is one of diversity.

TABLE AI.5 Rims

Context	#	R.Type	Brn	Dec1	L1	Dec2	L2	Dec3	L3	Motif 4	L 4	Ang	Diam	Mx thick
0–20	1	S1												0.7
	1	S1	ext/int									3	34	0.7
	1	S1										4		0.7
	1	S1	ext/int									4		0.4
	1	E16	ext/int									5		0.7
	1	E6	ext/int									4		0.7
	1	E44	ext									4		1.2
20–30	1	S1	ext/int									3	15	0.7
30–40	1	S1	ext/int									3		0.8
	1	S1	ext									4		0.7
40–50	2	S1										4		0.7
	1	S1	ext/int									3		0.9
	1	S1	int	undec	u-int	rc-1a	u-int							0.6
	1	E9	ext/int	pnt-r	u	pnt-r	u-int							0.5
	1	E9	ext/int	pnt-r	u							5		0.5
50–60	1	S1	ext									3	15	0.6
	1	S1	ext/int									5		0.6
	1	S1	ext/int									4		0.6
	1	S1	ext/int											1.0
	1	E18	ext/int	undec	u	sl-1	u	rc-1a	u			5		0.7
	1	T4	ext/int	indis	u	sl-3	u					2		1.0
60–70	1	S1	ext/int	sl-7	u							3	18	0.7
	1	S1	ext/int									3	14	0.8
	2	S1	ext/int									4		0.9
	1	S1		sl-1	l							4		0.6
	1	S1	ext/int	pnt-r										0.6
	1	S1	ext/int									5		0.7
	1	E18	ext									5		0.8
	1	E1										4		0.9
70–80	1	S1	int	indis	u							2		0.9
	1	S1	ext/int											0.8

TABLE AI.5 Rims (*cont.*)

Context	#	R.Type	Brn	Dec1	L1	Dec2	L2	Dec3	L3	Motif 4	L 4	Ang	Diam	Mx thick
	1	S1	ext/int									3	16	0.7
	1	T17	ext/int									4		0.6
	1	E15		indis	u			sl-3	u			4		0.9
80–90	1	S1										4		0.8
	1	S1		undec	u	rc	u	pnt-r	u			3	24	0.8
	1	S1	ext/int									4		0.6
	1	E1	ext/int	rc-1a	c-int	undec	c-int	rc-1a	c-int	pnt-r	c-int	5		0.6
	1	E1	ext/int									5		0.7
	1	E1	ext									5		0.7
	1	E9	ext/int									5		0.6
90–100	1	E18	ext/int	undec	u	is-geo 25	u					4		0.7
	2	T17												0.9
	1	E15	ext/int	sl-1	c	pnt-r	u	pnt-rb	c-int + u-int			4		0.5
	1	E37	ext/int											1.2
100–110	1	S1										4		1.0
	1	S1										3		0.7
	1	S1	ext									4		0.5
	1	T22												1.5
110–120	1	S1										3		0.6
	1	S4												1.2
	1	S3												0.8
	1	T14	ext/int									2		0.8
	1	E11												0.7
	1	E37	ext/int									4		1.3
120–130	1	S1										4		0.7
	1	S1												0.7
	1	S2										4	15	0.7
	1	T22												1.4
	1	T11	ext/int									2		1.2
	1	T11	ext/int											1.2
	1	E26	int									4		0.8
	1	E4										5		0.7
	1	S6	ext/int									2	18	0.8
Total	**67**													

Analysis by David Kay

12 KLI-RC1

TABLE AI.6 Desampling

Context	Number
Context1	177
Context 2	30
Context 3	37
Context 4	20
Context 5	72
Context 6	170
Total	**506**

Analysis in the field by Alexandre Livingstone Smith and at UEA by Sam Nixon and Anne Haour

TABLE AI.7 Category 4

Context	Undec	Illegible
Context 1	3	0
Context 2	4	0
Context 3	2	0
Context 4	0	0
Context 5	2	0
Context 6	9	0
Total	20	0

Analysis by Sam Nixon

TABLE AI.8 Category 3

Context	#	Burn	Dec1	Dec2	Dec3	Dec4
Context 1	4	ext				
	1	int				
	1		roul	plain		
	1		roul			
Context 2	1	int				
	2		rc-1a			
	1	ext/int	mch-2	plain	sp1-l	sh
	1	ext/int	is-geo 11			
Context 3	1	ext/int				
	2	ext				
	1		rc-1a			
Context 5	1	ext				
	1		rfp-1b			
Context 6	11	ext				
	1	ext/int				
	1	ext	rfp-1b inside			
	3		roul			
	1	int	roul			
	3		rc-1a			
	3		rfp-1b			
	2		rc-1a	plain		
Total	**43**					

Analysis by Sam Nixon and Anne Haour

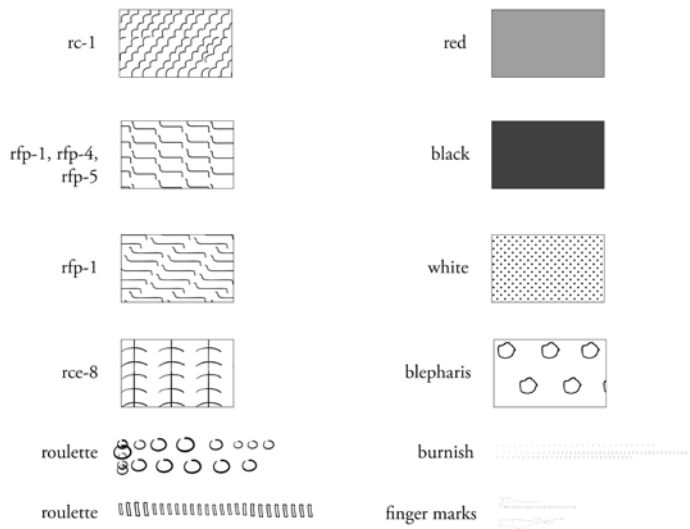
TABLE AI.9 Rims

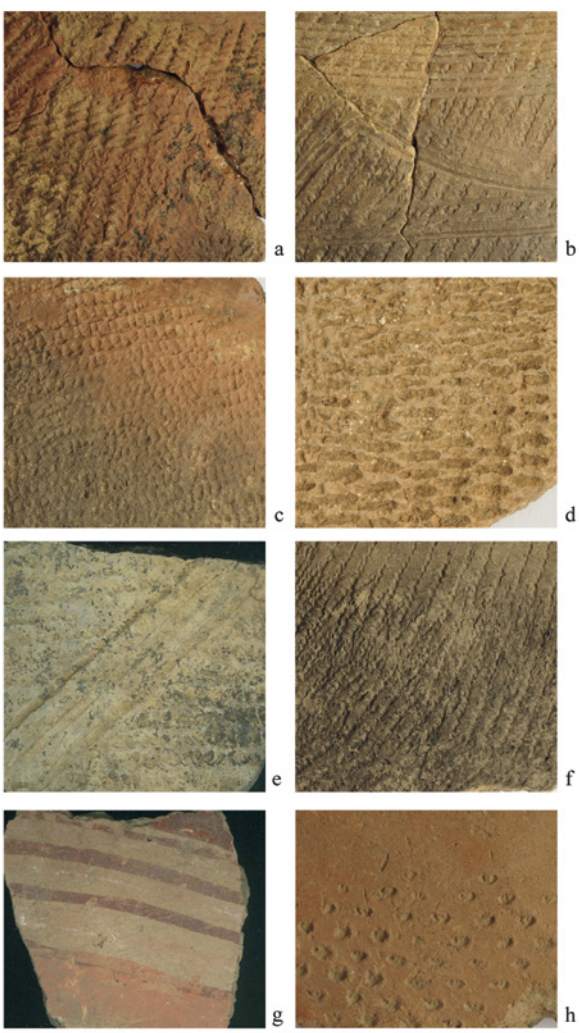
Context	#	R Type	Brn	Dec1	L1	Dec2	L2	Dec3.	L3	Ang	Diam	Mx thick
Context 2	1	S6								2	10	0.8
	1	S1										0.6
Context 3	1	S4										1.3
Context 5	1	S1		ch	l					4		0.7
Context 6	1	S4								3	22	0.7
	1	CB4	ext/int									0.5
Total	**6**											

Analysis by Sam Nixon

Pottery Plates

1 Key to the Codes Used to Represent Decorations





Distinctive types of pottery from archaeological sites in Dendi.

a. Folded strip roulette (rfp), Birnin Lafiya S11, Context 11
b. Folded strip roulette (rfp) and incision (sl-4, sl-3, SC-3, sl-4), TTK-S1, Context 19
c. Twisted cord roulette (rc-1), Birnin Lafiya, S11, interface contexts 18 and 21
d. Multiple stick cord-wrapped roulette (rce-8), Gorouberi-13-S11, Context 3a, 108-123 cm
e. Twisted cord roulette (rc-1b) and incision (sl-3), Gorouberi-13-S11, Context 6, 138–153 cm
f. Loose folded strip roulette (rfp-4), Kantoro SI, 80–90cm
g. Paint (pnt-r-b, pnt-r-l-3, pnt-or-b, pnt-bl-c, pnt-or-l-3, pnt-bl-l-3), Bogo Bogo S1, 80–90cm
h. Blepharis roulette (blepharis), Molla S1, 60–70cm

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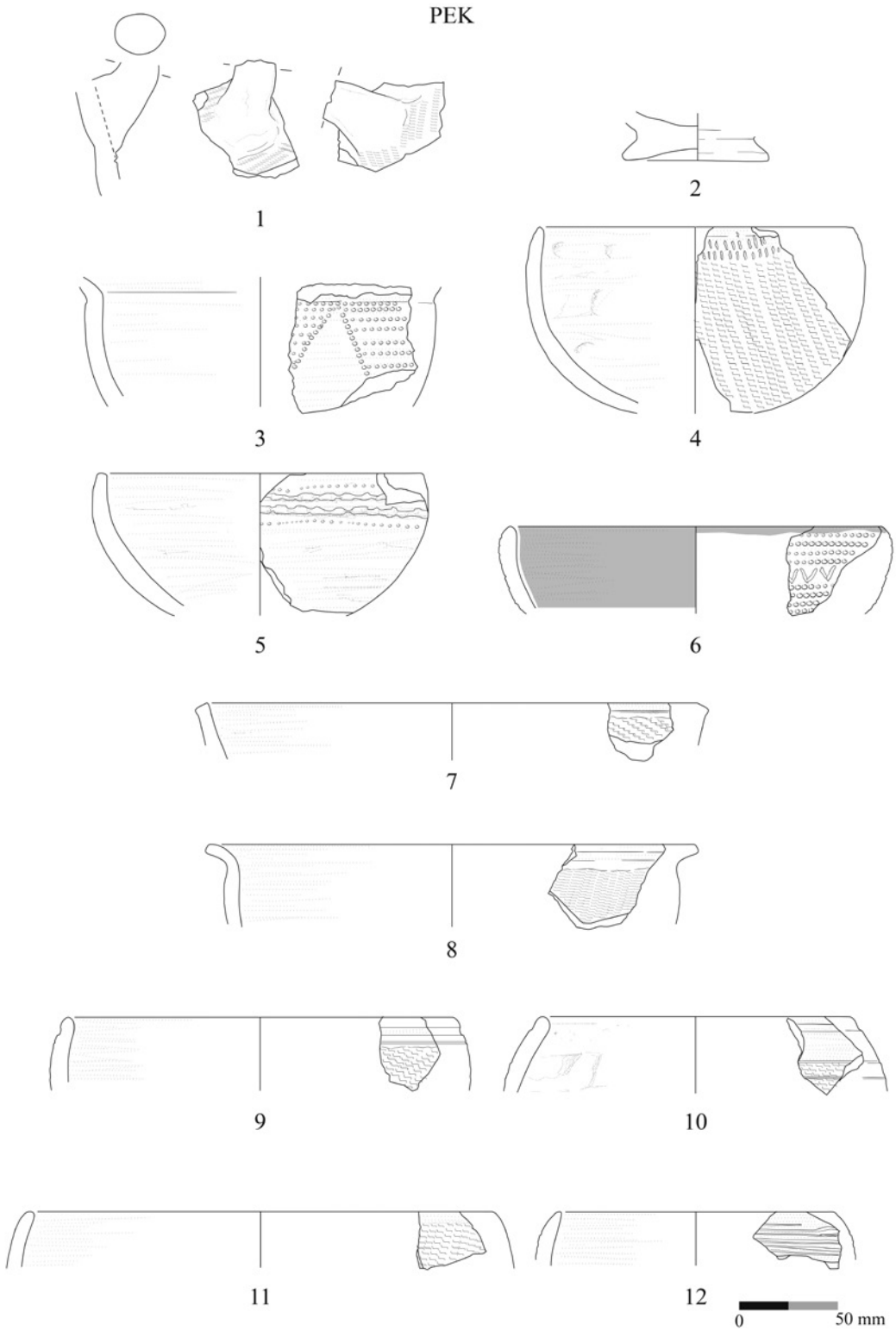


PLATE 1 Pekinga (PEK-12)

1	Context 6	7	Context 6
2	Context 6	8	Context 6
3	Context 1	9	Context 6
4	Context 6	10	Context 6
5	Context 8, in association with archaeobotanical sample	11	Context 6
6	Context 1	12	Context 6

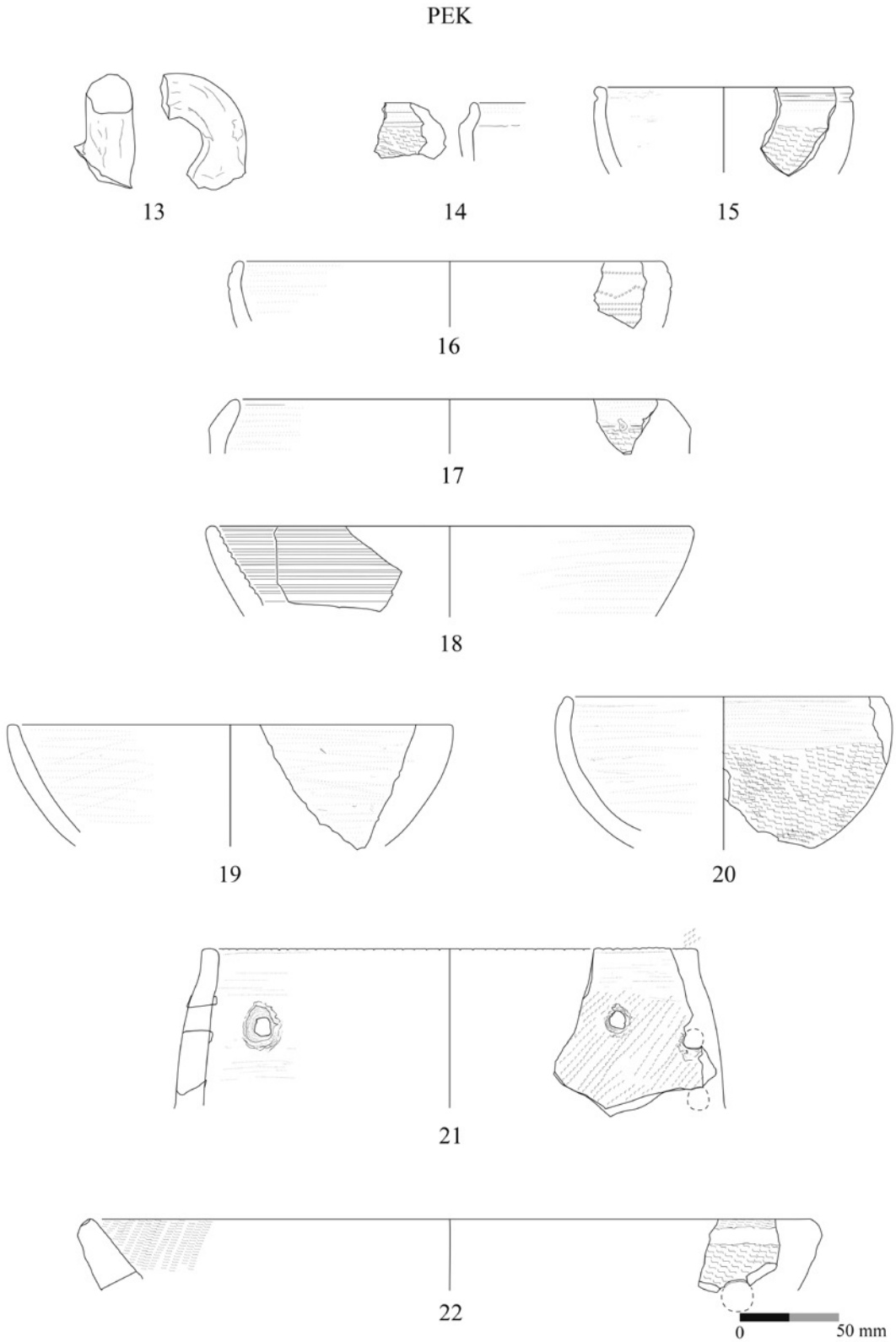


PLATE 2 Pekinga cont'd (PEK-12)

13 Context 5, in association with archaeobotanical sample
14 Context 6
15 Context 6
16 Context 2
17 Context 6
18 Context 2
19 Context 6
20 Sector B
21 Context 1, in association with archaeobotanical sample
22 Context 6

TTO

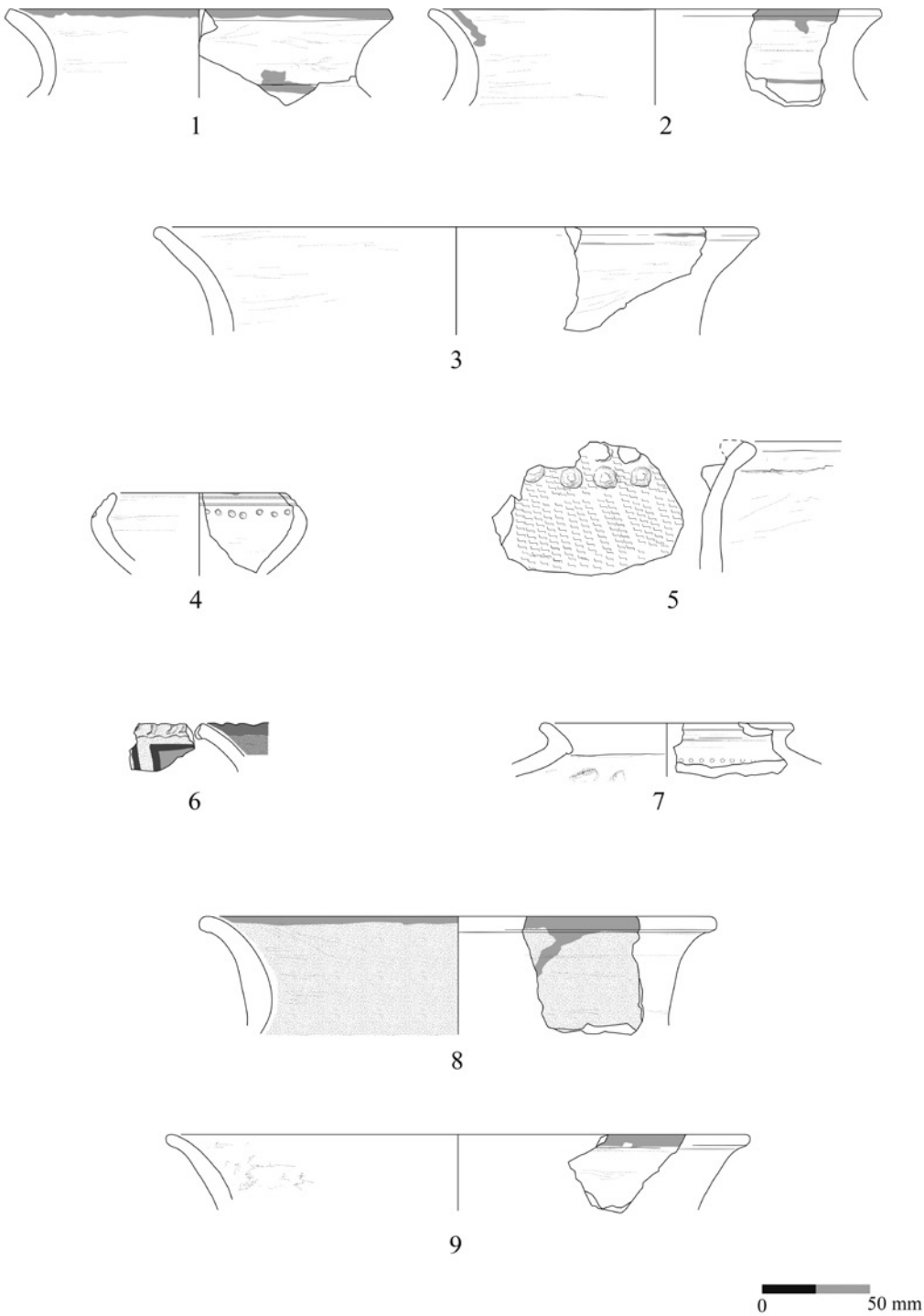


PLATE 3 Toutokayori (TTO-14)

1 SI 0–20
2 SI 0–20
3 SI 0–20
4 SII 30–40
5 SII 40–50
6 SIII 0–20
7 SIII 0–20
8 SIII 0–20
9 SIII 0–20/20–30

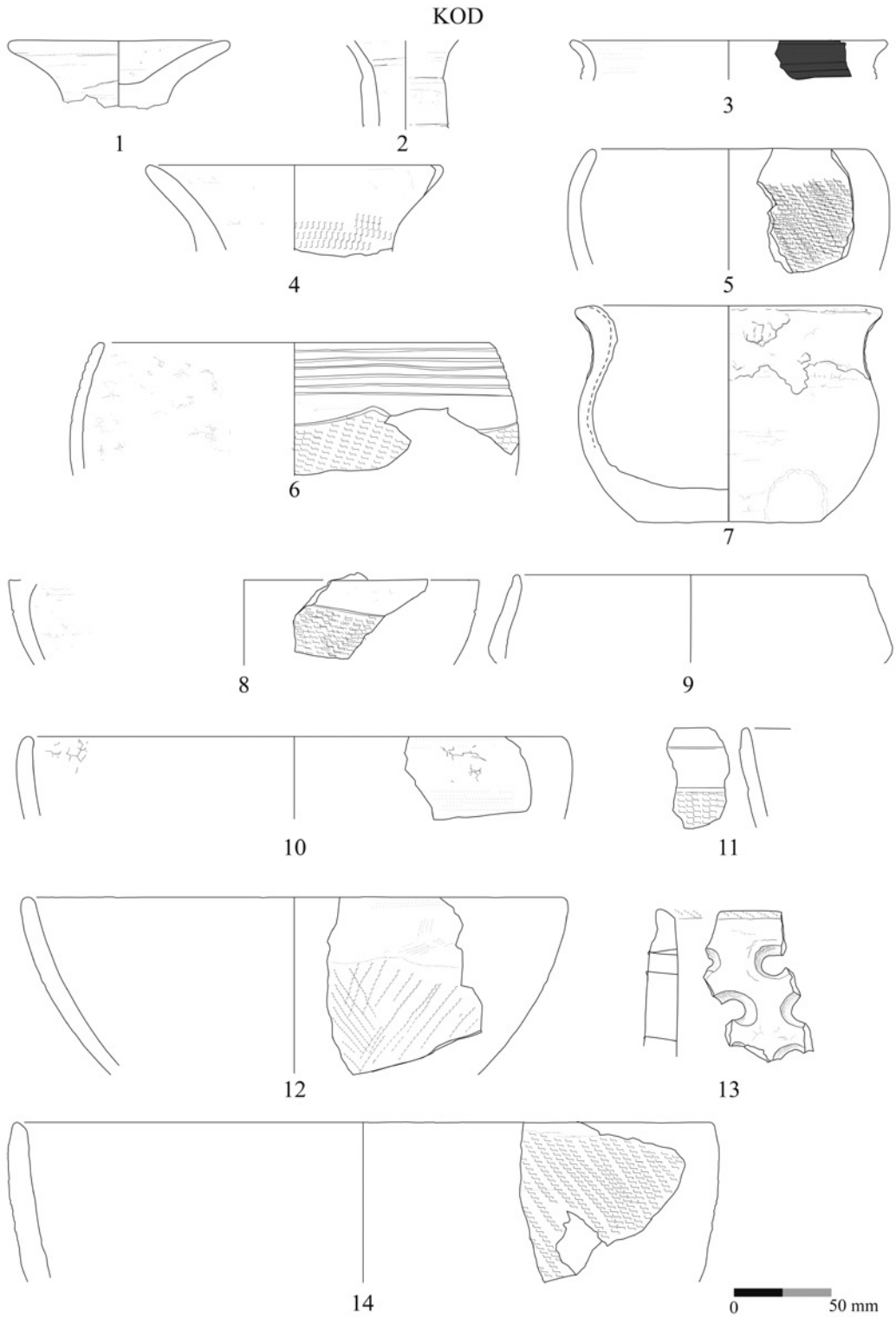
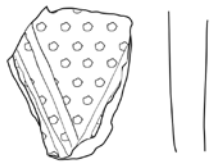


PLATE 4 Kompa Dune (KOD-13)

1 Context 1
2 Context 5
3 Context 4
4 unlabelled
5 Context 2
6 Context 5
7 Context 5; vessel extracted complete from the North section
8 Context 5
9 Context 3
10 Context 1
11 Context 2
12 Context 1/2 (item refitted from 2 sherds, one from each context)
13 Context 5
14 Context 2

TRO

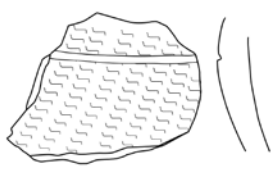


1

2

3

PTI



4

PLATE 5 Torouwey, Kompanti (TRO-14, PTI-14)

1 TRO, 20–30

2 TRO, 20–30

3 TRO, 20–30

4 PTI, 40–50

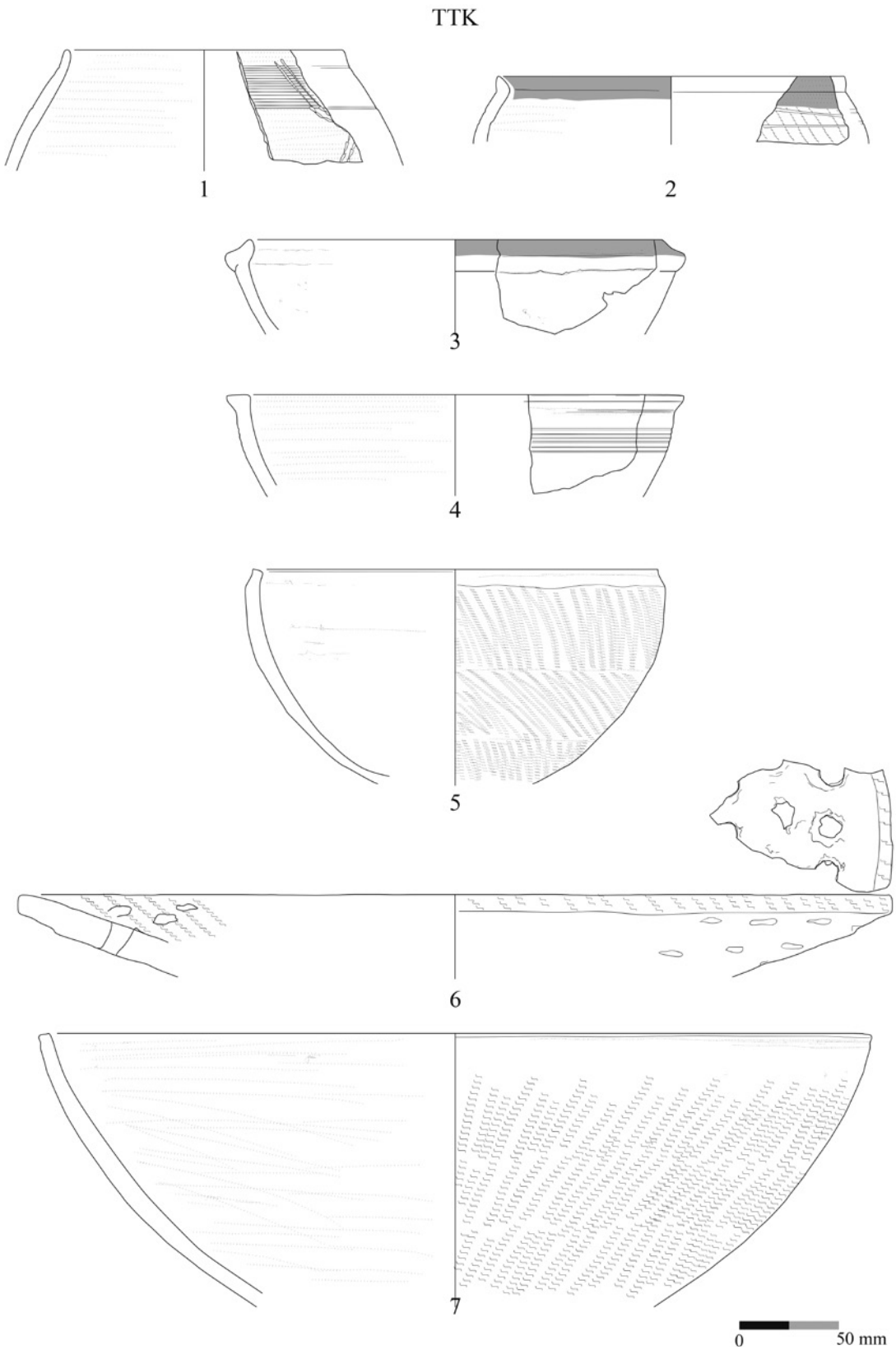


PLATE 6 Tin Tin Kanza (TTK-13)

1 SI, Context 17, Spit 18
2 SI, Context 19, Spit 13
3 SI, Context 0, Spit 1
4 SI, Context 19, Spit 12
5 SI, Context 19, Spit 22
6 SI, Context 19, Spit 14
7 SI, Context 19, Spits 33–36

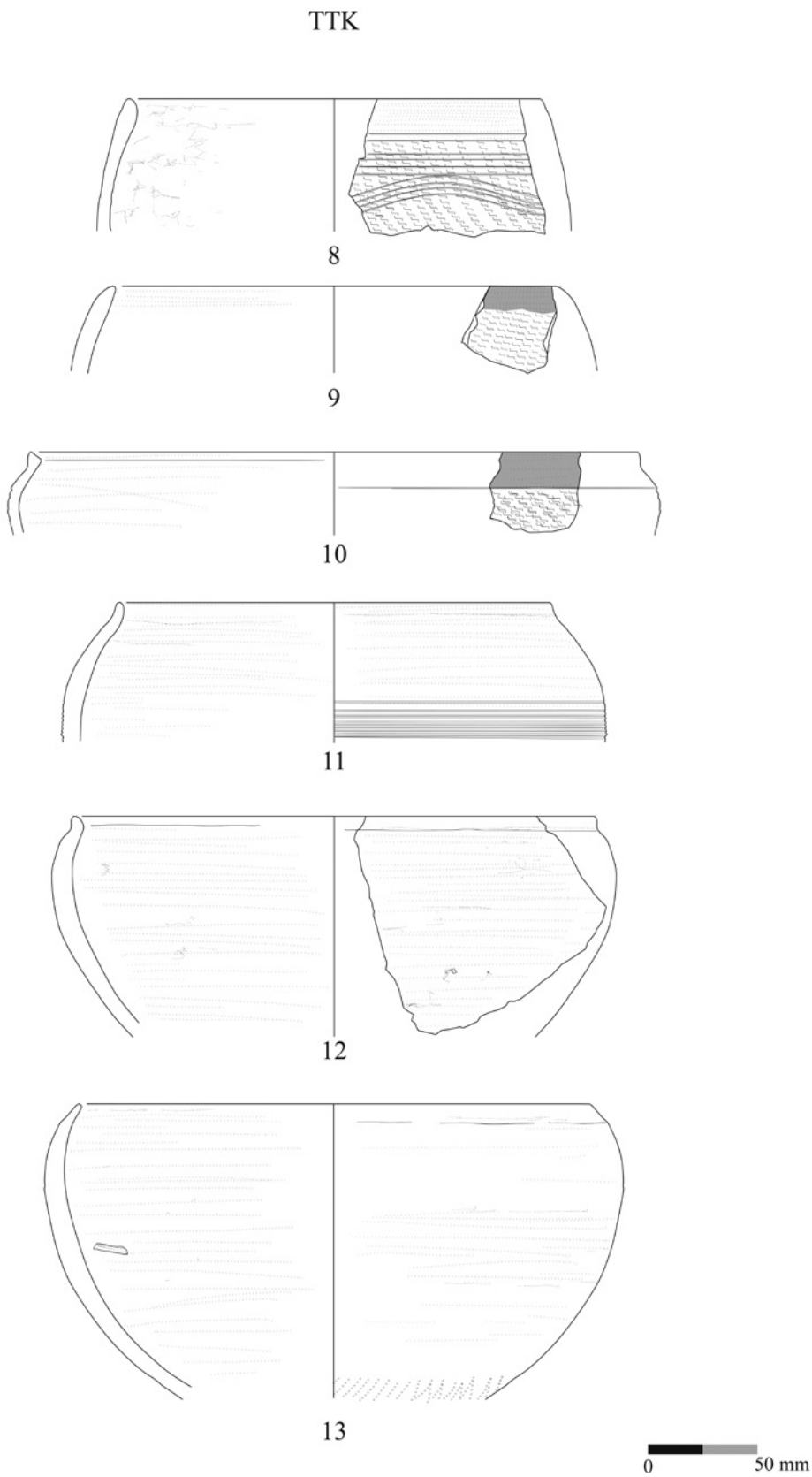


PLATE 7 Tin Tin Kanza cont'd (TTK-13)

8 S1, Context 19, Spit 33
9 S1, Context 19, Spit 20
10 S1, Context 21, Spit 12
11 S1, Context 19, Spit 32
12 S1, Context 19
13 S1, Context 19, Spits 35–36

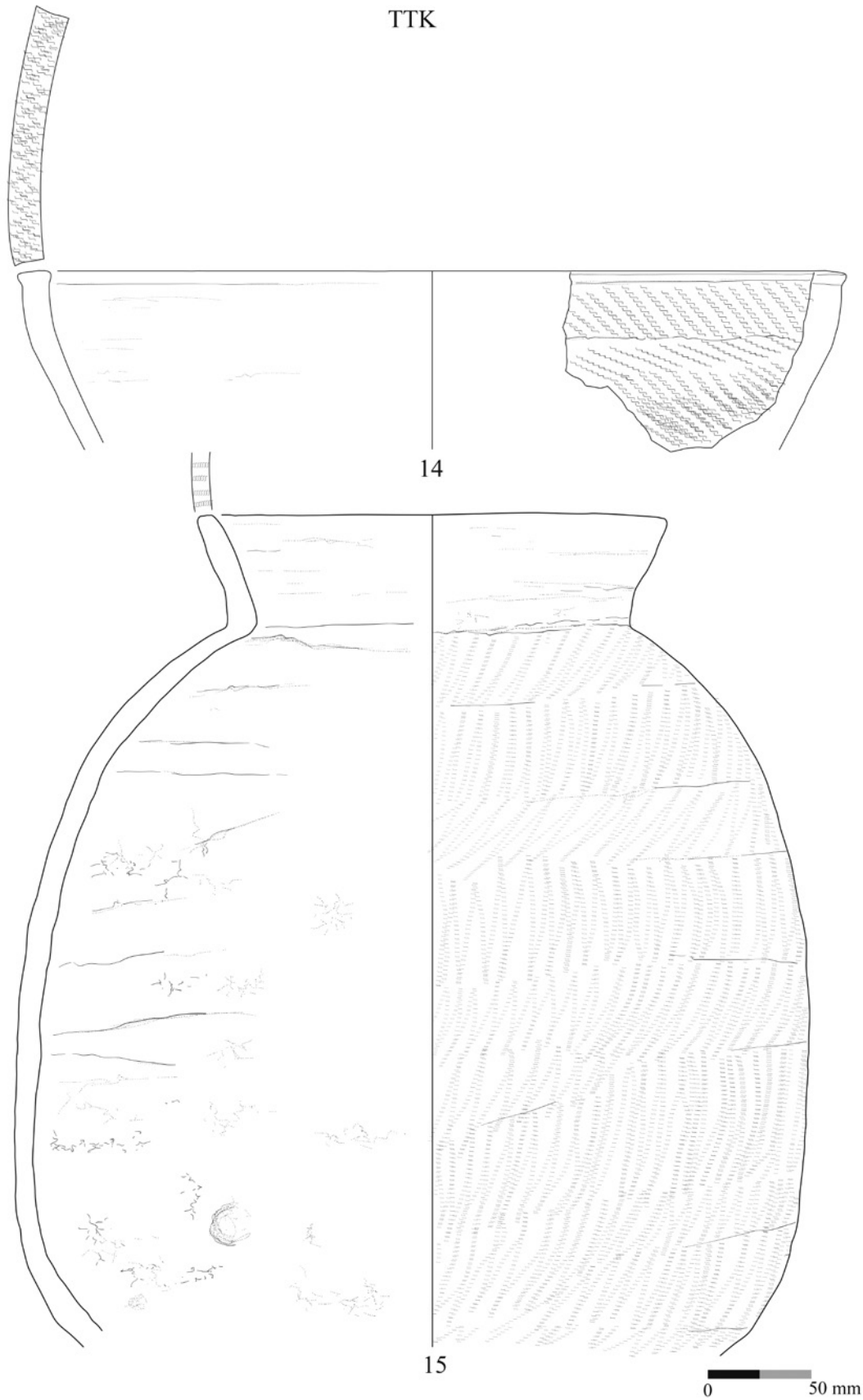


PLATE 8 Tin Tin Kanza cont'd (TTK-13)

14 SI, Context 14, Spit 10

15 SII, Context 8 – reftitted from dozens of sherds recovered on a pavement.

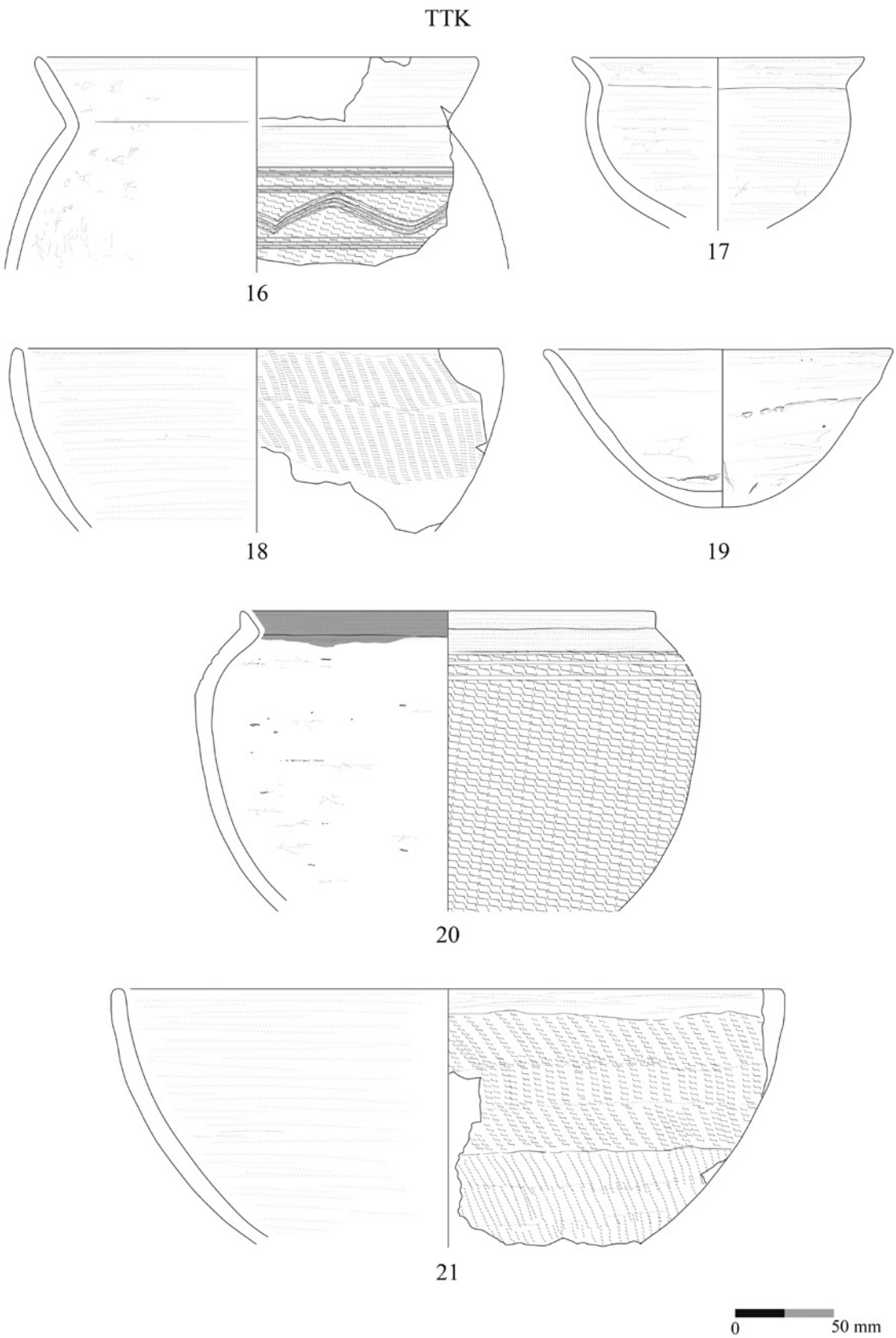


PLATE 9 Tin Tin Kanza cont'd (TTK-13)

16 SI, Context 19, Spit 24
17 SI, Context 1, level 5. Beta-417590 date on sample from inside
18 SI, Context 19, Spit 19
19 SI, Context 19
20 SII, from west section (see Figure F.11).
21 SI, Context 19, Spit 30

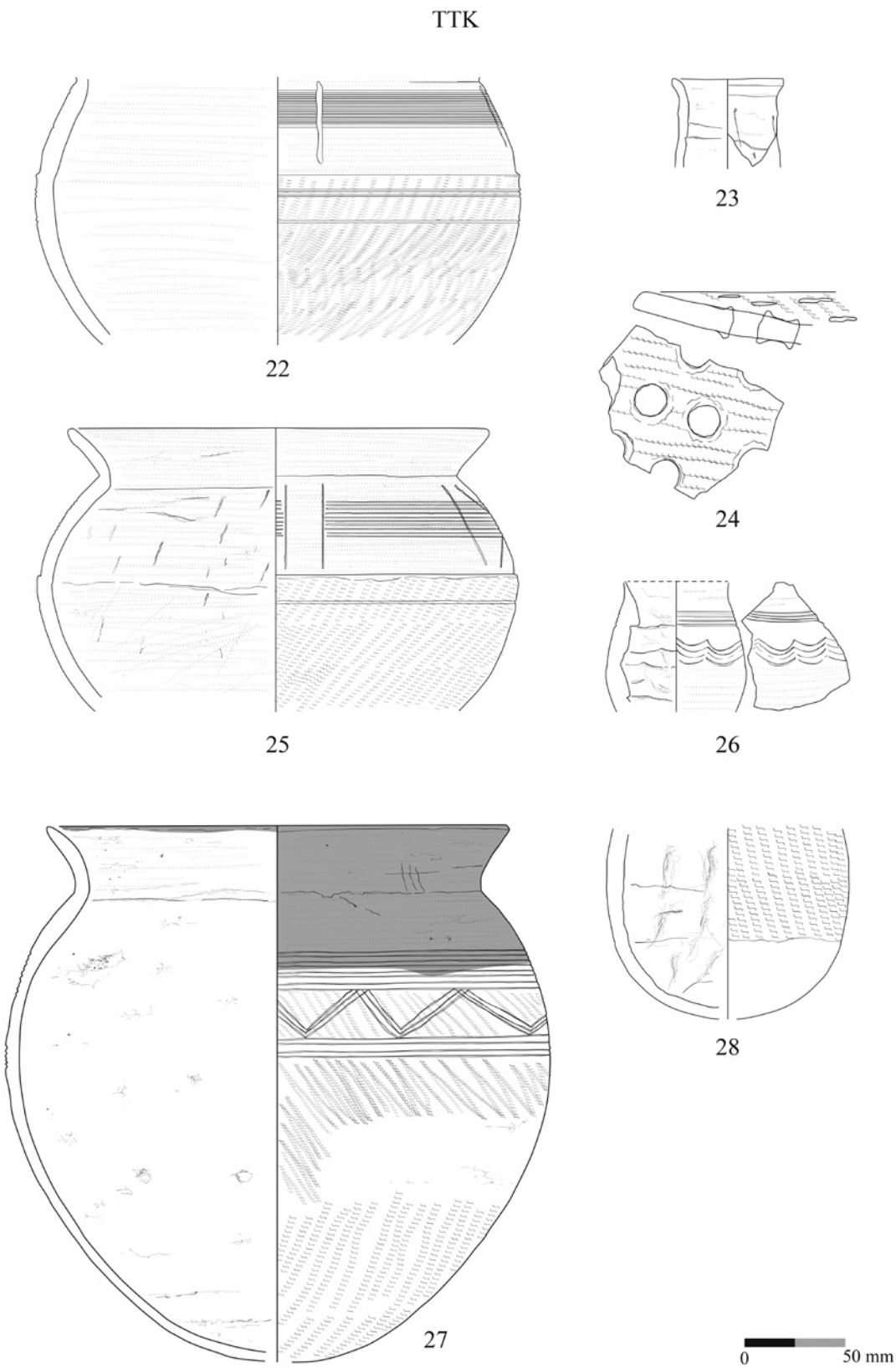


PLATE 10 Tin Tin Kanza cont'd (TTK-13)

22 S1, Context 19, Spit 22
23 S1, Context 18, Spit 21
24 S1, Context 21, Spit 13. Diameter unknown
25 S1, Context 10, Spit 24a/29
26 S1, Context 19 Spit 28
27 S1, Context 19
28 S1, Level 31, Context 19

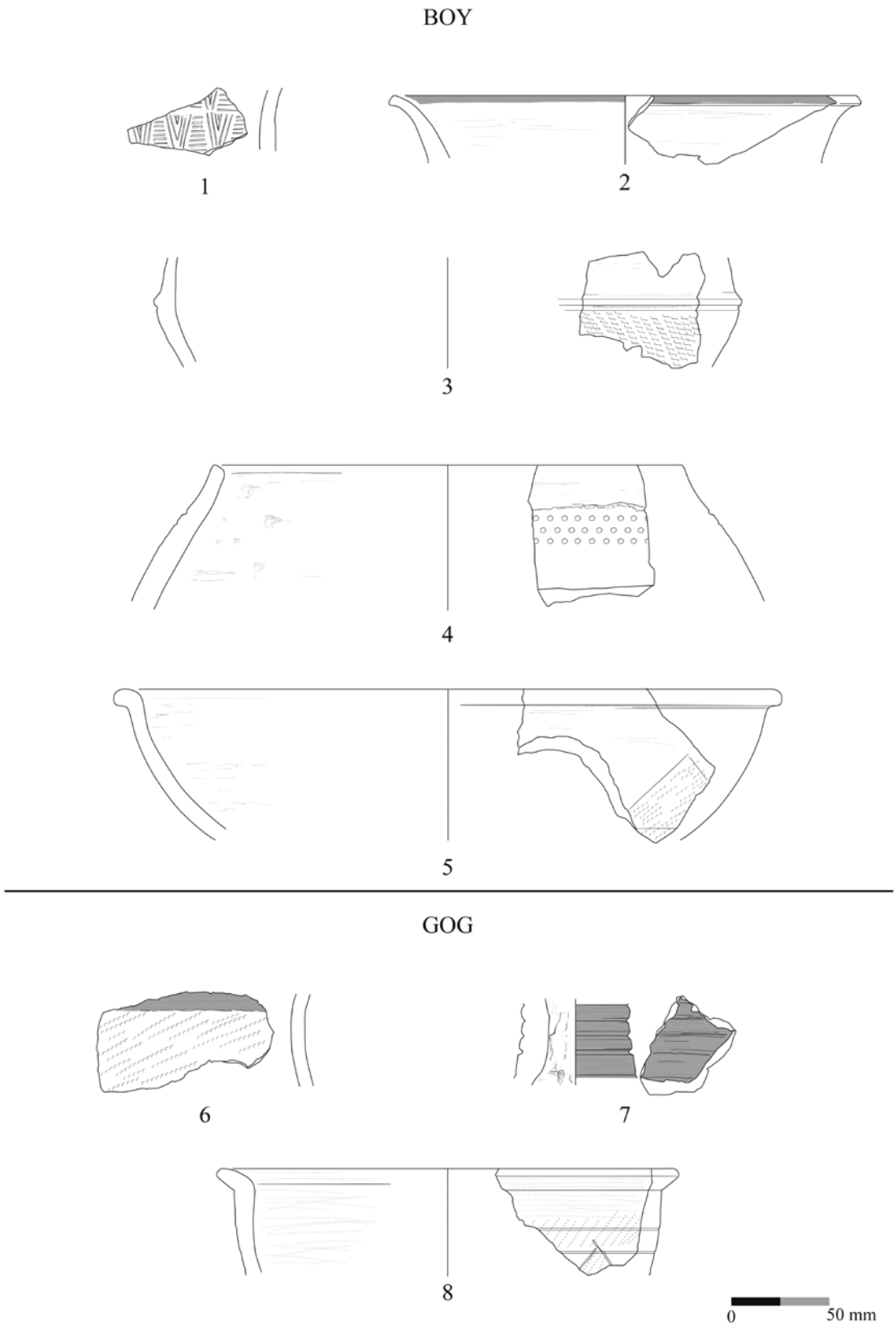


PLATE 11 Boyeri and Bogo Bogo (BOY-14, GOG-14)

1 BOY SI, Context 1, 30–40. Diameter unknown
2 BOY SI, 50–70
3 BOY SI, 40–50
4 BOY SII, Context 2, 50–60
5 BOY SII, 20–30
6 GOG, 110–110
7 GOG, 150–160
8 GOG, 140–150

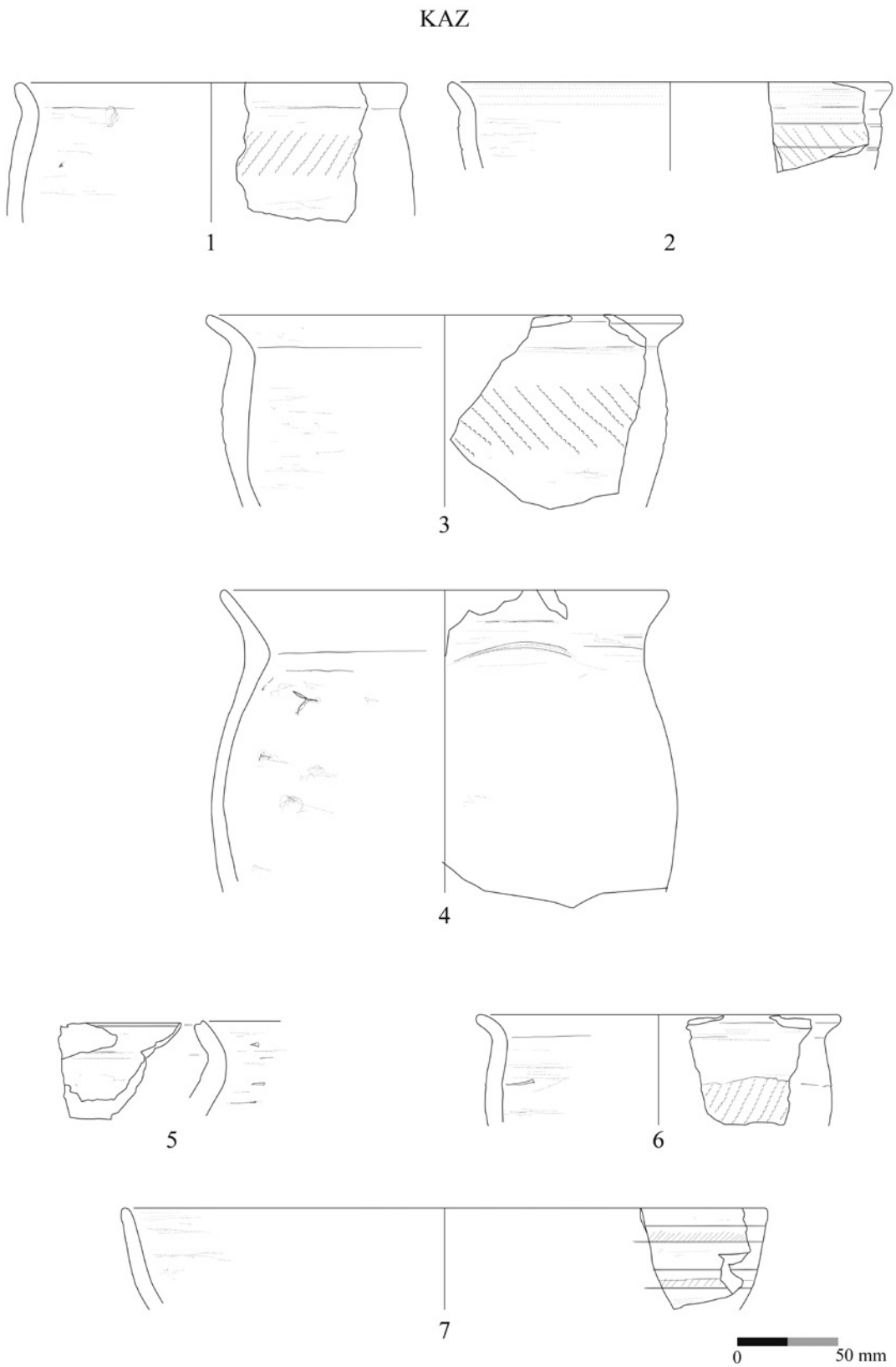


PLATE 12 Kwara zeno (KAZ-14)

1 SI, 0–20
2 SI, 0–20
3 SI, 0–20
4 SI, 0–20
5 SII, 20–30. Diameter unknown
6 SII, 0–20
7 SII, 30–40

GOB

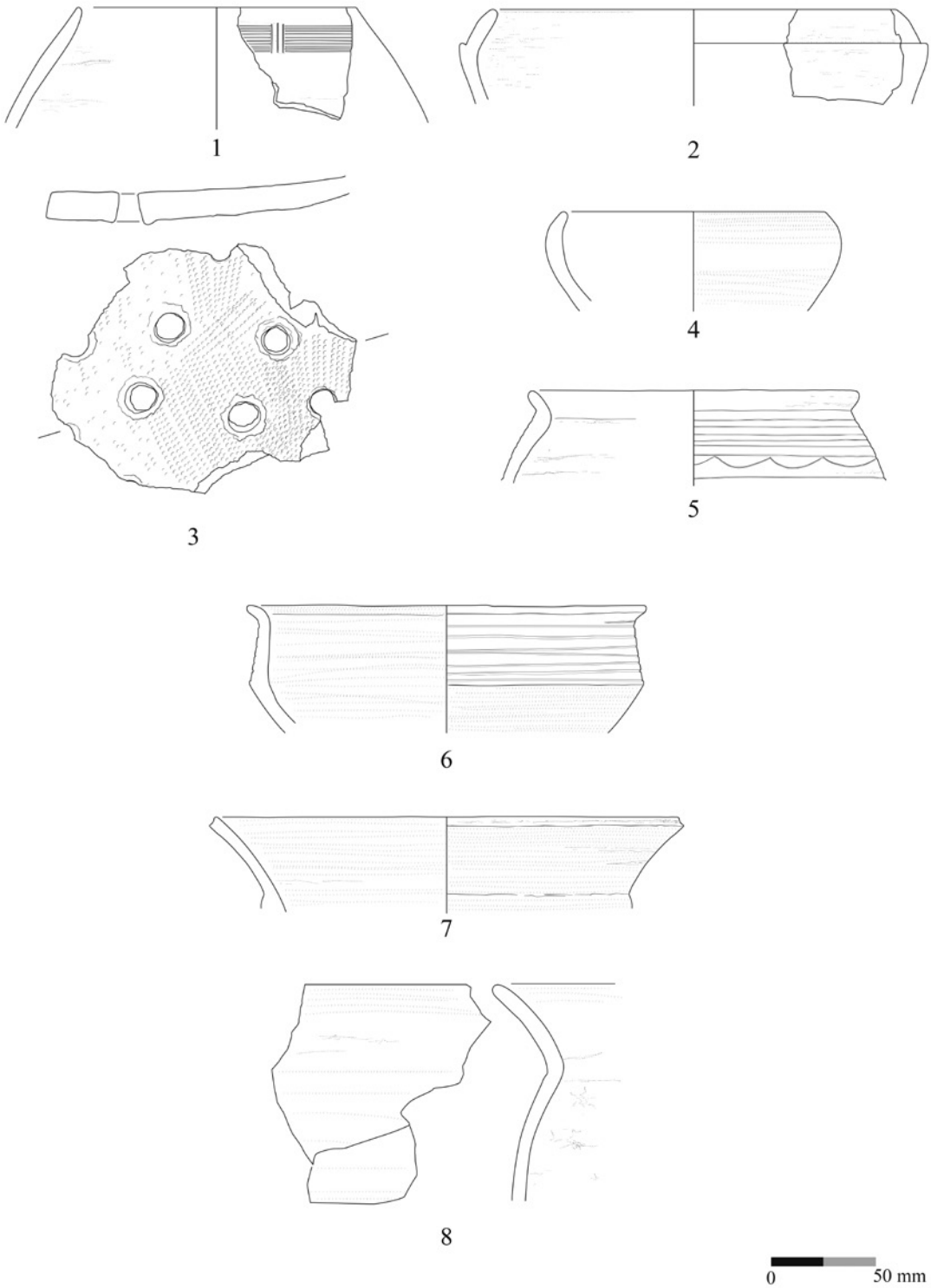


PLATE 13 Gourouberi (GOB-SI-14, GOB-SII-13)

1 GOB 14 SI, décapage
2 GOB 14 SI, décapage
3 GOB 13 SII, Context 3a, 168–183
4 GOB 13 SII, Context 3a, 93–108
5 GOB 13 SII, Context 3b, 78–93
6 GOB 13 SII, Context 3a, 123–138
7 GOB 13 SII, Context 3a, 123–138
8 GOB 13 SII, Context 3a, 108–123. Diameter unknown

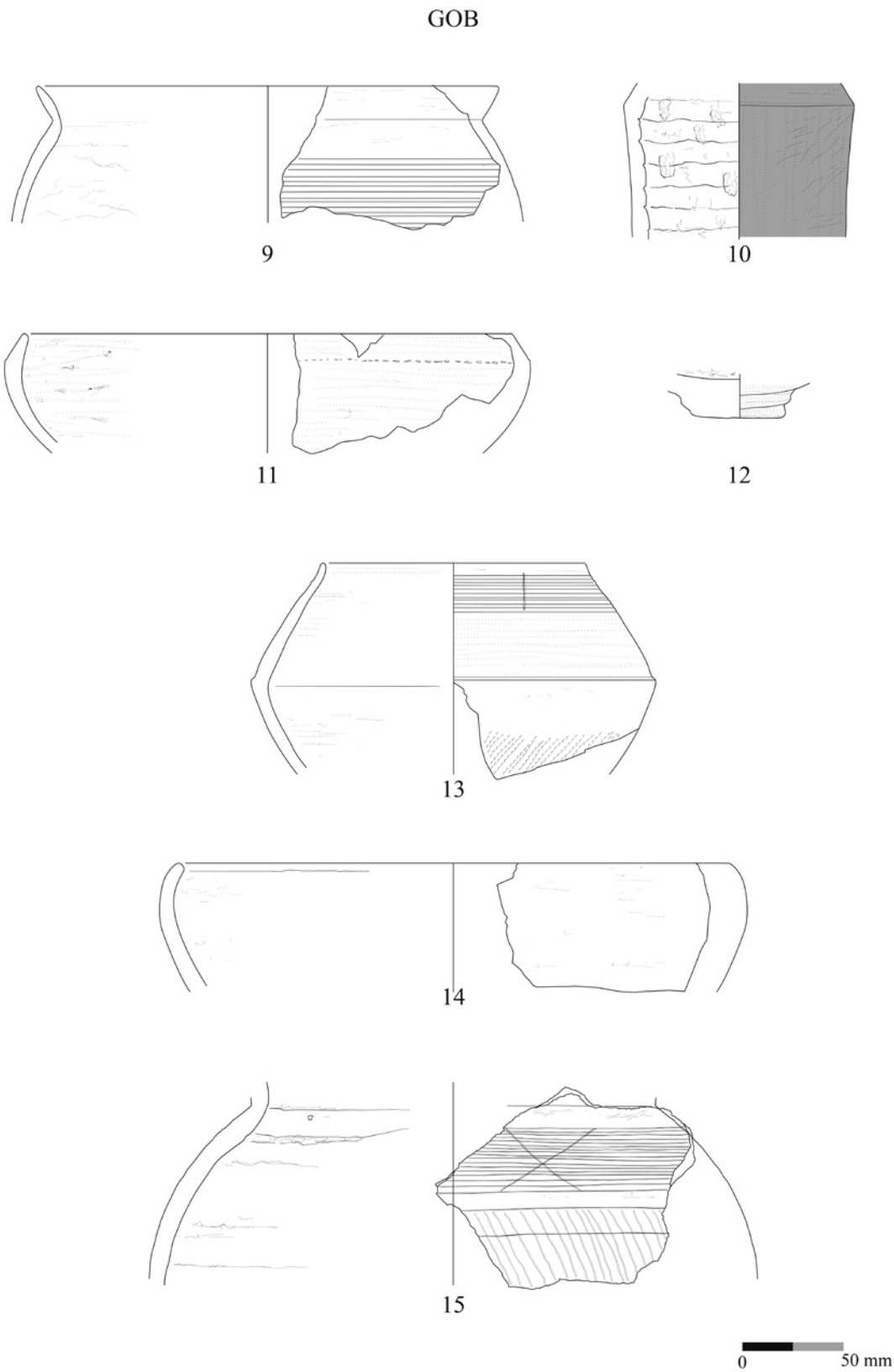


PLATE 14 Gourouberi cont'd (GOB-SII-13)

9 GOB 13 SII, Context 3a, 93–108
10 GOB 13 SII, Context 6, 123–138, 1-183-193, 1-168-183
11 GOB 13 SII, Context 3a, 168–183
12 GOB 13 SII, Context 5, 153–168
13 GOB 13 SII, Context 3a, 93–108
14 GOB 13 SII, Context 2, 108–123
15 GOB 13 SII, Context 3a, 93–108

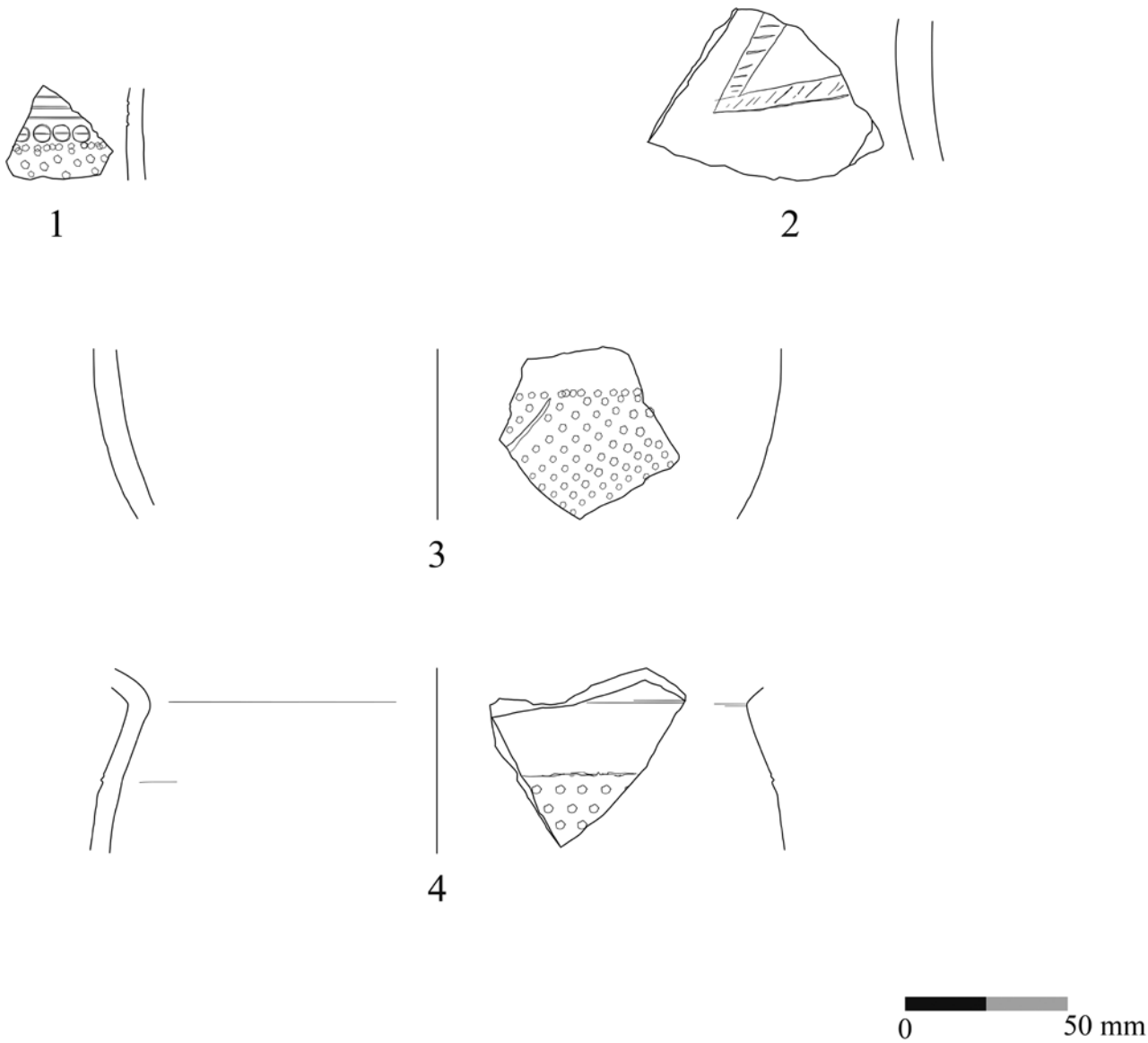


PLATE 15 Karimama (KAR-14)

1 0–20. Diameter unknown

2 20–30. Diameter and orientation unknown

3 0–20

4 unlabelled

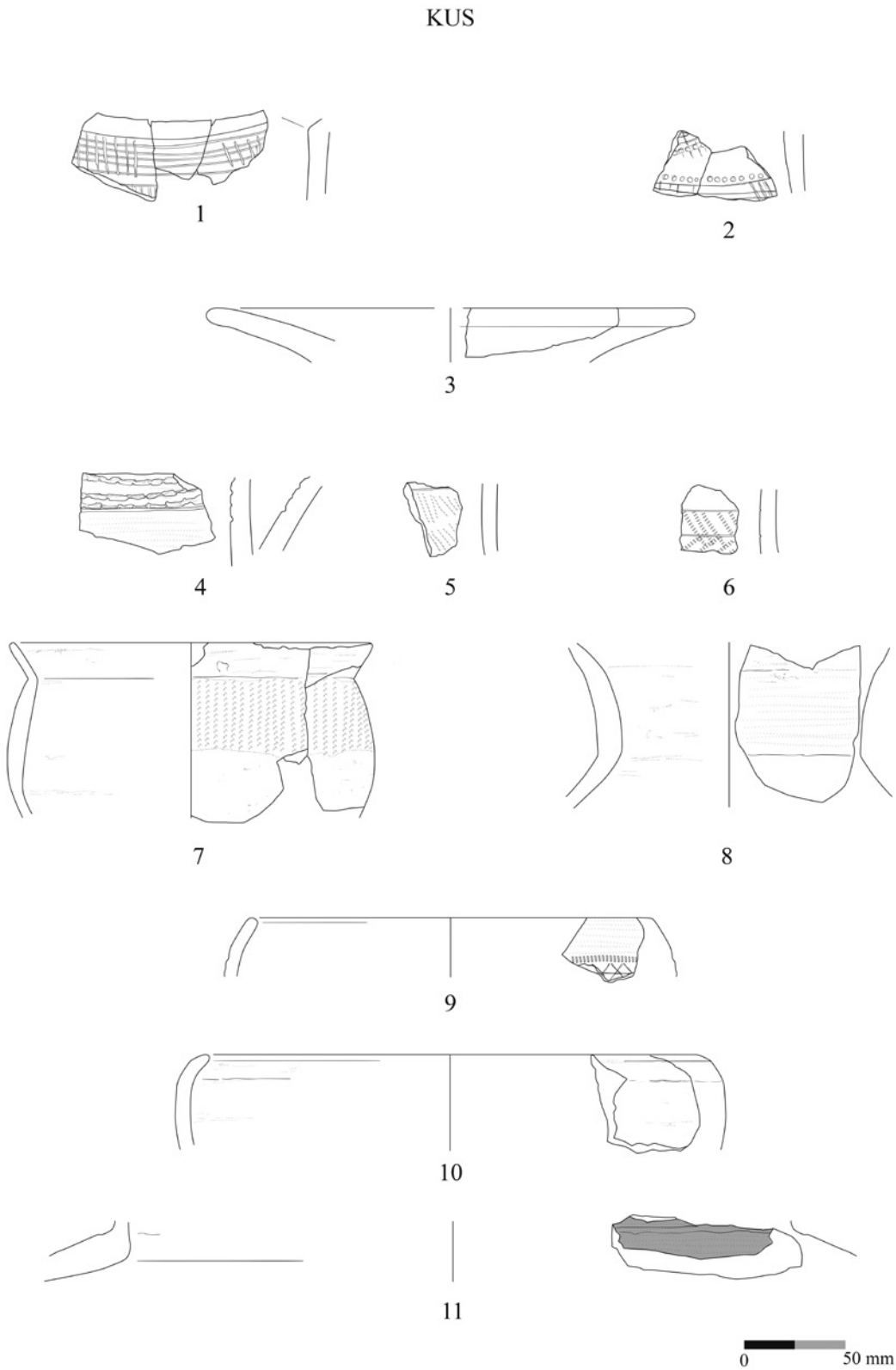


PLATE 16 Kusulabu (KUS-14)

1 SI, 0–20. Diameter and orientation unknown
2 SI, 0–20. Diameter and orientation unknown
3 SI, 0–20. Diameter unknown
4 SII, 30–40. Diameter and orientation unknown
5 SII, 0–20
6 SII, 0–20
7 SII, 20–30
8 SII, 20–30
9 SII, 20–30
10 SII, 0–20
11 SII, 30–40. Orientation unknown

KOZ

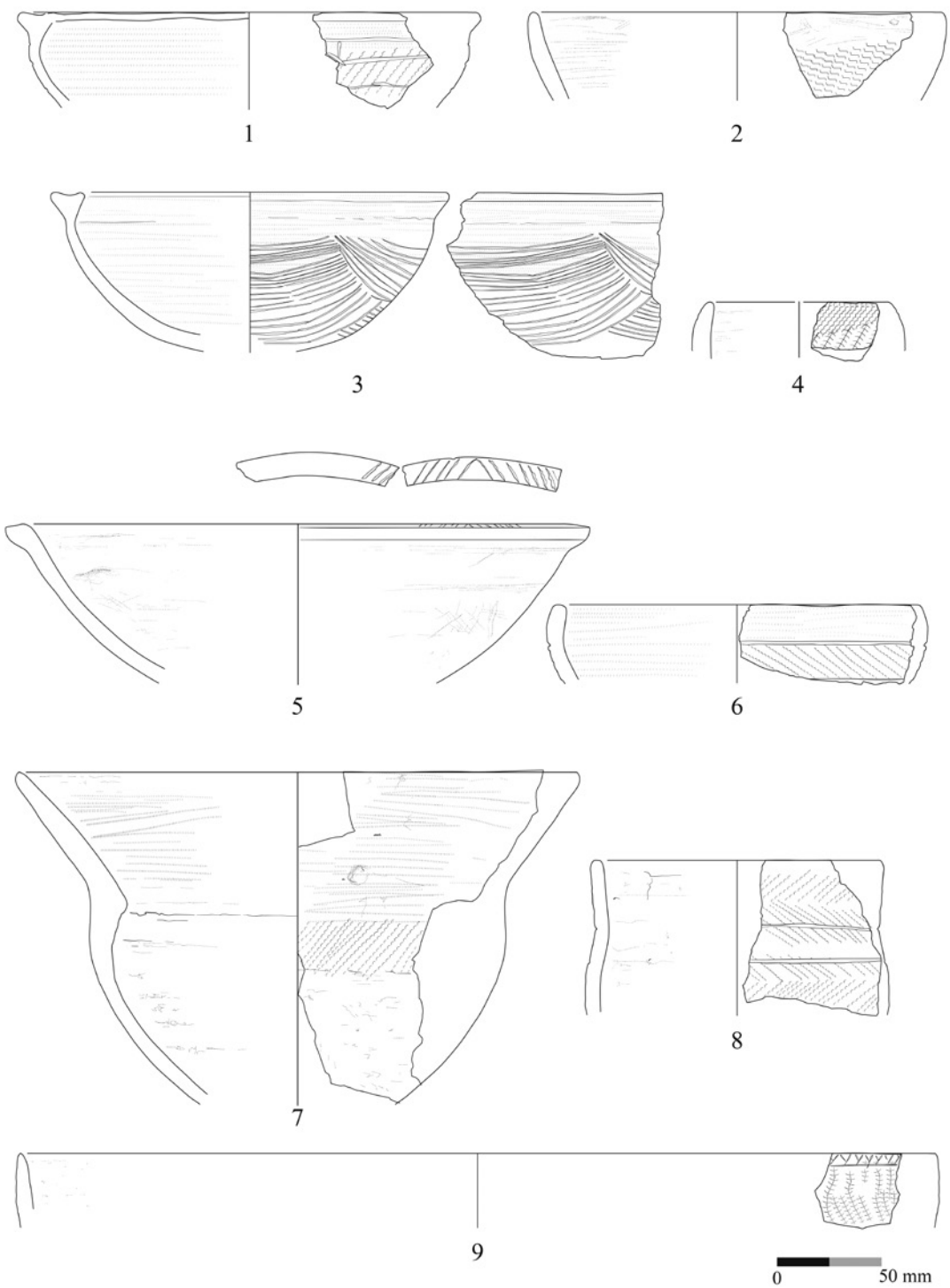


PLATE 17 Kozungu (KOZ-14)

1 SI, 60–80
2 SI, 6–80
3 SI, 80–90
4 SI, 90–100
5 SI, 60–80
6 SI, 60–80
7 SI, 40–50 and 50–60
8 SI, 90–100
9 SI, 90–100

KOZ

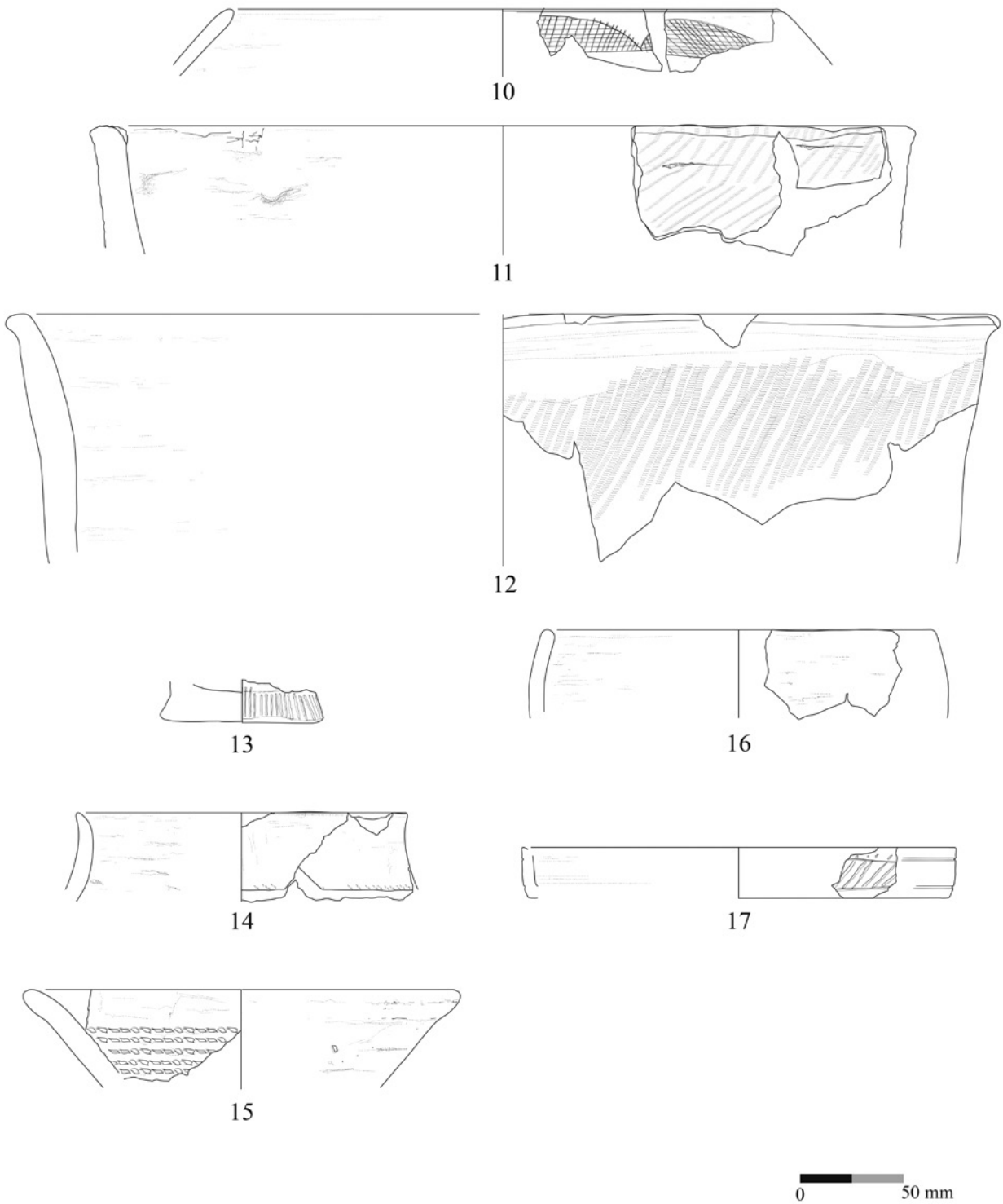


PLATE 18 Kozungu cont'd (KOZ-14)

10 SII, 20–30 and 130–140
11 SII, 40–50
12 SII, 30–40
13 SII, 20–30
14 SII, 130–140
15 SII, 30–40
16 SII, 70–80
17 SII, 30–40

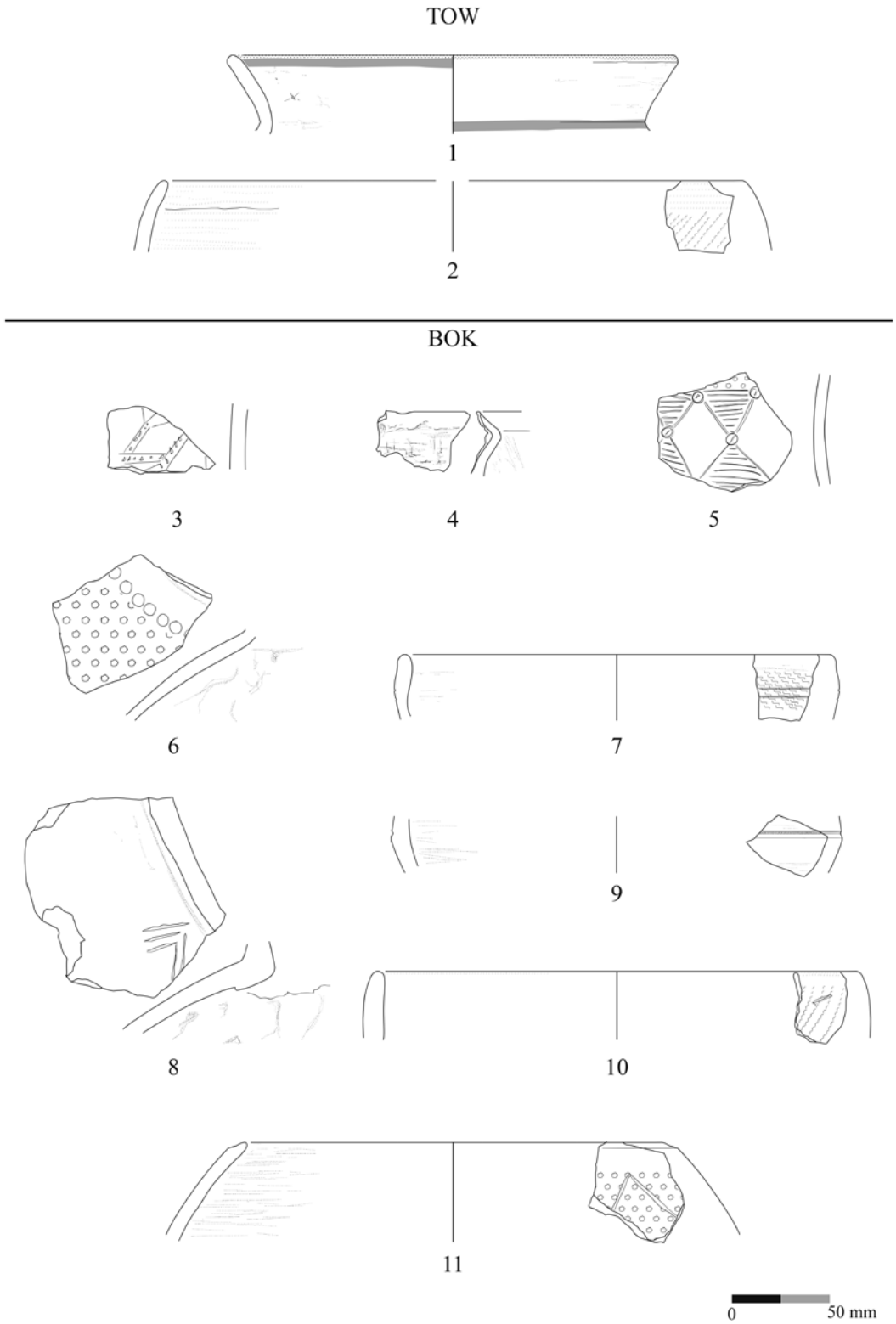


PLATE 19 Tondo windi, Bokorobu (TOW-14, BOK-14)

1 TOW, Context 1, 20–30
2 TOW, Context 3, 80–90. Approximate diameter 30; orientation unknown
3 BOK, Context 2, 70–80. Diameter and orientation unknown
4 BOK, Context 3, 140–150. Diameter unknown
5 BOK, Context 1, 50–60. Diameter unknown
6 BOK, 50–60
7 BOK, Context 1, 50–60
8 BOK, 50–60. Diameter unknown
9 BOK, Context 1, 50–60
10 BOK, Context 1, 50–60
11 BOK, 40–50

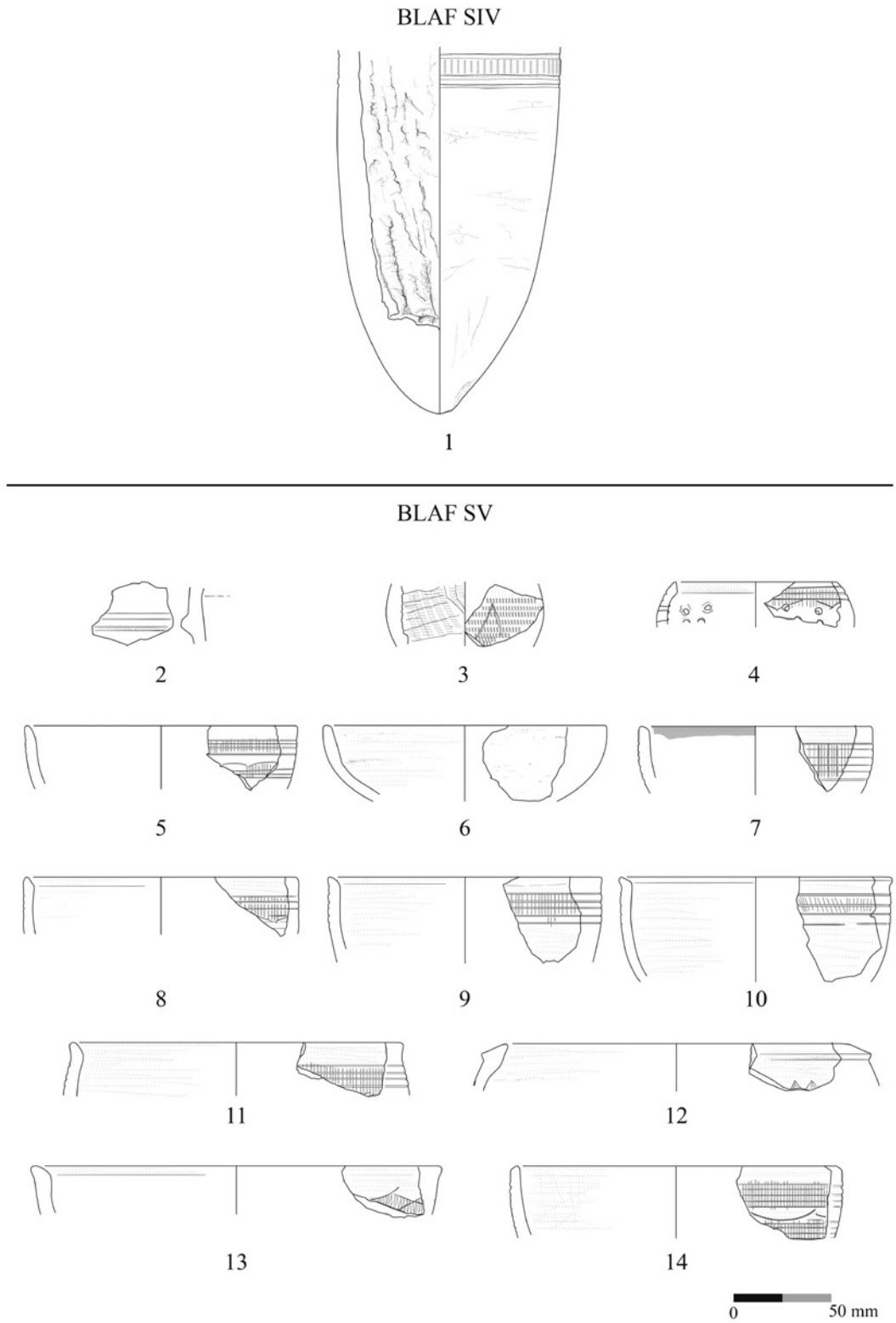


PLATE 20 Birnin Lafiya S4 and S5

1	S4, Context 4
2	S5, 10–20. Diameter approximately 24 cm
3	S5, 60–70
4	S5, 30–40
5	S5, 40–50
6	S5, 20–30
7	S5, 0–10
8	S5, 30–40
9	S5, 40–50
10	S5, 10–20
11	S5, 60–70
12	S5, 20–30
13	S5, 20–30
14	S5, 10–20

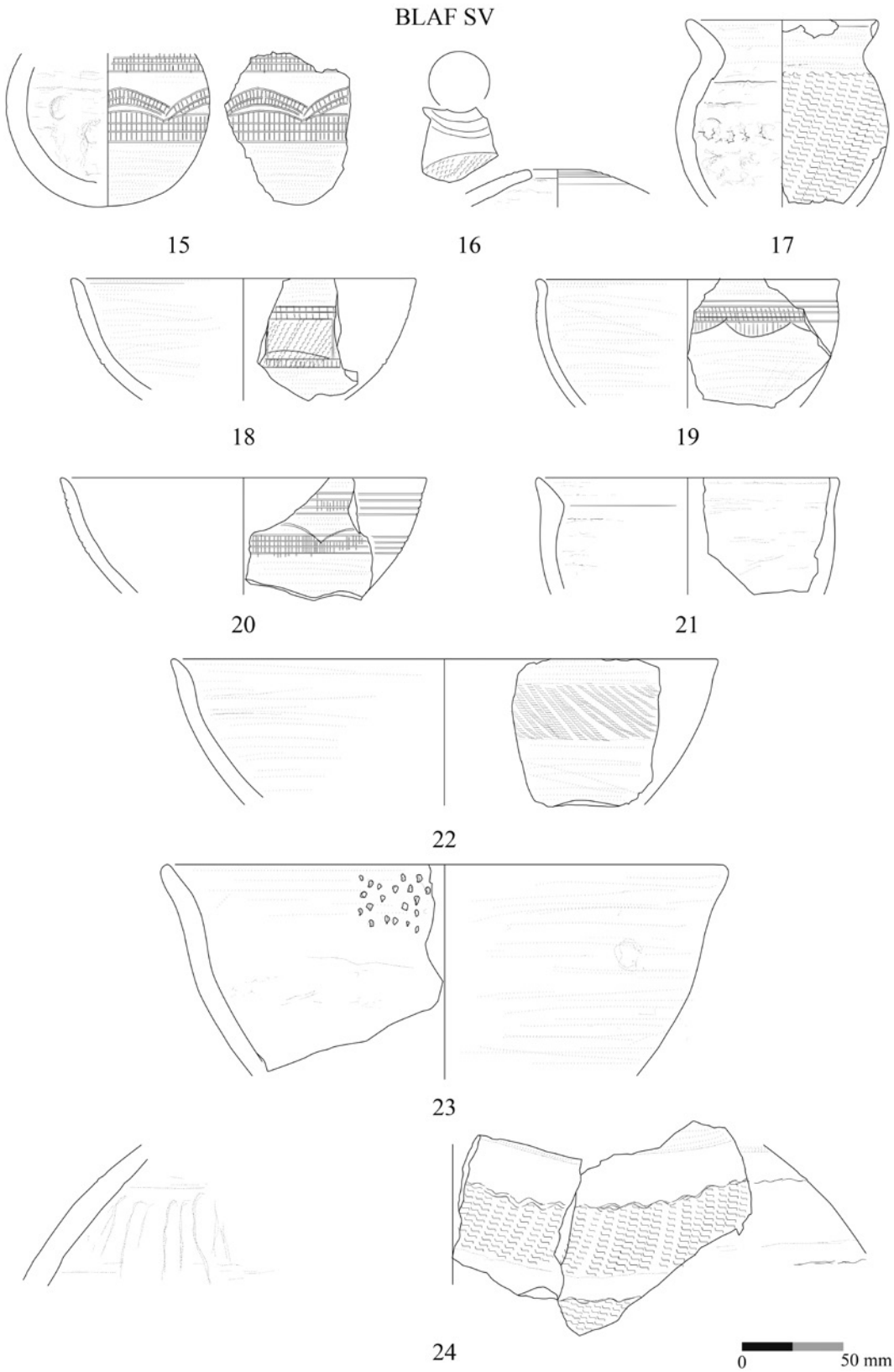
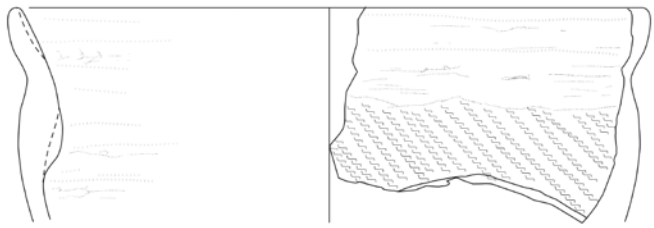


PLATE 21 Birnin Lafiya S5

15 S5, 110–120
16 S5, 20–30
17 S5, 10–20
18 S5, 120–130
19 S5, 60–70
20 S5, 80–90
21 S5, 20–30
22 S5, 80–90
23 S5, 20–30
24 S5, 60–70

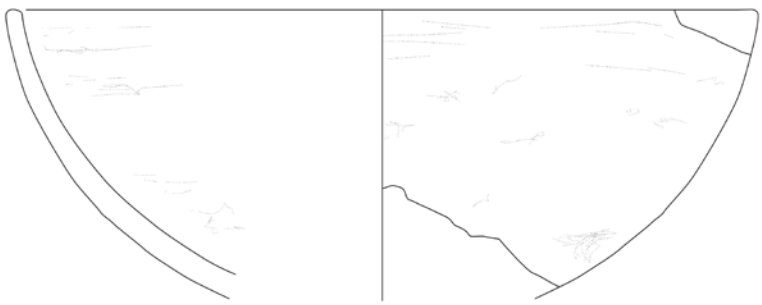
BLAF SV

25



26

27



28

BLAF SVIII

29

0 50 mm

PLATE 22 Birnin Lafiya S5, S8

25 S5, 120–130
26 S5, 90–100
27 S5, 90–100
28 S5, 100–110
29 S8, Context 1

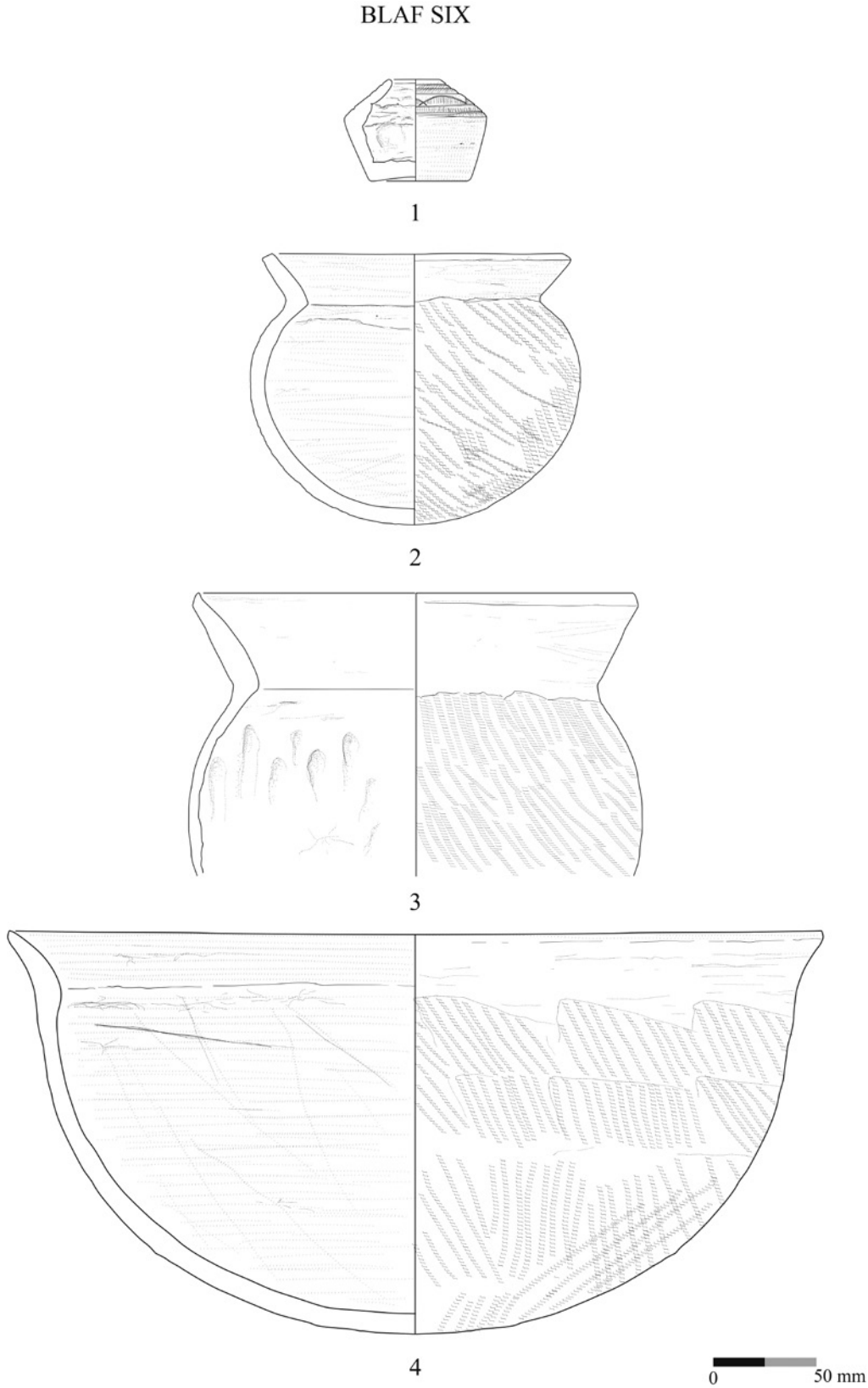


PLATE 23 Birnin Lafiya S9

1 S9, Context 4, –40 Pot 2

2 S9, Context 13

3 S9, Context 10, 150–160

4 S9, south section – 1,35

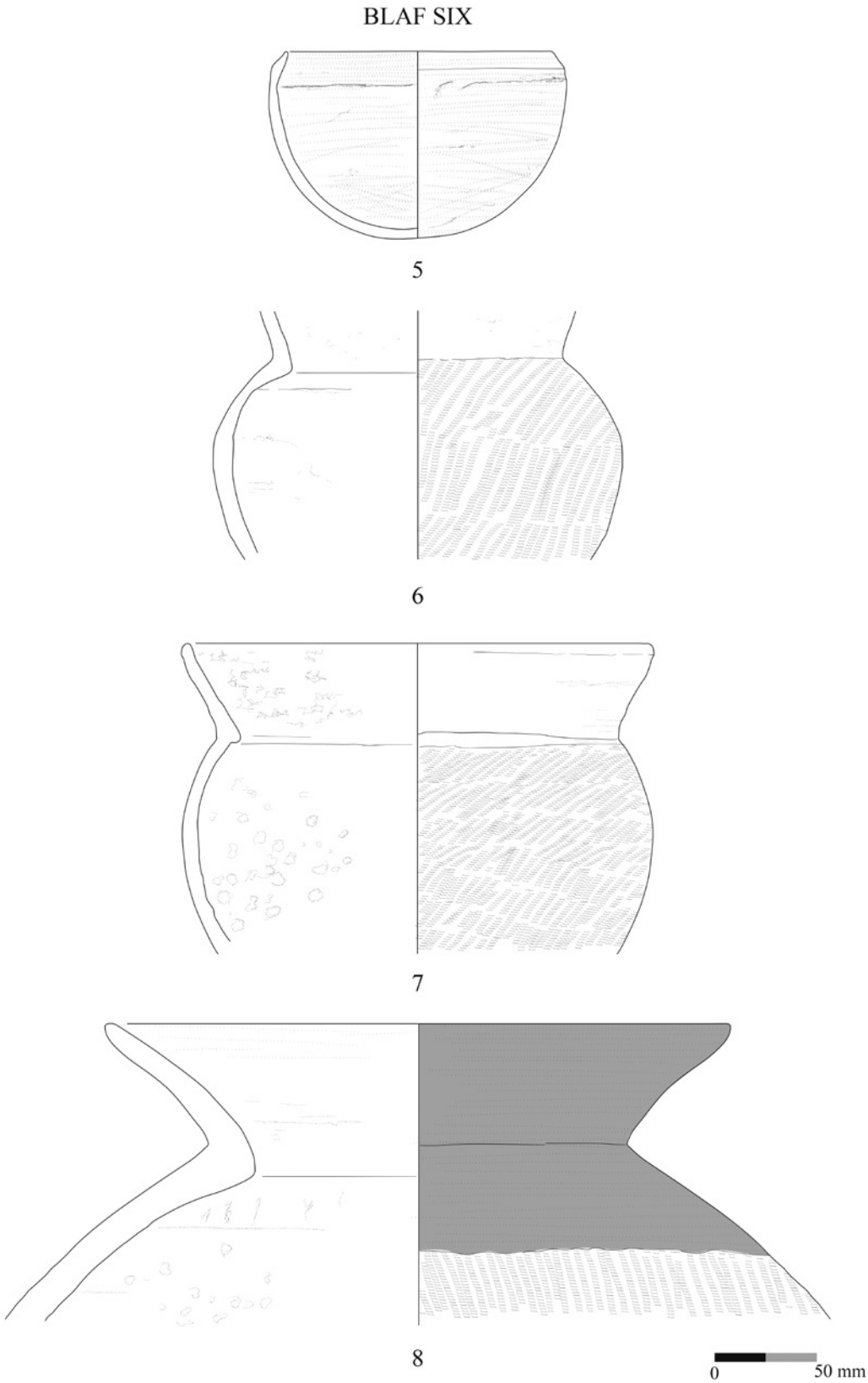


PLATE 24 Birnin Lafiya S9 cont'd

5 S9, Context 12, 270–280

6 S9, Context 13, 290–300

7 S9, Context 13, 290–300/300–310

8 S9, Context 2, 20–30/40–50 [91]

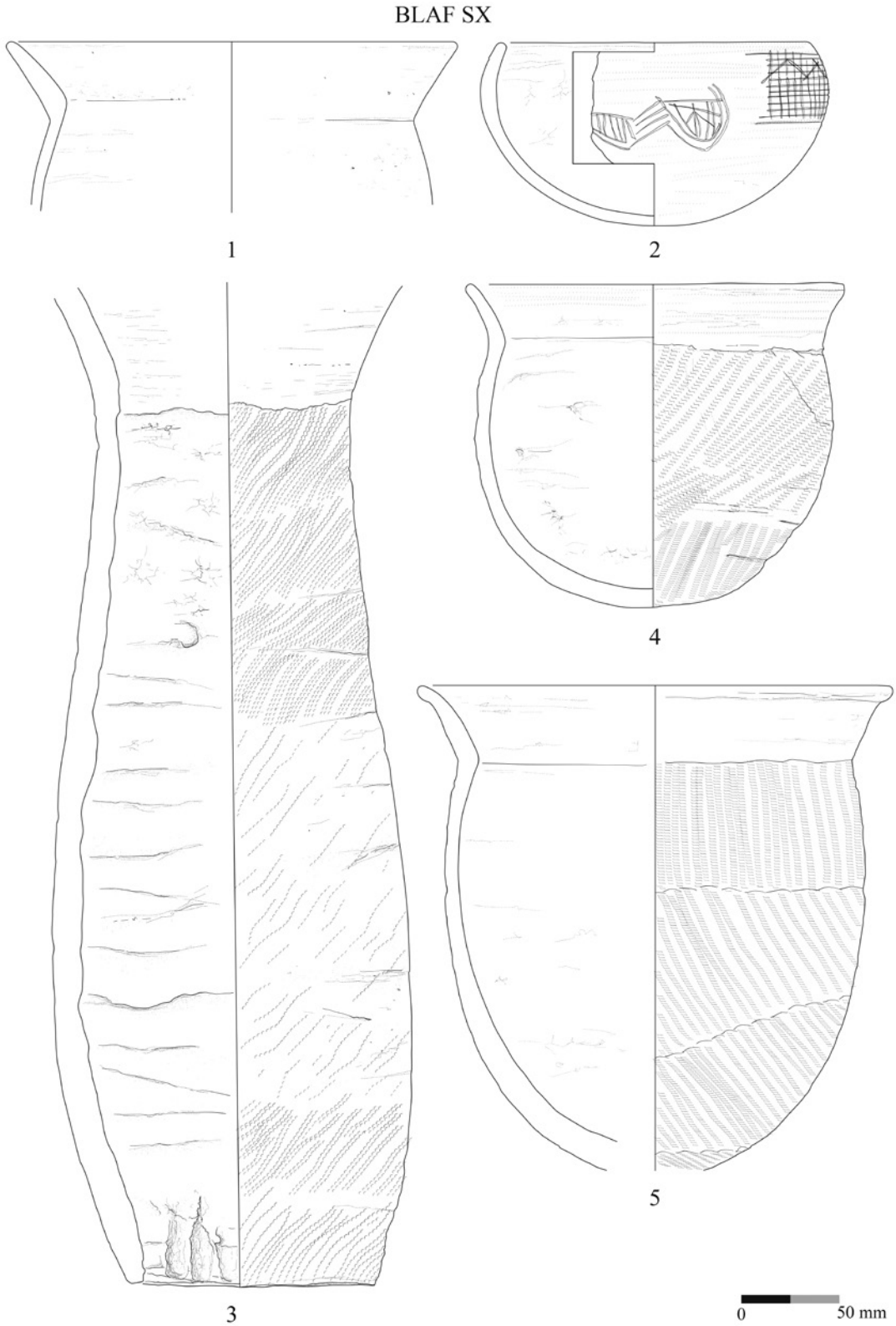


PLATE 25 Birnin Lafiya S10

1 S3/10 Pot cluster 3.2
2 S3/10 Pot cluster 2.1
3 S3/10 ceramic cylinder in Room 5 (Feature 5)
4 S3/10 Pot cluster 2.11 (see Figure V.9)
5 S3/10 Pot cluster 2.2

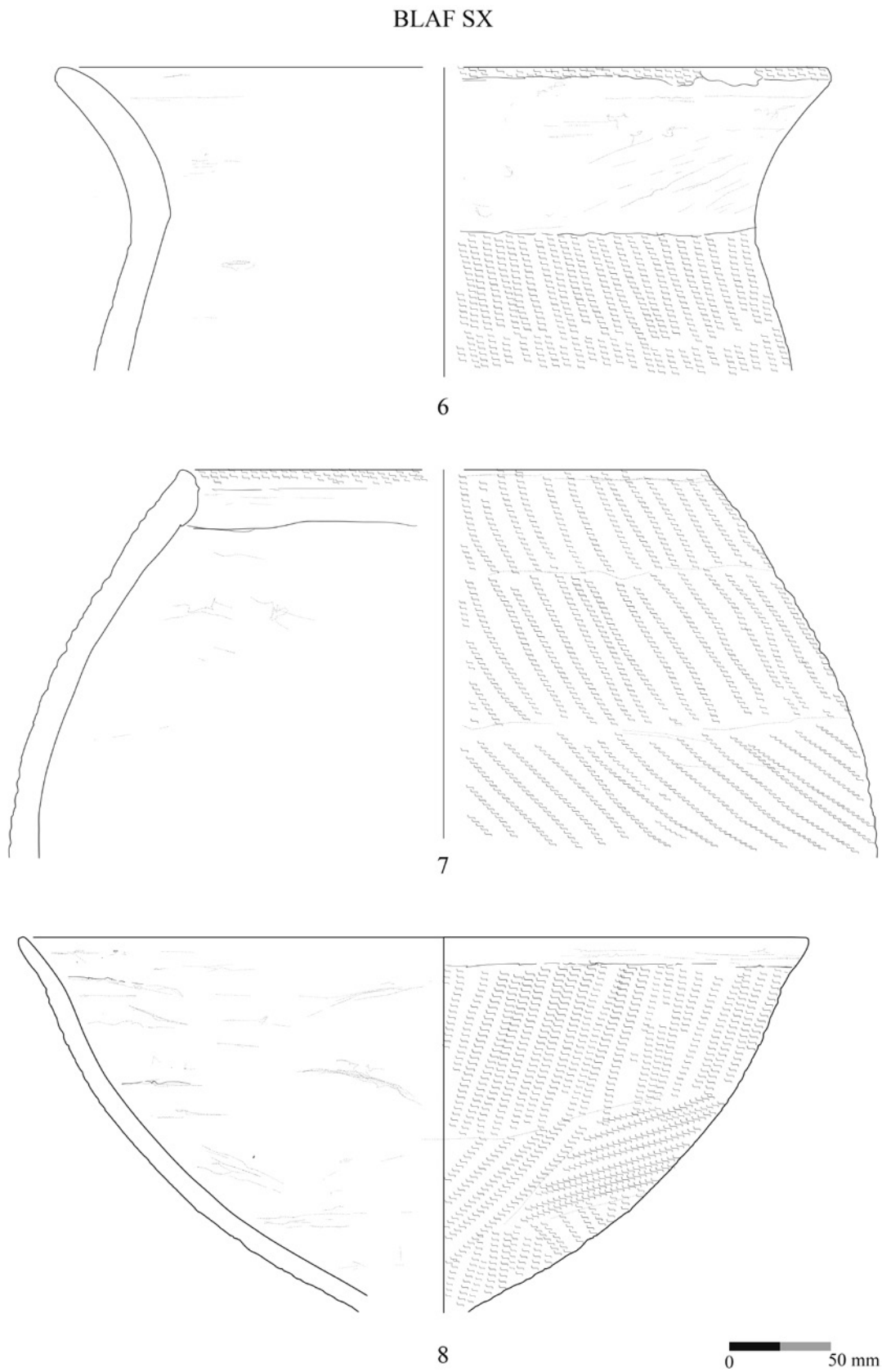


PLATE 26 Birnin Lafiya S10 cont'd

6 S3/10 Pot cluster 1. 1

7 S3/10 Pot cluster 1.1

8 S3/10 Pot cluster 2.12, Diameter 36–42

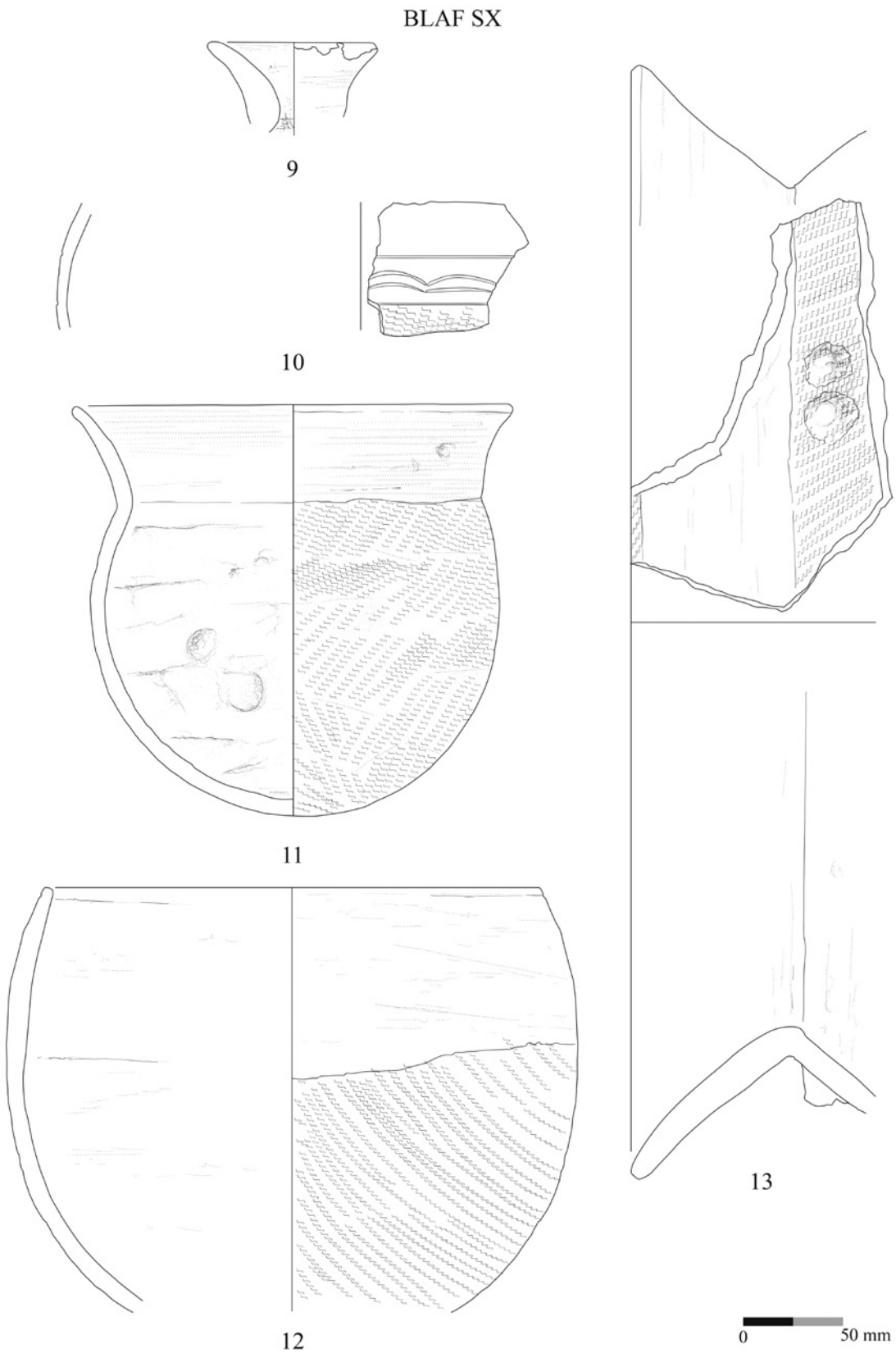


PLATE 27 Birnin Lafiya S10 cont'd

9 S3/10 Pot cluster 3.3
10 S3/10 Pot cluster 2.5
11 S3/10 – intact pot in Room 5 (see Figure V.9)
12 S3/10 Pot cluster 3.4
13 S3/10 Pot cluster 1.1

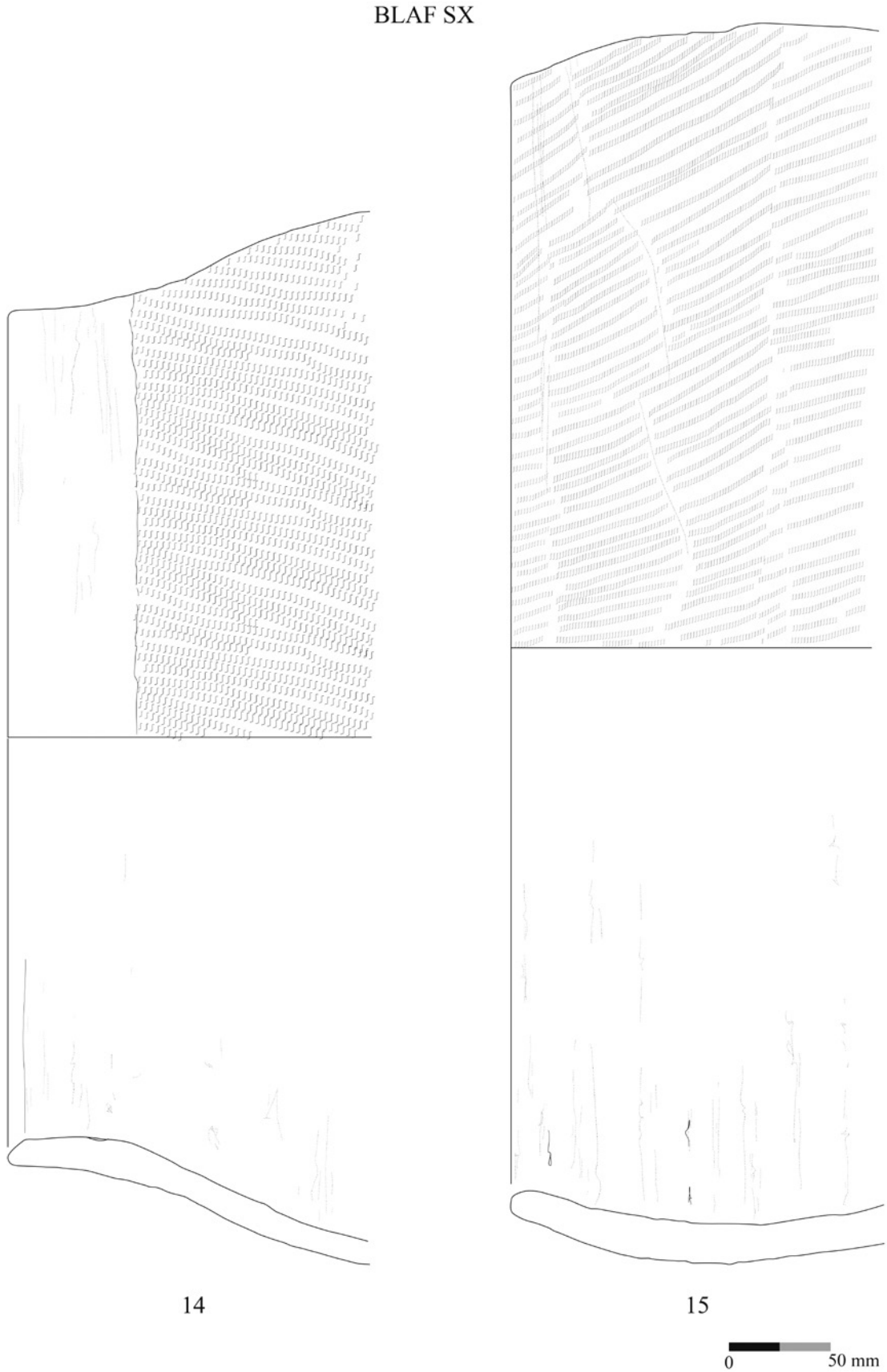


PLATE 28 Birnin Lafiya S10 cont'd
14 S3/10 Pot cluster 1.2
15 S3/10 Pot cluster 1.1

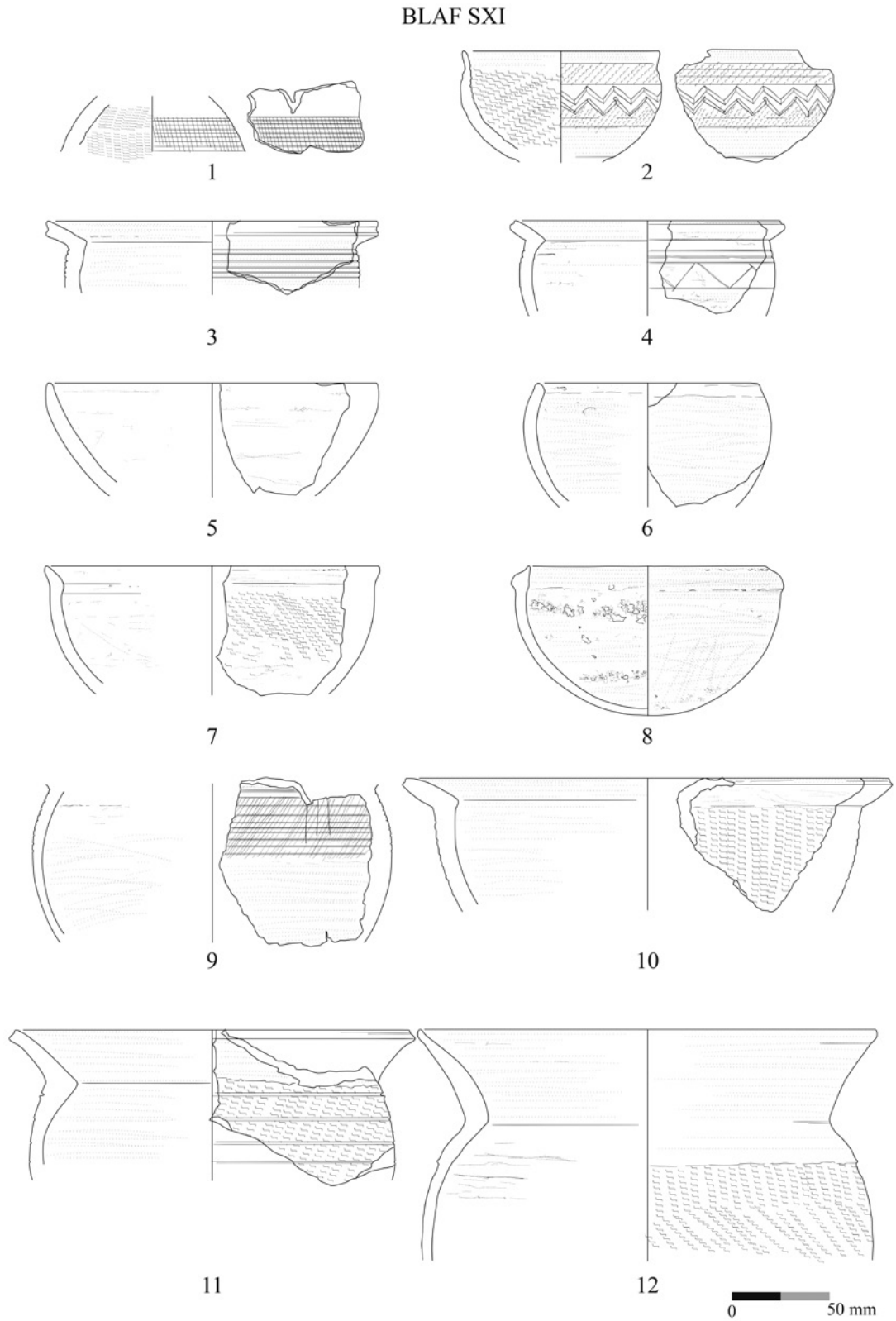


PLATE 29 Birnin Lafiya S11

1 S11, Context 2 Level 2
2 S11, likely Context 3
3 S11, Context 5
4 S11, Context 5
5 S11, Context 1
6 S11, –4
7 S11, Context 1
8 S11, 15-1 vessel
9 S11, Context 5
10 S11, Context 5
11 S11, Context 3 Level 3
12 S11, Context 3 Level 3/5

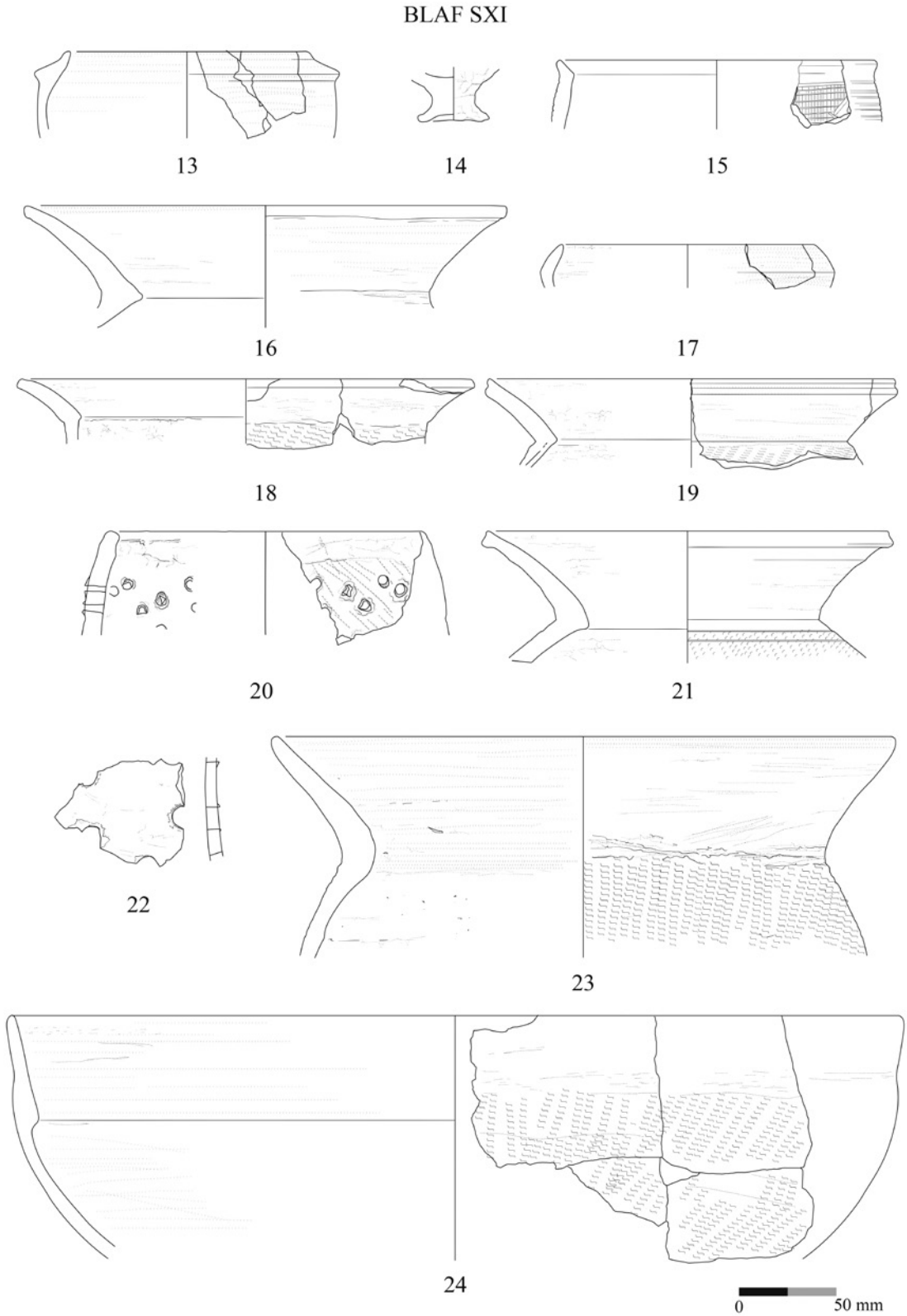


PLATE 30 Birnin Lafiya S11 cont'd

13 S11, Context 5
14 S11, Context 18
15 S11, Context 6 Level 1
16 S11, unlabelled
17 S11, Context 5
18 S11, Context 8
19 S11, Context 5
20 S11, Context 6 Level 1
21 S11, II 170–180
22 S11, Context 9
23 S11, Context 3 Level 2
24 S11, II 200–210

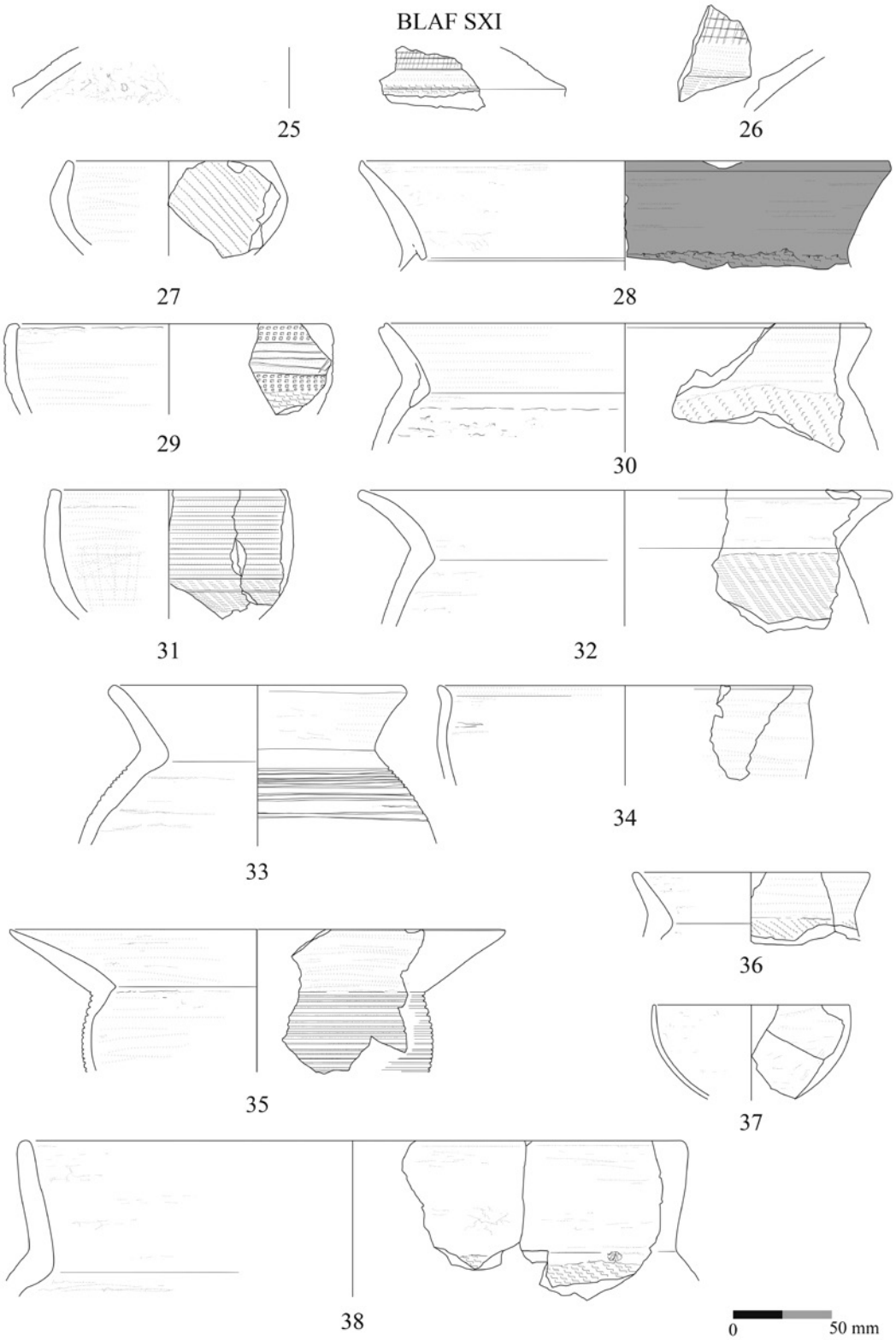


PLATE 31 Birnin Lafiya S11 cont'd

25 S11, Context 5
26 S11, Context 3/2
27 S11, Context 18
28 S11, Context 9
29 S11, Context 22
30 S11, Context 9 + Context 12
31 S11, Context 18
32 S11, Context 9 + Context 22
33 S11, Context 18
34 S11, Context 18
35 S11, Context 12 + Context 9
36 S11, Context 18
37 S11, Context 18
38 S11, Context 6-1

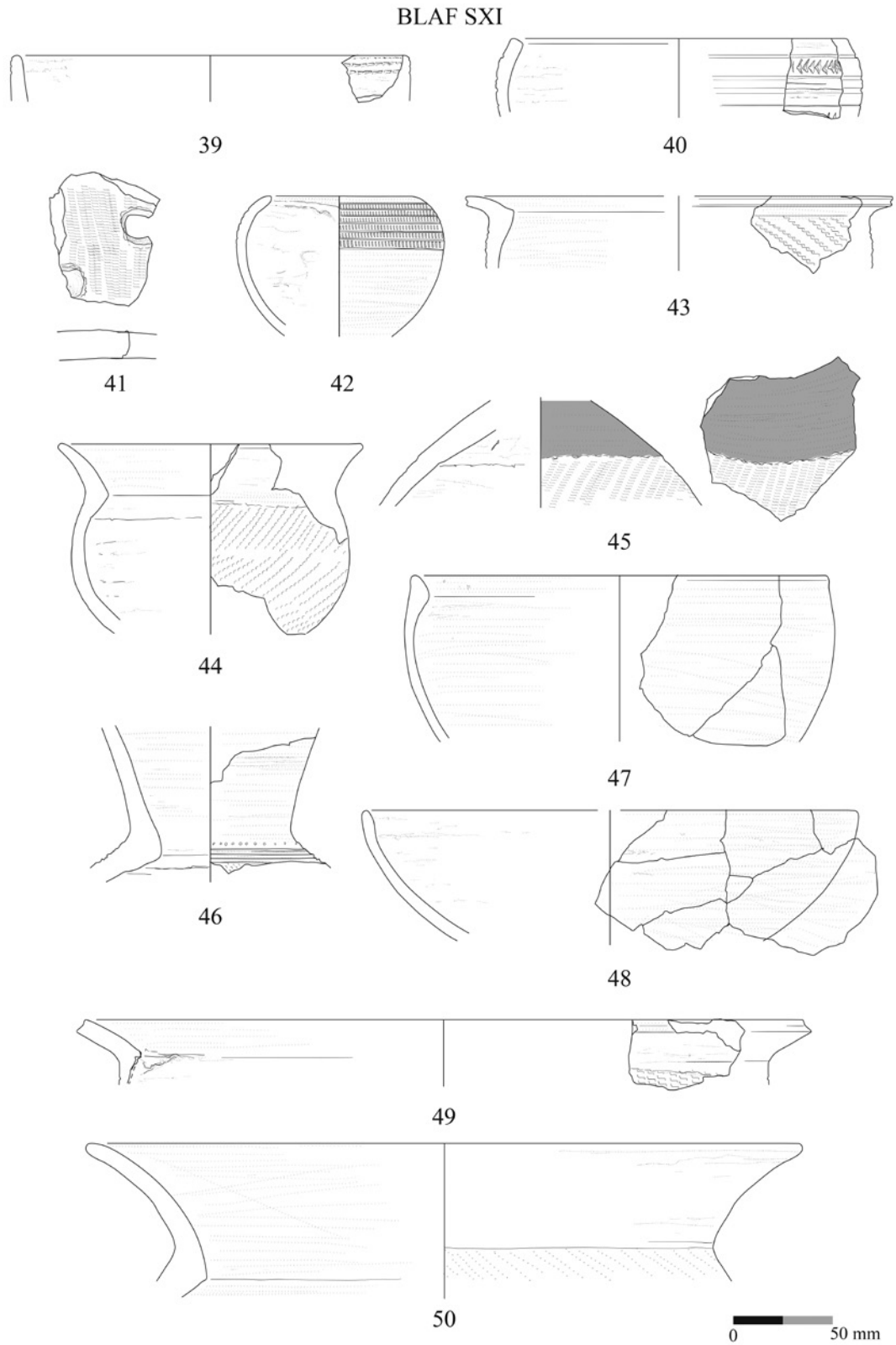


PLATE 32 Birnin Lafiya S11 cont'd

39 S11, Context 18
40 S11, Context 18
41 S11, Context 20
42 S11, Context 6-1
43 S11, Context 12. Diameter unknown
44 S11, Contexts 18 + 21
45 S11, Context 6 Level 1. Diameter unknown
46 S11, Context 11
47 S11, Context 18
48 S11, Context 18. Diameter unknown
49 S11, Context 12
50 S11, 16 220–230

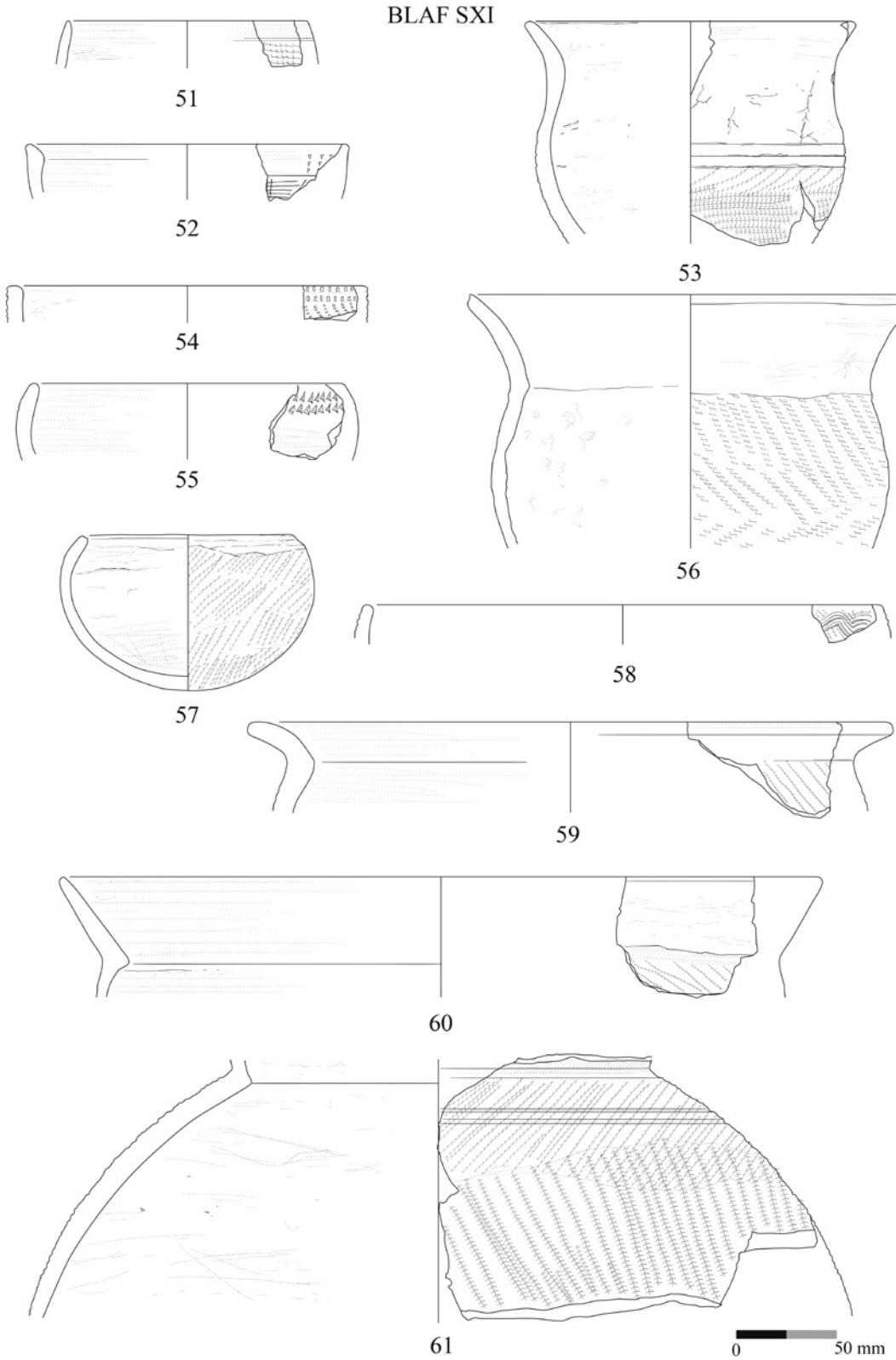


PLATE 33 Birnin Lafiya S11 cont'd (excavated 2013)

51 S11, Context 22
52 S11, Context 22
53 S11, Context 22 + Context 18
54 S11, Context 18
55 S11, Context 21
56 S11, unlabelled
57 S11, Context 21
58 S11, Context 18
59 S11, Context 18
60 S11, Context 21
61 S11, Context 21

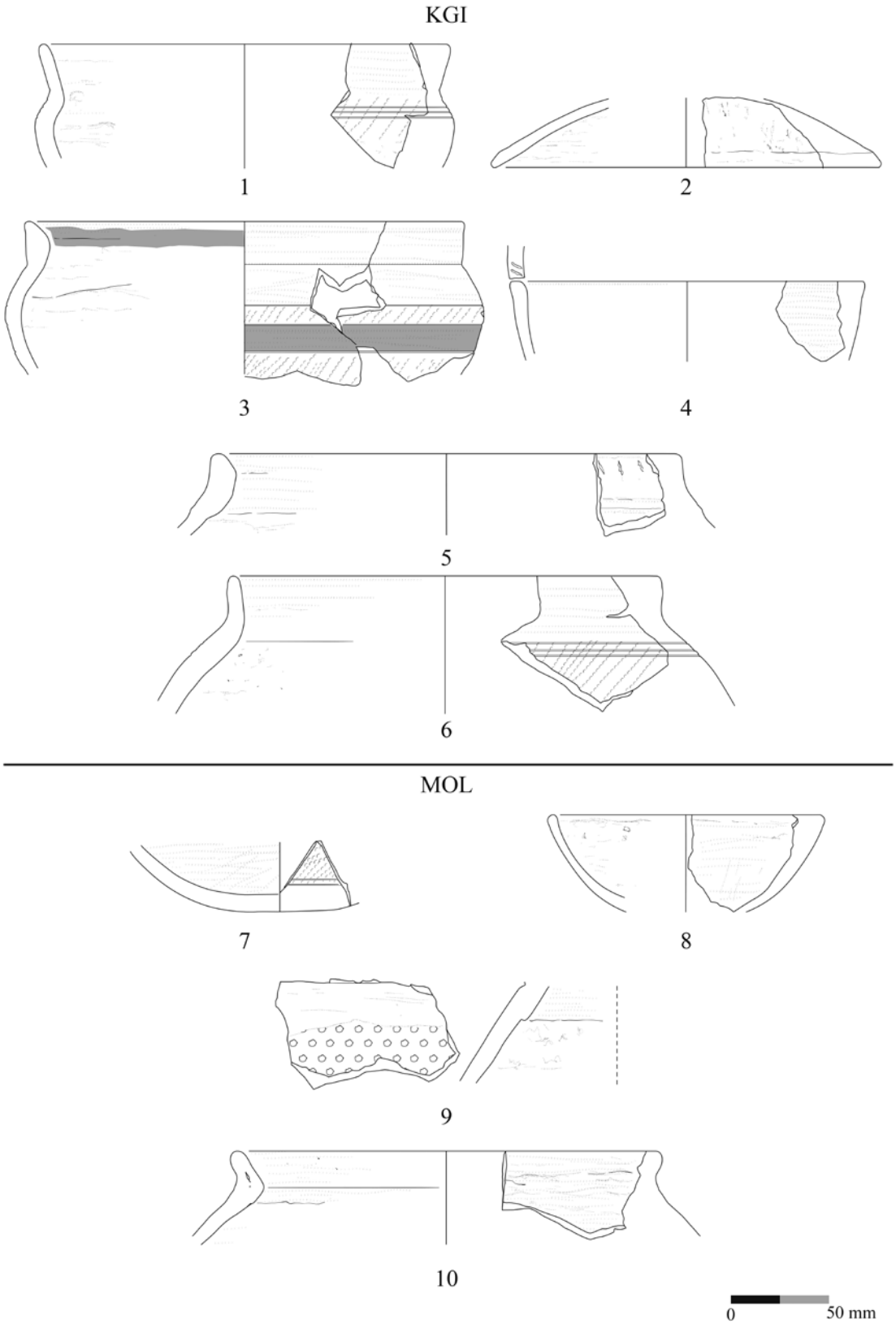


PLATE 34 Kargui and Molla (KGI-14, MOL-14)

1 KGI-14-SI, 40–50
2 KGI-14-SI, 90–100
3 KGI-14-SI, 90–100
4 KGI-14-SI, 70–80
5 KGI-14-SI, 30–40
6 KGI-14-SI, 0–20
7 MOL-14-SI, 60–70–80
8 MOL-14-SI, 60–70
9 MOL-14-SI, 60–70. Diameter unknown
10 MOL-14-SI, 60–70

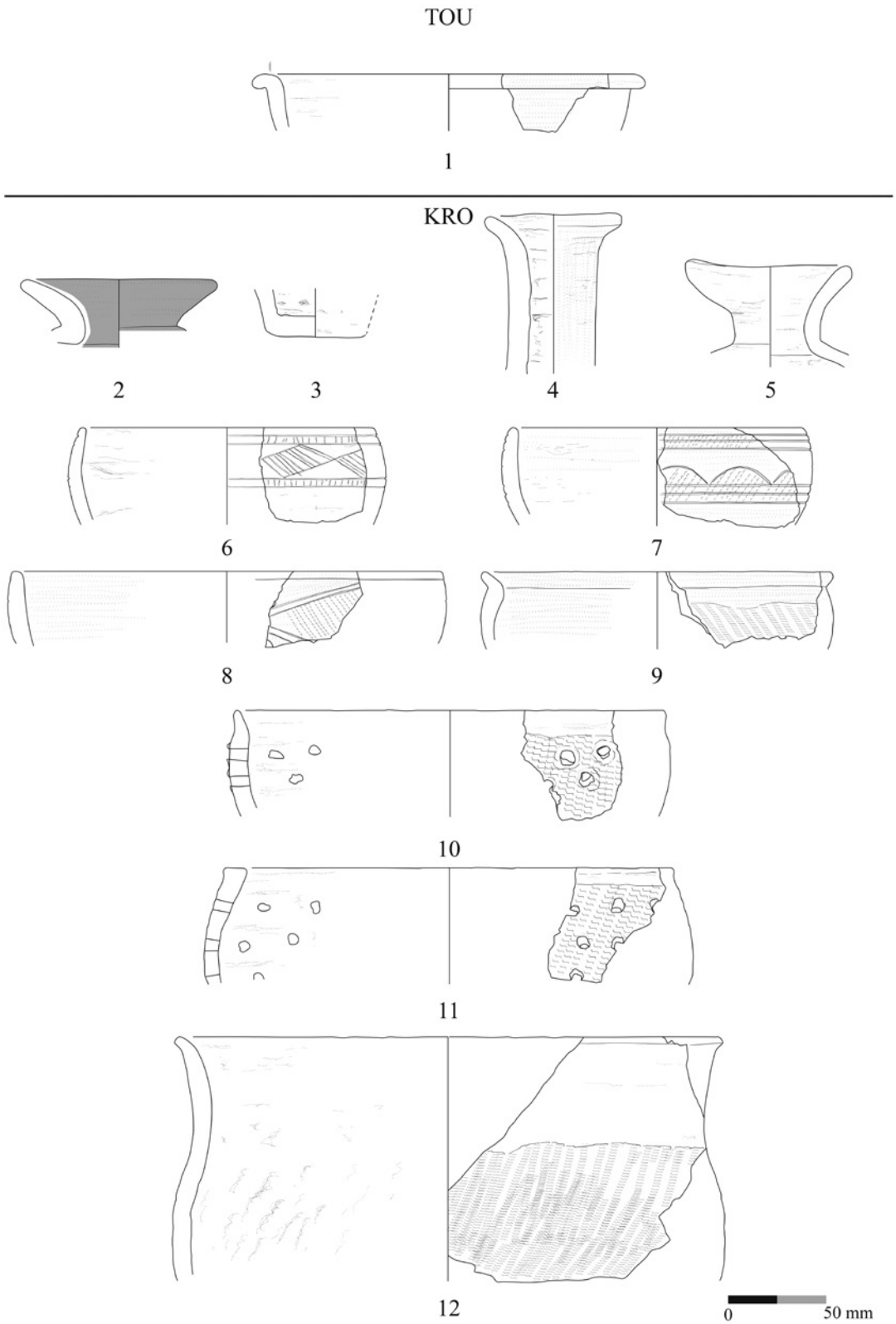
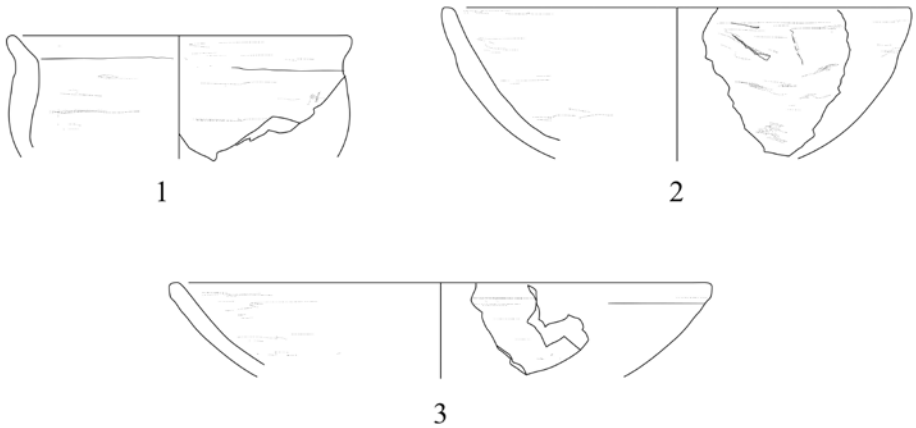


PLATE 35 Tomboutou and Kantoro (TOU-14, KRO-14)

1 TOU-14-SI, 40–50
2 KRO-14-SI, 60–70, 11
3 KRO-14-SI, 20–30, 11
4 KRO-14-SI, 20–30, 01
5 KRO-14-SII, 130–140
6 KRO-14-SI, 10–20, 18
7 KRO-14-SI, 70–80, 04
8 KRO-14-SI, 70–80, 27
9 KRO-14-SI, 10–20, 58
10 KRO-14-SI, 0–10, 01
11 KRO-14-SI, 80–90, 03
12 KRO-14-SI, 80–90, 01

GAR



ENE

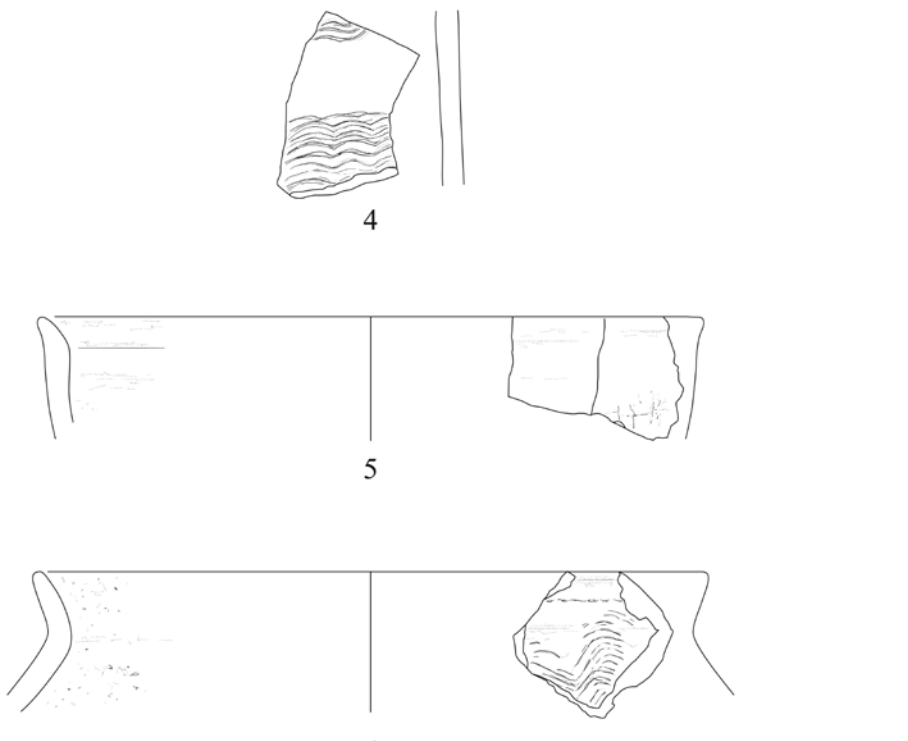


PLATE 36 Garou and Guene zeno (GAR-14, ENE-14)

1 GAR-14-SI, 0–20
2 GAR-14-SI, 20–30
3 GAR-14-SI, 30–40
4 ENE-14-SI, 0–20. Diameter unknown
5 ENE-14-SI, 0–20
6 ENE-14-SII, 0–20

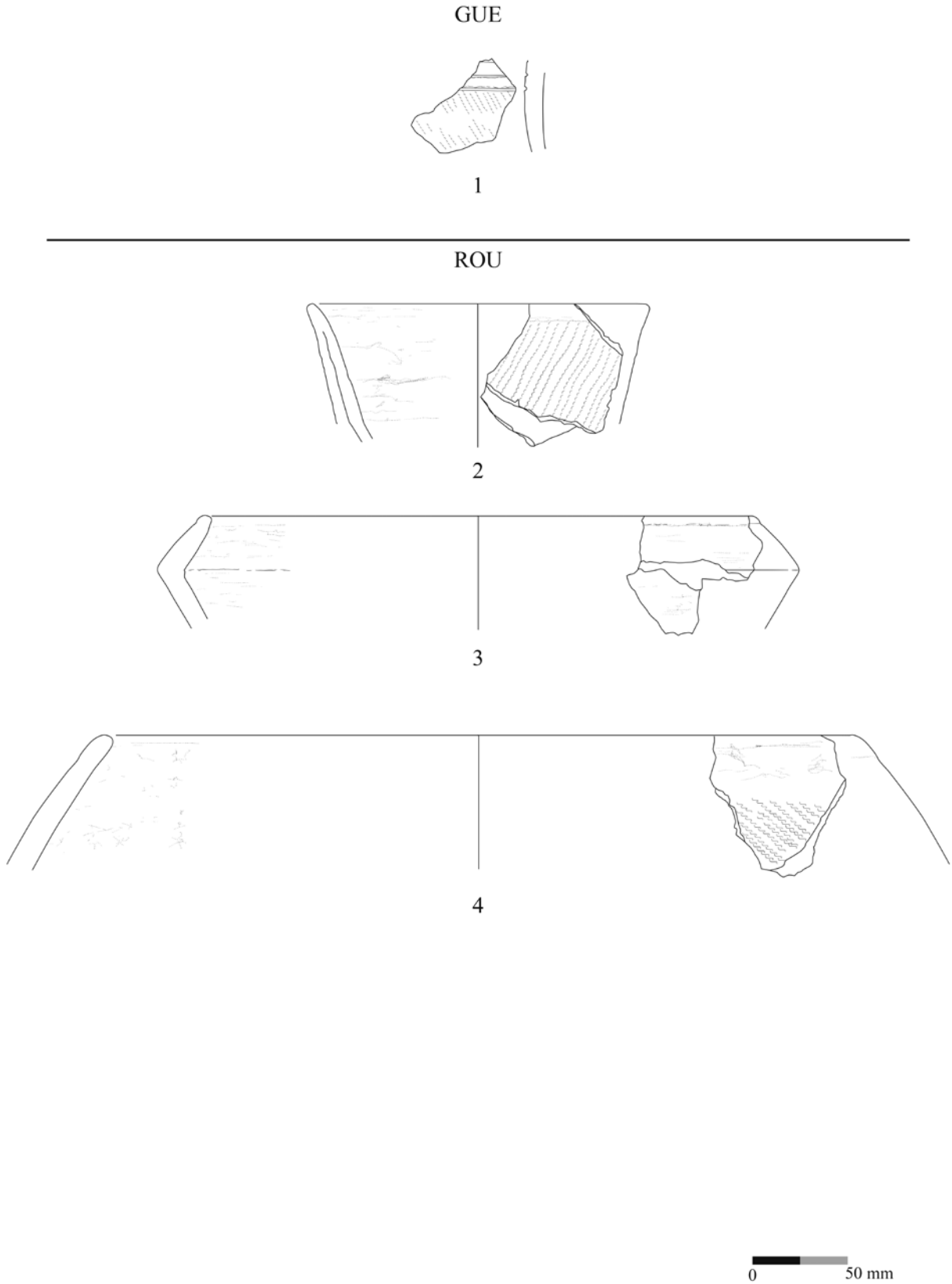


PLATE 37 Guene and Kouboukoukourou (GUE-14, ROU-14)

1 GUE-14-SI, 0–20. Orientation and diameter unknown

2 ROU-14-SI, 80–90

3 ROU-14-SI, 50–60/60–70

4 ROU-14-SI, 40–50

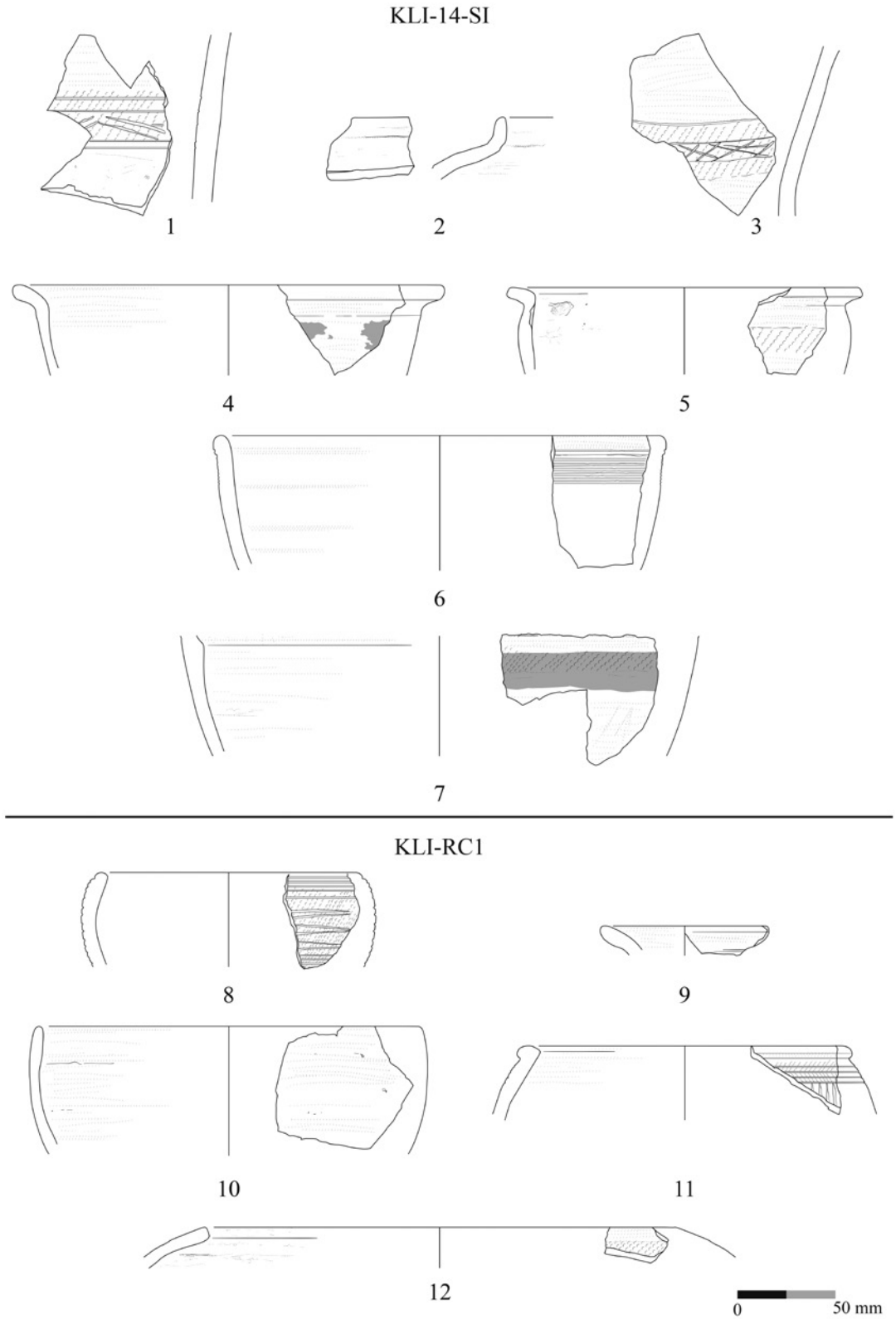


PLATE 38 Madekali (KLI-14 and RC-14)

1 KLI-14-SI, 0–20
2 KLI-14-SI, 50–60
3 KLI-14-SI, 40–50
4 KLI-14-SI, 90–110
5 KLI-14-SI, 30–40
6 KLI-14-SI, 30–40
7 KLI-14-SI, 20–30
8 KLI-RC1, section clean
9 KLI-RC1, Context 6
10 KLI-RC1, Context 6
11 KLI-RC1, section clean
12 KLI-RC1, section clean

Small Finds 2011

Metal (M)							
SF 2011-02	coil of metal	BLAF 11, S1	0–25 cm			2.5	Coiled metal ring
Modelled Clay (C)							
SF 2011-09	3 fragments of terracotta	BLAF 11, S1	75–100cm	3.4, 2.3, 1.6	2.0, 1.5, 1.2	1.0, 0.6, 0.2	Pottery foot (?)
SF 2011-11	ceramic figurine	BLAF 11, S1	At 80 cm	2.0	1.4	1.4	Small horn-shaped piece

Small finds 2012

Beads (B)						
SF 2012-01	white bead	BLAF S3, Cleaning NW section	0.7 cm		0.6 cm (diameter)	Stone bead, Type 3. White quartz bead in cylindrical shape. Diameter 7mm, length along perforation 6mm. Central perforation drilled from one side, tapering between 2–3mm. Facets along perimeter still visible (SM)
SF 2012-02	bead	BLAF 12, S 3 Con. 9	0.5 cm		0.8 cm (diameter)	Stone bead, Type 4. Rose quartz bead in discoid shape. Diameter 8mm, length along perforation irregular between 4 and 5mm. Slightly off-centre perforation drilled from one side, tapering between 2 and 3mm (SM)
SF 2012-03	bead	BLAF 12, S 3 Con. 8	1.6 cm	1 cm	0.3 cm (depth)	Glass (?) bead, no type assigned. Opaque black, glossy, smooth glass (?) bead with small irregularities on the surfaces. Tabular lozenge shape; possibly pressed into the form. Broadest diameter 10mm, width at apex 5 mm, length along perforation axis 17mm, thickness 3mm. Possibly a (sub-) recent Czech glass bead(?) (SM)
SF 2012-04	glass bead	BLAF 12, S3 Con. 8	0.3 cm		0.4 cm (diameter)	Translucent blue, drawn glass bead in short cylindrical shape. Diameter 4mm, length along perforation axis 3mm. Central perforation, 1.5mm wide. Unweathered surface. Type known from Kissi, Igbo Ukwu, Gao and elsewhere (SM). Currently undergoing analysis with SM

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SF 2012-05	bead	BLAF 12, S3 Con. 9		1 cm	0.8 cm	0.3 cm (depth)	Stone bead, Type 4. Dark stone (indet.) bead, discoid. Irregular diameter, ca. 9.5 to 10mm, irregular length along perforation axis ca. 3.5mm. Perforation slightly off-centre, drilled from one side, tapering between 1.8 and 2.5mm. Smooth surfaces with traces of lustre (SM)
SF 2012-06	stone bead	BLAF 12 S3, Con. 2		1.2 cm		2.8 cm	Stone bead, Type 1. Dark reddish-brown chalcedony (?) or radiolarian rock bead with white veins in irregular discoid shape with tapering edges. Diameter ca. 29mm, irregular length along perforation axis between 8 and 11mm. Almost central perforation, drilled from one side, tapering between 3.5 and 4.5 mm. Deep depression around hole on narrower perforation side, possibly due to a larger flake chipping off when borer reached this end. Roughly chipped, surfaces left relatively crude (SM)
SF 2012-07	clay bead	BLAF 12 S3, Con.8		0.9 cm		1.3 cm	Baked clay bead in short biconical shape. Diameter 13mm, length along perforation axis ca. 8mm. Slightly off-centre (unfinished?) perforation of about 1.5mm width. Fine-grained texture with smooth but unpolished surface (SM)
SF 2012-09	bead	BLAF 12 S5	60–70 cm	0.7 cm		2.4 cm	Stone bead, Type 1. Red chalcedony (jasper?) or radiolarian rock bead w. quartz inclusions. Irregular, roughly circular discoid with slightly tapering edges. Diameter 20–22mm, thickness between 6 and 9mm. Perforation slightly off-centre, drilled from one side, tapering between 2 and 3mm. Roughly chipped but both surfaces have smoothly polished areas (SM)
SF 2012-11	white bead	BLAF S3, surface of trench	Surface	0.6 cm		0.8 cm	Stone bead, Type 3. White quartz bead in cylindrical shape. Diameter 6mm, length 5mm. Almost central perforation drilled from one side, tapering between 1.7 and 3mm. Clearly visible facets along perimeter (SM)
SF 2012-12	stone bead	BLAF S3	Surface	1.2 cm		3.8 cm	Stone bead, Type 1.Reddish quartz or quartzite bead in circular discoid shape with tapering edges. Irregular diameter between 34 and 36 mm, irregular length along perforation axis between 5 and 9mm. Perforation almost central, drilled from one side, tapering between 2 and 4mm. Roughly chipped, irregular surface (SM)

Small finds 2012 (*cont.*)

SF 2012-17	bead	BLAF 12, S5	50–60 cm	0.9 cm	2.9 cm	Stone bead, Type 1.Dark reddish-brown chalcedony (jasper?) in circular discoid shape with tapering edges. Diameter between 25 and 27mm, irregular length along perforation axis ca. 8 to 9mm. Perforation almost central, drilled from one side, tapering between 2.5 and 4mm. Depression around the narrower hole, possibly due to a flake that chipped off when the borer reached this end. Roughly chipped, irregular but smoothed surfaces (SM)
SF 2012-20	bead	BLAF 12, S5	50–60 cm	0.4 cm	0.8 cm	Stone bead, Type 4. Red quartz or weathered carnelian bead in discoid shape. Diameter 7mm, length along perforation 4mm. Central perforation drilled from one side, tapering between 2 and 3mm (SM)
SF 2012-22	bead	BLAF 12 near S3 after surface sweet about 50 cm west of S3		0.6 cm	0.7 cm	Stone bead, Type 3.White quartz bead in cylindrical shape. Diameter 6.5mm, length 6.8mm. Central perforation drilled from one side, tapering between 2 and 2.5mm. Vague traces of facets along perimeter (SM)
SF 2012-23	bead	BLAF 12 S4 Context 1, second phase of excavation of raised pit		0.5 cm	0.6 cm	Stone bead, Type 4. Reddish-orangey quartz or weathered chalcedony in discoid shape. Diameter 7mm, length along perforation axis 4.5mm. Central perforation drilled from one side, tapering between 2 and 3 mm. Same type as SF 2012-18 and 2012-20 (SM)
SF 2012-24	bead?	BLAF 12 S4 Context 4, 2nd phase of raised pit		1.5 cm	1.1 cm	Unperforated (stone?) sphere, diameter ca. 15mm. Not necessarily a bead rough-out (SM) Similar to SF 2014-25
SF 2012-25	bead	BLAF 12, S4 Context 2		1 cm	0.6 cm	Stone bead, no Type assigned. Reddish quartzite bead, cylindrical (long barrel) shape. Diameter 6mm, length along perforation axis 11mm. Slightly off-centre perforation, drilled from one side, tapering between 2.5 and 3mm. Vague traces of facets along perimeter visible (SM)
SF 2012-28	bead	BLAF 12, S4 Context 22	287–310 cm	0.1 cm	0.4 cm	Dark shell bead in angular discoid shape. Diameter 4mm, length along perforation axis 1mm. Perforation ca. 1mm. There seems to be some red stain on both sides of the bead (SM)

SF 2012-29	bead	BLAF 12, S4 Context 13	140–160 cm	0.9 cm		1.4 cm	Baked clay bead in round-oblate shape. Diameter ca. 7 to 9 mm, irregular length along perforation axis between 6 and 10mm. Slightly off-centre (unfinished?) perforation, probably biconical perforation, ca. 2mm wide. Texture relatively fine-grained, surfaces unpolished, partly smooth, partly irregular (SM)
SF 2012-34	bead	BLAF 12, S3 Con. 8		1.4 cm		0.2 cm	Dichroic blue, drawn glass bead in long-cylindrical shape. Diameter ca. 4mm, length along perforation axis 14mm. Pale greyish-blue glass at reflected light turns to yellowish-green under transmitted light. Longitudinal striations due to forming technique. Central perforation, ca. 1mm wide (SM) Currently undergoing analysis with SM
SF 2012-35	bead	BLAF 12, S3 Con. 3		2.5 cm		1.8 cm	Fragmented clay bead
SF 2012-43	bead	BLAF 12 S4 Context 2, second phase of excavation of raised pit		0.6 cm		0.6 cm	Stone bead, Type 3. Milk-white quartz bead in cylindrical shape. Diameter 8mm, length 6mm. Central perforation drilled from one side, tapering between 1.5 and 2.5mm. Slight depression on the surface around the narrower perforation; possibly a flake chipped off when the borer reached this end. Very vague traces of facets along perimeter (SM)
Metal (M)							
SF 2012-87		PEK 12		2.3 cm	1.6 cm	1 cm	Fragment rather flat with fresh fractures. Possibly a disk, but distorted by oxidation (AF)
SF 2012-89	iron	BLAF 12, S4 Context 25	270–310 cm	5.8 cm	1.3 cm	0.6 cm	3 fragments of a same long object with a pointed end, a body with a quadrangular, possibly oval, cross-section and one end with two points (bifurcated), one of which still very sharp (AF). Originally mislabelled Context 22, now corrected.
SF 2012-90	iron	PEK 12	–80 cm	3 cm	1.2 cm	0.5 cm	Fragment of a flattened rod (narrow plate) of irregular width, with a bulge in the central portion, visible on one side only. Old breaks at both ends (AF)

Small finds 2012 (*cont.*)

SF 2012-93	iron	BLAF 12, S4 Context 20	250–270 cm	4 cm	3.3 cm	0.8 cm	Recently broken plate of rounded shape and uniform thickness (AF)
SF 2012-94	iron	BLAF 12, S5	80–90 cm	4.7 cm	2.5 cm	0.8 cm	Slightly trapezoidal and elongated plate; old breaks at both ends. Section appears triangular despite oxidation. Possibly a fragment of a knife blade (AF)
SF 2012-95	iron	BLAF 12, trench not noted but likely S5	110–120 cm	4 cm	3.2 cm	0.5 cm	Plate with old and new breaks; thickness relatively constant (AF)
SF 2012-96	iron	BLAF 12, S4 Con. 12		2.8 cm	1 cm	0.6 cm	Incomplete and probably stem regular quadrangular section (AF)
SF 2012-99	iron	BLAF 12, S3 Con. 5		2.7cm	0.4cm	0.2cm	Very thin piece
SF 2012-101	iron	BLAF 12, S3 Con. 3		3.3cm	0.3cm	0.3cm	A very thin rod
SF 2012-102	iron	BLAF 12, S5	60–70 cm	5.5 cm	0.9 cm	0.3 cm	Harpoon
SF 2012-103	iron	BLAF 12, S3 Con. 6		7.5 cm	1.5 cm	0.3 cm	Barbed point
SF 2012-104	iron	BLAF 12, S3 Con. 9		3.3 cm	1.3 cm	0.1 cm	Shaped metal fragment. Roughly triangular and very thin. Its cross section is triangular on the length of the object (AF)
SF 2012-105	iron	BLAF 12, S4 Con. 17	195–215 cm	3.2 cm	1 cm	0.6 cm	
SF 2012-106	iron	BLAF 12, S3 Con. 9		3.7 cm	0.7 cm	0.3 cm	Small rod, corroded; illegible section. Both ends seem to bear traces of cutting (AF)
SF 2012-107		BLAF 12, S3 Con. 8		5.5 cm	4.5 cm	0.3 cm	Plate fragment with old and new fissures. The thickness of the plate is homogeneous and has a very slight curvature. The original morphology cannot be determined (AF)
SF 2012-109	iron	PEK 12, Con. 6		2.4 cm	1 cm		Fragment rendered shapeless by oxidation (AF)

SF 2012-110	iron?	BLAF 12, S3, Con. 8		2 cm	1.6 cm	0.3 cm	S disc-shaped plate (AF)
SF 2012-118	iron	BLAF 12, S5	80–90 cm	4 cm	0.5 cm	0.3 cm	Rod with old fracture on one side and a tip of the other side (AF)
SF 2012-123	iron	BLAF 12, S4 Con.10		2.7 cm	1.3 cm		Elongated, shapeless fragment. Very oxidised, with an old fracture; may be a cutting edge at one end (AF)
			Modelled Clay (C)				
SF 2012-62	terracotta	BLAF 12, S4 Context 22	270–290 cm	4.2 cm		2.2 cm	Terracotta foot, one end flat. Similar to SF 2012-68
SF 2012-67	ceramic	BLAF 12, S5	90–100 cm	4 cm		1.7 cm	Terracotta foot, rounded at one end and with a possible hole
SF 2012-68	ceramic	BLAF 12, S4 Context 19	158 cm	3.5 cm		1.5 cm	Terracotta foot, one end flat. Similar to SF 2012-62
SF 2012-79	ceramic	BLAF 12 S3 Con. 6		5 cm	3.5 cm	0.5 cm	Spoon-like shape
SF 2012-125	pottery foot	BLAF 12, S3 Con. 4			3.3 cm	4.3 cm	Unusually shaped, thin ceramic piece with possible finger marks
SF 2012-126	pottery	BLAF 12, S4 Context 8	105–120 cm	3.5 cm	1.3 cm		
SF 2012-134	pot object	BLAF 12, S4 Context 6, in Pit 4		3.5 cm	1.7 cm	1.5 cm	Terracotta pointed fragment
SF 2012-136	clay cylinder	BLAF 12, S4 Context 2 (2nd phase of raised pit excavation)	80–110 cm	2.7 cm	0.6 cm	0.5 cm	
SF 2012-139	ceramic	BLAF 12, S4 Con.15					Horn shaped object
SF 2012-140	terracotta	BLAF 12, S4 Context 19	–158 cm				Unusually shaped lump of fired clay.

Small finds 2013 (*cont.*)

SF 2012-147	terracotta	BLAF 12, S3 Context 5		Terracotta fragment
SF 2012-148	terracotta	BLAF 12, S4 Context 19	119–158 cm	Relatively complete quadruped
SF 2012-149	terracotta	BLAF 12, S4 Context 19	119–158 cm	Anthropomorphic with belly button?
SF 2012-257	miniature pot	BLAF S4, Context 19 Fosse 3	119–258cm	
		Other (O)		
SF 2012-138	worked bone	BLAF S4 Context 20	250–270 cm	Piece of worked bone with several embryonic holes drilled into it
SF 2012-255	ivory	BLAF S4, Context 6	80–90 cm	Curved fragment. Broken in two. Elephant (Loxodonta africana) ivory
SF 2012-256	shell	BLAF S4, Context 2	70–80 cm	

Small Finds 2013

			Beads (B)				
SF 2013-06	1 red bead	BLAF 13, S8 Con. 2	Level 1	3.9	1.1		Dark reddish-brown soft stone pendant (hematite?) in long oblate shape. Dimensions 38mm x 12mm, length along perforation axis 9mm. Perforation in upper third, ca. 3mm wide. Unclear if and how drilled. Larger damage on one side (SM)
SF 2013-07	1 bead	BLAF 13, S9 Con.8	130–140	0.6		0.6	Carnelian (Chloë Duckworth, University of Leicester, pers. comm.)

SF 2013-08	1 bead	BLAF 13, S9 Con. 1	130–140	0.5	0.4	Stone bead Type 3. Translucent white quartz bead in short cylindrical shape. Diam 7.5mm, length along perforation axis ca. 5mm. Almost central perforation, drilled from one side, tapering between 1.5 and 3mm. Small depression around narrower perforation end; possibly a piece chipped off when the borer reached this end. Sharp edges; clearly visible longitudinal facets on perimeter (SM)
SF 2013-09	1 stone bead	BLAF 13, S10 Con. 25			2.9	Reddish stone bead with white quartz veins and other banded inclusions (indet. siliceous stone), in circular discoid shape with tapering edges. Diameter 27 to 29 mm, irregular length along perforation axis between 6 to 10mm. Almost central perforation, drilled from one side, tapering between 2.5 and 4mm. Crude surfaces (SM)
SF 2013-10	1 stone bead	BLAF 13, S10	Décapage		3.1	Reddish-brown quartzite (?) bead with white quartz vein (indet. siliceous stone), in circular discoid shape with tapering edges. Diameter ca. 30 mm (one edge partly damaged), irregular length along perforation axis between 7 to 9mm. Slightly off-centre perforation, drilled from one side, tapering between 2.5 and 4mm. Crude surfaces, sharp edges. Identical raw material and type to SF 2012-12.
SF 2013-11	1 stone bead	BLAF 13, S10 Con. 5			1.8	Carnelian (Chloë Duckworth, University of Leicester, pers. comm.)
SF 2013-12	1 stone bead	BLAF 13, S10 Con. 17			2.2	Type 1 bead. Dark reddish-brown stone bead (chalcedony?) in circular discoid shape with tapering edges. Diameter 20 to 21mm, irregular length along perforation axis 5 to 7mm. One side (larger perforation side) ground flat, the other side is convex. Central perforation, drilled from one side, tapering between 2.5 and 4mm. Deep depression around narrower perforation due to a flake chipping off when borer reached this end. Relatively crude surface, one side ground flat. Identical material and type to SF 2012-17 (SM)
SF 2013-13	1 stone bead	BLAF 13, S10 Con. 19			0.8	Carnelian (Chloë Duckworth, University of Leicester, pers. comm.)

Small finds 2013 (*cont.*)

SF 2013-14	1 bead	BLAF 13, S10 Con. 29				0.6	Near pot cluster # 12, Room 2. Possibly carnelian; results noisy as difficult surface topography when sample mounted in chamber (Chloë Duckworth, University of Leicester, pers. comm.)
SF 2013-15	1 red bead	BLAF 13, S10 Con. 29		0.4		0.8	Carnelian (Chloë Duckworth, University of Leicester, pers. comm.)
SF 2013-16	1 stone dark bead	BLAF 13, S10	décapage	0.6		1.0	Type 4 bead. Dark greyish quartzite (?) in discoid shape. Diameter 9.5mm, irregular length along perforation axis between 2.5 and 4.5mm. Central perforation, drilled from one side, tapering between 2 and 3mm. Relatively rough surfaces (SM)
SF 2013-17	1 bead	BLAF 13, S10 Room 2		0.7		0.6	Possibly worked iron ore (Chloë Duckworth, University of Leicester, pers. comm.)
SF 2013-18	1 blue glass bead + 9 minute blue fragments	BLAF 13, S10 Con. 4 (S10 Room 2 Pot Cluster 4)		1.8		0.3	Dichroic blue, drawn glass bead in long-cylindrical shape. Diameter 4mm, length along perforation axis 19mm (damaged at one end). Translucent blue glass at reflected light turns to yellow-greenish glass under transmitted light. Longitudinal striations due to forming technique. Central perforation, ca. 1mm wide. Very similar to SF 2012-34 (SM). Currently undergoing analysis with SM.
SF 2013-19	clay bead, fragmented	BLAF 13, S11 Con. 1		2.1 & 1.4-0.8	1.9 &: 0.7-0.7	1.2 & 0.4-0.5	Roughly spheroid. In three pieces.
SF 2013-20	1 bead	BLAF 13, S11 Con. 3	Level 3	1.0		1.2	Dark grey baked clay bead in spherical/biconical shape. Diameter between 12 and 15mm, length along perforation axis 11mm. Central perforation, ca. 1.5mm wide. Relatively fine-grained texture, smooth surface. Very similar to SF 2013-21 (SM)

SF 2013-21	1 dark bead	BLAF 13, S11 Con. 4		1.9	1.5	Dark grey-brown baked clay bead in spherical/biconical shape. Diameter between 15 and 17mm, length along perforation axis 15 to 16mm. Central oblate perforation, ca. 2 × 4 mm wide. Relatively fine-grained texture but crudely made (SM)
SF 2013-22	1 clay bead	BLAF 13, S11 Con. 5			3.7	Conical flattening on either side, likely a bead rather than a spindle whorl
SF 2013-23	1 bead	BLAF 13, S9 Con. 4	30–40		0.8	Type 4 bead. Pinkish chalcedony or rose quartz bead in short cylindrical/ discoid shape. Diameter 8.5mm, irregular length along perforation axis 4 to 5mm. Almost central perforation, drilled from one side, tapering between 2.5 and 3.8mm. Smooth but worn surfaces (SM)
SF 2013-24	1 bead	BLAF 13, S11 Con. 18			0.9	Stone bead
SF 2013-25	1 bead	BLAF 13, S11 Con. 18			0.9	White and reddish quartzite or granite bead in discoid shape. Irregular diameter between 7.5 and 8mm, slightly irregular length along perforation axis between 3 and 4mm. Slightly off-centre perforation, drilled from one side, tapering between 1.5 and 2.5mm. Crudely made or heavily worn. Very similar to item 29 from same context (SM)
SF 2013-26	12 beads	BLAF 13, S11 Con. 21	310		0.5-0.8	Set of 26 beads, consisting of ca. 23 shell beads (exact number difficult to assess because partly fixed together and/or due to their layered structure) and 3 stone beads (probably whitish bauxite). Shell beads: Mostly circular discoid, at least 4 are rather angular discoid. Diameters between 5 and 5.5mm, lengths along perforations axes between 1 and 1.5mm. Central perforations ca. 1 to 1.5mm wide. Stone beads: Short cylindrical/discoid shape. Diameters 6mm, lengths along perforation axes 3.5mm. Central perforations, drilled from both sides, ca. 2mm wide (2 beads) and 2.5mm wide (1 bead) on both openings (SM)

Small finds 2013 (*cont.*)

SF 2013-27	13 beads	BLAF 13, S11 Con. 23 Associated with skeleton – near head		0.3-1.0	15 beads, consisting of: 1 pale orangey-reddish bauxite(?) bead in barrel shape, 10 shell beads in circular discoid shape, 2 shell beads in irregular discoid shape (partly damaged), 2 fragments/ thin flakes chipped off of discoidal shell beads. The shells are most likely mollusc or gastropod shells, given their layered structure with visible prismatic layers. Chalcedony bead: diameter 5mm, length along perforation axis 6mm. Central perforation drilled from both sides with a conical borer, ca. 1.8mm wide at openings. Very smooth glossy surface, sharp edges. Shell beads: diameters 4mm (1 bead), 5.5mm (2 irregular beads), 7mm (1 bead), 8mm (5 beads and 1 flake), 9mm (3 beads), 11mm (1 fragment). Length along perforation axes between 1 and 1.5mm for all beads except one irregular (2mm). Perforations drilled, ca. 1.5mm wide (SM)
SF 2013-28	22 red beads Approx. 46 white beads (many fragments) red beads numbered 28-1 to 28-22 white beads numbered 28.1 to 28.46	BLAF 13, S11 Con. 23 Associated with skeleton – near head	0.1-0.6	0.4-0.7	48 beads, consisting of: 17 reddish-brown bauxite(?) beads in varying colour shades and cylindrical shapes, 31 shell beads and fragments of at least 9 further shell beads. (Shell beads: mollusc or gastropod shell, as mentioned above). Bauxite beads: mostly reddish-brown with orange or ochre-coloured patches, some with white patches. 5 are barrel shaped, 12 are short cylindrical/discoid. All diameters between 5 and 5.5mm. Lengths along perforation axes for barrel shaped beads 5.5mm, for cylindrical/ discoid beads 3 to 4mm. Apparently most or all drilled from both sides, all 2mm wide. 1 barrel shaped bead has a 3rd hole into its perimeter side, due to a misled drilling channel. All have very smooth glossy surfaces and sharp edges. Shell beads: all circular discoid except 1 damaged bead perhaps formerly angular discoid. 4 circular discoid beads have a diameter of 8mm, 3 damaged beads have diameters of 5mm, the rest of 29 beads or reconstructible bead fragments have all a diameter of 4mm (fragments of at least 4 further small beads not measured). Central perforations, drilled, 1.5 to 2mm wide for the 29 smaller beads, ca. 1mm wide for the larger beads (SM)

					28-1: Possibly worked metal ore – iron ore/bauxite? (Chloë Duckworth, University of Leicester, pers. comm.) 28-2: Possibly worked iron ore (hematite?) (Chloë Duckworth, University of Leicester, pers. comm.) 28-3: Possibly worked iron ore. Heterogeneity of composition visible in different coloured banding. (Chloë Duckworth, University of Leicester, pers. comm.) 28-4: Possibly worked iron ore. Note heterogeneity: SiO2-rich and FeO-rich areas. Ore + gangue? (Chloë Duckworth, University of Leicester, pers. comm.) 28-5: Possibly worked ore. As above, visibly (and compositionally) heterogeneous – deliberate selection likely. (Chloë Duckworth, University of Leicester, pers. comm.).
SF 2013-29	3 red beads 5 white beads red beads numbered 29-1 to 29-3 white beads numbered 29.1 to 29.5	BLAF 13, S11 Con. 23 Associated with burial. Waist.	0.1-0.6	0.3-1.0	White and reddish quartzite or granite bead in discoid shape. Irregular diameter between 7 and 8mm, slightly irregular length along perforation axis between 3 and 3.5mm. Slightly off-centre perforation, drilled from one side, tapering between 2 and 2.5mm. Crudely made or heavily worn (SM) 5 shell (see above) beads in discoid shape (2 are circular, 3 have damaged edges and former shape is not clearly discernible). Diameter 4mm (1 bead), 5mm (1 damaged bead), 6mm (2 damaged beads), 11mm (1 bead). Length along perforations 1 to 1.5mm. Perforations drilled, all 1mm except smallest bead which has a perforation of 2mm (SM) 29-1: Possibly worked iron ore/bauxite? (Chloë Duckworth, University of Leicester, pers. comm.) 29-2: Possibly worked iron ore/bauxite? (Chloë Duckworth, University of Leicester, pers. comm.) 29-3: Possibly worked iron ore (hematite?)/bauxite (Chloë Duckworth, University of Leicester, pers. comm.)

Small finds 2013 (*cont.*)

SF 2013-30	1 white bead	BLAF 13, S8	surface			0.6	White quartz bead in short barrel/discoid shape. Diameter 8mm, length along perforation axis 4mm. Perforation slightly off-centre, drilled from one side, tapering between 1 and 2.5mm. Smooth surfaces (SM)
SF 2013-87	stone	BLAF 13, S9 Con. 1	250–260	1.7		0.7	Clear stone cylinder, one end flattened, the other broken. Facetted. Labret?
SF 2013-88	stone	GOB 13, SII Con. 3a	123–138	2.7		0.7	Clear stone cylinder, both ends rounded. Labret?
SF 2013-211	terracotta bead??	BLAF 13, S11 Con. 18		1.6	0.5	0.5	Dark grey-brown long biconical clay or baked clay object, unclear if natural (insect container?). Diameter 7mm, length along perforation axis 15mm. Central perforation, ca. 2.5mm (SM)
			Metal (M)				
SF 2013-37	1 iron object	BLAF 13, S8 Con. 1		9.9	1.2		Irregular and slightly decreasing quadrangular section rod, broken at one end and likely broken tip of the other (AF)
SF 2013-38	1 iron object	BLAF 13, S8 Con. 2		10.0	1.0		Quadrangular and tapered rod made irregular by oxidation (may be same as –37) (AF)
SF 2013-39	1 iron fragment	BLAF 13, S8 Con. 2	Level 1	2.6	0.9	0.5	Ring fragment or hook. Deformed by oxidation. The section appears oval; ends are unreadable (AF)
SF 2013-40	2 curious objects	BLAF 13, S9 Con. 1	100–110	4.8, 1.8		1.6, 1.7	Terracotta/metal coiled cylinder, unidentified
SF 2013-41a, b	2 metal items	BLAF 13, S9 Con. 4	20–30	5.3, 2.9	0.8, 0.8		2 rods: the longest is irregular quadrangular section, the thin spikes and wide in the centre; one of the leading door double bevel. Context. The other rod shows an old fracture trace on one side and a blunt tip on the other. Rectangular and tapered (AF)
SF 2013-42	1 iron object	BLAF 13, S9 Con. 4	45–60	3.1	3.0	0.6	Rectangular and tapered rod bent in a slightly oval semicircle; old fractures on both ends (AF)

SF 2013-43	1 metal object	BLAF 13, S9 Con. 5	45–60	3.0	4.0		Large diameter wire of circular cross section for the retained part, wound upon itself with a fresh surface on one side (AF)
SF 2013-44	2 metal fragments	BLAF 13, S9 Con. 1	180–190	3.1, 3.0	0.5, 1.0		2 fragments of a quadrangular and tapered rod; very corroded (AF)
SF 2013-45	1 iron item	BLAF 13, S10 Con. 10		5.0	5.3		Irregularly shaped curved plate in the middle and more raised edges on one side. Right angle and a straight edge (AF)
SF 2013-46	1 iron item	BLAF 13, S10 Con. 16		3.3	0.4		Small curved rod section quadrangular or oval and slightly decreasing from one end to another. Old ends breakage (AF)
SF 2013-47a		BLAF 13, S10 Con. 17		13.4	2.5		Iron blade
SF 2013-47b		BLAF 13, S10 Con. 17		4.5	2		Fragment of very curved blade with a convex cutting edge. The back appears to follow the morphology of the blade but it is a bit denatured by oxidation. Some breaks are fresh (AF)
SF 2013-48	2 metal fragments	BLAF 13, S10 Con. 23		5.0, 3.1	2.9, 0.5		2 metal fragments
SF 2013-49	1 metal object	BLAF 13, S10	Décapage	10.0			Long thin straight section (AF)
SF 2013-50	bracelet	BLAF-13, S10 Con. 7		5.0	5.6	0.4	Bracelet or anklet, open one side (AF)
SF 2013-51	1 iron object	BLAF 13, S10 Con. 10		3.6		0.5	Small section of stem quadrangular broken its two ends; either end is slightly bent and flattened (which could correspond to a cut area by hammering and stretching). It could be a sort of pallet or a drop forge (AF)
SF 2013-52	1 iron object	BLAF 13, S10 Con. 10		2.3		0.6	Small quadrangular section rod. One end terminates in a point other by a fresh fracture. It could be a nail shank or perhaps a small punch (AF)

Small finds 2013 (*cont.*)

SF 2013-53	1 iron item	BLAF 13, S10 Con. 24		3.9	0.4-1.2	0.3	Quadrangular section shaft ended with a flattened end and irregular with traces of fresh fractures. No break at the other end: a grip could be a silk for an object being worked (AF)
SF 2013-54	1 iron item	BLAF 13, S10 Con. 29		3.1	0.7	0.4	Quadrangular shaft section broken at both ends (AF)
SF 2013-55	1 metal object	BLAF 13, S11 Con. 1	Level 3	3.7	3.0	0.6	Ring sectioned with recent breaks in near-circular section (AF)
SF 2013-56	2 metal pieces	BLAF 13 S11, Con. 8		9.5, 7.0		1.1, 1	Long rod in 3 pieces (recent breaks). Highly oxidised; illegible section (AF)
SF 2013-59	iron pieces	BLAF 13 S9, Con. 8–10		3.5, 1.6	1.4, 0.8	1.0, 1.1	Tapered rod; unreadable, fresh and old fractures; oxidation (AF)
SF 2013-62	2 metal items	BLAF 13, S9, Con. 11	220–230	2.5, 1.3	1.9, 1.2	0.5, 0.4	2 fragments of dagger blades or double-edged sword (fresh surface showing the oval section). Worn tip. Old breaks in the wide part (AF)
SF 2013-63	2 metal items	BLAF 13 S9, Con. 8–10	250–260	3.4, 2.2	0.9, 1.0	1.1, 1.0	2 fragments of a tapered pin; very corroded with fresh fractures on both ends (AF)
SF 2013-64	1 metal item	BLAF 13 S9, Con. 8–10	260–270	2.2	1.1	1.1	Stem fragment slightly curved quadrangular section with rounded corners (AF)
SF 2013-65	1 metal item	BLAF 13 S9, Con. 8–10	260–270	2.1, 0.7	1.1, 0.6	0.9, 0.5	Unformed fragment (AF)
SF 2013-66	1 metal item	BLAF 13 S9, Con. 13	260–270	4.0	1.2	0.5	Trapezoidal plate moiety, long, with fresh and old fracture of constant thickness (AF)
SF 2013-67	1 metal item	BLAF 13 S11 Con. 9		3.1	0.6	0.6	Rod terminating in a tip; old break. Too oxidised to read the section (AF)

SF 2013-68	1 iron item	BLAF 13 S11, Con. 18	310	4.0	0.8	0.8	Rod fragment; recent break. Slightly curved. Too oxidised to read the section (AF)
SF 2013-69	1 metal item	BLAF 13 S11, Con. 18	310	5.2	0.5	0.7	Rod tip with a side and a fresh surface of the other. Illegible section due to oxidation (AF)
SF 2013-70	2 metal items	BLAF 13 S11, Con. 21		4.2, 3.4	1.5, 0.6	0.5, 0.6	Two curved pieces
SF 2013-71	2 metal items	BLAF 13 S11, Con. 18		4, 3.5	1.6, 2		2 fragments of plaque that refit; many fresh and old cuts (AF)
SF 2013-73	1 iron item	TTK 13 SII, Con. 15		4.5	0.5		Slightly decreasing quadrangular shaft section lengthwise. At the smaller end, a bevel can be observed (possible brand cutting?). The other side is broken (AF)
SF 2013-74	1 iron blade	TTK 13 SII, Con. 28		19.3	2.7		Blade
SF 2013-75	1 iron item	TTK 13 SI, Con. 6 Level 11	110	6.2	3.4-2		Trapezoidal plate, the wider end of which ends in a rounded convex shape. The thickness is uniform. The wider edge seems thinner. Breaks on the less wide edge (AF)
SF 2013-76	1 iron item	TTK 13 SI, Con. 21 Level 12	2.2	0.7-0.3			Stem fragment; quadrangular section decreases and ends in a point. Old fracture on the other side (AF)
SF 2013-77	1 iron piece	TTK 13 SI, Con. 19 Level 25	8.4, 1.0	3.5, 0.5			Blade fragment: double-edged and heavily corroded, and with a gradually decreasing width. Broken at both ends (AF)

Small finds 2013 (*cont.*)

SF 2013-200	belt?	BLAF 13, S11 Con. 23 Associated with burial. "Below the pelvis was a rectangular metal object that was heavily corroded. It has the characteristic of a large belt buckle, although it may not be that. Approximately 30% of this artefact was taken for analysis as this portion protruded outside of the pelvis and was accessible without moving any of the bones. It was taken from the left side of the skeleton" (Lee, field report)	200-1: Fragment of circular section object (AF) 200-2: Fragment of circular section object (AF) 200-3: Refitting fragments of a circular section object. The object has a bend at the point at which there is a fresh break, and evidences waviness along its length. The position at which this object was recovered may indicate it was a belt. This is a thick wire suggesting a decorative, rather than functional, item. An X-ray would determine whether there is a single wire or if there are joins on the element (AF)
SF 2013-201		BLAF 13 S11, Con. 23 Associated with burial. See text related to SF 2013-200	201-1: Shapeless corroded mass, seemingly intact (AF) 201-2: Shapeless corroded mass, seemingly intact (AF) 201-3: Shapeless metal fragments; may belong to one same object (AF) 201-4: Small shapeless oxidation masses (AF) 201-5: Fragments of an object which a circular section which may possibly correspond in morphology and size to SF 200-3 (AF) 201-6: Object fragment with old break; appears to be a cylinder. Could match SF 2013-200-3 (AF)

SF 2013-202	earrings??	BLAF 13 S11, Con. 23 Associated with burial. "Two small metal objects were found near to the neck" (Lee, field report, 2013)					202-1: Disc-shaped plate, but oxidation does not allows us to say whether that was its original shape. It has an extension on one side (AF) 202-2: Earth fragment, possibly baked, with inclusions of small pisoliths (AF) 202-3: Baked earth fragment with unidentified inclusions (AF) 202-4: Flat fragment that appears to have been burned (AF)
SF 2013-203	metal point	BLAF 13, S9, Con 3					Rod with old fracture on one end and a point at the other. Quadrangular, tapered section (AF)
SF 2013-204	shovel/hoe?	BLAF 13, S11 Con. 6					Large metal implement
			Stone (S)				
SF 2013-79	1 polished axe	GOB 13, SII From the east section		3.7	3.4		Polished axe. Green stone, clear shaping and wear
			Modelled clay (C)				
SF 2013-89	2 items	BLAF 13, S8 Con. 2		2.6, 0.9	2, 0.5	0.8, 0.6	Broken, vaguely anthropomorphic
SF 2013-90	1 object	BLAF 13, S11 Con. 3	Level 3	3.3		1.4	Flat, tongue depressor shaped ceramic object
SF 2013-91	1 item	BLAF 13, S11 Con. 16	220–230	4.0		1.8	Ceramic knob with possible hole
SF 2013-92	1 item	BLAF 13, S11 Con. 16		2.6		1.4	Ceramic knob
SF 2013-93	1 item	TTK 13 SI	surface	4.8		2.6	Ceramic knob with possible hole
SF 2013-95	1 item	BLAF surface, close to S4					Rear end of quadruped?

Small finds 2013 (*cont.*)

SF 2013-96	1 pipe fragment	VNK-11-21 – a surface survey, 750m north of Sakawan		5.6	3.0	2.2	Pipe fragment
SF 2013-99	fragment	BLAF 13, S11 Con. 5		6.0	4.5		Curved, resembles a spoon
SF 2013-102	fragment	BLAF 13, S10 Con. 19		1.4	0.9		Crescent-shaped
SF 2013-103	fragment	BLAF 13, S11 Con. 4		3.9	1.7	1.0	Crescent-shaped
SF 2013-105	fragment	GOB 13, SII Con. 6	183–198				Terracotta pottery 'foot', pointed
SF 2013-106		GOB 13, SII Con. 2	48–63				Squarish clay impressed on several sides
SF 2013-107		KOD 13, SI Con. 6					Shaped sherd
SF 2013-108		KOD 13, SI Con. 2					Shaped sherd
SF 2013-109		KOD 13 SI, Con. 4					Shaped sherd
SF 2013-110	fragment	BLAF 13, S11 Con. 5					Small cigar shaped terracotta foot
SF 2013-111	fragment	BLAF 13, S11 Con. 15	Level 1				Fragment of a large clay bead?
SF 2013-112		BLAF 13, S11 Con. 16					Terracotta triangle
SF 2013-114		TTK 13, SI Con. 19	Level 13				Shaped sherd
SF 2013-115		BLAF 13, S11 Con. 5		4.5	1.8		Elongated ceramic fragment
SF 2013-203	figurine	BLAF 13 S9 Con.11 INF					Anthropomorphic

SF 2013-204	figurine?	BLAF 13, S11 Con. 13					Animal figurine? 6 (broken) protrusions
SF 2013-205	figurine?	BLAF 13, S11 Con. 4					One end spatula like, one with horns
SF 2013-206	fragment	BLAF 13, S9 Con.11	270–280				Curved terracotta piece, handle?
SF 2013-207	figurine?	BLAF 13, S11 Con. 9					One end a flattened dip, the other with point(s)
SF 2013-209	terracotta?	BLAF 13, S11 Con. 4		1.0	1.5	1.5	Shapeless
SF 2013-210		BLAF 13, S11 Con. 18		3.9	3.0	0.9	Shaped sherd. Abraded rim sherd
SF 2013-212	terracotta cup	BLAF 13, S 11 Con. 4					Cup-shaped terracotta object
			Other (O)				
SF 2013-01	worked bone	BLAF 13, S11 Con. 3	Level 1	2.0	0.6	0.6	
SF 2013-02	worked bone	BLAF 13, S9 Con. 11	170-180	2.6	1.0	0.2	
SF 2013-03	worked bone	BLAF 13, S11 Con. 18		5.2	2.5	0.9	
SF 2013-04	cowrie shell	TTK 13, SII Con. 4					
SF 2013-05	ivory	GOB 13, SII Con. 3a	78–93				Elephant (*Loxodonta africana*) bracelet
SF 2013-06	ivory?	BLAF 13, S11 Con. 1					

Beads (B)							
SF 2014-04	bead, red stone, rounded	BLAF S13, Con. 9	90–100	1.1	0.8		Carnelian (Chloë Duckworth, University of Leicester, pers. comm)
SF 2014-05	bead, white shell, flat	BLAF S13, Con. 8	73	0.9			
SF 2014-06	bead, grey stone, rectangular	BLAF S13, Con. 19	350–370	2.0	0.9	0.7	Stone bead, no type assigned. Whitish chalcedony (jasper?) bead with a very light greenish hue, in long-cylindrical/flattened oblong shape. Diameter between 7.5 and 10mm, length along perforation axis 15mm. Damaged at one end. Central perforation drilled (?) from one side, tapering between 1.5 and 2.5mm. Smooth surfaces but heavily worn and perhaps also imperfectly finished (SM)
SF 2014-07	bead, red stone	BLAF S13, Con. 13	150–160	3.1	3.1	1.1	Red jasper bead in circular discoid shape with tapering edges. Diameter ca. 31 to 32mm, irregular length along perforation axis between 4 and 8mm. Central perforation, drilled from one side, tapering between 3 and 4mm. Depression around narrower perforation due to flakes chipping off when borer reached this end. Surface partly well-polished, partly relatively crude (imperfect finishing), possibly also heavily worn. Same raw material and type as SF 2014-10, 2014-11, and 2014-16 (SM)
SF 2014-08	bead, white stone, cylindrical	BLAF S13, Con. 18	270–280	0.9	0.8	0.6	Milky-white quartz bead in cylindrical shape. Diameter 6.5mm, length along perforation axis 6.5mm. Central perforation drilled from one side, tapering between 1.5 and 3mm. Smooth surfaces, traces of longitudinal facets still visible on perimeter (SM)

SF 2014-09	bead, red stone	BLAF S13, Con. 17	230–240	2.2	2.2	0.9	Red stone bead, indet. material (similar to SF 2013-9) in circular discoid shape with tapering edges. Irregular diameter between 22 and 24mm, length along perforation axis 8 to 9mm. Perforation off-centre, drilled from one side, tapering between 2 and 4.5mm (SM)
SF 2014-10	bead, red stone	BLAF S13, Con. 18	280–290	2.6	2.5	0.9	Red jasper bead, circular discoid shape with tapering edges. Diameter ca. 25mm, length along perforation axis 8–9mm. Central perforation, drilled from one side, tapering between 2.5 and 4mm. Deep and large depression around narrower perforation due to a large flake chipping off when borer reached this end. Surface partly smoothed but otherwise left crude (imperfect finishing), possibly also heavily worn. Same raw material and type as SF 2014-16 (SM)
SF 2014-11	bead, red stone	BLAF S13, Con. 7	70–80	2.1	1.9	0.8	Red jasper bead in circular discoid shape with tapering edges. Diameter 19 to 20mm, length along perforation axis 7 to 8mm. Central perforation, drilled from one side, tapering between 2.5 and 4mm. Oblong depression around narrower perforation due to a flake chipping off when borer reached this end. Surface relatively crude (imperfect finishing), possibly also heavily worn. Same raw material and type as SF 2014-10 and 2014-16 (SM)
SF 2014-12	bead, red exterior, black interior	BLAF S13, Con. 1, NE corner	40–50	0.9	0.3		Mineral (ore), or more likely reworked slag (K and Ca = glassy) (Chloë Duckworth, University of Leicester, pers. comm).
SF 2014-14	bead, rounded, white	BLAF. Child burial under compound		0.5	0.4		Whitish, heavily weathered glass in formerly short cylindrical shape, now broken. Diameter 4.5mm, length along perforation axis 4mm. Central perforation, ca. 1.5mm wide (SM)

Small finds 2014 (*cont.*)

SF 2014-16	red bead	BLAF 14. Surface find, near S3/10		0.8		2.0	Red jasper (?) bead in circular discoid shape with tapering edges. Diameter 21mm, length along perforation axis 7 to 8mm. Almost central perforation, drilled from one side, tapering between 3 and 4.5mm. Depression around narrower perforation due to an oblong flake chipping off when borer reached this end. Surface partly smoothed but otherwise left crude (imperfect finishing), possibly also heavily worn (SM)
SF 2014-17	bead	BLAF Surface find, Near S5. GPS A037		4.5		0.8	Whitish-yellowish siliceous stone bead in discoid shape. Diameter 8mm, irregular length along perforation axis between 3.5 and 4.5mm. Central perforation drilled from one side, tapering between 2.5 and 3mm. Smooth surfaces. Very similar to SF 2013-2 (SM)
SF 2014-18	ring	BLAF Surface find, Near S5. GPS A037	0.7	0.7	0.2		Ring -?copper
SF 2014-19	bead	BLAF Surface find, Near S5. GPS A037		4.5		0.95	Red chalcedony (carnelian?) or other siliceous stone bead in discoid shape. Diameter 9.5mm, length along perforation axis 4 to 4.5mm. Central perforation, drilled from one side, possibly pecked from other side to reach hole, between 3 to 4mm. Partly smooth surface but heavily worn and possibly also imperfectly ground (SM)
SF 2014-20a	ceramic pendant?	BLAF S13, Con. 19	300–310				Ceramic disc, multiple holes
SF 2014-21a	clay bead	KOZ-14 SII	0–20	2.6	1.5	1.0	Fragment of a baked clay spindle whorl in spherical (?) shape. Diameter ca. 26mm, preserved length along perforation axis 17mm. Perforation channel is straight and ca. 3.5mm wide. Fine-grained texture, smooth surface, decorated by longitudinal, slightly curved lines (SM)

SF 2014-22a	clay bead	KLI-14 SI	not recorded	2.6	2.6	2.4	Possible spindle whorl. Pear shaped
SF 2014-23	bead, brown, cylindrical	KLI-14-SI	60–70	2.1	1.0	1.0	Dark brown bead (polished ceramic/soft stone/fossil bone?) in long-barrel shape. Diameter 9.5mm, length along perforation axis 22mm. Central perforation, invisible if and how drilled, 2.2mm on both sides. Relatively smooth and polished surface, a bit worn (SM)
SF 2014-24	bead, conical	KLI-14 SI	30–40	2.5	1.3	1.1	Dark brown bead (polished ceramic or a soft stone? Or fossil bone?) in long conical shape. Diameter 10 to 14mm, length along perforation axis 25.5mm. Central perforation, invisible if and how drilled, 3 to 3.5mm. Relatively smooth and polished surface, a bit worn (SM)
SF 2014-25	bead	KRO SII	100–110	1.1	1.1	1.0	No pierced holes visible, uncertain if ceramic or stone. Similar to SF 2012-24
SF 2014-26	bone, possibly a bead	KRO SI	80–90	3.5	0.6	0.4	
SF 2014-27	bead, rounded, white crumbly material	KRO SI	50–60	0.7	0.7	0.5	Glass (?) beads, no type assigned. Dark, opaque glass (?) with opaque white stripes in spherical shape. Diameter ca. 9.5mm, length along perforation axis 8mm. Central perforation, ca. 3mm wide (SM)
SF 2014-28	bead, red glass or stone	KRO SII	±165	0.9	0.3	0.2	Carnelian (Chloë Duckworth, University of Leicester, pers. comm)
SF 2014-29	sequin/bead, orange, round, flat	GOG-14 SI	30–40	1.1			Flat circular disc bead, plastic (SM)
SF 2014-30	sequin/bead, orange, round, flat	GOG-14 SI	30–40	1.2			Flat circular disc bead, plastic (SM)

Small finds 2014 (*cont.*)

SF 2014-31a	sequin/bead, orange, round, flat	GOG-14 SI	50–60	1.1			Flat circular disc bead, plastic (SM)
SF 2014-31b	1 red bead	BLAF 13, S13	Soil position 54	2.3	2.3	0.5	Dark reddish-brown stone bead with white quartz veins and other inclusions (indet. siliceous stone, possibly chalcedony), in circular discoid shape with tapering edges. Diameter 22mm, irregular length along perforation axis 6 to 9mm. Almost central perforation, drilled from one side, tapering between 2.5 and 4mm. Deep depression around narrower perforation due to a flake chipping off when borer reached this end. Crude surfaces. Identical material and type to SF 2012-6 (SM)
SF 2014-32	sequin/bead, pink, round, flat	GOG-14 SI	30–40	1.2			Flat circular disc bead, plastic (SM)
SF 2014-33	sequin/bead, black, round, flat	GOG-14 SI	40–50	1.2			Flat circular disc bead, plastic (SM)
SF 2014-34	sequin/bead, black, round, flat	GOG-14 SI	100–110	1.2			Flat circular disc bead, plastic (SM)
SF 2014-35	sequin/bead, black, round, flat	GOG-14 SI	40–50	1.2			Flat circular disc bead, plastic (SM)
SF 2014-36	sequin/bead, black, round, flat	GOG-14 SI	40–50	1.1			Flat circular disc bead, plastic (SM)
SF 2014-37	sequin/bead, black, round, flat	GOG-14 SI	40–50	0.9			Flat circular disc bead, plastic (SM)
SF 2014-38	sequin/bead, red, round, flat	GOG-14 SI	30–40	1.2			Flat circular disc bead, plastic (SM)

SF 2014-39	sequin/bead, red, round, flat	GOG-14 SI	50–60	1.1			Flat circular disc bead, plastic (SM)
SF 2014-40	sequin/bead, black, round, flat	GOG-14 SI	60–70	1.2			Flat circular disc bead, plastic (SM)
SF 2014-41	beads, multiple, plastic, green (49), light blue (3) dark blue round (6), white round (2), pink (2)	GOG-14 SI	0–20				Type 1 modern, 3 Glossy opaque sky blue glass bead in short barrel shape. Diameter 4mm, length along perforation axis 3mm (2 beads) and 5mm (1 bead). Central perforation, ca. 1.5mm wide (SM) 6 translucent dark blue glass beads in short barrel shape, still on a fiber string (incl. one glossy opaque sky blue bead, mentioned above). Diameters ca. 3.5 to 4mm, length along perforation axis ca. 3mm. Central perforation, not measured (SM) 45 green long-barrel beads, plastic (SM) 2 pink long-barrel beads, plastic (SM) 3 green cylindrical beads, plastic (SM) 2 white spherical beads, plastic (SM)
SF 2014-42	sequin/bead, black, round, flat	GAR-14 SI	0–20	1.4			Flat circular disc bead, plastic (SM)
SF 2014-45	bead	GUE-14 SI	0–20	2.1	1.1	0.8	Fragmented, vitrified, red geometric pattern black outlines and yellow dot in centre of each shape.
SF 2014-47	bead (possible)	ROU-14 SI	50–60	0.9	0.7	0.5	Ends are pressed together to form a circle, green patina
SF 2014-48	sequin/bead, black, round, flat	GOB-14 SI	30–40	1.4			Flat circular disc bead, plastic (SM)
SF 2014-49	bead, green plastic	TOU-14 SI	0–20	0.9	0.4	0.4	Green long-barrel bead, plastic (SM)

Small finds 2014 (*cont.*)

SF 2014-50	sequin/bead, yellow, round, flat	GOB-14 SI	0–20	0.8			Flat circular disc bead, plastic (SM)
SF 2014-51	bead, red plastic	GOB-14 SI	30–40	0.6	0.7	0.7	Type 2 glass bead. Opaque red glass bead in short barrel shape. Diameter 7mm, length along perforation axis 6mm. Central perforation, 2.5mm wide (SM)
SF 2014-52	sequin/bead, red, round, flat	GOB-14 SI	0–20	0.8			Flat circular disc bead, plastic (SM)
SF 2014-53	bead, yellow plastic	GOB-14 SI	0–20	0.2	0.1	0.2	Glass beads, Type 3 ("seed beads"). Glossy opaque yellow glass bead, short barrel shape. Diameter 2mm, length along perforation axis 2mm. Central perforation, ca. 1.5mm wide (SM)
SF 2014-54	bead, blue	GOB-14 SI	40–50	0.8	0.5	0.5	Blue long-barrel bead, plastic (SM)
SF 2014-55	bead, blue plastic	GOB-14 SI	30–40	0.7	0.7	0.5	Type 2 glass bead Semi-translucent blue drawn glass bead in short cylindrical shape. Diameter 7mm, length along perforation axis 5mm. Central perforation, 2.5mm wide (SM)
SF 2014-56	rounded metal piece, green patina	TOU-14 SI	0–20	1.7			Corroded coin, 5 Centimes, France, issue date 1925?, made of copper-nickel. Diameter 17mm, thickness 1.2mm, central perforation of 3.5mm (SM)
SF 2014-57	bead, green	TOW-14 SI Con. 2	50–60	0.8	0.8	1.1	Type 2 glass bead. Opaque to semi-translucent pale green glass bead, short cylinder in shape. Diameter 8.5mm, length along perforation axis 6mm. Central perforation, ca. 2.5 to 3mm (SM)

SF 2014-58	bead, black	TOU-14 SI	40–50	0.5	0.5	0.4	Type 2 glass bead. Glossy opaque black (drawn?) glass bead, short cylindrical shape. Diameter 5.5mm, length along perforation axis 4mm. Central perforation, ca. 2 to 2.5mm (SM)
SF 2014-59	bead, clay	TOW-14 SI	80–90	2.3	2.3	1.9	Bead or spindle whorl? Most likely bead given conical flattening on both sides
SF 2014-60	bead	TOW-14 SI	40–50	0.7	0.7	0.5	Type 2 glass. Opaque red glass bead, cylindrical. Diameter 7mm, length along perforation axis 5.5mm. Central perforation, ca. 2.5 to 3mm. Same type as SF 2014-58, -61 (SM)
SF 2014-61	bead, black	TOW-14 SI	30–40	0.7	0.7	0.6	Type 2 glass bead. Glossy opaque black (drawn?) glass bead in cylindrical shape. Diameter 7mm, length along perforation axis 6.5mm. Central perforation, ca. 2 to 3mm. Same type and material as SF 2014-58 (SM)
SF 2014-62	bead, blue	TOU-14 SI	40–50	0.7	0.7	0.4	Type 2 glass bead. Dark cobalt blue glass bead in short cylindrical shape. Diameter 7mm, length along perforation axis 4mm. Central perforation, ca. 2.5mm (SM)
SF 2014-63	bead, light green plastic	MOL-14 SI	0–20	0.7	0.4	0.4	
SF 2014-64	bead, cream colour	MOL-14 SI	80–90	0.7	0.4	0.4	Shell bead, White glossy shell (mollusc?) bead in perfect disc shape. Diameter 10mm, length along perforation axis 0.9mm. Central perforation, likely drilled, 2.5mm wide. Smooth surface, sharp edges (SM).

Small finds 2014 (*cont.*)

SF 2014-65	bead, vitrified, red, white, fragmented	MOL-14 SI	70–80	0.9	0.7	0.7	A fragmented bead with a white opaque core (porcelain?) and pink (glass?) coating, in cylindrical shape. The pink surface is heavily impacted (weathering or other physical impact). Green glass bead in short barrel shape. Diameter 4.5mm, length along perforation axis 2.5mm. Central perforation, ca. 1mm wide. "Seed bead" (SM)
SF 2014-66	sequin/bead, black, round, flat	MOL-14 SI	70–80	0.9			Flat circular disc bead, plastic (SM)
SF 2014-67	bead, light green plastic	MOL-14 SI	0–20	0.8	0.4	0.4	One of 7 green long-barrel beads, plastic (SM)
SF 2014-68	bead, light green plastic	MOL-14 SI	0–20	0.9	0.5	0.4	One of 7 green long-barrel beads, plastic (SM)
SF 2014-69	bead, light green plastic	MOL-14 SI	0–20	0.8	0.4	0.4	One of 7 green long-barrel beads, plastic (SM)
SF 2014-70	bead, light green plastic	MOL-14 SI	0–20	0.9	0.5	0.5	One of 7 green long-barrel beads, plastic (SM)
SF 2014-71	bead, light green	MOL-14 SI	0–20	0.4	0.4	0.2	Type 1 modern glass. Glossy opaque green glass bead in short barrel shape. Diameter 4.5mm, length along perforation axis 2.5mm. Central perforation, ca. 1mm wide (SM)
SF 2014-72	bead, red plastic	MOL-14 SI	0–20	0.7	0.4	0.4	Pink long-barrel bead, plastic (SM)
SF 2014-73	bead, light green plastic	MOL-14 SI	0–20	0.8	0.4	0.4	One of 7 green long-barrel beads, plastic (SM)
SF 2014-74	bead, light green plastic	MOL-14 SI	0–20	0.8	0.4	0.4	One of 7 green long-barrel beads, plastic (SM)
SF 2014-75	bead, light green plastic	MOL-14 SI	0–20	0.7	0.4	0.5	One of 7 green long-barrel beads, plastic (SM)

SF 2014-76	bead, light pink	PTI-14 SI	20–30	0.6	0.6	0.4	Glass bead Type 2. Opaque pale pink drawn glass bead in short cylindrical shape. Diameter 6mm, length along perforation axis 4mm. Central perforation, 2.5mm wide (SM)
SF 2014-77	bead, cream and silver paint	KAZ-14 SI	30–40	0.8	0.7	0.7	Glass bead, Type 1. Translucent blue bead with heavy white-yellowish surface patina, (drawn?) in barrel shape. Diameter 7mm, length along perforation axis 8mm. Central perforation, 1.5mm wide (SM)
SF 2014-78	bead, clay	TTO-14 SI	0–20	2.6	2.5	2.5	Possible weight or spindle whorl. Pear-shaped
				Metal (M)			
SF 2014-01	metal disk, possibly jewellery	GOG-14-SI	30–40	1.1	1.1	0.2	Metal disc bearing a decoration of two concentric circles with a central point on one side (the middle circle is a little off). The other side is flat with a small central "button" onto which is fastened a very thin rod of the same metal (AF)
SF 2014-02	metal clasp, part of a button	GOG-14-SI	40–50	0.9	0.9	0.3	Eyelet (AF)
SF 2014-03	metal disk, possibly coin or pendant	GOG-14-SI	0–20	2.3	2.3	0.1	Coin: a profile on one side and an unidentifiable decoration on the other. The disc is pierced at the edge, above the head. The perforation was then broken, as if torn from its support (AF)
SF 2014-04		GOG-14-SI	0–20	1.3	0.9	0.8	Very slightly truncated cylinder, possibly a weight? (AF)
SF 2014-05	iron fragment, twisted	GOG-14-SI	30–40	3.8	0.6	0.7	Tapering rod of circular section (AF)

Small finds 2014 (*cont.*)

SF 2014-06	metal fragments and 1 long, pointy metal object, possibly a nail	GOG-14-SI	60–70	Nail: 8.9	1.4	1.2	6-1: Rod of quadrangular section, pointed on one side; the presence of a matrix of oxidation renders the other part unreadable (AF) 6-2: Fragments of very oxidised plate
SF 2014-07	iron fragment, slightly curved	BLAF S13, Con. 5	60–70	2.1	0.5	0.5	Fragment of a slightly curved object, with old breaks; oval, so possible sharp edges (AF)
SF 2014-08	iron fragment	BLAF S13, Con. 5	60–70	2.3	0.4	0.5	Fragment of a rod of circular section, with old breaks at both ends; tapered (AF)
SF 2014-09	iron fragment, pin shaped	BLAF S13, Con. 3	50–60	4.3	0.4	0.5	Fragment of a rod with a decreasing quadrangular section. Twisting marks on the non-pointed part and over the length of the rod. Old breaks (AF)
SF 2014-10	iron fragment, pin or nail shape	BLAF S13, Con. 9	80–90	5.2	0.4	0.4	Shaft with an irregular quadrangular section/rod with a flattening then a tip on one side and a cutting mark at the other end (AF)
SF 2014-11	iron fragment, pin shaped	BLAF S13, Con. 9	80–90	5.2	0.4	0.3	Quadrangular-sectioned rod, widening at one end to give a flattened extremity. Old fractures (AF)
SF 2014-12	iron shovel shaped fragment	BLAF S13, Con. 9	80–90	2.8	1.5	0.4	A sort of sharpened plate, cutting on one side, the largest, and then narrowing so as to form a quadrangular section rod which could correspond to a fitting (AF)
SF 2014-13	iron fragment, feather-shaped	BLAF S13, Con. 9	80–90	4.1	0.9	0.5	Quadrangular section rod extended by a triangular plate. Arrowhead? Old fractures (AF)

SF 2014-14	iron fragment, concave, possible spoon	BLAF S13, Con. 12	120–130	5.0	2.3	0.5	Elongated plate, convex on a portion that draws an arc on one side and a straight line from the other. The thickness is constant over the bent portion and the portion of the circular arc could be sharp. The right portion is thicker and narrower (AF)
SF 2014-15	iron fragment	BLAF S13, Con. 12	120–130	3.7	0.9	0.5	Fragment of an item with old and new breaks. It has a flat and elongated portion terminated on one side by the start of a rod and on the other by a break (AF)
SF 2014-16	iron arrow point and shaft	BLAF S13, Con. 12	110–120	8.2	1.6	0.8	Arrowhead lacking the tip of the head; the square sectioned rod is slightly bent at its end. The fins are not very marked and the head is small relative to the rod (worn). Superficial oxidation (AF)
SF 2014-17	iron fragment, pin shaped	BLAF S13, Con. 12	110–120	3.6	0.6	0.5	Rod fragment terminating in a tip. Corroded, so illegible section. Ancient break (AF)
SF 2014-18	iron fragment, curved	BLAF S13, Con. 8	78	2.6	1.2	0.5	Quadrangular sectioned rod fragment, folded to form a ring or a hook. Old fractures. Possible traces of a torsade decoration (AF)
SF 2014-19	iron object, possible nail	BLAF S13, Con. 13	140–150	4.6	0.6	0.6	Square section stem fragment carrying old breaks and incomplete tip (AF)
SF 2014-20	iron fragment, pin/nail shaped	BLAF S13, Con. 13	140–150	6.8	0.4	0.6	Very corroded rod, quadrangular in section (AF)
SF 2014-21	iron fragment, possible nail	BLAF S13, Con. 9	90–100	5.0	0.7	0.8	Rod terminating in a curved tip. Section illegible due to oxidation (AF)
SF 2014-22	iron fragment, flat	BLAF S13, Con. 12	100–110	3.3	2.0	0.5	Plate of uniform thickness, refined almost sharp on some sides. An old fracture (AF)

Small finds 2014 (*cont.*)

SF 2014-23	iron fragment, L-shaped	BLAF S13, Con. 12	100–110	4.7	1.2	0.5	Rod of circular section with possible twists. Both ends are pointed and bent to 90° (AF)
SF 2014-24	iron fragment, pin or nail shaped	BLAF S13, Con. 12	100–110	4.5	0.4	0.4	Shaft, quadrangular in section, twisted slightly and thinner in its central part. Possible old break on one side and blunt end of the other (AF)
SF 2014-25	iron fragment, partial ring	BLAF S13, Con. 12	100–110	2.9	0.5	0.7	Ring fragment with two fresh breaks (AF)
SF 2014-26	iron fragment, possible nail	BLAF S13, Con. 15	160–170	3.7	0.4	0.4	Rod deformed by oxidation, probably quadrangular in section (AF)
SF 2014-27	iron fragment, cylindrical	BLAF S13, Con. 15	180–190	4.3	0.8	0.7	Rod of indeterminate and irregular cross-section, with a bevelled end. Oxidation has shattered a part of the rod (AF)
SF 2014-28	iron fragment	BLAF S13, Con. 15	190–200	5.6	0.7	0.7	Rod of apparently quadrangular section, but very poorly preserved; a bevel at one end. Recent breaks are visible (AF)
SF 2014-29	iron fragment, curves	BLAF S13, Con. 15	190–200	2.6	0.4	0.5	Rod fragment of slightly quadrangular section, curved, with old breaks at both ends. Possible area where the head of a nail was hung (AF)
SF 2014-30	iron fragment	BLAF S13, Con. 15	200–210	4.7	1.6	0.7	Quadrangular section rod extended by an elongated plate and pointed like an olive leaf. Very oxidised. Possible weapon (spear, arrow,…) (AF)
SF 2014-31	iron fragment, pin or nail shaped	BLAF S13, Con. 15	210–220	9.3	0.7	0.6	Quadrangular section shaft terminated by two points Possible tool. Very oxidised (AF)

SF 2014-32	iron fragment, flat	BLAF S13, Con. 15	220–230	3.0	2.5	0.4	2 fragments of an irregular sheet but of constant thickness (AF)
SF 2014-33	iron clump	BLAF S13, Con. 15	220–230	3.0	1.3	0.8	Shapeless fragment; fresh break which shows an oval section but strong oxidation. Maybe a knife point? (AF)
SF 2014-34	iron fragment, elongated	BLAF S13, Con. 16	220–230	4.2	1.0	0.8	Quadrangular section rod piece, fragmented by oxidation. Fresh fractures at both ends (AF)
SF 2014-35	iron fragment	BLAF S13, Con. 16	220–230	3.0	0.9	0.9	Fragment with new and old breaks (AF)
SF 2014-36	iron fragment, curved	BLAF S13, Con. 16	220–230	3.4	0.9	0.9	Section of rod fragment, probably quadrangular but very oxidised (AF)
SF 2014-37	iron fragment	BLAF S13, Con. 17	230–240	2.6	0.9	0.6	Rod fragment broken by oxidation (AF)
SF 2014-38	iron fragment, curved	BLAF S13, Con. 17	230–240	4.6	1.0	0.8	Flat annular fragment, very regular rectangular section. Old break on one side and a recent break on the other (AF)
SF 2014-39	iron fragment	BLAF S13, Con. 18	280–290	4.7	1.6	1.7	Fragment of a massive object, with tapered section, seemingly quadrangular. It would end with a point. Oxidation is important and presents recent breaks. Possible tool or construction component?
SF 2014-40	iron fragment	BLAF S13, Con. 18	270–280	6.1	1.2	1.0	Fragmentary object consumed by oxidation (AF)
SF 2014-41	iron fragment	BLAF S13, Con. 18	270–280	2.1	1.2	1.0	Shapeless fragment
SF 2014-42	iron fragment, clumpy, narrows to a point	BLAF S13, Con. 19	290–300	5.6	1.1	1.2	Rod fragment; possible silk (tool or handle): one side ends in a tip and the other with breakage, by a larger rectangular cross section.
SF 2014-76		BOY-14-SI	72 cm BD	9.5	9.3	1.2	Metal bracelet, armlet possibly, nearly complete (AF)

Small finds 2014 (*cont.*)

SF 2014-77		BOY-14-SII	0–20	5.7	1.6	0.6	Elongated and narrow plate of variable width. Break caused by oxidation. Width appears increasing. Despite the poor condition of the best-preserved part, one guesses that the section is triangular. A rivet is present on the narrow portion (= tongue) (AF)
SF 2014-78	metal clump	KAR-14-SI	0–20	2.0	0.7	0.5	
SF 2014-79	metal ring, half circle, green patina (possibly copper)	KAR-14-SI	20–30	2.6	1.4	0.3	Copper alloy half ring, quadrangular section. A break occurs at a place where the section is reduced. Other part broken but this area is affacted by oxidation. Chain ring; earring ?? (AF)
SF 2014-80	metal fragment	GOB-14-SI	50–60	1.7	0.5	0.4	Rod fragment. Too oxidised to determine the shape of the section; old breaks (AF)
SF 2014-81	metal pointed fragment	GOB-14-SI	50–60	1.8	1.2	0.3	Metal sheet fragment with a fresh break that shows a regular section. Triangular sheet with a sharply pointed tip may be due to an old fracture; tool tip or knife? (AF)
SF 2014-82	metal necklace chain fragment	GOB-14-SI Con. 2	70–80	2.5	0.3	0.1	Small chain with 5 links of figure-8 shape (AF)
SF 2014-85	metal stake	GOB-14-SI	0–20	16.5	3.0	3.2	Carpentry nail with a cylindrical shaft and round head. The point is bent. Significant oxidation in the central part (AF)
SF 2014-86	metal fragment, flattened	GOB-14-SI	0–20	5.8	5.0	1.0	Magnetic plate. Could be reduced slag. Appearance is different from iron. Identification difficult due to significant superficial oxidation. Slightly raised runs visible on surface (AF)

SF 2014-87	metal dish, round, side walls	GOB-14-SI	0–20	3.3	3.1	0.9	Bottle cap, discoid with a small return on the circumference (AF)
SF 2014-88	metal ring, complete	KAZ-14-SII	surface	4.8	4.9	0.7	Ring made of a thread of near-circular cross-section (AF)
SF 2014-89	metal pin or nail	KAZ-14-SII	20–30	11.6	0.5	0.4	Quadrangular shaft section with two pointed ends: the thinner may have been the active part of the object and the other the fitting silk (AF)
SF 2014-90	metal fragment, folded, green patina	KGI-14-SI	40–50	3.3	1.2	0.5	Incomplete copper-alloy cylinder, crushed, made from a single sheet wound on itself. The sheet outside shows a bunching across its length produced by folding of the sheet. There are two notches at this level on each side of the cylinder. The greater is on the intact side of the cylinder which also shows a bunching corresponding to the work of a sheet of metal thicker than the rest of the cylinder. In the lower part of the cylinder, two elongated and nearly identical holes have been made, like notches for the passage of a bind. The object bears a chisel mark on one side (AF)
SF 2014-91	iron fragment,?fish hook tip	KGI-14-SI	40–50	1.7	1.1	0.4	Bent wire – sharp on one side, the other side broken (AF)
SF 2014-92	metal, ?fish hook + appendage	KGI-14-SI	40–50	4.4	1.2	1.1	Very thin rod, like a wire, broken on one side and with an unidentified appendage on the other, fragile and wrapped in earth (AF)
SF 2014-93	metal clump, frag. protrudes	KLI-14-SI	50–60	6.4	4.1	2.3	Triangular mass with a small tip (detached). A very solid piece (AF)
SF 2014-94	metal stake	KLI-14-SI	90–100	13.3	2.2	2.5	Large shaft ending at one end with a point and broken at the other. Very corroded, surface ready to split, so the dimensions of the section are estimates (AF)

Small finds 2014 (*cont.*)

SF 2014-95	metal, curved	KOZ-14-SI	50–60	3.9	1.0	0.7	Curved element of quadrangular and regular section. Illegible end by oxidation and the other seems intact (AF)
SF 2014-96	metal object, pin shaped	KOZ-14-SI	70–80	2.0	0.4	0.3	Fragment of a pointed rod with an irregularly tapering cross-section (AF)
SF 2014-97	metal hinge or pendant	KOZ-14-SII	40–50	3.5	1.1	0.5	
SF 2014-98	metal ring or bracelet, partial	KOZ-14-SII	50–60	8.2	6.1	1.8	Incomplete oval ring with square or oval section rod. A protrusion is observed on the small side which seems conserved integral with the ring, a broken rectangular plate (AF)
SF 2014-99	metal ring, half	KOZ-14-SII	60–70	2.0	1.0	0.4	Half ring of oval cross-section; a broken end and the other seems to end in a point (AF)
SF 2014-100	iron possible arrowhead	KRO-14-SII	0–20	6.9	1.7	0.8	Object comprising a long triangular part of a long rectangular-sectioned rod (AF)
SF 2014-101	metal, twisted, possible nail	KRO-14-SII	20–30	3.9	0.4	0.5	Quadrangular section rod with a twist, likely ending on one side with a point. Break on the other side (AF)
SF 2014-102	iron point with shaft	KRO-14-SII	40–50	10.8	1.5	0.7	Long object formed of a quadrangular cross-section rod (oxidation) and a shaped flat part of olive leaf relatively thin. The edges could be sharp and there is a slight bulge at the centre of this part (AF)
SF 2014-103	iron fragment, flat	KRO-14-SII	70–80	6.2	3.4	1.2	Elongated plate having two straight portions at a right angle. The rest of the piece is less readable (oxidation, wear?) (AF)

SF 2014-104	iron fragment, possible nail	KRO-14-SII	100–110	3.0	0.5	0.5	Rod with circular section, fresh break (AF)
SF 2014-105	metal fragment, flat	KRO-14-SII	110–120	6.8	4.2	0.8	Plate of uneven thickness due to superficial oxidation. Shapeless (AF)
SF 2014-106	iron fragment	KRO-14-SII	120–130	2.8	0.8	0.8	Irregular and unidentifiable shaft section, broken at both ends (AF)
SF 2014-107	iron fragment, elongated, possible nail	KRO-14-SII	130–140	5.8	0.9	0.8	Irregular and slightly tapering quadrangular-sectioned rod. Old cracks at both ends (AF)
SF 2014-108	metal fragment	KRO-14-SII	130–140	5.6	1.0	0.9	Straight rod of near-circular cross-section with fresh breaks at both ends (AF)
SF 2014-109	iron fragment	KRO-14-SII	130–140	4.1	1.0	0.8	Illegible tapered rod with a point on one side and a fresh break on the other (AF)
SF 2014-110	iron fragment	KRO-14-SII	130–140	3.8	0.6	0.6	Rod, broken at both ends, probably of circular section (AF)
SF 2014-111	iron nail	KRO-14-SII	130–140	4.5	0.4	0.	Rod of circular section with a point on one side and an old fracture on the other (AF)
SF 2014-112	iron point, flattened, possible spatula	KRO-14-SI	40–50	5.2	1.4	1.3	Very long, slightly oval. At one end is an extension, thin, bent back and terminating in a very thin rod of quadrangular section, twisted to be at 90° and parallel. The length of the section goes in the same direction as the length of the object. Slightly curved lengthways (AF)
SF 2014-113	metal fragment	KRO-14-SI	40–50	2.6	0.7	0.7	Section of a rod of indeterminate section, a break at one end and a point at the other (AF)

Small finds 2014 (*cont.*)

SF 2014-114	metal fragment, flat	KRO-14-SI	50–60	4.3	1.7	0.4	Elongated plate with two parallel and slightly curved edges, broken on both short sides. It seems that the thickness is different on one side and the other of the long edges (AF)
SF 2014-115	iron fragment	KRO-14-SI	50–60	1.9	0.6	0.5	Fragment of indeterminate shaft section but tapering and broken at both ends (AF)
SF 2014-116	iron fragment	KRO-14-SI	60–70	2.9	0.9	0.7	Fragment of indeterminate shaft section with a point on one side and an old fracture on the other. There is a bend just before the break (AF)
SF 2014-117	iron fragment, hook shape	KRO-14-SI	80–90	1.6	0.8	0.5	Quadrangular section rod fragment which has the shape of a hook (but broken at both ends) (AF)
SF 2014-118	iron flakes	KRO-14-SI	100–110	3.3	1.6	0.4	Fragments of unshaped sheet (AF)
SF 2014-119	iron fragment	KRO-14-SI	100–110	2.9	2.1	0.6	Large fragment. Unshaped sheet fragment (AF)
SF 2014-120	iron object, oblong	KRO-14-SI	110–120	12.0	0.9	1.0	Straight rod with no trace of breakages. Section illegible. One end carries a trace of having been worked: a flattening of the section, perhaps to make a cutting edge (AF)
SF 2014-121	iron fragment, point	KRO-14-SI	110–120	3.9	0.8	0.7	Quadrangular shaft section bearing a point on one side and a break on the other which could correspond to a junction with a head (nail) (AF)
SF 2014-122	iron fragment, pin/nail shaped	KRO-14-SI	110–120	4.4	0.7	0.	Quadrangular shaft section that appears broken at both ends. Illegible (AF)

SF 2014-123	iron fragment	KRO-14-SI	110–120	2.8	0.5	0.5	Very fine rod of indeterminate but increasing section, broken at one end (oxidation) and pointed on the other (AF)
SF 2014-124	iron arrowhead point	KRO-14-SI	120–130	7.4	1.3	0.7	Triangular arrowhead. One fin is broken at its end and the other has disappeared. The fitting is done by a silk of quadrangular section. The section of the head is slightly oval (AF)
SF 2014-125	iron oblong object	KRO-14-SI	140–150	7.4	1.0	0.8	Rod, seemingly of quadrangular section (oxidation) of variable width along its length. The flatter end appears broken but the other appears intact. This could be a tool or a weapon: perhaps the tip of a harpoon or of an arrow that was damaged and/or reused. If the context is that of a forge, this could be a failed or practice object (AF)
SF 2014-126	metal clump	KRO-14-SI Con. 1	150–160	5.38	1.5	1.5	Illegible shaft section (oxidation) break on one side and bent tip of the other. Tapered (AF)
SF 2014-127	metal fragment, curved	KUS-14-SII	0–20	5.1	1.7	0.4	Fragment of quadrangular section ring. Broken on one side and tapering of the other (opening?) (AF)
SF 2014-128	metal, key shaped	MOL-14-SI	30–40	4.8	2.0	0.5	Consisting of a disc and a rod/point extension (AF)
SF 2014-129	metal, 4 pin shaped	MOL-14-SI	30–40	4.3	0.3	0.3	Set of 4 very thin rods of slightly curved circular section. Same diameter for 4 rods. Slightly oxidised surface (AF)
SF 2014-130	metal flakes	MOL-14-SI	30–40	4.1	2.5	1.5	130-1: 8 sheet metal fragments, very thin, shapeless and not refitting 130-2: Mass of crumpled and agglomerated metal without fresh breaks, therefore to be differentiated from 130-1 (AF)

Small finds 2014 (*cont.*)

SF 2014-131	metal fragment, nail shaped	MOL-14-SI	30–40	5.9	0.6	0.7	Thin rod of circular section the height of which decreases towards one end. Both ends are broken and the broader includes an oxidised mass on one side (AF)
SF 2014-132	metal fragment, pin shaped	MOL-14-SI	30–40	4.5	0.4	0.4	Fine circular section rod broken at its two ends (AF)
SF 2014-133	metal rim fragment	MOL-14-SI	30–40	2.6	1.1	0.5	Shaped sheet fragment: one part comprises a fold towards the inside of a circle (as for a container). The sheet expands outward as to form a belly (AF)
SF 2014-134	metal flake	MOL-14-SI	30–40	3.7	2.6	0.7	Metal fragment broken on its entire circumference (AF)
SF 2014-135	metal flake	MOL-14-SI	30–40	3.0	2.8	0.5	Metal fragment broken on its entire circumference (AF)
SF 2014-136	metal tools and fragments: chisel, twisted wire, nail, can top, can fragments	MOL-14-SI	0–20		0.9 2.3 0.8	0.8 0.7 0.6	136-1: 34 fragments of cans/spools 136-2: 10 indeterminate fragments 136-3: 3 fragments which could belong to one object 136-4: 2 indeterminate fragments 136-5: 4 fragments of plates: one with a fold along its length; a rolled sheet; two small strips 136-6: Packaging fragment with blue and white paintings and inscriptions of Asian characters shown. Precise cutting traces show a reuse of the object 136-7: 3 nails of different modules 136-8: Rod of circular section with a winding along its length 136-9: Worked robar fragment, showing evidence of reuse: one end has been flattened to become sharp (AF)
SF 2014-137	metal, folded, woven fibre attached	MOL-14-SI	20–30	5.3	3.1	1.6	Folded sheet, with a gauze fragment enfolded within it (AF)

SF 2014-138	metal fragment	MOL-14-SI	20–30	4.4	0.8	0.7	Rod fragment slightly curved quadrangular section (AF)
SF 2014-139	metal fragment	MOL-14-SI	40–50	4.0	4.4	0.7	Fragment of indeterminate shaped plate with white paint deposition (AF)
SF 2014-140	metal fragment	MOL-14-SI	40–50	5.0	1.4	0.7	Elongated and narrow plate of variable thickness between the two long edges; oxidised (AF)
SF 2014-141	metal fragment	MOL-14-SI	40–50	2.3	1.8	0.7	Misshapen sheet fragment with convex shape and an oxidation heap on the inside (AF)
SF 2014-142	metal fragment	MOL-14-SI	40–50	5.2	1.3	0.6	Very thin metal fragment, elongated and with a small winding on one long edge; punctual significant oxidation (AF)
SF 2014-143	metal flake	MOL-14-SI	40–50	2.3	1.4	0.3	Almost oval metal fragment carrying at one end an old break mark which corresponded to an extension of this piece by a pin (AF)
SF 2014-144	metal fragment, thin, curved	MOL-14-SI	50–60	4.3	0.3	0.4	2 fragments of the same module wire with significant oxidation (AF)
SF 2014-145	metal fragment	MOL-14-SI	50–60	6.4	1.2	0.7	Quadrangular section rod being terminated at one end by a tip and on the other by a flattening and bend but broken on this side (AF)
SF 2014-146	metal fragment, heavy	MOL-14-SI	50–60	5.7	3.5	1.1	Quadrangular plate broken at one end. There is a perforation near the centre of the piece (AF)

Small finds 2014 (*cont.*)

SF 2014-147	metal, triangular shaped, several flakes	TOU-14-SI	0–20	12.7	3.2	0.9	147-1: Unshaped fragments 147-2: Fragmented disc with a little fold on the circumference 147-3: Set of 3 stems of which 2 circular section of nails with a small circular head; one of them has lost its tip 147-4: Set of 4 small objects: a ring or eyelet that seems detached from its support; and 3 rods or iron wire fragments oxidised portion 147-5: Knife blade, straight back and slightly convex blade. Missing fitting (AF)
SF 2014-148	metal fragment, curved and to a point	TOU-14-SI	0–20	6.3	1.4	0.4	Fragmented blade, side fitting, back straight, slightly raised toward the tip, and the convex edge (AF)
SF 2014-149	metal tile	TOU-14-SI	0–20	2.0	2.1	0.5	Quadrangular plate, very regular and dense (AF)
SF 2014-150	metal nut	TOU-14-SI	0–20	1.7	1.5	0.8	Lightly oxidised nut (AF)
SF 2014-151	metal fragment, curved	TOU-14-SI	0–20	6.3	0.5	0.3	Ring fragments of very large, but fine, irregular section. Old and new fractures (AF)
SF 2014-152	metal fish hook	TOW-14-SI	20–30	3.6	1.5	0.3	Fishing hook
SF 2014-153	metal fish hook	TOW-14-SI	30–40	4.0	1.6	0.4	Fishing hook
SF 2014-154	metal fish hook	TOW-14-SI	40–50	3.6	1.8	0.4	Fishing hook
SF 2014-155	iron fragment	TOW-14-SI, Context 3	70–80	4.5	2.7	0.9	Plaque fragment, which involves one point with a straight edge and a convex edge; the other end has an old break. Significant oxidation but it seems that the profile (in length) is triangular: the convex side is the thickest. Could be a blade fragment (AF)

SF 2014-156	metal fragments	TOU-14-SI	20–30	5.9	4.6	1.5	156-1: Fragmented plate. Both sides appear intact and form a rounded 90° corner. It appears that the general shape is trapezoidal. The thickness is increasing; perhaps was it a cutting edge (AF) 156-2: Fragment of indeterminate shaft section with a point on one side and an old fracture on the other (AF) 156-3: Rod of indeterminate section with two balls at the ends. Rivet? Oxidation? No visible trace of fracture (AF)
SF 2014-158	metal fragment	TOU-14-SI	30–40	3.7	0.3	0.4	Fragment of rod or wire, a little twisted. Probably circular section (AF)
SF 2014-159	metal fragment	TOU-14-SI	30–40	2.7	0.4	0.4	Wire fragments of twisted iron. Section illegible. Oxidised (AF)
SF 2014-160	metal fragments	TOU-14-SI	30–40	2.6	1.8	0.5	160-1: Fragment (AF) 160-2: Fragments of sheet, shapeless and irregular (AF)
SF 2014-161	metal fragment	TOU-14-SI	50–60	2.3	0.7	0.7	Fragment of rod, illegible section; significant oxidation (AF)
SF 2014-162	metal fragment, twisted	TOU-14-SI	60–70	3.0	0.7	0.5	Copper alloy. Twisted and curved rod notched over its entire length (AF)
SF 2014-164	metal fragment	KRO-14-SI	40–50	1.8	0.5	0.4	Rod fragment, cross-section broken (AF)
SF 2014-165	iron fragment	KRO-14-SII	140–150	4.7	1.5	1.2	Rod fragments. Evidence of old breaks. Quadrangular section visible on fresh surface (AF)
SF 2014-166	metal	KGI-SI	0–20				Thin, slightly curved flat piece; old and fresh breaks (AF)
			Modelled Clay (C)				
SF 2014-03	ceramic figure, broken	PTI-14-SI	0–20	5.1	2.3	2.2	

Small finds 2014 (*cont.*)

SF 2014-04	ceramic jar fragment	KLI-14-SI	90–100	5.0	3.7	0.4	With rim, finely polished red exterior, residue. Possibly a large pipe bowl?
SF 2014-05	ceramic pipe fragment	KAZ-14-SII	20–30	3.7	0.6	0.4	With rim, polished exterior, smoothed interior. Exterior is incised around rim under lip
SF 2014-06	ceramic pipe fragment	KAZ-14-SI	20–30	2.5	1.5	0.3	With rim, polished and incised exterior
SF 2014-07	ceramic, possible pipe fragment	TRO-14-SI	20–30	1.2	0.8	1.2	Polished and decorated exterior
SF 2014-08a	ceramic fragment, pipe bowl	GOB-14-SI Con. 3	100–110	1.3	1.2	0.3	Polished and incised exterior
SF 2014-10a	ceramic fragment, pipe bowl	GOB-14-SI Con. 3	110–120	0.8	0.1	0.2	With rim, red polished exterior
SF 2014-32a	ceramic spoon	BLAF S13 Con. 17	230–240	5.0	4.6	0.7	No handle, likely broken off
SF 2014-34a	shaped sherd	KOZ-14 SII	100–110	4.8	2.1	0.9	
SF 2014-35a	shaped sherd	KOZ-14 SII	120–130	4.2	4.8	0.7	
SF 2014-08b	ceramic object	BLAF S13, Con. 3	50–60	3.7	1.7	1.7	
SF 2014-09	ceramic fragment	BLAF S13, Con. 8	80	3.3	1.2	1.3	Cylindrical, hole in centre, recently broken in two pieces
SF 2014-10b	ceramic object	BLAF S13, Con. 12	110–120	3.2	3.3	3.5	Bell shaped, broken at shaft end
SF 2014-11	ceramic oblong	BLAF S13, Con. 13	150–160	3.1	1.9	0.8	Possible hole through middle
SF 2014-12	ceramic crescent	BLAF S13, Con. 13	150–160	3.7	0.9	1.0	Curved

SF 2014-13	ceramic, possible spoon handle	BLAF S13, Con. 15	200–210	4.3	1.5	1.7	Cylindrical but narrows to a point
SF 2014-14	ceramic shaft	BLAF S13, Con. 15	210–220	2.7	1.9	1.9	Smoothed, black, appliqué spiral clay wrapped around exterior
SF 2014-15	ceramic shaft	BLAF S13, Con. 17	260–270	3.2	1.0	1.0	Smoothed, black, appliqué spiral clay wrapped around exterior
SF 2014-16	ceramic	BLAF S13, Con. 17	260–270	3.0	1.2	1.3	Cylindrical object, black
SF 2014-17	ceramic fragment	BLAF S13, Con. 18	300–310	3.3	1.5	1.3	Cylindrical, narrows to a point, nodule before break
SF 2014-19	ceramic 4-legged animal figure	BLAF S13, Con. 19	310–330	7.2	3.3	2.6	
SF 2014-20b	ceramic object	BLAF S13, Con. 19	310–330	3.4	1.9	1.3	Pierced hole, unclear whether goes through, broken at one end
SF 2014-21b	ceramic fragment	BLAF S13, Con. 19	310–330	3.9	1.2	1.1	Rounded at one end, broken on other
SF 2014-22b	ceramic fragment	BLAF S13, Con. 19	310–330	3.4	2.2	1.8	
SF 2014-23	ceramic cylindrical fragment	BLAF S13, Con. 19	310–330	4.6	1.7	1.5	Broken at both ends
SF 2014-24	ceramic fragment	BLAF S13, Con. 19	330–350	3.4	1.8	1.9	
SF 2014-25	ceramic figurine fragment	BLAF S13, Con. 19	350–370	4.6	2.7	2.6	
SF 2014-26	miniature pot	BLAF S13, Con. 19	350–370	3.3	3.1	3.3	
SF 2014-27	ceramic	BLAF S13, Con. 19	350–370	4.3	2.3	1.9	Black, polished, in two pieces

Small finds 2014 (*cont.*)

SF 2014-29	ceramic clump, flat base	GOG-14-SI	30–40	3.6	3.1	1.8	
SF 2014-30	fragment	BLAF S13, Con. 15	160–170				
SF 2014-31	terracotta figurine	BLAF S13, Con. 13	130–140				Anthropomorphic figurine
SF 2014-32b	terracotta figurine	BLAF S13, Con. 19	280–290				Quadruped
SF 2014-33	fragment	BLAF S13, Con. 19	350–370				
SF 2014-34b	fragment	KLI-14-SI	70–80				
SF 2014-35b	pipe fragment	KLI-14-SI	80–90				
SF 2014-36	fragment	KRO-SII	30–40				
SF 2014-37	terracotta fragment	TOW-14, Con. 2	60–70				
SF 2014-39	fragment	KRO-SII	150–160				
SF 2014-40	handle/figurine fragment	TOU-14-SI	60–70	2.5	1.9	1.7	
SF 2014-200	miniature pot	BLAF Surface find, Near S5. GPS A037					
			Glass (G)				
SF 2014-01	glass fragment, white	GAR-14-SI	0–20	2.1	1.7	0.2	
SF 2014-02	glass fragment	GAR-14-SI	0–20	1.4	1.5	0.4	Rim of small jar/bottle
SF 2014-03	glass fragment, green	GAR-14-SI	0–20	1.9	1.2	0.3	

SF 2014-04	glass fragment	GAR-14-SI	0–20	4.7	6.5	0.5	Clear and white, possibly plate or dish, flat bottom with flared ridges
SF 2014-05	glass fragment, clear	GAR-14-SI	0–20	3.5	1.9	0.7	Rim of jar with ridges
SF 2014-06	glass fragment, clear and white	GAR-14-SI	0–20	2.4	1.3	0.4	Possibly neck of jar
SF 2014-07	glass fragment, green	GAR-14-SI	0–20	1.6	1.3	0.3	
SF 2014-08	glass fragment, white	GAR-14-SI	0–20	2.0	1.2	0.2	
SF 2014-09	glass bottle, complete	GAR-14-SI	20–30	6.9	3.3	3.2	
SF 2014-10	glass fragment, clear	GOB-14-SI	0–20	1.3	0.6	0.2	
SF 2014-11	glass frag, clear/white, bracelet	GOG-14-SI	80–90	3.2	1.0	0.6	
SF 2014-12	glass fragment, green	GOG-14-SI	60–70	4.4	2.5	0.4	
SF 2014-13	glass fragment, clear	GOG-14-SI	0–20	3.6	2.5	0.3	
SF 2014-14	glass fragment, brown	GOG-14-SI	0–20	2.5	1.5	0.4	
SF 2014-15	glass fragment, clear	GOG-14-SI	0–20	2.6	1.1	0.1	
SF 2014-16	glass fragment, mirror	GOG-14-SI	0–20	1.1	0.7	0.2	
SF 2014-17	glass frag., iridescent, bracelet	GOG-14-SI	50–60	1.9	0.8	0.4	
SF 2014-18	glass fragment, yellow, bracelet	GOG-14-SI	0–20	2.6	1.0	0.7	

Small finds 2014 (*cont.*)

SF 2014-19	glass fragment, blue, bracelet	GOG-14-SI	0–20	3.1	0.9	0.5	
SF 2014-20	glass fragment, brown, bracelet	GOG-14-SI	0–20	3.2	0.9	0.7	Iridescent, white inclusion
SF 2014-21	glass fragment, clear	GOG-14-SI	40–50	2.3	1.1	0.3	
SF 2014-22	glass fragment, clear	GOG-14-SI	40–50	2.2	1.9	0.5	Iridescent, ridges
SF 2014-23	glass fragment, clear, iridescent	GOG-14-SI	40–50	2.0	1.2		
SF 2014-24	glass fragment, clear	GOG-14-SI	40–50	3.2	1.9	0.1	
SF 2014-25	glass fragment, clear and white	GOG-14-SI	40–50	2.3	1.1	0.2	
SF 2014-26	glass fragment, clear	GUE-14-SI	0–20	3.4	2.2	0.3	
SF 2014-27	glass fragment, clear bracelet	KGI-14-SI	70–80	2.9	0.8	0.4	
SF 2014-28	glass fragment, green	KGI-14-SI	90–100	2.7	2.1	0.2	
SF 2014-29	glass fragment, clear, bracelet	KGI-14-SI	60–70	5.2	1.0	0.5	
SF 2014-30	glass fragment, clear, bracelet	KGI-14-SI	60–70	6.4	0.8	0.4	
SF 2014-31	glass fragment, clear	MOL-14-SI	0–20	2.0	1.9	0.2	

SF 2014-32	glass bottle, clear, complete	MOL-14-SI	20–30	4.0	2.2	2.2	
SF 2014-33	glass fragment	MOL-14-SI	0–20	2.0	1.4	0.2	
SF 2014-34	glass frag, red/white ext., bracelet	MOL-14-SI	0–20	3.5	1.1	0.5	
SF 2014-35	glass fragment, clear	MOL-14-SI	0–20	2.7	0.8	0.2	
SF 2014-36	glass fragment, mirror	MOL-14-SI	0–20	2.4	1.0	0.2	
SF 2014-37	glass fragment	TTO-14-SII	0–20	2.8	3.4	0.2	
SF 2014-38	glass fragment, white, bracelet	GOG-14-SI	80–90	1.3	0.6	0.5	
SF 2014-39	glass fragment, clear, ridged	GOG-14-SI	50–60	0.9	0.9	0.3	
SF 2014-40	glass frag, green/white, bracelet	TOU-14-SI	0–20	2.4	0.8	0.5	
SF 2014-41	glass fragment, bracelet	TOU-14-SI	30–40	2.5	1.4	1.0	Black with white design, smooth and rounded interior, has a ridgeline, design only along ridge
SF 2014-42	glass fragment, green	TOU-14-SI	40–50	3.2	2.1	0.4	
SF 2014-43	glass fragment	TOU-14-SI	60–70	2.7	2.5	0.5	Green with white coating, pink fanning design, and bronze interior
SF 2014-44	glass fragment, white	TOU-14-SI	50–60	2.0	0.9	0.3	

Small finds 2014 (*cont.*)

SF 2014-45	glass fragment, dark with white design	TOW-14-SI	0–20	3.5	0.8	0.7	Very similar to SF 2014-41; could be the same object
SF 2014-46	glass fragment, green	TOU-14-SI	0–20	1.5	1.2	0.4	
SF 2014-47	glass nail polish bottle fragment, clear	TOU-14-SI	0–20	2.2	1.9	0.4	'GDK', 'Gold', 'ail Poli', caked dirt inside
SF 2014-48	glass fragment, green	TOU-14-SI	0–20	3.1	1.1	0.3	
SF 2014-49	glass fragment, green	TOU-14-SI	0–20	2.9	1.7	0.4	
SF 2014-50	glass fragment, white	TOU-14-SI	0–20	1.0	0.8	0.4	
SF 2014-51	glass fragment, green	TOU-14-SI	0–20	3.0	1.4	0.4	
SF 2014-52	glass fragment, clear	TOU-14-SI	0–20	1.8	1.2	0.4	
SF 2014-53	base fragment	TOU-14-SI	0–20	1.8	1.1	0.8	White
SF 2014-54	glass fragment, white	TOU-14-SI	0–20	2.6	2.7	0.4	
SF 2014-55	glass fragment, white	TOU-14-SI	0–20	1.0	0.7	0.2	
SF 2014-56	glass fragment, white	TOU-14-SI	0–20	2.5	0.7	0.5	
SF 2014-57	glass fragment, white	TOU-14-SI	0–20	1.5	1.1	0.4	
SF 2014-58	glass fragment, white	TOU-14-SI	0–20	2.9	1.8	0.4	Two ridges

SF 2014-59	glass fragment, green glass, white exterior, bracelet	TOU-14-SI	20–30	3.3	0.8	0.6	
SF 2014 60	glass fragment, white exterior, possible bracelet	TOU-14-SI	40–50	2.5	0.9	0.5	
SF 2014 61	glass fragment, green	TOU-14-SI	40–50	1.0	1.0	0.4	
SF 2014-62	glass fragment, green	TOU-14-SI	40–50	3.1	1.1	0.4	
SF 2014-63	glass fragment, black	KGI-14-SI	80–90	5.4	2.0	1.9	
SF 2014-64	glass bottle fragment, green	GOG-14-SI	90–100	11.1	6.2	0.4	Broken in two refitting pieces
SF 2014-65	glass fragment, clear iridescent	GOG-14-SI	130–140	5.9	2.6	0.4	
			Plastic (**P**)				
SF 2014-01	plastic fragment, green	GOG-14-SI	0–20	2.1	1.1	0.1	
SF 2014-02	plastic battery cap, round, pink	GOG-14-SI	0–20	2.9	2.9	0.2	‘Swan Battery’ brand
SF 2014-03	plastic cap, round, white	GOG-14-SI	0–20	1.7	1.5	0.3	Hole in centre
SF 2014-04	plastic, round, dark blue	GOG-14-SI	0–20	1.2	1.3	0.2	Hole in centre
SF 2014-05	plastic letter ‘C’ pendant, yellow	GOG-14-SI	0–20	2.1	0.9	0.3	
SF 2014-06	plastic fragment, pink	GOG-14-SI	0–20	1.0	0.9	0.1	

Small finds 2014 (*cont.*)

SF 2014-07	plastic disk fragment, possibly battery cap, brown	GOG-14-SI	0–20	2.7	1.1	0.1	
SF 2014-08	plastic fragment, yellow	GOG-14-SI	0–20	1.3	1.0	0.1	
SF 2014-09	plastic fragment, orange	MOL-14-SI	0–20	2.9	0.6	0.1	
SF 2014-10	double sided plastic rose, green	MOL-14-SI	0–20	1.4	1.4	1.1	1 green plastic bead in rose-flower shape Diameter ca. 11 to 14mm, length along perforation ca. 14mm. Large oval perforation, ca. 6.5mm wide (SM)
SF 2014-11	plastic trash bag	MOL-14-SI	0–20	6.5	5.3	1.9	
SF 2014-12	plastic shell, double sided cowrie, dark blue	MOL-14-SI	0–20	1.8	1.3	0.5	
SF 2014-13	plastic sheath	PTI-14-SI	0–20	3.8	2.4	0.1	
SF 2014-14	plastic pill blister, 3 round spaces	GOB-14-SI	20–30	3.4	3.0	0.3	
SF 2014-15	plastic pill blister, one oblong space	TOU-14-SI	0–20	2.8	1.7	0.2	
SF 2014-16	plastic, cylindrical rod	TOU-14-SI	0–20	1.3	0.4	0.4	
SF 2014-17	plastic fragment, semi-circular, discoloured	TOU-14-SI	0–20	1.6	1.1	0.1	Looks to fit SF 2014-21.
SF 2014-18	plastic fragment, flat, white/blue	TOU-14-SI	0–20	4.3	2.9	0.1	

SF 2014-19	plastic fragment, red	TOU-14-SI	0–20	2.1	0.6	0.2	Threading around rim
SF 2014-20	plastic battery cap, round, pink	TOU-14-SI	0–20	2.9	2.9	0.1	'Swan Battery' brand, hole in centre
SF 2014-21	plastic fragment, semi-circular, discoloured	TOU-14-SI	0–20	2.9	1.5	0.1	
SF 2014-22	plastic battery cap, round, pink	TOU-14-SI	0–20	2.9	2.9	0.1	'Swan Battery' brand, hole in centre
SF 2014-23	plastic stopper, complete, grey	GOG-14-SI	0–20	1.9	1.9	0.6	
SF 2014-24	plastic fragment, brown	GOB-14-SI	20–30	3.2	1.4	0.2	
SF 2014-25	plastic fragment, base, clear	TOU-14-SI	0–20	1.8	1.5	1.4	
			Stone (S)				
SF 2014-01	flake	TOW-14-SI	180–190				?quartz flake
SF 2014-05	polished axe	KOZ-14-SI	40–50	4.8	4-2		Trapezoid
			Other materials (O)				
SF 2014-01	cowrie shell	BOY-14-SII, Con. 2	40–50	1.9	1.3	0.9	
SF 2014-02a	cowrie shell	BOY-14-SI	0–20	2.3	1.7	0.8	
SF 2014-03a	cowrie shell	GAR-14-SI	20–30	1.9	1.4	0.6	

Small finds 2014 (*cont.*)

SF 2014-04	cowrie shell	GOB-14 SI	60–70	1.9	1.4	1.0	
SF 2014-05	cowrie shell	GOB-14 SI	30–40	2.0	1.9	0.7	
SF 2014-06a	cowrie shell	GOG-14 SI	80–90	2.2	1.6	1.0	Circular polish
SF 2014-07a	cowrie shell	MOL-14 SI	60–70	1.7	1.2	0.8	
SF 2014-08a	cowrie shell	MOL-14-SI	50–60	2.3	1.7	0.9	Incised
SF 2014-09	cowrie shell	KGI-14-SI	40–50	1.7	0.6	0.4	
SF 2014-10	cowrie shell	KGI-14-SI	70–80	1.8	1.4	0.7	
SF 2014-11	cowrie shell	KGI-14-SI	80–90	1.9	1.4	0.8	
SF 2014-16	cowrie shell fragment	PTI-14-SI	0–20	1.2	1.2	0.6	
SF 2014-17	cowrie shell	TOU-14-SI	70–80	1.6	1.2	0.8	
SF 2014-18	cowrie shell	TOU-14-SI	60–70	2.0	1.6	1.0	
SF 2014-19	cowrie shell	TOU-14-SI	50–60	1.6	1.1	0.7	
SF 2014-20	cowrie shell fragment	TOU-14-SI	40–50	2.0	1.0	0.6	
SF 2014-22	cowrie shell	TOW-1-14 Con. 3	80–90	2.1	1.6	1.0	
SF 2014-23	cowrie shell	TOW-1-14 Con. 3	80–90	1.9	1.4	1.1	Burnt
SF 2014-24	cowrie shell	TOW-1-14 Con. 3	80–90	1.6	1.1	0.8	

SF 2014-25	cowrie shell	TTO-14-SI	0–20	2.3	0.9	0.6	Burnt
SF 2014-26	cowrie shell	TTO-14-SI Con. 2	30–40	1.4	1.0	0.5	
SF 2014-28	cowrie	KOZ-14-SII	50–60				
SF 2014-29	shell	BLAF, S13	50–60				
SF 2014-02b	ivory ?	BLAF, S13, Con. 15	200–210	3.5	2.9	1.6	Fragmenting bottle-top shaped item
SF 2014-03b	textile, folded and stitched	MOL-14-SI	30–40	30.4	14.8	0	
SF 2014-06b	worked bone	BLAF S13, Con. 19	350–370				
SF 2014-07b	ivory?	BLAF S13, Con. 9	80–90				2 small fragments
SF 2014-08b	ivory?	KRO-14-SII	0–20				Fragment
SF 2014-163	fragment, tubular centre	TTO-14-SIII	30–40	1.9	1.6	0.3	Like a bone shaft in shape, but heavier, and red inside.

Table of Small finds recovered from key contexts discussed in this book during 2011, 2012, 2013, and 2014 field seasons. Objects are listed by year of excavation then by material type, where the prefix (M, B, etc) allows items with the same number to be discriminated from one another. The columns list in order Small finds number, basic description, location/context, depth, dimensions (L/W/D), and Other notes. Items are referred to through the book by their Small Find number. Comments from Anne Filippini (AF) and Sonja Magnavita (SM) are included and should be read in conjunction with their relevant chapters within the book. Pers. comm. from Chloë Duckworth are tentative, as they are based on preliminary analysis.
Table prepared by Anne Haour, Sam Nixon and Florence Reynolds.

Lab Reference	Bp	Error	Context	Calibration (Oxcal at 2 sigma)	Phase	Previously published
Beta-305221	1300	30	BLAF 11 Trench 1, 25–50cm, 47 cm.	Cal AD 660 to 731 (0.644), 736–770 (0.31)	Phase 3	Haour 2013: Table 1, Haour et al. 2016: Table S1
Beta-305220	1420	30	BLAF 11 Trench 1, 75–100 cm.	Cal AD 582–661	Phase 3	Haour 2013: Table 1, Haour et al. 2016: Table S1
Beta- 305219	1260	30	BLAF 11 Trench 1, 120cm.	Cal AD 669 to 779 (0.853), 791–829 (0.059), 838–865 (0.042)	Phase 3	Haour 2013: Table 1, Haour et al. 2016: Table S1
Beta-305217	1350	30	BLAF 11 Trench 1, 125 cm.	Cal AD 637 to 714 (0.885), 744–765 (0.069)	Phase 3	Haour 2013: Table 1, Haour et al. 2016: Table S1
Beta-305218	740	40	BLAF 11 S2, Context 2, a possible posthole associated with pottery pavement.	Cal AD 1215 to 1301 (0.926), 1368–1382 (0.028)	Phase 4	Haour 2013: Table 1, Haour et al. 2016: Table S1
OxA-29886	862	22	BLAF 12 Trench 3/10, Room 3, Sample 1 (see Figure V.4). *Anogeissus leiocarpus.*	Cal AD 1052–1080 (0.05), cal AD 1152–1225 (0.891), 1233–1244 (0.012)	Phase 4	Haour et al. 2016: Table S1
OxA-29887	910	23	BLAF 12 Trench 3/10, Room 4, Sample 2 (see Figure V.4). *Anogeissus leiocarpus.*	Cal AD 1036–1185	Phase 4	Haour et al. 2016: Table S1
Beta-320517	880	30	BLAF 12 Trench 3 Context 9, 40 cm. On potsherd pavement buried by house collapse.	Cal AD 1042–1105 (0.27), 1117–1222 (0.684)	Phase 4	Haour 2013: Table 1, Haour et al. 2016: Table S1
Beta-320518	1650	30	BLAF 12 Trench 4. West profile, Pit 4, a well-sealed and deep pit, 200 cm.	Cal AD 264–274 (0.011), 330–433 (0.853), 461–466 (0.005), 489–533 (0.085)	Phase 2	Haour 2013: Table 1, Haour et al. 2016: Table S1
Beta-320519	1210	30	BLAF 12 Trench 4. South profile, Pit 5, at the base of which were two stacked pots; but in a poorly differentiated layer within it. 90 cm.	Cal AD 695–700 (0.006), 710–745 (0.108), 764–891 (0.839)	Phase 3	Haour 2013: Table 1, Haour et al. 2016: Table S1

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Table (*cont.*)

Lab Reference	Bp	Error	Context	Calibration (Oxcal at 2 sigma)	Phase	Previously published
Beta-320520	1540	30	BLAF 12 Trench 4. South profile, at base of Pit 9, a well-sealed and very deep pit, 250 cm.	Cal AD 426–588	Phase 2–3	Haour 2013: Table 1, Haour et al. 2016: Table S1
Beta-320521	900	30	BLAF 12 Trench 5, 60–70 cm.	Cal AD 1039–1210	Phase 4	Haour 2013: Table 1, Haour et al. 2016: Table S1
Beta-320522	920	30	BLAF 12 Trench 5, 110–120 cm.	Cal AD 1028–1184	Phase 4	Haour 2013: Table 1, Haour et al. 2016: Table S1
Beta-321055	850	30	BLAF 12 Trench 6, C, Context 3, 10 cm.	Cal AD 1052–1080 (0.052), 1152–1260 (0.902)	Phase 4	Haour 2013: Table 1, Haour et al. 2016: Table S1
Beta-321056	1160	30	BLAF 12 Trench 6, C, Context 6, 28 cm.	Cal AD 773–906 (0.718), 916–968 (0.236)	Phase 3	Haour 2013: Table 1, Haour et al. 2016: Table S1
Beta-321054	1270	30	BLAF 12 Trench 7, B, 60 cm. Together with red-coated plaster fragments.	Cal AD 663–778 (0.923), 792–804 (0.013), 819–821 (0.002), 842–859 (0.0016)	Phase 3	Haour 2013: Table 1, Haour et al. 2016: Table S1
Beta-345491	1620	30	BLAF 13 Trench 8, Context 4.	Cal AD 382–539	Phase 2	Haour et al. 2016: Table S1
Beta-360210	880	30	BLAF 13 Trench 9, Context 3, 45–60 cm.	Cal AD 1042–1105 (0.27), 1117–1222 (0.684)	Phase 4	Haour et al. 2016: Table S1
Beta-360211	850	30	BLAF 13 Trench 9, Context 7, 90–100 cm.	Cal AD 1052–1080 (0.052), 1152–1260 (0.902)	Phase 4	Haour et al. 2016: Table S1
Beta-360212	1080	30	BLAF 13 Trench 9, Context 8, 150–160 cm.	Cal AD 894–930 (0.272), 938–1018 (0.682)	Phase 3	Haour et al. 2016: Table S1
Beta-360213	1110	30	BLAF 13 Trench 9, Context 8–10, 220–230 cm.	Cal AD 879–1013	Phase 3	Haour et al. 2016: Table S1

Table (*cont.*)

Lab Reference	Bp	Error	Context	Calibration (Oxcal at 2 sigma)	Phase	Previously published
Beta-360214	1620	30	BLAF 13 Trench 9, Context 13, 260–270 cm, Charcoal associated with partial ceramic vessel.	Cal AD 382–539	Phase 2	Haour et al. 2016: Table S1
Beta-360215	1390	30	BLAF 13 Trench 9, Context 13, 320–330 cm.	Cal AD 602–674	Phase 3	Haour et al. 2016: Table S1
Beta-360216	1270	30	BLAF 13 Trench 9, Context 16, 185 cm.	Cal AD 663–778 (0.923), 792–804 (0.013), 819–821 (0.002), 842–859 (0.0016)	Phase 3	Haour et al. 2016: Table S1
OxA-29889	887	23	BLAF 13 Trench 3/10, Room 1, Sample 4 (see Figure V.4). *Pterocarpus* sp. Sample recovered under pot cluster 3 in Room 1.	Cal AD 1045–1095 (0.303), 1119–1217 (0.651)	Phase 4	Haour et al. 2016: Table S1
OxA-29890	819	24	BLAF 13 Trench 3/10, Room 1, Sample 5 (see Figure V.4). *Sapotaceae vitellaria* par.	Cal AD 1170–1263	Phase 4	Haour et al. 2016: Table S1
OxA-29891	843	23	BLAF 13 Trench 3/10, Room 1, Sample 6 (see Figure V.4). *Sapotaceae vitellaria* par.	Cal AD 1160–1255	Phase 4	Haour et al. 2016: Table S1
OxA-29892	921	23	BLAF 13 Trench 3/10, Room 2, Sample 7 (see Figure V.5). *Sapotaceae vitellaria.*	Cal AD 1034–1163	Phase 4	Haour et al. 2016: Table S1
OxA-29893	869	24	BLAF 13 Trench 3/10, Room 6, Sample 8 (see Figure V.5).	Cal AD 1048–1085 (0.116), cal AD 1123–1138 (0.023), 1149–1224 (0.815)	Phase 4	Haour et al. 2016: Table S1
OxA-29894	781	24	BLAF 13 Trench 3/10, Room 6, Sample 9 (see Figure V.5). *Dalbergia melanoxylon.*	Cal AD 1218–1275	Phase 4	Haour et al. 2016: Table S1
OxA-29895	906	23	BLAF 13 Trench 3/10, Room 5, Sample 10 (see Figure V.4). *Rubiaceae, Mitragyna iner*. Recovered under an intact pot (Figure V.9 and Plate 27.11).	Cal AD 1038–1189	Phase 4	Haour et al. 2016: Table S1

Table (*cont.*)

Lab Reference	Bp	Error	Context	Calibration (Oxcal at 2 sigma)	Phase	Previously published
OxA-29896	840	24	BLAF 13 Trench 3/10, Room 5, Sample 11 (see Figure V.4). *Anogeissus leiocarpus.*	Cal AD 1161–1256	Phase 4	Haour et al. 2016: Table S1
OxA-29897	908	22	BLAF 13 Trench 3/10, Room 5, Sample 12 (see Figure V.4). *Anogeissus leiocarpus.*	Cal AD 1038–1185	Phase 4	Haour et al. 2016: Table S1
OxA-29888	819	24	BLAF 13 Trench 3/10, Room 4, Sample 3 (see Figure V.4).	Cal AD 1170–1263	Phase 4	Haour et al. 2016: Table S1
Beta-412222	890	30	BLAF 13 Trench 11, Context 1.	Cal AD 1041–1108, 1116–1218	Phase 4	
Beta-412223	920	30	BLAF 13 Trench 11, Context 3. Relates to pavement and large iron implement (SF 2013-204). *Sapotaceae Vitellaria.*	Cal AD 1028–1184	Phase 4	
Beta-412224	1460	30	BLAF 13 Trench 11, Context 18, a thick compacted horizon. *Anogeissus.*	Cal AD 553–648	Phase 3	
Beta-345492	1560	30	BLAF 13 Trench 11, Context 23. Human burial; sample taken inside cranium.	Cal AD 420–565	Phase 2–3	Haour et al. 2016: Table S1
Beta-411139	1210	30	BLAF 14 Trench 13, Context 14, 150–160. Upper part of pit feature in SE corner of trench.	Cal AD 695–700 (0.006), 710–745 (0.108), 764–891 (0.839)	Phase 3	
Beta-411140	1320	30	BLAF 14 Trench 13, Context 14, 180–190. Lower part of pit feature in SE corner of trench.	Cal AD 652–723 (0.73), 740–768 (0.224)	Phase 3	
Beta-411141	1300	30	BLAF 14 Trench 13, Context 19, 280–290. Associated with baked earth near pit feature in SE corner of trench.	Cal AD 660 to 731 (0.644), 736–770 (0.31)	Phase 3	

Table (*cont.*)

Lab Reference	Bp	Error	Context	Calibration (Oxcal at 2 sigma)	Phase	Previously published
Beta-378256	710	30	ALB 14 Site 1, Trench 1, 0–10 cm.	Cal AD 1256–1306 (0.85), 1363–1385 (0.104)	Phase 4	
Beta-378260	750	30	ALB 14 Site 1, Trench 2 Context 3, 20–30 cm. From a concentration of large potsherds.	Cal AD 1222–1287	Phase 4	
Beta-378257	730	30	ALB Site 2, Trench 3 10–20. Relates to occupation containing both pottery and lithics and in association with a pavement.	Cal AD 1224 to 1298	Phase 4	
Beta-378259	2440	30	ALB 14 Site 2, Trench 3 50–60. Clear separation between lithics and pottery, with a yellowish sediment in the north and a reddish one to the south.	Cal BC 751 to 682 (0.235), 669–636 (0.089), 626–614 (0.015), 592–408 (0.615)	Phase 1	
Beta-378258	2440	30	ALB 14 Site 2, Trench 3 70–80. Clear separation between lithics and pottery, with a yellowish sediment in the north and a reddish one to the south.	Cal BC 751 to 682 (0.235), 669–636 (0.089), 626–614 (0.015), 592–408 (0.615)	Phase 1	
Beta-345494	1350	30	DJA 2. Djaboutchia section clean, base of stratigraphy, bottom sample.	Cal AD 637 to 714 (0.885), 744–765 (0.069)	Phase 3	
Beta-345493	1350	30	DJA 1. Djaboutchia section clean, base of stratigraphy, upper sample.	Cal AD 637 to 714 (0.885), 744–765 (0.069)	Phase 3	
Beta-417597	340	30	GAR 14 Trench 1, 60–70.	Cal AD 1470–1640	Phase 5	

Table (*cont.*)

Lab Reference	Bp	Error	Context	Calibration (Oxcal at 2 sigma)	Phase	Previously published
Beta-402969	170	30	GOB 14 Trench 1, 60–70.	Cal AD 1695 to 1699 (0.173), 1721 to 1818 (0.505), 1833 to 1880 (0.08) and post 1916 (0.196)	Phase 5	
Beta-402970	100	30	GOB 14 Trench 1, Context 3, 80–90.	Cal AD 1682 to 1736 (0.271), 1805 to 1935 (0.683)	Phase 5	
Beta-345495	1150	30	GOB 13 Trench 2, Context 3a, 78–93 cm.	Cal AD 776–971	Phase 3	
Beta-345496	1280	30	GOB 13 Trench 2, Cont: 5, 108–123 cm.	Cal AD 662–774	Phase 3	
Beta-345497	1550	30	GOB 13 Trench 2, Structure 4, 135–153 cm.	Cal AD 423 to 574	Phase 2	
Beta-345498	1080	30	GOB 13 Trench 2, Context 3a, 138–153 cm.	Cal AD 894–930 (0.272), 938–1018 (0.682)	Phase 3	
Beta-345499	1130	30	GOB 13 Trench 2, Context 6, 153–168 cm.	Cal AD 777–791 (0.032), 805–842 (0.056), 861–988 (0.866)	Phase 3	
Beta-345500	1880	30	GOB 13 Trench 2, Context 3a, 168–183 cm. A small intact pot came from this level.	Cal AD 66–222	Phase 2	
Beta-345501	1930	30	GOB 13 Trench 2, 168–183 cm. From a concentration of ceramics, 'Structure 4'.	Cal AD 4–131	Phase 2	

Table (*cont.*)

Lab Reference	Bp	Error	Context	Calibration (Oxcal at 2 sigma)	Phase	Previously published
OxA-X-2605–39	183	38	GOG 14 Trench 1, Context 5.	Cal AD 1647–1706 (0.203), 1720–1819 (0.484), 1832–1880 (0.077), post 1915 (0.191) This sample has been OxA-X-ed because it had a low graphite target current and a delta offset between the d13C value measured on the AMS and on the mass spectrometer. This could mean that the age is not wholly accurate (Tom Higham, pers. comm., April 2015).	Phase 5	
OxA-31581	136	25	GOG 14 Trench 1, 70–80.	Cal AD 1674–1778 (0.399), 1799–1891 (0.40), 1909–1942 (0.155)	Phase 5	
OxA-31582	129	25	GOG 14 Trench 1, Context 6.	Cal AD 1677–1765 (0.347), 1773–1777 (0.008), 1800–1894 (0.45), 1906–1940 (0.149)	Phase 5	
Beta- 417598	100	30	KAR 14 Trench 1, 50–60.	Cal AD 1682 to 1736 (0.271), 1805 to 1935 (0.683)	Phase 5	
Beta-416119	120	30	KAZ Trench 1, 30–40.	Cal AD 1679–1765 (0.326), 1800–1940 (0.628)	Phase 5	
Beta-416120	280	30	KAZ Trench 2, 40–50. Within a small pit feature.	Cal AD 1498–1504 (0.008), 1513–1601 (0.543), 1616–1666 (0.382), 1784–1795 (0.021)	Phase 5	

Table (*cont.*)

Lab Reference	Bp	Error	Context	Calibration (Oxcal at 2 sigma)	Phase	Previously published
OxA-30957	138	29	KGI 14 Trench 1, Context 7.	Cal AD 1670–1780 (0.422), 1798–1892 (0.379), 1908–1944 (0.153) This sample had a high offset value between the stable isotope of carbon measured on the mass spectrometer compared with that done on the AMS. Sometimes this can have associated age shifts, although these are not likely to be greatly significant at this age (Tom Higham, pers. comm., April 2015).	Phase 5	
OxA-30958	168	29	KGI 14 Trench 1, Context 11.	Cal AD 1661–1699 (0.17), 1721–1818 (0.506), 1833–1880 (0.082), post 1916 (0.195) This sample had a high offset value between the stable isotope of carbon measured on the mass spectrometer compared with that done on the AMS. Sometimes this can have associated age shifts, although these are not likely to be greatly significant at this age (Tom Higham, pers. comm., April 2015).	Phase 5	

Table (*cont.*)

Lab Reference	Bp	Error	Context	Calibration (Oxcal at 2 sigma)	Phase	Previously published
OxA-30959	160	29	KLI 14 Trench 1, Context 18.	Cal AD 1664–1707 (0.167), 1719–1820 (0.478), 1832–1883 (0.121), post 1914 (0.187) This sample had a high offset value between the stable isotope of carbon measured on the mass spectrometer compared with that done on the AMS. Sometimes this can have associated age shifts, although these are not likely to be greatly significant at this age (Tom Higham, pers. comm., April 2015).	Phase 5	
OxA-31049	143	27	KLI 14 Trench 1, Context 8.	CalAD 1668–1709 (0.161), 1717–1781 (0.287), 1797–1890 (0.344), 1910–1945 (0.161)	Phase 5	
OxA-31050	162	27	KLI 14 Trench 1, 80–90.	CalAD 1663–1700 (0.165), 1720–1819 (0.5), 1832–1880 (0.098), post 1915 (0.191)	Phase 5	
OxA-31051	970	28	KLI 14 Trench 1,120–130.	Cal AD 1016–1155	Phase 4	
OxA-31353	1045	29	KLI 14 RC 1, Context 2.	CalAD 901–921 (0.062), 950–1029 (0.892)	Phase 3–4	
OxA-31583	992	26	KLI 14 RC 1, Context 2.	Cal AD 989–1050 (0.656), 1083–1126 (0.236), 1136–1151 (0.062)	Phase 3	
OxA-31584	1030	27	KLI 14 RC 1, Context 5.	Cal AD 907–915 (0.01), 968–1036 (0.944)	Phase 3–4	
OxA-31585	1093	27	KLI RC 1, Context 6.	Cal AD 891–1013	Phase 3	

Table (*cont.*)

Lab Reference	Bp	Error	Context	Calibration (Oxcal at 2 sigma)	Phase	Previously published
Beta-348773	1190	30	KOD 13 Trench 1, Context 5, from a white, hardened soil, associated with potsherd.	Cal AD 728–737, 768–895, 928–940 (no specific probability ranges given)	Phase 3	Robion-Brunner et al. 2015: Table 1
Beta-348772	910	30	KOD 13 Trench 1, Context 3, Charcoal directly associated with fragmented pot.	Cal AD 1033–1190 (0.94), 1198–1204 (0.014)	Phase 4	Robion-Brunner et al. 2015: Table 1
Beta-348771	910	30	KOD 13, Context 3.	Cal AD 1033–1190 (0.94), 1198–1204 (0.014)	Phase 4	Robion-Brunner et al. 2015: Table 1
Beta-354923	1050	30	KOD-MOUS, Furnace 14, collected at the base of one of the blowholes.	Cal AD 900–922 (0.087), 948–1027 (0.867)	Phase 3	Robion-Brunner et al. 2015: Table 1
Beta-354922	1000	30	KOD-MOUS. Slag mound 1, 50cm.	Cal AD 983–1051 (0.71), 1082–1128 (0.192), 1135–1152 (0.052)	Phase 3–4	Robion-Brunner et al. 2015: Table 1
OxA-31042	351	27	KOZ 14 Trench 1, 20–30.	CalAD 1457–1530, 1539–1635	Phase 5	
OxA-31043	357	28	KOZ 14 Trench 1, 20–30.	CalAD 1452–1530 (0.463), 1541–1635 (0.491)	Phase 5	
OxA-31580	609	25	KOZ 14 Trench 1, 30–40.	Cal AD 1297–1403	Phase 4	
OxA-31577	557	27	KOZ 14 Trench 1, Context 4, 80–100.	Cal AD 1311–1360 (0.462), 1386–1429 (0.492)	Phase 4	
OxA-31578	607	25	KOZ 14 Trench 1, Context 4, 80–100.	Cal AD 1297–1404	Phase 4	
OxA-31579	339	26	KOZ 14 Trench 1, Context 5, 110–120.	Cal AD 1473–1639	Phase 5	
OxA-31044	605	27	KOZ 14 Trench 2, Context 4, 60–70.	Cal AD 1297–1406	Phase 4	

Table (*cont.*)

Lab Reference	Bp	Error	Context	Calibration (Oxcal at 2 sigma)	Phase	Previously published
OxA-X-2600–42	601	30	KOZ 14 Trench 2 80–90.	Cal AD 1297–1408 This sample had a high offset value between the stable isotope of carbon measured on the mass spectrometer compared with that done on the AMS. Sometimes this can have associated age shifts, although these are not likely to be greatly significant at this age (Tom Higham, pers. comm., April 2015).	Phase 4	
Beta-411136	2920	30	KOZ 14 Trench 2, 110–120.	Cal BC 1211–1020	Phase 1	
Beta-411137	2910	30	KOZ 14 Trench 2, 120–130.	Cal BC 1209–1011	Phase 1	
Beta-411138	2860	30	KOZ 14 Trench 2, 130–140.	Cal BC 1118–929	Phase 1	
Beta-397870	890	30	KRO 14 Trench 2, 70–80.	Cal AD 1041–1108, 1116–1218 (no specific probability ranges given)	Phase 4	
Beta-397866	960	30	KRO 14 Trench 2, 110–120, Context 4.	Cal AD 1020 to 1155)	Phase 4	
Beta- 397871	1050	30	KRO 14 Trench 2, 150–160, Context 5.	Cal AD 900–922, 948–1027 1218 (no specific probability ranges given)	Phase 3	
Beta-402972	960	30	KRO 14 Slag mound Cutting 2, 50–60.	Cal AD 1020 to 1155	Phase 4	
Beta-402971	1170	30	KRO 14 Slag mound Cutting 1, 90–100.	Cal AD 771–903 (0.808), 918–965 (0.146)	Phase 3	
Beta-321057	610	30	PEK 12 Trench 1, Context 2, 22 cm BD. Associated with a grindstone and with a pavement.	Cal AD 1295–1404	Phase 4	

Table (*cont.*)

Lab Reference	Bp	Error	Context	Calibration (Oxcal at 2 sigma)	Phase	Previously published
Beta-321058	1040	30	PEK 12 Trench 1, Context 6, 130 cm.	Cal AD 901–921, Cal AD 954–1033 (no specific probability ranges given)	Phase 3–4	
OxA-31047	849	29	ROU 14 Trench 1, 40–50.	Cal AD 1055–1077 (3.7), 1153–1260 (91.7)	Phase 4	
OxA-31045	852	27	ROU 14 Trench 1, 70–80.	Cal AD 1057–1076 (0.032), 1154–1257 (0.922)	Phase 4	
OxA-31046	851	29	ROU 14 Trench 1, 70–80.	Cal AD 1053–1080 (0.049), 1152–1260 (0.905)	Phase 4	
OxA-31048	860	27	ROU 14 Trench 1, 80–90.	Cal AD 1050–1083 (0.079), 1127–1135 (0.011), 1151–1255 (0.864)	Phase 4	
Beta-397872	320	30	TOM 14, T2 cut B–C across furnace at site of Tomboutou 2.	Cal AD 1483–1646	Phase 5	
Beta-397873	270	30	TOM 14, T2, dates smelting event at Tomboutou 2.	Cal AD 1514–1599, 1617–1669, 1781–1799 (no specific probability ranges given)	Phase 5	
Beta-397868	110	30	TOW 14 Context 2, 60–70.	Cal AD 1681–1739, 1745–1763, 1802–1938 (no specific probability ranges given)	Phase 5	
Beta-397867	270	30	TOW 14 Context 3, 120–130.	Cal AD 1514–1599, 1617–1669, 1781–1799 (no specific probability ranges given)	Phase 5	
Beta-397869	200	30	TOW 14 Context 1, 60–70. Context 1 is made of mud brick and burnt clay presenting a yellow/red colour; possibly a burnt wall.	Cal AD 1646–1690, 1729–1810, post 1926AD (no specific probability ranges given)	Phase 5	

Table (*cont.*)

Lab Reference	Bp	Error	Context	Calibration (Oxcal at 2 sigma)	Phase	Previously published
Beta-416121	70	30	TRO Trench 1, 40–50.	Cal AD 1691–1730 (24.3), 1810–1924 (71.1)	Phase 5	
Beta-417590	620	30	TTK 13 Trench 1, Context 1, level 5. From inside a vessel (Plate 9.17).	Cal AD 1292–1401	Phase 4	
Beta-345502	1010	30	TTK 13 Trench 1, Context 2, 62cm. Direct association with pavement.	Cal AD 973–1049 (0.824), Cal AD 1085–1125 (0.104), Cal AD 1137–1150 (0.026)	Phase 3–4	Champion & Haour 2013: 115
Beta-417589	570	30	TTK 13 Trench 1. Associated with destruction level 7.	Cal AD 1304–1365 AD (0.578), 1384–1423 (0.376)	Phase 4–5	
Beta-417591	930	30	TTK 13 Trench 1. Associated with destruction level 9.	Cal AD 1025–1165	Phase 4	
Beta-417593	910	30	TTK 13 Trench 1. Context 21, level 12.	Cal AD 1033–1190 (0.94), 1198–1204 (0.014)	Phase 4	
Beta-417592	560	30	TTK 13 Trench 1. Associated with destruction level 12.	Cal AD 1307–1363 (0.501), 1385–1429 (0.453)	Phase 4–5	
Beta-417594	880	30	TTK 13 Trench 1. From hearth in middle of Pavement 7 (Context 16).	Cal AD 1042–1105 (0.27), 1117–1222 (0.684)	Phase 4	
Beta-417595	900	30	TTK 13 Trench 1. Context 18, Level 10.	Cal Ad 1039–1210 AD	Phase 4	
Beta-348769	610	30	TTK 13 Trench 1, Context 18, 110 cm. Lowest level at which pavement occurred.	Cal AD 1295–1404	Phase 4	Champion & Haour 2013: 115

Table (*cont.*)

Lab Reference	Bp	Error	Context	Calibration (Oxcal at 2 sigma)	Phase	Previously published
Beta-348770	1060	30	TTK 13 Trench 1, Context 19, 340 cm.	Cal AD 897–925 (0.144), 943–1024 (0.81)	Phase 3	Champion & Haour 2013: 115
Beta-348774	920	30	TTK 13 Trench 2, Context 11. Direct association with a pavement.	Cal AD 1028–1184	Phase 4	Khalaf & Haour 2013: 103, but wrongly identified there as being from context 8
Beta-348775	1120	30	TTK 13 Trench 2, Context 25.	Cal AD 778–790 (0.017), 809–815 (0.005), 826–841 (0.014), 863–995 (0.918)	Phase 3	Khalaf & Haour 2013: 105, but wrongly identified there as being from context 11
Beta-345503	1010	30	TTK 13 Trench 2, Context 28. From hearth with associated iron blade, SF 2013-74.	Cal AD 973–1049 (0.824), Cal AD 1085–1125 (0.104), Cal AD 1137–1150 (0.026)	Phase 3–4	Khalaf & Haour 2013: 108
Beta-417596	630	30	TTO 14 Trench 2, 20–30.	Cal AD 1287–1399 AD	Phase 4	

Radiocarbon dates issued from the *Crossroads of Empire* project, 2011–2014. Table prepared by Anne Haour and Florence Reynolds. Charcoal determinations, where available, are by Barbara Eichhorn. Dates were calibrated by Anne Haour on OxCal 4.2. using IntCal13 northern hemisphere (Bronk Ramsey 2009, Reimer et al. 2013). Dates with Ox codes were run with funding from National Radiocarbon Facility.

Gazetteer

Gazetteer One

Lat	Long	Elevation	Date	Survey Ref	Description	Other info	Collector
12.23681	3.013774	175	15/02/2011	ALS8	Settlement mound. Pottery concentration (rfp-1, folded strip roulette).	General survey 2011	ALS
12.234341	3.014063	172	15/02/2011	ALS9	Settlement mound. Pottery concentration (rfp-1) and slag fragments.	General survey 2011	ALS
12.23442	3.014177	171	15/02/2011	ALS10	Settlement mound. Pottery concentration (rfp-1) and large slag fragments. Prolongation of ALS9	General survey 2011	ALS
11.959517	3.221043		23/01/2012	ALS12	End of survey. Artefact concentration. Pottery concentration.	2011-TR1	ALS
12.34271	2.857558	172	15/02/2011	ALS13	Settlement mound. Pottery (rfp-1, comb impression, incision). Same mound as GPS012	2011-TR1	ALS
12.3424	2.85743	173	15/02/2011	ALS14	Settlement mound. Pottery. See GPS013.	2011-TR1	ALS
12.34104	2.857363	172	15/02/2011	ALS15	Decorated pottery	2011-TR1	ALS
12.34041	2.857555	179	15/02/2011	ALS16	Foothill. Pottery concentration (rfp-1, incision, perf. pottery) and slag. Extends from GPS.015 to GPS.019	2011-TR1	ALS
12.33989	2.85726	183	15/02/2011	ALS17	Comb impressed pottery (?).	2011-TR1	ALS
12.340101	2.85781	182	15/02/2011	ALS18	Pottery decorated with hatching	2011-TR1	ALS
12.34437	2.857993	171	15/02/2011	ALS19	Small grinder fragment.	2011-TR1	ALS
12.323802	2.893485	177	15/02/2011	ALS20	Pottery scatter near a river (rfp-1), including jars and perforated pottery.	2011-TR2	ALS
12.32349	2.893467	181	15/02/2011	ALS21	Pottery scatter near a river (rfp-1).	2011-TR2	ALS
12.323123	2.893944	182	15/02/2011	ALS22	Large fragment of slag.	2011-TR2	ALS
12.322492	2.894723	184	15/02/2011	ALS23	Furnace (?). Captive slag. Twelve GPS points taken associated with this site: ALS023 to 033 and 035, 038.	2011-TR2	ALS
12.322877	2.893073	186	15/02/2011	ALS34	Small settlement mound (?). Pottery scatter (rfp-1, rc-1, bottle neck) on a small rise overlooking river.	2011-TR2	ALS
12.323876	2.892859	177	15/02/2011	ALS36	Pottery scattered on a riverbed (includes complete pot).	2011-TR2	ALS
12.323195	2.890445	182	15/02/2011	ALS37	Pottery scatter on a river bank (rfp-1, perforated pottery). Pottery in the river bank (profile).	2011-TR2	ALS
12.316708	2.903512	175	15/02/2011	ALS40	Small settlement mound overlooking a river. Pottery concentration (rfp-1, including tightly folded, comb impression, grinding stones). Same as AH 56.	2011-TR2	ALS
12.316306	2.903826	177	15/02/2011	ALS41	Small settlement mound overlooking a river. Pottery concentration (rfp-1 and incision).	2011-TR2	ALS

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Gazetteer One (*cont.*)

Lat	Long	Elevation	Date	Survey Ref	Description	Other info	Collector
12.314619	2.905811	174	15/02/2011	ALS42	Small settlement mound overlooking a river. Pottery concentration (rfp-1, perforated pottery, grinding stones). Extension of GPS040?	2011-TR2	ALS
12.314356	2.905796	174	15/02/2011	ALS43	Small settlement mound overlooking a river. Pottery concentration (rfp-1, perforated pottery). Extension of GPS042.	2011-TR2	ALS
12.284706	2.927451	180	15/02/2011	ALS45	Firing structure (no slag in the area).	2011-TR3	ALS
12.284182	2.92825	178	15/02/2011	ALS46	Pottery concentration on a river bank.	2011-TR3	ALS
12.283919	2.928676	176	15/02/2011	ALS47	Pottery scatter (incised pottery).	2011-TR3	ALS
12.285066	2.929158	176	15/02/2011	ALS48	Pottery scatter (rfp-1, buried pottery).	2011-TR3	ALS
12.285256	2.929251	176	15/02/2011	ALS49	Pottery concentration (rfp-1, grinding stone)	2011-TR3	ALS
12.276916	2.97419	167	16/02/2011	ALS50	Stone piles (old farming area?).	2011-TR4	ALS
12.278477	2.974974	164	16/02/2011	ALS51	Small pottery concentration and granary emplacement.	2011-TR4	ALS
12.261433	3.000387	165	16/02/2011	ALS52	Small settlement mound. Pottery scatter (rfp-1) on a small rise overlooking river.	2011-TR5	ALS
12.240154	3.013051	174	16/02/2011	ALS53	Slag heap (including tuyère).	2011-TR5	ALS
12.239914	3.013043		16/02/2011	ALS54	Slag heap (including tuyère).	2011-TR5	ALS
12.239879	3.012969	172	16/02/2011	ALS55	Furnace (flat but appears well preserved). Overlooking a dry river bed. Associated GPS points ALSGPS56–68.	2011-TR5	ALS
12.238613	3.013066	167	16/02/2011	ALS69	Pottery in the profile of a small dry river (rfp-1, incision, geometric designs).	2011-TR5	ALS
12.20855	3.025644	167	16/02/2011	ALS71	Pottery concentration (rfp-1, including tightly folded, large jars)	2011-TR6	ALS
12.202365	3.023824	173	16/02/2011	ALS72	Isolated nucleus?	2011-TR6	ALS
12.201587	3.022815	174	16/02/2011	ALS73	Furnace (flat but appears well preserved). Point represents area where 24 other points were indicated as flat furnaces well preserved, ALS74–97.	2011-TR6	ALS
12.199792	3.022231	174	16/02/2011	ALS98	Small settlement. Pottery concentration (rfp-1, rc-1).	2011-TR6	ALS
12.199268	3.021944	175	16/02/2011	ALS100	Small settlement. Several pottery concentrations (rfp-1, rc-1).	2011-TR6	ALS
12.199529	3.021957	174	16/02/2011	ALS101	Small settlement. Pottery concentration (rfp-1, rc-1, hatching	2011-TR6	ALS
12.199538	3.021959	175	16/02/2011	ALS102	Small settlement. Pottery concentration (rfp-1, rc-1, hatching	2011-TR6	ALS
12.199567	3.021968	175	16/02/2011	ALS103	Small settlement. Pottery concentration (rfp-1, rc-1, hatching).	2011-TR6	ALS
12.164466	3.047726	179	16/02/2011	ALS106	Settlement mound (?). Pottery concentration on a slope (rfp-1, incision, carinated).	2011-TR7	ALS

Gazetteer One (*cont.*)

Lat	Long	Elevation	Date	Survey Ref	Description	Other info	Collector
12.164142	3.048961	169	16/02/2011	ALS107	Pottery concentration. Extension from GPS106.	2011-TR7	ALS
12.164195	3.049076	169	16/02/2011	ALS108	Graves (?). Complete pottery, bone, fragments of iron. 5 points taken associated with the possible graves, ALS 109–114.	2011-TR7	ALS
12.137299	3.082195	177	16/02/2011	ALS115	Settlement. Small pottery concentration (rfp-1, Sen).	2011-TR8	ALS
12.137051	3.081803	179	16/02/2011	ALS116	Settlement. Small pottery concentration below a baobab (painted pottery).	2011-TR8	ALS
12.137069	3.081389	181	16/02/2011	ALS117	Settlement mound (?). Pottery concentration (rfp-1, incision, large jars, perforated), grinding equipment.	2011-TR8	ALS
12.136945	3.081115	181	16/02/2011	ALS118	Settlement mound (?). Pottery concentration (rfp-1, incision, large jars, perforated), grinding equipment.	2011-TR8	ALS
12.136816	3.080946	181	16/02/2011	ALS119	Settlement mound (?). Pottery concentration (rfp-1, incision, large jars, perforated), grinding equipment.	2011-TR8	ALS
12.136138	3.08024	184	16/02/2011	ALS120	Settlement mound (?). Pottery concentration (rfp-1, incision, large jars, perforated), grinding equipment.	2011-TR8	ALS
12.137554	3.099188	171	16/02/2011	ALS121	Pottery scatter below a baobab.	General survey 2011	ALS
12.121685	3.128785	172	16/02/2011	ALS122	Small settlement mound. Pottery concentration (rfp-1, perforated). Next mound is recorded on Didier Nda's GPS under GPSDidier111.	2011-TR9	ALS
12.120556	3.146687	165	16/02/2011	ALS123	Modern painted jar made in by Zarma potters in Una (Niger).	Ethnographic survey (potter)	ALS
12.113401	3.15625	166	16/02/2011	ALS124	Small settlement mound (?). Scattered potsherds (rfp-1) and grinding equipment.	General survey 2011	ALS
12.09481	3.162872	168	16/02/2011	ALS127	Slag heap and furnace (?). On the slope overlooking the river.	2011-TR10	ALS
12.099733	3.167107	164	16/02/2011	ALS129	Large settlement mound (on the hill overlooking the river). Whole pottery (rfp-1) and pottery scatter. Associated grind stone found nearby, ALS2130.	2011-TR10	ALS
12.099912	3.168484	167	16/02/2011	ALS131	Settlement mound. Pottery scatter in the fields (rfp-1). Extension of GPS128–129. End of survey.	2011-TR10	ALS
12.098749	3.167169	169	16/02/2011	ALS132	Settlement mound. Pottery scatter in the fields (rfp-1). Pot buried in the ground. Extension of GPS128–129.	2011-TR10	ALS
12.018481	3.209829	159	17/02/2011	ALS135	Pottery scatter.	2011-TR12	ALS
11.967169	3.221107	169	17/02/2011	ALS138	Series of settlement mounds. Erosion surface with abundant pottery (rfp-1, painted, incised, incision, polishing). Fine pottery.	2011-TR13	ALS

Gazetteer One (*cont.*)

Lat	Long	Elevation	Date	Survey Ref	Description	Other info	Collector
11.922667	3.222014	174	17/02/2011	ALS165	Pottery concentration near the Alibori River.	2011-TR14	ALS
11.922813	3.221855	173	17/02/2011	ALS166	Pottery concentration near the Alibori River (rfp-1).	2011-TR14	ALS
11.923462	3.220714	174	17/02/2011	ALS167	Pottery concentration (rfp-1)	2011-TR14	ALS
11.923462	3.22054	172	17/02/2011	ALS168	Large pottery concentration on erosion surface near the Alibori River (rfp-1 + special decoration see bag).	2011-TR14	ALS
11.852231	3.27092	178	17/02/2011	ALS170	rfp-1 pottery, ALS170–173.	2011-TR16	ALS
11.864434	3.245977	177	17/02/2011	ALS179	Settlement mounds. Pottery concentration on eroded surfaces (rfp-1, etc.).	2011-TR16	ALS
11.865762	3.246411	175	17/02/2011	ALS180	Settlement mounds. Pottery concentration on eroded surfaces (rfp-1, etc.).	2011-TR16	ALS
11.867039	3.246492	174	17/02/2011	ALS181	Settlement mounds. Pottery concentration on eroded surfaces (rfp-1, etc.).	2011-TR16	ALS
11.867389	3.246456	177	17/02/2011	ALS182	Settlement mounds. Pottery concentration on eroded surfaces (rfp-1, etc.).	2011-TR17	ALS
11.880637	3.25357	168	17/02/2011	ALS186	Settlement (?). Pottery scatter in the fields (rfp-1).	2011-TR17	ALS
11.880491	3.253054	168	17/02/2011	ALS187	Settlement (?). Pottery scatter in the fields (rfp-1, fragment of large jar).	General survey 2011	ALS
11.965793	3.221431	165	18/02/2011	ALS191	Pottery pavement (rfp-1, etc.). Neck of a Zarma jar and Small polishing tool (found by OPG) nearby.	General survey 2011	ALS
11.966423	3.221471	164	18/02/2011	ALS192	Pottery pavement (rfp-1, etc.).	General survey 2011	ALS
11.96643	3.221281	165	18/02/2011	ALS193	Pottery pavement (rfp-1, etc.).	General survey 2011	ALS
11.966432	3.221281	164	18/02/2011	ALS194	Pottery pavement (rfp-1, etc.).	General survey 2011	ALS
11.966461	3.221189	165	18/02/2011	ALS196	Pottery pavement (rfp-1, etc.). Subsequently excavated as Blaf SII	2011-TR19	ALS
11.796391	3.225436	212	19/02/2011	ALS204	Small settlement. Pottery scatter on a very low dune (rfp-1).	2011-TR19	ALS
11.797832	3.225017	211	19/02/2011	ALS205	Small settlement. Pottery scatter on a very low dune (rfp-1).	2011-TR18	ALS
11.836387	3.22995	184	19/02/2011	ALS207	Pottery, rfp-1, associated ALS 206 and 208.	2011-TR18	ALS
11.837423	3.228027	184	19/02/2011	ALS209	Pottery, rfp-1, associated ALS 210.	2011-TR18	ALS
11.83799	3.226171	193	19/02/2011	ALS211	Small settlement on a low dune with baobab. Scattered pottery (rfp-1). A big settlement mound to the N-NW of GPS211.	2011-TR18	ALS
11.866208	3.240174	184	19/02/2011	ALS214	Settlement mound with baobab overlooking swamp. Pottery concentration (rfp-1). Zarma pottery neck. Associated with ALS213.	2011-TR18	ALS

Gazetteer One (*cont.*)

Lat	Long	Elevation	Date	Survey Ref	Description	Other info	Collector
11.866181	3.240771	182	19/02/2011	ALS215	Settlement mound with baobab overlooking swamp. Pottery concentration (rfp-1).	2011-TR17,5	ALS
11.866692	3.24315	180	19/02/2011	ALS216	Settlement mound with baobab overlooking swamp. Pottery concentration (rfp-1) and occasional slag.	2011-TR17,5	ALS
11.867542	3.24336	181	19/02/2011	ALS217	Settlement mound with baobab overlooking swamp. Important pottery concentration (rfp-1). Pottery fragments with anvil impressions.	2011-TR17,5	ALS
11.867717	3.243418	178	19/02/2011	ALS218	Settlement mounds. Pottery concentration (rfp-1).	2011-TR17,5	ALS
11.865883	3.243218	180	19/02/2011	ALS219	Settlement mounds. Pottery concentration (rfp-1).	General survey 2011	ALS
11.86518	3.243736	180	19/02/2011	ALS220	Settlement mounds. Pottery concentration (rfp-1).	General survey 2011	ALS
11.864844	3.244421	179	19/02/2011	ALS221	Settlement mounds. Pottery concentration (rfp-1).	2011-TR25	ALS
11.794837	3.38826	181	22/02/2011	ALS224	Large settlement overlooking a river. Pottery concentration (rfp-1, incision), grinding equipment and occasional slag.	2011-TR25	ALS
11.788303	3.465439	175	22/02/2011	ALS227	Small settlement (?) with baobab overlooking dry river. Pottery scatter (rfp-1?). Extensions ALS228, 229 and 249.	2011-TR25	ALS
11.692485	3.552122	160	22/02/2011	ALS235	Settlement? Pottery scatter (rfp-1, rc-1, incision)?	2011-TR25	ALS
11.692112	3.552195	161	22/02/2011	ALS236	Settlement? Pottery scatter.	2011-TR25	ALS
11.688414	3.552538	162	22/02/2011	ALS238	Scattered slag and burnt earth.	2011-TR25	ALS
11.686774	3.554134	165	22/02/2011	ALS240	Small settlement on a very low dune with baobab? Pottery scatter (rc-1 and incision, beginner's pot).	2011-TR25	ALS
11.686053	3.553735	165	22/02/2011	ALS241	Small settlement (?) on a very low sandy-clay dune with baobab. Pottery scatter (rc-1, thick pottery / jar fragment).	General survey 2011	ALS
11.686097	3.553547	164	22/02/2011	ALS242	Large slag fragment (captive slag?). Further uphill to the west AH and DN found a very large smelting site.	General survey 2011	ALS
11.688684	3.556212	163	22/02/2011	ALS243	Large settlement (?) at the foot of a hill in an erosion gully. Pottery concentration on the bank of the erosion gully.	2011-TR24	ALS
11.71028	3.546031	166	22/02/2011	ALS245	Small settlement (?) on the outskirts of Madekali. Pottery scatter (rc-1). Picture just before is a Nigerian enamel casserole.	General survey 2011	ALS
11.709856	3.545778	167	22/02/2011	ALS246	Small settlement (?) on the outskirts of Madekali. Pottery scatter (rc-1). Near GPS245. Other settlement mounds visible on the right (northeast) with pottery and burnt earth.	General survey 2011	ALS

Gazetteer One (*cont.*)

Lat	Long	Elevation	Date	Survey Ref	Description	Other info	Collector
11.768707	3.508372	172	22/02/2011	ALS248	Small settlement on a sand dune (?). Isolated pottery (rfp-1).	2011-TR22	ALS
11.787604	3.463988	175	22/02/2011	ALS250	Furnace (in situ slag?).	General survey 2011	ALS
11.786945	3.463784	177	22/02/2011	ALS251	Small settlement (?) on a hill overlooking dry river. Pottery scatter (rfp-1, incision) and slag.	General survey 2011	ALS
11.785697	3.463716	179	22/02/2011	ALS252	Small settlement (?) on a hill overlooking dry river. Pottery scatter (rfp-1, incision) and slag.	2011-TR21	ALS
11.780269	3.426175	174	22/02/2011	ALS253	Important settlement on a hill cut by the road overlooking a dry riverbed. Pottery concentration (rfp-1, rc-1, incision) and occasional slag fragments.	2011-TR21	ALS
11.821247	3.368912	177	22/02/2011	ALS254	First entrance to the cave. Pottery scatter (rfp-1, rolled impressions of Blepharis Ciliaris). Second entrance ALS255.	2011-TR21	ALS
11.781091	3.4174	214	23/02/2011	ALS256	Small settlement (?). Pottery scatter (rfp-1, wavy line).	2011-TR21	ALS
11.780111	3.416701	206	23/02/2011	ALS257	Small settlement (?). Pottery scatter (rfp-1, a lot of undecorated pottery).	2011-TR21	ALS
11.779854	3.416713	203	23/02/2011	ALS258	Pottery scatter (small wavy line potsherds).	2011-TR21	ALS
11.77644	3.414843	187	23/02/2011	ALS260	Furnace. Slag fragments and burnt earth scattered on a sandy slope near a rocky outcrop.	2011-TR27	ALS
11.780096	3.416685	177	23/02/2011	ALS261	Small settlement (?). Pottery scatter (rfp-1, rc-1, Wavy line).	2011-TR27	ALS
11.78189	3.416886	173	23/02/2011	ALS262	Pottery scattered in erosion gully near a baobab (layer below?).	2011-TR27	ALS
11.654731	3.190222	198	23/02/2011	ALS265	Small settlement (?) on a hill near a river. Pottery scatter (rfp-1, abundant undecorated pottery) and grindstone fragment. Little pot with closed shape (inkpot?). Grindstone fragment.	2011-TR27	ALS
11.630252	3.178713	205	23/02/2011	ALS268	Slag heap. AH also found some potsherds near the road. The road goes through the site!	2011-TR28	ALS
11.629908	3.179327	207	23/02/2011	ALS269	Settlement and smelting site (?) on a hill overlooking dry river. Pottery scatter (rfp-1, rc-1, complete pots) and slag heaps (with tuyère).	2011-TR28	ALS
11.630419	3.179602	204	23/02/2011	ALS270	Settlement and smelting site (?) on a hill overlooking dry river. Furnace and slag heap. The roads passes right in the middle of the site!	2011-TR28	ALS
11.630145	3.17775	201	23/02/2011	ALS271	Complete pottery set in laterite and clay (rfp-1, rc-1). Large fragment of slag nearby.	2011-TR28	ALS
11.629679	3.176939	201	23/02/2011	ALS272	Settlement (?). Loose pottery scatter on erosion surface (rfp-1).	2011-TR28	ALS

Gazetteer One (*cont.*)

Lat	Long	Elevation	Date	Survey Ref	Description	Other info	Collector
11.630435	3.178202	200	23/02/2011	ALS273	Furnace (?) with slag heap and tuyère. Undecorated pottery and grindstone nearby.	2011-TR28	ALS
11.630319	3.178514	202	23/02/2011	ALS274	Important slag heap cut by access road. Extension of GPS 268.	2011-TR28	ALS
11.629103	3.179898	204	23/02/2011	ALS276	Furnace (?). Burnt earth, slag and tuyère.	2011-TR29	ALS
11.628912	3.1799	206	23/02/2011	ALS277	Scattered potsherds (rfp-1, loose).	2011-TR29	ALS
11.62891	3.179316	207	23/02/2011	ALS278	Slag heap with tree growing on top	2011-TR29	ALS
11.562152	3.119405	232	24/02/2011	ALS281	Small settlement (?). Pottery scatter on the side of a pit (rfp-1, Wavy line incisions, rc-1, Paille tressée).	2011-TR30	ALS
11.563512	3.120967	229	24/02/2011	ALS282	Pottery scatter on the banks of a dry river. With associated slag heaps recorded nearby.	2011-TR30	ALS
11.563848	3.122599	233	24/02/2011	ALS288	Pottery scatter (rfp-1, Flat rim, 1 perforated).	2011-TR30	ALS
11.481598	3.08262	277	24/02/2011	ALS289	Pottery scatter and slag fragments next to the road.	2011-TR30	ALS
11.481612	3.082852	276	24/02/2011	ALS290	Scattered slag fragment.	2011-TR30	ALS
11.481053	3.08302	275	24/02/2011	ALS293	Slag with tuyère (not in situ).	2011-TR30	ALS
11.480877	3.083131	278	24/02/2011	ALS294	Isolated potsherd (rfp-1).	General survey 2011	ALS
11.480608	3.084546	280	24/02/2011	ALS296	Very large slag heap (15 × 5 m) with tuyères. Several other heaps nearby.	General survey 2011	ALS
11.481147	3.082581	276	24/02/2011	ALS298	Incised wavy line potsherd.	Agberoubwe 2011	ALS
11.360979	3.064706	312	24/02/2011	ALS299	Small settlement (?). Pottery scatter (rc-1, 1 jar fragment) and occasional slag.	Agberoubwe 2011	ALS
11.028341	2.879514	280	26/02/2011	ALS300	Pottery scatter (Wavy line).	Agberoubwe 2011	ALS
10.542634	2.728323	323	26/02/2011	ALS303	Settlement mound (?). Pottery concentration (Wavy line, Oil lamp) and slag.	Agberoubwe 2011	ALS
10.542114	2.728099	325	26/02/2011	ALS304	Tombs with pottery marker.	Agberoubwe 2011	ALS
10.542097	2.728117	323	26/02/2011	ALS305	Tombs with pottery marker.		ALS
10.542136	2.729047	325	26/02/2011	ALS306	Pottery concentration (Wavy line). Extension of GPS 303-304-305. Possible oil lamp recovered.		ALS
10.542552	2.728062	324	26/02/2011	ALS307	Brick extraction pit with pottery concentration (Wavy line). Extension of GPS 303–304–305. rfp-1, rc-1, incision.		ALS
11.84857	3.23347		6/02/2011	AH52	Site mentioned by Didier N'Dah in Nyame Akuma 2006		AH

Gazetteer One (*cont.*)

Lat	Long	Elevation	Date	Survey Ref	Description	Other info	Collector
12.23645	3.01351	181	16/02/2011	AH54	Between the hills and the river, a little height (breeze). Site with tuyère, furnace walls, slag, many sherds. Scattered stones – slag? Structures?		AH
12.26052	3.00173	162	16/02/2011	AH57	Field with baobabs. Collect the shards in the gullies. Probably an old site, very deteriorated.		AH
12.2016	3.02249	166	16/02/2011	AH59	Very eroded furnace. Rc-1		AH
12.20015	3.02238	166	6/02/2011	AH60	Furnace area, very eroded ceramic clusters. Isolated shards (not collected because not in situ).		AH
12.16451	3.04759	172	6/02/2011	AH67	Exceptional ceramics on site, found by Didier. Rfp-1, incision, rc-1.		AH
12.09407	3.1587	172	16/02/2011	AH70	Site with rare sherds.		AH
12.06179	3.19405	164	17/02/2011	AH71	Some shards, eroded and few, in a gully erosion.		AH
11.85994	3.24347	179	17/02/2011	AH80	Mound already reported by Didier in Nyame Akuma 2006, on the edge of the road. Gentle slope, cultivated. Large ceramic slag. Few bones; 1 pearl. Visited 14/02/11 and 17/02/11.		AH
11.87994	3.24961	170	17/02/2011	AH83	Pot sherds in an isolated field. rfp-1.		AH
11.68589	3.55227	167	22/02/2011	AH87	Slag heap.		AH
11.68296	3.55121	176	22/02/2011	AH88	Series of eroded furnaces. Slag, clay, no apparent tuyère except on one possible location. No potsherds. On a hill in the foothills, Nigeria border. rc-1		AH
11.7803	3.42626	171	22/02/2011	AH94	Around 5.04 km from the river Sota. The road cuts a site. There are abundant and very large sherds. Some slag.		AH
11.79729	3.38256	150	22/02/2011	AH100	Lithic cutting workshop? To the left of the road, on a ridge, just after the bridge of the Sota towards Bodjekali. Rfp-1		AH
11.65613	3.18716	199	22/02/2011	AH101	Slight elevations scattered sherds. Sherds scattered in a cotton field. Large baobab trees, water about 100m. Rc-1, slag.	Transect 27–65.5km from Kandi	AH
11.65705	3.18627	199	22/02/2011	AH102	Slight elevations, scattered sherds. Baobabs. Near a river. Rfp-1, slag.	Transect 27–65.5km from Kandi	AH
11.62991	3.177	202	22/02/2011	AH106	Stream erosion, with sherds running down the wall, similar to the case in the Mekrou. Sherds, slag grinding fragments. Rfp-1, rc-1	62km Kandi	AH
11.63042	3.17883	183	22/02/2011	AH107	Slag heaps. Few sherds or worn or undecorated. The old road cut a big group of furnaces. Rc-1		AH
11.55908	3.11827	237	24/02/2011	AH108	Prospecting along a stream, 24/02/11, to Goungoun. Grass cover, no baobabs. Concentration of highly eroded small sized sherds. Rc-1, slag		AH

Gazetteer One (*cont.*)

Lat	Long	Elevation	Date	Survey Ref	Description	Other info	Collector
11.56134	3.11968	217	24/02/2011	AH109	Prospecting along a stream, Goungoun. Grass cover, no baobabs. Concentrations sherds very eroded and small.		AH
11.56205	3.12117	234	24/02/2011	AH110	Prospecting along a stream, Goungoun. Grass cover, no baobabs. Concentrations sherds very eroded and small.		AH
11.4815	3.0828	284	24/02/2011	AH111	Prospection attracted to the greenery and the baobabs. Depression and baobabs. Harvested field-grooves and stems. Slag, tuyère base, frequent sherds, thick.		AH
11.48123	3.08178	270	24/02/2011	AH112	Dense vegetation, no crops (hunting area?). Slag and sherds, pile of rubble		AH
11.33101	3.04498	286	24/02/2011	AH114	Scattered potsherds. Close to Angaradebou in a field near Bell Benin beacon.		AH
11.28651	3.03112	297	25/02/2011	AH118	Transect 31, 25/02/11, hills near Thui. Potsherd isolated in a field. Few slag fragments.		AH
11.28651	3.03099	297	25/02/2011	AH119	Potsherd isolated in a field. Increasing numbers of slag fragments. Rfp-1		AH
11.26236	3.0771	283	25/02/2011	AH127	Furnaces at Lolo (61 points taken in total at individual furnaces: AH127–187).		AH
11.24482	2.99631	267	26/02/2011	AH191	Transect 32, 26/02/11. 6 km north of Thui, at the health centre in Regina Pacis Kofoissa. Sherds isolated in a field. Thick (1.5 cm) and undecorated.		AH
11.24496	2.99519	267	26/02/2011	AH192	Small concentration of potsherds. Field near of an existing home. One rfp-1. Rc-1.		AH
11.18179	2.95247	263	26/02/2011	AH193	Baobabs. Isolated sherds. Incision.	33. Kpeede transect.	AH
11.18212	2.95039	267	26/02/2011	AH194	At the foot of a baobab tree. Scattered sherds.		AH
11.18263	2.94923	268	26/02/2011	AH195	At the foot of a baobab tree. Concentration of sherds. Separated from GPS AH194 by a cotton field, but otherwise may be the same site. Sherds large sized and thick. Some pounding stones, no slag. Almost intact pottery found at AH196, probably same site.		AH
11.18333	2.95596	263	26/02/2011	AH197	Site under a school.		AH
12.322463	2.819797		27/01/2012	ALS346	Artefacts scatter. Pottery.		ALS
12.344048	2.83795		27/01/2012	ALS347	Furnace (captive slag).		ALS
12.342664	2.85676		29/01/2012	ALS405	Sq sampled. Pottery.		ALS
12.341534	2.856719		29/01/2012	ALS409	Sq. Sampled. Dense artefacts scatter. Pottery.		ALS
12.34948	2.84867			AH205	Small mound adjacent to modern houses. rfp-1, twisted cord, incision, no surface collection.		AH
12.31565	2.82165			AH209	Former Pekinga birni		AH

Gazetteer One (*cont.*)

Lat	Long	Elevation	Date	Survey Ref	Description	Other info	Collector
12.31466	2.82159			AH210	Well		AH
12.31478	2.82148			AH211	Scattered potsherds on medium mound		AH
12.30925	2.83653			AH212	Scattered potsherds		AH
12.34292	2.84496			AH214	Scattered potsherds, possibly some in situ? On path, so disturbed.		AH
12.34249	2.84802			AH216	Rock-cut well 6.5m deep. Named agusa after Boubé Gado's terminology		AH
12.34287	2.85718			AH217	Series of rises abutting the hills within site of Pekinga birni showing evidence of continuous occupation in pottery. Seems homogeneous but is cut by gullies.		AH
12.09993	3.16725	172		AH220	10 furnaces with slag tuyère fragments and potsherds no photos. Several collapsed furnaces surrounded by hills.		AH
12.29791	2.79353			AH226	furnace with Pekinga in background.		AH
12.34453	2.83805			AH227	Potsherd scatter.		AH
12.33742	2.85658			AH228	Dense pottery and ashy. Pottery continues up onto hill with possible retaining walls and structures with alignments of lateritic blocks. Scatter continues other side of gully.		AH
12.34081	2.85128			AH229	Other side of gulley from above		AH
12.239889	3.013083	175	14/01/2013	Kompa Dune Fourneaux	Village just near recent establishment of 'Malian of Gao' who came to put their fields there because of the water.		AH
12.23696	3.01222		15/01/2013	Kompa	Small site next to the mountains. Few sherds, very eroded.		DN
12.23425	3.01038		15/01/2013	Kompa	An isolated mound with furnace, good preservation with slag present.		CRB
12.23401	3.01017		15/01/2013		Furnace site at the bottom of the mountains		CRB
12.23014	3.00959		15/01/2013		Mound		CRB
12.225583	3.011194		17/01/2013		Mound		CRB
12.225917	3.011639		17/01/2013		Mound		CRB
12.225806	3.01175		17/01/2013		Mound		CRB
12.222278	3.013333		17/01/2013		Mound		CRB
12.22175	3.013778		17/01/2013		Mound		CRB
12.221	3.013861		17/01/2013		Mound		CRB
12.220278	3.013833		17/01/2013		Mound		CRB
12.21775	3.0165		17/01/2013		Mound		CRB
12.216917	3.016278		17/01/2013		Mound		CRB
12.209639	3.023639		12/01/2013		Mound		CRB

Gazetteer One (*cont.*)

Lat	Long	Elevation	Date	Survey Ref	Description	Other info	Collector
12.209528	3.023917		12/01/2013		Mound		CRB
12.231194	3.014167		12/01/2013		Mound		CRB
12.225889	3.01125		17/01/2013		Furnace		CRB
12.235639	3.011222		15/01/2013		Medium-sized, slightly elevated mound with dispersed pottery sherds.		NK
12.22845	3.0142		15/01/2013		Slightly elevated mound truncated by a trackway. Heavily eroded with very dispersed, eroded pottery sherds.		NK
12.236944	3.013806	175	16/01/2013		Mound with pottery sherds on the surface, some finds are dispersed but some are concentrated.		AH
12.234417	3.014111	174	16/01/2013		Mound with high density of slag and pottery.		AH
12.234417	3.013889	176	16/01/2013		Eroded mound close to the pyramid of sherds.		AH
12.234056	3.014194	172	16/01/2013		Furnace site with rare sherds and fragmented slag.		AH
12.236556	3.014194	170	16/01/2013		Eroded mound with fragmented sherds on the surface. Site cut by the road.		AH
12.225472	3.01225	179	17/01/2013		Unknown		AH
12.225806	3.012167	176	17/01/2013		Large site with dispersed but large pottery sherds.		AH
12.223722	3.013667	174	17/01/2013		Unknown		AH
12.22429	3.01298		17/01/2013	GPS LC 1	Large settlement mound with RFP and cord decorated sherds.		LC
12.223056	3.013889		17/01/2013		Mound, eroded with few sherds.		LC
12.222917	3.013556		17/01/2013		Mound		LC
12.23175	3.014306		17/01/2013		Mound, with laterite		LC
12.2225	3.014222	170	17/01/2013		Site on river bank with sherds exposed in the section. No stratigraphy clear.		AH
12.223083	3.014167	170	17/01/2013		Unknown type, small and eroded pottery sherds		AH
12.20925	3.024944	165	17/01/2013		Unknown, flat mound		AH
12.2085	3.026139	168	17/01/2013		Unknown, dispersed sherds		AH
12.209861	3.024194	169	17/01/2013		Mound		AH
12.22858	3.01358		17/01/2013		Mound, slightly elevated, dispersed pottery sherds.		NK
12.225889	3.011917	179	17/01/2013		Site with visible sherds every where, site cut by the river.		AH
12.230944	3.014139	176	17/01/2013	Butte 2	Mound, eroded		AH
12.231	3.014306	178	17/01/2013	Butte 1	Mound, eroded with few sherds.		AH

Gazetteer One (*cont.*)

Lat	Long	Elevation	Date	Survey Ref	Description	Other info	Collector
12.227583	3.009833		17/01/2013		Mound, a few small, eroded pottery sherds coming out of sediment retained by tree		AH
12.23033	3.00764		17/01/2013		Unknown, eroded slope. Small, concentrated pottery sherds.		NK
12.22868	3.01457		17/01/2013		Small mound on a slight elevation with eroded pottery.		NK
12.217389	3.018722		17/01/2013		Unknown, large pottery sherds and site cut by river.		AH
12.22709	2.012		17/01/2013		Unknown in nature but mound-like site eroded by the river. Cut by gulley. Mixture of concentrated sherds on mound area but dispersed in gulley.		NK
12.22685	3.01171		17/01/2013		Mound, eroded by gulley (same as above).		NK
12.22597	3.01131		17/01/2013		Mound with at least four fragmented complete rouletted pots that are probably in-situ.		NK
12.22431	3.01352		17/01/2013		Mound with concentrated small pottery sherds.		NK
12.22296	3.01477		17/01/2013		Slightly elevated mound cut by a stream/ gulley. Concentrations of eroded pottery sherds present.		NK
12.239389	3.012694	184	18/01/2013		Large site with furnace. Dispersed material including slag and pottery sherds. Sherds are very small.		AH
12.238306	3.014167	172	18/01/2013		Unknown, small site with dispersed sherds.		AH
12.238389	3.013833	171	18/01/2013		Unknown		AH
12.237972	3.013333	178	18/01/2013		Unknown, eroded and cut by trackway. Sherds lie close to our excavated mound, but does not appear to be continuous between the two, but difficult to determine due to grass cover.		AH
12.237694	3.013667	178	18/01/2013		Mound, very degraded with small sherds that are dispersed.		AH
12.231361	3.008056	179	18/01/2013		Unknown, located in a dip between hills. Laterite nodules present with burnt earth fragments.		AH
12.232111	3.00775	179	18/01/2013		Heavily eroded slope with dispersed pottery sherds.		AH
12.232139	3.009056	175	18/01/2013	A3	Site		AH
12.232	3.007972	177	18/01/2013	A1	Unknown, fragments of pottery are heavily eroded and trodden surface, but some large sherds including a perforated sherd, maybe not in situ as we are clearly on a modern thoroughfare.		AH

Gazetteer One (*cont.*)

Lat	Long	Elevation	Date	Survey Ref	Description	Other info	Collector
12.236056	3.009944	182	18/01/2013		Furnace by the leaning tree' described by CRB.		AH
12.232944	3.008722	174	18/01/2013	A5	Clearly a mound, quite elevated in its surroundings. Alignment of stones that could signal structures.		AH
12.232194	3.008889	172	18/01/2013	A4	Unknown, likely continuation of A2 and A3, from which is separated by dips. Small sherds present.		AH
12.232	3.00875	179	18/01/2013	A2	Unknown, eroded site close to river but stops short of it and does not continue onto other side.		AH
12.110611	3.157833		27/01/2013	MAC5	Mound disturbed by farming. Presence of some large pottery sherds.		BM
12.112	3.157278		27/01/2013	MAC 6	Mound, with considerable amount of pottery sherds. Site very disturbed by farming.		BM
12.110222	3.158611		27/01/2013	MAC 8	Kind of mound with dispersed pottery sherds. Eroded site.		BM
12.1105	3.158833	169	27/01/2013	MAC 9	Mound with large sherds but sparse in distribution. Possibly washed in from MAC 8.		AH
12.108889	3.160361		27/01/2013	MAC 10	Mound		BM
12.102694	3.165444		27/01/2013	MAC 11	Mound, with slag present but no furnace.		BM
12.113028	3.156	172	27/01/2013	MAC 1	Mound, eroded.		AH
12.11125	3.156083		27/01/2013	MAC 2	Flattened mound where material appears most abundant on top of slope.		AH
12.111806	3.15675	170	27/01/2013	MAC 3	Quite prominent elevated mound. Pebble-ey and disturbed by agriculture.		AH
12.111444	3.157528	169	27/01/2013	MAC 4	Mound		AH
12.111361	3.157694	173	27/01/2013	MAC 4	Mound		AH
12.110611	3.158722	167	27/01/2013	MAC 4	Mound		AH
12.111083	3.158194	161	27/01/2013	MAC 4	Mound		NK
11.923083	3.216689		29/01/2013		Small mound with concentrated pot sherds.		NK
11.954778	3.218972		29/01/2013	DP13-1	Mound with some cultivation. Erosion present on surface and very concentrated pottery sherds. Evidence of lithics and complete pot. Pottery pavement also present.		NK
11.950306	3.215944		29/01/2013	DP13-2	Slightly elevated settlement mound, very large. Limited erosion so dispersed pot sherds which are not clear.		NK
11.965583	3.215		29/01/2013	DP13-3	Mound with dispersed decorated pottery.		NK
11.940056	3.201056		30/01/2013	Bontas Tonga	Mound close to river channel. Finds include small hand axe, pottery pavements, large pot sherds and almost complete pot.		NK

Gazetteer One (*cont.*)

Lat	Long	Elevation	Date	Survey Ref	Description	Other info	Collector
11.938972	3.204083	169	31/01/2013		Small, flat sparsely vegetated site with isolated pot sherds.		NK
11.938222	3.196806		30/01/2013		Eroded small site by the river.		NK
11.9425	3.193028		30/01/2013	GPS Di 13-14	Unknown site with small pot sherds and traces of a pavement.		AH
11.942044	3.193111		30/01/2013	GPS Di 13-13	Unknown		AH
11.941333	3.193806		30/01/2013	GPS Di 13-12	Unknown in nature, pavement present.		AH
11.940694	3.193639		30/01/2013	GPS Di 13-11	Unknown		AH
11.941917	3.192833		30/01/2013	GPS Di 13-15	Very flat site close to the Alibori.		AH
11.941083	3.193444	160	30/01/2013		Very flat site with fragments of pottery.		NK
11.948417	3.173694		31/01/2013		Very flat, eroded unvegetated site. Grindstone present on the surface.		NK
11.948472	3.182806		31/01/2013		Flat and unvegetated site with evidence of lithics.		NK
11.945028	3.187139		31/01/2013		Flat, unvegetated site that is truncated by the road. Finds are generally dispersed but are partially concentrated in some areas. Potsherd pavement and lithics are also present.		NK
11.940361	3.200778		31/01/2013		Sparsely vegetated site along an eroded relic river channel. River bed has pot sherds. Sherds are very abraded, FSR present.		NK
11.956694	3.175722		01/02/2013		A small cluster of elevations with dispersed pottery and slag.		BM
11.954361	3.177861		01/02/2013		Mound with erosion, entirely cultivated and very disturbed. Sherds are dispersed on the surface.		BM
11.95991	3.17422		01/02/2013	DI 13-11	Mound with presence of pavement and lithic material.		BM
11.96161	3.17477		01/02/2013	DI 13-9	A large mound with a small mound adjoined with a great concentration of pottery on the surface.		BM
11.96202	3.17263		01/02/2013	DI 13-10	Mound with lithics and pottery sherds.		BM
11.950889	3.179611		01/02/2013		Eroded mound with small sherds on surface.		NK
11.948389	3.180972		01/02/2013		Flat, large, unvegetated site with pottery pavement.		NK
11.95122	3.17966		01/02/2013	DP13-23	A prehistoric site on a slight elevation, on the base of a rocky escarpment. An area with source material for knapping present. No flakes, but evidence of worked stone.		NK
11.954444	3.179528		01/02/2013		Low concentration of pottery in a highly cultivated area. Extents of site are not clear.		NK
11.952111	3.178861		01/02/2013		Small site with large concentrations of lithic material.		NK

Gazetteer One (*cont.*)

Lat	Long	Elevation	Date	Survey Ref	Description	Other info	Collector
11.949167	3.1795		01/02/2013		Cultivated settlement mound with dispersed pottery sherds.		NK
11.958556	3.17425		01/02/2013		Mound with few pottery sherds but many flakes and lithics.		NK
11.799028	3.513		03/02/2013		Unknown		AH
11.794972	3.508444		03/02/2013		Low, elevated mound which is subtle but visible. Cultivated but currently not vegetated, very arid. Dispersed pottery sherds.		NK
11.797722	3.513389		03/02/2013	DP13-26	Slightly elevated mound, cultivated with dispersed pottery sherds		NK
11.780472	3.428028		03/02/2013		Mound, disturbed by road.		NK
11.813694	3.520972		03/02/2013		Large settlement mound by the roadside. Concentrated material culture on surface.		NK
11.780583	3.426333		03/02/2013		Site destroyed by machine.		NK
11.934194	3.208944		04/02/2013		Mound c. 3ha in size. On the Alibori River bank. Site is cultivated with cotton. Fragmented sherds which are dispersed.		DND
11.934639	3.217444		04/02/2013	DP13-27	Very slight 'slim' settlement mound. Very dispersed undecorated pot sherds.		NK
12.06225	3.171222		04/02/2013		A series of small settlement mounds connected by dispersed pottery scatter.		NK
11.935139	3.210417		04/02/2013	DP13-28	Settlement mound close to the Alibori River. Dispersed, mainly undecorated pottery sherds.		NK
11.962056	3.219333		05/02/2013		Mound with lithics and pottery sherds.		DND
11.963722	3.217611		05/02/2013		Mound with partial destruction by farmers. Situated on cotton field. Artefacts visible on the surface with a high concentration.		DND
11.96397	3.20651		05/02/2013	DP13-31	Flat, unvegetated site with slag and lithics. Very few pot sherds.		NK
11.96508	3.21501		05/02/2013		Small mound with very small undecorated pottery sherds.		NK
11.96553	3.21495		05/02/2013	DP13-29	Mound, cultivated with very few pottery sherds. But very clearly a mound.		NK
11.966028	3.194278		06/02/2013		Mound with lithics and pottery sherds.		DND
11.96197	3.17602		06/02/2013	DP13-27	Mound		NK
11.9617	3.17726		06/02/2013	DP13-33	Settlement mound close to the Alibori River. Connected to a series of mounds.		NK
11.96182	317723		06/02/2013	DP13-34	Mound (part of a series of mounds)		NK
11.96193	3.17713		06/02/2013	DP13-35	Mound (part of a series of mounds)		NK

Gazetteer One (*cont.*)

Lat	Long	Elevation	Date	Survey Ref	Description	Other info	Collector
11.96219	3.17639		06/02/2013	DP13-36	Mound (part of a series of mounds). All of the mounds are small but collectively probably make a larger site. Site has large and small decorated sherds.		NK
11.96942	3.20612		06/02/2013	DP13-32	Flat, unvegetated site with very dispersed sherds and lithics		NK
11.977778	3.139611		07/02/2013	Gorou Kambon	Mound with presence of furnace, situated on the foot of a large mound with pottery sherds. Sherds are highly concentrated with interesting decorations. Some slag fragments.		DND
11.96133	3.16793		07/02/2013	DP13-46	Slightly raised mound which is close to the Alibori. Pottery highly concentrated.		DND
11.96157	3.166		07/02/2013	DP13-45	A series of small mounds.		NK
11.95947	3.15828		07/02/2013	DP13-43	Mound with concentrations of pottery sherds close to eroded areas.		NK
11.97773	3.13957		07/02/2013	DP13-40	Mound with possible furnace. Potsherd pavement and whole pot, possibly insitu.		NK
11.97932	3.1639		07/02/2013	DP13-39	Mound with concentrated and dispersed pottery sherds. Decorated and non-decorated sherds with possible pavement but hard to tell.		NK
11.96849	3.1286		07/02/2013	DP13-42	Mound next to a pre-existing settlement close to the Alibori River. Site has stone circles, unclear what these are. Possible graves?		NK
11.97569	3.17859		07/02/2013	DP13-38	Slim settlement mound under cultivation. Extent of site is unclear. Large pieces of decorated pottery present.		NK
11.96133	3.16793		07/02/2013	DP13-46	Flat site by the roadside and the river, slight elevation. Site reaches the river but is truncated by the road. Some areas of concentrated pottery sherds and some dispersed. Evidence of pottery pavement.		NK
11.96258	3.1649		07/02/2013	DP13-44	Flat site with erosion. Dispersed pottery sherds.		NK
11.96154	3.16386		07/02/2013		Site with possible furnaces. Slag and pottery present.		NK
12.059722	3.1925		11/02/2013		Eroded mound close to the river. Some pottery and lithics on the surface.		DND
12.025722	3.211194		11/02/2013		cultivated mound close to the river. Pottery on the surface,		DND
12.024667	3.209444		11/02/2013		A small cultivated mound.		DND
11.963778	3.167556		11/02/2013	Tondi Bouka	Mound with high concentration of pottery and lithics.		DND

Gazetteer One (*cont.*)

Lat	Long	Elevation	Date	Survey Ref	Description	Other info	Collector
11.961972	3.172556		11/02/2013	Tondi Bouka	Very large settlement mound c.23ha. Pottery pavements present. Site well preserved with high concentrations of pottery sherds with diverse decorations. Site would be interesting to study.		DND
11.963611	3.16575		11/02/2013	Tondi Bouka	Small mound with pavements and pottery and lithics.		DND
11.963778	3.161972		11/02/2013	Tondi Bouka	Mound slightly raised. Evidence of pavements and pottery is highly concentrated.		DND
11.966167	3.162639		11/02/2013	Tondi Bouka	Low settlement mound with good preservation of lithics which are dispersed.		DND
11.965111	3.165972		11/02/2013	Tondi Bouka	Slightly raised mound with pottery and pavements. Also presence of lithics.		DND
12.099861	3.166306		11/02/2013		Large mound that has been cultivated. Lots of artefacts on the site including lithics.		DND
12.097778	3.165222		11/02/2013		Large mound with presence of rare pottery that was almost absent. Concentrated presence of slag and lithics.		DND
12.088444	3.17675		11/02/2013		A small mound with the presence of a furnace. Presence of lithics, potteries and slag on surface.		DND
12.088778	3.176472		11/02/2013		Cultivated, small mound with concentrated areas of slag.		DND
12.062583	3.1815		11/02/2013		A large mound with three adjoining mounds. Site is eroded and not cultivated. Strong concentration of lithics.		DND
12.062556	3.184667		11/02/2013		Small mound close to the river and under cotton farming. Some pottery concentrated in one part of the site.		DND
12.062528	3.192833				Small, eroded mound with lithics across the whole site.		DND
11.74489	3.2684		11/02/2013		Flat area with pottery		DND
12.09927	3.16973			DP13-53	Large mound with dispersed pottery sherds. This area has a high concentration of cultivated mounds.		NK
12.099436	3.166483		11/02/2013		Site on the river bank with high concentration of lithics.		
12.08276	3.18052		11/02/2013	DP13-56	Slim settlement mound next to the Niger. High concentration of lithics. Near Karimama.		NK
12.063387	3.18		11/02/2013	DP13-57	Very steep mound with many lithics.		NK
12.063017	3.184227		11/02/2013	DP13-58	Slim mound with high concentration of lithics and close to a dry river bed.		NK
12.05899	3.1921		11/02/2013	DP13-59	Large settlement mound with small amounts of pottery. The rest maybe buried. Pottery is present in eroded areas and includes perforated sherds.		NK

Gazetteer One (*cont.*)

Lat	Long	Elevation	Date	Survey Ref	Description	Other info	Collector
12.05956	3.19261		11/02/2013	DP13-60	Lateritic slim mound with no vegetation. Complete pot visible on the surface.		NK
12.040383	3.203389		11/02/2013	DP13-61	Small slope eroded mound. Lithics and pottery present, very dispersed.		NK
12.026692	3.210985		11/02/2013	DP13-62	Settlement mound close to the Birni Lafia to Karimama road. Niger River in view of site. Dispersed pottery sherds.		NK
12.022565	3.209587		11/02/2013	DP13-65	Small mound with dispersed pottery sherds.		NK
12.024616	3.209446		11/02/2013	DP13-64	Mound cut by the road with pottery fragments.		NK
11.963622	3.168202		11/02/2013	DP13-641	Flat area with pottery, next to school. Site disturbed by habitation.		NK
11.964562	3.166331		11/02/2013	DP13-651	Slim mound with high concentration of pottery and red laterite. Next to fossil valley.		NK
11.964659	3.166134		11/02/2013	DP13-66	Flat, unvegetated site. Concentrated artefacts.		NK
11.963617	3.165763		11/02/2013	DP13-67	Flat, unvegetated with laterite. Potsherd pavement present.		NK
11.96511	3.165615		11/02/2013	DP13-68	Small, unvegetated area with dense pottery collection. Very large, thick sherds of pottery on the surface.		NK
11.966559	3.164831		11/02/2013	DP13-69	Large, flat, unvegetated site with lithic flakes, and pottery sherds. Some areas of concentrated finds but on the whole very disturbed.		NK
11.9677	3.16302		11/02/2013	DP13-70	Eroded strip close to the river with nice lithics.		NK
11.96524	3.16209		11/02/2013	DP13-71	Flat, unvegetated eroded settlement area close to fossil valley. Probable pottery pavement present.		
11.964499	3.16219		11.02/2013	DP13-72	Eroded site with lots of pottery.		NK
11.963875	3.162528		11/02/2013	DP13-73	Small, slim mound next to modern village. Partly cultivated and partly eroded. Interesting circular feature present. Also similar pot to TTK11 noted.		NK
11.961502	3.164804		11/02/2013	DP13-731	Possible furnace with nearby pot, site truncated by the road.		NK
11.96139	3.162921		11/02/2013	DP13-75	Unvegetated, flat are with lithics and pottery.		NK
12.099717	3.167325		11/02/2013	DP13-50	Very large settlement mound. Dispersed pottery.		NK
12.100015	3.168547		11/02/2013	DP13-51	Large mound close to the Niger River. Cultivated so difficult to identify sherds. Some areas have a high concentration of pottery.		NK

Gazetteer One (*cont.*)

Lat	Long	Elevation	Date	Survey Ref	Description	Other info	Collector
12.100033	3.169117		11/02/2013	DP13-52	Mound, possibly a continuation of the site above. Five more survey sheets were filled out for the same site describing the large mound with dense pottery sherds in some areas.		
11.958417	3.157861		12/02/2013	Sven-3	Mound with burnt looking surface material. Eroded area.		SL
11.961556	3.162472		12/02/2013	Sven-2	Flat surface above previous site with evidence of burnt material.		SL
11.961417	3.162694		12/02/2013	Sven-1	Small mound, sparsely vegetated with evidence of erosion.		SL
12.09834	3.16894		27/01/2013	CRB GOB13 S1	Iron site on anthropogenic mound	Gourouberi	CRB
12.23425	3.01038		15/01/2013	CRB 1			CRB
12.23401	3.01017		15/01/2013	CRB 2			CRB
12.23014	3.00955		15/01/2013	CRB 3			CRB
12.22585	3.00796		17/01/2013	CRB 19			CRB
12.23696	3.01222		18/01/2013	CRB K		Kompa Moussekoubou	CRB
12.23382	3.0101		18/01/2013	CRB f14		Kompa Moussekoubou	CRB
12.33949	2.85491		22/01/2013	CRB 20	Small site 15 metres from the cliff. Site is under cultivation with no visible furnace. Sherds: rare. Slag: reducing slag, identical to Kompa Moussekoubou, slag internal castings millet type, tuyères.		CRB
12.33973	2.85233		22/01/2013	CRB 21	Medium size site around 40 metres in diameter. Site at the entrance to a valley against a slope, eroded in nature, dispersed pot sherds and fragments of slag reduction.		CRB
12.33931	2.85157		22/01/2013	CBR 23	Medium size site at the entrance of a valley. Concentrated material culture including reduction slag which is extremely fragmented.		CRB
12.33945	2.85165				Small site at the entrance of a valley. Internal slag present.		CRB
12.33936	2.85155				Small site at the entrance of a valley.		CRB
12.33924	2.85161				Small site at the entrance of a valley. Concentrated artefacts, fragmented slag.		CRB
12.33916	2.85171				Small site, 11m × 70m × 50m tall. At the entrance of a valley. Concentrated artefacts, slag.		CRB
12.33943	2.8515				Small site at the entrance of a valley. Concentrated artefacts, slag.		CRB
12.33928	2.85151				Site at the entrance of a valley		CRB

Gazetteer One (*cont.*)

Lat	Long	Elevation	Date	Survey Ref	Description	Other info	Collector
12.33934	2.85151				Small site at the entrance of a valley. Concentrated artefacts, slag, tuyères.		CRB
12.33947	2.85157				Site with slag.		CRB
12.33948	2.85118				Small site 5 metres in diameter, large internal slag fragments with 8 nozzles stuck to the slag (see photo).		CRB
12.34095	2.84895		22/01/2013	CRB 24	Small, eroded, site 15 metres in diameter, at the foot of a cliff in a valley. Concentrated artefacts, fragmented slag reduction.		CRB
12.34086	2.84335		22/01/2013	CRB 25	Medium, eroded, site at the entrance of a valley. Concentrated finds, pottery rare, 3 furnaces with tuyères and internal slag blocks.		CRB
12.34009	2.84695		22/01/2013	CRB 26	Small, eroded, mound 50 metres in diameter, in a valley between a cliff. Dispersed, rare pottery and tuyères present.		CRB
12.3401	2.84697		23/01/2013	CRB 27	Medium site on a plain. Site is in a vegetated, savanna area. Dispersed material culture. Hearth wall, sherds, internal slag, large blocks, the presence of many coals in the slag. Slag plate with trace branches on the underside. Furnaces: 84 cm diam ext, 4.5 cm wall thickness, tapered chimney. No clusters		CRB
12.34099	2.84624		23/01/2013	CRB 28	Medium, eroded, mound, 40 metres in diameter, in a valley, close to the reduction site (record 29). Dispersed pottery.		CRB
12.34089	2.84587		23/01/2013	CRB 29	Small, eroded, mound, 15 metres in diameter, at the entrance of a valley. Dispersed pottery.		CRB
12.34106	2.84557		23/01/2013	CRB 30	Small, eroded, mound, 10 metres in diameter, in a valley, close to the site CRB 29. Dispersed pottery and large stone blocks.		CRB
12.34077	2.84521		23/01/2013	CRB 31	Medium, eroded, quarry site and ore sorting, 40 metres in diameter. Concentrated ore and stones, rare pottery.		CRB
12.34206	2.8434		23/01/2013	CRB 32	Eroded, quarry site and ore sorting at the bottom of a cliff. Isolated pot sherds.		CRB
12.34207	2.8423		23/01/2013	CRB 33	Medium size mound, eroded, 30 metres in diameter, at the bottom of a cliff. Dispersed pottery sherds.		CRB
12.34262	2.84232		23/01/2013	CRB 34	Very large iron site, 60 metres in diameter, with furnaces, spreading slag, located at foot of the cliff, near a trail that leads to the camp. Site is in a good state of preservation. Four aligning furnaces, in a circular formation, 2 m in diameter. Tuyère and slag plaque. Upflow of slag present.	One diagram	CRB

Gazetteer One (*cont.*)

Lat	Long	Elevation	Date	Survey Ref	Description	Other info	Collector
12.34192	2.84205		23/01/2013	CRB 35	Small iron site, with furnaces and slag spreads, 3 metres in diameter, at the bottom of a cliff. Site is in a good state of preservation. Base slag with many traces of plants. Furnace surrounded by stone block: 103 cm diam ext, 14 cm wall thickness. Tuyères used in the furnace wall.	One diagram	CRB
12.3423	2.83853		23/01/2013	CRB 36	Large ironworking site (29.30m × 45.30m in diameter, 1 m high) with 4 clusters of fused slag and 1 isolated, 8 bottoms, 200 metres from the cliff. Site is in a good state of preservation. 8 bases: 44 cm diameter, 72 cm diameter, 70 cm diameter, 65 cm diameter, 55 cm diameter, 50 cm diameter, 45 cm diameter, 65 cm diameter, 25 cm high.		CRB
12.34322	2.83872		23/01/2013	CRB 37	Large, ironworking site (41 × 47 in diameter, 3–4 m high) with furnaces located on a plain, possible natural mound. Site is in a good state of preservation and under cultivation. Furnaces, with half moon tuyère. Upflow slag castings. Cinder blocks internal castings.		CRB
12.34252	2.83818		23/01/2013	CRB 38	Small, eroded, ironworking site with a slag head, 10 metres in diameter, located on a plain. CRB sites 36, 37 and 38 are near and west of the Fulani camp. Large furnace bottom. Slag internal flows.		CRB
12.3414	2.83842		23/01/2013	CRB 39	Small, Eroded, ironworking site with furnace, 1.5 metres in diameter, located on a plain. Completely eroded furnaces.		CRB
12.34141	2.83842		24/01/2013	CRB 40	Large anthropogenic mound, 80mx50m in diameter orientated north to south. Site is under cultivation with good preservation. Concentrated material culture, sherds with interesting decor. Forge slag (base). Tuyères. Reducing slag: rare. Polishing tools.		CRB
12.19186	3.02172		24/01/2013	CRB 41	Eroded, anthropogenic mound with ironworking site, average in size 33 × 15.50 m in diameter, 3 m high, oriented north-south with the majority of slag in the south. Around 20 m from site CRB 40. Sherds with varied decorations (inc. perforations) Tuyères. Slag plaque. Slag internal castings millet type.		CRB
12.19201	3.02101		24/01/2013	CRB 42	Ironworking site with slag heaps. Average size, 28 × 25 m in diameter, 5 m high, and north-south orientation. Located on a plain, 33 m away from site CRB 40. Site is under cultivation with good preservation. Tuyères present, internal slag castings. Circular millet shaped slag, within sandy-clay.	Faïssikwara	CRB

Gazetteer One (*cont.*)

Lat	Long	Elevation	Date	Survey Ref	Description	Other info	Collector
12.19979	3.02309		24/01/2013	CRB 43-1	Large ironworking site (13 × 7.5m in diameter and 10 × 8 m in diameter, 0.5 m high). At least 30 remote furnaces a few meters from each other. Located on degraded plain with no trees. Good preservation. Pottery sherds, slag sandy-clay, slag plaque. Slag external castings and tuyères.	Bobossaykoukou	CRB
12.19929	3.02358		24/01/2013	CRB 43-2	As above?		CRB
12.19788	3.02255		24/01/2013	CRB 44	Eroded, anthropogenic mound, small in size, 3 metres diameter located on a plain. Concentrate sherds and slag reduction.		CRB
12.19799	3.02278		24/01/2013	CRB 45	Small ironworking site with heaps of slag, 4 × 2 metres in diameter. Good preservation.		CRB
12.19719	3.02242		24/01/2013	CRB 46	Eroded, small anthropogenic mound, 3 metres in diameter, located on a plain. Concentrated pot sherds.		CRB
12.19742	3.02241		24/01/2013	CRB 47	Small, eroded, anthropogenic mound, 10 metres in diameter, located on a plain. Concentrated sherds and slag reduction.		CRB
12.1974	3.0224		25/01/2013	CRB 48	Ironworking site comprised of several areas, 1 large, 3 average and 1 small. The large seems set on a mound of sand. 90 m in diameter 5 clusters slag aligned in an arc. Located on a plain around 8.5 km from Kompa. Good preservation. Tuyères, slag internal castings. millet shaped slag, slag sandy-clay. Slag plaque. Slag external flows.	Tchantchou	CRB
12.17616	2.96765		25/01/2013	CRB 49	Large ironworking site with 10 slag heaps aligned in an arc with one isolated southernmost, located on a plain. Good preservation. Sherds: rare, tuyères, slag external castings, slag internal castings, slag sandy-clay and oxidized slag.	Tchantchou	CRB
12.17581	2.96715		25/01/2013	CRB 50	Medium sized, eroded, ironworking site with 3 spreads of slag with 3 residual content, located on a plain, 32 metres from the last cluster of the site CRB 49. Concentrated artefacts pot sherds and slag. Same Site CRB 49.		CRB
12.17798	2.96819		25/01/2013	CRB 51	Large, eroded, ironworking site, 50 metres in diameter, with ten clusters of isolated slag. Located on plain, near a south facing anthropogenic mound, 15 m in diameter, 0.5 m high. Dispersed pot sherds. Slag tuyère.		CRB
12.17466	2.9684		25/01/2013	CRB 52	Large ironworking site with 4 west facing slag heaps located on a plain. Good preservation. Concentrated slag. Same as CRB 51.		CRB

Gazetteer One (*cont.*)

Lat	Long	Elevation	Date	Survey Ref	Description	Other info	Collector
12.174	2.96915		25/01/2013	CRB 53	Ironworking site with 2 slag heaps. Located on a plain where a trackway divides the site. Good preservation. Dispersed sherds with slag present. Same as CRB 51.		CRB
12.18669	2.99132		01/02/2013	CRB 54	Small, ironworking site with 3 large slag column bottoms, slag spread and located on a plain, eroded by a stream. Furnace, slag internal castings and fragmented slag and tuyères present.	Momasaga = water that comes out when you dig the earth. Directed to site by Kompa blacksmiths	CRB
12.19008	3.04138		01/02/2013	CRB a	Small, forge site, located on plain in the middle of a road. No finds.	Tourouè	CRB
11.78792	3.48177		03/02/2013	CRB Garou 1	Small, eroded, forge site located on the edge of the Niger. Concentrate slag from forge.	Djaboutchia	CRB
11.78685	3.46445		03/02/2013	CRB Garou 2	Small, ironworking site with 2–3 furnaces, located on a plain, eroded by stream. Dispersed finds, internal slag same as CRB Garou 1		CRB
11.81165	3.22154		03/02/2013	CRB Sakaran-1	Ironworking site located on a large, anthropogenic mound, around 50 metres in diameter and 1.5 metres high. There is a forge present. Concentrated finds, pot sherds, forged slag and slag reduction.		CRB
11.81133	3.22022		03/02/2013	CRB Sakaran-2	Ironworking site		CRB
11.47234	3.20526		03/02/2013	CRB NK 4	Small, eroded, ironworking site, 30 metres in diameter, located on a plain. Dispersed finds. Fragmentary wall. Tuyères: rare, clogged with slag. Internal slag with wall effect, traces of plants. Most internal slag.		CRB
12.00014	3.07977		04/03/2013	CRB 55	Ironworking site with slag spread, medium-sized, 3 m in diameter, 30 cm high. Located on a slope near a mound anthropogenic (Kofounou), eroded. Concentrated finds, 2 furnaces: recapping (4 layers), 53 cm in diameter int, ext 72 cm diameter, 13 cm thick. Sherds. Tuyères. Forge slag. Reducing slag: Internal slag millet type. Many internal slag plate. Some external castings slag		CRB
12.00012	3.0798		04/03/2013	CRB 56	Large, ironworking site with several clusters of slag. Located on both sides of a road, near a anthropogenic mound. Eroded. Concentrated finds, internal slag plate. Slag external flows. Furnaces. No traces of tuyères. Slag internal castings.		CRB
12.04331	3.12489		06/03/2013	CRB 57	Large ironworking site with many furnaces (48) located in a valley. Cut by a stream. Concentrated finds; slag internal flows. Slag plate. Tuyères crescents.		CRB

Gazetteer One (*cont.*)

Lat	Long	Elevation	Date	Survey Ref	Description	Other info	Collector
12.04348	3.1254		06/03/2013				CRB
12.04145	3.13098		06/03/2013	CRB 58			CRB
1203742	3.1327		06/03/2013	CRB 59-1			CRB
12.03397	3.1351		06/03/2013	CRB 59-2			CRB
12.03662	3.1354		06/03/2013	CRB 60	Small, ironworking site with piles of slag, 3 m in diameter and 0.5 m high, located in a valley. Under cultivation with slag in field. Concentrated finds, sherds near a small hill. Fragment wall. Tuyères. Slag very fragmented. Internal slag plate.		CRB
11.97555	3.19414		06/03/2013	CRB 61	Small, iron mining site located on a hill.		CRB
11.98271	3.19512		06/03/2013	CRB 62	Large site on a hill with possible iron mine.		CRB
11.26038	3.07802		08/01/2013	CRB 63-1	Ironworking site	Lollo	CRB
11.26394	3.07763		08/01/2013	CRB 63-2	Ironworking site	Lollo	CRB
11.2625	3.07936		08/01/2013	CRB 63-3	Ironworking site	Lollo	CRB
11.26023	3.07886		08/01/2013	CRB 63-4	Ironworking site	Lollo	CRB
11.25819	3.08252		08/01/2013	CRB 63-5	Ironworking site	Lollo	CRB
11.26332	3.07542		08/01/2013	CRB 64	Ironworking site	Lollo	CRB
12.14236	3.00471		14/01/2013	Kompa Moussekoubou	Ironworking site		
12.23425	3.01038		15/01/2013	Secteur Kompa Moussekoubou	Ironworking site		
12.23401	3.01017		15/01/2013	Secteur Kompa Moussekoubou	Iron mining site		
12.23014	3.00955		15/01/2013	Secteur Kompa Moussekoubou	Mound		
12.225889	3.01125		17/01/2013		Ironworking site		
12.225583	3.011194		17/01/2013		Mound		
12.225916	3.011638		17/01/2013		Mound		
12.225806	3.01175		17/01/2013		Mound		
12.222277	3.013333		17/01/2013		Mound		
12.22175	3.013778		17/01/2013		Mound		
12.221	3.013861		17/01/2013		Mound		
12.220277	3.013833		17/01/2013		Mound		
12.21775	3.0165		17/01/2013		Mound		
12.216917	3.016277		17/01/2013		Mound		
12.209639	3.023639		17/01/2013		Mound		
12.209527	3.023916		17/01/2013		Mound		
12.231194	3.014166		17/01/2013		Mound		

Gazetteer One (*cont.*)

Lat	Long	Elevation	Date	Survey Ref	Description	Other info	Collector
12.22585	3.00796		17/01/2013		Mound		
12.23382	3.0101		18/01/2013	Kompa Moussekoubou	Ironworking site		
12.097166	3.1702977	168	05/02/2014	GOK-14-01	Mound. Small site, cultivated and part eroded at its N-E side. Dispersed potsherds. Slag. Surface collection carried out.		BM
12.096099	3.1715454	170	05/02/2014	GOK-14-02	Mound, about 50cm high. Large site, cultivated. Dispersed potsherds. Surface collection carried out. 2 baobabs on the site, which is also crossed by a track linking Gorouberi village with the river. Located S-E of site GOK-14-01 and between the two occur potsherds.		BM
12.095588	3.1723611	171	05/02/2014	GOK-14-03	Mound. Large site, cultivated and part eroded. Dispersed potsherds (more abundant than on sites GOK-14-01 and -02; note that sparse potsherds occur between the 3 sites). Surface collection carried out. Pipe fragment. Baobab on site. Site crossed by a track between Gorouberi village and river.		BM
12.093576	3.1742647	175.325	05/02/2014	GOK-14-04	Large, prominent mound. At least 23 baobabs on site. Cultivated, and erosion at the east site has revealed lithics and pottery. Dispersed artefacts. Unusually high density of lithics, and DND commented the raw materials seem of interest. Again a certain continuity if potsherds with sites GOK-14-01 to -03. Surface collection carried out.		BM
12.088718	3.1764011	178.209	05/02/2014	GOK-12-05	Archaeometallurgical site. Small site, pottery and slag present. No surface collection.		BM
12.088036	3.176529	178.209	05/02/2014	GOK-12-06	Mound. Large site, cultivated and eroded at its east side and thus more artefacts visible there. Dispersed potsherds. Surface collection carried out. 2 baobabs on site.		BM
12.085674	3.1767365	177.968	05/02/2014	GOK-14-07	Mound. Large site, cultivated. Dispersed potsherds. Surface collection carried out. Perforated sherds noted, which had not been seen at sites GOK-14-01 to -06. Points GOK-07-01 to GOK-07-05 were taken to delimit the mound.		BM
11.84157	3.294342	180.131	18/02/2014	A04	Scattered potsherds in field, some quite large. Off transect so no formal survey sheet or description, but it resembled site marked by Ag017		AH

Gazetteer One (*cont.*)

Lat	Long	Elevation	Date	Survey Ref	Description	Other info	Collector
12.2166	2.980216	180.612	18/02/2014	A024	Mound with dense pottery, near-intact pots, quartz flakes, slag, 1 blue bead, perforated sherds, 3-dimensional rfp-1-decorated pottery ('pot stands'), possible pavements [photo 1270070]. On plateau. Other mounds in vicinity. Presently not cultivated. Small pottery collection carried out.		AH
12.29612	2.823302	201.761	18/02/2014	A025	Lantana mines. Two pits were found, the informants knew of a third but couldn't locate it in the scrub.		AH
12.29614	2.822524	201.04	18/02/2014	A026	Erosion gully close to Bonwalou lantana mines – identified by ALS as we searched for sites connected to mines. Small concentration of sherds, flat site on slope, cut by gully. No in situ layers visible. Near-intact pots, iron-rich stones. Impressionistic pottery collection carried out.		AH
12.23297	2.904461	195.993	18/02/2014	A028	Scattered potsherds, eroded site on slope. Lithics, near-intact pots, slag. Cattle track. Pisoliths, black stones, quartz flakes. Dark brown crust under which appears, in gullies, potsherds. Sherds are small, eroded and/or largely undecorated; rfp-1 + undecorated band. On hill opposite TTO trench.		AH
12.23439	2.905592	191.667	18/02/2014	A029	Scattered potsherds within a large erosive feature on slope. Near intact pots. Pottery seems not be in situ but rather brought in by erosion. Note however the presence of an in situ layer of white stones suggesting evenly deposited layer at some point. Pottery collected: very large rfp-1 sherd with 9 incised bands on top. Other sherds show incision, loose rfp.		AH
11.84971	3.291743	171.239	17/01/2014	Ag005	Mound site on slope, in a field close to modern Tomboutou, approx. 1.76 ha, scattered potsherds. Identified by local villagers as being past settlement not connected to them		AH
11.8497	3.291735	170.999	17/01/2014	Ag006	Mound site on slope, in a field close to modern Tomboutou, approx. 0.725 ha, scattered potsherds.		AH
11.85042	3.29355	174.604	17/01/2014	Ag007	Mound site on slope, close to modern Tomboutou, seemingly not cultivated at present, cut by the track to Ferekire, approx. 0.950 ha, scattered potsherds. Start of 17 Jan transect Tomboutou-Ferekire		AH

Gazetteer One (*cont.*)

Lat	Long	Elevation	Date	Survey Ref	Description	Other info	Collector
11.84938	3.296045	176.527	17/01/2014	Ag008	Pronounced mound on slope, cultivated, approx 0.995ha, scattered potsherds. Metal point, slag remains in eucalyptus grove to east of site (one taken and showed to CRB), dominant position over landscape, dry river bed to west.		AH
11.8487	3.295896	177.247	17/01/2014	Ag009	Surface potsherd collected outside collection area, site AG008 - diagnostic rfp-1 & fine incision		AH
11.84712	3.293332	189.504	17/01/2014	Ag011	Flat site on slope, approx 0.252ha, field and shrubs, scattered potsherds. Likely that most of this site is still buried: the point sampled and described here happens to have been ploughed for cultivation, bringing the archaeology to light		AH
11.84695	3.293884	193.83	17/01/2014	Ag012	Flat site on slope, approx. 0.171ha, former field and shrubs, scattered potsherds, slag. Likely to be same site as Ag011, only apparent where cultivation has brought the archaeology to light. This said the site clearly does have bounds, because no archaeological material occurs in the adjacent fields to north and east.		AH
11.8462	3.293255	189.745	17/01/2014	Ag013	Flat site on slope, approx 0.226ha, former field recently burnt, scattered potsherds. High grasses to east may hide further archaeological material. Likely same site as Ag011 and Ag012, to be classified as 'the same site', though there occur clear discontinuities in distribution of material: I didn't see any pottery in the field separating Ag011 from Ag013, for example.		AH
11.8444	3.294072	186.62	17/01/2014	Ag014	Flat site on slope, approx 0.186ha, field, scattered potsherds.		AH
11.8444	3.294079	186.38	17/01/2014	Ag015	Flat site on slope, approx 0.603ha, field, scattered potsherds. Note that the site is no doubt larger: its area as we defined it is bounded by high grasses and shrubs on all sides.		AH
11.84286	3.294068	184.698	17/01/2014	Ag017	Flat site on slope, approx 0.229ha, dry grass, scattered potsherds, in places dense. On eastern edge along track, Pisoliths and dense pottery, but apart from that peculiarity Ag017 resembles Ag011–Ag016		AH
11.84016	3.293826	178.449	18/01/2014	Ag018	Flat site on slope, approx 1.280ha, dry grass, scattered potsherds.		AH

Gazetteer One (*cont.*)

Lat	Long	Elevation	Date	Survey Ref	Description	Other info	Collector
11.84011	3.294249	177.728	18/01/2014	Ag019	Flat site on slope, approx 0.160ha, dry grass, scattered potsherds, in places dense. In places exposed by erosion, and in one of these eroded areas pavement + dense potsherds. This eroded area is discontinuous and we cannot therefore say if Ag019 and Ag017 are in fact part of the one and same site.		AH
11.83832	3.293722	191.427	18/01/2014	Ag020	Flat site on slope, approx. 1.132ha, scattered potsherds, grass and shrubs. Sherds are almost never dense but they are everywhere: this low density appears to be a product of the undisturbed nature of the land surface		AH
11.83541	3.293651	194.311	18/01/2014	Ag021	Flat site on slope, approx. 0.089ha, dense grass and bushes, dispersed potsherds		AH
11.8337	3.294007	197.675	18/01/2014	Ag022	Flat site on slope, approx. 0.659ha, dense grass, scattered potsherds, spherical stone pounders, 1 possible slag. Sherds are unevenly distributed, over a large surface with some areas of concentration notable: we suppose this is a product of how much the soil has been cultivated. It's likely the site is more extensive than we can see.		AH
11.83325	3.294941	198.637	18/01/2014	Ag023	Flat site on a slope cut by the track, which exposed dense concentration of potsherds. Approx. 0.823ha. Grass and shrubs.		AH
11.83169	3.294859	197.435	18/01/2014	Ag024	Very slight mound on a slope, scattered potsherds, slag, possible stone pounder, in a field, approx. 0.77ha. Isolated potsherds occurred between Ag023 and Ag024 and it seems probable archaeology is continuous in the sub-surface.		AH
11.83144	3.293954	196.954	18/01/2014	Ag025	Slight mound on a slope, scattered potsherds, slag, in a field, approx. 0.319ha. The twin to Ag024. Other slight elevations are visible to the west and may well be sites, but they are outside our survey zone.		AH
11.83047	3.293896	196.954	18/01/2014	Ag026	Flat site on a slope, field. Scatter of very abundant slag, no furnace remains noted but one possible base photographed. No surface material collected, as very few sherds. Sherds occur in field on the other (east) side of the track but as these are outside our survey zone they were not sampled or described.		AH
11.82942	3.293891	189.264	19/01/2014	Ag027	Flat site on a slope, scattered potsherds, slag (in places abundant). Field. Approx. area 1.279ha. Isolated sherds seen between Ag 026 and Ag 027 and it's likely we have a continuous site here.		AH

Gazetteer One (*cont.*)

Lat	Long	Elevation	Date	Survey Ref	Description	Other info	Collector
11.82291	3.294781	192.628	19/01/2014	Ag028	Same site as Ag 029 - a large site (7.694ha) in a field, at which we did two surface collections. Ag 028 is collection point 1. Series of mounds on a slope. Scattered potsherds, dense in places. Stone pounder, slag, ?quartz flakes, ?remains of burnt structures, stone bead. We saw continuous isolated sherds between Ag 027 and Ag 028-29 and took the decision to only stop for a dense concentration; Ag028 was the first we encountered. Note however that just north of Ag028 on the transect there were no sherds: so the edge of the site IS clearly marked.		AH
11.82158	3.294153	196.233	19/01/2014	Ag029	Same site as Ag 028 - a large site (7.694ha) in a field, at which we did two surface collections. Ag 029 is collection point 2. Series of mounds on a slope. Scattered potsherds, dense in places. Slag.		AH
11.78605	3.297233	208.971	20/01/2014	Ag032	Flat site on the plateau. 0.175ha. Scattered/isolated sherds, stone pounder. Dense shrubs, but recently burnt and rained on, which aided visibility of the site. No strati or in situ pottery visible in holes dug by ?root seekers. A very isolated site so, as well as the usual collection, we make another strategic collection of all sherds of a good size, with good decoration/shape.		AH
11.76572	3.297124	195.512	20/01/2014	Ag033	Flat site on the plateau. Scattered/isolated potsherds. Area is less than Ag 0032 (team has no GPS with track function at this point as we have lost Mardjoua!) and is clearly circumscribed: good visibility all round, yet no surface sherds. Photos taken by Anne as we have lost Jennifer. Given the site is so isolated and so poor in material we collected ALL the pottery we could see.		AH
11.75452	3.300369	193.109	20/01/2014	Ag036	Same site as Ag 037 - distribution of material was so discontinuous (yet it clearly consistently occurred) that we decided to do two collections. Slight rise on a slope. Scattered potsherds. Recently burnt, and humid because of rain. 0.94ha. Ag036 is higher up than Ag037 and there seems to have been a lot of water action: evidenced by areas of pottery sherds placed flat or on edge.		AH
11.75397	3.300911	192.148	20/01/2014	Ag037	Same site as Ag 036 - distribution of material was so discontinuous (yet it clearly consistently occurred) that we decided to do two collections. Slight rise on a slope. Scattered potsherds. Recently burnt, and humid because of rain. 0.94ha.		AH

Gazetteer One (*cont.*)

Lat	Long	Elevation	Date	Survey Ref	Description	Other info	Collector
11.75871	3.298153	198.637	20/01/2014	Ag038	Slight slope southwards, former field, scattered potsherds, 0.574ha.		AH
11.75346	3.298083	194.791	20/01/2014	Ag039	Slight slope southwards, field, scattered potsherds, 0.361ha. Modern metal (?iron).		AH
11.75444	3.298593	196.233	20/01/2014	Ag040	Slight slope southwards, shrubs and grasses, sand compacted by rain as was the case for Ag 0036-39. Scattered potsherds, 0.4020ha. Final site of the Tomboutou-Ferekire survey, carried out 17 to 20 Jan 2014.		AH

Gazetteer Two

Lat	Long	Elevation	Date	Collection (site ID)	Nature of site	Collector
11.98057	3.226437	164.2	07/01/2014	P14-0701-1	Large settlement mound east of Birni Lafia modern settlement, heavily cultivated. Combination of small and large pot sherds.	NK
11.97953	3.228346	164.7	07/01/2014	P14-0701-2	Very small, slightly elevated mound by road side, east of modern Birni Lafia.	NK
11.97861	3.228127	164.6	07/01/2014	P14-0701-3	Very large settlement mound close to Birni Lafia modern village. River is East but not in sight. Many baobabs, around 4 in total.	NK
11.9886	3.213106	162	07/01/2014	P14-0701-4	Heavily cultivated, limit of site unclear. Close to heavily cultivated field. As site is heavily disturbed only large pieces of pottery collected.	NK
11.97852	3.224444	161.1	08/01/2014	P14-0801-1	Heavily cultivated, site very close to modern Birni Lafia and settlement mound which were discovered previously on 07/01/2014.	NK
11.98527	3.217683	162.9	08/01/2014	P14-0801-2	Site north east of modern village of Birni Lafia on slightly elevated mound.	NK
11.99247	3.20259	163.3	09/01/2014	P14-0901-1	Small site with furnace, slag and lithics. No pottery. No limits of site.	NK
11.96342	3.219078	169.9	09/01/2014	P14-0901-2	Large site close to Birni Lafia excavation in association with GPS 2 P14-0901-2. Elevated mound.	NK
11.96359	3.218582	166.3	09/01/2014	P14-0901-3	Possible extension of settlement mound P14-0901-2. Pottery all over the site and close to Birni Lafia site.	NK
11.96372	3.217605	169.7	09/01/2014	P14-0901-4	Small elevated mound with dense scatter of pottery, slag and possible evidence of furnace.	NK
11.96516	3.214754	169.8	09/01/2014	P14-0901-5	Very large settlement mound, but heavily cultivated, so collection made in area where artefact visible.	NK
11.96266	3.17227	169.7	11/01/2014	P14-1101-1	Eroded site close to the Alibori palaeochannel lots of laterite. Pottery and lithics present at the site.	NK
11.95775	3.172373	165.8	11/01/2014	P14-1101-2	Very small site, which is very eroded, close to the Alibori River.	NK
11.9584	3.174073	170.4	11/01/2014	P14-1101-3	Very large, deflated settlement mound close to the river. Pottery is only visible in some areas due to erosion and this is where the collection was made.	NK

Gazetteer Two (*cont.*)

Lat	Long	Elevation	Date	Collection (site ID)	Nature of site	Collector
11.95844	3.174317	171.9	11/01/2014	P14-1101-4	Continuation of P14-1101-3.	NK
11.95785	3.174735	172.3	11/01/2014	P14-1101-5	Large deflated, but slightly elevated mound close to the Alibori River.	NK
11.95752	3.174461	172.7	11/01/2014	P14-1101-6	Small, eroded mound close to site P14-1101-5.	NK
11.92377	3.221022	164	12/01/2014	P14-1201-1	Very eroded site close to the Alibori. Lots of laterite present and a few pot sherds. One large sherd of pottery not in collection unit.	NK
11.92386	3.220779	166.6	12/01/2014	P14-1201-2	Site very close to P14-1201-2. Very eroded and close to latrine.	NK
11.92342	3.220897	172.6	12/01/2014	P14-1201-3	Large eroded area with a high density of pot sherds, potsherd pavement and river stratigraphy. Pottery in the crevasses of the elevation like it is being washed away.	NK
11.92333	3.221056	172	12/01/2014	P14-1201-4	See P14-1201-3 Decided to do area calculation for visible area of pottery, but it's not the extent of site as that is unclear.	NK
11.92349	3.220544	175.3	12/01/2014	P14-1201-5	Very large 'site' (limits are undefined due to erosion), close to P14-1201-3. Evidence of possible furnace/mud brick structure/ building material. Very, very dense pottery scatters.	NK
11.92372	3.220293	175	12/01/2014	P14-1201-6	Same site as P14-1201-5. Different collection unit. Area calculation was conducted where pottery is visible.	NK
11.9241	3.219966	172.4	13/01/2014	P14-1301-1	Eroded site close to P14-1201-6. Very close to Alibori River. Potentially the old banks of the Alibori River? Sparse vegetation and escarpment. General photo of potential ancient river banks? Standing from the top of 'site', looking west photo 100-0176.	NK
11.92414	3.219731	170.1	13/01/2014	P14-1301-2	Possible extension of P14-1301-1, but hard to tell as it lies on laterite eroded area again. Pottery is denser in this area in comparison to P14-1301-1. Bead found within collection unit.	NK
11.92444	3.219501	171.4	13/01/2014	P14-1301-3	Very large 'site' on the banks very close to river. Very dense pottery scatter, looks like a sea of pot sherds. Limits of site again not clear. Pottery sloping down from high elevation to low. View of end of site 100-1095, looking toward river.	NK
11.92455	3.21909	169.9	13/01/2014	P14-1301-4	Continuation of site P14-1301-3. Found incised glass (modern) and partial remains of potsherd pavement.	NK
11.92404	3.218869	172.6	13/01/2014	P14-1301-5	Possible extension of previous sites of the same day. Track shows the extent of pottery visible, there is a gap of pottery between sites. Site then extends possibly into cultivated field. More glass found but in collection unit so no GPS taken.	NK
11.92489	3.217236	170.2	13/01/2014	P14-1301-6	Small elevated mound of laterite with few pot sherds.	NK
11.92549	3.215896	164.8	14/01/2014	P14-1401-1	Small, deflated site close to the Alibori River. Laterite on the ground, plus low density pot sherds..	NK
11.92594	3.216001	166.6	14/01/2014	P14-1401-2	Site on a cultivated chilli field. Hard to define limits due to cultivation	NK
11.92636	3.216055	165	14/01/2014	P14-1401-3	The northern side of chilli field of P14-1401-2.	NK
11.92615	3.214302	165.5	14/01/2014	P14-1401-4	Very eroded small site close to chilli field P14-1301-2&3.	NK
11.92792	3.214075	167.9	14/01/2014	P14-1401-5	Small elevated mound with pot sherds close to the Alibori River. Quite densely vegetated in comparison to other sites in the area.	NK

Gazetteer Two (*cont.*)

Lat	Long	Elevation	Date	Collection (site ID)	Nature of site	Collector
11.92846	3.209926	170.5	14/01/2014	P14-1401-6	Heavily cultivated area with few pottery sherds.	NK
11.92937	3.209396	171.7	14/01/2014	P14-1401-7	Small area with pottery and laterite cut by track way.	NK
11.92935	3.208989	170.5	14/01/2014	P14-1401-8	Very eroded site, similar to P14-1401-7 and close to a track way in area with no vegetation, but vegetation is around.	NK
11.93058	3.204674	172.7	14/01/2014	P14-1401-8	Very flat, unvegetated area with eroded pot sherds and laterite on the ground.	NK
11.92902	3.20629	172.7	16/01/2014	P14-1601-1	Very eroded site close to road/track way and Alibori River. Sparse vegetation and flat.	NK
11.93599	3.188837	177.1	16/01/2014	P14-1601-2	Medium sized settlement mound close to Alibori, found when driving for Barou.	NK
11.93689	3.183787	167.1	17/01/2014	P14-1701-1	Small, eroded site in the area of laterite and sparse vegetation. Many pottery sherds and evidence of small pot.	NK
11.93612	3.183597	167.2	17/01/2014	P14-1701-2	Small, eroded area with pottery and sparse vegetation.	NK
11.94003	3.170055	174.3	17/01/2014	P14-1701-3	Very small area with pot sherds on an eroded laterite area.	NK
11.94354	3.171168	175.3	17/01/2014	P14-1701-4	Very eroded site with little vegetation, close to the Alibori. Lithics present on site and general area.	NK
11.94552	3.171321	174.8	17/01/2014	P14-1701-5	Small, very eroded site with pottery sherds and laterite.	NK
11.95318	3.172718	180.6	17/01/2014	P14-1701-6	Small site close to Alibori with pottery sherds.	NK
11.95335	3.172979	180.2	17/01/2014	P14-1701-7	Cultivated area with pottery sherds, site limits are unclear.	NK
11.95558	3.161488	169.1	19/01/2014	P14-1901-1	Very large site close to the bank of the Alibori River. Dispersed pot sherds.	NK
11.95223	3.159797	169.7	19/01/2014	P14-1901-2	Pottery sherds on slightly elevated mound. Potentially whole settlement on pottery mound.	NK
11.95234	3.157398	169.1	19/01/2014	P14-1901-3	Small area with pot sherds on the edge of a village with FE object, charcoal and pottery. Fe (iron) objects in collection unit.	NK
11.95272	3.156687	169.8	19/01/2014	P14-1901-4	Small area of pottery sherds. Site limits are not clear.	NK
11.95106	3.151136	173.7	19/01/2014	P14-1901-5	Large, eroded settlement mound close to the Alibori and in sight of a small, modern settlement. Dense pottery and lithics.	NK
11.95179	3.145786	180.3	19/01/2014	P14-1901-6	Probably the largest settlement mound area I have seen along the Alibori River. Possible evidence for stone building construction?	NK
11.95225	3.146138	175.7	20/01/2014	P14-2001-1	Continuation of very large site P14-1901-6. Elevated area of the large site with evidence of furnaces, slag and tuyère present.	NK
11.95192	3.146133	170.4	20/01/2014	P14-2001-2	Continuation of larger site but collection made in lower lying area where potential whole pots have been abandoned.	NK
11.95144	3.146151	165.7	20/01/2014	P14-2001-3	Continuation of large site, but collection made in area of cultivation to show the difference of pottery density.	NK
11.96147	3.135438	172.9	20/01/2014	P14-2001-4	After walking along Alibori from very large site 1.60 km through heavy vegetation, come into dry flat area. Few pot sherds and very eroded.	NK
11.96181	3.135543	175.1	20/01/2014	P14-2001-5	Heavily eroded, dry flat site close to a high elevated mound. Sparse vegetation	NK

Gazetteer Two (*cont.*)

Lat	Long	Elevation	Date	Collection (site ID)	Nature of site	Collector
11.96206	3.135478	178.2	20/01/2014	P14-2001-6	Dense pottery scatter close to P14-2001-5 on a slight, small, elevation with laterite and eroded features. Probably part of site recorded by GPS 3.	NK
11.9625	3.135019	168.3	21/01/2014	P14-2101-1	Eroded site close to the Alibori and possibly the same site as GPS 3 site 1, but two collection made as followed transect.	NK
11.96692	3.131772	165.4	21/01/2014	P14-2101-2	Slightly elevated settlement mound within sight of the Alibori River. Largely cultivated so has potential to have more pot sherds than were collected.	NK
11.9772	3.132058	173.3	21/01/2014	P14-2101-3	Slightly elevated mound close to the banks of the Alibori River. Dispersed pot sherds and area with site unvegetated.	NK
11.98148	3.130591	173.4	21/01/2014	P14-2101-4	Small eroded mound with a few pot sherds and some lithics, within sight of the Alibori River.	NK
11.98165	3.130011	175.2	21/01/2014	P14-2101-5	Very eroded site close to the Alibori River.	NK
11.98326	3.126099	177.9	21/01/2014	P14-2101-6	Small settlement mound close to the river with two modern houses on top.	NK
11.96831	3.128513	167.5	22/01/2014	P14-2201-1	Large settlement mound with a dense scatter of pottery sherds located close to or on a modern settlement. Informant spoke to villagers who said pottery was here long before they arrived and the villagers do not know how to make pottery.	NK
11.96768	3.12855	177	23/01/2014	P14-2201-2	Another collection within the modern village encountered in P14-2201-1, this time the unit was on top of the settlement mound. JPG100-0505 shows possible burial. Pottery surrounds the village.	NK
11.96687	3.129217	170.4	22/01/2014	P14-2201-3	Medium sized settlement mound on the bank of the Alibori River, close to modern village. Found a worked piece of RFP-1 in a circular shape. Not collected, not in unit.	NK
11.96573	3.130204	170.8	22/01/2014	P14-2201-4	Relatively large area with disperse pottery on the bank of the Alibori River. Perhaps once a settlement mound but very eroded at the edges with pottery flanking in.	NK
11.96394	3.130973	172.3	22/01/2014	P14-2201-5	Small site with dense scatter of pot sherds on surface on a piece of non-vegetated ground surrounded by cultivation.	NK
11.95856	3.133663	171.8	22/01/2014	P14-2201-6	Small area with pot sherds close to the river. Cultivated with loose dirt.	NK
11.97302	3.125907	178.9	22/01/2014	P14-2201-7	Large eroded area with pottery. Site limits are not very clear and pot sherds very eroded with laterite.	NK
11.92424	3.184658	168.2	25/01/2014	P14-2501-1	Small site shown to us by locals of a settlement during transect away from the Alibori. Villagers say people lived here long ago.	NK
11.92083	3.184077	172.8	25/01/2014	P14-2501-2	Very small area, flat with no vegetation with small area of pot sherds. Vegetation and cultivation all around but not in this area.	NK
11.91196	3.176691	182.8	25/01/2014	P14-2501-3	After speaking to villagers we found a small site around 2.8km away from the Alibori. In a flat, unvegetated area. Not as big as we anticipated from description given by locals.	NK
11.91711	3.182829	184.1	25/01/2014	P14-2501-4	Small area of pot sherds in a heavily cultivated field.	NK
11.92317	3.181592	182.9	25/01/2014	P14-2501-5	Small, flat unvegetated area with pottery sherds.	NK
11.90684	3.1849	181.3	26/01/2014	P14-2601-1	Eroded area close to the valley with pottery sherds discovered in area when trying to find a place to transect away from the river. Possibly associated with P14-2601-1 GPS 2.	NK

Gazetteer Two (*cont.*)

Lat	Long	Elevation	Date	Collection (site ID)	Nature of site	Collector
11.86472	3.189046	210	26/01/2014	P14-2601-2	After walking from the start 4.26km we come across a selection of sites. The one on this sheet is heavily cultivated with dispersed pot sherds.	NK
11.96004	3.174274	173.3	27/01/2014	P14-2701-1	Large site close to Alibori re-visited after not having enough time before. Half cultivated and non-vegetated, slightly elevated mound.	NK
11.94914	3.181528	167.9	27/01/2014	P14-2701-2	Large site on eroded area close to cultivation, near to Alibori River.	NK
11.94709	3.180864	165	27/01/2014	P14-2701-3	Large site on cultivated area close to Alibori River. Dispersed pot sherds.	NK
11.9624	3.176557	170.8	27/01/2014	P14-2701-4	Small site close to Tondi Bouka. On elevated mound but cultivated so pot sherds dispersed.	NK
11.96144	3.167927	172.8	27/01/2014	P14-2701-5	Small site cut by the road with dense pottery scatter and evidence of potsherd pavement. Close to Tondi Bouka school.	NK
11.96462	3.166121	177.9	27/01/2014	P14-2701-6	Very large settlement mound which is partially abandoned, partially cultivated. Areas with dense pot sherds in some places. Pot even at the base of mound.	NK
11.96497	3.166392	173.1	28/01/2014	P14-2801-1	Same site as P14-2701-6 but as it is so large made a decision to do a second circle. Quite vegetated area but not difficult to walk in.	NK
11.9648	3.165795	173.4	28/01/2014	P14-2801-2	Large, cultivated area with pottery concentrations but dispersed nature, perhaps because of cultivation. Close to large site P14-2701-6.	NK
11.96458	3.163428	168.1	28/01/2014	P14-2801-3	A small, eroded site on a laterite area close to a modern settlement. The boundaries of site are hard to define.	NK
11.96433	3.162858	170.7	28/01/2014	P14-2801-4	Possible continuation of site P14-2801-3 but pottery sherds around modern village. Village is on elevated area.	NK
11.96454	3.162605	168.9	28/01/2014	P14-2801-5	Dense pottery scatters close to previous site, near the modern village. Possibly same site but pottery stopped and continued again.	NK
11.96443	3.16089	171.6	28/01/2014	P14-2801-6	Small, flat site with a scatter of pottery sherds refined to a small area. Possible erosion.	NK
11.95328	3.163993	165	29/01/2014	P14-2901-1	Small site on cultivated area close to the Alibori. Site has potential to have more pot than exposed but heavily cultivated.	NK
12.00173	3.079706	170.2	30/01/2014	P14-3001-1	Small settlement mound close to Kofuno. Pottery dense but scattered. Situated on deep red, orange sand. Settlement mounds less than 100 metres from the river.	NK
12.00068	3.078954	167.6	30/01/2014	P14-3001-2	Medium-large cultivated settlement mound on the banks of the Alibori. Dispersed pottery sherds.	NK
11.99429	3.073722	175	30/01/2014	P14-3001-3	Settlement mound close to the Alibori River with a dense scatter of pottery sherds.	NK
11.99378	3.072956	176.6	30/01/2014	P14-3001-4	Settlement mound close to the Alibori River. Long elongated mound. Possible erosion from flood plain?	NK
11.74372	3.268605	183.6	01/02/2014	P14-0102-1	Few pot sherds on a cultivated elevated mound close to small river channel. Mound is relatively big but pot sherds are scarce.	NK
11.73956	3.258255	194.3	01/02/2014	P14-0102-2	Pottery found in a heavily vegetated, flat area. Looks like a large site but boundary not very clear. Probably same as P14-0102-3 GPS 2.	NK

Gazetteer Two (*cont.*)

Lat	Long	Elevation	Date	Collection (site ID)	Nature of site	Collector
11.73974	3.257047	196.7	01/02/2014	P14-0102-3	Possible continuation of last site, but in a millet stalk area with less grass cultivation so the pottery is easier to see. Boundary not very clear. Site very large with dispersed pot sherds.	NK
11.74108	3.25346	208.9	01/02/2014	P14-0102-4	Cultivated but flat site with dispersed pottery. Site area with pottery quite small, perhaps due to cultivation/vegetation.	NK
11.74106	3.254243	210.5	01/02/2014	P14-0102-5	Small site with dispersed pot sherds which are noticeable due to burning of ground	NK
11.74095	3.256067	211.3	01/02/2014	P14-0102-6	Small mound with very red, sand and high density pot sherds in a small area	NK
11.7589	3.260396	199.9	02/02/2014	P14-0202-1	Relatively large with dispersed pottery sherds on a sandy context. Found isolated sherd close to the drive river then more sherds further in land.	NK
11.79061	3.387431	167.2	03/02/2014	P14-0302-1	Large, cultivated site close to the Sota River. Difficult to detect boundaries due to the surrounding cultivation. Enquiries made about pottery.	NK
11.79703	3.419718	157.5	04/02/2014	P14-0402-1	Large, elevated mound with Baobab and dense scatters of pot sherds. Some of the mound is heavily grassy but areas with no grass, the pottery is clear. On closer inspection, mound is very large and two collections will be made.	NK
11.79669	3.420621	158.8	04/02/2014	P14-0402-2	Continuation of P14-0402-1 GPS 1.	NK
11.79703	3.419055	159.3	04/02/2014	P14-0402-3	Possible continuation of P14-00402-1/2. Small elevation mound with pot sherds. Looks like they are cutting trees on mound to make way for more cultivation.	NK
11.79703	3.417249	162.1	04/02/2014	P14-0402-4	Cultivated settlement mound, relatively large elevation and dispersed, fragmented pottery.	NK
11.79727	3.416012	163	04/02/2014	P14-0402-5	Elevated mound, cultivated with pottery sherds. Heavy cultivation around the site therefore difficult to define the real boundary. Whole area is elevated but a lot of grass obscuring view of surface material. Pot sherds very dense in same area.	NK
11.79566	3.414632	163.9	04/02/2014	P14-0402-6	Pottery sherds visible on the ground due to fire but part of a larger vegetated area where surface finds are difficult to spot. Pottery even on the road next to site.	NK
11.79199	3.411839	169.4	04/02/2014	P14-0402-7	A typical settlement mound, which is well defined with pottery sherds on the surface.	NK
11.79684	3.411567	159.4	05/02/2014	P14-0502-1	Part of large settlement mounds that form the site of Busa. The surround is heavily cultivated but this collection is in an area that is accessible.	NK
11.79668	3.412143	159.7	05/02/2014	P14-0502-2	Continuation of P14-0502-1. Site is very large and forms settlement of Busa. Difficult to make collections in some places due to vegetation.	NK
11.78199	3.43892	166	08/02/2014	P14-0802-1	Very large settlement mound around 100 metres from the building of a new road. Mound sits high up in landscape. Same site as P14-0802-1 GPS 2. Lack of high density pottery sherds due to sand coverage.	NK
11.78197	3.437897	163.9	08/02/2014	P14-0802-2	Large settlement close to site 1. Area appears to be succession of mounds running parallel to the road about 100 metres in. Sand coverage means not many potsherds.	NK

Gazetteer Two (*cont.*)

Lat	Long	Elevation	Date	Collection (site ID)	Nature of site	Collector
11.78212	3.436239	165.9	08/02/2014	P14-0802-3	Very large settlement mound in a succession of mounds running parallel to road. It appears this mound is on the edge of an old river channel. Again few pot sherds due to sand/ cultivation.	NK
11.78194	3.434011	172.8	08/02/2014	P14-0802-4	Large settlement mound, similar to the succession of mounds found in this area but with a higher density of pottery sherds and again a channel running through.	NK
11.78139	3.43254	175	08/02/2014	P14-0802-5	Very large site on a settlement mound cut, again, by small river channel. Many baobabs and pottery on laterite surface.	NK
11.78075	3.430911	174.1	09/02/2014	P14-0902-1	Large, but cultivated with millet settlement mound with dispersed pot sherds. GPS 2 also recording the same site. Mound has very clear topography. Part of succession of mounds close to the road.	NK
11.78095	3.428445	173.3	09/02/2014	P14-0902-2	Medium sized settlement mound close to the new road and part of very large area with settlement mounds. Appears to have concentrated pottery sherds.	NK
11.78057	3.426198	170.1	09/02/2014	P14-0902-3	Site which was visited last year and destroyed by machine for new road. GPS 2 – site 4, is recording the extension of the site. Dense pottery sherds on the surface. Please note the track area is the track of destruction. No collection made, 2 interesting sherds were collected instead.	NK
11.78163	3.422512	168.6	10/02/2014	P14-1002-1	Area very close to the new road with a big elevation and pot sherds sloping down the side of the elevation. Looks like a small stream in the East of the mound. Pot sherds seem isolated to one area where collection was made.	NK
11.78192	3.421151	168	10/02/2014	P14-1002-2	Large settlement mound on the edge of the new road. Few pot sherds present and only found in one area.	NK
11.78201	3.418672	176.4	10/02/2014	P14-1002-3	Large settlement mound close to the new road and part of continuation of mounds being cut by road. Dispersed pot sherds. Mound is vegetated with grass and trees. Sites probably continue onto other side of the road. Sedimentation may mean pot sherds not clear.	NK
11.78198	3.417148	175	10/02/2014	P14-1002-4	Settlement mound close to the road with dispersed pot sherds and small baobab it is close to a small river/stream valley. Heavily cultivated. Streams could have been present before the mound because there is no pottery appearing in the section. Collection made by GPS 2.	NK
11.78056	3.416772	186.5	10/02/2014	P14-1002-6	Large site with baobab partially destroyed by road building and will be totally removed on 11/02/2014.	NK
11.78263	3.412922	167.7	11/02/2014	P14-1102-1	Medium, large sized slightly elevated settlement mound close to a very small shallow stream, cut by new road. Heavily vegetated. Appears to be part of a large mound area.	NK
11.78286	3.410351	180.6	11/02/2014	P14-1102-2	Small elevated settlement mound that is cut by the road with dispersed pot sherds. Appears to be part of a set of small elevations.	NK
11.78254	3.409869	184.3	11/02/2014	P14-1102-3	A small, elevated mound next to site 2 with dispersed pottery sherds throughout. Cultivated with millet.	

Gazetteer Two (*cont.*)

Lat	Long	Elevation	Date	Collection (site ID)	Nature of site	Collector
11.80317	3.517748	163.7	12/02/2014	P14-1202-1	Very large site on the bank of the Niger River with very dense pottery scatters. Known last year as Djaboutchia, the site is collapsing into river and has encroaching chilli farm now present on the mound. First collection on the most northerly edge of site.	NK
11.8029	3.517738	167	12/02/2014	P14-1202-2	Second collection on the site of Djaboutchia, going south along the bank of the river.	NK
11.80249	3.517916	175.5	12/02/2014	P14-1202-3	Third collections moving south down the bank of the Niger River and moving down site of Djaboutchia. Dense pot sherds and pavement here.	NK
11.80106	3.517719	174.5	12/02/2014	P14-1202-4	Collection 4 at Djaboutchia moving south from modern village down the site.	NK
11.79801	3.517124	160.1	13/02/2014	P14-1302-1	Small are with pottery close to the large site of Djaboutchia. Possible extension of the site. Close to many baobabs.	NK
11.98622	3.206216	169.4	07/01/2014	P14-0701-1	Flat site with cultivated fields surrounding it.	AD
11.99408	3.210792	164.6	09/01/2014	P14-0901-1	Little, flat site. Cultivated and covered with dry grass stems.	AD
11.96297	3.219229	174.2	09/01/2014	P14-0901-2	Small mound surrounded by a little vegetation	AD
11.96297	3.217497	168.9	09/01/2014	P14-0901-3	An elongated, from east to west, settlement mound with vegetation.	AD
11.96204	3.172632	172.7	11/01/2014	P14-1101-1	A mound surrounded by a valley, east, west and south.	AD
11.96188	3.172644	170.7	11/01/2014	P14-1101-2	Settlement mound with valley around it	AD
11.95735	3.175365	174.1	11/01/2014	P14-1101-3	A small, flat site, completely cultivated	AD
11.9566	3.175783	179.2	11/01/2014	P14-1101-4	A settlement mound with cultivation and vegetation.	AD
11.92211	3.224744	169.9	12/01/2014	P14-1201-1	A small site in a completely eroded area.	AD
11.92172	3.221797	171.4	12/01/2014	P14-1201-2	Site covered in sorghum stalks.	AD
11.92271	3.216118	178.9	12/01/2014	P14-1201-3	A large mound site with cultivation and vegetation.	AD
11.92285	3.216001	177.9	12/01/2014	P14-1201-4	A large mound site with cultivation and vegetation same site as P14-1201-3.	AD
11.92282	3.215377	181.4	12/01/2014	P14-1201-5	A small mound covered both with vegetation in the west and grass stalks in the east.	AD
11.92183	3.219173	172.5	13/01/2014	P14-1301-1	A large site located in an eroded area and consists of several mound	AD
11.9215	3.219303	171.3	13/01/2014	P14-1301-2	See P14-1301-1 GPS 2.	AD
11.92102	3.219113	174.6	13/01/2014	P14-1301-3	See P14-1301-1 GPS 2.	AD
11.92009	3.219657	174.9	13/01/2014	P14-1301-4	A very large site consisting of several mounds covered in sorghum stalks.	AD
11.91996	3.220357	175.1	13/01/2014	P14-1301-5	See P14-1301-4 GPS 2.	AD
11.9197	3.218976	177.2	13/01/2014	P14-1301-6	A small mound surrounded by fields.	AD
11.92016	3.218706	171.7	14/01/2014	P14-1401-1	A very large site with several mounds covered in stalks and cotton.	AD
11.91928	3.218301	171.8	14/01/2014	P14-1401-2	See P14-1401-1 GPS 2.	AD

Gazetteer Two (*cont.*)

Lat	Long	Elevation	Date	Collection (site ID)	Nature of site	Collector
11.91961	3.217478	173.9	14/01/2014	P14-1401-3	A mound covered almost entirely in grass	AD
11.92011	3.216045	177.9	14/01/2014	P14-1401-4	A large mound covered in vegetation.	AD
11.91971	3.21532	178.1	14/01/2014	P14-1401-5	See P14-1401-4 GPS 2.	AD
11.92414	3.217454	164.8	16/01/2014	P14-1601-1	A small site situated in a zone of erosion.	AD
11.92421	3.217042	165.6	16/01/2014	P14-1601-2	A large site completely eroded.	AD
11.92556	3.212592	174	16/01/2014	P14-1601-3	A small flat site.	AD
11.93556	3.182624	170.2	17/01/2014	P14-1701-1	A small site located in an eroded area but much of the site is located on flat terrain.	AD
11.9356	3.1821	169.9	17/01/2014	P14-1701-2	A very small site located on the edge of eroded terrain.	AD
11.9435	3.170007	175	17/01/2014	P14-1701-3	A small site surrounded by several elevations in an eroded area. This is a site with lithics and no pottery, so no collection made.	AD
11.94443	3.170321	175.7	17/01/2014	P14-1701-4	A small site located on an eroded area but situated more or less on a flat surface.	AD
11.95372	3.170422	183.9	17/01/2014	P14-1701-5	An average site located in a flat area.	AD
11.95389	3.170015	184.2	17/01/2014	P14-1701-6	An average site located in a flat area.	AD
11.95517	3.163316	169.1	19/01/2014	P14-1901-1	A large site situated on a mound.	AD
11.9511	3.152185	169.5	19/01/2014	P14-1901-2	A large site located on a slight elevation where the surface is flat.	AD
11.95255	3.148167	173.5	19/01/2014	P14-1901-3	A small site located on the slope of an elevation.	AD
11.95257	3.147332	179.5	19/01/2014	P14-1901-4	A large mound completely covered with vegetation.	AD
11.96291	3.135331	171.8	21/01/2014	P14-2101-1	An average site located on several small, scattered mounds.	AD
11.96613	3.133678	167.2	21/01/2014	P14-2101-2	A very small site situated on a small mound.	AD
11.96735	3.132862	168	21/01/2014	P14-2101-3	Large mound covered almost entirely with vegetation.	AD
11.97643	3.133699	177.9	21/01/2014	P14-2101-4	A large site situated in an eroded area.	AD
11.9813	3.131564	174.6	21/01/2014	P14-2101-5	A large site located in a completely eroded area.	AD
11.98171	3.131494	181	21/01/2014	P14-2101-6	An average site situated on a flat surface.	AD
11.98444	3.125894	177.5	21/01/2014	P14-2101-7	An average site located on completely flat ground covered with sorghum stalks.	AD
11.98417	3.125093	178	21/01/2014	P14-2101-8	A small hill, part of which is determined by fluvial erosion	AD
11.97238	3.127321	171.3	22/01/2014	P14-2201-1	A small site located on a small elevation	AD
11.96983	3.125242	168	22/01/2014	P14-2201-2	A small site located on a flat terrain within a zone of erosion.	AD
11.96403	3.128304	171	22/01/2014	P14-2201-3	A small site located in a flat area surrounded by fields of sorghum.	AD
11.96079	3.131223	172.3	22/01/2014	P14-2201-4	An average site situated on a flat area.	AD
11.96153	3.13048	176.3	22/01/2014	P14-2201-5	A large site situated on an extended flat surface.	AD
11.91108	3.181814	186.6	25/01/2014	P14-2501-1	A large site located in a flat area which is destroyed by the effects of erosion.	AD
11.9067	3.18473	183.4	26/01/2014	P14-2601-1	A large site situated on flat land, much of which was destroyed by erosion.	AD
11.86757	3.190506	210.1	26/01/2014	P14-2601-2	An average sized site located on the side of a large hill covered with vegetation and gravel, but also many lithics.	AD

Gazetteer Two (*cont.*)

Lat	Long	Elevation	Date	Collection (site ID)	Nature of site	Collector
11.86222	3.190247	213.3	26/01/2014	P14-2601-3	A large site on a flat surface completely covered in cotton cultivation.	AD
11.96182	3.17472	170.6	27/01/2014	P14-2701-1	A small site situated within several small elevations in a flat area. Part of the site is cultivated.	AD
11.96191	3.175187	174.1	27/01/2014	P14-2701-2	A very large site completely covered in cultivation. Located in an area more or less flat, with a significant portion of space is occupied by cassava plant.	AD
11.9632	3.168135	177	27/01/2014	P14-2701-3	A large site on a settlement mound, where part of the site is eroded and the north of the site is occupied by cotton fields.	AD
11.9639	3.168045	180.6	27/01/2014	P14-2701-4	Same as P14-2701-3 GPS 2.	AD
11.96454	3.16805	174.3	28/01/2014	P14-2801-1	Same as P14-2701-3 GPS 2.	AD
11.96548	3.164966	173.8	28/01/2014	P14-2801-2	An average sized site situated on a flat area within a zone destroyed by erosion.	AD
11.96591	3.163217	172.3	28/01/2014	P14-2801-3	A large lithic site located within several mounds on eroded terrain.	AD
11.96318	3.138847	169.4	28/01/2014	P14-2801-4	An average sized site (illustration depicts close to 'tiny village').	AD
11.9477	3.159624	168.8	29/01/2014	P14-2901-1	A large site surrounded by vegetation and located on a flat area with some elevations in the east.	AD
11.94889	3.150309	171.6	29/01/2014	P14-2901-2	A small site covered by sorghum (millet) stalks located a few meters north of the village.	AD
11.94928	3.14695	167.9	29/01/2014	P14-2901-3	A large site where a small part of which is covered with vegetation. It is located on a mound in an area where there are many hills and vegetation.	AD
11.94908	3.146786	174	29/01/2014	P14-2901-4	See P14-2901-3 GPS 2.	AD
11.94821	3.14635	179.9	29/01/2014	P14-2901-5	A large site covered by vegetation including thorny trees, which is situated a few metres from Alibori and several mounds.	AD
11.94855	3.146312	180.6	29/01/2014	P14-2901-6	See P14-2901-5 GPS 2.	AD
11.94838	3.145747	181.3	29/01/2014	P14-2901-7	An average sized site surrounded by vegetation and thorny trees. It is located on a mound in an area where there are several elevations.	AD
12.00272	3.079746	179.3	30/01/2014	P14-3001-1	An average sized site located on a small elevation, part of which is destroyed by erosion.	AD
12.0027	3.079013	179.1	30/01/2014	P14-3001-2	An average sized site located in a more or less flat area with mounds and depressions all around. Large mound and baobab to the West.	AD
11.99431	3.076054	175.3	30/01/2014	P14-3001-3	A site covered in pottery and lithics. Where the site extends it is cut by an eroded area.	AD
11.9938	3.077725	182	30/01/2014	P14-3001-4	A large site located on a flat surface destroyed by erosion.	AD
11.99632	3.081541	183.4	30/01/2014	P14-3001-5	A large site consisting of several mounds with lots of vegetation around.	AD
11.74295	3.26816	187.3	01/02/2014	P14-0102-1	A small elevation covered in vegetation and lots of grass.	AD
11.74256	3.267323	188.5	01/02/2014	P14-0102-2	An average sized site located about twenty metres south of the road.	AD
11.73935	3.257624	195.6	01/02/2014	P14-0102-3	See P14-0102-2 GPS 2.	AD

Gazetteer Two (*cont.*)

Lat	Long	Elevation	Date	Collection (site ID)	Nature of site	Collector
11.73864	3.253457	201.5	01/02/2014	P14-0102-4	A large site situated on flat terrain, almost entirely cultivated.	AD
11.74197	3.253938	210.7	01/02/2014	P14-0102-5	An average sized site covered in vegetation and located on a flat area.	AD
11.75854	3.260986	200.4	02/01/2014	P14-0202-1	A site located in a flat area, cultivated with lots of shrubs and vegetation northwest to southeast.	AD
11.76034	3.260212	202.4	02/01/2014	P14-0202-2	A small site in a flat area surrounded by burnt vegetation caused by bush fires.	AD
11.76295	3.258946	209.3	02/01/2014	P14-0202-3	A very large site consisting of several mounds with lots of baobab trees and cashew trees on the east and west.	AD
11.76341	3.258824	210.1	02/01/2014	P14-0202-4	See P14-0202-3 GPS 2	AD
11.74754	3.272418	187.1	03/01/2014	P14-0301-1	An average sized flat site surrounded by vegetation.	AD
11.74754	3.271426	189.1	03/01/2014	P14-0302-2	An average sized site located on a small elevation surrounded by vegetation. Located in the northern part is a cotton field.	AD
11.75565	3.262456	196.7	03/01/2014	P14-0302-3	A site completely covered with vegetation on flat ground. It is situated a few metres away from a laterite path that leads to Kwara Tegui.	AD
11.79294	3.387774	168	03/01/2014	P14-0302-4	A large site situated on a small mound about 200 metres north of the main road to Garou. The centre of site has two large baobabs.	AD
11.79845	3.42	159.7	04/02/2014	P14-0402-1	An average sized site situated on flat land with pot sherds barely visible due to crops of tomato, chilli and onion.	AD
11.79816	3.416741	158.4	04/02/2014	P14-0402-2	A large site on flat land, a substantial portion of which is covered with vegetation.	AD
11.79774	3.415961	161.4	04/02/2014	P14-0402-3	A large site situated on a mound completely covered with vegetation and sorghum (millet) stalks.	AD
11.79744	3.415262	162.5	04/02/2014	P14-0402-4	A very large site consisting of two mounds, the biggest of which is covered by a chilli plantation. The second mound is almost completely vegetated.	AD
11.79701	3.414978	166.5	04/02/2014	P14-0402-5	See P14-0402-4 GPS 2	AD
11.79525	3.411139	170.1	04/02/2014	P14-0402-6	A very large site situated on a large hill surrounded by gardens and crops out of season. South of the site there is a large baobab, and two other baobabs elsewhere.	AD
11.79543	3.410629	173	04/02/2014	P14-0402-7	See P14-0402-6 GPS 2	AD
11.79787	3.411552	160.2	05/02/2014	P14-0502-1	Site of Busa. A very large site encompassing elevations and flat areas. The people of Monkassa state this site as an ancient village of inhabitants of Garou. This site has chill plantation and out of season crops.	AD
11.79859	3.412225	162.5	05/02/2014	P14-0502-2	An average sized site situated on a mound, half covered in vegetation and half a chilli plantation. This site is part of the territory of Busa.	AD
11.79906	3.411717	161.9	05/02/2014	P14-0502-3	A large mound in the area of Busa with palm trees and large bushes.	AD
11.79848	3.411537	164.4	05/02/2014	P14-0502-4	A mound with pottery, which is more or less visible, located in the area of Busa. The site is cultivated, but still possesses shrub and palms.	AD

Gazetteer Two (*cont.*)

Lat	Long	Elevation	Date	Collection (site ID)	Nature of site	Collector
11.78281	3.440334	170.1	06/02/2014	P14-0602-1	A large mound completely exploited by onion, chilli and tomato cultivation.	AD
11.7825	3.438983	163.4	08/02/2014	P14-0802-1	A large site located on a mound surrounded by vegetation and an onion field in the north.	AD
11.78256	3.438016	163.8	08/02/2014	P14-0802-2	A very large mound where a significant portion has onion and tomato crops and is surrounded by vegetation. The site is a few metres north of the main road to Garou.	AD
11.7827	3.436338	163.7	08/02/2014	P14-0802-3	A very large mound with some small baobab on site. To the north, on the edge of the site are three large baobabs.	AD
11.78105	3.434448	170.4	08/02/2014	P14-0802-4	A very large site consisting of several mounds and large baobabs in the north, south and west of the site. Area completely covered in vegetation and shrubs.	AD
11.78079	3.432698	170.4	08/02/2014	P14-0802-5	A large mound covered in lots of pottery and vegetation. Part of the site is determined by a small river which limits the eastern edge of the site. A large baobab is located approximately 10 metres from the small river east of the site.	AD
11.78012	3.431069	173.6	09/02/2014	P14-0902-1	A very large extended on a hill and very more or less flat site. Part of the site is cultivated, but the southern part is completely covered with vegetation.	AD
11.78041	3.429564	174	09/02/2014	P14-0902-2	A large mound with a path for herding cattle cutting across it. The site is crossed by several narrow paths and the road to Garou.	AD
11.78067	3.427999	174.4	09/02/2014	P14-0902-3	A small site located on a small mound completely covered in millet stalks. The site is surrounded by vegetation and located approximately 100 metres from the main road.	AD
11.78113	3.426258	172.2	09/02/2014	P14-0902-4	A large site situated on a mound totally covered by vegetation. Much of the site has been destroyed by the road.	AD
11.78217	3.420061	173.3	10/02/2014	P14-1002-1	A large elevation with scattered pottery and vegetation across the site.	AD
11.78279	3.418741	168.6	10/02/2014	P14-1002-2	A medium (average) sized site located on a small elevation, covered with vegetation.	AD
11.78322	3.416727	170.3	10/02/2014	P14-1002-3	A very large site located on several mounds covered in shrubs and vegetation. The east side of the site has a deep valley.	AD
11.78277	3.41644	176	10/02/2014	P14-1002-4	See P14-1002-3 GPS 2 description	AD
11.78344	3.413424	172	11/02/2014	P14-1102-1	A large site located on a mound with two dry river channels running north to south on the eastern and western edges of site. The mound is vegetated with scattered pottery sherds.	AD
11.78379	3.412924	170.3	11/02/2014	P14-1102-2	A large site situated on an elevation with a large baobab. The site is cultivated with millet and surrounded by vegetation.	AD
11.78398	3.41144	173.4	11/02/2014	P14-1102-3	A small mound with dispersed pottery. Just to the east of the site lies a shallow valley and southwest and northwest there are two large baobabs.	AD
11.7846	3.409478	177.3	11/02/2014	P14-1102-4	An average site on a small mount with shrubs and millet stalks. The mound has scattered pottery sherds on the surface.	AD

Gazetteer Two (*cont.*)

Lat	Long	Elevation	Date	Collection (site ID)	Nature of site	Collector
11.78341	3.409699	181.7	11/02/2014	P14-1102-5	An average site situated on an elevation completely cultivated. There is dispersed pottery, which is a little visible. There are two large baobabs to the west of the site.	AD
11.78349	3.409127	184.4	11/02/2014	P14-1102-6	A small site, at the centre of which is a large baobab. A large part of the site is cultivated.	AD
11.80076	3.517727	163.9	12/02/2014	P14-1202-1	A large site situated on the banks of the River Niger. The site has been destroyed partially by river erosion. Same as GPS 1.	AD
11.92296	3.22086	176.8	12/01/2014	P14-1201-1	A flat zone, with 5 mounds (termite mounds?) identified with trees present/	ST + AA
11.92365	3.216505	180	13/01/2014	P14-1301-1	Mound	ST + AA
11.92409	3.216666	169.2	14/01/2014	P14-1401-1	Area completely eroded.	ST + AA
11.92224	3.216096	173.4	14/01/2014	P14-1401-2	Mound	ST + AA
11.92375	3.215252	179.5	14/01/2014	P14-1401-3	Mound	ST + AA
11.92394	3.212931	180.6	14/01/2014	P14-1401-4	Mound with a baobab. High density of ceramic material on the surface.	ST + AA
11.92382	3.212353	180.1	14/01/2014	P14-1401-5	Mound	ST + AA
11.92339	3.211964	186.3	14/01/2014	P14-1401-6	Mound	ST + AA
11.92506	3.213914	169.1	16/01/2014	P14-1601-1	Eroded zone.	ST + AA
11.92525	3.213655	173.1	16/01/2014	P14-1601-2	Edge of an eroded area that is at height, but flat. Few shrubs with no grass and small nodules of laterite.	ST + AA
11.92844	3.206854	174.4	16/01/2014	P14-1601-3	A mound with almost no vegetation, in an elevated area of a basin with erosion.	ST + AA
11.92877	3.205137	178.1	16/01/2014	P14-1601-4	Sandy bowl-like area with mounds.	ST + AA
11.93637	3.181021	169	17/01/2014	P14-1701-1	Eroded.	ST + AA
11.94372	3.170652	174.9	17/01/2014	P14-1701-2	A lateritic mound with lithics.	ST + AA
11.95421	3.171381	184	17/01/2014	P14-1701-3	Flat site on a laterite terrain surrounded by shrubby vegetation and bushy.	ST + AA
11.95423	3.160079	167.8	19/01/2014	P14-1901-1	Flat site close to an inhabitation.	ST + AA
11.95126	3.158759	170.1	19/01/2014	P14-1901-2	Settlement mound within a flat terrain.	ST + AA
11.95036	3.154759	172.9	19/01/2014	P14-1901-3	Flat site close to an inhabitation.	ST + AA
11.95144	3.149439	176.1	19/01/2014	P14-1901-4	A mound situated with a laterite area, surrounded by vegetation and the Alibori River to the South.	ST + AA
11.95161	3.147652	177	19/01/2014	P14-1901-5	A site that extends over a laterite mound area with vegetation, located south of the Alibori River.	ST + AA
11.95222	3.146554	178.1	19/01/2014	P14-1901-6	Settlement mound located with eroded laterite area, surrounded by scattered vegetation.	ST + AA
11.95263	3.146717	169.5	20/01/2014	P14-2001-1	Eroded site over an area cultivated with shrubby vegetation to west and river to the south.	ST + AA
11.95309	3.146861	171.6	20/01/2014	P14-2001-2	Mound site eroded besides thorny vegetation with black occurrences on the ground presenting the appearance of a furnace.	ST + AA

Gazetteer Two (*cont.*)

Lat	Long	Elevation	Date	Collection (site ID)	Nature of site	Collector
11.96189	3.136068	175.5	20/01/2014	P14-2001-3	Eroded site on a plateau with vegetation.	ST + AA
11.96229	3.135851	180.5	20/01/2014	P14-2001-4	A flat site on a completely eroded area.	ST + AA
11.96607	3.134555	177.5	20/01/2014	P14-2001-5	Settlement mound eroded in an area with shrubby vegetation.	ST + AA
11.96257	3.135724	181.3	20/01/2014	P14-2001-6	A flat site within an eroded area.	ST + AA
11.96265	3.135163	164.3	21/01/2014	P14-2101-1	Site eroded amid vegetation spaced away from my river.	ST + AA
11.96564	3.133588	166.4	21/01/2014	P14-2101-2	Site in an eroded area near the Alibori amid dispersed vegetation.	ST + AA
11.96598	3.133152	168.2	21/01/2014	P14-2101-3	A little flat area surrounded by vegetation.	ST + AA
11.97636	3.132857	176.7	21/01/2014	P14-2101-4	Flat area surrounded by a palaeochannel south of lateritic soil.	ST + AA
11.98347	3.125363	182.4	21/01/2014	P14-2101-5	Site on a raised area with a flat terrain surrounding, near the River Alibori with vegetation northward and close to inhabitation.	ST + AA
11.98393	3.124887	180	21/01/2014	P14-2101-6	Site within slightly eroded area covered with vegetation lying north of the Alibori.	ST + AA
11.96937	3.127074	171.4	22/01/2014	P14-2201-1	Mound completely eroded made of red soil near Alibori channels.	ST + AA
11.96906	3.127262	170.6	22/01/2014	P14-2201-2	Eroded area on a reddish soil south of Alibori River with vegetation.	ST + AA
11.96682	3.12827	170.8	22/01/2014	P14-2201-3	A site in a flat area with the Alibori sitting in the south west. There are inhabitants and cultivation around the site.	ST + AA
11.96152	3.130846	170.9	22/01/2014	P14-2201-4	Flat area surrounded by sparse vegetation, south of the Alibori.	ST + AA
11.96143	3.13141	175	22/01/2014	P14-2201-5	Site on a mound close to the Alibori	ST + AA
11.97073	3.125175	179.1	22/01/2014	P14-2201-6	Site entirely eroded south and east, close to the Alibori and vegetated.	ST + AA
11.90986	3.182619	185.3	25/01/2014	P14-2501-1	Eroded site on lateritic soil completely degraded.	ST + AA
11.90974	3.182182	187.1	25/01/2014	P14-2501-2	Very large flat site in a completed eroded area.	ST + AA
11.91283	3.181907	188.7	25/01/2014	P14-2501-3	Flat site with hardly any vegetation, 2.7 km from the Alibori, located on a high area.	ST + AA
11.90695	3.184006	175.9	26/01/2014	P14-2601-1	Eroded area surrounded with small sparse vegetation.	ST + AA
11.86656	3.189666	207.2	26/01/2014	P14-2601-2	Flat area with a mound to the east.	ST + AA
11.86237	3.189605	213.4	26/01/2014	P14-2601-3	Flat site on cultivated area with little vegetation.	ST + AA
11.94961	3.182015	173.7	27/01/2014	P14-2701-1	Flat site with cultivation close to the Alibori River.	ST + AA
11.96149	3.174032	175.8	27/01/2014	P14-2701-2	Flat site, close to a village and enclosed cultivation, surrounded by a water channel.	ST + AA
11.9614	3.168458	172.7	27/01/2014	P14-2701-3	A flat, cultivated area on the north of the Alibori to the West of the village Tondi Bouka.	ST + AA
11.96271	3.169671	178.3	27/01/2014	P14-2701-4	Flat area with the presence of very little vegetation, near the village Tondi Bouka to the east.	ST + AA
11.96456	3.1667	172.2	28/01/2014	P14-2801-1	Eroded area on a downward slope towards the east a midst of vegetation.	ST + AA
11.9654	3.16644	174.4	28/01/2014	P14-2801-2	Eroded site to the west of Tondi Bouka with some trees present.	ST + AA

Gazetteer Two (*cont.*)

Lat	Long	Elevation	Date	Collection (site ID)	Nature of site	Collector
11.96554	3.163265	171.1	28/01/2014	P14-2801-3	Completely eroded site with little presence of vegetation.	ST + AA
11.96557	3.16268	165.2	28/01/2014	P14-2801-4	Flat area very close to an eroded area with clear vegetation to the west.	ST + AA
11.95724	3.170527	167.9	29/01/2014	P14-2901-1	Site in a flat area close to the Alibori.	ST + AA
11.95775	3.168972	166.7	29/01/2014	P14-2901-2	Site flat and cultivated close to the Alibori River, which lies to the south.	ST + AA
11.94809	3.159149	169.1	29/01/2014	P14-2901-3	Flat site, surrounded thorny vegetation near Alibori area.	ST + AA
11.94747	3.154054	172.1	29/01/2014	P14-2901-4	Flat site close to the Alibori River	ST + AA
11.94913	3.147369	175.4	29/01/2014	P14-2901-5	Very eroded site close to the Alibori area.	ST + AA
11.94908	3.146311	178.6	29/01/2014	P14-2901-6	Settlement mound made up of laterite around 30 metres from the Alibori River.	ST + AA
11.94879	3.145631	179.4	29/01/2014	P14-2901-7	Settlement mound made up of laterite around 50 metres from the Alibori River.	ST + AA
11.94831	3.145135	182	29/01/2014	P14-2901-8	Settlement mound exposed over a large area in laterite very close to the river.	ST + AA
12.00209	3.079316	177.6	30/01/2014	P14-3001-1	Partially eroded area close to the Alibori	ST + AA
12.00211	3.078646	181.6	30/01/2014	P14-3001-2	Very large mound, with large baobab.	ST + AA
11.99372	3.073877	177.6	30/01/2014	P14-3001-3	Site on eroded area close to the Alibori surrounded by vegetation.	ST + AA
11.99313	3.073199	180.3	30/01/2014	P14-3001-5	Flat site in the Alibori area surrounded by vegetation.	ST + AA
11.993314	3.07321	178	30/01/2014	P14-3001-4 GPS 4	A little flat site, in the south east.	ST + AA
12.002001	3.079636	180	30/01/2014	P14-3001-1 GPS 4	Located back during the last campaign, the site is located on top of a natural mound by the Alibori.	ST + AA

Sites identified during *Crossroads of Empires* fieldwork, 2011–2014 (Gazetteer One), and through Khalaf's doctoral work in 2014 (Gazetteer Two). Surveyors' names are abbreviated and are as follows: NK = Nadia Khalaf, ALS = Alexandre Livingstone Smith, DND = Didier N'Dah, AH = Anne Haour, CRB = Caroline Robion-Brunner, SL = Sven Leman, AD = Abbas Diallo, BM = Barpougouni Mardjoua, ST + AA = Samson Tokannou and Amour Ayibatin, LC = Louis Champion. In 2011 DND and ALS largely surveyed together so many of the points labelled ALS are joint discoveries.

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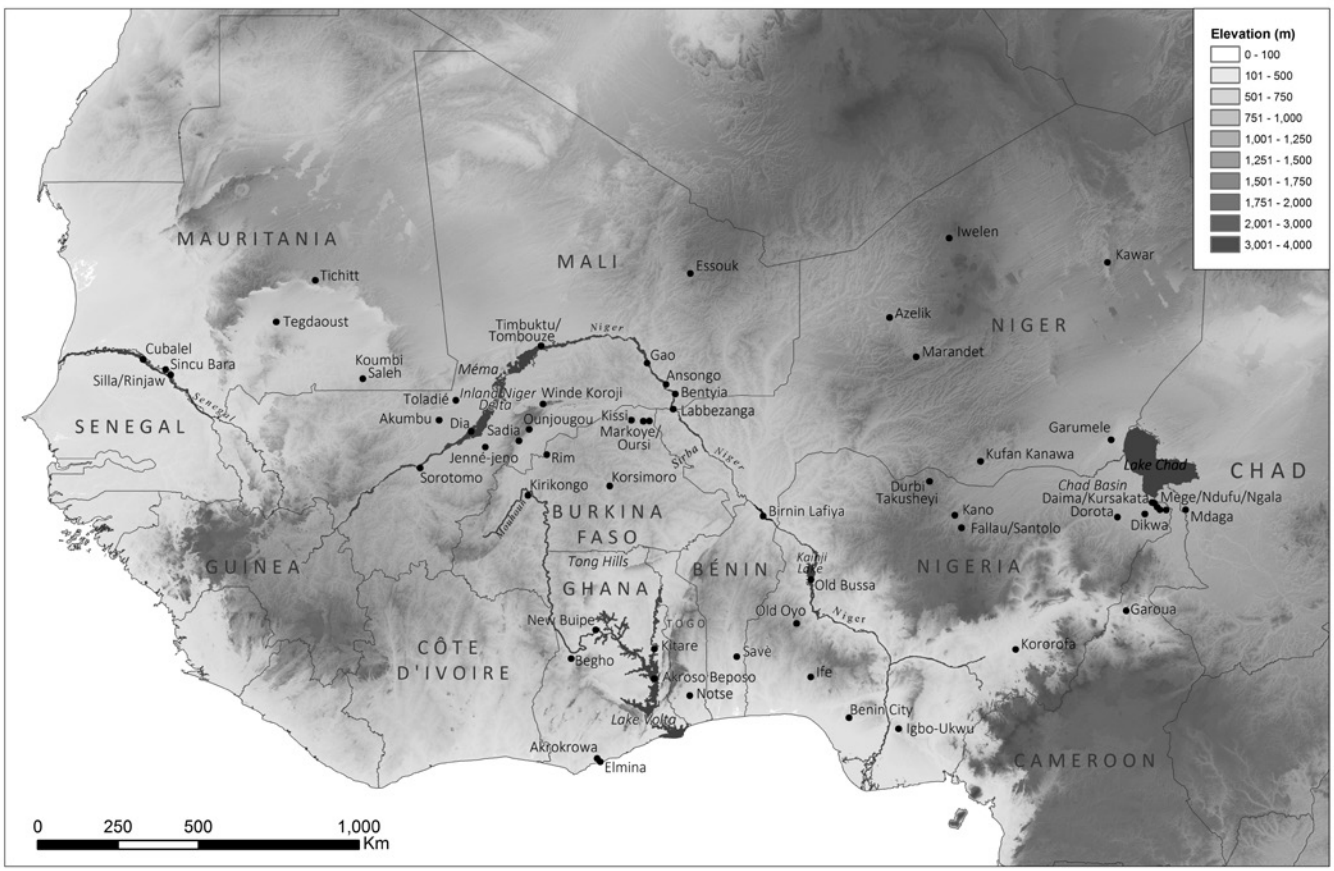
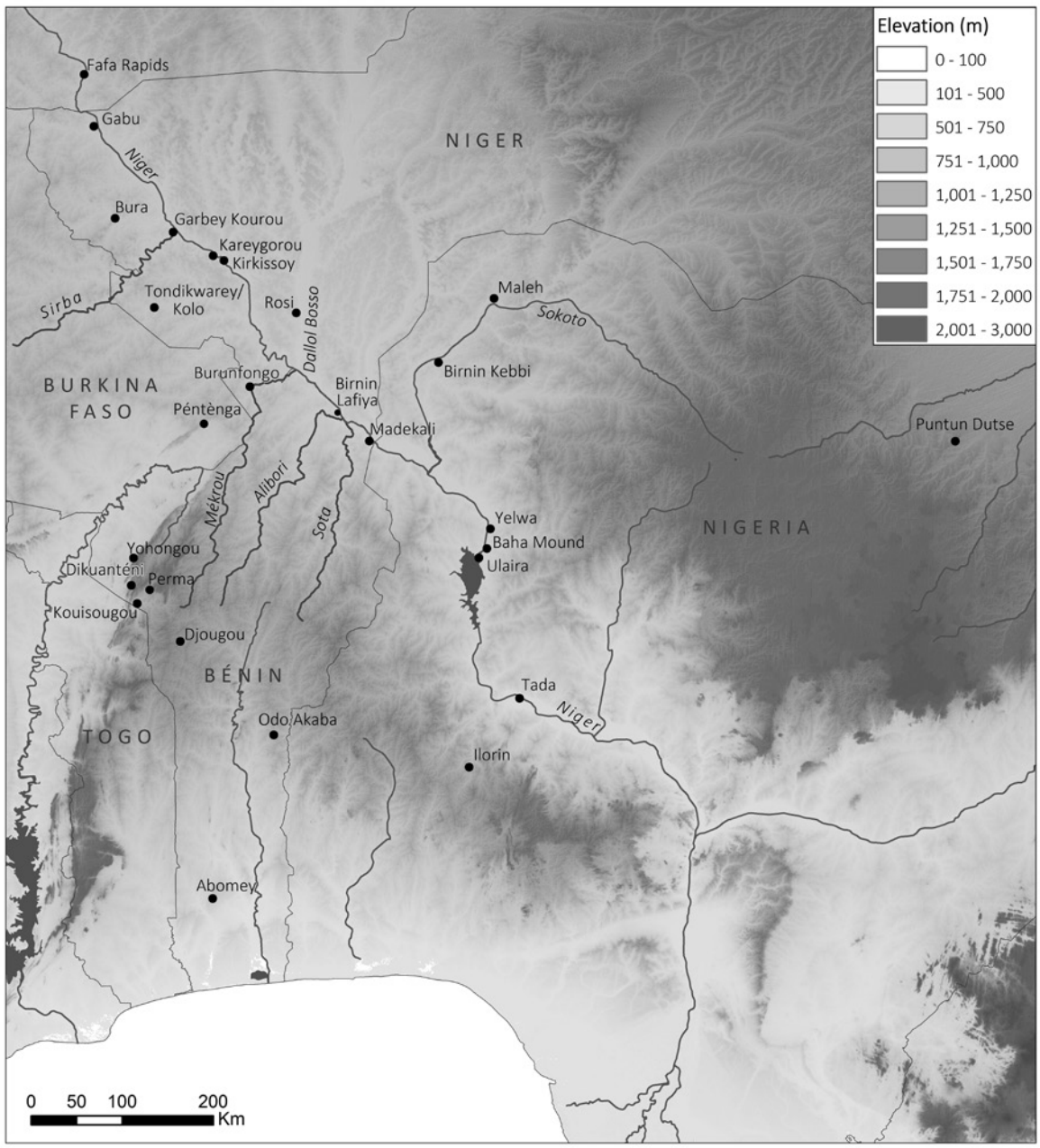
Maps

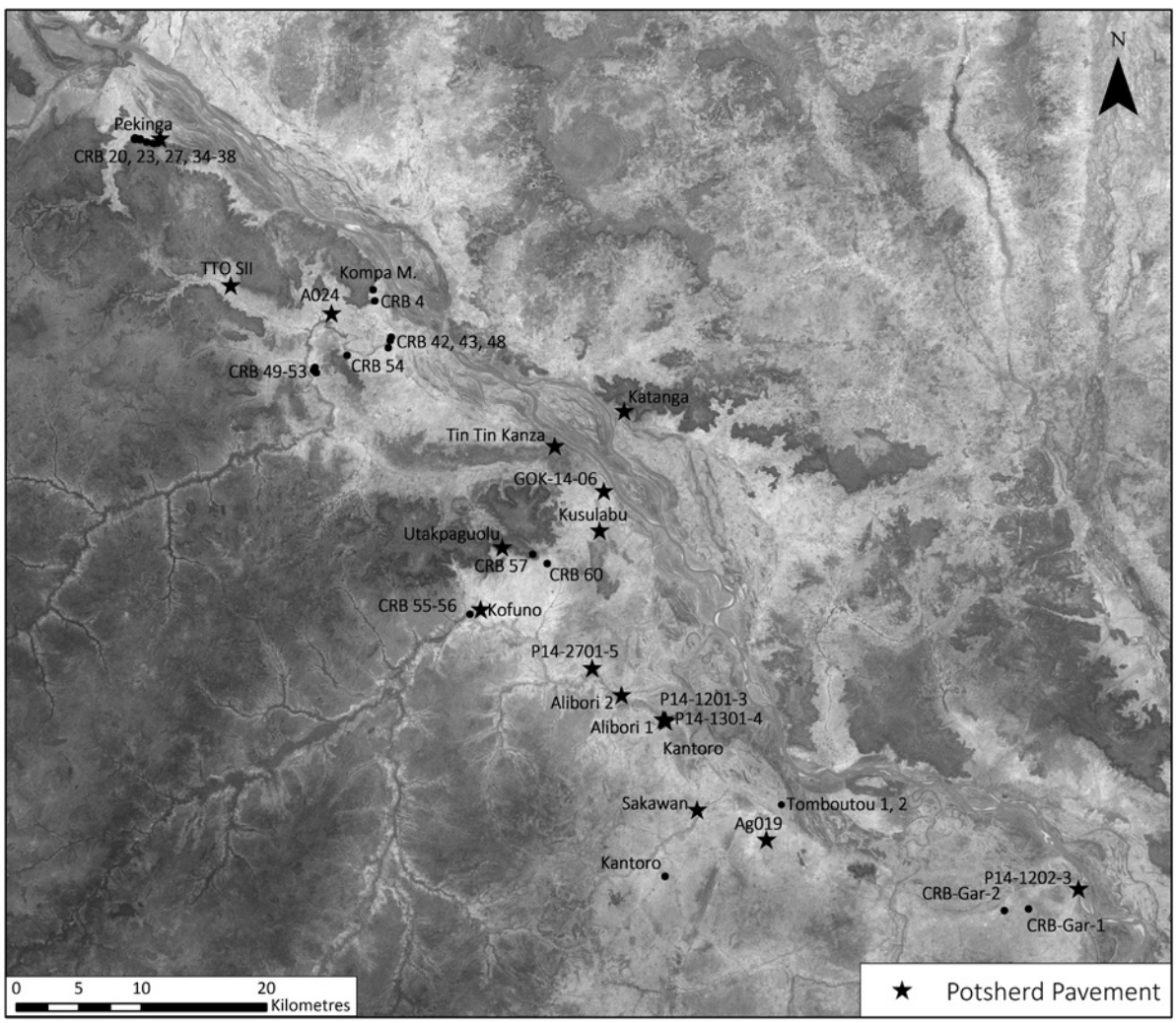


MAP 1 Selected archaeological sites of West Africa

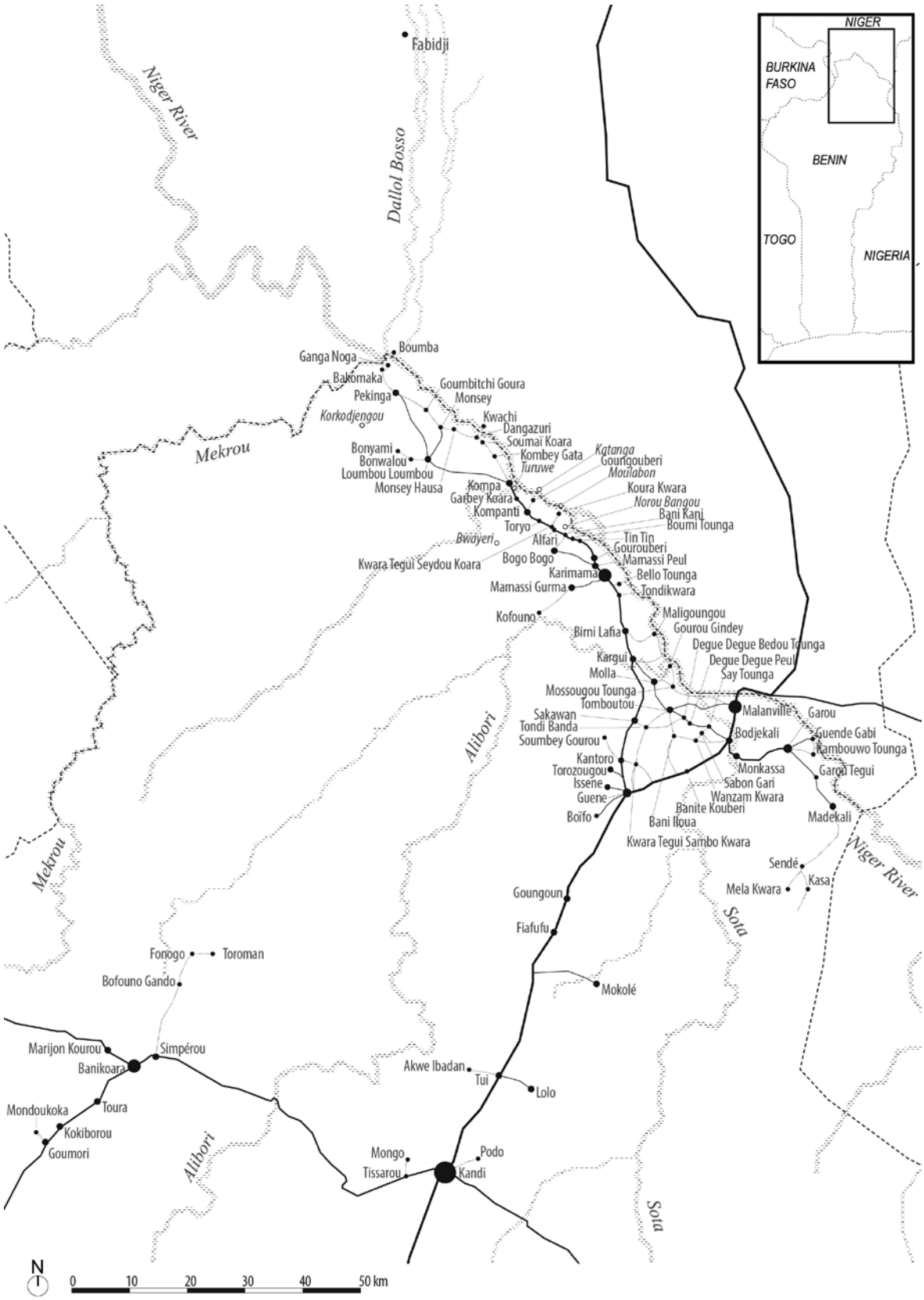
MAP PRODUCED BY NADIA KHALAF USING SHUTTLE RADAR TOPOGRAPHY MISSION (SRTM) DATA COURTESY OF NASA/USGS



MAP 2 The eastern arc of the Niger – selected archaeological sites
MAP PRODUCED BY NADIA KHALAF USING SHUTTLE RADAR TOPOGRAPHY MISSION (SRTM) DATA COURTESY OF NASA/USGS

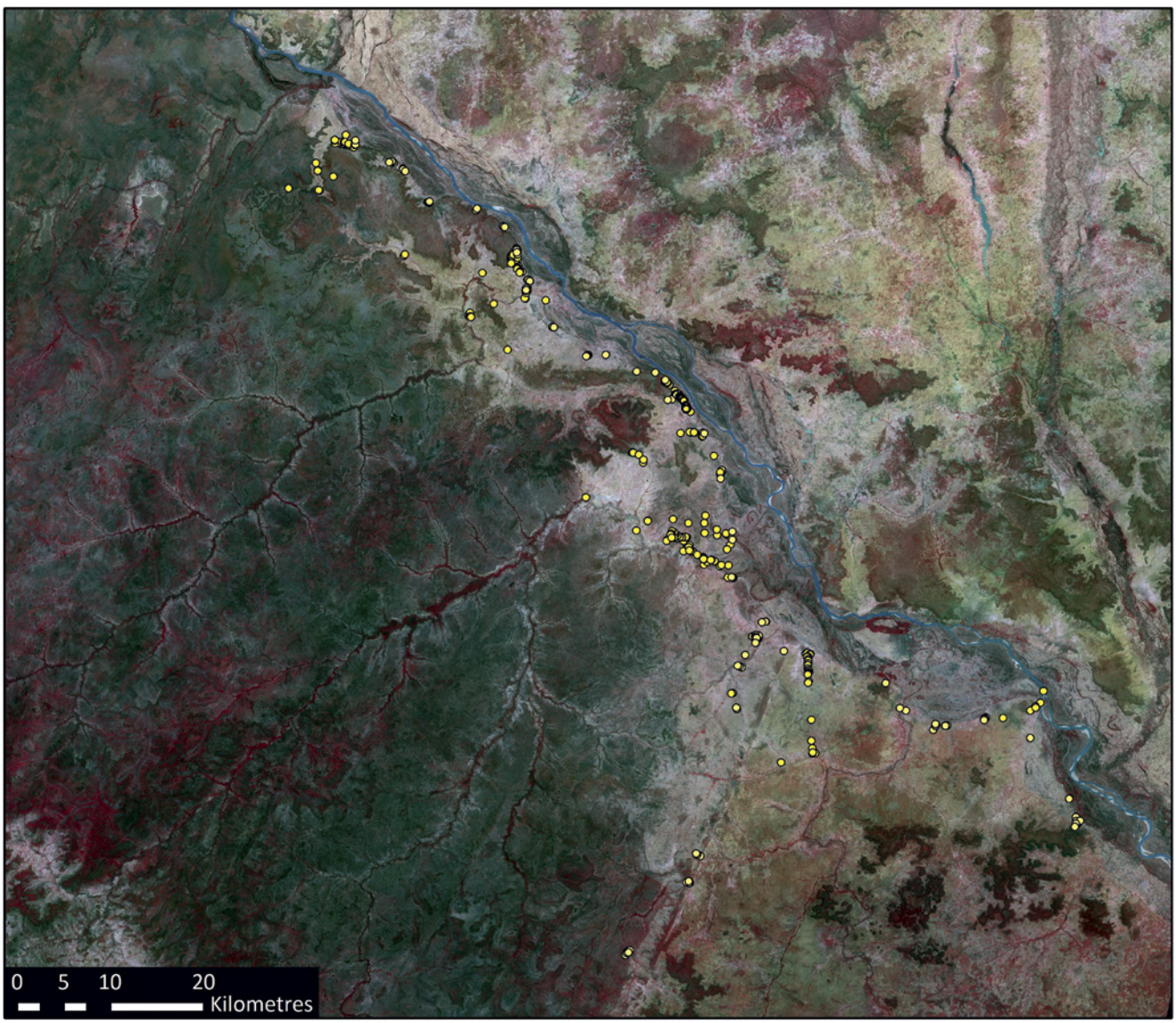


MAP 3 Archaeological sites of Dendi. Stars indicate sites where potsherd pavements were noted
MAP PRODUCED BY NADIA KHALAF USING LANDSAT 8 IMAGERY COURTESY OF USGS/NASA

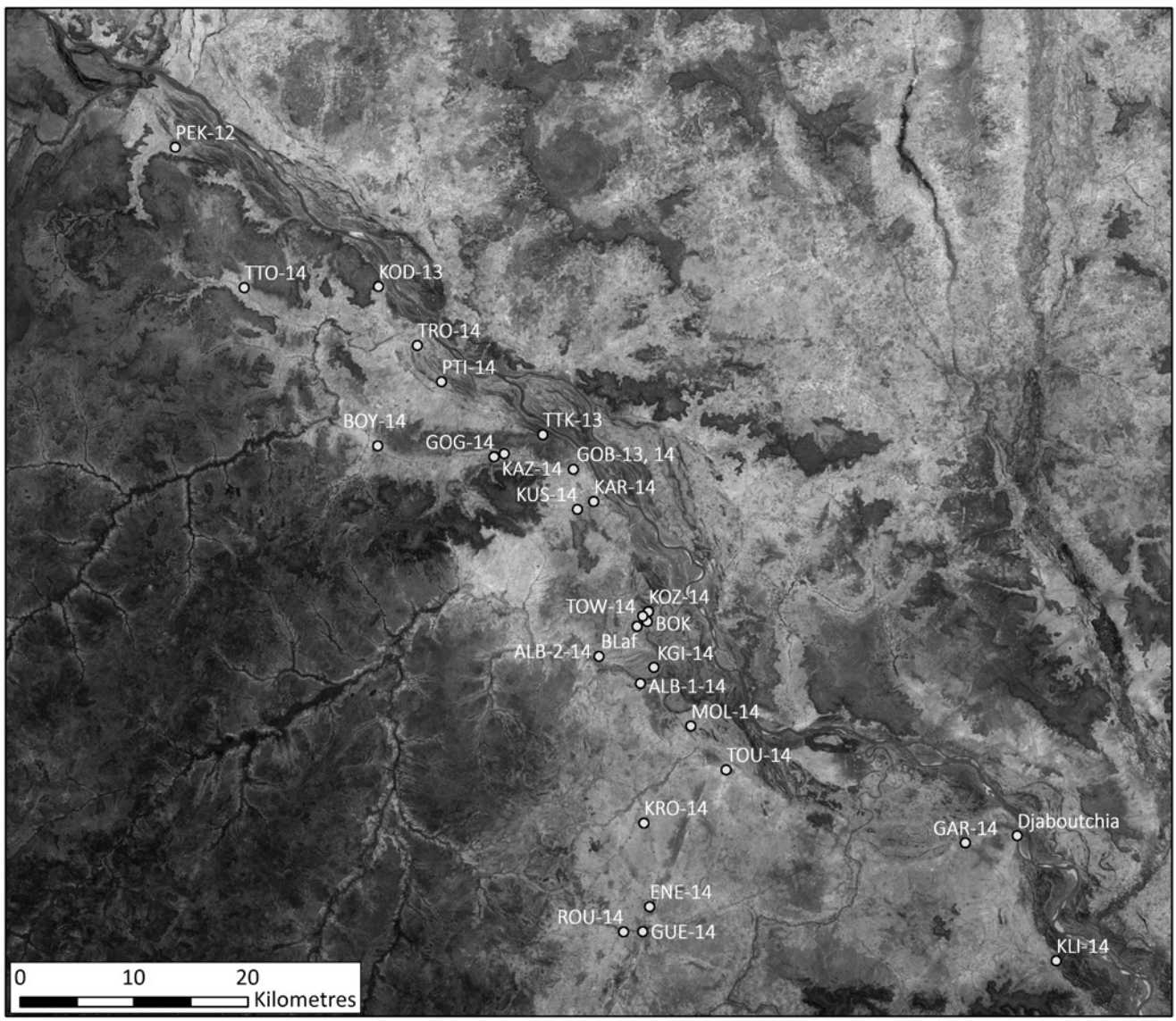


MAP 4 Present-day villages and towns of Dendi

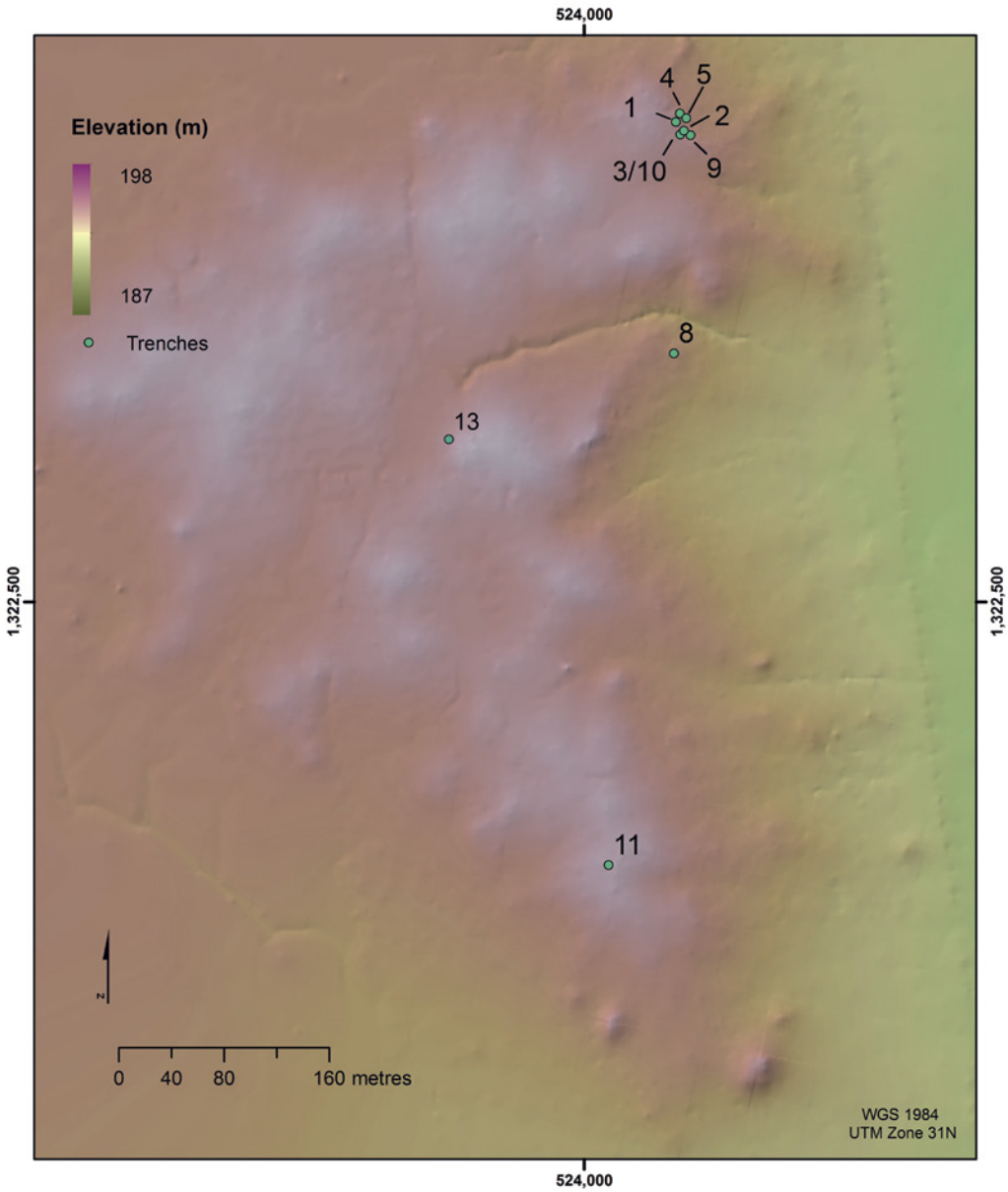
MAP BY JEAN-FRANÇOIS PINET, BASED ON VARIOUS SOURCES (GOOGLE EARTH, IGN, VAN DRIEL 2001, CARTEDUMONDE.NET, ECOPAS COMPOSANTE BÉNIN 2006)



MAP 5 Sites located during survey
MAP PRODUCED BY NADIA KHALAF USING LANDSAT 8 IMAGERY COURTESY OF USGS/NASA



MAP 6 Sites test-pitted by the *Crossroads* team
MAP PRODUCED BY NADIA KHALAF USING LANDSAT 8 IMAGERY COURTESY OF USGS/NASA



MAP 7 Birnin Lafiya. Digital elevation model from systematic landscape survey (Leica GS09 GNSS/GPS differential; Leica Geosystems AG, St. Gallen) with excavation locations (NW corner of excavation) indicated.

MAP BY PAUL ADDERLEY

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