



Settlement and Cemetery at Giza: Papers from the 2010 AERA-ARCE Field School

edited by Freya Sadarangani and Alexandra Witsell



Ancient Egypt Research Associates, Inc.

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Cover photo: Susan Sobhi Azeer and James Taylor draw fieldstone walls in the bakery rooms of Area AA at the Heit el-Ghurab site during the 2007 season. Photo by Mark Lehner.

Contents

Acknowledgements 5

Bibliographic Abbreviations 6

List of Abbreviations Used in this Volume 7

Preface 11

Ana Tavares and Mohsen Kamel

Excavations

1 Bread and Bakeries at the Heit el-Ghurab Site: Preliminary Reports on the AA and EOG-D Bakeries

Bakeries at the Heit el-Ghurab Site: An Introduction 15

Hanan Mahmoud and Rabee Eissa

A Preliminary Report on the AA Bakery 33

Hanan Mahmoud and James Taylor, with Mohamed Abd el-Aziz Gabr, Mohamed Ahmed Abd el-Rahman, and Momeen Saad

A Preliminary Report on the EOG-D Bakery 55

Rabee Eissa, with Mansour el-Badri Mustafa Ali, Shaima Montasser Abu el-Hagag, Ahmed Omar Shoukri, and Hussein Rikaby Hamed

2 Prolific Pedestals: A Preliminary Report on Area Main Street East (MSE) 69

Ashraf Abd el-Aziz, with Ayman Ashmawy Ali, Mohamed Hatem Ali, and Osama Mostafa Mohamed

Specialist Reports

3 A Study on the Ceramics from the Main Street East Area 101

Mahmoud el-Shafey, Mohamed Naguib, and Sherif Abd el-Monaem, with Ilham Ahmed M. el-Tawil, Mohamed Ali Abd el-Hakim Ismail, Shaima Rasheed Salem, and Nermeen Shabaan Abayazeed

4 A Report on the 2009 Burials from the Chute Area 169

Scott D. Haddow and Afaf Wahba Abd el-Salam Wahba, with Sara Sabri Abdallah, Maha Siah Abd el-Tawb, and Mahmoud Ali Abd el-Rahman

5 A Report on the Faunal Remains from the AA Bakery 229

Rasha Nasr Abd el-Mageed

6 A Report on the Khentkawes Town-House E Archaeobotanical Remains 237

Mary Anne Murray and Rebab el-Gendy

The Analysis and Publication Field School

7 The AERA-ARCE Field School in Context 253

Ana Tavares

Bibliography 277

Arabic Abstracts 301

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* All Ministry titles are those from the time this manuscript was written.



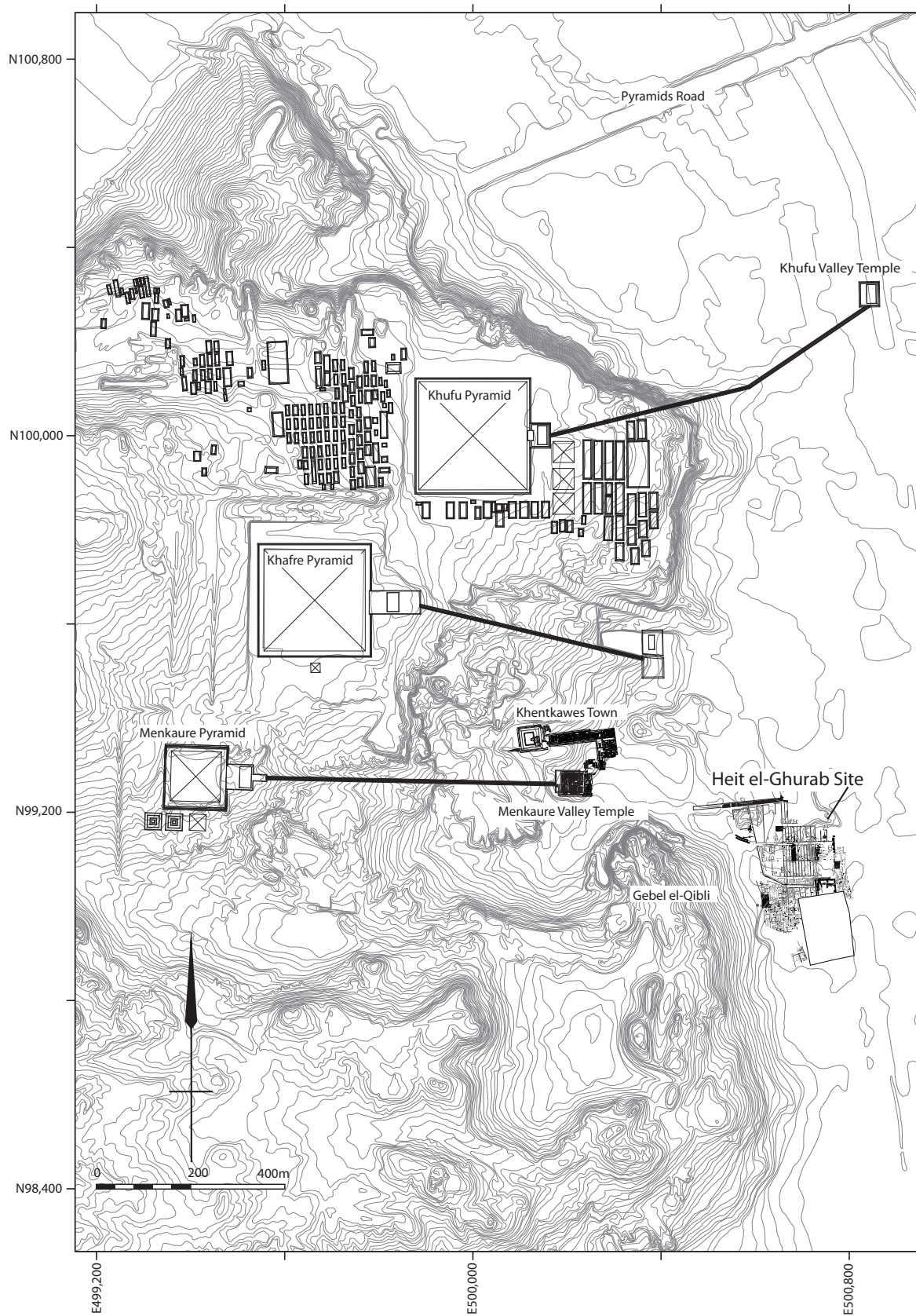
Bibliographic Abbreviations

ASAE	<i>Annales du Service des Antiquités de l'Égypte</i> (Cairo)
AVDAIK	Archäologische Veröffentlichungen, Deutschen Archäologisches Institut, Abteilung Kairo (Berlin)
BAR	British Archaeological Reports (Oxford)
BARCE	<i>Bulletin of the Amercian Research Center in Egypt</i>
BASOR	<i>Bulletin of the American Schools of Oriental Research</i> (Ann Arbor and New Haven)
BIFAO	<i>Bulletin Institut français d'archéologie orientale</i> (Cairo)
BCE	<i>Bulletin de la céramique égyptienne</i> (IFAO, Cairo)
CCE	<i>Cahiers de la céramique égyptienne</i> (Cairo)
EES	Egypt Exploration Society
FIFAO	Fouilles de l'Institut français d'archéologie orientale (Cairo)
GOP1	<i>Giza Plateau Mapping Project, Season 2004: Preliminary Report</i> , ed. by M. Lehner, M. Kamel, and A. Tavares. Boston: Ancient Egypt Research Associates, Inc. 2009.
GOP2	<i>Giza Plateau Mapping Project, Season 2005: Preliminary Report</i> , ed. by M. Lehner, M. Kamel, and A. Tavares. Boston: Ancient Egypt Research Associates, Inc. 2006.
GOP3	<i>Giza Plateau Mapping Project, Season 2006–2007: Preliminary Report</i> , ed. by M. Lehner, M. Kamel, and A. Tavares. Boston: Ancient Egypt Research Associates, Inc. 2009.
GOP4	<i>Giza Plateau Mapping Project, Season 2008: Preliminary Report</i> , ed. by M. Lehner, M. Kamel, and A. Tavares. Boston: Ancient Egypt Research Associates, Inc. 2009.
GOP5	<i>Giza Plateau Mapping Project, Season 2009: Preliminary Report</i> , ed. by M. Lehner. Boston: Ancient Egypt Research Associates, Inc. 2011.
GR1	<i>Giza Reports, The Giza Plateau Mapping Project, Vol. 1: Project History and Survey, Main Street, Gallery III.4, and Ceramics</i> , ed. by M. Lehner and W. Wetterstrom. Boston: Ancient Egypt Research Associates, Inc. 2007.
IFAO	Institut français d'archéologie orientale (Cairo)
JARCE	<i>Journal of the American Research Center in Egypt</i> (Boston and New York)
JEA	<i>Journal of Egyptian Archaeology</i> . Egypt Exploration Society (London)
MDAIK	<i>Mitteilungen des deutschen archäologischen Instituts</i> , Abteilung Kairo (Wiesbaden)
OIR	<i>Oriental Institute, Annual Reports</i> . Univ. of Chicago (Chicago)
SAK	Studien zur Altägyptischen Kultur (Hamburg)
SDAIK	Sonderschriften des deutschen archäologischen Instituts, Abteilung Kairo (Cairo)

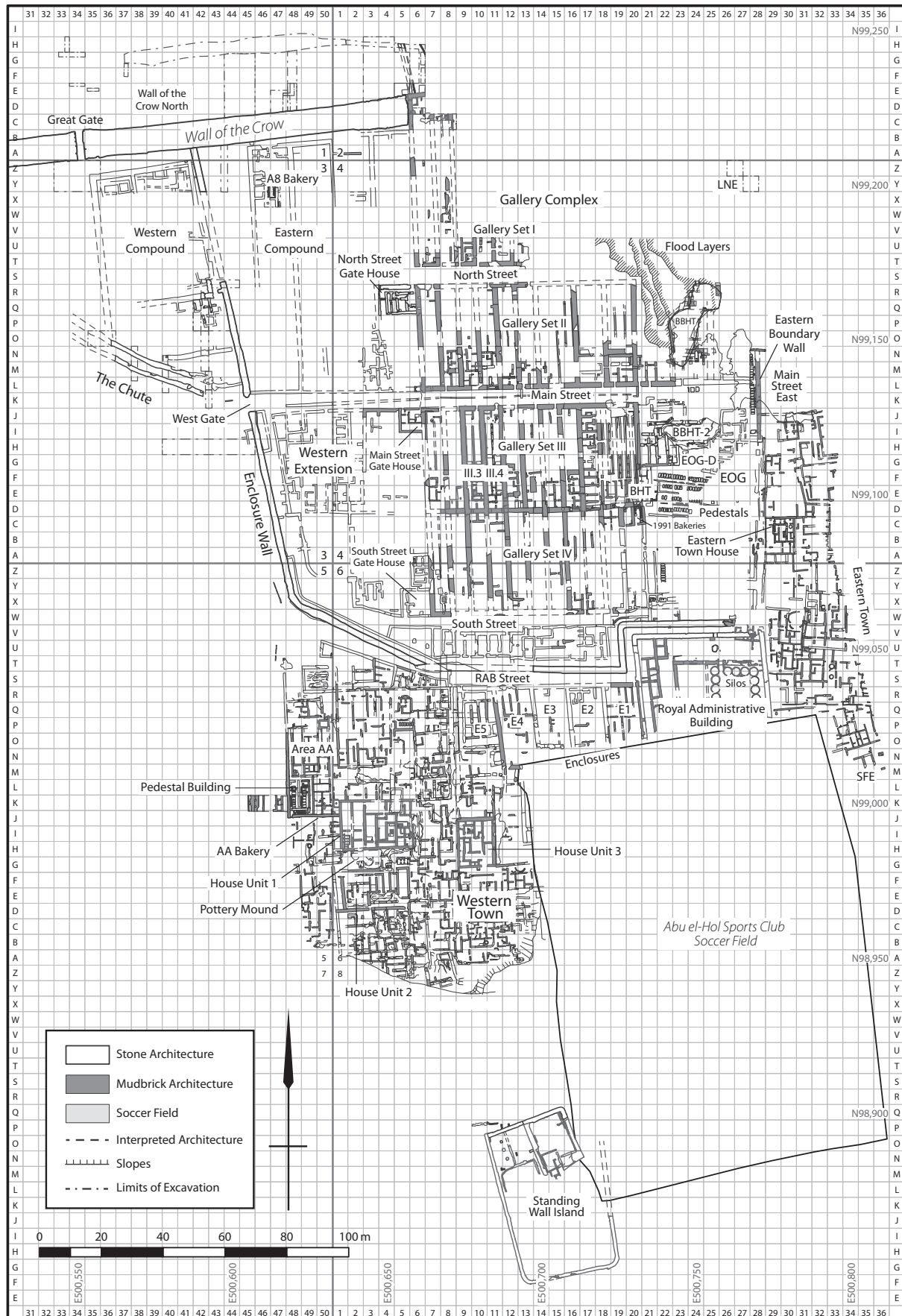
List of Abbreviations Used in this Volume

AERA	Ancient Egypt Research Associates
ARCE	American Research Center in Egypt
asl	above sea level
cm	centimeters
DSR	Data Structure Report
EOG	East of Galleries
ESA	Egyptian Survey Authority
ETH	Eastern Town House
GI	Khufu Pyramid
GII	Khafre Pyramid
GII.VT	Khafre Valley Temple
GIII	Menkaure Pyramid
GIII.VT	Menkaure Valley Temple
GIS	Geographical Information System
GOP	Giza Occasional Papers
GPMP	Giza Plateau Mapping Project
HeG	Heit el-Ghurab
KKT	Khentkawes Town
KKT-N	Khentkawes Town - North
LOE	limit of excavation
m	meters
MoLA	Museum of London Archaeology
MSA	Ministry of State for Antiquities
MVT	Menkaure Valley Temple
NSGH	North Street Gate House
RAB	Royal Administrative Building
SFW	Soccer Field West
SFW.H1	Soccer Field West House Unit 1
SoE	Survey of Egypt
WoC	Wall of the Crow
WD	Western Dump

In AERA literature, feature numbers are indicated in square brackets, for example, [29,904].



Frontispiece 1. The Giza Plateau, showing the Heit el-Ghurab (HeG) site in relation to the Great Pyramids, cemeteries, Khentkawes Town, and the Menkaure Valley Temple. Plan by Rebekah Miracle, AERA GIS, and Hassan Ramadan.



Preface

by Ana Tavares and Mohsen Kamel

This volume charts the journey of the joint Ancient Egypt Research Associates-American Research Center in Egypt (AERA-ARCE) Field School from trowel edge to printed page. The Egyptian authors are all graduates of the field school and have been trained as beginners through to advanced level in excavating, recording, analyzing, and writing archaeological material. This is AERA's first field school publication and the culmination of our training efforts since 2005. The AERA-ARCE team developed a program consisting of Beginners, Advanced, Salvage, and Analysis and Publication Field Schools. We discuss the field school program, and in particular the Analysis and Publication Field School (APFS) in Chapter 7, "The APFS in Context." Students and supervisors developed the articles in this volume during the APFS in 2010, and during a further short session in 2013. The papers in this volume are primarily descriptive reports written by the students while learning the basics of analysis and publication. They deal with material from two ancient settlements in Giza: the Khentkawes Town (KKT; frontispiece 1), and the Heit el-Ghurab (HeG; frontispiece 2).

The Heit el-Ghurab Site

The Heit el-Ghurab settlement at Giza has been excavated since 1989 by the Giza Plateau Mapping Project (GPMP), one of AERA's programs under the direction of Mark Lehner (Lehner 2007a: 3–50). This settlement, dated to the reigns of Khafre and Menkaure (mid-4th Dynasty, c. 2472–2442 BC; Nolan 2010), is located approximately 400 m south of the Sphinx (see frontispiece 1). The site is known by the modern Arabic name Heit el-Ghurab ("Wall of the Crow"), after a massive masonry wall bounding the settlement to the north (frontispiece 2). The HeG settlement formed part of the infrastructure of pyramid building and administration. It shows three distinct urban areas, named: the Gallery Complex, the Eastern Town, and the

Western Town, linked by streets, gates, and enclosure walls (see Lehner and Tavares 2010). A large building, the Royal Administrative Building (RAB, Sadarangani 2009b), controls the interface between these separate areas, which are characterized by distinct urban layout, design, and size of structures (Tavares 2011a). Differing material culture patterns are also apparent between these areas (Lehner 2003, Murray 2005, Nolan and Pavlick 2008, Redding 2010, Tavares 2004 and 2008a, and Wodzińska 2007b).

The central area of the HeG settlement is occupied by four sets of elongated structures, laid out orthogonally: Gallery Sets I, II, III, and IV (frontispiece 2). Two broad east-west streets, designated as North Street and Main Street, separate Gallery Sets I from II, and II from III. Gallery Sets III and IV are back to back. South Street runs along the southern side of Gallery Set IV towards the RAB. The area at the east end of Main Street, designated Main Street East (MSE), is the subject of two articles in this volume: an excavation report and a ceramics report. The Gallery Complex is flanked to the east and west by auxiliary structures—storerooms, bakeries, and "pedestal structures" (the latter are discussed in detail in Lehner 2009a and in Abd el-Aziz et al., this volume). In this volume Eissa et al. deals with one of these auxiliary structures: a bakery in the area "East of the Galleries" (EOG). The galleries and auxiliary structures are bounded to the north by the Wall of the Crow, to the west and south by a continuous limestone enclosure wall, and to the east by a mudbrick enclosure wall. Hypotheses for the function of the Gallery Complex include barracks for a rotating work force (Lehner 2007b, Tavares 2011a), a possible royal guard (Lehner 2004) or an expeditionary force (Lehner 2013). The pottery, small finds, and botanical and faunal remains excavated here indicate that the barracks were centrally provisioned (Lehner 2003; Murray 2005; Redding 2010; Wodzińska 2007b). The

material culture shows parallels with other centrally provisioned 4th Dynasty sites, such as the workmen's houses at the Wadi Garawi dam (Dreyer and Jaritz 1983 and 1985) and an industrial site at Sheikh Said, Deir el-Bersha (Willems et al. 2009).

To the east of the galleries the Eastern Town shows a self-organized urban pattern and was probably occupied by a permanent population. The material culture reflects a village economy with a high density and variety of plant items, and evidence of pig raising (Murray 2005; Redding 2010). The third urban area, the Western Town, is characterized by large, well-appointed houses. For example, House 3 has a central open courtyard with a tree pit (GOP2: 74–76) while House 1 is one of the largest Old Kingdom houses excavated to date in Egypt, with an area of 400 m² (GOP5: 135–145). Evidence from clay sealings and faunal material suggests that these structures housed important scribes and officials (Nolan and Pavlick 2008, Redding 2007). Two articles in this volume, namely the AA Bakery report and the faunal report, deal with material from the Western Town.

The HeG was abandoned and dismantled at the end of the 4th Dynasty. Later, the site was used as a burial ground from the late Third Intermediate Period (c. 760 BC) to the present (Kaiser 2006b; Tavares and Laemmel 2011). The ancient burials are clustered densely around the east end of the Wall of the Crow, and extend south to Main Street and west beyond the Enclosure Wall. The burials analyzed by the APFS were excavated in the Chute, a northwest-southeast passage in the Western Extension, an extra-mural area of auxiliary structures to the west of the Enclosure Wall (frontispiece 2).

The Khentkawes Town

The Khentkawes Town (frontispiece 1) is represented in this volume by an archaeobotanical report. The town and funerary complex were built for Queen Khentkawes I towards the end of the 4th Dynasty (Hassan 1943; Lehner 2009a). AERA has been working here and in the adjacent Menkaure Valley Temple (MVT) since 2005 (GOP2, GOP3, GOP4, Lehner et al. 2011, Tavares 2008b). The Khentkawes Town was initially excavated by Selim Hassan in a single season in 1936 (Hassan 1943). His excavation revealed a series of large modular houses, built to the north of a causeway linking the Queen's funerary monument with a valley complex and harbor (Lehner 2011b). We designated this part of the settlement as KKT-N. Selim

Hassan also excavated other structures (houses, water tanks, ovens, and silos) extending south towards the Menkaure Valley Temple (Lehner 2011a). The town was initially built for priests and administrators involved in Khentkawes' funerary cult. After the initial occupation, there was a period of abandonment and re-occupation, possibly in the 6th Dynasty (Lehner et al. 2011; Wodzińska 2011). The work in the Khentkawes Town and the MVT provides comparative data for the HeG settlement, both in terms of urban layout and material culture. The botanical remains recovered from one of the houses (House E) in KKT-N are the subject of the archaeobotanical article in this volume. A detailed introduction to House E is provided in that article.

Archaeological Methodology

The history and development of the excavation and recording methodology of the GPMP have been discussed in detail elsewhere (GOP5; Sadarangani and Taylor, forthcoming in GOP6). Here we briefly summarize the methodology used in the excavation areas published in this volume.

The excavation areas are cleaned and excavated by hand. Archaeological units—be they built, depositional, or cut—are designated as features. All features observed are fully excavated, planned, and recorded on pro-forma record sheets in accordance with guidelines set down by the Museum of London Archaeology (MoLA; Museum of London 1994). Feature numbers are allocated sequentially, but the numerical sequence does not reflect depositional or excavation order. Features are assembled into a stratigraphic matrix (Harris 1979) and phased. This provides the structure for the archaeological narrative. Plans are drawn to a scale of 1:20; sections, elevations and assemblages are drawn to a scale of 1:10. Plans and sections show coordinate values within the GPMP's Giza-wide grid system (Goodman 2007). Grid quadrants for the HeG are shown in frontispiece 2, and explained by Tavares (2011b; see also Lehner 2001: 7). A peculiarity of the GPMP recording system to be kept in mind is that grid squares are designated by the northeast grid peg. A detailed photographic record is made of all features prior to excavation. Photographs are taken at different stages of excavation and when structures and features are “in-phase.”

Elevations are taken on all features and are in meters above sea level (asl) (Goodman 2007). In Area MSE a temporary benchmark was set up in Square

4.N26 (value 17.00 m asl) then moved to the 4.L23 grid peg (value 16.67 m asl). This benchmark was used for work at the EOG Bakery. In the AA Bakery two benchmarks were established, at 16.03 m and 17.39 m asl. In the Chute area a temporary benchmark was set up on the 3.N44 grid peg with a value of 18.32 m asl.

AERA follows a 100% sampling strategy for artifacts, ceramics, lithics, clay sealings, bone, shell, and charcoal. All these are handpicked during excavation. The location of significant finds is recorded with x, y, z values (northing, easting, and elevation values). Bulk environmental samples are taken for flotation from significant features. Features are 100% dry sieved on site, and all material culture collected. The residue is sent for wet-sieving because of the rich object and lithic assemblages yielded in these areas. All material is then sent to AERA's Giza Laboratory for recording and analysis.

Concurrent with excavation, the feature information is entered in a detailed Excel spread sheet and uploaded onto the online AERA database. This database integrates the excavation record (written, drawn, and photographic) with specialist databases. The drawn record and survey information is assembled into the AERA GIS and then used to produce phased area plans. The AERA GIS is also used to present specialist data and material culture distribution maps (Brown 2006; Renfrew and Bahn 2008: 92–93; Miracle 2011 and 2013). A complete archive is assembled for each area, including forms and registers; notebooks; drawings and photographs; weekly site reports, specialist reports, and a final report; matrices; and survey and specialist data. A duplicate, in both paper and digital form, is kept at the Giza archive, while originals are curated in AERA's Boston archive.

Articles

This volume is the product of a field school. Pedagogic constraints affected the texts produced for publication. They determined the areas chosen for publication, the depth and breadth of analysis, and produced an overlap with previously published material and gray literature (archival reports), as well as an unevenness of authors' skills and "voice." These issues are discussed in detail in Chapter 7, "The APFS in Context." In the APFS we trained students to produce reports such as those published regularly during the last century in the journal *Annales du Service des Antiquités de l'Égypte* (ASAE). The rationale of publishing preliminary reports versus fully integrated archaeological volumes,

as well as other issues faced by the APFS, are discussed in Chapter 7.

The excavation articles in this volume consist of preliminary reports on two bakeries, the AA Bakery and the EOG-D Bakery, preceded by an article on bread and bakeries in ancient Egypt, and followed by a report on area Main Street East (MSE), all in the HeG site. The specialist articles comprise preliminary articles on pottery from Main Street East, human burials from the Chute area, faunal remains from the AA Bakery, all from the HeG site; and an archaeobotanical report on House E from the Khentkawes town.

Excavation Reports

"Bakeries at the Heit el-Ghurab Site: An Introduction" provides a brief overview of bread-making and bakery types, particularly the range of bakeries excavated at the HeG site. The article was written jointly by Hanan Mahmoud and Rabee Eissa.

"A Preliminary Report on the AA Bakery" deals with a bakery located in the Western Town and built late in the construction sequence of that area (GOP3: 65–86). This type of bakery, usually attached to a house, is found throughout the HeG site. It has a series of small square rooms with hearths and specific areas for baking, as well as areas for mixing and storage. Parallels to this type of bakery were found at the Old Kingdom Governor's Palace in Ayn 'Asil, Dakhla oasis (Soukiasian, Wuttman, and Pantalacci 2002). Hanan Mahmoud worked with Mohamed Abd el-Aziz Gabr, Mohamed Ahmed Abd el-Rahman, and Momeen Saad on this article. It draws considerably on the end-of-season report by James Taylor (Taylor 2009b), hence the co-authorship. Authorship and the use of material previously published are discussed in "The APFS in Context." The report on the faunal remains from the AA Bakery, in the current volume, complements that article.

"A Preliminary Report on the EOG-D Bakery" reports on the excavation of a bakery located in the area of auxiliary structures between the galleries and the Eastern Enclosure Wall. This area was filled with pottery waste from bread production, with up to 70% of the pottery consisting of bread mold fragments (Wodzińska 2011). Bakery EOG-D is an industrial type of bakery with numerous parallels within the HeG site. It is one of a series of at least four long structures (A–D), all originally thought to be bakeries. It is the longest bakery excavated at the HeG site. Rabee Eissa with Mansour el-Badri Mustafa Ali, Shaima Montasser

Abu el-Hagag, Ahmed Omar Shoukri, and Hussein Rikaby Hamed wrote the EOG-D Bakery report.

“Prolific Pedestals: A Preliminary Report on Area Main Street East (MSE)” reports on the excavation of pedestal structures along the Eastern Boundary Wall, which was initially built of mudbrick and rebuilt in fieldstone in a later phase (frontispiece 2). Along the eastern side of the wall a path leads south to the north entrance of the Royal Administrative Building (RAB) (Lehner and Tavares 2010: 187–188). This entrance controls access between the Eastern Town, the Gallery Complex, RAB, and the Western Town (Lehner and Tavares 2010). A row of low pedestals were built as part of the auxiliary structures extending from the Galleries to the boundary wall. These pedestal structures are ubiquitous at the HeG site, yet their function remains enigmatic (Lehner 2009a). The report discusses other known examples of pedestals from the HeG site. The article was written by Ashraf Abd el-Aziz with Ayman Ashmawy Ali, Mohamed Hatem Ali, and Osama Mostafa Mohamed. The ceramics report in this volume complements the MSE article.

Specialist Reports

Chapter 3, “The Pottery from the Main Street East Area,” provides a corpus and preliminary analysis of the ceramics excavated in the MSE area. A shape and ware typology is presented as well as a detailed fabric classification. The MSE ceramics are discussed under the headings of open forms, closed forms, and non-containers. Buto-Maadi culture sherds from MSE are also discussed. A catalog completes this article. The article was written by Mahmoud el-Shafey, Mohamed Naguib, and Sherif Abd el-Monaem, based on their work, with the assistance of Nermeen Shaban Abayazeed, Mohamed Naguib, Ilham Ahmed M. el-Tawil, and Shaima Rasheed Salem; supervised by Teodozja Rzeuska, Sabine Laemmel, Janine Bourriau, Sherif Abd el-Monaem, and Mohamed Ali Abd el-Hakim Ismail.

Chapter 4, “A Report on the 2009 Burials from the Chute Area,” presents the excavation and analysis of 19 human burials excavated by the field school from the Late Period cemetery in the Heit el-Ghurab site, specifically the area designated as the Chute in the Western Extension (see frontispiece 2; Abd el-Aziz 2011). The article includes discussions of field and laboratory methodology: age and sex assessment, determination of minimum number of individuals

(MNI), pathologies, and estimates of stature. Burial practices are briefly discussed including coffins, orientation, grave goods, and mummification. A burial catalog completes the report. The article was written by Scott D. Haddow and Afaf Wahba Abd el-Salam Wahba, with Sara Sabri Abdallah, Maha Siah Abd el-Tawb, and Mahmoud Ali Abd el-Rahman.

Chapter 5, “A Report on the Faunal Remains from the AA Bakery,” presents fish and mammal bone samples recovered from the AA Bakery compared to overall faunal remains from the HeG site as a whole and assessed in the context of the Western Town. The article is by Rasha Nasr Abd el-Mageed who was taught at the APFS by Richard Redding. This article complements the AA Bakery excavation report in this volume.

Chapter 6, “A Report on the Khentkawes Town House E Archaeobotanical Remains,” presents the results of the botanical samples excavated from House E, in the Khentkawes Town. The article details the archaeological context of House E, and describes the archaeobotanical sampling strategy, as well as quantification and identification methods. The discussion on charcoal, cereals, wild plants and crop weeds addresses questions regarding diet, crops, fuel use, function of rooms, and local ecology. The article was written by Mary Anne Murray and Rebab el-Gendy.

The Analysis and Publication Field School

Lastly, Chapter 7, “The APFS in Context,” introduces the AERA-ARCE training program and places the APFS in the context of renewed interest in the role of archaeological field schools in the construction of knowledge, heritage, community archaeology, and outreach (Mytum 2012). The structure and context of the APFS are described in detail, and the issues faced while running the APFS and producing this publication are addressed candidly.

Conclusion

Defining the character and function of the Heit el-Ghurab and Khentkawes settlements is a central focus of AERA’s on-going research agenda. The work of the field school is fully integrated into AERA’s substantive research program. In the production of this first field school volume we have learned valuable lessons for the future. With this volume we feel that the field school has contributed towards an understanding of Old Kingdom and Late Period Giza.

1. Bread and Bakeries at the Heit el-Ghurab Site: Preliminary Reports on the AA and EOG-D Bakeries

by Hanan Mahmoud, Rabee Eissa, and James Taylor

Bread and Bakeries at the Heit el-Ghurab Site: An Introduction

by Hanan Mahmoud and Rabee Eissa

Bread played an important role in the ancient Egyptian diet, economy, and ritual practice. Bread and beer were essential in every ceremony and consumed at every ancient Egyptian meal (Samuel 1999: 125). Both were a main part of the diet and both were made from barley and emmer wheat (Kemp, Samuel, and Luff 1994: 145; Samuel 1999: 125). Everyone partook of these staples, from pharaoh to the laboring peasant. Also they played an important role as an economic payment system or ration in a moneyless economy (Samuel 1999: 125; Kemp 2006: 171–179). Bread is mentioned in offering lists, proverbs, scribal exercises, and administrative records (Samuel 2000: 537). At the most fundamental level, bread made a major contribution to nutrition (Samuel 2000: 554). Bread contained protein, starch, and trace nutrients. It played a number of key roles in society.


The ancient Egyptians used a number of names for bread. As many as 117 kinds of bread are mentioned in New Kingdom documents, with 47 of these terms dating back to the Old and Middle Kingdoms (el-Mahdy 2009: 19, 22). This indicates that there were a variety of different kinds of bread; these must have varied in size, shape, ingredients, and taste (Samuel 1996: 488; el-Mahdy 2009: 19, 22).

The importance of bread to the ancient Egyptian diet meant that its preparation was an important part of daily life for people in small households, on large estates, and in temple bakeries (Samuel 1999: 125). It is therefore unsurprising that evidence relating to the importance of bread is widely attested in many areas of the Heit el-Ghurab (HeG) site. Bread molds and

beer jars dominate the ceramic corpus (Wodzińska 2007b: 309), and there are many instances of bakeries (see below). Following this introduction, we report on excavations of two bakeries at HeG. We offer a survey of the bakeries at the settlement to place these in context and better understand how they relate to the activities of the town.

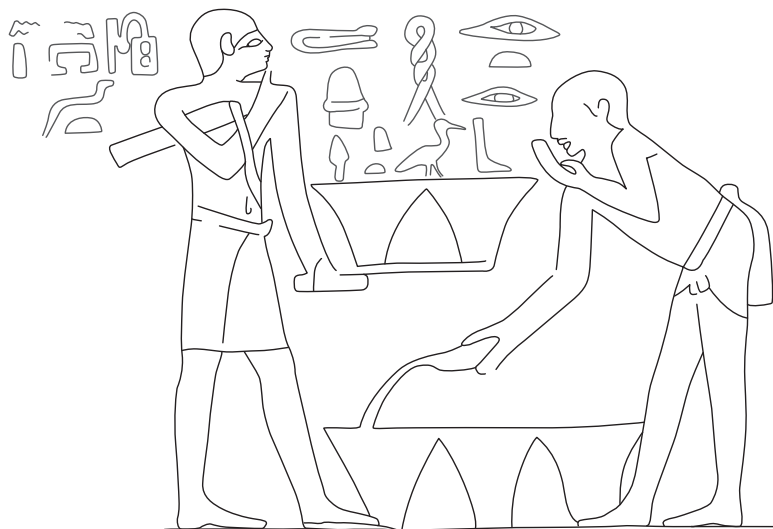
The Baking Process

Bread production in ancient Egypt was divided into different stages, beginning with harvesting the wheat or barley and cleaning it. The second step was to separate the grain from the straw and chaff by threshing, winnowing, and sieving (Murray 2000: 520–526). Flour was produced by grinding the grain on a quern, often made from quartzite. These querns made coarse flour but different hand stones could be used for finer flour. Mixing the flour with water made dough. Finally, the baking itself was done in different ways, such as by putting the bread directly in the fire, baking on hot ashes, baking in ovens, or putting the dough in hot molds set in sockets in shallow troughs in the floors of the baking room and then surrounding them with hot embers (Samuel 2000: 557–59). The charcoal could be taken from hearths constructed in the corners of the baking rooms (el-Mahdy 2009: 139–42).

Depictions in Old Kingdom tombs show bread being baked in conical ceramic bread molds called *bedja*,  (Erman and Grapow 1926: 488; Faltings 1998: 89–137; Hendrickx et al. 2002: 294; Wreszinski 1926: 12–13) (fig. 1.1). One of these scenes, from the tomb of Nianchchnum at Saqqara, depicts the bread


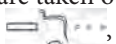



Saqqara Tomb of Htp-hr-ḥ.t, Faltings 1998: 92, Dok. 7 (PM 593).



Saqqara tomb of Hnty-kꜣ(=i), Faltings 1998: 102, Dok. 25 (PM 508).

Figure 1.1. Scenes of bread production in ancient Egypt from Old Kingdom tomb scenes in Saqqara. Drawings after Faltings 1998.

manufactured in *bedja* form, and the text and scene display the steps of manufacturing *bedja* bread. This process starts with grinding the grain for *ht* bread, or , and cleaning the grain. The *bedja* pot for the *ht* bread is heated, then the pots are taken out of the pile one by one, the *sd.t* dough, or , is made and put in the pot. The thick wall and base of the bread mold would absorb considerable heat, which would then bake the bread as the container cooled (Mills 1995: 64). Another scene also depicts this process in the tomb of Ti at Saqqara (Faltings 1998: 91–92; Erman and Grapow 1926: 203–4). The oven is referred to in Greco-Roman hieroglyphic texts as *bedja.t*, .

At the HeG site it has been suggested that the *bedja* were set in the floors of the bakery and then more *bedja* were placed upside down as lids, over the ones in the floor. Then hot ashes were piled around the two pots, baking the bread (AERAGRAM 1996: 6–7).

Types of Bread at the HeG Site

At the HeG site, AERA ceramicist Anna Wodzińska classified the bread molds into two types: flat rough trays (F1) and conical molds (F2) (fig. 1.2; Wodzińska 2007b: 306). She subdivided the flat rough trays into five variants according to shape and size, and the conical bread molds into three sub-groups according to size (Wodzińska 2007b: 306). Of the conical bread molds, the smallest (F2A) has a rim diameter of 10–14 cm and a height of 9 or 10 cm, the medium-sized mold (F2B) has a rim diameter of 18–20 cm and height of 18–19 cm, and the largest mold (F2C) has a rim diameter of 33–36 cm and a height of 27–36 cm (Wodzińska 2007b: 306). The F2 molds, the *bedja*, appear in tomb depictions next to the flat rough trays called *prt* (Wodzińska 2007b: 308). These trays were used to bake flat bread called *psn* (Lehner 1992: 4). Of the trays three variants are the most common: tray F1A

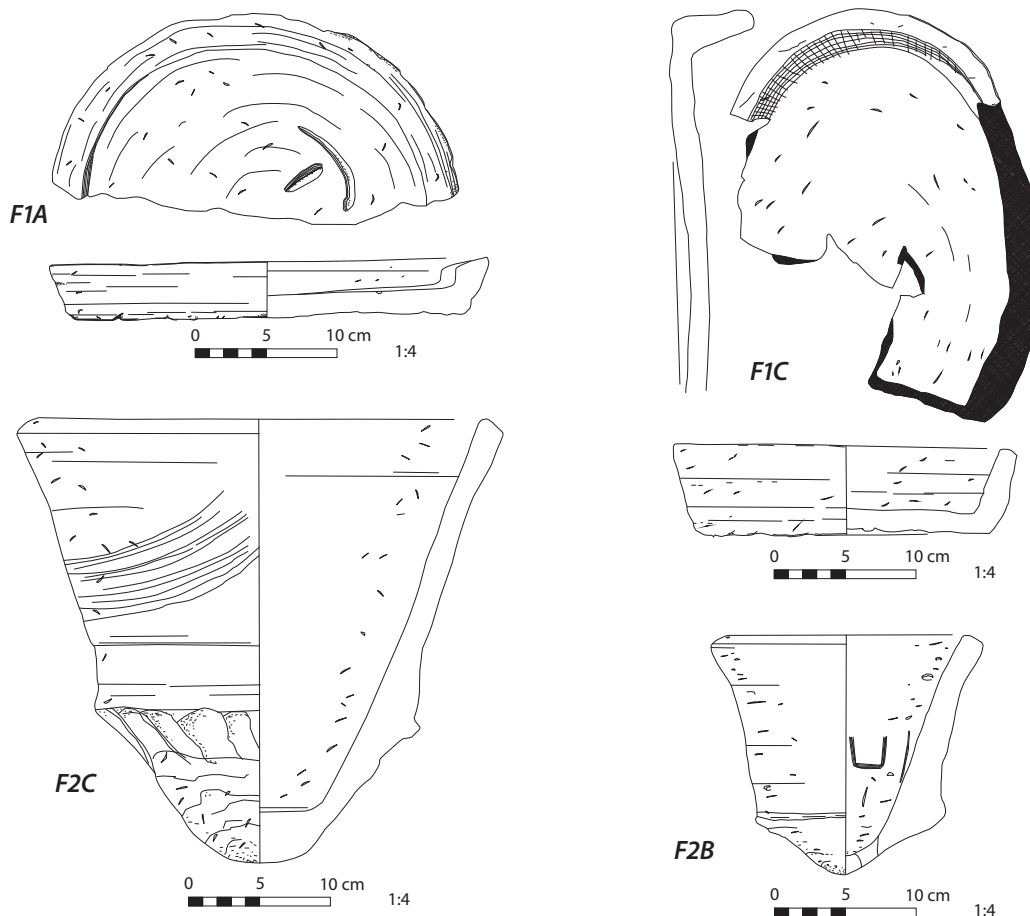


Figure 1.2. Typical 4th Dynasty bread molds from the Heit el-Ghurab site. Drawings by Anna Wodzińska (2007b: 307).

(a tray with a ledge rim, rim diameter of 30–35 cm and height 2.3–5.2 cm); tray F1B (a rim diameter of 18–20 cm and a height of 2–4 cm); and tray F1C (an oval tray with a height of 1–10 cm) (Wodzińska 2007b: 306).

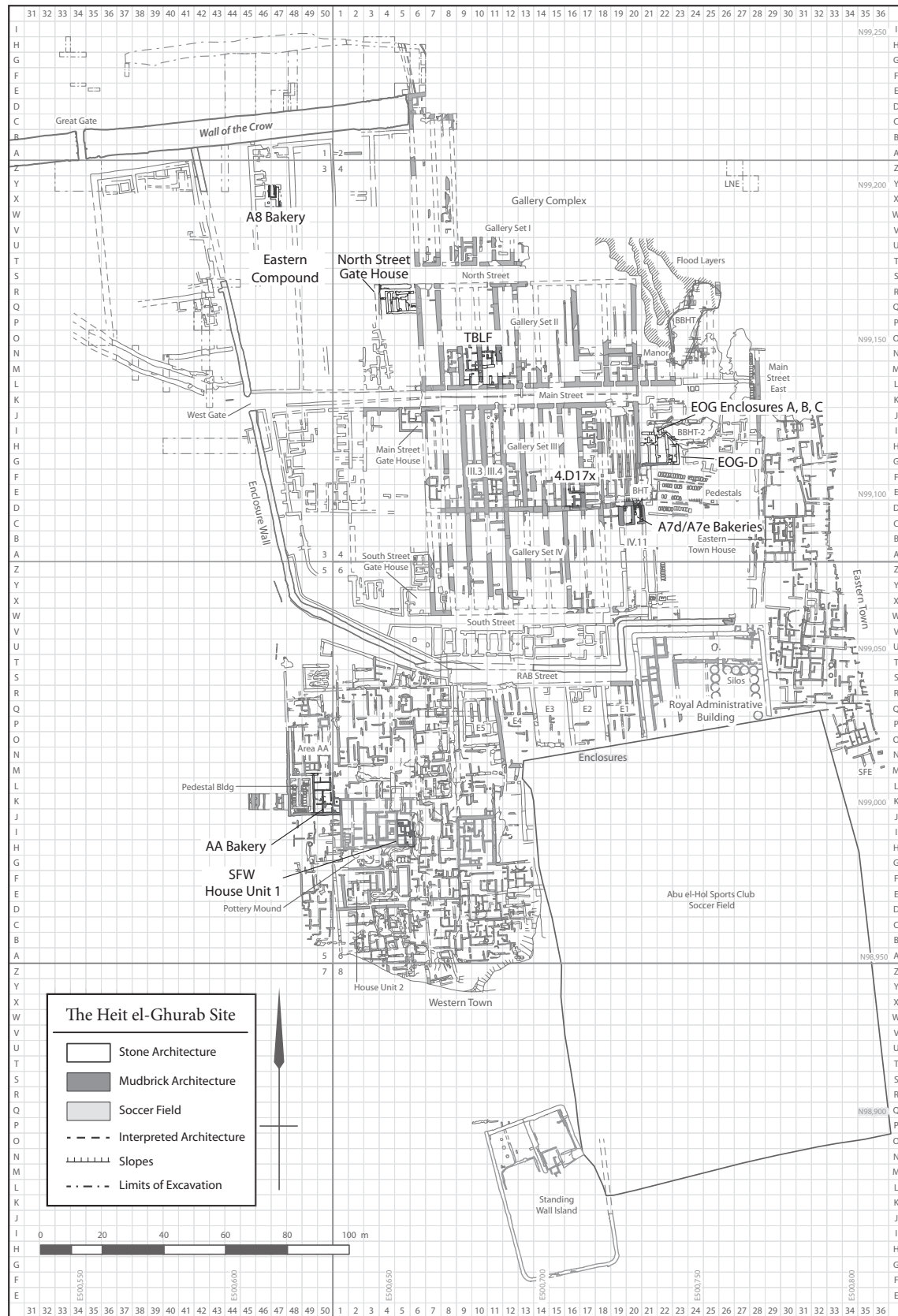
Defining a Bakery at the HeG Site

AERA teams have found at least ten bakeries within the HeG site (fig. 1.3). The majority of these are large, industrial-style bakeries in what seem to be governmental areas or buildings. This section begins by describing the first discovery of a bakery at HeG. The suite of features that was found there has come to characterize HeG bakeries and is therefore the criteria by which other HeG bakeries are identified. We then go on to present in more detail the specific bakeries found at the HeG site.

During AERA's Fall/Winter 1991 excavation season (the third season excavating the HeG settlement) team members encountered three buildings or rooms that they interpreted as bakeries (Bakeries A7d, A7e,

and A8; fig. 1.3) (AERAGRAM 1996: 6–7; Lehner 2007a: 24–25). At that time the majority of the HeG settlement lay beneath thick deposits of modern sand overburden (Lehner 2007a: 17) that obscured the settlement's overall ground plan. The bakeries contained a suite of features that included a room or rooms that had been filled with thick powdery ash, accumulated during occupation (not dumped on or after the room's disuse), at least one hearth, a mixing vat or vats, and most characteristically, linear troughs adjacent to walls, with circular (*bedja*-shaped) depressions cut into their base.

Using Old Kingdom tomb scenes (such as those in fig. 1.1) as a guide, Lehner hypothesized that bread molds would have been stacked and heated on the hearths (or tempered on the hearth to create a non-stick surface), then carried over to the troughs, probably using sticks, and placed within the depressions (Lehner 1992: 4–5). Here they would have been filled with dough that had been mixed and stored in



AERA GIS, RLM 2013

Figure 1.3. Plan showing bakeries in HeG site. Plan by Rebekah Miracle, AERA GIS, and Hassan Ramadan.

the nearby vats. The bakers would have then placed upturned bread molds over each dough-filled mold and hot ash and embers would have been raked around and over the molds (Lehner 2007a: 25). This process led to ash accumulating and filling the room, constantly being turned over in the baking pits (Lehner 1992: 5).

Since 1991 the team has exposed about 7 hectares of the ground plan of the 4th Dynasty settlement south of the Wall of the Crow, north and west of the Soccer Field, west of the modern town of Nazlet es-Semman, and east of the Workers' Cemetery, on the slope of the Maadi Formation escarpment (GRI: 12), as well as having conducted a number of targeted excavations within the confines of that area (GRI; GOP1–5). In doing so, AERA teams have now exposed even more bakeries. We first give a brief description of the HeG bakeries and then an overview of HeG bakery types, then provide more detailed, preliminary reports on two of them: the Area AA Bakery and the “East of Galleries Enclosure D” (EOG-D) Bakery (Chapter 1, this volume).

Bakeries within the HeG Site

AA Bakery

The AA Bakery is located within the Western Town, a “neighborhood of large house units flanked by small courts and chambers” in the southwestern portion of the HeG settlement (Lehner 2007a: 15; fig. 1.3 here). The AA Bakery comprises five rooms in total. A further two rooms may or may not be associated with the bakery. The southern rooms contain ovens, a hearth, linear troughs with circular depressions, vessels set in the ground, and thick layers of ash. We describe this bakery in detail later in this chapter.

Bakery A7d and A7e

These bakeries are located at the northern end of Gallery IV.11 and west of Area EOG, in an industrial zone containing other bakeries, thick and wide spreads of dumps of bread mold fragments, and rows of rectangular limestone “pedestals” (Lehner 2007a: 45; GOP2: 36; fig. 1.3 here). The western bakery was designated A7d while the eastern one was named A7e (Lehner 2002a: 32; figs. 1.4, 1.5 here). The adjacent bakeries are very similar in their design, style, and contents. Each bakery measures about 5.25 m in length and 2.50–2.60 m in width (Lehner 2007a: 24). The bakeries might be

contemporary, as there is no evidence to prove that one was built before the other (Stevens, House, and Driaux 2007: 59). Two rows of linear depressions or troughs are sunk into the floors along the eastern walls of the two bakeries (Stevens, House, and Driaux 2007: 30). In the A7e Bakery the two troughs are c. 75 cm wide and c. 4.50 m long. At the base of these troughs the team recorded a series of at least 23 circular depressions with a diameter of 25 cm. Vats, about 56 cm in diameter, were set into the two bakeries (two *in situ* vats and one robbed in A7e, and three *in situ* in A7d). Hearths occupy the southeast corners (c. 1.25 m by c. 1.25 m in A7d, and 1.50 m by 75 cm in A7e). In both bakeries the entrance is located in the southwest corner and both bakeries were filled with fine black ash (Lehner 1992: 4–5).

The hearths are open to the room. The platform of the hearths were made up of limestone slabs and marl bricks (Lehner 1992: 4). The ash under the hearth in A7e had reddish and gray lenses “indicating an atmosphere of higher oxidation” (Lehner 1992: 5). Both bakeries contained conical bread molds (F2) and flat bread trays (F1). Bakery A7d contained more bread trays than Bakery A7e (Lehner 1992: 4).

A8 Bakery

Bakery A8 was also excavated in 1991. The bakery is located within an area of the site dubbed the Eastern Compound, an area that is largely unexcavated and lies to the west of Gallery Set I and abuts the southern side of the Wall of the Crow (fig. 1.3). Bakery A8 is very similar to the A7e and A7d Bakeries, but preservation was not as good because the area was very eroded. It measures 7.40 m north-south by 2.40 m east-west. Its walls were built of limestone, and it has two rooms (figs. 1.6, 1.7). The northern room has two linear rows of circular depressions that were filled with ash, and it includes the bottom of a larger circular depression that may have housed a ceramic vat. This room is the baking room (Lehner 2007a: 24).

AERA teams identified a stone-lined shallow hearth or fireplace, filled with dense ash, inside the southern room. The team identified a series of depressions each c. 30 cm in diameter inside the northern room. There were four depressions against the east-west wall that represents the southern boundary of the northern room. Eight of them were located against the north-south wall that represents the eastern boundary of the northern room and one in the corner where the two walls abut. Further along was a second row

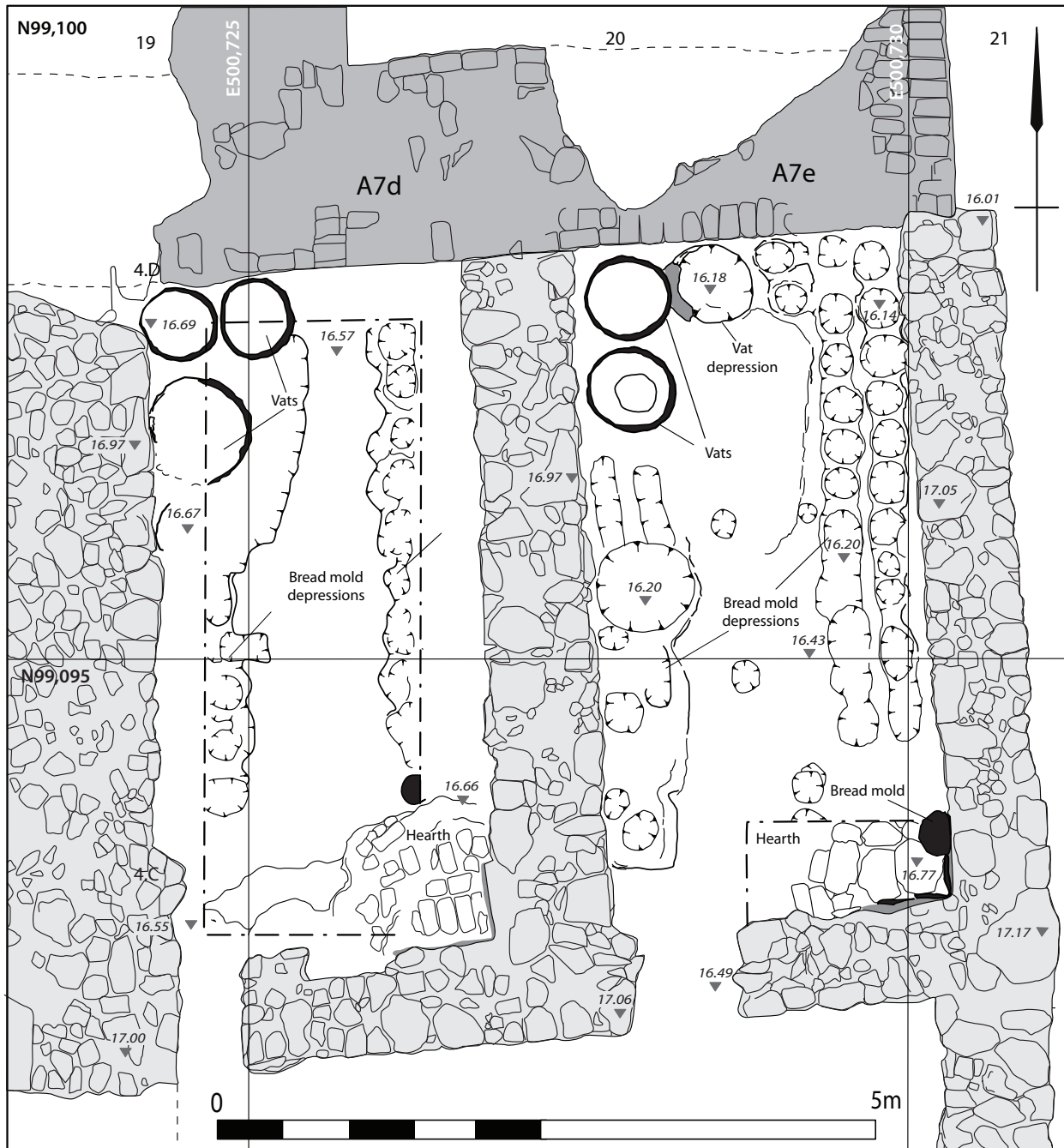


Figure 1.4. Plan showing A7d and A7e Bakeries. Plan by Rebekah Miracle, AERA GIS, and Hassan Ramadan, based on field drawing GPMP 1991-2 by Mark Lehner. Elevations shown with gray triangles are in meters above sea level (asl).

of troughs, one just north of the four-troughs group and then another one to the west of the eight-troughs group.

These troughs seem to have contained small depressions as well but they were not as distinct. There was also another double row of troughs c. 2.40 m, running north-south. Finally, there was a large depression,

just north of the troughs running north-south, which was c. 80 cm in diameter (Hassan 2005: 10).

EOG-D Bakery

The East of Galleries-D (EOG-D) Bakery represents one of a series of at least four (A–D) long enclosures in the northwest corner of the EOG production zone (figs.



Figure 1.5. Bakery A7e. View to the northwest showing the *in situ* vats in the northwest corner, two rows or troughs containing circular depressions along the eastern wall, and a hearth in the southeast corner with a bread mold on top. Photo by Mark Lehner.

1.3, 1.8). The outside walls of the bakery were built of limestone. EOG-D Bakery consists of two rooms. The northern room was the baking area and the southern room was used for preparing and mixing the dough. Shallow rectangular troughs with dimensions approximately 5.28 m long by 90 cm wide were discovered along the western wall of the northern room, along with the remains of a hearth that had been truncated by a backhoe. The team also discovered two bins and an *in situ* pot emplacement in the southern room, where the dough may have been mixed. We describe this bakery in detail later in this volume (see Eissa et al., Chapter 1, this volume).

Enclosures A, B, and C

In 2006 Dan Hounsell excavated directly to the west of the EOG-D Bakery. The excavation in this area exposed three buildings designated by the team—from west to east—A, B, and C. These enclosures and Bakery EOG-D are very similar to each other in design (figs. 1.3, 1.8). All are rectangular in shape, consist of two rooms, orientated north to south, with bounding walls constructed

of fieldstone. Although we are sure that Enclosure D was a bakery, the evidence that Enclosures A, B, and C are real baking facilities is not as strong. The hypothesis that Enclosures A, B, and C are bakeries rests on several points. Firstly their location, next to the EOG-D Bakery, and the fact that they share the same design and the same number of rooms. Secondly, Enclosures A and B contained a series of large depressions, possibly vat emplacements, in the northern rooms (fig. 1.9). However, the team did not find troughs, hearths, concentrations of ash, or pottery sherd deposits (GOP3: 44–47)—our typical markers of bakeries.

Gallery Bakeries

The backs of the gallery units often contain some features that are characteristic of bakeries, namely rows of small circular depressions, a build-up of ash, and hearths. On the whole the team only uncovered these rooms and features in 5 × 5 m exposures, as opposed to larger, open plan exposures. Lehner has referred to these back rooms as “rear industrial chambers” (Lehner 2002a: 37). In 1998 AERA teams excavated a

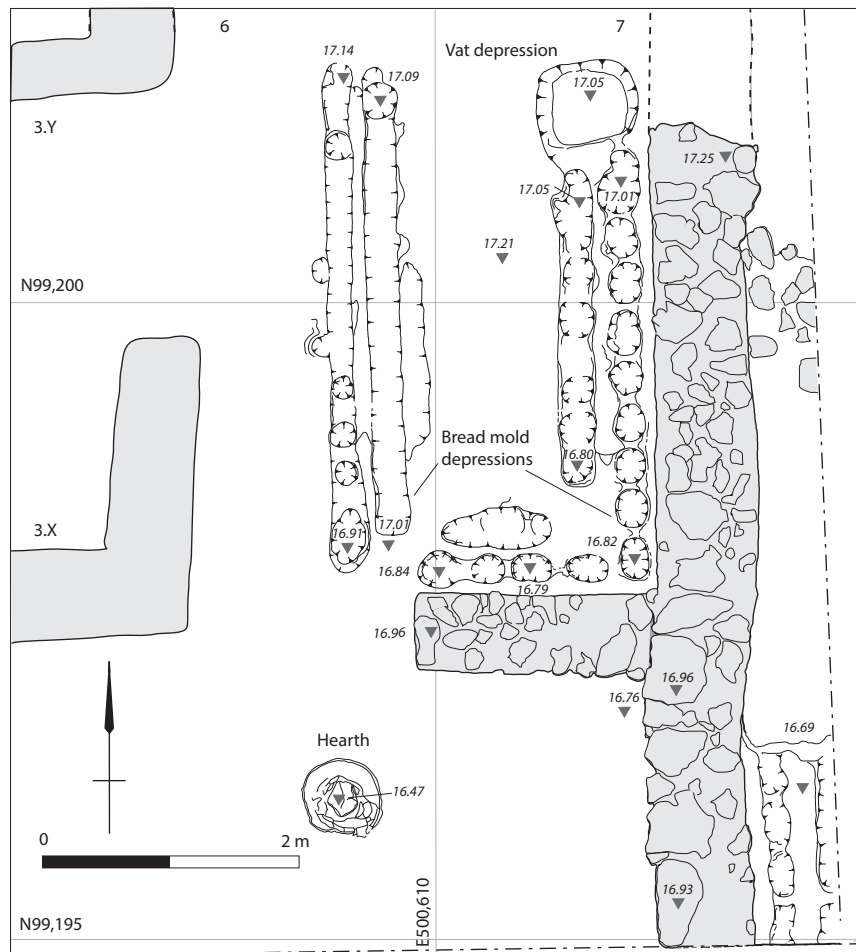


Figure 1.6. Detail plan showing the A8 Bakery. Plan by Hassan Ramadan, based on field drawing GPMP 2005-1844 by Augusta McMahon.



Figure 1.7. General shot of A8 Bakery facing northwest, showing four rows of linear depressions (troughs). The two bread molds shown here are not *in situ*. They have been positioned here in this photograph to demonstrate that bread molds could have fit within the troughs. Photo by Mark Lehner.



Figure 1.8. Plan showing Enclosures A, B, C, and D, forming what may be a set of EOG bakeries. Plan by Rebekah Miracle, AERA GIS, and Hassan Ramadan.

small portion of the southwest room of Gallery Set III.3 (fig. 1.3). Here they found a sequence of floors and ash deposits. In one of the floors the team found a series of small round depressions and a half of one bread mold *in situ* in one of the depressions (Lehner 2007a: 32).

During the campaign called “the Big Leap Forward” (TBLF) in 1998, AERA team members excavated a checkerboard pattern of 5×5 m grid squares at the southern end of Gallery Set II (figs. 1.3, 1.10). In Gallery Set II.2 (Squares 4.L9) in the southeast

corner of the southeast room the team found seven small circular depressions loosely aligned north-south and varying in size, two large pits, scorching on the walls, and ash (Sadarangani 2007b: 43). Next door in Gallery Set II.3 in the northeast corner of the southeast room there was a circular pit, at least four small circular depressions, ash, and evidence of *in situ* burning (Sadarangani 2007b: 43–44). To the east, in Gallery Set II.4 there were two hearths in the southeast room, including one of mudbrick and limestone



Figure 1.9. Enclosures A, B, and C, facing south, showing circular depressions (possibly robbed vat emplacements) in Rooms 3 and 4. Photo by Dan Hounsell.

in the southwest corner. In the southwestern room there were eight small circular depressions and ash (Sadarangani 2007b: 45–46). In all three galleries these bakery-like features belonged to an earlier phase of occupation within the galleries (Sadarangani 2007b). Later, they were covered over with floors.

In 2001 and 2002 AERA teams excavated a complete gallery, Gallery Set III.4 (fig. 1.3). In the southwestern room of the gallery there were two hearths, one in both the southeastern and southwestern corners of

the room. These hearths had been plastered over, indicating that the burning relates to an earlier phase of use of the gallery (Abd el-Aziz 2007b: 216), just as the “baking” activity in Galleries II.2, II.3, and II.4 appears to belong to an early phase.

Also in 1998 the team conducted excavations in Area 4-D17x (fig. 1.3). Here, in the southeast room of Gallery Set III.8 the team found a room filled with ash and containing *in situ* jars that were associated with copper working. Bread molds in hearths appeared



Figure 1.10. Area “The Big Leap Forward” (TBLF), Phase 2, Occupation A, showing the back rooms of Galleries II.2, II.3, and II.4. Plan by Rebekah Miracle, AERA GIS.

to have been used as furnaces (Lehner 2007a: 34). A room to the southwest contained small, circular depressions molded into the floor. In one of these the team found a bread mold that supported an *in situ* jar (Lehner 2007a: 34). Our exposure and understanding of these rooms show that the defining characteristics of bakeries (circular depressions, hearths, ash, and bread molds) are also indicative of other types of occupation and industry. As such, we need to be careful when naming a room or set of rooms a bakery.

North Street Gatehouse “Bakery”

This bakery is located within a building called North Street Gatehouse (NSGH), located on the southern side of North Street—the street that divides and provides access to Gallery Sets I and II—and at the western end of Gallery Set II (fig. 1.3). Based on its location—just south of the entrance into North Street before it moves through the galleries—Lehner hypothesizes that this building functioned as a gatehouse (GOP1: 10). The building was excavated in 2001 and 2004 (Kamel 2001; Foster 2004). The bakery occupies one room of the house, Room 6, and measures c. 2.20 m by 3.10 m (figs. 1.11, 1.12). The walls of the building are built of limestone. Pits dug for Late Period burials destroyed approximately half of the floor inside the room; nonetheless, we can see its installations are typical of baking rooms found elsewhere in HeG. The team identified two shallow troughs that ran parallel to the western and eastern walls, below an ash layer. These may have been baking pits. In addition there are two large, shallow pits in the southwestern corner, each with a diameter of 62 cm, that might have housed vats. There was also hearth platform, c. 1.20 m by 1.00 m, in the northwest corner (GOP1: 10–12; Lehner and Tavares 2010: 195). Also, the team identified scorching on the eastern face of the northern end of the western wall of the bakery near the hearth. Although this room may have been used to bake bread, it may also have been used to cook and prepare other foodstuffs.

SFW House Unit 1

The Soccer Field West House Unit 1 (SFW.HU1) bakery is located at the eastern end of House Unit 1 in the Western Town (fig. 1.3). The SFW.HU1 bakery was exposed and partially excavated in 2009 and 2011. It comprised five rooms (figs. 1.13, 1.14). The bakery is 10.80 m long north-south by 6.10 m wide east-west (GOP5: 131). Since 2004 Lehner has referred to this

network of rooms as a bakery, because the rooms contained ash and there were outlines of vats and other ceramic vessels visible on the surface (GOP3: 87–91). On excavation however, the team did not find the linear troughs with circular depressions at the base that were so characteristic of the EOG-D Bakery, the A7e and A7d Bakeries, and the A8 Bakery (although they may be there, beneath unexcavated deposits). They did, however, find rooms filled with ash (the Baking Room and the Southwestern Room), at least one hearth, and vats. They also found a basin space and configuration of spaces that were almost identical to the AA Bakery (Sadarangani and Kawae 2011) (see Mahmoud and Taylor et al., Chapter 1, this volume). We describe the five rooms briefly below.

The Southwestern Room

This room is located in the southwest corner of the bakery. It measures 2.64 m north-south by 2.20 m east-west. Three entrances lead into this room. Two are located in the northeast corner of the room: one, 58 cm wide, leads to the baking room to the east, and the other one leads to the platform room to the north. A third access is a stepped gap, 58 cm wide, in the western wall, leading into the main body of the house. The northern entrance has two roughly hewn red granite stones that were set against the two sides of the entrance probably to support a wooden door frame. There is also a limestone door socket next to this access.

The Platform Room

The northern entrance of the southwestern room leads to the platform room. This room measures 2.64 m north-south by 2.16 m east-west and has a platform in the northeast corner that measures 1.74 m north-south by 1.02 m east-west. This platform has a flat top and a slightly clayey, silty sand floor. The location of this room at the back of the building and the presence of the door socket access led the excavators to hypothesize that this room was the most private room inside the bakery (Sadarangani and Kawae 2011: 139).

The Baking Room

The baking room is in the southeast corner of the bakery. The room measures 2.80 m north-south by 2.20 m east-west. This room has two entrances, one that leads to the southwestern room and a northern access, 72 cm wide, that leads into the preparation room to the

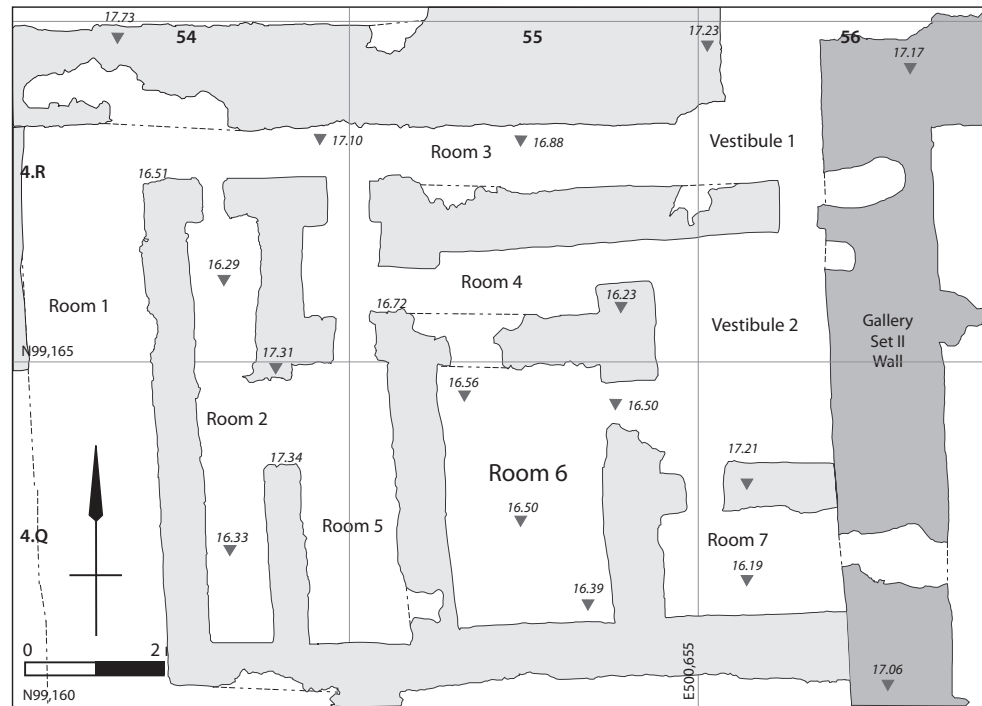


Figure 1.11. Plan showing North Street Gatehouse (NSGH). Plan by Hassan Ramadan.

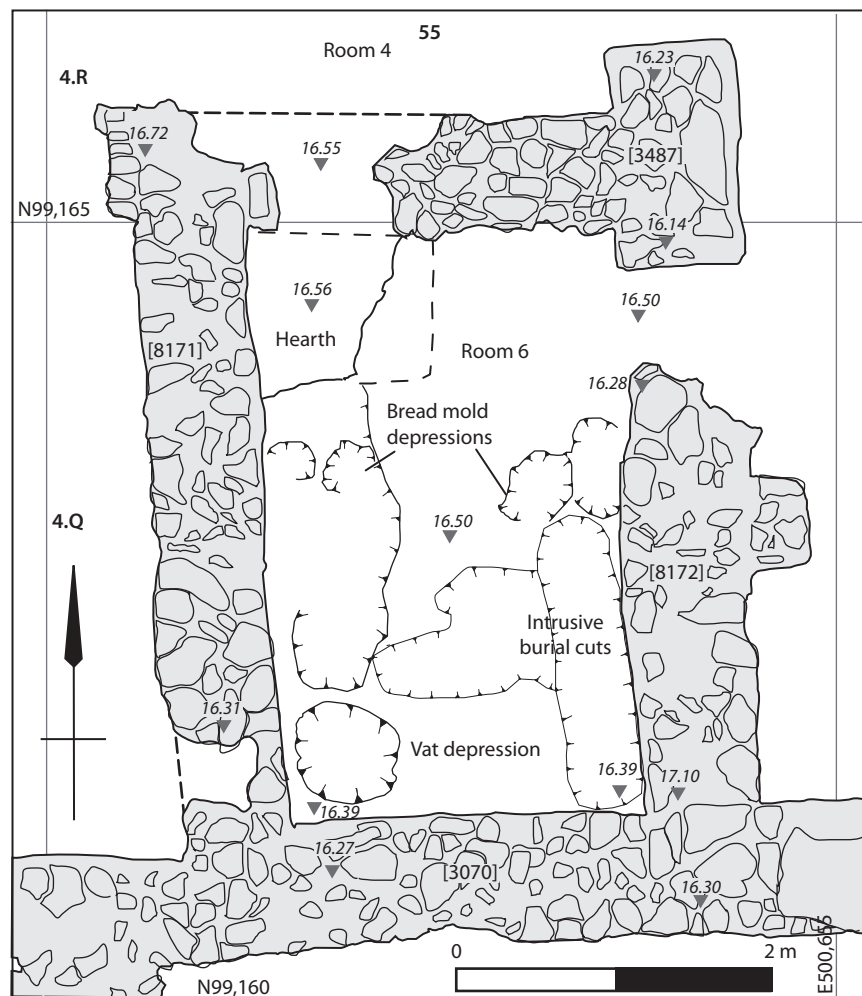


Figure 1.12. Detail plan showing North Street Gatehouse (NSGH), Room 6 Bakery. Plan by Hassan Ramadan, based on field drawing GPMP 2004-1454 by Johnny Karlsson.

north. There is a hearth located in the southwestern corner of the room that showed signs of extensive use. The 2009 team identified at least three phases of use separated by two phases of structural consolidation or repair. In the hearth the team found a deposit of mudbrick that seemed to function as a support for an *in situ* pottery assemblage within the hearth. The bases of two small upturned bread molds, a small dish, and one potstand were embedded in the mudbrick-rich deposit. While working in the northeast corner, the team found an *in situ* jar that had been placed on the underlying floor that functioned with a newly created ashy surface and the hearth located in the southwest corner. A shallow circular pit, 80 cm across by 17 cm deep, cut into the southeast corner and may have held a pottery vat for mixing (Sadarangani and Kawae 2011: 141).

The Mixing/Preparation Room

The room measures 2.56 m north-south by 2.28 m east-west. Two entrances lead into this room, one located in the north, 76 cm wide, leading into the northern room of the bakery and the other one to the south. The team identified different installations in the mixing/preparation room. A basin in the northwest

corner of the room covers an area 1.84 m north-south by 1.40 m east-west. Inside this basin there is a pit 40 cm in diameter and 30 cm deep that may have held a ceramic vessel. The creation of this mudbrick border or basin created an eastern corridor 80 cm wide and a southern corridor 66 cm wide. To the south, scorching on the north face of the southern wall was associated with a large vat, 60 cm in diameter, set within the floor. Two bins were constructed later in the southeast corner of the room. The bin walls are preserved to a height of 23 cm (Sadarangani and Kawae 2011: 140–41).

The Northern Room

This northern room measures 3.40 m north-south by 4.10 m east-west, but the eastern and southern walls that bound this space were cut away. The team exposed a circular oven with a 1.34-m diameter, a pot emplacement, and bins. The oven in the southwestern corner was filled with pottery and sandy silt containing moderate amounts of burnt mudbrick and occasional burnt pottery. Immediately to the west of this oven was an associated *in situ* ceramic vat with a diameter of 50 cm, set within the floor. Two bins were excavated in this room. One, a large rectangular bin measuring 3.40 m by 1.64 m, bounded on the north

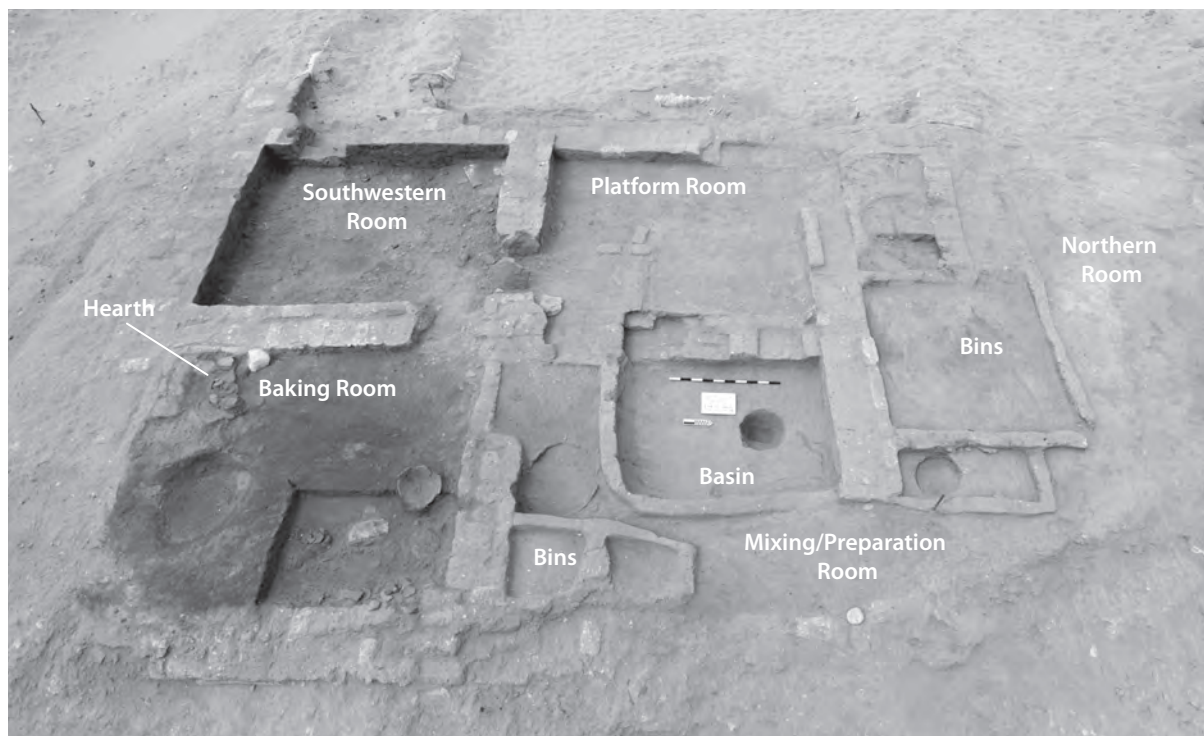


Figure 1.13. Overview of the bakery in SFW House Unit 1, facing west. For the full extent of House Unit 1 see frontispiece 2. Photo by Jason Quinlan.

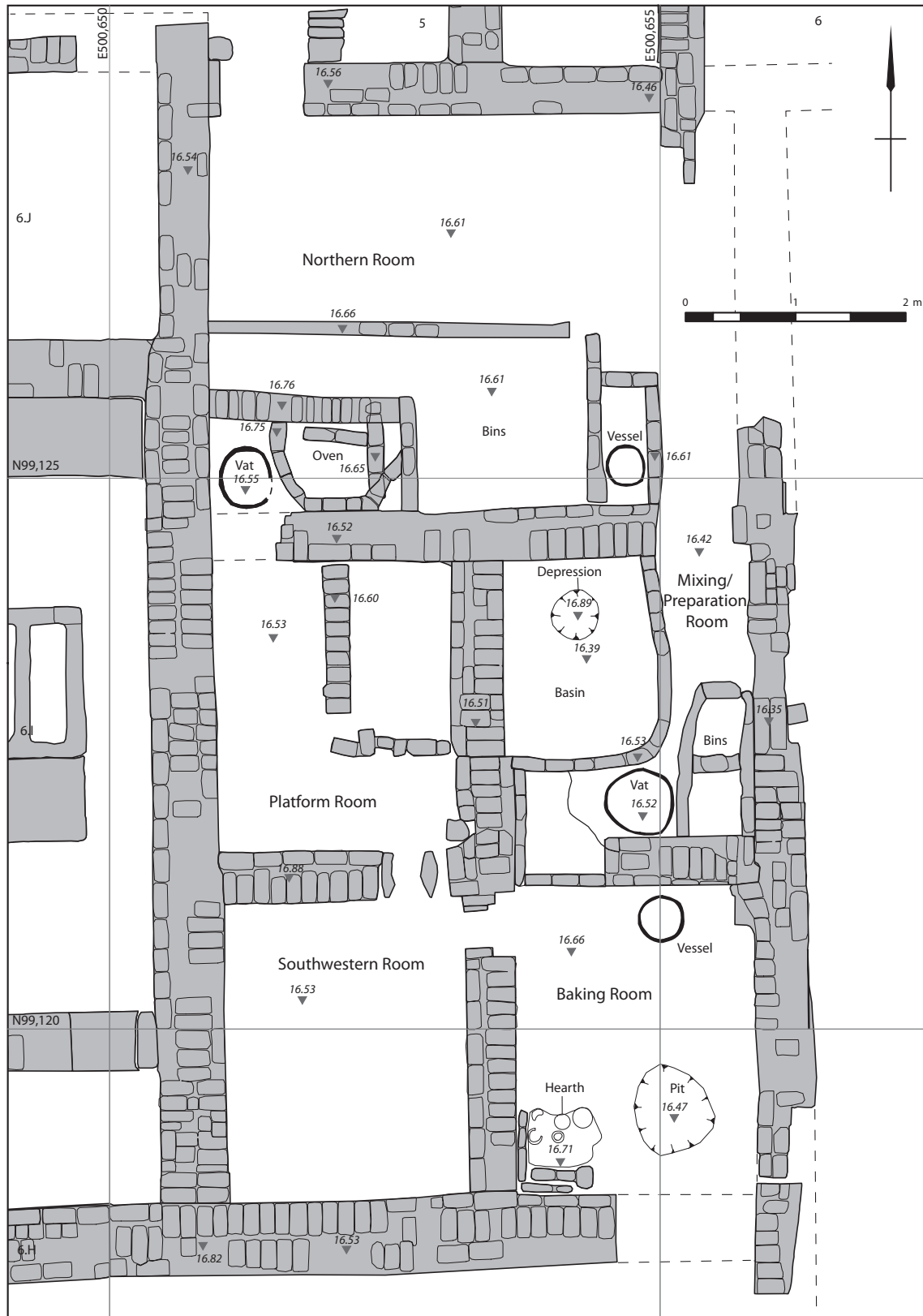


Figure 1.14. Detail plan of the Soccer Field West House Unit 1 (SFW.HU1) Bakery. Plan by Rebekah Miracle, AERA GIS, and Hassan Ramadan.

and east by thin mudbrick walls, survived to a height of 6 cm. The second bin is a smaller rectangular one, 1.06 m north-south by 40 cm east-west, located on the southeastern side of the room (Sadarangani and Kawae 2011: 135–145).

Bakery Types

In order to frame and understand both the AA and EOG-D bakeries, we looked to see whether there are repeated “types” of bakeries at the HeG site. Using context, architecture, and layout as criteria by which to classify each bakery, we classified these HeG facilities into three types of bakeries: bakeries in governmental structures or government-run industrial areas (these bakeries produced bread on a large scale), bakeries within houses (bakeries that serve a domestic function), and a third, intermediate type, other, that does not fall neatly into either category. We discuss the governmental/industrial bakeries and domestic bakeries below. We discuss the third type later in the chapter, in the preliminary report of the AA Bakery.

Governmental/Industrial Bakeries: Bakeries A7d, A7e, Enclosures A, B, and C, EOG-D, and A8

The industrial bakeries are located in areas of the site that are industrial in character. Bakeries A7d, A7e, Enclosures A, B, and C, and EOG-D are in Area “East of Galleries” (EOG) (figs. 1.3, 1.8). As we have already mentioned, this area is covered in bakery compounds, pedestals, bread mold waste, and pitting. There are no clear domestic-type structures or streets. Bakery A8 is located in the Eastern Compound (fig. 1.3). At present we know very little of this area of site; Bakery A8’s inclusion here is more based on type of architecture and layout.

The industrial bakeries are located next to the gallery sets. Bakeries A7d, A7e, Enclosures A, B, and C, and the EOG-D Bakery lie to the east of Gallery Sets III and Gallery Set IV. To the west, Bakery A8 lies west of Gallery Set I. In his report on Area EOG Stevens states that Bakeries A7d and A7e had been built after the construction of the galleries (and Hypostyle Hall) and that Enclosures A, B, and C, and the EOG-D Bakery had been built after the construction of Bakeries A7d and A7e (Stevens, House, and Driaux 2007: 81).

Bakeries A7d, A7e, Enclosures A, B, and C, and EOG-D were constructed out of limestone (Stevens, House, and Driaux 2007: 29; Hassan 2005: 7–12; Eissa and el-Laithy 2006: 5–6). We hypothesize that

limestone was used for these bakeries because it does not easily decay and it is strong enough to survive the intensive work of bread-baking and production on a large scale, provisioning a large number of people.

The industrial bakeries tend to be the same size, averaging between 7.11 m long by 2.65 m wide (except for the later phase construction of the EOG-D Bakery, which measures 10.30 m). Bakeries A7d and A7e are single rectangular rooms, with the suite of features and components of the baking process—troughs, depressions, pot emplacements, ovens, hearths, and large areas of burning and ashy deposits—situated in a single room (Taylor 2009b: 151). Bakeries A8 and EOG-D comprise two rooms, one used for baking, the other for mixing and preparation. We discuss the Industrial type of bakeries in more detail later (see Eissa et al., Chapter 1, this volume).

Domestic Bakeries: SFW House Unit 1, NSGH Bakery, and the Gallery Bakeries

These bakeries occur within houses. Our excavations in the Western Town revealed large structures that we have interpreted as house units. These include SFW House Unit 1 (fig. 1.3). The Western Town is “a densely packed urban layout, perhaps originally composed of large household enclosures or estates surrounded by smaller support structures” (Lehner 2007a: 42). These houses may have been the homes of high administrators (Redding 2007; Nolan 2010). This interpretation is based on the observation that these house units are much larger than “houses” found elsewhere on site (such as in the Eastern Town House, fig. 1.3) and the large quantity of clay sealings that were discovered in the dumps there—particularly from the Pottery Mound (fig. 1.3), a large mound of refuse that had been dumped to the south of SFW House Unit 1—impressed by seals bearing titles such as “royal scribe” (GOP2: 72).

SFW House Unit 1 is approximately 25 m east-west by 16 m north-south and covers a total area of 400 m² and comprises some twenty spaces. The main body of the building contains a platform interpreted as a bed platform, an L-shaped bench, and a bin filled with beer jars (Sadarangani and Kawae 2011: 135). It is the presence of the bed platform in the main body of the building and the general layout of the building that has led the team to view this structure as a domicile.

The NSGH bakery and the gallery bakeries may be more like kitchens within houses in which baking, alongside other sorts of cooking, took place. We

include the gallery bakeries as domestic examples because they have long colonnades with sleeping platforms and possibly back room accommodation for an overseer (Abd el-Aziz 2007b: 193–234).

The bakeries within houses tend to be constructed using mudbrick (sFW House Unit 1 and the Gallery Bakeries), which contrasts with the limestone build of the industrial bakeries. We suggest that the limestone was necessary for large-scale, industrial baking and that because the domestic bakeries operated on a smaller scale, they could be built of mudbrick, which is easier to modify and replace.

A Third Type of Bakery?

We consider the AA Bakery to be a third type of bakery, one that is neither industrial nor domestic. Although its ground plan is extremely similar to the bakery in sFW House Unit 1, its context is unusual. The AA Bakery is described and discussed in considerably more detail below in the Preliminary Report (Hanan and Taylor et al., Chapter 1). This is then followed by the EOG-D Preliminary Report (Eissa et al., Chapter 1), which also offers more insight into the possible functions of the industrial type of bakery.

A Preliminary Report on the AA Bakery

by Hanan Mahmoud and James Taylor, with Mohamed Abd el-Aziz Gabr,
Mohamed Ahmed Abd el-Rahman, and Momeen Saad

In 2005 AERA taught its first Basic Field School, a Field School in which Egyptian Ministry of State for Antiquities (MSA)—at the time Supreme Council of Antiquities (SCA)—Inspectors were trained in the basic methods of excavation, survey, illustration, and ceramic, faunal, and archaeobotanical analysis. That year, one of the field school groups excavated part of the AA Bakery under the training of Lauren Bruning. The following year, in 2006, AERA held an Advanced Field School program in which graduates of the 2005 Basic Field School returned to become embedded within ongoing fieldwork teams to further their knowledge and experience of excavation and post-excavation techniques. Susan Sobhi Azeer was one such student. She returned as a student of

James Taylor, working again in the same bakery. In 2007 Sobhi returned yet again, but this time as a full-fledged team member, working with and under the supervision of Taylor (see cover image).

Area AA contains three separate buildings with different functions (figs. 1.3, 1.15, 1.16). These include a structure we refer to as the Pedestal Building, which is a rectangular structure of fieldstone containing two rows of six or seven rectangular limestone structures that we call pedestals (Lehner 2007a: 21). Area AA also contains the Northern Structure—a building to the north of the Pedestal Building containing a series of smaller chambers situated around a central space—and the AA Bakery, a building to the east of the Pedestal Building and south of the Northern Structure



Figure 1.15. AA Bakery after excavation. The ash filling Room I (the Baking Room) is shown in quadrants, view to the north. Photo by Susan Sobhi Azeer.

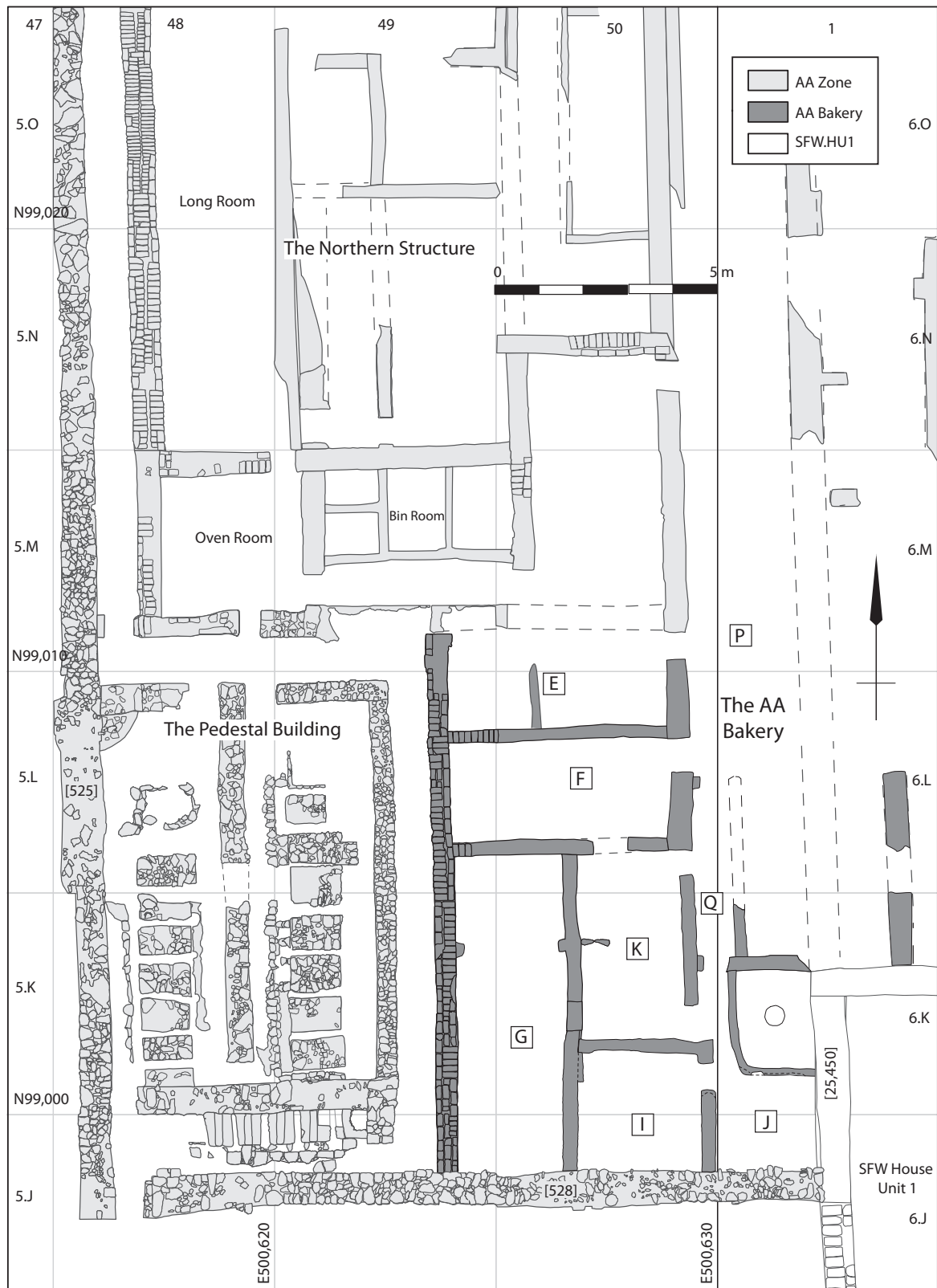


Figure 1.16. Plan showing the construction of the AA Bakery, Phases 3 and 4. Plan by Rebekah Miracle, AERA GIS, and Hassan Ramadan. Room H, not labeled here, was created in a later phase.

that contains at least five rooms. These rooms feature an oven, a hearth, troughs, depressions, vessels set in the ground, large areas of burning, and thick layers of ash (figs. 1.15, 1.16). Together these features are typical of buildings that the team has interpreted as bakeries elsewhere on the HeG site (see Mahmoud and Eissa, Introduction to Chapter 1, this volume).

Area AA was one of the first areas that AERA team members excavated in the HeG site. At that time, during the 1988–1989 and 1991 seasons, the team uncovered part of the building that later became known as the AA Bakery (Lehner 1991: 23). This excavation also exposed the Pedestal Building. As mentioned, excavations continued in the area as part of the Field School programs in 2005, 2006, and finally in 2007.

Our excavations of the AA Bakery aimed to answer a number of questions. The AA Bakery is different from many of the other known HeG bakeries (fig. 1.3). Its location within a large structure (not clearly a domicile), the types of features, and the types of spaces appeared to be different from both the industrial-style and domicile bakeries (see Mahmoud and Eissa, Introduction to Chapter 1, this volume). The sheer quantity of bread molds discarded within the HeG site (Wodzińska 2007b: 283), the existence of numerous bakeries, and the working hypothesis that the site housed a large workforce (Lehner 2007a: 43–44) all suggest that bread and baking are key to our understanding of the site and how its inhabitants were provisioned. It was therefore important to understand this different bakery “type” more clearly. What was the AA Bakery’s relationship to the Pedestal Building and the Northern Structure? Who was the bakery provisioning? What was its role in the Western Town? What was its role in the HeG settlement? Was the bakery producing only bread, or was it also producing other types of commodities and/or provisions?

Limit of Excavation and Sampling Procedure

AERA’s methods of excavation and post-excavation have been presented elsewhere (see preface, this volume). During excavation, the team took bulk environmental samples (15–20 liters) from some deposits for flotation. Due to the rich artifact assemblages yielded by this area we employed a 100% finds retrieval policy. Material culture was handpicked, sorted, and bagged during excavation. The rest of each feature was dry-sieved on site and resultant material culture was further handpicked, sorted, and bagged. The residue

in the dry sieve was then sent to be wet-sieved; material was again handpicked, sorted, and bagged.

The team excavated parts of Room E, Room G, and Room H in the 1988–1989 and 1991 seasons, but stopped work once they had reached the uppermost floors in Rooms E and G (fig. 1.16). In Room H the team excavated through floors and other features (fig. 1.18). Elsewhere, during the 2006 and 2007 seasons, the team excavated down onto the uppermost floors, except in Room I, where they excavated through the upper work surfaces.

In 2007 they made the decision to divide Room I into four sections or quadrants because the room was filled to a depth of 34 cm with two ashy layers that yielded many artifacts. This included an assemblage of over 170 clay sealings bearing the Horus names of Khafre and Menkaure, most of which seem to have been dumped in with the ash. By excavating two quadrants the team was able to preserve some of this material for further sampling or investigation in the future (fig. 1.15). It should also be noted that the abandonment deposits (Phase 6, see below) were not completely excavated inside Rooms E and H.

Description of the AA Bakery

The AA Bakery measures 7.00 m north-south by 8.00 m east-west and comprised five rooms in total (figs. 1.16, 1.17). A further two rooms (Rooms E and F) may or may not be associated with the bakery. The walls of the bakery are preserved approximately 60 cm high, although some walls are far more denuded. The rooms are labeled Rooms E–K (with Room H created during a later phase of remodeling) (figs. 1.16, 1.17). The main rooms of the bakery are Rooms G, I, J, and K. They cluster around the main baking room, Room I. This may have been to assist in heating the rest of the structure, or possibly to keep stored goods dry (Taylor 2009b: 122).

The main rooms of the bakery structure all seem to have been developed with specific purposes in mind. There are “dirty” industrial mixing and baking rooms to the south and east, and “clean,” perhaps domestic spaces or storage spaces to the north and west. The active baking area is divided into the baking room (Room I) and the preparation room (Room J). The latter also has signs of “clean” and “dirty” areas.

The only access into the bakery unit was from the northern end of the long, 88 cm-wide, north-south Corridor Q, located to the east of Room K. Before

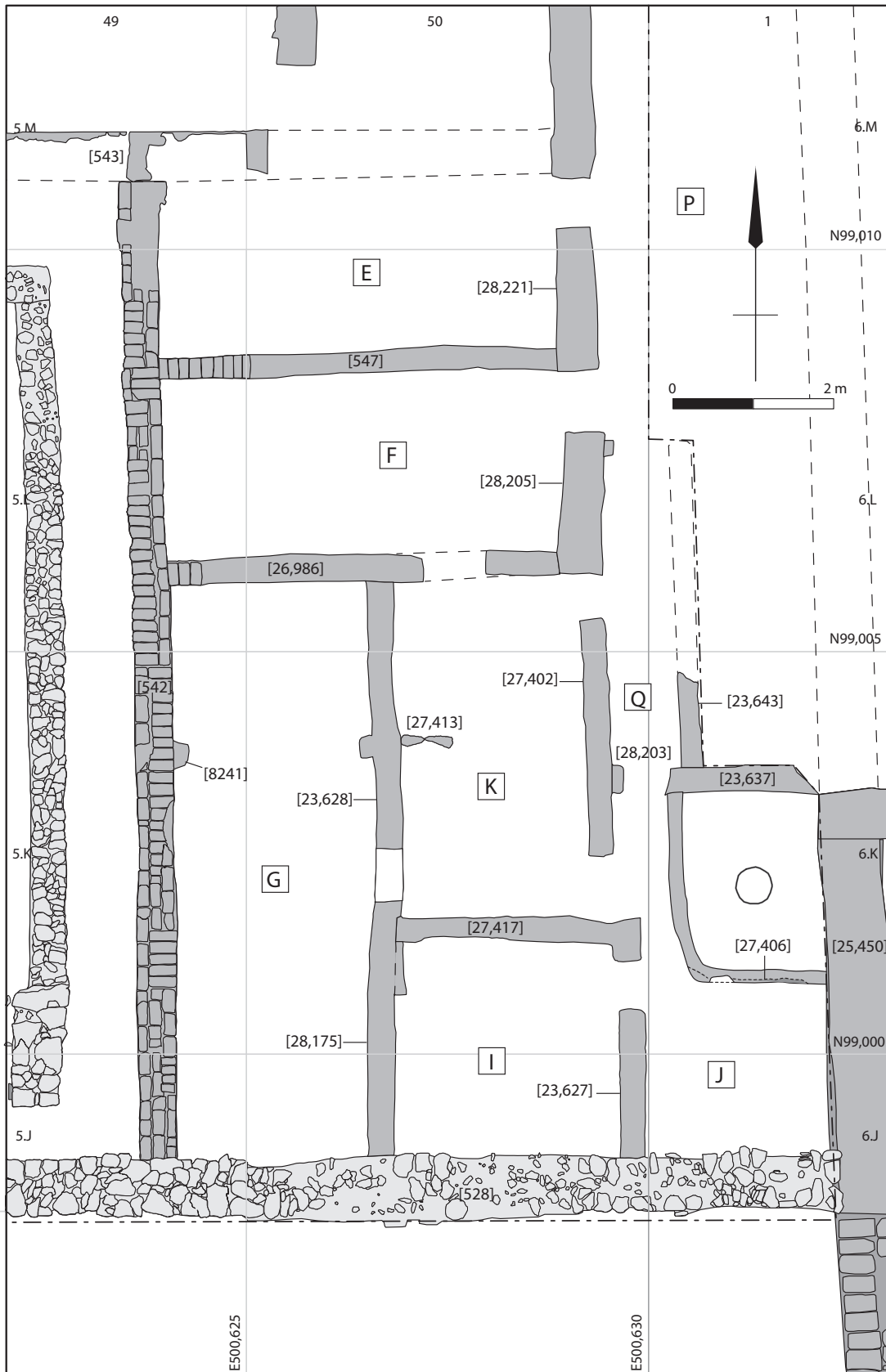


Figure 1.17. Plan showing AA Bakery, Phase 4, by Rebekah Miracle, AERA GIS, and Hassan Ramadan.

entering the bakery rooms one could access two rooms (Rooms E and F) through two doors that open on to what may have been a broader corridor (Corridor P). Two large bread pots lay on a floor immediately outside the doorway (GOP3: 74). The internal dimensions of these rooms were similar, approximately 2.30 m north-south by 5.00 m east-west. There were no other installations inside these two rooms, and we hypothesize they might have been used for storage.

Two doorways along Corridor Q led to Room K, to the west of the corridor. A pivot socket set into the floor on the south side of the southeastern entrance indicates that a wooden door existed here (fig. 1.18). A dip in the floor and two stones embedded in the floor divided the room into two halves (GOP3: 76). Shallow ceramic pot emplacements were located in the southwest corner of the room adjacent to an access that lead through to Room G.

Room G occupies the western length of the bakery. It measured 7.25 m north-south by 2.40 m east-west before it was divided into two rooms by an east-west mudbrick wall, with Room G to the north and Room H to the south. Two buttresses separated Room G into two parts. A circular feature was set into the floor and lined with dense gray clay and granite in the southern part of the room. Patches of irregular floor were laid inside the room, which was more preserved around the edge of the room walls. There is a small L-shaped spread of burnt ceramic, which might have been a hearth located in the northwestern corner of the room. A narrow access about 58 cm led into the newly created Room H from the southwest corner of Room G (fig. 1.18). Room H measures 2.30 m east-west by 2.66 m north-south.

Rooms I and J, the baking and preparation rooms, could be accessed from outside of the AA Bakery via Corridor Q, without one having to move through the rest of the building. Room I occupies the heart of the complex. It could only be accessed from the door in the western wall of Room J, located in the northeast corner of Room I. Furthermore, the clean rooms (Rooms K and G) could be accessed by a separate doorway from the northern (cleaner) half of Room J.

Within Room I there was a rectangular oven or open fireplace in the northwestern corner that showed signs of extensive use. We inferred that the oven was dome-shaped because the foundation walls of the structure were angled and the burnt superstructure had collapsed onto the surface of the oven. The team

found a number of large ceramic vessel fragments and bread trays, lying upside down on the oven. The room itself measures 2.70 m north-south by 2.80 m east-west. Within the room there are linear cuts along all four walls that form shallow troughs and the walls have been badly damaged by *in situ* burning. These troughs may have been used for baking bread in molds, or for setting down warm bread pots for cooling after baking.

Three entrances led to the preparation room, Room J. This room measures approximately 4.50 m north-south by 1.40 m east-west. There is an entrance, 56 cm wide, through Corridor Q and another two doorways from Rooms K and I. There is a low plastered L-shaped curb in the northeast corner of the room, 2.15 m north-south by 1.80 m east-west with a circular plastered pit, 50 cm in diameter, for a possible pot emplacement in the very center. The vessel housed here might have been used to contain raw ingredients, grain and flour. To the south of this basin there is a regular, rectangular cut filled with ash and in the southwest corner of the room there is a square hearth platform, 1.00 m by 77 cm. There is clear evidence of *in situ* burning on the surface of the fireplace and against the walls.

Temporal Development of the AA Bakery

The excavation of Area AA enabled us to trace the development of the area. The full AA sequence is presented elsewhere (Taylor 2009a). Here we only present the phases specifically pertinent to the bakery (table 1.2) and not the wider AA area, with the exception of the first three phases (Phases 1 to 3). These are not specifically part of the AA Bakery, but are relevant here because they shed light on the bakery within its surroundings and wider context.

Phase 1: Natural

This phase is represented by the natural aeolian sands that are seen throughout Area AA in various sondages, erosion, burial, robbing and pit cuts. These natural sands were recorded at elevations between 16.77 m above sea level (asl) and 17.16 m asl.

Phase 2: Early Activity

This phase contains ephemeral activity in Area AA. The team found no structural remains beneath the Pedestal Building, the Northern Structure, and the AA Bakery. The team found ashy bands of sand under the western wall of the bakery. These appear to have been

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Table 1.2. The AA Bakery Phasing.

AA Bakery Phase No.	Description	Summary
Phase 1	Natural	Underlying natural sands
Phase 2	Early Activity	Ephemeral anthropogenic activity (including pitting and disturbance of the natural sand) predating the Pedestal Building, the Northern Structure, and the AA Bakery
Phase 3	Definition of AA Zone	The construction of the AA Pedestal Building, the Northern Structure, and SFW House Unit 1
Phase 4	Construction of the AA Bakery	Construction of the walls of the AA Bakery
Phase 5	Occupation of the AA Bakery	Includes the laying and use of floors, the use of the oven, the hearth, the depressions and vessels set in the ground, and areas of burning. This phase also includes the thick layers of ash and troughs in Room I.
Phase 6	Post-occupation of the AA Bakery	Includes collapse and dumping within the area (subphase 6a), physical degradation (mudbrick tumble; subphase 6b) and later taphonomic processes, such as robbing (subphase 6c)

dumped and used as leveling material on which to construct the bakery.

The team also found some pits, which may have been used to mix construction materials for the overlying building. Some of the pitting (especially under Room G in the bakery unit) may in fact have been related to the occupation of that room, where repairs to the later floors may have been missed during excavation, making the pitting seem earlier than the architecture.

Phase 3: Definition of the AA Zone

The AA bakery unit was constructed on an unused space between three already established structures, the Pedestal Building, the Northern Structure, and SFW House Unit 1 (fig. 1.16). Stratigraphically, it is clear that the western wall, [25,450], of House Unit 1 existed before the AA Bakery.

The first major development that can be identified in the area is the establishment of the AA Zone. The AA Zone comprises the two limestone walls [525] and [528]¹, the Pedestal Building, the Northern Structure, and later the AA Bakery (fig. 1.16). The *gebel* to the west of the HeG settlement (frontispiece 1) stood as a gentle sandy slope rising up to the west. To the east, the Western Town may or may not have already been established. But the area that comprises the AA Zone would have been a broad open area, acting as the marginal zone between the newly developing

Western Town and the *gebel*. To the east is the earlier House Unit 1 complex, which, though forming part of the eastern boundary of this AA Zone, has no direct access, east to west, between the areas and therefore can be regarded separately.

The north-south orientated wall [525], which bounds the western side of the AA Zone, has an average width of c. 70 cm and height of c. 1.60 m from its foundation on the natural sands (fig. 1.16). This wall extends over 30 m. The fact that there are no apparent breaks in this wall suggests that it may have served as a boundary for a much larger architectural complex.

The east-west orientated wall [528] bounds the southern limits of the area. This southern wall is very similar to the north-south wall. It too had been constructed of mud-bonded limestone, averaging 80 cm wide and surviving to a height of 1.15 m. The limestone in both walls had been very roughly hewn, both being constructed of boulders whose average size range from c. 10–40 cm, making the coursing highly irregular. The faces of the wall had been covered in a sandy silt render. The foundation level of the wall [528] remains unclear, however it clearly abuts, and was therefore later than, the western boundary wall of SFW House Unit 1, [25,450].

Later robbing events associated with the wall [25,450] exposed a small band of underlying stratigraphy at the eastern terminus of wall [528], which clearly demonstrates that the wall had not been completely

1. In GOP3 wall [528] was incorrectly labeled [23,648].

founded on natural sands. Rather, it appeared to be resting, in part, upon a sequence of as yet unexcavated deposits, which had built up against the western side of wall [25,450]. By contrast a sondage excavated inside the Pedestal Building revealed that wall [525] had been founded on the surface of the underlying natural sands only, hinting that it may have been founded first. The space between the two walls at the western terminus of southern wall [528] formed a 65 cm-wide entrance between the architectural complex within the AA Zone and a separate complex to the south.

Phases 4 and 5: Construction and Occupation of the Bakery

These phases represent the main construction and occupation of the AA Bakery. We cannot say for sure whether the bakery is later than the Pedestal Building to the west, or whether it was laid out at the same time. But we do know that the bakery unit cannot have been laid out any earlier than the pedestals since all the architecture within the bakery springs from the same early wall, [528], which bounds the southern limit of the AA Zone (fig. 1.16). The team found no evidence of roofing so we are unable to say which rooms were roofed and which rooms were open. There was also no evidence of a second story.

The team did not excavate the northeastern limit of the AA Bakery; their limit of excavation skirted around Room J and part of Corridor Q (fig. 1.18). On the surface, the archaeological horizons to the northeast appear denuded, possibly cut away by later pitting or erosion.

Corridors P and Q: The Eastern Corridors

The denuded and truncated area to the northeast may contain a broad corridor (Corridor P) (GOP3: 74). Portions of a north-south wall were mapped in grid squares 6.N1 and 6.O1, to the east of the Northern Structure, which align with the eastern wall of the AA Bakery, wall [25,450] (fig. 1.16). Together, the projected line of this wall may have formed Corridor P. From this broad corridor there are accesses into the Northern Structure, Rooms E and F, and a smaller corridor (Corridor Q). Corridor Q is 88 cm wide, accesses Room K, and terminates at the northern entrance into Room J. The access leading from Corridor P into Corridor Q contained a small doorjamb that protrudes out of the eastern face of wall [28,205] (fig. 1.18). A little to the east of this there is a stone set in the floor that may have

functioned as a threshold for the access through into Corridor Q (GOP3: 75). The existence of Corridor Q, the doorjamb and threshold suggests that the access into the main bakery area (Rooms I and J) and Rooms G, H and K were very restricted (GOP3: 75).

The Northern Bakery Rooms

Rooms E and F are both situated north of the bakery structure. The two rooms labeled E and F may not have served as part of the bakery unit, but may have been a separate functional entity, or possibly (but less likely) related to the Northern Structure. The internal dimensions of these rooms are similar, Room E measures 2.30 m north-south by 5.00 m east-west and Room F is 2.2 m north-south by 4.95 m east-west. Other than the Corridor Q accesses there were no other openings into or out of these two rooms (fig. 1.18).

Rooms E and F are bounded by three east-west mudbrick walls. The two southernmost of these were numbered [547] (north) and [26,986] (south), however the northern wall [543] had been robbed out. The eastern limits of these two rooms were defined by the north-south walls [28,221] and [28,205]. There is a doorway in the northeastern corner of Room E, 60 cm wide, and a doorway in the northeast corner of Room F, c. 75 cm wide (fig. 1.18).

The majority of Room E has not been excavated and remains under abandonment deposits. However some of the western end of the room was excavated in the 1991 season in a sondage, revealing a portion of the latest uppermost occupation deposits. The eastern and southern walls are faced with a 2 cm-thick, pale yellow, sandy marl plaster. The earliest occupation deposit identified within this room was a very charcoal-rich friable sandy silt. This was only seen beneath the overlying 1 cm-thick floor surface [583] (fig. 1.17). Under the unexcavated post-occupation material was at least one, partially exposed, dividing mudbrick wall that abutted the southern wall [547].

Underlying all of the floor deposits in Room F and set on the natural sands in the northeastern doorway of the room is limestone threshold [28,204], a large trapezoidal slab measuring 62 cm long × 56 cm wide × 5 cm high (fig. 1.19). This was sealed by a firm but friable sandy silt deposit serving either as floor makeup or perhaps as a floor in itself. If this was a floor it was in bad condition and was replaced by a second very good surface, [28,164]. This is the last floor in this room before its abandonment.



Figure 1.19. Details of occupation in Phase 5 of Room F, facing west. Limestone threshold [28,204] is evident in the opening between Room F and Corridor Q, where the two bedja pots were found. Photo by Susan Sobhi Azeer.

The obvious spatial similarities (both size and layout of plan) suggest that Room F served a similar function and use as Room E. The lack of internal features in Room F provides very little evidence as to what its function might have been. Since the rooms appear to have had two formal doors that led directly into them from Corridor Q, one might speculate that the rooms were for storage, although whether this was to serve the bakery unit or the Northern Structure remains unclear.

The Bakery Unit

The bakery proper consists of the five southern rooms. The only access into this unit was from Corridor Q. Unlike Rooms E and F, however, these were interconnected, forming a complex or multi-room structure (figs. 1.16, 1.20). It is impossible to say for sure whether this architecture is founded on the natural sands of Phase 1 because most of the lower occupation deposits still remain *in situ*.

Rooms G and H

Initially Room G was most likely a long open space running the length of the western side of the bakery

unit (fig. 1.17). The internal dimensions of Room G are in total c. 2.40 m wide east-west by 7.25 m long north-south. The northern third of the room (c. 2.2 m) seems to have been demarcated using two opposing pilasters. These pilasters survive to a height ranging between 47–65 cm. Room G is bounded on its western side by the north-south orientated wall [542]. The northern limit of the room was also shared by the southern wall of Room F, [26,986]. The eastern limit is a north-south orientated wall [23,628]. However, to the south of this was wall [28,175], separated by a c. 65 cm-wide door forming the only entrance. This connected Room G and Room K, immediately to the east. Wall [528] was the southern bounding wall of Room G before the room was partitioned into two spaces (fig. 1.18).

The 1991 excavations revealed an occupation sequence in Room G. This included an early silty marl floor that was sealed by a 2–3 cm-thick band of cemented sand running the length of Room G, that possibly had been resurfaced at the northern end. An east-west orientated mudbrick wall [28,262/8238], which partitioned the room, had been founded at this level (fig. 1.18). This wall, [28,262], functioned with a doorjamb, [8264], on the western wall, [542]. These

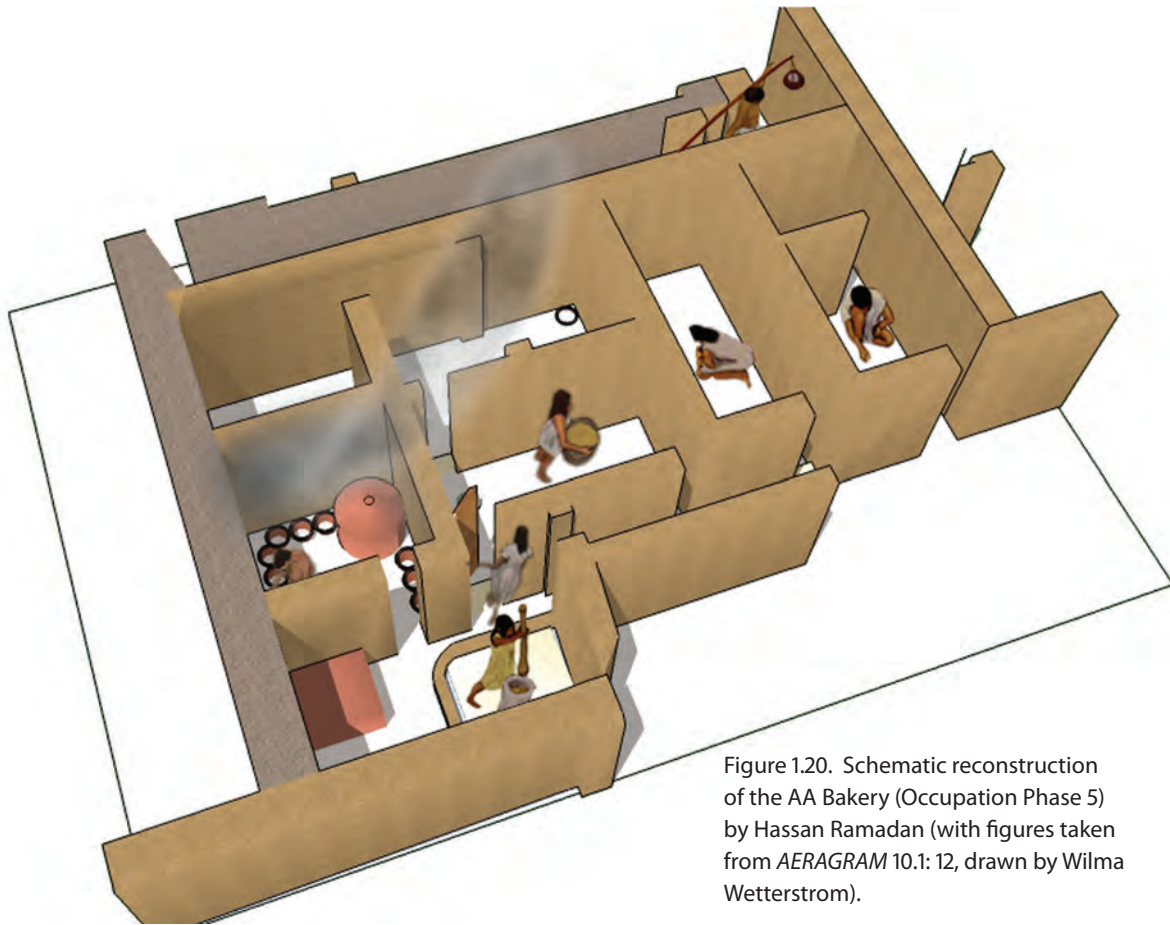


Figure 1.20. Schematic reconstruction of the AA Bakery (Occupation Phase 5) by Hassan Ramadan (with figures taken from *AERAGRAM* 10.1: 12, drawn by Wilma Wetterstrom).

walls divided Room G to the north and the smaller Room H to the south. The doorway between the two rooms is slightly narrower than the other doorways in the bakery. The latest floor [28,174/8244]=[28,165] in Room G was probably also contiguous with the adjacent floor [8248] in Room K. The floor is similar to those found elsewhere in the bakery unit. However in Room G, the floor was patchy and irregular, with the best preservation being around the edges of the room, indicating wear. This can probably be attributed to the use of the hearth (see below) in the northwestern corner of the room, as well as traffic into and out of Room K across the threshold (fig. 1.18).

Room G showed evidence of occupation perhaps on a domestic scale. We found scorched pottery in the northwest corner of the room that may be the *in situ* remains of an informal hearth. This hearth had been demarcated from the rest of the room by the two pilasters [8241] on the eastern and western walls. There was an unusual pit, [29,172], constructed from a cluster of flattened pink granite rocks, [28,227], pressed into the

lining of a circular cut and bonded/rendered with a smoothed silty clay plaster. This may have housed a ceramic vessel, possibly used for storage. Given its proximity to the hearth, the pit and hearth seem to have functioned together. Whether this room served as a domestic cooking area or an additional part of the baking taking place in Room I, is unclear. The whole room was filled with a thick build-up of loose, dark gray to black ash which contained moderate charcoal flecks and occasional ceramic sherds, bone fragments, and lithics. This deposit had probably been created as a result of the continued use of the hearth. This is further suggested by the fact that all of the ash was restricted to the area demarcated in the north by the two opposing pilasters, [8241] (fig. 1.18).

Within Room H the sequence continued with the laying of another floor. The room was finally sealed by an ash-rich make-up layer that formed the foundation for the latest floor. There was also a shallow cut hearth filled with dark gray fine ash recorded in the section cut in the 1988/1989 and 1991 section.

Room I: The Baking Room

Room I (fig. 1.18) is one of two rooms located east of Room G. Room I is roughly square, 2.70 m north-south by 2.80 m east-west. The only entrance into the room was through a 60 cm-wide doorway in the northeast corner of the chamber, leading into Room J. The room is bounded by wall [28,175] to the west and wall [528] to the south. The northern limit of Room I is marked by wall [27,417] (abutting [28,175]), which separated the room from Room K to the north. Finally, the eastern limit is marked by wall [23,627] (abutting [528]), which effectively separated the room from Room J to the east (fig. 1.18). This room had been badly damaged by heat generated during the baking process (see Phase 6).

The earliest occupation deposit in Room I that the team identified was slightly silty sand. This deposit is an interface between the overlying occupation within the room and the underlying natural sands. The earliest deliberate feature is an oven, [28,178], constructed in the northwestern corner of the room (figs. 1.18, 1.21). This structure is rectangular and measures 1.10 m by 90 cm and stands 28 cm high. It had been mainly constructed of marl and mudbricks and fragments of

limestone (fig. 1.21). There is a small depression in the surface of the structure. According to Kemp rectangular ovens were best for baking bread when using pottery molds (Kemp 1987: 76). Whether this structure functioned as an oven or open fireplace remains ambiguous. There was a heavier content of discernible bricks at the southern end of the structure, suggesting that the structure might have been walled (with a possible entrance in the southeastern corner?) and a large amount of burnt and collapsed mudbrick superstructure sealing it. The northern and western sides of the structure were sloping, suggesting that the feature had been dome-shaped and enclosed. Since enclosed ovens do not strictly fit the conventional model of stacking bread molds over an open heat source in order to preheat them (Faltings 1998: 92, 96, 98), this is at odds with our interpretation of Room I as a baking room. We cannot rule out the possibility that the oven in Room I and the hearth in Room J (see below) began their respective life spans as broadly contemporaneous structures and that they performed different parts of the same process. The oven (or hearth) had been put to extensive use; the room was filled with ash [27,042] and [25,239]. This ash eventually built



Figure 1.21. Oven [28,178] in the northwest corner of Room I, facing west. Photo by Andrea Nevistic.

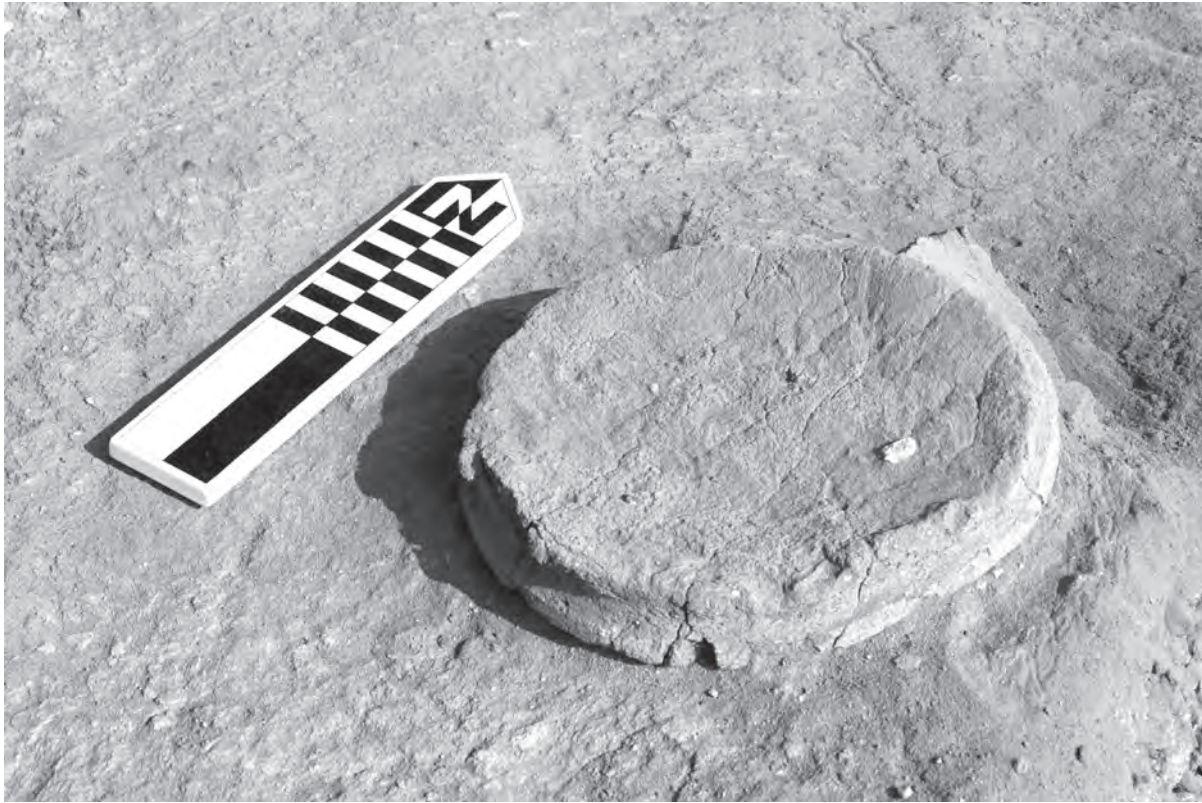




Figure 1.22. Example of an unfired platter/tray. This particular platter was found in the basin in Room J to the east of depression [27,400]. Photo by Mike House.

up over the hearth/oven in Phase 5, suggesting that Room 1's oven fell out of use first, before the bakery was abandoned.

The team found five partial or nearly complete ceramic vessels in the center of the oven/fireplace. Most of these were shallow baking plates (platters) or trays of F1A or F1C type (fig. 1.22 here; *GOB*3: 77; Wodzińska 2007b: 306). These platters or trays are crudely made, poorly fired, and fragile (Samuel 2000: 567, fig. 22.16), and were overlain by part of a large, very deep vat (type CD25 in Wodzińska's typology, Wodzińska 2007b: 303–304). Platters are associated with the baking process. In ethnographic studies these platters have parallels with modern Egyptian vessels used for making *'eish shams*, or sun bread (Samuel 2000: 568). Peet and Woolley describe a modern baking method by villagers living near Amarna in which they place the dough on unfired platters or plates, and both platter and bread are then baked together in the oven (Peet and Woolley 1923: 64). Also, unfired trays and trays fired at low temperature or partially fired have been discovered in the Elephantine bakery from the First Intermediate Period (T. Rzeuska, personal communication). These trays often break

when the bread is taken off (Saintilan 2000: 171). This kind of tray is called *apr.t*, , or  (Erman and Grapow 1926: 181; Willems et al. 2009: 19, fig. 11c–f).

As mentioned, the team divided the ash into two deposits. The lower one, [27,042], was a compact lighter medium-gray ash and the higher one, [25,239], was a moderately compact medium-gray ash. Combined, these deposits were 43 cm thick. Despite our designation of only two separate numbers to the ash deposits, it is probably best to think of them as many depositions, an accumulation of ash over time that has been constantly turned over, raked, and walked on. Another indication that the ash was generated *in situ* was the soot and fire damage on the walls themselves. All the internal faces of the walls in Room 1 were caked in ash, which had made its way deep into the bond of the bricks. When cleaned, the faces of the walls were invariably discolored (orange or bright reddish-brown), suggesting *in situ* heat damage.

These deposits yielded a notable and unique assemblage of clay sealings bearing the Horus names of Khafre and Menkaure (although overwhelmingly



Figure 1.23. General view of the Preparation and Baking Rooms, Rooms I and J, facing south. Photo by James Taylor.



Figure 1.24. Room I, facing north, showing ash [25,239] and linear cuts (troughs) [27,412] and [27,415] alongside the walls. Photo by James Taylor.



Figure 1.25. Plan showing troughs [27,415], [27,417] and ash [25,239] in Room I (phase 5). Plan by Rebekah Miracle, AERA GIS, and Hassan Ramadan.

Menkaure) that seem to have been dumped in independently or within the ash. It is possible that whatever these sealings were securing was used as fuel to burn, which in turn had generated these large quantities of ash.

The occupants of the bakery appeared to have been working within the ash. Features were cut into the ash and those cuts were then filled with more ash. The uppermost surface of the ash deposit was convex (figs. 1.23, 1.24), mounding up slightly in the middle. There was some lensing in the ash visible in a section in the center of the room. Consequently we think that as this ash was being deposited, it was raked toward the center.

Linear cuts [27,412] and [27,415] ran alongside all of the room's four walls, through ash deposit [25,239] (figs. 1.23, 1.24, 1.25). This same ash covered the oven, [28,178], in the northwest corner of the room. The cuts formed shallow slightly irregular, flat-based troughs with concave sides. Inside these troughs there were circular depressions with a 38 cm diameter (fig. 1.25). These depressions had very diffuse edges. We believe that these depressions held bread molds. These troughs and circular depressions were created and used after the hearth, [28,178], in the northwest corner of Room I had gone out of use. This suggests that the troughs and depressions functioned with the hearth in Room J.


Room J: The Preparation Room

This room is an irregular rectangle, approximately 4.50 m north-south by 1.40–1.54 m east-west, filling the void left between SFW House Unit 1 to the east and Rooms I and K to the west (figs. 1.17, 1.18). There are three entrances to this room: one in the north wall, leading to Corridor Q, and two in the western wall leading to Rooms I and K. The Corridor Q to Room J doorway was the only conclusive point of access into the Bakery Complex via Corridor Q. The other two doorways were formed from the space between wall [27,402] to the north and wall [23,627] to the south. The terminus of east-west orientated wall [27,417] divides this space, forming the two doorways. The southern one has a corresponding doorjamb, while the northern one is formed by the northern face of wall [27,417] and the southern terminus of wall [27,402], and is 78 cm wide. The northern limits of the room are defined by wall [23,637].

The uppermost floor, [28,226], identified in Room J can be equated with the other upper floors within the bakery. The most striking point about the floors in Room J was the division of “dirty” and “clean” zones. The dirty zone was where the floors were ashy and where the activity seemed to relate to baking (figs. 1.18, 1.25). The “clean” zone, immediately to the east of the entrance, in the northeastern corner of the room was within a c. 2.15 m north-south by c. 1.80 m east-west rectangular space that had been well-plastered and well-maintained, demarcated by a low plastered L-shaped curb in the floor. This curb, [27,406], is not more than 10 cm high (figs. 1.25, 1.26).

Within the curbed space there is a slight slope on the surface from north to south. In the very center of this space is a circular, smooth-sided plastered pit [27,400], with a 48 cm diameter and a slightly concave base (figs. 1.25, 1.26). This pit probably would have housed a ceramic vessel. Its presence has two implications. Firstly it supports the theory that the function of the features in this space were very much pre-planned and laid out. Secondly, and more importantly, it suggests that the ceramic vessel was meant to function with this hole, but was not meant to rest there *in situ* for its entire useful lifespan. The vessel may have been lifted in and out of the plastered hole as part of a process, further suggesting this kind of vessel is used in the bread preparation process (Faltings 1998: 55, figs. 3, 22). Lehner suggests that the sunken vats in the basin's floor were used for soaking grains, which were

then spread out across the basin with any excess water draining back to the socket or vat in the center of the basin (GOPS: 133).

The presence of this basin led us to assume that the bakery may have had as much to do with malting as baking. The malting process would have been accomplished by soaking the emmer and barley grains in water to be sprouted, activating enzymes which produced sugar. After that the grains were spread out to dry before the growth of the seedling consumed the sugar (Lehner 2009a; Kemp 2006: 172; Samuel 2000: 551–553). Evidence for malting in hieroglyphic texts comes from the word *beshā*,  (Erman and Grapow 1926: 478; Luoma 2009: 10–11; Nims 1958: 63–65, Faltings 1998: 156–225).

The clean, curb-bordered space also led directly into the “clean rooms” (Rooms K, G, and H). The clean rooms could be physically shut off by a door, indicated by the presence of a limestone pivot just inside Room K. The occupants could thus avoid the “dirty” area altogether.

Elsewhere in Room J the team recorded a square, open, mudbrick platform, [27,403], in the southwestern corner of the room (figs. 1.25, 1.27). More formal than a plain hearth, this structure appeared to act as a fireplace and displayed clear evidence of *in situ* burning, both on its surface and against the walls of the room. There was evidence of prolonged use and several instances (or phases) of repair and extension of the structure. The platform was very solid and was associated with a very complex sequence of “dirty” ash floors, floor repairs and consolidation, and cut features, which dominated the southern half of the room. The southern half of the room had been far more heavily used than the curbed enclosure. The cut features in the area around the fireplace were mostly shallow squarish pits (perhaps rake-out pits for hot ash and embers?), or shallow inter-cutting circular scoops presumably for temporarily resting shallow concave vessels during the bread-making process. They contained much higher densities of ceramic sherds and even lithics. This suggests that they may have been dumped in to consolidate the wear patterns in the floor. To the east of these floors, abutting the wall and to the immediate south of the curb, was a very regular rectangular cut exclusively filled with very black ash, perhaps associated with material raked out from the nearby hearth. There was a build-up of dark gray ash around the fireplace platform. This ran in front of the



Figure 1.26. Room J, facing north, showing the basin in the northeast corner of the room and circular pit [27,400] at its center. Photo by James Taylor.



Figure 1.27. Hearth [27,403] in southwest corner of Room J, facing south. Photo by Andrea Nevistic.

structure (to the north) by about 10 cm to 15 cm, but was mainly concentrated to the east. It was mostly sterile although it did yield a large lithic blade. This ash was identical to a broader spread of compact light to mid-gray ash, which was approximately 5 cm thick and dominated the southern part of the room, stopping to the south of the curb structure.

According to el-Mahdy there is a relationship between the design of the hearth used to bake bread and the bread shape and kind (el-Mahdy 2009: 17, 22, 77). Since we have two types of hearths in the AA Bakery—square and open, rectangular and closed—the bakery may have produced two different types of bread. Once the data from the analysis of the ceramic material has been integrated with the excavation data we will be able to test this hypothesis.

Room K

This room is bordered by four mudbrick walls (fig. 1.18). To the north is wall [26,986], to the west is wall [23,628/28,175], to the south is wall [27,417], and to the east is wall [27,402]. The northern wall of Room κ is poorly preserved, truncated by a later pit. The walls form a rectangular space 2.40 m east-west by 4.20 m north-south. There is a limestone block and a lump of granite, [27,413], in the middle of the room abutting the western wall. These stones may be the remnants of a partition that divided the room into roughly square spaces. The room had been badly damaged by robbing that occurred after the occupation of the bakery (see Phase 6).

The southern part of Room κ, adjacent to the southern wall, showed some evidence of activity; a shallow ceramic vessel emplacement, [27,419], in the southeastern corner of the room adjacent to the door through to Room G, and some light burning and ash in a pit abutting the southern wall, possibly associated with another small vessel. We found a pivot socket, [27,418], 24 cm long, set into the floor on the south side of the southeastern entrance, indicating that a swinging, possibly wooden, door once shut the room (GOP3: 76). The room did not have any “dirty” spaces and did not contain activity-specific features that might have been indicative of the room’s function.

Phase 6: Post-Occupation of the AA Bakery

Stratigraphically, we can divide the phases of abandonment into three sequential subphases: the activity

that took place upon the abandonment of the structure, such as dumping and littering of the building predating the collapse or demolition of the structure (Phase 6a), the physical degradation and destruction of the structure, represented by mudbrick tumble (Phase 6b), and finally, the taphonomic process (Phase 6c), either natural or anthropogenic, including ancient or modern robbing cuts, later burial cuts, and natural erosion.

Small, localized events, such as dump layers indicated the first stage of the process (Phase 6a). This phase is clearly represented inside the baking and preparation rooms (Rooms I and J). Here the team excavated a large assemblage of nineteen bread molds and a large amount of pottery sherds supported by and mixed in with a pure gray ash layer. These objects were resting on the uppermost surfaces inside Rooms I and J, leading us to hypothesize that the work inside these two rooms might have suddenly stopped and that these vessels had been left because they were not valuable and/or easy to replace. Lehner has noted similar phenomena elsewhere (*AERAGRAM* 2002: 13). The team also found two complete bread molds sitting on the floor of Corridor Q in front of the limestone threshold to Room F. These also seem to have been left behind by the occupants.

The second phase of abandonment (Phase 6b) was evident as mudbrick tumble, possibly from the collapse of the upper part of the walls. It should be noted that the team found no examples of sheet collapse or collapsed roofing material. A homogenous deposit, comprised of small fragments of mudbrick, superseded the large-scale tumble and probably represents a gradual deceleration of the destruction process. During this phase there is evidence of dumping, as these deposits contained significant amounts of cultural material.

The primary tumble deposit that spread throughout Room κ was a 20 cm-thick band of loose sandy silt debris, containing obvious fragments of mudbrick and a significant quantity of cultural debris (especially ceramic sherds, animal bone, and charcoal). This deposit was largely spread throughout the southern part of the room. This was sealed by the first band of true structural tumble in Room J. Despite being dominated by whole mudbricks, this tumble was still completely supported by loose, dark-gray, ashy silt. This was presumably residual material. The sequence of tumble supported by ash continued

within Room J to a depth of up to 60 cm thick at c. 17.76 m asl (maximum).

Room I was also filled with dark ash to a height of 17.70 m asl and a depth of 60 cm. This ash was stratigraphically later than or interspersed with non-ashy tumble deposits in adjacent rooms, suggesting that the ash was laid at the same time as the structural degradation of the rooms. Then the room was filled with mudbrick tumble to a height of 17.77 m asl, which extended east to seal Room J as well. Finally, the room was sealed by cemented mudbrick tumble.

The other rooms of the bakery followed a pattern similar to the one seen in Room K. Rooms G and H were filled with three or four dense sandy silt mudbrick tumble deposits. These sealed several sandy, ashy deposits. Both of the two rooms had tumble at the base of the sequence, sealing the latest occupation deposits.

Concerning the two northern rooms, Rooms E and F, a very thin dark ash layer sealed the floor inside Room F. This had been sealed by a silt tumble that filled the whole room and spread outside into the adjacent corridor. Then Room E was filled with a massive silty layer that brought the fill of the room to a height of 16.81 m asl. As for Room E, much of the earlier abandonment layers are unexcavated. The room was sealed to the south with mudbrick tumble mixed with gray-brown ash. The southern part of the room was sealed with cemented sandy silt.

Finally, the last phase within the area is the taphonomic process that affected the AA Zone following the degradation of the main structures. The activities that took place during this phase were mainly natural and anthropogenic processes/events, such as robbing or later truncation, and natural erosion.

The instances of robbing across the AA Zone fall into two categories: pitting and wall-robbing. All the robbing events involved the mudbrick of the bakery unit. Two large pits truncated the room fills in Rooms E, F, and K. We were unable to establish when these robbing events took place. Finally, the area was covered in a laminated layer of sterile light yellow-brown sand, which was almost certainly of aeolian origin.

AA Bakery: Analytical and Comparative Study

The main goal of this section is to define the function of the AA Bakery. We ask, did this bakery produce bread that provisioned the HeG settlement and possibly beyond, did it produce bread for a single

household, or did it perform some other role? While addressing these questions we considered whether the AA Bakery conforms to the other types of HeG bakeries (Mahmoud and Eissa, introduction to Chapter 1, this volume).

A Third Type of Bakery

Although the AA Bakery is located within the Western Town, which we have hypothesized is largely domestic in character (Mahmoud and Eissa, introduction to Chapter 1, this volume), it is adjacent to two buildings with unclear functions, the so-called Pedestal Building and the Northern Structure. Neither is clearly domestic, nor are they clearly industrial. The Northern Structure may be a brewery (see below). To the south, the Pedestal Building can be accessed from the Northern Structure (fig. 1.16). The Pedestal Building is a structure dedicated to the enigmatic pedestals (Abd el-Aziz, Chapter 2, this volume), the function of which is unclear. Lehner suggests that they provided some sort of specialized storage and perhaps were related to the activities of the Northern Structure (GOP3: 69). The context of the AA Bakery therefore suggests that it does not fall neatly within our industrial or domestic bakery types, but may represent a separate, third type of bakery. This is also inferred by the types of sealings that were recovered from Area AA (the Pedestal Building, AA Bakery, and the Northern Structure). The sealings team has been able to reconstruct at least sixteen separate cylinder seals in use here. Five of these belonged to officials who were connected with the Royal Funerary Workshop of Menkaure (AERA 2011: 22). Eight of these belonged to royal purification priests who served the royal mortuary cults of Khafre and Menkaure (AERA 2011: 22).

Faunal Material

Here we ask what class of people the AA Bakery may have served. Rasha Abd el-Mageed, in her study of faunal remains from the site, concludes that the AA Bakery was used by “high-status individuals” (Abd el-Mageed, Chapter 5, this volume). She found that mammals were the dominant meat source and that young cattle—veal, more specifically—were the dominant mammal. These were the most desirable and costly meat sources. She also found that the fish sample supported this trend, reflecting wealth and status. The sample also suggests, based on a preponderance of male sheep-goat and young cattle, that the garbage in the AA

Bakery had been left by people who had been provisioned (Abd el-Mageed, Chapter 5, this volume).

Bread and Beer Production

The AA Bakery consists of a number of rooms, which were probably used for bread production or for another purpose. We thought that the AA Bakery, together with the Northern Structure and the Pedestal Building, may have formed a large complex. The AA Bakery may have been focused on bread-making, while the Northern Structure and the Pedestal Building were connected with beer production.

AERA archaeobotanist Mary Anne Murray studied plant remains from the AA Bakery. According to Murray there is a high proportion of barley to emmer wheat compared with other areas of the town and most of the barley chaff in Area AA was recovered from the bakery (AERA 2011: 23). Barley chaff is a byproduct of beer brewing. However it is also used as fuel and the bakery also produced more acacia wood (the most common fuel) than the eastern area of the site (AERA 2011: 23).

Lehner thought that during the malting process the grain would be laid out on the floors of two rooms located inside the Northern Structure. The Northern Structure contains a room with two circular ovens (the Oven Room), a room with four bins (the Bin Room), and a long room with a narrow bench (the Long Room) (fig 1.16). Lehner hypothesizes that the Long Room and the bins had been used as “malting floors” for the production of beer (GOP3: 73).

The northernmost boundary wall of Room E, [543], in the AA Bakery was not well-defined. It also formed the southern boundary of the two rooms located at the very south of the Northern Structure. A robber's cut had removed most of this wall, so much so that it is impossible to say whether there had originally been an access here that would have linked the AA Bakery and the Northern Structure (Taylor 2009b: 28). An access through this wall would suggest that the Northern Structure, the AA Bakery, and the Pedestal Building all had a functional connection.

From all of this, one can suggest that the two processes of brewing and baking may require two adjacent buildings to supply some of the inhabitants of the Western Town, perhaps including those associated with a royal mortuary cult, with bread and beer.

Malting and Brewing

On the other hand, the AA Bakery might have initially been built for another purpose, such as malting and brewing. This hypothesis was suggested by Lehner, who thinks that the occupants steeped the barley in the vat located in the basin room, then scooped it out and spread the barley across the bin floor. Also, he suggested that they might have placed malt into the trays (that were found in the AA Bakery) for curing in ovens or malting kilns (Lehner 2009a: 201, 206).

Is the AA Bakery a House Unit?

Another hypothesis that might help us understand the nature of the AA Bakery is whether or not the bakery is a house divided into two areas. The first area contains the clean rooms that acted as living rooms for the residents of the house. The second area may have been service rooms. Rooms I and J were easily accessible from outside of the complex (without having to go through the other rooms), with the baking room, Room I, at the heart of the bakery, accessible only from the southern door in the western wall of Room J. This presumably allowed raw materials into—and finished product out of—the bakery without disrupting other activities in the building. The clean rooms (Rooms K and G) were accessed by a separate doorway from the northern, cleaner half of Room J. This would promote a level of cleanliness and organization in these rooms, which in turn supports the idea that they may have been domestic or storage spaces. The latter hypothesis is supported by the fact that Room G would have been very secure, being the part of the complex farthest away from the only entrance (in Room J). These rooms spiral around the central baking room, which meant they would all have benefitted from the heat given off during the baking process, keeping domestic quarters warm and storerooms dry. The existence of an entrance to Room K and the clean rooms suggests they were separated from the other rooms to prevent the flow of smoke resulting from baking and cooking activities.

Although there was no evidence of a sleeping platform, a feature that we often use as a primary indicator of a “house,” sleeping quarters could have been located on a second story or roof (although we did not find a staircase or other means of accessing the roof), or actual beds could have been used. To the southeast of the AA Bakery, there is a second house unit, SFW House Unit 3 (frontispiece 2). This structure does not

have a sleeping platform, but based on its location, spatial configuration, and sets of features, AERA teams refer to it as a house unit (GOP2: 74–75).

There are elements of the AA Bakery that are remarkably similar to the bakery at the eastern end of SFW House Unit 1, particularly the mixing/preparation room and the baking room (figs. 1.3, 1.13, 1.14). Both contain a bordered basin with a circular depression at the base and a hearth in the space to the south. As such, in terms of organization of spaces and types of features within spaces, the AA Bakery has more in common with the SFW House Unit 1 bakery than the more industrial style bakeries found elsewhere on the HeG site (Mahmoud and Eissa, introduction to Chapter 1, this volume; Eissa et al., Chapter 1, this volume).

Other Similar Bakeries

We looked at other Egyptian sites for comparable bakeries. Below we present an account—by no means exhaustive—of similar Egyptian bakeries. Also very similar to the AA bakery are a series of bakeries excavated in 'Ayn Asil in the Dakhla Oasis (fig. 1.28), within the settlement related to the Old Kingdom Governor's palace. These bakeries include basin rooms (Soukiassian 1997: 16–17; Soukiassian et al. 2002: 289–302) very similar to the basin room in the AA Bakery. The northern two-thirds of the Governor's Palace was occupied by large residential rooms, bordered by service rooms, bakeries, and servants' rooms (Soukiassian 1997: 16–17). These bakeries included typical characteristics of a bakery, such as a bin with a pot emplacement and hearth. A large number of bread molds associated with an accumulation of ash were also found. The basin measured 2.00 m by 2.00 m. A pot, 40 cm in diameter and 25 cm deep was set in the ground in the center of the basin (Soukiassian, Wuttman, and Pantalacci 2002: 101–105, 108, 199–208, figs. 87, 173, 175, 177–179).

Another sequence of bakeries were identified in the 'Ayn Asil site dated to the First Intermediate Period inside the central area, Room 26, which measured 9.75 m north-south by 3.00 m east-west. It contained a typical installation of bakeries, with a fixed pot emplacement and places for querns, bordered by a small curb and hearths along the eastern wall. Room 27 contained a hearth, clay floor, and a square space bordered by one line of mudbrick and a central room (23), with two cooking rooms on two sides. Within the northern area, Room 22 was square and may have been

partly roofed. There was a large hearth in the northeast corner. There is no access between it and Rooms 23, 24, and 25 to the east. Inside Rooms 24 and 25 the excavators found small low compartments used as bins and a circular hearth 40 cm diameter. These spaces were not interpreted as storage but rather as a domestic area (Marchand and Soukiassian 2010: 60, 90–91; figs. 3, 61, 79, 82–83, and 120–121).

Two other examples of bakeries from the Old Kingdom include one excavated in the area of Khafre's diorite quarry settlement in Gebel el-Asr. The rough, low-walled oval structure contained several typical Old Kingdom bread molds with large amounts of ash, indicating the baking of bread (Shaw 2003: 452). The second example was discovered by Abd el-Aziz Saleh within the third pyramid settlement of Menkaure at Giza. He found two kinds of ovens differing in shape, some being circular in form and others octagonal. They had been built of unbaked mudbricks stacked vertically. He found twelve circular ovens similar in type and size, measuring about 105 cm in diameter on the outside, 60 cm internally (Saleh 1974: 135–136). These cylindrical- or barrel-shaped ovens are very similar to those still in use in the modern Egyptian countryside. The ovens measure 1.50 m long by 1.30–1.56 m wide by 1.10–1.27 m high, with an outer diameter measuring between 1.04–1.14 m (Saleh 1974: 135–136).

At Amarna, Kemp also found a rectangular space containing two different types of oven to the east of Chapel 556: a circular one, 29 cm in diameter with a small circular hole, and a rectangular-shaped box oven, 66 cm by 75 cm, with a narrow step or ledge at the east end (Kemp 1987: 73–74, 76). We believe that the presence of two types of hearths with different designs might correspond to different shapes of bread being produced inside the AA Bakery, an idea further supported by el-Mahdy, who thought that the different shapes of the hearths corresponded to the different types of bread (el-Mahdy 2009: 176–177). The AA Bakery contained two hearths located in two separate rooms, I and J. How these related chronologically to one another was not completely clear. It was possible that the Room I oven was the first to be laid, since it was founded on the primary floor surface of the room. It was certainly the first to fall out of use. It seems likely that it fell out of use as the room filled up with ash and the hearth in Room J—which appeared to be a later addition to the room—may have replaced it.

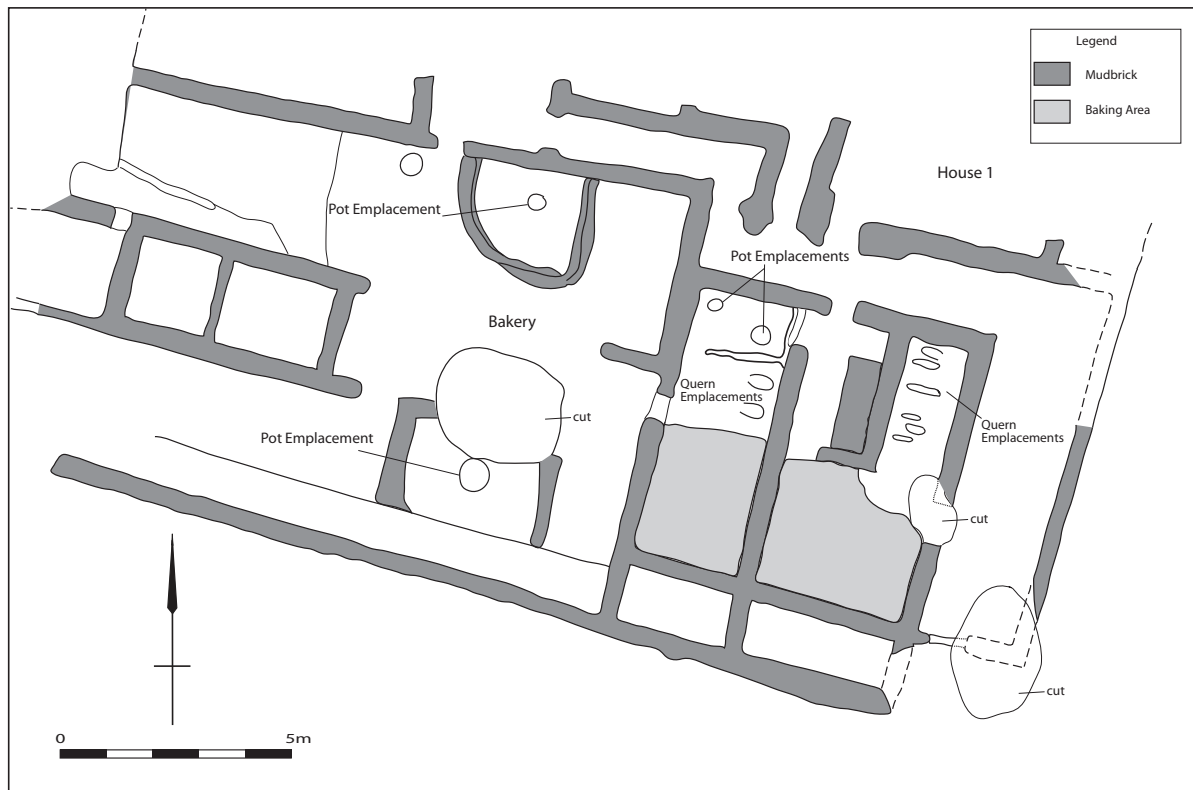


Figure 1.28. Plan showing the bakeries in House-Bakery 1, Phase 1.1, at 'Ayn Asil. After Soukiassian, Wuttman, and Pantalacci 2002, Fig. 173. Redrafted by the graphics team.

Conclusion

The AA Bakery is one of a number of bakeries that AERA teams have excavated at the HeG site (see Mahmoud and Eissa, introduction to Chapter 1, this volume). Elsewhere on site there seem to be two distinct types of bakeries. The first of these is an industrial governmental type, which is generally found to the east and west of the Galleries. They are single, sometimes double, room structures that are built next to one another, and unattached to houses. Judging from the extreme build-up of baking waste (broken bread molds, etc.) nearby these facilities, these bakeries seem to have been producing vast quantities of bread (see Eissa et al., Chapter 1, this volume). The second type is a more domestic type of bakery. These bakeries occur within houses or in the living quarters at the back ends of the gallery units. One of these bakeries, sfw House Unit 1, bears a striking resemblance to the AA Bakery. Both share features that are uncharacteristic of the other bakeries at HeG, namely the curbed basin with a circular pit at its centre. The types of features in the AA Bakery and in the sfw House Unit bakery has led team members to hypothesize that not only bread baking was done there

but also malting and brewing (Lehner 2009a: 201, 206; Lehner 2011c: 133).

The baking (and perhaps brewing) areas (Rooms 1 and j) of the AA Bakery occupy a small area of the total building. If baking and possibly brewing was occurring in Rooms 1 and j, what was happening in Rooms e, f, h, and k? Were these living quarters? Were they administrative quarters? Furthermore, could the AA Bakery be a functioning part of a much larger ensemble that included the Pedestal Building and the Northern Structure? Together could these have functioned as a Royal Funerary Workshop as the sealings seem to suggest (AERA 2011: 22)? Once the material culture has been integrated with the excavation data we hope to answer these questions and develop a fuller understanding of the purpose and inhabitants of the AA Bakery.

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A Preliminary Report on the EOG-D Bakery

by Rabee Eissa, with Mansour el-Badri Mustafa Ali, Shaima Montasser Abu el-Hagag,
Ahmed Omar Shoukri, and Hussein Rikaby Hamed

The 2006 AERA Advanced Field School included an excavation module aimed at training selected Ministry of State for Antiquities Inspectors in archaeological field techniques and methods of recording. The students were divided into three groups that excavated in three different areas. One of these areas was “EOG-FS,” the East of the Galleries Field School Transect (later known as EOG-D). The transect was excavated by Ahmed el-Laithy and Rabee Eissa, both of whom graduated from the 2005 AERA Beginners Field School, and then excavated under the supervision of Mike House in 2006.

Area “EOG” is used by AERA team members to describe the entire area east of the galleries. The area measures about 40 m from east to west and 75 m from north to south (Stevens, House, and Driaux 2007: 1) (figs. 1.3, 1.8). To the north this area is enclosed by Main Street, one of three east-west oriented streets, each about 5.20 m (10 cubits) wide and 160 m long, that divide and access a series of four north-south blocks that contain a series of individual rectilinear structures we call galleries (Abd el-Aziz 2007b: 193–234; Lehner 2007a: 35–36, 40). The western limit of EOG is bounded by Gallery Sets III and IV. These galleries have been interpreted as barracks with private housing at the rear (Abd el-Aziz 2007b: 221–228; Lehner 2007a: 43–44). The eastern boundary of the EOG is the Eastern Town (fig. 1.3), a network of small houses with narrow rooms and courts; the town itself extends eastwards under the modern village of Nazlet es-Samman (Lehner 2007a: 42). Finally, the southern limit of the large area of EOG is bounded by the main Enclosure Wall to the south, which turns around the northern end of the Royal Administrative Building (RAB), a large enclosure containing silos.

Area EOG-D, a sub-unit of EOG, stretches across Squares 4.G22, H22, and I22, and measures approximately 11.50 m long (north-south) and 1.80 m wide (east-west) at the southern end and 1.33 m wide at the northern end (fig. 1.8). Its northern end is truncated by a large backhoe cut (the Biggest Backhoe Trench 2

or BBHT2). Area EOG-D is bounded by what might be a faience workshop to the southwest. The blue glazed material discovered in this area may be archaeological evidence of one of the oldest faience workshop or production areas so far identified in Egypt (GOP3: 58), recalling that the faience kilns excavated in Abydos may date as early as the mid-Old Kingdom (Nicholson and Shaw 2000: 180–181). The Field School trench’s western boundary was formed by three north-south rectangular limestone buildings that may also be bakeries—from west to east these are Enclosures A, B, and C (fig. 1.8). Parts of these buildings were also excavated in 2006. The area to the east of the EOG-D Bakery is unexcavated.

Prior to our excavation of EOG-D our knowledge of Area EOG was limited to excavations around and within another backhoe trench (Area BHT) (fig. 1.8). To the southwest of this cut AERA teams had already excavated the A7d and A7e Bakeries in 1991 (fig. 1.3), and teams had mapped large areas densely packed with broken bread molds to the east and south. Area EOG appeared to be some sort of production and discard area featuring a sequence of different industrial facilities that included pedestals, bakeries, and a faience workshop (Stevens, House, and Driaux 2007: 105–116).

In order to build a fuller understanding of this production zone, our excavations in Area EOG-D firstly aimed to ascertain whether or not the buildings to the north of BHT were bakeries. Based on their rectangular shape, the black ash filling the rooms, the concentration of bread molds visible on the surface and around the building, and the fact that these features were typical of bakeries found elsewhere on site, Lehner suspected that these buildings were bakeries (GOP3: 44–47). By the end of the 2006 season the Field School team had ascertained that the building in the EOG-D trench was, in fact, a bakery. Additionally to the west, Dan Hounsell excavated Enclosures A and B (figs. 1.8, 1.9). In these, he found large circular depressions that may have held large vats in which dough could

have been mixed (Hounsell 2006: 25). Previously, in Bakeries A7d and A7e, AERA teams found several vats preserved *in situ* set within the floor and at least one vat-sized circular depression where the vat had been removed (see Mahmoud and Eissa, introduction to Chapter 1, this volume; figs. 1.4, 1.5).

The second aim of the excavation in EOG-D was to connect the stratigraphic sequences that AERA teams had previously recorded within the sections of the two irregular backhoe trenches, BHT and BBHT2 (fig. 1.8). This would enable us to create a better understanding of chronological developments within this area of the HeG site.

Finally, the excavation of the EOG-D transect aimed to establish whether the pottery dump located at the southern end of the bakery was part of the same sequence of dumps that extend across the whole EOG area. This pottery dump was one thick layer, approximately 70 cm thick within the limits of the EOG-D trench. In addition, we wanted to ascertain the stratigraphic relationship between this pottery deposit and the bakery construction itself: which is earlier and which is later? Was this concentration of pottery waste from the baking process? Or had it been used as a leveling and foundation material under the walls of the bakery?

Limit of Excavation and Sampling Procedure

AERA's methods of excavation and post-excavation procedures have been presented elsewhere (see preface, this volume). During excavation we took bulk environmental samples for flotation, generally 15–20 liters. We dry-sieved deposits that contained significant amounts of cultural material (handpicking, sorting, and bagging the cultural material) and sent the residue to be wet-sieved. Once wet-sieved, any remaining material was hand-picked by team members, then sorted and bagged for analysis.

Prior to the 2006 season AERA teams had removed the overburden from Area EOG and planned the uppermost, visible archaeological features. It was clear at this time that the external walls of EOG-D were constructed of roughly-hewn limestone blocks and that the building's footprint consisted of two north-south orientated rooms with different dimensions, but a total size of 12 m long by 2.70 m wide (fig. 1.8). Within this, Room 1 measures approximately 2.72 m wide east-west by more than 7 m long north-south, while Room 2 measures approximately 2.81 m

east-west by 1.90 m north-south. However, the 2006 season team excavated only the western half of the bakery creating a north-south orientated transect measuring approximately 1.35 m east-west and 11.50 m north-south. This was done so that we could provide a cross-section through the bakery. The elevation of the top of the bakery walls averaged 17.15 m above sea level (asl). We excavated to and stopped at the uppermost floors within the building, 16.71 m asl in Room 2 and 16.70 m asl in Room 1.

Description of the EOG-D Bakery

The excavation in this transect showed that the EOG-D Bakery had been remodeled at least once by the residents. The first picture of the bakery is one that consists of only one rectangular room measuring about 2.75 m wide and approximately 4.10 m long north-south (fig. 1.29). After a period of time and for unknown reasons (possibly to increase the production of bread for the workers), the authorities decided to extend the bakery and restructure the EOG-D building to consist of two rooms (figs. 1.30, 1.31). The longer, northern room (Room 1) appears to have been where the baking was done, while the dough was prepared in the southern room (Room 2). We based this interpretation on the types of features that we discovered in each room.

In Room 2 the team exposed the remains of two marl brick, bin-type installations and an *in situ* ceramic vat (fig. 1.32). Based on the stratigraphy we dated the two bins to two different occupation phases during the use of the bakery itself. The second (latest) bin is located in the southwest corner of the room. It is square, bounded by marl brick, and encloses a space approximately 90 cm east-west by 80 cm north-south. The bin survives to a height of 11 cm. The latest bin was filled with a concentration of broken bread mold pottery sherds, a deposit that leads us to hypothesize that the bin was used for collecting waste and broken pots during the preparation and baking process. The complete design and real dimensions of the earliest bin is not known because it is not fully exposed and it extends under the unexcavated half of the bakery. The function of Room 2 as a place for preparing and mixing dough is supported by the discovery of the remains of a complete *in situ* ceramic vessel that is classified by the project ceramicists as a CD25 vat—a large and deep vat bearing a flat base (Wodzińska 2007b: 303)—in what appears to be a cut. The cut is 36 cm deep and has an approximate diameter of 40 cm. We believe the

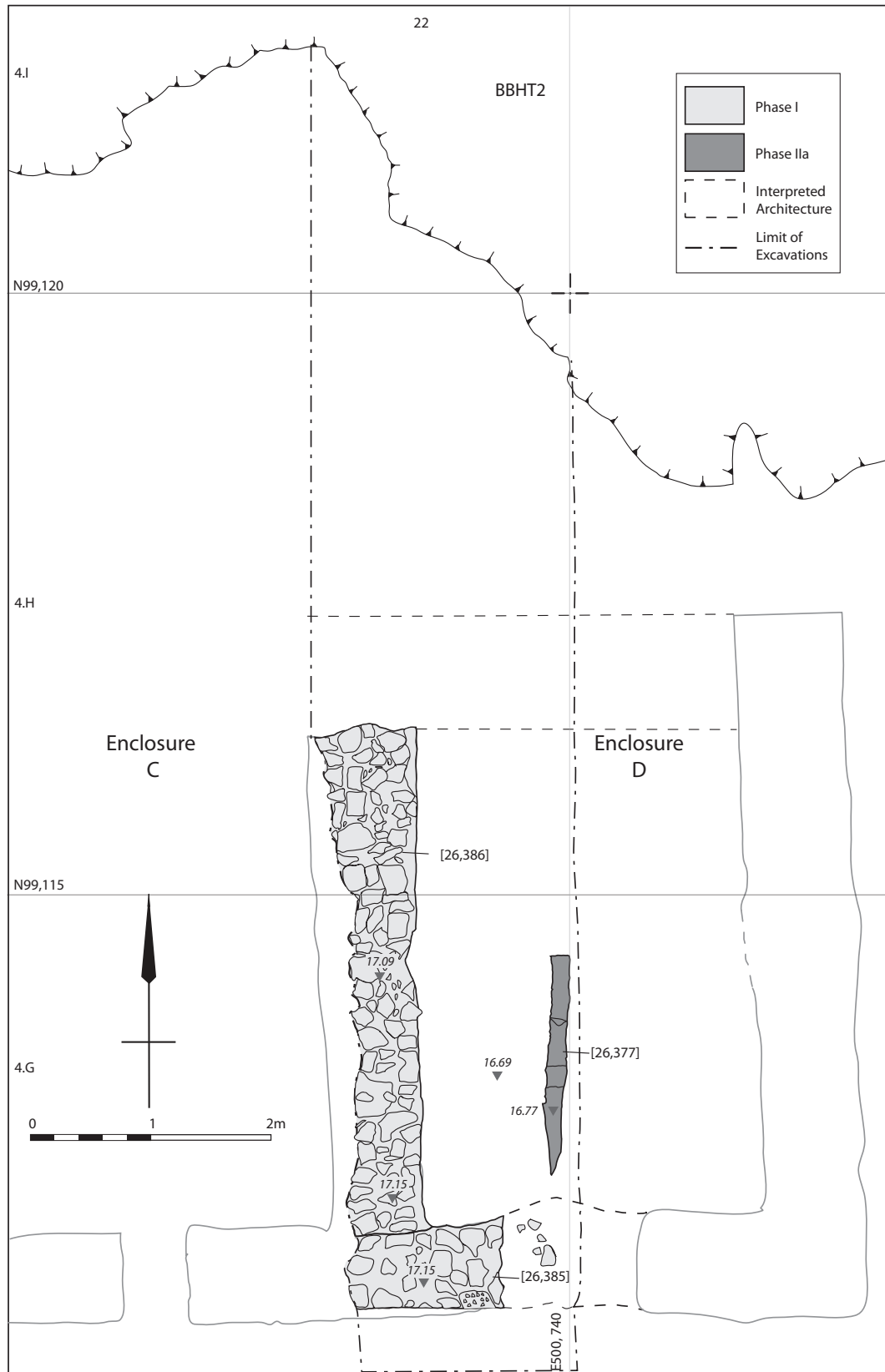


Figure 1.29. Plan showing the EOG-D limit of excavation, Phases I and II. Plan by Rebekah Miracle, AERA GIS, and Hassan Ramadan.

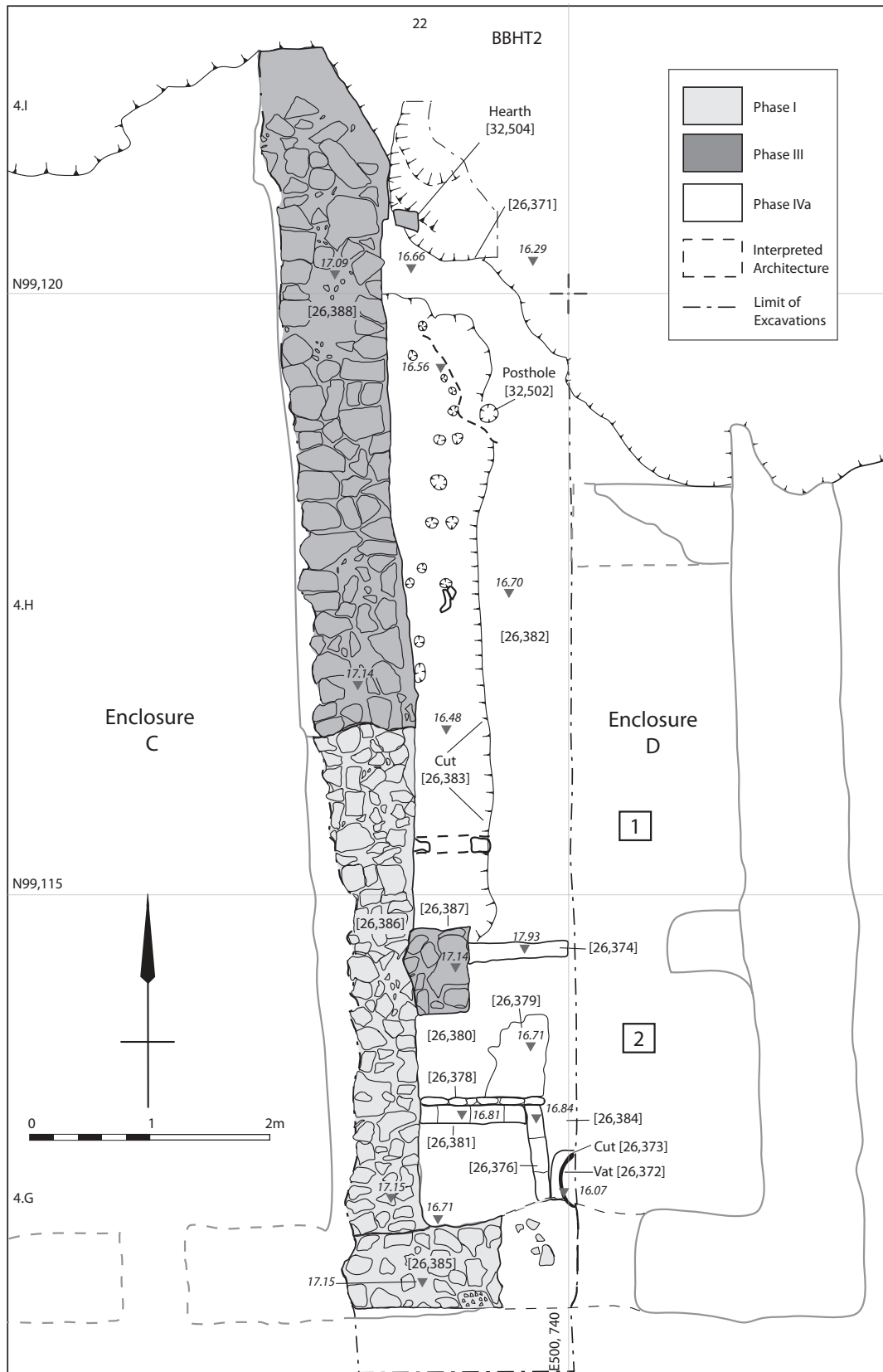


Figure 1.30. Plan showing Phases I, III and IVa. Plan by Rebekah Miracle, AERA GIS, and Hassan Ramadan.



Figure 1.31. Post-excavation photograph of the EOG-D Bakery, facing north. Photo by Rabee Eissa.

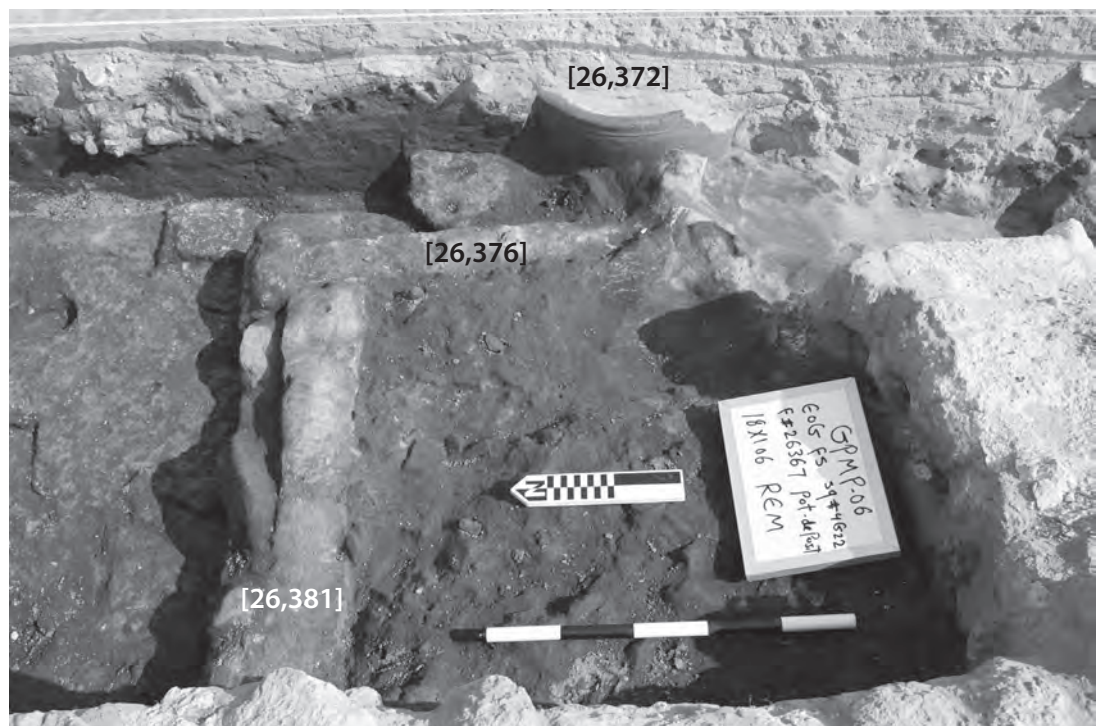


Figure 1.32. Marl brick bin (walls [26,381] and [26,376]) and ceramic vat [26,372] of Phase IVa, facing east. Photo by Rabee Eissa.

inhabitants used this vat for mixing dough for baking. This suggestion is based on the same assemblage of features that we see elsewhere in bakeries on site, such as the A7d and A7e Bakeries (see Mahmoud and Eissa, introduction to Chapter 1, this volume; fig. 1.5), in addition to the bread production process portrayed in Old Kingdom tomb scenes, which show the mixing of dough in this kind of vat prior to baking (fig. 1.1).

The function of Room 1 as a baking area is supported by the presence of three archaeological features that are typical of other HeG bakeries: a trough with small circular depressions at the base, a hearth or oven, and scorched floors. We exposed in the northern room a shallow rectangular trough or cut, 5.28 m long by 90 cm wide, along the western wall containing fourteen rounded, shallow depressions with diameters ranging between 10–16 cm (fig. 1.33). We hypothesize that the long trough was a baking pit. We interpret the shallow, rounded depressions as emplacements for bread molds which would have been filled with dough (having been prepared in Room 2 in the big ceramic mixing vats). Secondly, we found the remains of a hearth, two reddish burnt limestone blocks—unfortunately truncated by the backhoe that dug trench

BBHT2—in the northwest corner of the room. Thirdly, we found scorching on the floor of Room 1. Based on Old Kingdom tomb scenes at Saqqara (for example, fig. 1.1) and Giza, we can say that the baking process included pouring the dough in hot bread molds set in sockets in shallow troughs in the floors of the baking room. These were then surrounded by hot embers (Faltings 1998: 92), possibly taken from hearths constructed in the corners of the baking rooms.

The access connecting the two rooms of the EOG-D Bakery contains an east-west marl brick wall that consists of only one row of bricks, surviving approximately 30 cm high. Its function appears to be preventing the ash—accumulated from the baking process in Room 1—from seeping into Room 2.

Temporal Development of EOG-D Bakery

The excavations and the sections in the BHT trenches (fig. 1.8) allowed us to trace some aspects of the temporal development of the area: from the pre-bakery construction, perhaps relating to a period when the area was used for the production of faience, through the construction of the bakery, its first use, an extension of the bakery's ground plan, the bakery's continued



Figure 1.33. Post-excavation photograph of the EOG-D Bakery, facing south. Photo by Rabee Eissa.

Table 1.3. EOG-D Bakery Phasing.

Phase Number	Description	Remains
Phase I	Earliest bakery construction	External limestone walls
Phase IIa	Earliest use of the bakery (earlier installation)	Marl brick wall
Phase IIb	Earliest use of the bakery (occupational deposit)	Ash deposit
Phase III	Re-planning of the bakery and construction of bakery extension	Two limestone walls
Phase IVa	Second use of the bakery (latest installations)	Marl brick bin, ceramic vat, pot emplacements, posthole, and hearth's remains
Phase IVb	Second use of the bakery (occupational deposits)	Firing remains (ash-rich) and pottery-rich deposits
Phase V	Disuse of the bakery	Pottery-rich deposits
Phase VI	Aeolian sands	Sand and modern pits

use, and finally through to its demolition and/or collapse (table 1.3). The development of the complete area and surrounding areas are described in the excavation preliminary reports of each sub-area within the larger EOG zone (Hounsell 2006; Stevens, House, and Driaux 2007). These reports are known in the project's archive system as Data Structure Reports (DSRs). Table 1.3 lists the EOG-D Bakery phases. This is a simplified version of the phase structure outlined in the EOG-D Bakery DSR (Eissa and el-Laithy 2006: 1–15).

Construction of the Bakery (Phase I)

This phase represents the earliest EOG-D Bakery construction, before the later extension and remodeling. Within the limits of our excavation, the phase is characterized by two roughly hewn fieldstone walls (fig. 1.29). The eastern wall of the bakery probably also belongs to this phase but since it lies outside of our excavation area we were unable to tie it into our stratigraphic sequence. The east–west wall [26,385] forms the southern boundary of the bakery. This wall measures approximately 70 cm wide by 65 cm high at 17.15 m asl, and runs only 1.40 m to the eastern end of the transect, where it continues beyond the limit of excavation. The second wall [26,386] abuts the southern one, at its western end, to form the western line of our bakery. It runs, from south to north, about 4.95 m (8.5 cubits) long and about 53 cm wide. About one meter of the northernmost wall [26,386] was bonded to and ran under the limestone wall [26,388] at the meeting point between the two major construction phases of the bakery, Phases I and III (fig. 1.30). It should be noted that the two western walls (of the two phases)

also acted as the eastern boundary of Enclosure c to the west. This possible bakery was excavated by Dan Hounsell in the 2006 season (Hounsell 2006: 34; fig. 1.8 here). The eastern limit of Enclosure d (our EOG-D building) has not been fully exposed yet; however it is visible in plan, and we know the eastern wall is constructed from the same local limestone as the western and southern walls. We hypothesize that the eastern wall was also built in Phase 1.

By the end of the season the team had ascertained that our bakery walls had been constructed on the top of a deposit often described as the “pink stuff” (GOP3: 52). This deposit occupies a wide area in the EOG zone and represents a massive dump of pinkish soft waste from pyrotechnic activity. This deposit had been the subject of considerable debate prior to our EOG-D excavation. After many examinations and analyses the team hypothesizes that this material is waste from faience production workshops (GOP3: 52).

Earliest Use of the Bakery (Phases IIa and IIb)

These two phases represent the first occupational remains of the bakery, before the re-planning and extension of Phase IV (table 1.3). They include only two features, each one in a separate phase, which are discussed below.

The Earliest Installation of the Bakery (Phase IIa)

This phase represents the construction of a thin, one-row marl brick wall [26,377] at the southern end of the bakery, which we exposed by the end of the season (fig. 1.29). The wall runs from south to north and is

approximately 1.84 m long. It survived to a height of 9 cm at the eastern end of the trench. Its real dimensions are not known because it is still not fully exposed. We think that wall [26,377] is the oldest structure exposed within the bakery, because its southwestern half underlies the later marl brick bin and is also truncated by a later pottery emplacement [26,373] that dates to the second use of the bakery (Phase Iva). The location, building materials, and the dimensions—especially the width of wall [26,377]—suggest that it is the remains of an earlier bin, related to an earlier occupation phase within the bakery.

The team did not find any deposits separating the two marl brick bins, and the later bin of Phase Iva was constructed directly on the top of the southern end of wall [26,377]. This could mean that the people cleaned the room before the construction of the new bin of Phase Iva on the compact ground. There seems to have been no abandonment period between earlier use of the bakery and the remodeling.

The Earliest Use of the Bakery, Occupation Deposit (Phase IIb)

This phase is characterized by one dense, pure ash deposit, [26,368]. This ashy layer had been exposed under the Phase III extension, fieldstone wall [26,388], and was 11 cm thick. The ash deposit was contaminated with the concentration of another ash deposit [26,364] that filled Room 1 and stuck to the eastern face of wall [26,388] in the second occupation phase of the bakery. We believe that ash [26,368] dates to an occupation phase before the bakery had been remodeled in Phase III. We think that the ash had been removed from inside the old bakery and was then used as a foundation layer under the limestone wall [26,388]. In general, the idea of using the debris, especially material extracted from occupation and/or demolition deposits as foundations for new walls or as makeup layers for new floors was very common in ancient Egyptian construction (Soukiassian, Wuttman, and Pantalacci 2002: 281–283, Dreyer et al. 2002). The method of letting occupation deposits accumulate and then using them as foundation material was used in both the A7e and A7d Bakeries, where the bakers left the ash to accumulate through the bakery over time and then used it as make-up for a sequence of floors (Stevens, House, and Driaux 2007: 29–37).

The Bakery Extension (Phase III)

The remodeling of the bakery's plan is the main event of this phase, shown through the construction of the latest two roughly-hewn fieldstone walls (fig. 1.30). The first wall, [26,388], is orientated north-south, measures about 4.85 m long, survived to about 30 cm high, and is approximately 90 cm wide. This wall is 16 cm wider than the underlying wall and had been constructed directly upon the ash of Phase IIb, while its southern end seemed to have been founded directly over the northern end of wall [23,686]. The northern end of the wall had been truncated by backhoe cut BBHT2 and therefore we do not know the length of the original extension. The interface between walls [26,388] and [26,386] is unclear. Either wall [23,686] had been torn down to foundation level (the same level as the ash in Phase IIb) so that the bakery could be extended, or there was a period of abandonment wherein the walls of the bakery had been demolished or fallen down, prior to the extension of the bakery.

After comparing all the bakeries exposed and excavated at the HeG site, we ascertained that the EOG-D extension made it the longest bakery known from the site. Also, it is the only bakery that we know was extended over time. We noticed an interesting point that relates to the possible real length of the EOG-D Bakery before the extension. This is the visible length of wall [26,386], which represents the oldest construction of the bakery in Phase I. It ran until its meeting point with wall [26,388], about 4.50 m. This means that the original length of the bakery was approximately 5 m, making it the same size as the A7e and A7d Bakeries before the extension (see Mahmoud and Eissa, introduction to Chapter 1, this volume).

We have no archaeological evidence to explain the reasons for the extension. We believe that the EOG bakeries produced provisions for the occupants of the galleries, and that the bakery extension may have been done to increase bread production for provisioning the increasing population of people living or working here.

The second limestone wall [26,387] projects from the oldest western boundary [26,386], approximately 1.80 m to the north of the southern limit of the bakery. It runs east-west for a length of about 54 cm and is 70 cm wide, forming what appears to be a doorjamb. This doorjamb divides the bakery into two rooms (Room 1 and Room 2), creating a doorway between the two.

Based on the footprint of Enclosures A, B, and C (Hounsell 2006: 21), which lie to the west of EOG-D Bakery and have a similar layout (figs. 1.8, 1.9), we expect the entrance to be positioned at the northern end of the building (fig. 1.8). This would explain why we found no access into the EOG-D Bakery, because the northern end of the building had been removed by backhoe cut BBHT2.

The Bakery's Second Use (Phases IVa and IVb)

A sequence of occupation features filled the two rooms of our bakery. Room 2 has a squared marl brick bin and one ceramic vat, while Room 1 contains a sequence of pot emplacements. In addition, all of these installations were sealed by a thick layer of very dark, soft ash in each room. We divided this phase into two sub-phases, which are discussed below.

Latest Installations (Phase IVa)

In the southwestern corner of Room 2 we discovered a small squared bin that measures 90 cm east-west by 80 cm north-south on the inside, and 1.05 m at the outside face of the bricks. This bin is enclosed by two thin marl brick walls, [26,375] and [26,376], which survive to 10–11 cm high (fig. 1.30).

The floor of this bin and the whole of the southern room had been coated by buff-colored desert marl clay [26,381], [26,379], and [26,380]. We exposed a concentration of bread mold pottery sherds filling the bin. This fill led us to consider two possible functions of the bin. Firstly, we suggest that it may have been a rubbish bin for collecting waste and broken pots during the preparation and baking process. Secondly, it may have been for the storage of flour and grain, or for the storage of small pots filled with sourdough and salts. These pottery sherds could represent a demolition event. We support the first interpretation because the pottery remains were broken into small sherds. Approximately 10 cm to the east of our bin we exposed a ceramic vat [26,372], set in a cut in the ground, surviving 36 cm high, with an approximate diameter of 40 cm. This vessel is classified as a CD25 bowl in Wodzińska's HeG ceramic typology (Wodzińska 2007b: 303). According to Wodzińska these vessels were handmade from Nile clay and covered with red slip. This vat type is well known from Old Kingdom tomb reliefs at Saqqara and Giza depicting bread production (Faltings 1998: 92–96). These tomb reliefs suggest that the inhabitants used these vats for mixing

dough for baking, perhaps the key to explaining the function of Room 2. The cut for the vat truncated north-south marl brick wall [26,377]. The vat is still *in situ*, visible in the eastern section (fig. 1.34).

A marl brick wall, [26,374], was built against the limestone doorjamb mentioned above. This marl brick wall consisted of only one row of bricks, 14 cm wide and survived to a height of approximately 30 cm. We exposed only about 84 cm of its length and the rest of it continues under the unexcavated half of the bakery. The real function of this thin wall may have been to prevent the ash—which accumulated from the baking process in the northern room—from going into Room 2.

Along the western side of Room 1, there is a shallow, rectangular channel or cut, [26,383], measuring 5.28 m long by 90 cm wide. The base of this cut contained fourteen circular, shallow depressions that may have been emplacements for ceramic vessels (fig. 1.35) and these are a signature feature of bakeries elsewhere on site. These depressions are 10–16 cm in diameter, meaning they are smaller than the depressions discovered in the A7d and A8 Bakeries (figs. 1.4, 1.6). There the depressions had a diameter of between 30–40 cm (figs. 1.4, 1.5) and were therefore more suitable to house bread molds than the EOG-D Bakery depressions. Also the EOG Bakery depressions are not aligned in straight lines as they were with the A7e, A7d, and A8 Bakeries' bread mold troughs (see Mahmoud and Eissa, introduction to Chapter 1, this volume). It is difficult to ascertain the real function of our bakery's depressions, but the differences in the dimensions and design of the EOG bakery have led us to consider different hypotheses.

The first one is the least likely to be true, that they could have been used for grinding emmer wheat to make flour. In particular, in some ancient milling places excavators have found small rounded depressions filled with stone fragments, covered with a layer of clay, such as what was discovered in the Predynastic site of Merimde Beni Salama (el-Mahdy 2009: 166). Our depressions are not big enough for this kind of use, but these troughs may have been eroded or modified over time. Further grinding querns in the Old Kingdom seem to have been placed in rows directly on the floor such as those found at 'Ayn Asil (Soukiasian, Wuttman, and Pantalacci 2002). Another hypothesis is that these depressions accommodated F2B bread molds, the medium-sized bread mold that is common

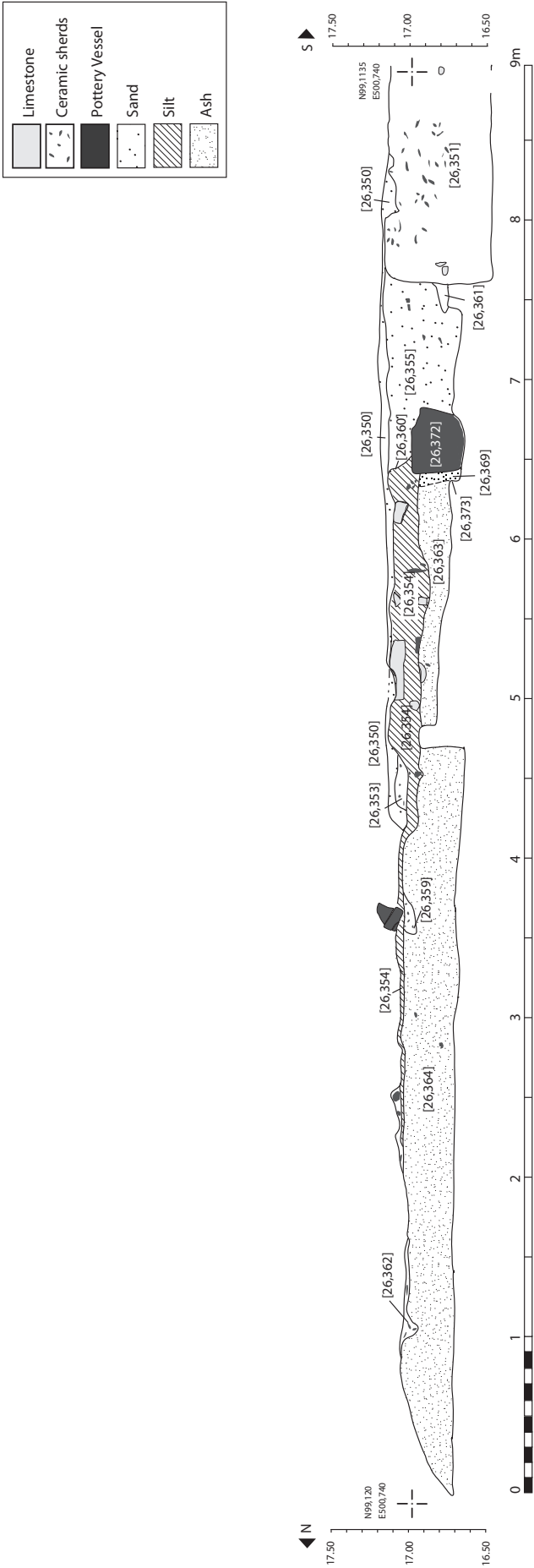


Figure 1.34. West-facing section of EOG Bakery D. Section drawing by Hassan Ramadan, based on field drawing by Rabee Eissa.

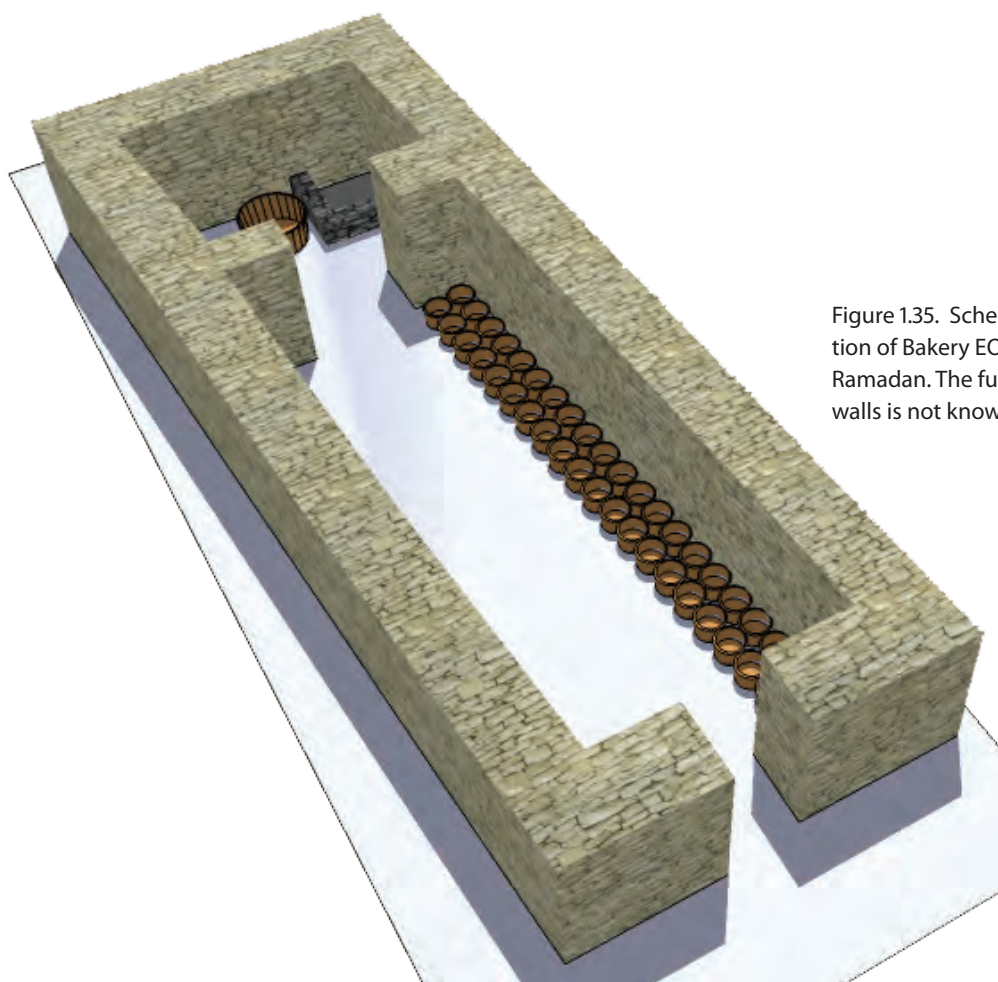


Figure 1.35. Schematic reconstruction of Bakery EOG-D by Hassan Ramadan. The full height of the walls is not known.

to the HeG site. The rim diameter of this vessel is between 18–20 cm. Its height is 18–19 cm, and its weight around 3 to 3.5 kg (Wodzińska 2007b: 306), meaning the depressions are the right size to hold $\mathbb{F}2\mathbb{B}$ bread molds. By the end of the season we discovered the remains of a damaged depression ([26,371]) for a vat emplacement. This depression occupied the northwest corner of the northern room; its northern extent had been truncated by the backhoe trench.

We exposed two reddish burnt limestone blocks in the northern room, measuring about 42 cm by 44 cm. These two blocks may be the remains of a hearth, [32,504] (fig. 1.30). The same was found in the A7d and A7e Bakeries, however, there they were complete hearths in the southeast corner of each bakery. The remains of this partially missing hearth supports our hypothesis that the real location of the bakery entrance was in the northeastern corner of the northern room, which would mean that it was in the opposite corner

from the northwest hearth and far away from the firing and baking, which would have been focused around and within the rectangular cut ([26,383]) along the western half of the room. All of the installations mentioned above, the big ceramic vats and the long rectangular cut with its circular depressions, indicate that the baking process in this bakery was the same for all the EOG bakeries (A7d and A7e) because they shared the same design and had the same kinds of installations.

About 1.50 m to the south of hearth [32,504] mentioned above, we discovered a rounded posthole, [32,502], approximately 16 cm in diameter (fig. 1.30). This posthole may have supported an awning that provided the bakers with some shade from the sun during their work. In particular, the hearth and heating process likely needed to be in an open area, a room without a roof.

Occupation Deposits Within the Bakery (Phase IVb)

This phase is characterized by two thick layers of very black soft ash, [26,363] and [26,364], and a very thick layer of pottery sherds, [26,351] (fig. 1.34). The ash deposits filled the two bakery rooms with a combined thickness of about 35 cm. After analyzing samples of this ash, Dr. Mary Anne Murray discovered that there are no plant remains present (M. Murray, personal communication 2010). The only items are small white balls, probably made of silica, likely from straw burnt as fuel. These balls may be the result of a very hot fire. We found two bivalve half-shells [26,386], each 8 cm wide and 13 cm long, on the surface of this dense, ashy deposit against the west wall in the southwest corner of the southern room (fig. 1.36). These shells are most probably of the freshwater bivalve *Aspatharia*, which was very common in Egypt since the prehistoric period as an exotic food (<http://www.collectorshells.com/land-freshwater-shells.php>). The shell was sometimes used as scoops or containers (Reese, Mienis, and Woodward 1986: 79–84) and may have been used in the baking process.

There was a pottery-rich deposit concentrated outside the bakery, directly against the southern face of the south wall of the building. Bread molds made up most of this deposit (about 70%). We removed approximately 800 kg of different sized bread mold sherds from an area that measured 1.50 m × 1.80 m × 50 cm deep or 1.35 m³. The deposit's location suggests that the bakery workers collected the broken bread molds inside the bakery and threw them out toward the back of the bakery area, away from the entrance of the bakery and the working zones.

Abandonment of the Bakery (Phase V)

This phase is characterized by a sequence of pottery sherd deposits, spread throughout the bakery. Most of these sherds were bread molds that sealed the thick Phase IVb ash layer. This suggests that although the EOG-D Bakery had gone out of use, other bakeries in the EOG area were still operational and were dumping their baking waste into EOG-D. We recorded no structural collapse/demolition deposits on the top of these deposits.



Figure 1.36. Two bivalve shells beside the limestone wall [26,386]. Photo by Rabee Eissa.

Aeolian Sand (Phase VI)

The area was covered by a series of sand-rich deposits that appeared to be windblown sand. These deposits spread across the whole trench with a combined thickness of 11 cm.

Discussion of the EOG-D Bakery

The location, design, and building material of the EOG-D Bakery has led us to classify it as a governmental-type bakery. The governmental type of bakeries—Bakeries A7d, A7e, A8, and EOG-D (see Mahmoud and Eissa, introduction to Chapter 1, this volume; fig. 1.3)—at the HeG site are located adjacent to and within the galleries, suggesting that the two are connected. Because of this connection we hypothesize that the bakeries provisioned the occupants living there. According to Lehner, it is possible that the galleries were barracks that housed laborers who rotated in and out of large-scale governmental projects, such as the building of the pyramids. This idea is supported by ancient Egyptian texts mentioning the rotation of unskilled groups of workmen serving royal projects (Lehner 2002a: 70). We hypothesize that the site officials built these large bakeries to produce large amounts of bread to feed the workers living in the galleries. Some of these bakeries were constructed beside each other in one group, almost like a factory compound, such as the set that contains the A7e and A7d Bakeries and the set that contains EOG Enclosures A–D (fig. 1.8). The area to the west of the A8 Bakery has not yet been excavated, so we are unsure whether this bakery was also part of a set or stood alone. The governmental bakeries appear to share a similar design, size, orientation, and building material. They are rectangular in plan, consist of one or two rooms, are oriented north to south, have external walls constructed from limestone blocks, and internal installations constructed using small marl clay bricks.

A8 Bakery

It is noteworthy that the EOG-D Bakery was very similar to the A8 Bakery in the Eastern Compound (fig. 1.6). Both the A8 and EOG Enclosures A–D comprised two rooms with different functions. The long room in each bakery was the northern one. It occupied two thirds of the bakery and featured rows of circular depressions that may have once held bread molds (see Mahmoud and Eissa, introduction to Chapter 1, this volume). The southern room was the short room

and appeared to be an area dedicated to the mixing of dough and preparing it for the baking process. The main difference between the A8 Bakery and the EOG-D Bakery is that the A8 Bakery is about 7.40 m long and 2.40 m wide, making it shorter by about 3 m than the EOG-D bakery.

A7d and A7e Bakeries

There are both similarities and differences between these two bakeries and the bakery of EOG-D. Both are constructed out of limestone and are rectangular in plan (fig. 1.4). The main difference between the two is that the A7d and A7e Bakeries have no internal divisions, each of them consisting of only one rectangular room measuring about 5.03 m long by 2.60 m wide (see Mahmoud and Eissa, introduction to Chapter 1, this volume). That being said, prior to the remodeling in Phase III, Bakery EOG-D also comprised only one room. In Bakeries A7e and A7d that one room contained all our typical bread production installations: hearths, large ceramic vats, and bread mold depressions. Further, their entrances and hearths were all constructed at the southwest and southeast corners, respectively. In the EOG-D Bakery these were at the northern end. One of the main features we noted in all of the A7e, A7d, and A8 Bakeries are two troughs of bread mold depressions in each bakery. The first trough in each bakery, located directly beside the inner face of the bakery's eastern boundary, contained two north-south rows of bread mold depressions, while the second trough, located directly beside the inner face of the bakery's western boundary also contained two north-south rows of bread mold depressions. These two troughs indicate that there might be another north-south trough with bread mold depressions in the unexcavated half of the EOG-D Bakery.

EOG Enclosures A, B, and C

As already discussed, we believe that we have strong evidence to suggest that EOG-D is a bakery. The evidence that Enclosures A and B are bakeries is not so convincing (see Mahmoud and Eissa, introduction to Chapter 1, this volume).

Although there are similarities between all enclosures, there are differences with the internal divisions of the four Enclosures A, B, C, and D. We noted that the southern room was the shorter one and the longer room was constructed in the northern part of Enclosures C and D (figs. 1.8, 1.9). This contrasts with

the layout of Enclosures A and B. Enclosures C and D may have been constructed at a later time, or, the difference in layout may have been because the two western buildings served a different function than just baking bread. According to the chronology and the stratigraphic relationships between the walls in Enclosures A and B, the longer rooms located at the southern end of the enclosures formed the original footprint, and then the northern rooms were added later (Hounsell 2006: 18–21, 41). The oldest rooms in each enclosure—the southern rooms—were 5.85 m long by 2 m wide, close to the lengths of most of the EOG Bakeries, A7d, A7e, and the EOG-D Bakery before any extensions.

Intersite Comparisons

The ancient Egyptians had different types of bread production facilities. These could be found in their private houses, the workers' dwelling areas within governmental projects' zones, and inside temples. All were constructed at different scales.

We noted that most of the hearths inside these facilities—whether they were inside big bakeries or were small baking rooms within houses in Giza, in the el-Dakhla Oasis (Soukiassian 1997: 16–17), Amarna (Kemp 1995: 13–21), or Deir el-Medina (Meskell 2002: 123)—were constructed in the corners of special rooms. We suppose that this is firstly so that the corner walls protect the hearth, and secondly, so that the air coming through the doorways helps ignite the fuel during the heating process.

Hearths and baking areas were also found in open courts (Kemp 1987: 73–76). Sometimes a sunshade was constructed in the baking zone to protect the bakers from the heat of the sun. Thus, the post-hole at the middle of the northern room at our bakery suggests that a shade was constructed here, if the bakery was unroofed. A similar feature was found in the Old Kingdom bakery in al-Sheikh Saied (Willems et al. 2009: 15). In contrast, the bakery at Elephantine had columns to support the roof (Raue et al. 2004: 5–6), and the bakeries at Ayn 'Asil were also roofed (Marchand and Soukiassian 2010).

Conclusion

The majority of the excavated bakeries at the HeG site

can be divided into two main types: governmental and domestic (see Mahmoud and Eissa, introduction to Chapter 1, this volume). We classify the EOG-D Bakery as a governmental bakery. This type of bakery appears to have served a royal project, provisioning bread to a large number of workers. The EOG-D Bakery had a very similar design to the A7d, A7e, and A8 Bakeries. All of these bakeries are rectangular. They consist of one or two rooms. The outer walls are made of roughly hewn blocks. They are all orientated north to south. Lastly, they all contain similar features/installations including ceramic vats for mixing dough, troughs of bread mold emplacements, marl brick bins, and a hearth(s).

The EOG-D Bakery had two different construction phases. The earlier construction phase has the same design as the A7d and A7e Bakeries, meaning that it consisted of only one north-south rectangular room measuring about 4.10 m long by 2.75 m wide. In its second construction phase the bakery was extended more than 7 m to the north and re-planned to include two rooms; each one with its own function. The northern room was the longer one and appeared to be the baking room, while the southern room—the shorter one—was where the dough was prepared. The reason for this extension may have been to increase the bread production of EOG-D. This may have been a response to an increase in workers that needed to be provisioned.

Acknowledgments

Firstly we would like to thank all AERA members for their efforts to establish the Basic, Advanced, and Salvage Field Schools that have created a good generation of Egyptian archaeologists in the MSA. Special thanks to Dr. Mark Lehner, Mohsen Kamel, and Ana Tavares for their encouragement and support. Thanks to Ahmed el-Laithy who shared the excavation of the EOG-D Bakery with me. Many thanks to Mike House, James Taylor, and Ashraf Abd el-Aziz for their help and teaching, and a special thanks to Freya Sadarangani for helping, teaching on site, and for help in writing this article. Finally we would like to thank the illustration team who prepared figures for this article, and Christine Clifton-Thornton for her review of the English of this article in 2010.

2. Prolific Pedestals: A Preliminary Report on Area Main Street East (MSE)

by Ashraf Abd el-Aziz, with Ayman Ashmawy Ali, Mohamed Hatem Ali, and Osama Mostafa Mohamed

Area Main Street East (MSE) is located to the east of the Gallery Complex, four rectangular blocks (Gallery Sets I–IV) containing individual galleries that may have been used as barracks (Lehner 2007b: 190–192) (frontispiece 2). It lies at the eastern end of Main Street, a roadway that runs west–east through two sets of galleries (Gallery Sets II and III) for at least 160 m (Lehner 2007a: 13). Area MSE is also located to the west of the Eastern Town, an area containing houses with small rooms and courtyards, and in the northeastern corner of Area EOG (“East of Galleries”), an industrial and production zone in between the Gallery Complex and the Eastern Town (Lehner 2007a: 14). Unfortunately, Area MSE, in the northeastern part of the Heit el-Ghurab (HeG) site, is badly eroded. This erosion removed the northeastern parts of the Gallery Complex (Gallery Sets II and III) and the northern part of the Eastern Town (frontispiece 2).

In 1998, 1999, 2000, and 2001 AERA teams excavated through Main Street (Abd el-Aziz 2007a). Mark Lehner oversaw the shallow excavation at the far eastern end of Main Street in 2002 in order to define the eastern extension of the street and to expose the 4th Dynasty settlement in that area. In Squares 4.L27–29 he excavated flood layers of laminated alluvial silt and sand, 14–25 cm thick, which covered the northern fieldstone wall bounding Main Street and the mudbrick Eastern Boundary Wall (the wall that separates the Eastern Town from Area EOG; *GOP*3: 35) (frontispiece 2).

Tobias Tonner excavated two probes in Squares 4.L–N31 and 4.N–O31, but he did not identify any traces of the 4th Dynasty settlement, walls, or surfaces. Instead, he identified similar laminated Nile silt and sand flood layers, 25 cm thick, which covered coarse sand features about 1 m thick (Tonner 2002). To the north in Area LNE (“Leap to the Northeast”) AERA teams excavated two squares (4.Z26.5 and 4.Y27.5)

in 1998. Here the team exposed a Nile inundation “flood layer” about 20 cm thick (Lehner 2007c: 37). According to Karl Butzer the northeast corner of the site had been entirely eroded away by floods, rain, and the rising water table (Butzer 2001: 3–5).

In 2006 and 2007 we excavated seven 5 × 5 m squares in Area MSE (four squares in 2006 and three in 2007; fig. 2.1). Abd el-Aziz supervised these MSE excavations. The team consisted of Ahmed Ali Mohammed, Mohammed Fathi Mikawee, Hudi Mohammed Mer’zi, Ramadan Ali Mohammed, Nuha Hassan Bulbul, Nermin Abd el-Momen Mohammed, Marim Taha Zagloul, and Badra el-Dosoki Sholkami, all of whom are from the Giza Inspectorate and work for the Ministry of State for Antiquities. In 2006 Advanced Field School students Essam Mohammed Shihab, Sayed Abd el-Fatah, and Noha Ismael excavated Square 4.H28, also under Abd el-Aziz’s supervision.

Research Questions

Following Lehner’s exposure of the Eastern Boundary Wall across the eastern end of Main Street it was clear that Area MSE represented the intersection of a number of key areas: the Eastern Town, Main Street, Area EOG, and a possible thoroughfare (the Eastern Roadway, east of the wall) connecting the southeast portion of the site to the northeast (fig. 2.1). Our subsequent excavations in Area MSE sought to look at this intersection more closely; how did these separate areas develop and interact with each other? Did the Eastern Boundary Wall extend south toward the large enclosure that housed a courtyard of silos, the Royal Administrative Building (RAB)? If yes, then this would have been an important feature of the overall ground plan. Movement through the HeG settlement may have been as strictly controlled on the east as it was on the west by the limestone Enclosure Wall, the wall that

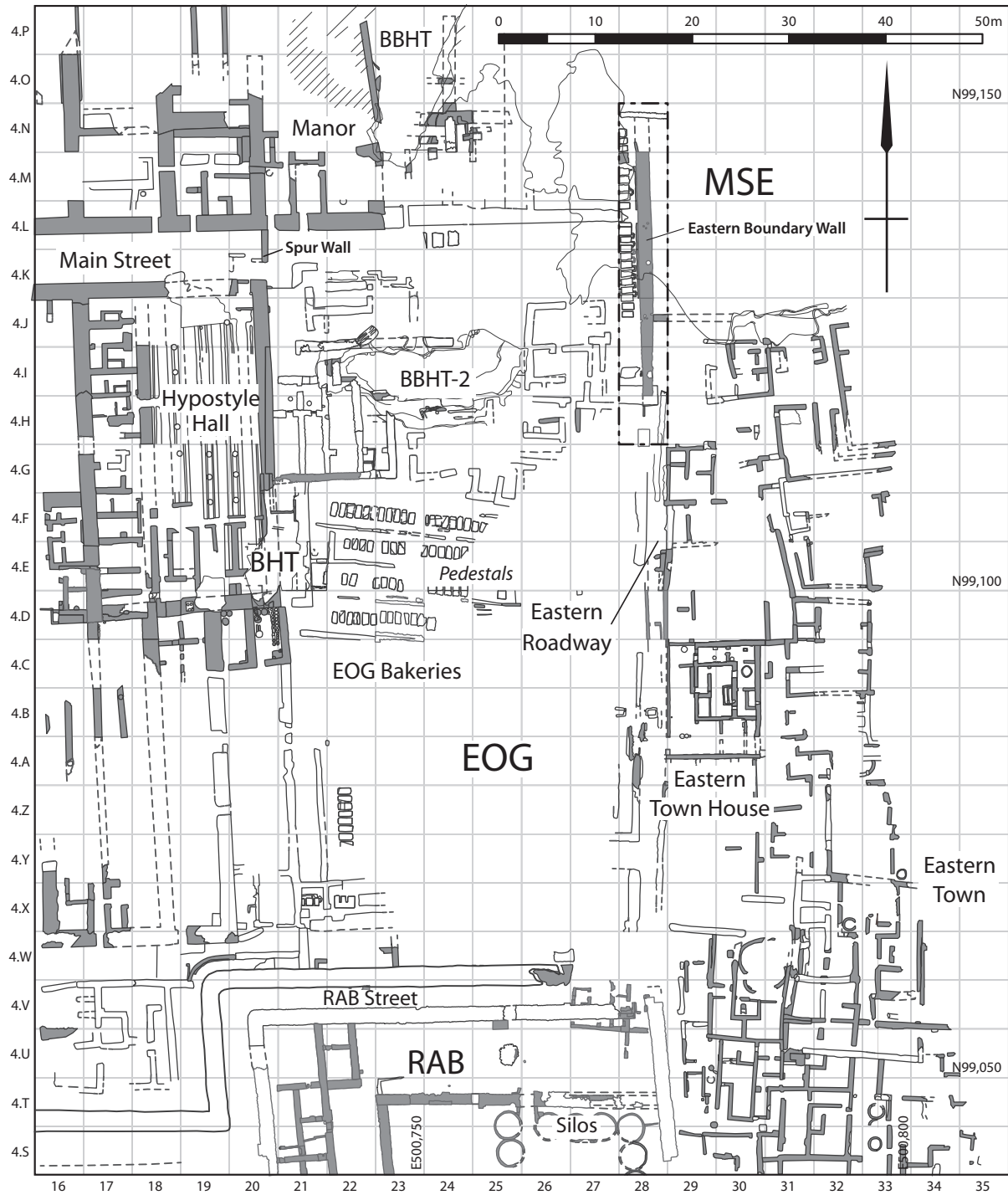


Figure 2.1. Map showing the MSE in context, including EOG, the Eastern Roadway, Eastern Town, Main Street, and RAB Street. Map by Rebekah Miracle, AERA GIS, and Hassan Ramadan.

wraps around the west and south of the galleries (from-tispiece 2). Even if Main Street continued (although there is no southern boundary wall for the street to the east of Square 4.K20), the Eastern Boundary Wall would have been a dead end for it. Based on these

observations and hypotheses, one of our objectives was to expose as much as we could of the Eastern Boundary Wall, [25,945]. We hoped that this would provide us with a better understanding of the access routes in the eastern part of the HeG settlement. How,

for example, would the inhabitants of the Eastern Town have accessed the other areas of the site, such as RAB, EOG, and the Gallery Complex? Elsewhere AERA teams had already exposed and excavated other streets (Main Street, North Street, South Street, Wall Street, RAB Street, and the Chute), so consequently we had a much better idea of how traffic moved through the site in these areas (frontispiece 2) (Abd el-Aziz 2007a: 109–140; Abd el-Aziz 2011: 123–129; *GOP2*: 40–42, 63–68).

Limit of Excavation and Sampling Methods

AERA's methods of excavation and post-excavation procedures have been presented elsewhere (see preface, this volume). The Eastern Boundary Wall, [25,945], divided the MSE transect into two parts (figs. 2.2, 2.3). We excavated the western part deeper, and here the team excavated a sequence of surfaces and their preparation layers to around 16.05 m above sea level (asl). To the east of the wall the team only excavated to one of the latest occupation phases, at 16.45 m asl. Because of the rising of the water table we did not excavate to the underlying natural strata or to the foundation level of the Eastern Boundary Wall, [25,945]. We did not excavate to the foundation level of the so-called “pedestals” (see below, also fig. 2.2) either, except in one area,

Trench A (fig. 2.3). We did not fully expose the western part of some pedestals because they extend beyond our limit of excavation.

We took bulk environmental samples for flotation from most of the features. We dry-sieved 100% of all features on site. We handpicked the material culture from the sieve and then sent the residue to be wet-sieved. Once wet-sieved, the team handpicked and sorted any remaining material culture again. This was because of the rich object and lithic assemblages that this area yielded.

Trench A

We excavated Trench A in Square 4.M28, between the Eastern Boundary Wall, [25,945], and the pedestals (see below), in order to understand the stratigraphic relationship between wall [25,945], bench [29,011], and pedestal [27,093] (see below; fig. 2.3). Trench A measured 50 cm north-south by 73 cm east-west. We could not excavate lower than 15.70 m asl because of the ground water level, which stood at 15.74 m asl on April 7, 2007.

General Description of MSE

Area MSE lies in the northeast part of an industrial

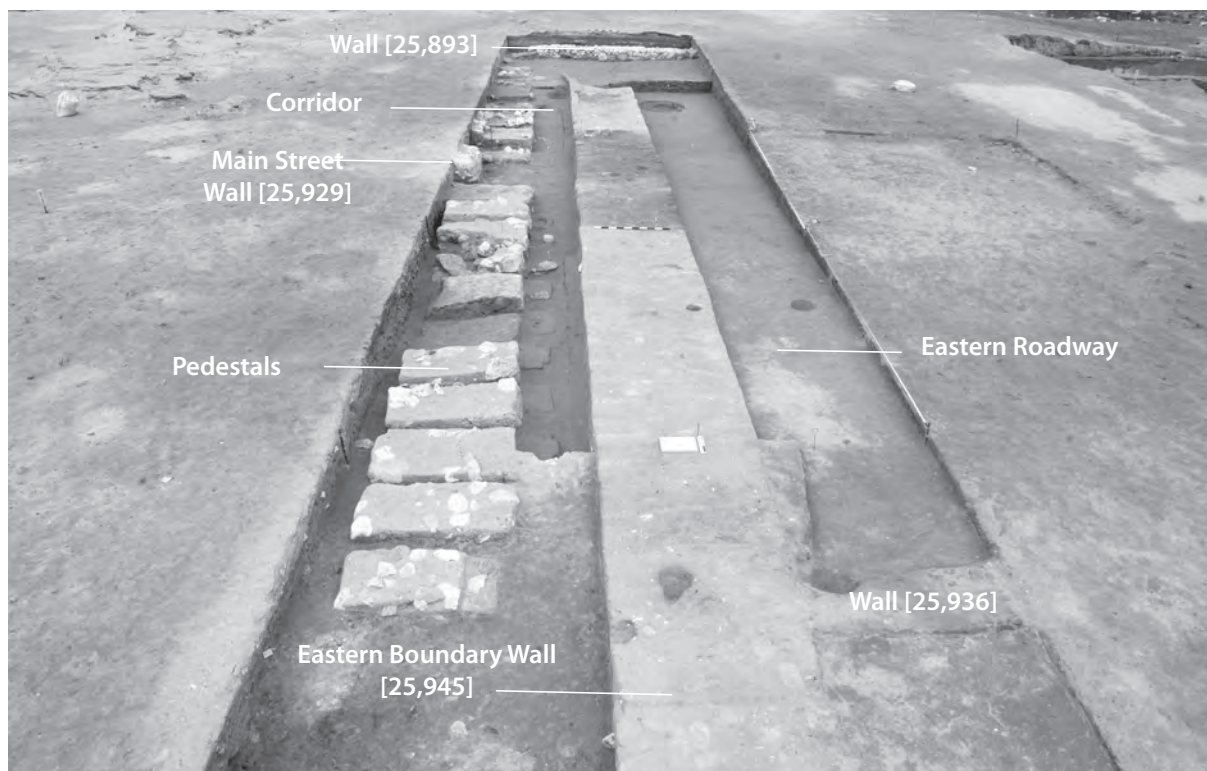


Figure 2.2. The features of MSE, facing north. Photo by Ashraf Abd el-Aziz.

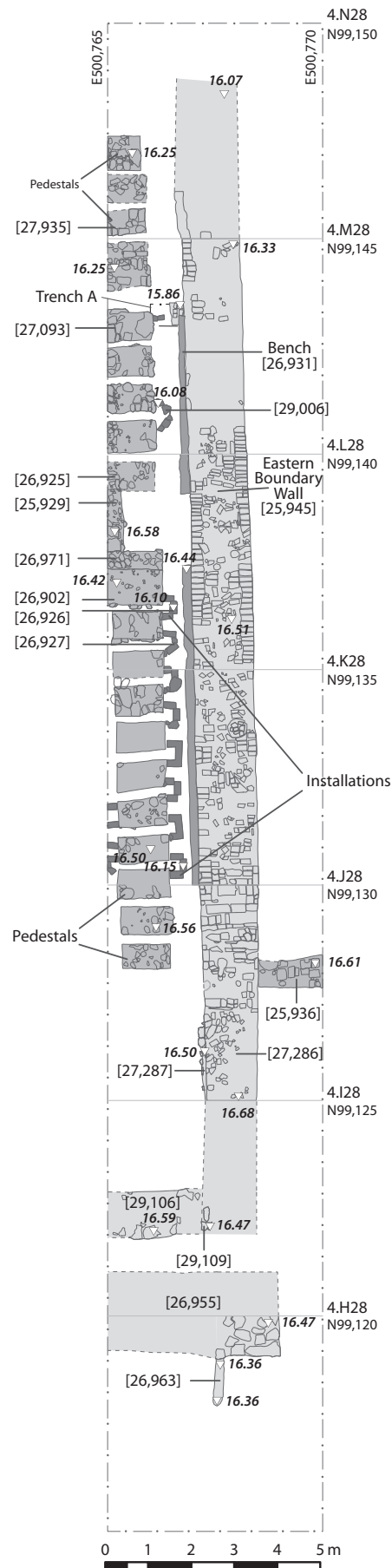


Figure 2.3. Plan of MSE Phases 1a, 1b, 1d, and 2a, showing main features. Elevations above sea level (asl) shown in italics. Plan by Rebekah Miracle, AERA GIS.

and production zone (Area EOG) and is the interface between the Gallery Complex to the west and the Eastern Town to the east (frontispiece 2). EOG measures 75 m north-south by 40–45 m east-west, and includes several bakeries (for more details see the EOG bakery article in this volume). The Eastern Boundary Wall, [25,945], divided MSE into two halves, with Area EOG to the west and the Eastern Town to the east.

In Square 4.L28 we found the remains of an east-west limestone wall, [25,929], which was the extension of the northern Main Street wall, [25,929] (figs. 2.2, 2.3). This wall had originally continued east to abut the western face of the Eastern Boundary Wall, [25,945], forming the original northern limit of the EOG industrial yard. The eastern end, 1.40 m shy of the Eastern Boundary Wall, appears to have been cut away.

We exposed nineteen “pedestals,” enigmatic rectangular structures built of limestone, arrayed in a row, one next to another, along the west side of the Eastern Boundary Wall, [25,945] (and therefore within the Area EOG industrial zone; figs. 2.1, 2.3). These pedestals continue north of the robbed-out Main Street wall, [25,929], suggesting that the series post-date the cut or removal of the east end of this wall. The MSE pedestals are very similar to other pedestals in the HeG settlement in construction material, dimensions and orientation. Elsewhere in Area EOG we find rows of pedestals laid out together, separated by walls and lanes (fig 2.1). The narrow, linear, north-south space between the wall and the pedestals measures 17 m long by 60–75 cm wide. At the bases of eight of the slots between the pedestals, we exposed little sockets, constructed from mudbrick and stone fragments. These sockets may have held jars.

A narrow mudbrick wall, [25,936], constructed perpendicular to the eastern face of the Eastern Boundary Wall, [25,945], may have been the northernmost wall of the Eastern Town (figs. 2.2, 2.3). It forms the southern limit of a corridor or street that may continue along the east side of the Eastern Boundary Wall. This corridor or “Eastern Roadway” may terminate at wall [25,936], which might form a barrier across the street, like the cross walls in Main Street in Squares 4.K13 and 4.K20 (Abd el-Aziz 2007a: 114, 125).

At both the northern and southern ends of MSE, limestone walls were constructed in the latest phases of occupation (see below). By this stage, the pedestals and Eastern Boundary Wall were no longer in use. At the southern end of Area MSE two limestone walls

formed a corridor or street. This corridor may be a later re-installation of the earlier Eastern Roadway.

Temporal Development and Stratigraphic Analysis

We identified fourteen provisional phases in this area (table 2.1).

Construction (Phase 1)

Phase 1 is the earliest constructions in Area MSE. We identify Phase 1a as the construction of the Eastern Boundary Wall, [25,945], and limestone walls in grid square 4.L28, which together may form an east-west corridor (fig. 2.3). Phase 1b represents the construction of the pedestals to the west of the Eastern Boundary Wall and the construction of wall [25,936], built perpendicular to and abutting the east face of the same wall (fig. 2.3). Since we were unable to reach the foundation level of these walls, because of the rising ground water, we are not sure that the walls of Phase 1a were all constructed at the same time. We describe these two subphases together.

The Eastern Boundary Wall is the earliest structure found so far in Area MSE and is one of the main features in the area. With our exposure of this wall we were able to define the limits of the EOG production yard. We could now see that this wall bounded the area to the east; the northern wall of Main Street, [25,929], created the EOG northern limit; the eastern wall of Gallery sets III and IV created the western limit; and the northern limestone wall of RAB Street, its southern limit (fig. 2.1).

Wall [25,945] runs through the middle of the MSE transect. Two rows of headers form the sides of the Eastern Boundary Wall, with irregular brick fragments and silt filling the core. This wall is built of both marl and silt bricks, with bonding material of silt mixed with sand. The bricks measure 28 cm × 14 cm × 8 cm. The wall had been truncated at both the northern and southern ends (fig. 2.3). We have so far exposed this wall for a length of 18 m, a width of 1.41 m, and a height of 46 cm (representing five courses in total). Before it was truncated on the south this wall may have once continued all the way down to join a small surviving patch of silt and marl brick wall [26,963] in grid square 4.H28 (fig. 2.3).

We identified patches of limestone in grid squares 4.L28 and 4.J28 that may represent parts of more than one wall (fig. 2.3). These include two limestone fragments ([29,109]) on the same alignment as the Eastern Boundary Wall, and wall [27,287], which is adjacent

Table 2.1. Area MSE Phasing.

Phase		Description	Summary
1	1a	Earliest construction in the MSE area	Construction of Eastern Boundary Wall [25,945] which divided the MSE transect into two parts
	1b	Construction to the east and west of the Eastern Boundary Wall [25,945]	Construction of wall [25,936] perpendicular to and abutting the east face of the Eastern Boundary Wall [25,945], construction of the pedestals to the west of the same wall, construction of mudbrick benches in the space between the Eastern Boundary Wall [25,945] and the pedestals
2	2a	Earliest use of the MSE area	Construction of the mudbrick and limestone installations at the base of the pedestals
	2b	Base installations went out of use	Fill of the installations at the base of the pedestals
	2c	Surfaces in between the Eastern Boundary Wall and the pedestals	Sequence of surfaces that sealed the installations
	2d	Surfaces	Surfaces laid and used after the pedestals went out of use
3		Collapse of the earliest mudbrick structures in MSE	The earliest disuse of the mudbrick structures and recycling deposits of MSE
4		Series of surfaces	Surfaces to the east of the Eastern Boundary Wall
5		Collapse	Eroded mudbrick collapses in the southern part of MSE in Squares 4.I28 and 4.H28
6		Limestone construction	Construction of one of the later limestone walls ([25,914]) in the southern part of MSE
7		Marl plaster surfaces and mixing pit	Mudbrick collapse deposits were used as preparation layers for marl plaster surfaces and mixing pit for making marl
8		Collapse of the Eastern Boundary Wall	Eroded tumble of the upper part of the Eastern Boundary Wall [25,945], to the south of MSE
9		Remodeling of structures and surfaces	Construction of small mudbrick wall after the pedestals were no longer in use to the west of wall [25,945], a series of surfaces, flint knapping and hammerstone cache
10		Demolition of MSE structures	Period of disuse of MSE
11		Limestone construction	The latest limestone constructions, walls [25,893] and [25,904], to the north and south of MSE
12		Abandonment	Final disuse of structures within Area MSE
13		Flood layers	Sequence of flood deposits
14		Modern activities	Modern pits

to the Eastern Boundary Wall and constructed from limestone fragments. These patches of limestone may be parts of the foundation of the Eastern Boundary Wall. In grid square 4.H28 the team exposed limestone wall [26,955] measuring 1.00 m north-south by 1.21–1.55 m east-west by 5–20 cm high (fig. 2.3). There are some small limestone fragments scattered on lines to the north and west—these may form the rest of the wall, making it 2 m wide in total. To the northwest of this, the team recorded another patch of limestone,

[29,106], which may have formed another wall, 1.40 m long by 1.00 m wide by 10 cm high, oriented east-west. Together, these walls, [26,955] and [29,106], may have formed an east-west corridor (1.10 m wide), which in Phase 1b may have opened into the north-south corridor to the north (see below).

To the north, [25,929], the northern Main Street wall, runs east-west and is 1.40 m wide (north-south) by 57 cm high. This wall would have originally continued east to abut the western face of the Eastern

Boundary Wall (figs. 2.3, 2.4). However, as noted, the eastern end of this wall had been robbed out (fig. 2.5).

At the bottom of Trench A we identified a north-south mudbrick bench, [29,103], 30 cm wide, running alongside the Eastern Boundary Wall at a height of 15.83–15.88 m asl (figs. 2.3, 2.6). We could not excavate lower than 15.70 m asl because of the ground water level.

During Phase 1b mudbrick wall [25,936] was constructed perpendicular to the eastern face of the Eastern Boundary Wall and the north-south linear row of 19 pedestals were built to the west of the same wall (fig. 2.3).

The pedestals are separated from the western face of the Eastern Boundary Wall by a narrow corridor, about 65 to 75 cm wide. Eleven of the pedestals are located to the south of the robbed-out Main Street north wall, [25,929], and eight pedestals are north of this wall. The pedestals are nearly rectangular in shape; however, we did not expose the full limits of the northern pedestals. The pedestals were constructed from uncoursed, roughly-hewn limestone fragments (varying from $57 \times 42 \times 5$ cm to $4 \times 3 \times 3$ cm) with sand mixed with silt as bonding material. Each pedestal is oriented

east–west. The sides are roughly faced. Lengths range between 98 cm and 1.26 m, and excluding those that were disturbed or cut, they range in width from 59 to 84 cm (most average 60 to 65 cm in width). The surviving height of the pedestals range from between 11 to 45 cm, at a maximum elevation of 16.58 m asl. The slots between the pedestals range between 15 cm and 25 cm wide, but most of the intervals or slots are 22 cm wide. We found the remains of marl plaster coating the eastern and western faces of some of the southern pedestals. A mass of limestone, [26,971], fills the space between the north Main Street Wall, [25,929], and the first pedestal to the south, [26,902] (fig. 2.3). The first pedestal to the north, [26,925], abuts the north Main Street Wall.

Perhaps those who built the pedestals meant to split them into two groups: those to the north and those to the south of the northern Main Street Wall, [25,929]. The eastern end of wall [25,929] may have been removed when the pedestals were built so that people could pass along the north-south corridor. All the pedestals could be accessed from the east, along the north-south corridor formed by the pedestals and the Eastern Boundary Wall. The pedestals may also have been accessible from

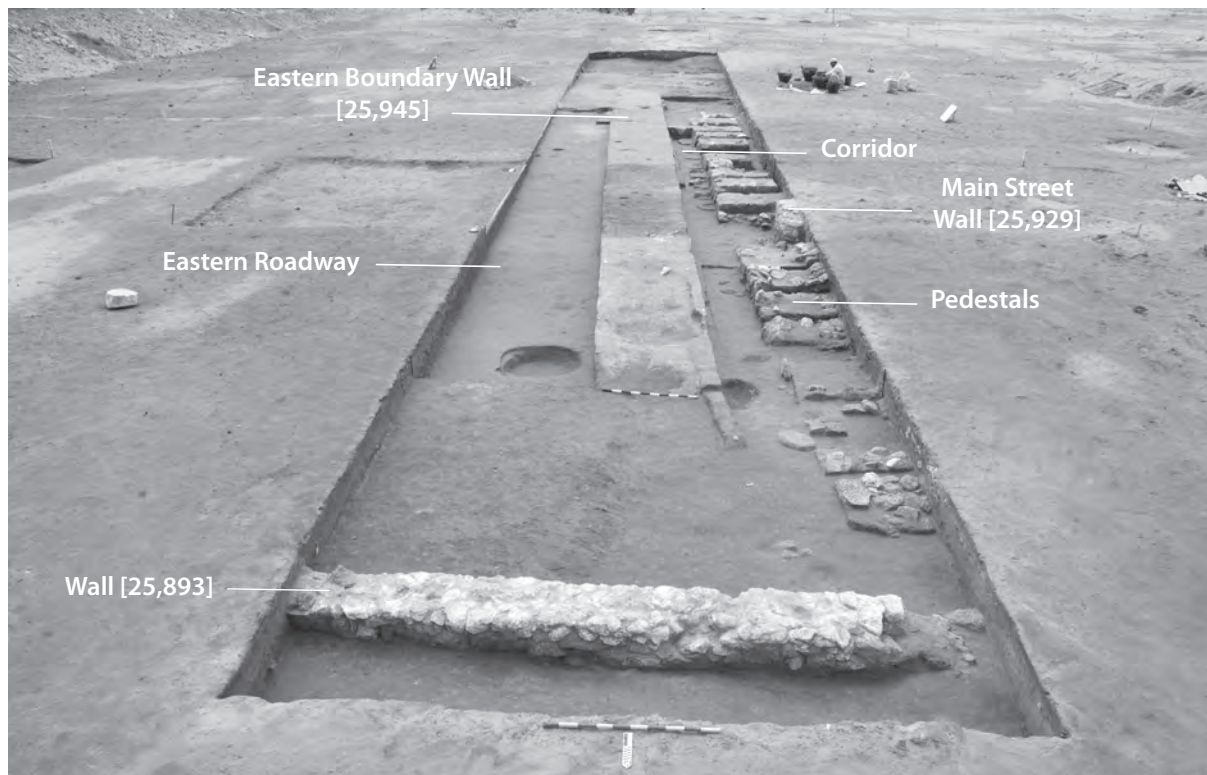


Figure 2.4. The main features in MSE, the Eastern Boundary Wall, the pedestals and the possible Eastern Roadway, facing south. Photo by Ashraf Abd el-Aziz.

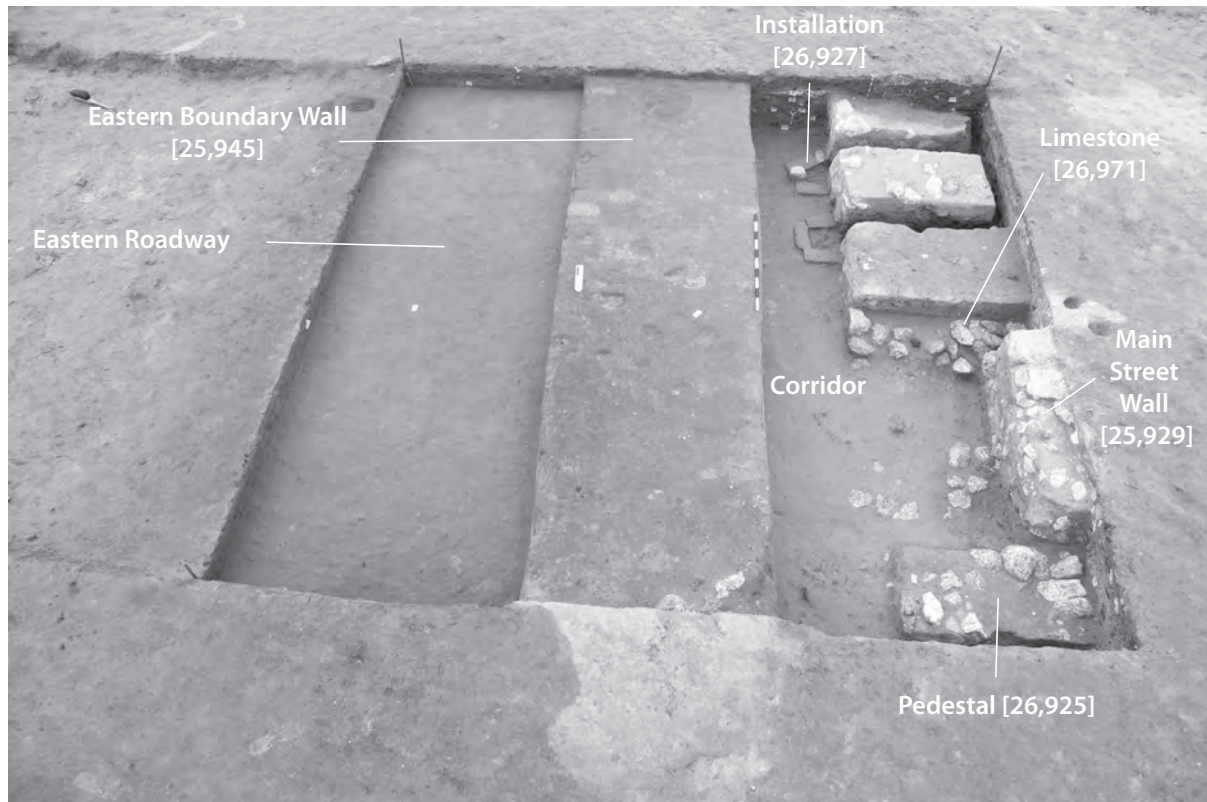


Figure 2.5. The features of Square 4.L28 including the robbed north wall [25,929] of Main Street, facing south. Photo by Ashraf Abd el-Aziz.

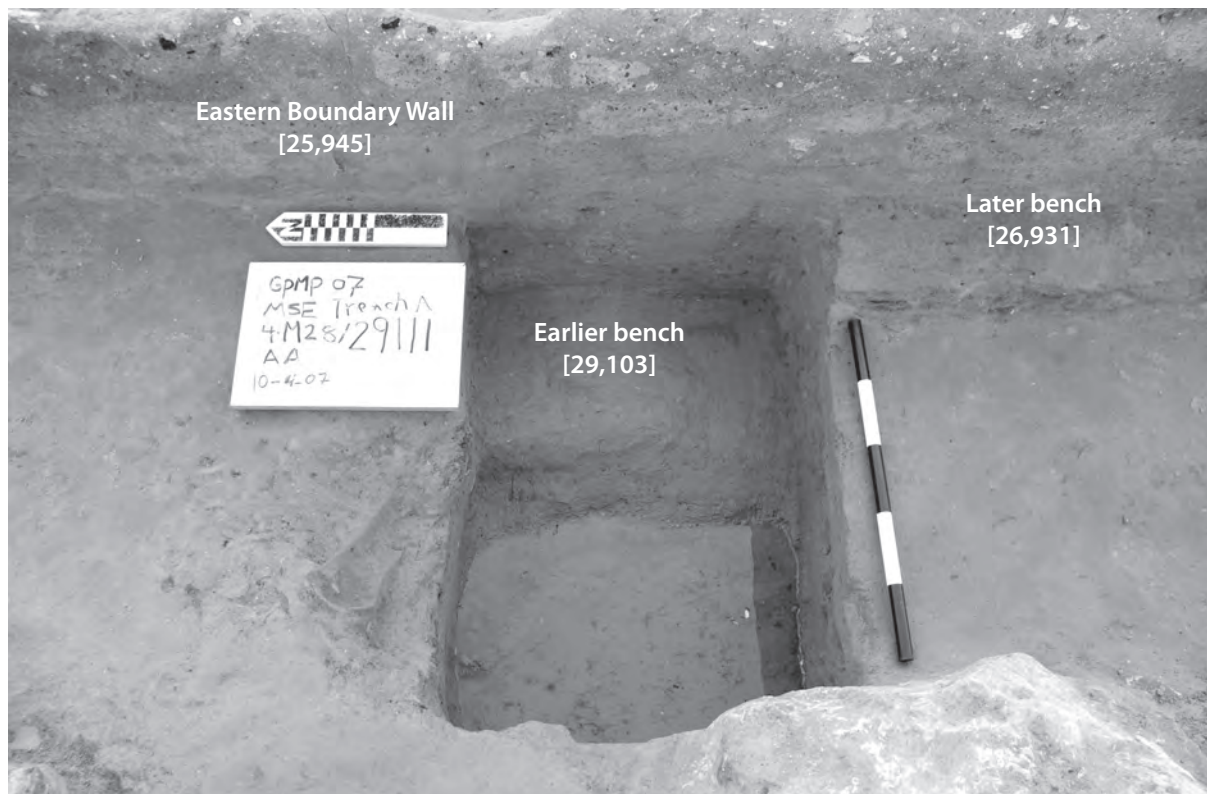


Figure 2.6. The sequence in Trench A: the Eastern Boundary Wall, the earlier bench, the pedestal and the later bench, facing east. Photo by Ashraf Abd el-Aziz.

the west, but this area is unexcavated. In Trench A we exposed a sandy silt plaster floor, which was the earliest surface within the north-south corridor, at a height of 15.82–15.84 m asl. From the stratigraphy, it was apparent that this floor would have functioned with the pedestals, specifically pedestal [27,093].

An east-west mudbrick wall, [25,936], abuts the eastern face of the Eastern Boundary Wall. This wall, which as noted, may form the northern boundary of the Eastern Town, is 1.50 m long by 55–74 cm wide surviving to a height of 3–7 cm. It was built of small marl and mud bricks, measuring 28 cm × 14 cm × 8 cm thick. Its northern face is coated with marl plaster. Throughout all the phases that we recorded in Area MSE, wall [25,936] is the only wall we found to the east of the Eastern Boundary Wall. This means that there is a stretch approximately 18.75 m long without walls to the east of wall [25,945]. This space could be a north-south street (an extension of the Eastern Roadway) or simply a large open space. This possible “street” roughly aligns with the eastern wall and the entrance of the RAB—some 50 m to the south (fig. 2.1)—with a mudbrick-wall-bordered street in Square 4.D28 (Abd el-Aziz 2004: 19), and with the eastern wall of the same street in front of the Eastern Town House (GOP3: 44). Here the street is 1.50 m wide. The Eastern Roadway could have acted as a street between the Eastern Town and the EOG production yard, linking the northern part of the site with the RAB and RAB Street. Elsewhere, on the same alignment, between Area MSE and the northeast corner of the RAB, AERA teams have mapped portions of a street (in grid squares 6.X–Z28, 4.B–C28, 4.E–G28) bounded by limestone walls. Whether these are the same street or belong to a later version of the roadway (see Phase 11) is unclear.

Wall [25,936] may be a short spur wall, just as we found across Main Street (fig. 2.1; Abd el-Aziz 2007a: 114, 118, 135), which left only a narrow gap for traffic to pass through. Or, wall [25,936] may extend eastward to form the northern limit of the Eastern Town. Perhaps this wall was part of the Eastern Town, and formed its northern boundary, which is why it is slightly thicker than the other Eastern Town walls.

Earliest Use in MSE (Phase 2)

Our four provisional subphases of Phase 2 include the earliest known occupation within the MSE transect

(table 2.1): the upper bench running along the west side of the Eastern Boundary Wall, mudbrick and limestone sockets at the base of the pedestals (2a), the fill of these installations (2b), a sequence of surfaces that sealed the installations in between wall [25,945] and the pedestals (2c), and surfaces laid after the pedestals had gone out of use (2d). We describe the sub-phases of Phase 2 together.

We exposed the low north-south bench [26,931] running along the western face of wall [25,945] in two stretches (figs. 2.3, 2.6). One stretch is located north of Main Street wall [25,929]. Here the bench is 4.40 m long × 16–18 cm wide × 8 cm high. South of the Main Street wall [25,929] the bench runs for 7.42 m and is 21–26 cm wide. Both stretches are about the width of a single brick. We recorded a silty sand marl plaster floor in Trench A at the same level as the base of this bench, at a height of 15.86–15.94 m asl.

The stratigraphic sequence shows that the bench or curb had been built later than the Eastern Boundary Wall and the pedestals. However, the gap in the bench corresponds to where Main Street Wall [25,929] would have once attached to wall [25,945]. This would suggest that the Main Street Wall was standing when the pedestals were constructed and also when the bench was built and that the wall had been robbed out later. The purpose of this bench is unclear. Team members have found similar benches in the galleries (Lehner 2007b: 185–86, Abd el-Aziz 2007b: 206–209, 227) and in the northern room of the structure immediately north of the Pedestal Building (GOP3: 69).

We exposed small triangular or rectangular installations (or sockets) formed by mudbricks at the eastern base of the southern pedestals, and in 4.K28 we also exposed them to the west of the pedestals (fig. 2.3). Each socket was constructed of three marl and mud bricks, except for one built of small limestone fragments, forming a rectangular shape, 28 cm north-south by 23 cm east-west on the inside and 32 cm east-west and 58 cm north-south on the outside. One installation, [26,927], is triangular, formed of two mudbricks, with eastern edges that abut half of a square “pillow stone”¹ fragment, made of limestone (fig. 2.7). Another small limestone fragment against the base of the southern pedestal completes this socket. One installation, [29,006], is semicircular, with outer dimensions of 72 cm long × 37 cm wide and inner dimensions 54 cm long

1. Defined as “rectangular blocks of limestone with rounded corners and edges” (GOP2: 58).

× 20 cm wide. We recorded a floor at the base of Trench A that had functioned with the pedestals but was earlier than the installations, indicating that the pedestals had been used prior to the installations being built.

The installations at the bottom of the pedestals must have been connected with the function of the pedestals. The different shapes and sizes of the installations may relate to different functions of individual pedestals. The installations were probably sockets that supported small jars because they were very similar to those that James Taylor exposed in front of slots between the pedestals in the southern corridor of the Pedestal Building, a building containing a series of pedestals in the Western Town (GOP3: 67–69; see below, this volume). Here the installations supported *in situ* AB4 beer jars (fig. 2.8; GOP3: 65–69).

In Area MSE, the small installations at the base of the pedestals would have reduced the width of the north-south corridor between the pedestals and wall [25,945] from 60–75 cm wide to 35 cm wide (fig. 2.3). The bench alongside the western face of Eastern Boundary Wall [25,945], which measures 15–20 cm wide, reduced the width of this corridor further, to only 15–20 cm.

People must have stepped over the installations when they moved through this corridor. If these installations housed beer jars like those at the base of the pedestals in the Pedestal Building, these would have only risen about 25 cm to 35 cm above the floor level. This corridor was probably not the only nor the primary route to the pedestals. It is possible that most of the activities related to the pedestals took place on the western side, beyond the limits of our excavation.

We excavated two installations, [26,926] and [26,927], in Square 4L28. Both contained compacted small ceramic fragments, to a height of 5 cm below the tops of the installation. This fill of pottery fragments began a few centimeters east from the front bases of the pedestals. At the base of the slots, between the pedestals, the material was brown, slightly silty sand over cleaner, more sterile sand. Once the installations had been filled they may have gone out of use, at which time the pedestals themselves may no longer have been used, or their function may have changed.

We identified a sequence of floors in the north-south corridor, between the pedestals and the western face of the Eastern Boundary Wall in Phases 2b and



Figure 2.7. Triangular mudbrick installation [26,927] on bottom left, with limestone fragment *in situ*, in Square 4L28, facing west. Photo by Ashraf Abd el-Aziz.



Figure 2.8. Pedestals with beer jars in the Southern Corridor of the Pedestal Building, facing north. Photo by Yukinori Kawae.

2c. These floors, including floor [26,918], covered all of the eastern installations east of the pedestals (figs. 2.9, 2.10). Because these floors sealed the installations but seemed to be associated with the pedestals (they abut the pedestals) we hypothesize that the function of the pedestals changed, the installations were decommissioned, but the pedestals remained in use.

We exposed patches of a marl gravel floor ([26,945], [26,968], [26,969]) that contained frequent limestone and ceramic inclusions in the southwest part of Square 4.J28 (fig. 2.9), which we assigned to Phase 2d (table 2.1). These patches may have belonged to one continuous surface. This floor was very similar to the second Main Street limestone gravel surface in Squares 4.K-19 and Squares 4.K8 and 4.K13 (Abd el-Aziz 2007a: 121–123) and to surfaces we recorded in the northwest of the HeG site during our excavation of another street, the Chute (frontispiece 2). Here we found gravel surfaces that pre-dated the Chute and gravel surfaces within the Chute (Abd el-Aziz 2011: 125, 128).

Collapse and Abandonment Deposits (Phase 3)

Phase 3 consists of numerous mudbrick collapse and

dumped deposits in the southern part of MSE, in Squares 4.I28 and 4.H28. These deposits were composed of compact sandy mudbricks with ceramic sherds, lithics, and small limestone fragments. The collapse deposits are c. 15 cm thick and abut the southernmost pedestals of MSE. The collapse may have fallen from the Eastern Boundary Wall. In squares 4.I28 and 4.H28, foundation courses of the Eastern Boundary Wall might continue beneath unexcavated Phase 3 deposits (fig. 2.9).

The APFS ceramicists identified a sherd of a shallow bowl and a sherd of a holemouth jar (see plates 17b and 17c, Chapter 3, this volume) in one of the mudbrick collapse deposits [29,097] that are typical of the Buto-Maadi culture, dating to the Predynastic period (3800–3200 BC) (see el-Shafey, Naguib, and el-Monaem et al., Chapter 3, this volume). This has led the APFS ceramicists to hypothesize that there was a Buto-Maadi site nearby, potentially adding to our knowledge of the Giza Plateau at this time. Because the Buto-Maadi sherds were found within the mudbrick collapse we suppose they were added to the bricks as temper when the bricks were being formed. This may have been done to the east of the HeG settlement, since a brick yard would have required a permanent

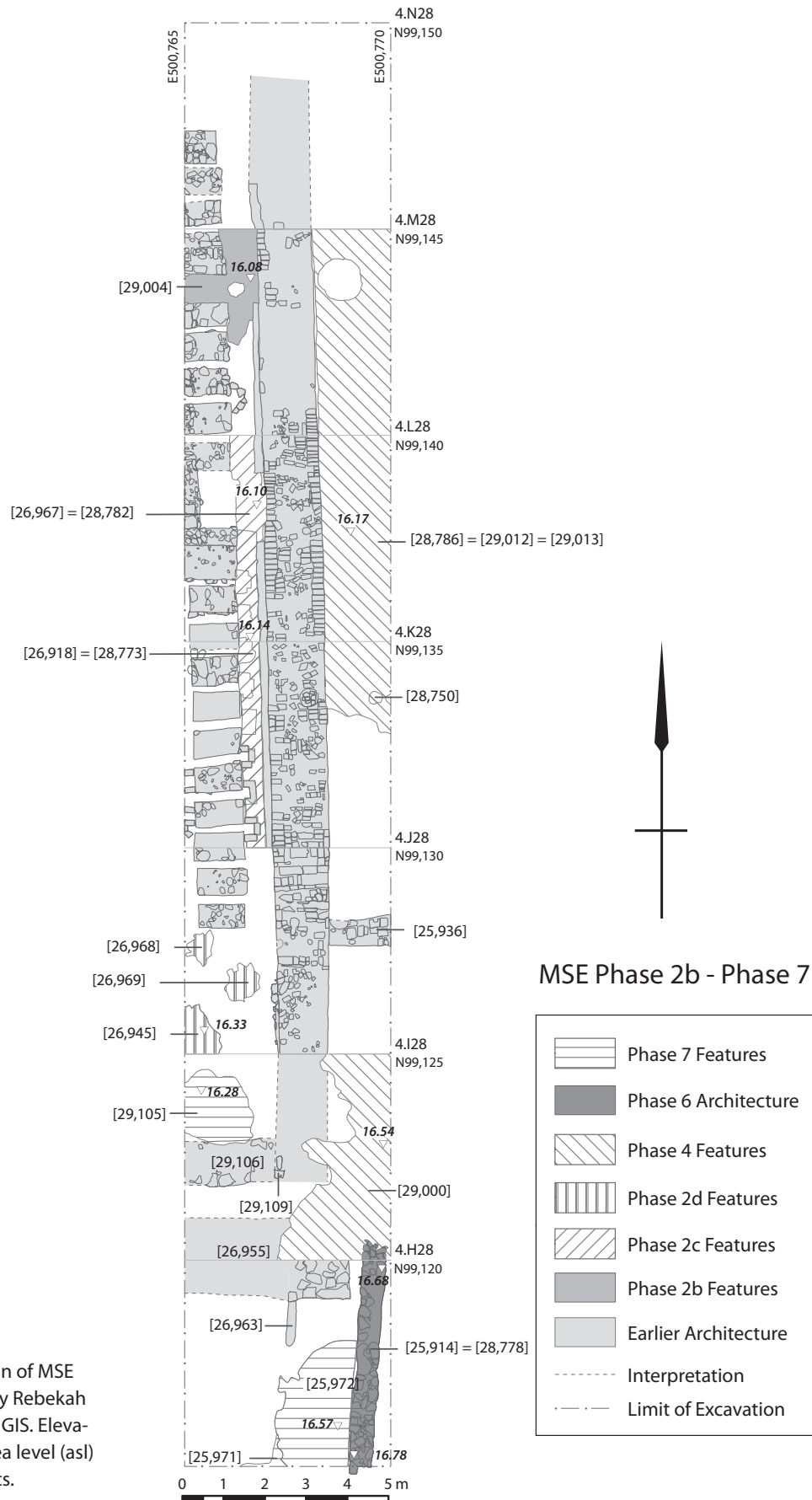




Figure 2.10. Facing south, floor [26,918] sealed the installations in Square 4.L28. Photo by Ashraf Abd el-Aziz.

water source (Abd el-Aziz 2008: 1–7). For an alternative explanation see Chapter 3 in this volume.

Surfaces to the East of the Eastern Boundary Wall (Phase 4)

In Squares 4.H–J28 we recorded a sequence of three deposits of black ash mixed with silt, or sand mixed with silt and occasional ceramic, to the east of the Eastern Boundary Wall, [25,945], and to the south of wall [25,936], acting as bedding for plaster floor [29,000] (fig. 2.9). We found no walls associated with this floor.

To the north of wall [25,936], in Squares 4.K28, 4.L28, and 4.M28, we recorded a series of floors to the east of the Eastern Boundary Wall. They had a top level of around 16.45 m asl. These surfaces were made of silt mixed with sand and marl plaster. We exposed a feature that may have been a hearth, [28,750], a red-dish brown burnt patch measuring 30 cm east-west by 2–5 cm thick, on silt-mixed-with-sand surface [28,786 /29,012/29,013] in Square 4.K28 (fig. 2.9).

Eroded Collapse (Phase 5)

We recorded four deposits of eroded mudbrick collapse in Squares 4.I28 and 4.H28. Three of them lay

one on top of the other and all were rich with limestone, exotic stone fragments, and ceramic sherds. They had a combined thickness of 15 cm. It is unclear to us which walls these deposits fell from.

Constructing Wall [25,914] (Phase 6)

We recorded north-south limestone wall [25,914/28,778] at the southern end of Area MSE, extending across four grid squares (Squares 4.F–I28) (partially shown in fig. 2.9). This was one of the latest walls to be built in the southern part of Area MSE. Mark Lehner oversaw a shallow excavation in 2002 to expose its southern extent in Squares 4.F28 and 4.G28 and we exposed it in Squares 4.H28 and 4.I28 for a distance of 6.35 m. It was 50 cm wide and 23 cm high. The west face of this wall had been coated with marl mixed with silt. The wall was founded on compact silt mixed with ash and sand with frequent ceramic sherds, and constructed from uncoursed, roughly-hewn limestone fragments.

Floors and Pits (Phase 7)

In Square 4.H28 we excavated eroded mudbrick collapse deposits used as leveling deposits for floors, deposits containing frequent limestone and pottery inclusions,

and floors (such as floor [25,972], see fig. 2.9). We also recorded a shallow pit, [29,105], in Square 4.J28 (fig. 2.9) filled with ash and small balls made of Nile clay, which may have been used as stoppers for ceramic jars (T. Rzeuska, personal communication 2007), and a shallow pit [25,971] in Square 4.H28 that had been used for mixing marl plaster. Elsewhere at the HeG site, in Area RAB, EOG, and Main Street (Sadarangani 2007a: 86, Abd el-Aziz 2004: 10, Abd el-Aziz 2007a: 118–120), AERA teams have recorded similar marl mixing pits.

Eroded Tumble at the Southern End of Area MSE (Phase 8)

In Squares 4.H–I28 and 4.K28 we excavated a series of limestone and mudbrick collapse deposits and dumped deposits to the east and west of the Eastern Boundary Wall [25,954]. These had a combined thickness of 25 cm. The collapse deposits may have fallen from the Eastern Boundary Wall during a period in which people had abandoned the southern part of Area MSE and used the area as a dumping ground.

Floors, Hammerstone Cache, and Flint Knapping (Phase 9)

In Phase 9 a sequence of floors was laid down and used, a cache of hammerstones was deposited, and a wall was built over two of the pedestals. The pedestals appear to have gone out of use during or by this phase.

We recorded patches of a marl plaster floor and two possible temporary hearths or open fires, [28,798] and [28,797], seen as reddish-brown patches in the southwest part of Square 4.I28 (fig. 2.11). We did not find any evidence of walls near these hearths, indicating this area had been an open space at this time. Both hearths may have been short-lived, given that they were small and the underlying mudbrick collapse had not been intensely scorched.

In Square 4.J28 the team found a sequence of three overlying dumped deposits, [26,911/29,091], [26,909], and [25,974/29,018] (fig. 2.11), that were incredibly rich with lithics (chipped stone). These deposits also contained small stones, fragments of dolerite, red granite, sandstone, and quartzite, small limestone fragments, as well as ceramic sherds. AERA ceramicists identified a rounded rim sherd of a jar in one of these deposits, [29,018], dating to the Buto-Maadi culture. We interpreted these deposits as industrial lithic waste, mainly because they contained a number of lithic cores, from which the inhabitants struck off flakes that they then

used as tools. The recovery of these cores was particularly exciting for the project's lithicist at that time, Tim Stevens, since cores are rarely found at the HeG site. He hypothesized that this part of Area MSE had been used as a knapping zone (Stevens 2007: 1–3). None of these deposits were associated with surfaces or work platforms, so it is unclear whether these materials were dumped in the area (having been generated close by) or whether the materials were worked here.

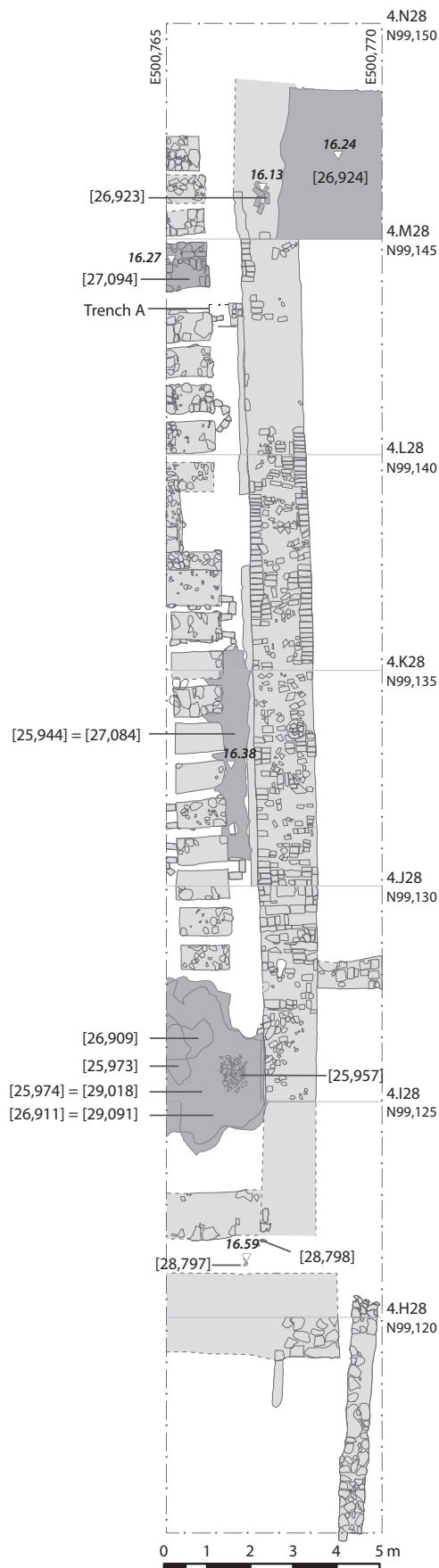
In Square 4.J28 the team found a floor of compact marl gravel with crushed limestone, [25,973], at level 16.76 m asl, sealing deposit [25,974/29,018] (fig. 2.11). This floor was very similar to the other patches of marl gravel with crushed limestone—[26,945], [26,968], and [26,969]—in the same square, which were at the level of 16.30–16.41 m asl in Phase 2d (fig. 2.9).

Also, in Squares 4.L28 and 4.K28 we recorded a surface [25,944/27,084] filling the narrow corridor between the Eastern Boundary Wall, [25,945], and the pedestals (fig. 2.11), 60 cm higher than the base of the pedestals. In Square 4.L28 a series of make-up layers underlay this floor, including a deposit [25,957] containing 36 kg of dolerite fragments, which contained some small hand hammerstone fragments (fig. 2.12).

Parts of the Eastern Boundary Wall may still have been functioning at this point because these floors abutted the face of the wall and did not extend over it.

In Square 4.M28 an east-west mudbrick wall, [27,094], had been built over one of the pedestals (fig. 2.11). Only the lower few centimeters of the foundation course of this wall has survived; it is 1.10 m wide and was built using small marl and silt bricks, 28 cm × 14 cm × 8 cm. The function of this wall is unclear, but it does seem that the pedestal [27,935] had been destroyed in order to build it—a further indication that the pedestals were no longer in use at this time.

Also in Square 4.N28, we found well-shaped dolerite hand hammerstones (figs. 2.13, 2.14). The tools were embedded in a deposit of compact silt mixed with sand, limestone fragments, and ceramic sherds. The hammerstones were smooth and oval-shaped. Three of them have grooves, possibly for rope, twine, or leather to haft them to a handle (Adams 2002: 160–179). The size of the tools vary from 17 cm × 7 cm × 2 cm to 12 cm × 7 cm × 5 cm. We suspect these hammerstones were left near the area where they were used. The team found another hammerstone slightly higher up in the same deposit.



MSE Phase 9

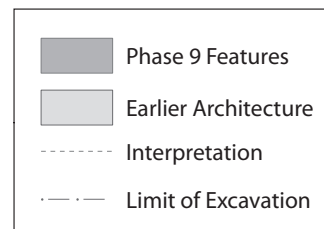


Figure 2.11. Plan of MSE Phase 9 by Rebekah Miracle, AERA GIS. Elevations above sea level (asl) shown in italics.



Figure 2.12. Facing south in Square 4.L28, showing the dolerite stone fragments in feature [25,957]. Photo by Ashraf Abd el-Aziz.



Figure 2.13. Facing west, showing the hand hammerstones in Square 4.N28. Photo by Ashraf Abd el-Aziz.

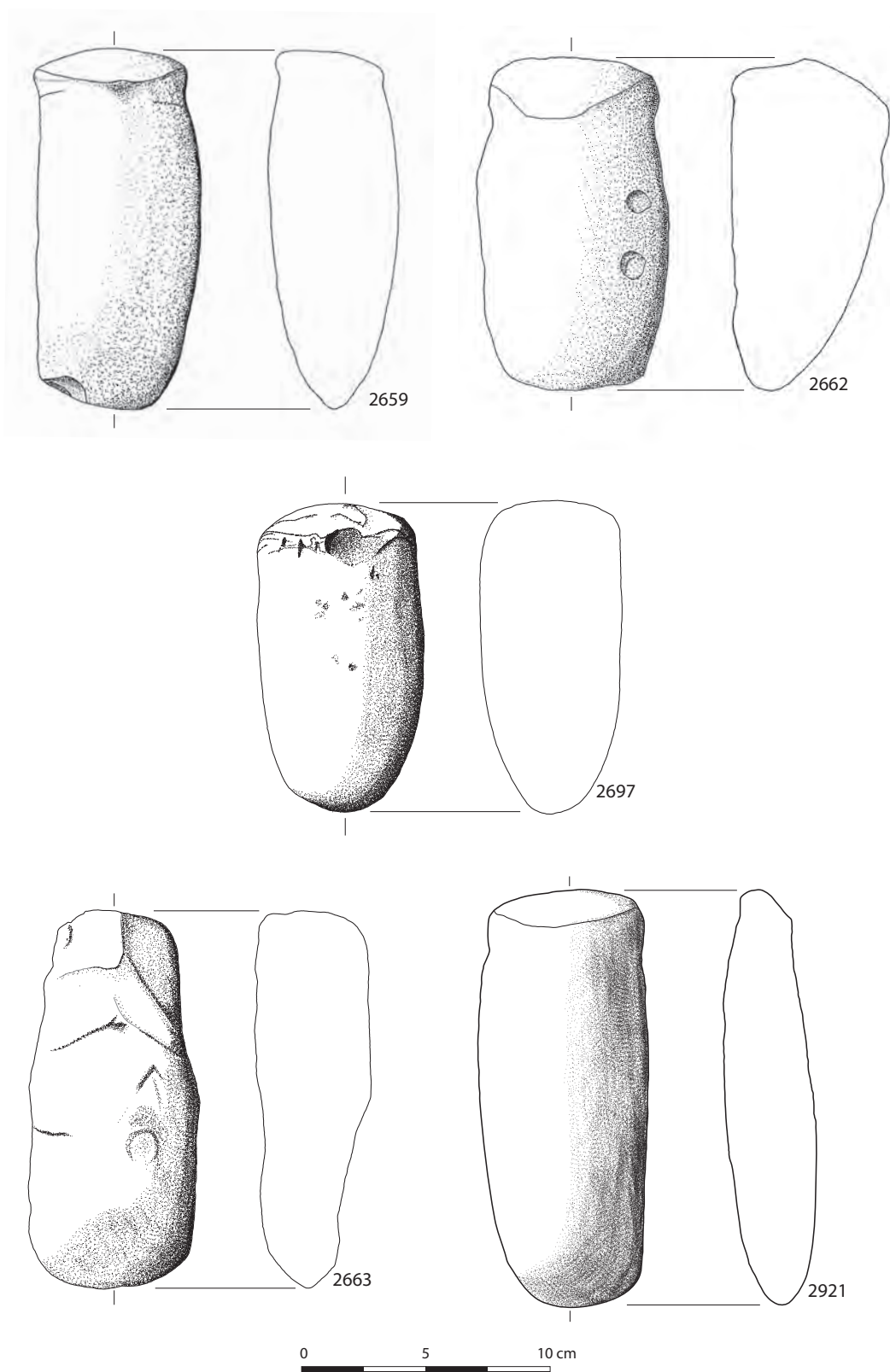


Figure 2.14. Drawings and sections of the five hammerstones found in the cache. Objects were drawn and then both manually and digitally inked by Mohamed Osman, Hazem Salah, and Hassan Ramadan.

Demolishing of Area MSE (Phase 10)

Phase 10 comprises a sequence of mudbrick with limestone collapse, pure limestone collapse, dumped deposits, and pitting. These deposits covered the Eastern Boundary Wall and the pedestals (figs. 2.15, 2.16). Combined, these deposits were thicker to the west of [25,945], at 10–50 cm thick, than to the east, where they were about 30 cm thick. We excavated a circular pit to the east of [25,945], which measured 1.05–1.10 m in diameter by 46 cm deep and was filled with mudbrick debris. It seems that the upper part of [25,945] had been completely dismantled or had collapsed in this phase. The pitting in this area, however, had begun while [25,945] was still standing.

Limestone Walls (Phase 11)

In Phase 11 three limestone walls were built (fig. 2.17). All three walls are severely eroded. In Square 4.N28, at the northern end of Area MSE, east-west limestone wall [25,893] is 4.41 m long (but continues east and west beyond the limits of our trench), 52–55 cm wide, and 24–34 cm high, and constructed using uncoursed, roughly-hewn limestone fragments. In Square 4.M28 an east-west limestone wall [27,078], 58 cm (wide) by at least 52 cm west, surviving to a height of 4 cm, was built over mudbrick wall [27,094] (figs. 2.3, 2.17).

At the southern end of the area in Squares 4.E–H28 we recorded a broad north-south limestone wall [25,904] for at least 13.50 m that was 1.10–1.20 m wide and 5 cm high. We excavated the wall in Square 4.H28, for a distance of 2.53 m. Both limestone walls [27,078] and [25,904] had been constructed over mudbrick collapse.

Although limestone wall [25,904] aligns with the Eastern Boundary Wall [25,945] to the north, in Squares 4.J28 to N28 wall [25,945] was certainly earlier and was no longer standing by the time of Phase 11. Perhaps there had originally been a later limestone wall above wall [25,945] that had been the northern continuation of wall [25,904], which had entirely eroded away.

Wall [25,904] formed a lane 63–84 cm wide in tandem with the earlier north-south wall, [25,914] (fig. 2.17). This lane or street runs north-south and roughly aligns with the northeast corner of the RAB and other segments of limestone architecture planned to the south in Squares 6.X–Z28, 4.B–C28, 4E–G28 (fig. 2.1). As discussed, this narrow lane or street may be a later version of the wider Eastern Roadway.

Final Use of Area MSE (Phase 12)

Pitting, dumping, and deposits of collapse represent the final ancient use of Area MSE. By this time the walls of Area MSE had collapsed. We uncovered a very compact limestone collapse deposit in Square 4.N28. Numerous pits, different sizes and shapes, were randomly distributed in Squares 4.J–M28, and in fact covered most of Area EOG in grid ranges 20–28 and tiers 4.D–N. The fills of these pits varied between ceramic deposits, ashy ceramic dumps, and silt mixed with sand-rich, ceramic deposits. These pits measure between 0.45 m–3.70 m long by 0.15 m–1.50 m wide, with a maximum depth of 43 cm.

Flood Layers (Phase 13)

The annual Nile floodwater may have soaked the eastern part of the Heit el-Ghurab site repeatedly before 1964 when the second Aswan Dam (the High Dam) was activated (GOP3: 35). We recorded a sequence of flood layers in Squares 4.N28, 4.M28, 4.K28, and 4.I28, one on top of the other. They were composed of fluvial sand, silt, and clayey sand. These deposits were contaminated with modern leather, iron, plastic bags, wood, glass, and fragments of red brick and asphalt.

Modern Pits (Phase 14)

From the 1980s onwards the villagers of Nazlet es-Samman dug through the 4th Dynasty settlement features—the walls, surfaces, and other occupation deposits, in addition to the flood layers. We exposed nine modern pits in Area MSE. Their sizes varied from 13–80 cm long × 12–43 cm wide × 6–23 cm deep.

MSE Pedestals: Comparative Analysis

We looked at other instances of pedestals in Giza, comparing their form and context to those in Area MSE. Here we begin by describing what a complete pedestal looks like. We then go on to describe each instance of pedestals at Giza, describing in detail their size and form as they were found. We end with a discussion on the function of these features.

A Complete Pedestal

Over the years, AERA teams have uncovered HeG pedestals in various states of preservation. Often we find them extremely denuded. The best-preserved pedestals have been found in the Southern Corridor of Area AA (fig. 2.8). Although it is clear that not all pedestals looked alike (they vary in size and form), or indeed

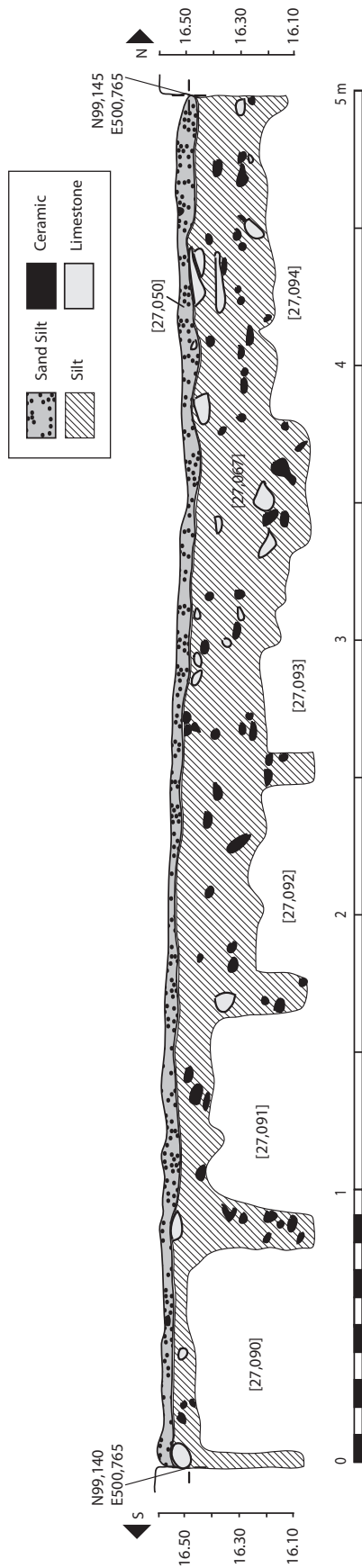


Figure 2.15. East-facing section of Square 4.M28, showing Phase 10 deposit [27,067] covering the tops of the pedestals. Section by Hassan Ramadan, based on field drawing by Mohamed Fathi Mekawy.

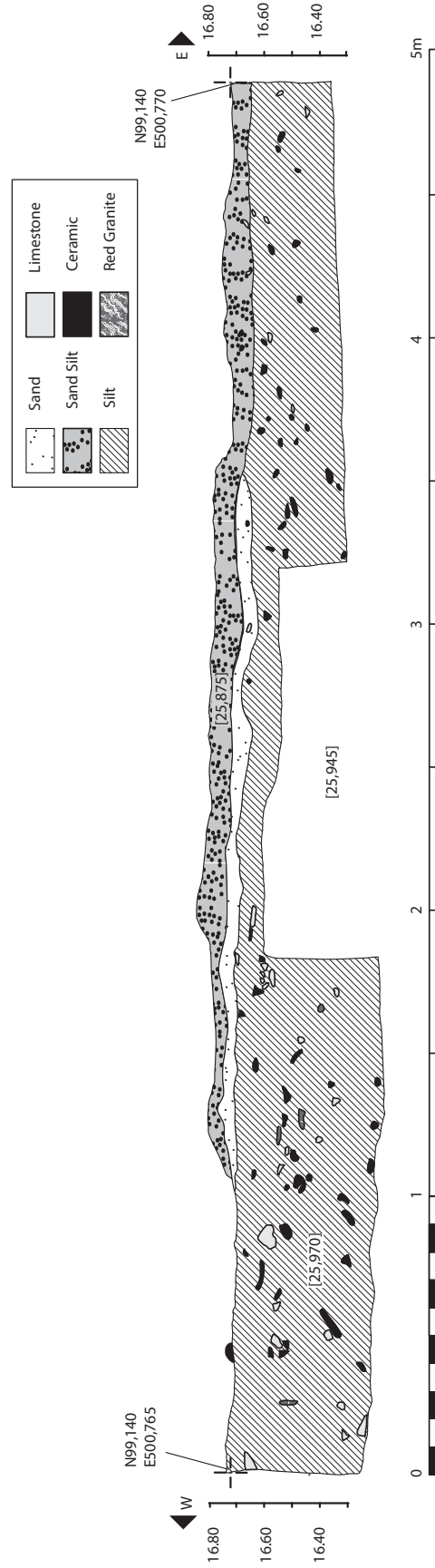


Figure 2.16. South-facing section of Square 4.L28, showing Phase 10 deposit [25,970] covering the top of Eastern Boundary Wall [25,945]. Section by Hassan Ramadan, based on field drawing by Noha Hassan Bolbol Ahmed.

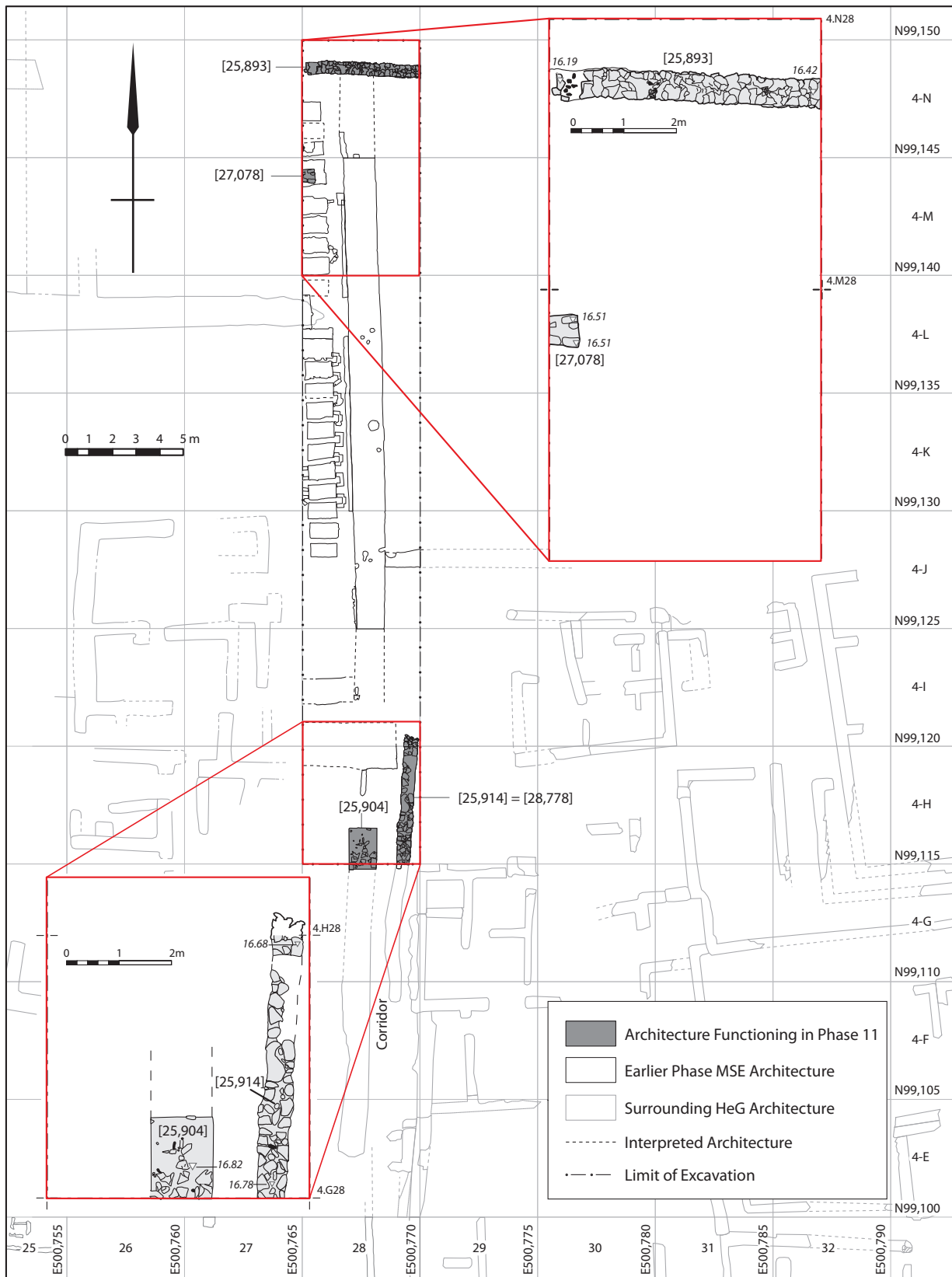


Figure 2.17. Plan showing Phase 11 architecture, with insets for Squares 4.M-N28 and 4.H28. Plan by Rebekah Miracle, AERA GIS.

were even used for the same purposes, the AA pedestals provide us with the most complete picture of a pedestal. In the Southern Corridor the team found four and a half pedestals. The complete pedestals are 56–64 cm high, 55 cm wide, and 74 cm long (GOP3: 67). The team found five mudbrick partition walls on top of these pedestals. These are 20 to 30 cm high. The walls on top of the pedestals create four suggested compartments that are about 60 cm wide, and these compartments lie over the spaces (slots) between each pedestal (GOP3: 67). The sides of the partition walls and the pedestals themselves are plastered, although the plaster does not continue beyond 15–20 cm down the sides of the slots (GOP3: 69). At the base, in front of the slots, the team found *in situ* beer jars (type AB4, Wodzińska 2007b: 296–297). These jars had been supported by a line of limestone that created a channel in front of the pedestals (GOP3: 69).

Pedestals in Giza

Pedestals have been exposed in two Old Kingdom settlements in Giza (the HeG site and a site southeast of the Menkaure Pyramid). The two settlements were inhabited at the same time, in the second half of the 4th Dynasty. AERA teams have identified a series of pedestals in two major areas within the settlement of HeG (fig. 2.18). They have found them in Area EOG: east of Gallery Set III (Area EOG, Abd el-Aziz 2004: 1–2); east of Gallery Set IV (Area BBNW); and Area MSE. Also we have found them in the Western Town: in the Pedestal Building (Taylor 2009b: 22–70, 102–22); in Soccer Field West (SFW) House Unit 3 (Mahmoud and Sadarangani 2009: 17–18); in Squares 6.P5–6; under the Pottery Mound (Kawae and Björk 2005: 9–10); to the east of the Pottery Mound in Square 6.G5 (Abd el-Aziz 2004: 2; Kawae and Björk 2005: 4–5); and in a small magazine in a building just south of RAB Street (the Western Roadway area, Hounsell 2005: 57–58; GOP3: 66). They have also been found in the Western Dump in Square 3.H40 (Bruning and Kelany 2004: 10–12).

The AA Pedestal Building

As already mentioned, the Pedestal Building lies along the western margins of the Western Town (fig. 2.18). The building contains only pedestals and features associated with pedestals. These pedestals were developed through three main phases: 4b, 5i and 5ii, and 7 (these are Area AA phases, see Taylor 2009b: 20–70

and 102–22). In Phase 4b the core of the Pedestal Building was constructed. Two north-south rows of roughly-hewn limestone pedestals were constructed in a space that measures 8.55 m north-south by 5.90 m east-west (figs. 2.19, 2.20). These rows of pedestals are separated by a north-south limestone wall, which measures 8.65 m (north-south) by 58 cm (east-west) and survived to a height of 62 cm. This wall divided the Pedestal Building into two halves, which were accessed from the north. Seven pedestals are located to the west of this wall and nine to the east. Some of these were actually half pedestals, which were bonded into the southern east-west wall. The pedestals themselves are orientated from east to west and measure around 1.20 m (east-west) by 49 cm to 87 cm (north-south) by 60 cm high. AERA teams exposed traces of mudbrick partition walls (one brick wide), which would have formed quadrants, on top of some of the pedestals. These may have formed compartments (averaging between 50–75 cm wide), which would have spanned the 10–20 cm spaces between the pedestals, explaining why the two half pedestals were required to abut the southern wall (Taylor 2009b: 26).

The second development in the Pedestal Building occurred in Phase 5ii. A row of four pedestals, oriented from east to west, were constructed in the Southern Corridor. This corridor was accessed by three entrances, one in the northwest corner, one in the southwestern corner and one in the southeastern. The pedestals are oriented north-south and abut the north wall of the Southern Corridor. These have been described in detail above.

The third development occurred in the northeast corner of the Pedestal Building where one pedestal, flanked by two half pedestals, were constructed in Room A (Taylor 2009b: 70). This space was accessed through the northwest corner. These pedestals were very similar to those found in SFW House Unit 3 (in shape and dimension) (see below). The team found traces of a single mudbrick partition on the central pedestal. This would have created two compartments (GOP3: 66).

Abd el-Aziz Saleh Excavations, Giza

In 1972–1973 Abd el-Aziz Saleh identified pedestals in an industrial settlement to the southeast of the Menkaure Pyramid at Giza. Here he found a large number of red granite and alabaster stones that seem to have resulted from the industrial waste materials

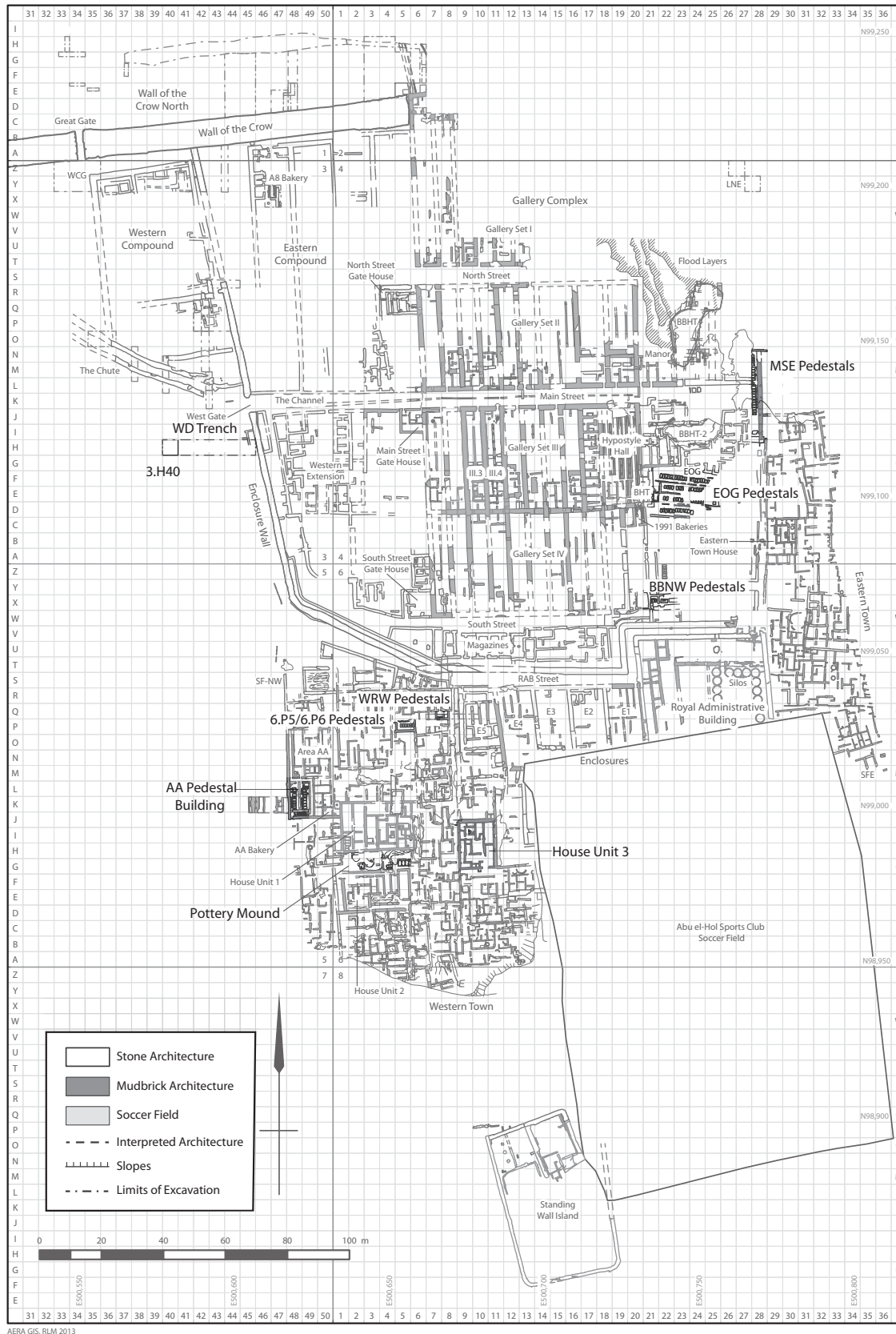


Figure 2.18. Location of Pedestals at the HeG site. Plan by Rebekah Miracle, AERA GIS, and Hassan Ramadan.

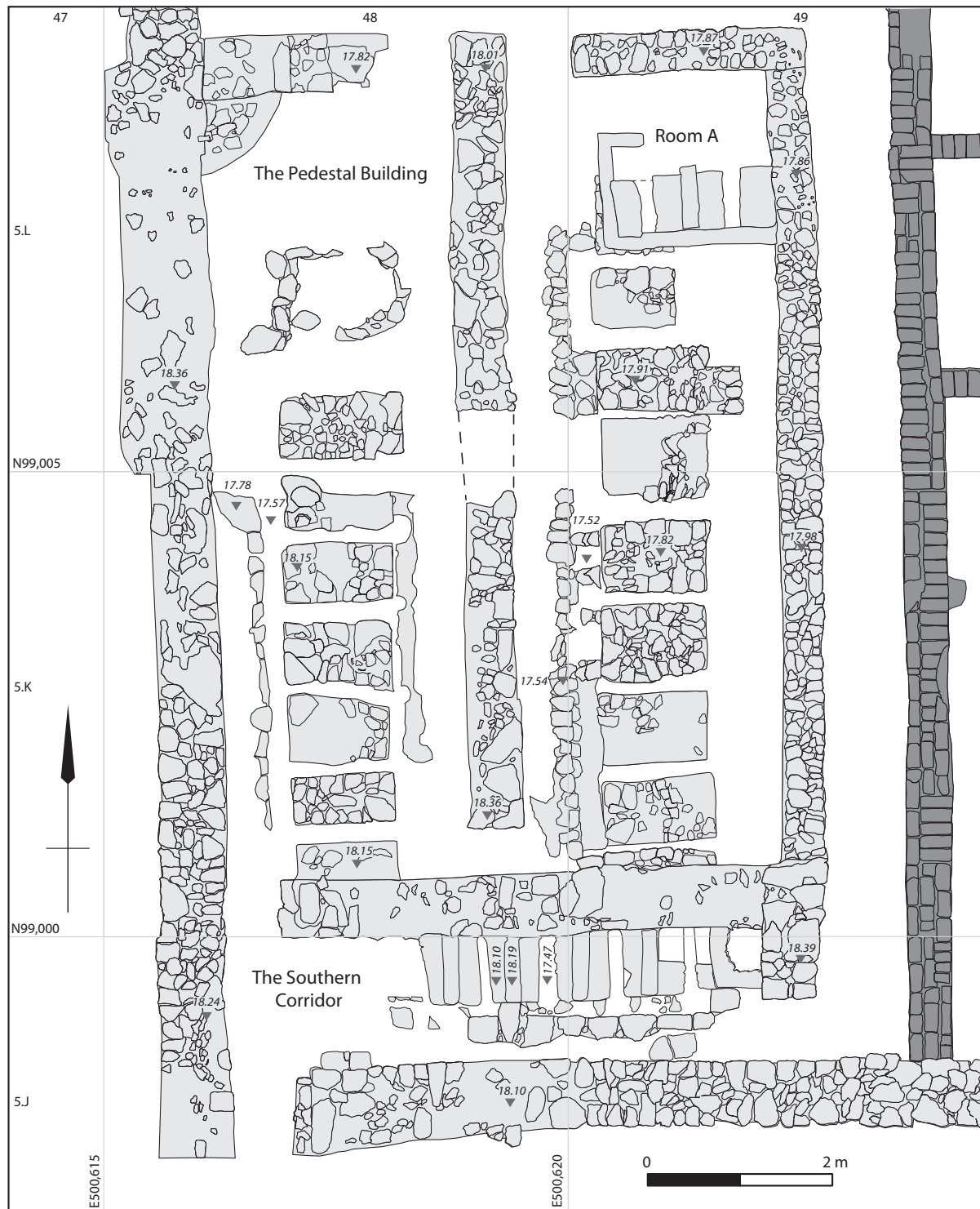


Figure 2.19. Multi-phase plan (4b, 5i and 5ii, and 7) showing the Pedestal Building in the Western Town. Plan by Rebekah Miracle, AERA GIS, and Hassan Ramadan.



Figure 2.20. The Pedestal Building, facing northwest. Photo by Yukinori Kawae.

of the construction casing of the 4th Dynasty pyramid complexes, in addition to ovens and kilns (Saleh 1974: 138). He exposed four linear rows, up to 19 m long, of east-west low rectangular limestone pedestals with their surfaces and sides leveled up with marl clay. There was a row of 14 limestone pedestals, two rows of 20, and one row of 18. Saleh referred to these structures as daises, bases, pedestals, platforms, tables, and benches, but he preferred to simply call them “rectangles” (Saleh 1974: 145). Their average dimensions were similar to those at the HeG site, 95 cm–1.10 m long by 57–65 cm wide by 15–40 cm high. They were built at roughly regular intervals (nearly 20–23 cm). Saleh noted on either side of each row a narrow slot or trough coated with clay, running the length of the trenches, as if to allow small quantities of liquids to flow away (Saleh 1974: 145).

EOG

Area EOG contains the EOG pedestals, the MSE pedestals, and the BBNW pedestals (fig. 2.18). Teams found no evidence of partition walls on top of the Area EOG pedestals; these pedestals were heavily denuded. The EOG pedestals are located in four east-west rows in

Squares 4.D–F21–25 (fig. 2.21). The pedestals themselves are oriented north to south and are constructed of roughly-hewn limestone, uncoursed, with silt mixed with sand used for bonding material. Unlike the Pedestal Building examples, these had no marl plaster on any of the pedestals. The rows of pedestals were divided by narrow limestone walls 22–42 cm wide by about 12 cm high; these walls are roughly hewn and uncoursed. These created east-west lanes, 85 cm to 1.18 m wide. We found no clear accesses through these walls, and we believe these walls may have functioned as benches.

We exposed 14, 11, 23, and 25 pedestals in these rows, respectively, from south to north. The EOG pedestals do not seem to have been housed within a building; they seem to have been out in the open. They measure 1.12–1.38 m long by 52–85 cm wide and survive 58 cm high (maximum) in the southern row, 1.12–1.30 m long by 58–74 cm wide and survive to a height of about 10 cm in the next row, 1.09–1.22 m long by 57–62 cm wide and survive to a height of 12–50 cm (maximum) in the third row, and the biggest pedestals in EOG were in the northern row. These measure 1.40–1.44 m long by 57–72 cm wide and survive 18–35

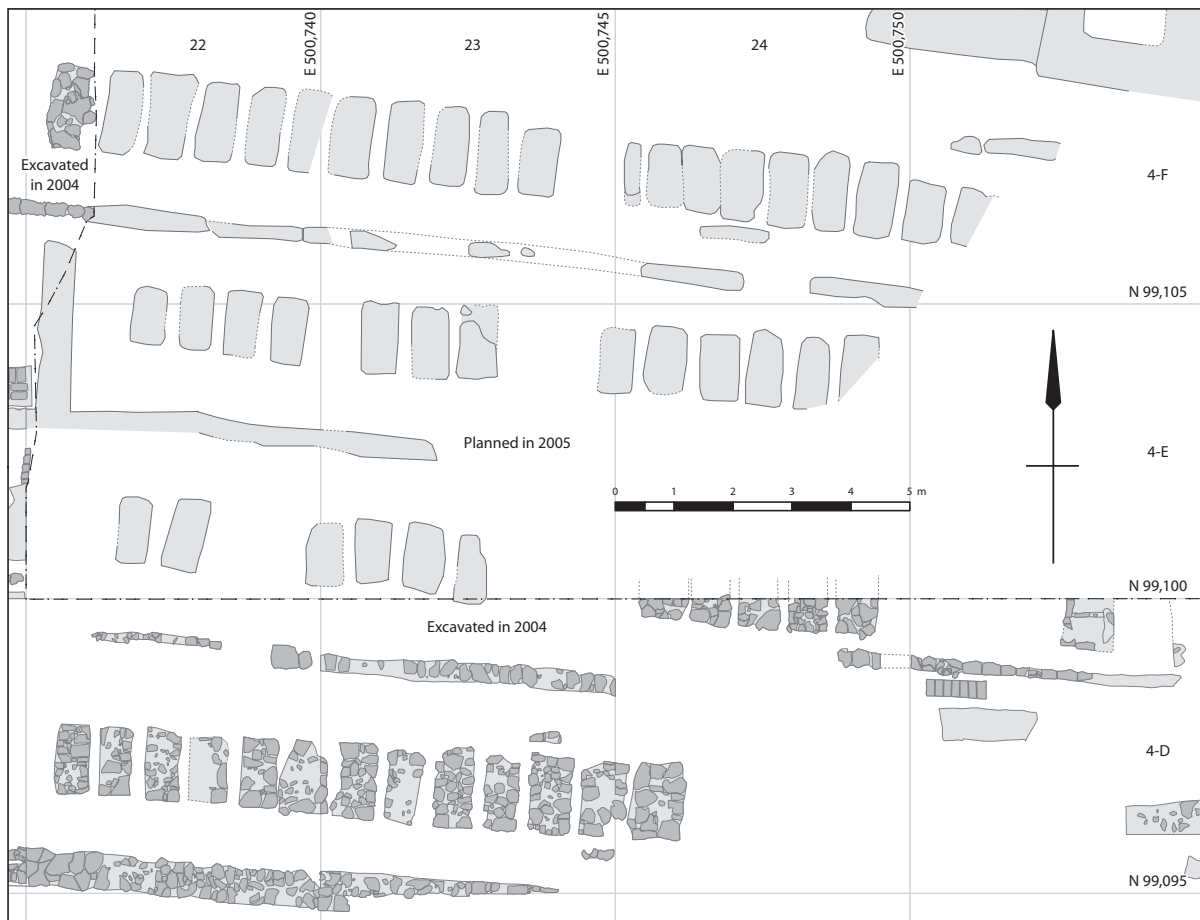


Figure 2.21. Plan showing the pedestals in EOG. Plan by Rebekah Miracle, AERA GIS.

cm high. Some pedestals were badly deteriorated or had been robbed out completely. We expect these pedestals to continue east and south beneath unexcavated flood layers. The intervals between the pedestals were 12–28 cm (Abd el-Aziz 2004: 1–2). The western pedestals were bigger than the eastern ones. There is stratigraphic evidence that suggests that the northern rows of EOG pedestals were built after the southern rows of pedestals, possibly after they had gone out of use (Stevens, House, and Driaux 2007: 98).

More east-west limestone pedestals lie in the southern part of EOG in Area BBNW, in Squares 6.Y–Z22 (fig. 2.18). They form a north-south row, containing at least seven pedestals. But we did not expose enough of this set to record their dimensions. These pedestals probably continue outwards in other directions, although a wall to the west likely blocks their continuation in that direction. AERA teams exposed more pedestals in the same area in 2005, in Square 6.X21 (fig. 2.22).

The Pottery Mound

In 2005 an AERA team also excavated a large mound of dumped rubbish (the Pottery Mound) in the Western Town, south of sfw House Unit 1 (fig. 2.18). Beneath the Pottery Mound there are at least three pedestals aligned north-south. These measure 1.70–2 m long by 82–94 cm wide, with intervals of 18–20 cm between them. All were plastered with marl coating (Kawae and Björk 2005: 9–10). These pedestals were badly preserved because most of the limestone blocks had been robbed (fig. 2.23) (Kawae and Björk 2005: 43).

To the east of this in 2004, AERA teams exposed three limestone pedestals, oriented east-west in Square 6.G5. Most of these pedestals had not been completely exposed. They were plastered with marl coating. The first double pedestal measures 95 cm–1.16 m long by 72 cm wide and survives to a height of 12–18 cm. The interval between them was 14–20 cm. The second double pedestals measures 90–98 cm long by 72–87 cm wide. The interval between them is 11–21 cm. The

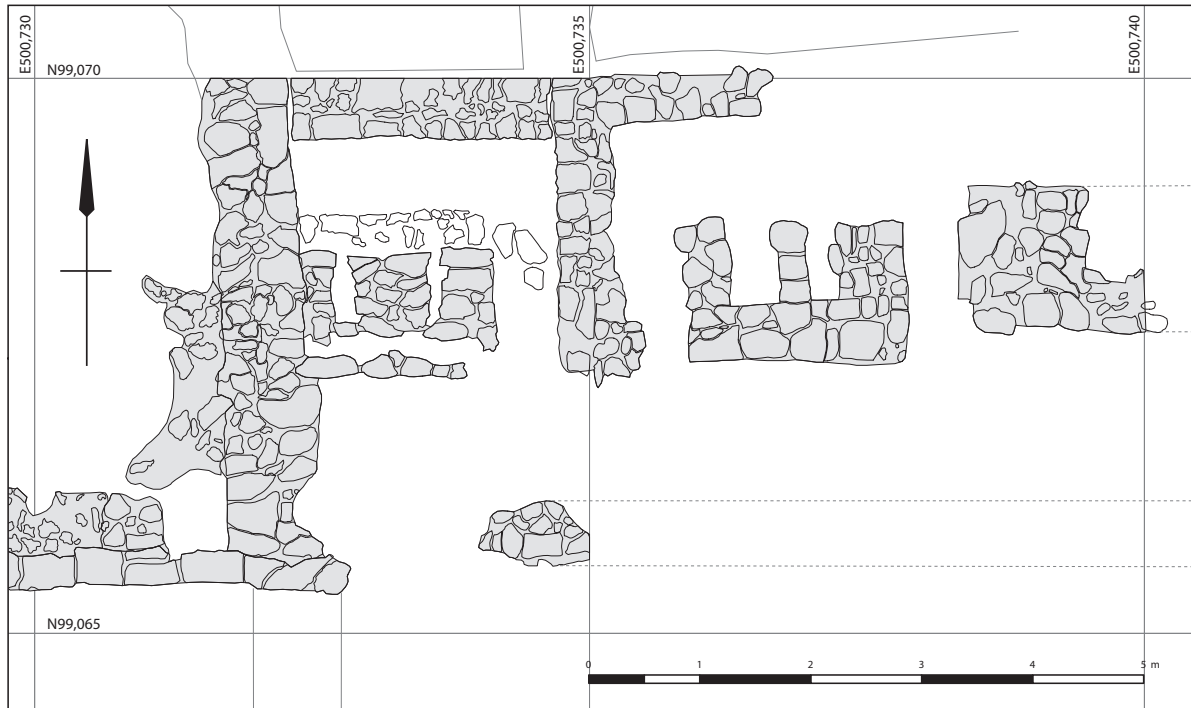


Figure 2.22. Plan showing the pedestals in BBNW. Plan by Rebekah Miracle, AERA GIS.



Figure 2.23. General shot of pedestals in the Pottery Mound, facing east. Photo by Yukinori Kawae.

third double pedestal is 94–98 cm long by 77 cm wide (Abd el-Aziz 2004: 2; Kawae and Björk 2005: 4–5).

Soccer Field West House Unit 3

In 2005 AERA teams excavated a building in the Western Town that appeared to be “a discrete domestic unit” (GOP2: 73) and called it SFW House Unit 3 (figs. 2.18, 2.24). A series of rooms, including kitchen spaces, surround a central courtyard. In the northwest corner of the building in a private location is a room (Room c) that contains one full pedestal and two half pedestals. The layout and size of the pedestals and pedestal room are identical to those found in Room A of the Pedestal Building. Room c is 1.70 m long by 1.25 m wide. These mudbrick pedestals measure 66 cm north-south by 40 cm east-west to 1.52 m north-south by 50 cm east-west. The pedestals had been damaged by later pitting and were severely denuded. This probably accounts for why there was no trace of partition walls. The base of a ceramic vessel had been excavated from the end of the westernmost slot (Mahmoud and Sadarangani 2009: 33–34). There is a low curb or platform in the northeast corner of the room and there were traces of black paint on the northern and eastern walls of Room c (Mahmoud and Sadarangani 2009: 33–34).

The Western Dump

In 2004 AERA teams excavated the western margins of the HeG settlement where HeG inhabitants dumped their rubbish (the Western Dump) up the slope of the *gebel* (fig. 2.18). Here, in Square 4.H40, the team exposed three denuded limestone pedestals, orientated from east to west (fig. 2.25). They were built of small roughly-hewn limestone fragments with bonding of silt mixed with sand. These pedestals measure 95 cm east-west by 53 cm north-south and survive 8 cm high. The intervals between them were 17–20 cm (Bruning and Kelany 2004: 10–12).

The Western Roadway

In 2005 an AERA team excavated three transects (Area WRW) across and south of RAB Street, at the northern end of the Western Town. One of these transects crossed what may be a magazine (the Mastaba Room) that contained four limestone pedestals (figs. 2.18, 2.26, 2.27). There are two full width pedestals and two half pedestals that are attached to the eastern and western walls of the room. The pedestals are about 70

cm long north-south; the complete pedestals are 40 cm to 50 cm wide and the half pedestals are about 30 cm wide. The space in between the pedestals (the slots) are about 18 cm wide (GOP2: 67). The team found evidence of a single partition wall on the two full pedestals, these would have created three compartments above the slots. These pedestals were very similar to some of the pedestals in the Pedestal Building in material and dimensions.

Pedestals Outside of Giza

There are similar fieldstone constructions in rows in Siwa, in different Greco-Roman sites like al-Qurayshat, Abu Shuruf, al-Zaytun, al-Maasir, and Timeira. They were used for oil pressing or wine-making (Aldumairy 2005: 37, 42, 46).

Also of note, three similar low rectangular mudbrick structures were exposed in an elongated storeroom of one of the palaces at Mari (modern Tell Hariri in Syria) in ancient Mesopotamia, dating to the early second millennium BC. These structures served as supports for big wine storage jars, a few of which were exposed *in situ*, measuring 1.05 m high with a rim diameter of 50 cm (Zettler and Miller 1996: 127, 129, figs. 10.3, 10.4).

Giza Pedestal Types

In general, AERA teams have only exposed pedestals in two specific areas of the HeG settlement: Area EOG and the Western Town. Based on context and form we can divide the HeG pedestals into two types: governmental/industrial pedestals and pedestals within houses. In instances where context and form were ill-understood because of limited exposure (such as the pedestals beneath the Pottery Mound and the pedestals within the Western Dump trench) we were unable to classify them.

The governmental/industrial type is located in Area EOG, the production zone east of the galleries (EOG, MSE, BBNW) (fig. 2.18), where large-scale bread making was widespread (see Mahmoud and Eissa, introduction to Chapter 1, this volume). Here the pedestals were arranged in rows, normally separated with narrow limestone walls or benches. These pedestals may have served the Gallery Complex, the RAB, and the Eastern Town, which might be why no pedestals have been found in those specific areas. Saleh exposed similar pedestals in the settlement to the southeast of Menkaure's Pyramid.



Figure 2.24. Plan showing House Unit 3, including the pedestals in Room C. Plan by Rebekah Miracle, AERA GIS.



Figure 2.25. The pedestals in Trench 2 in the Western Dump area, facing west. Photo by Lauren Bruning.

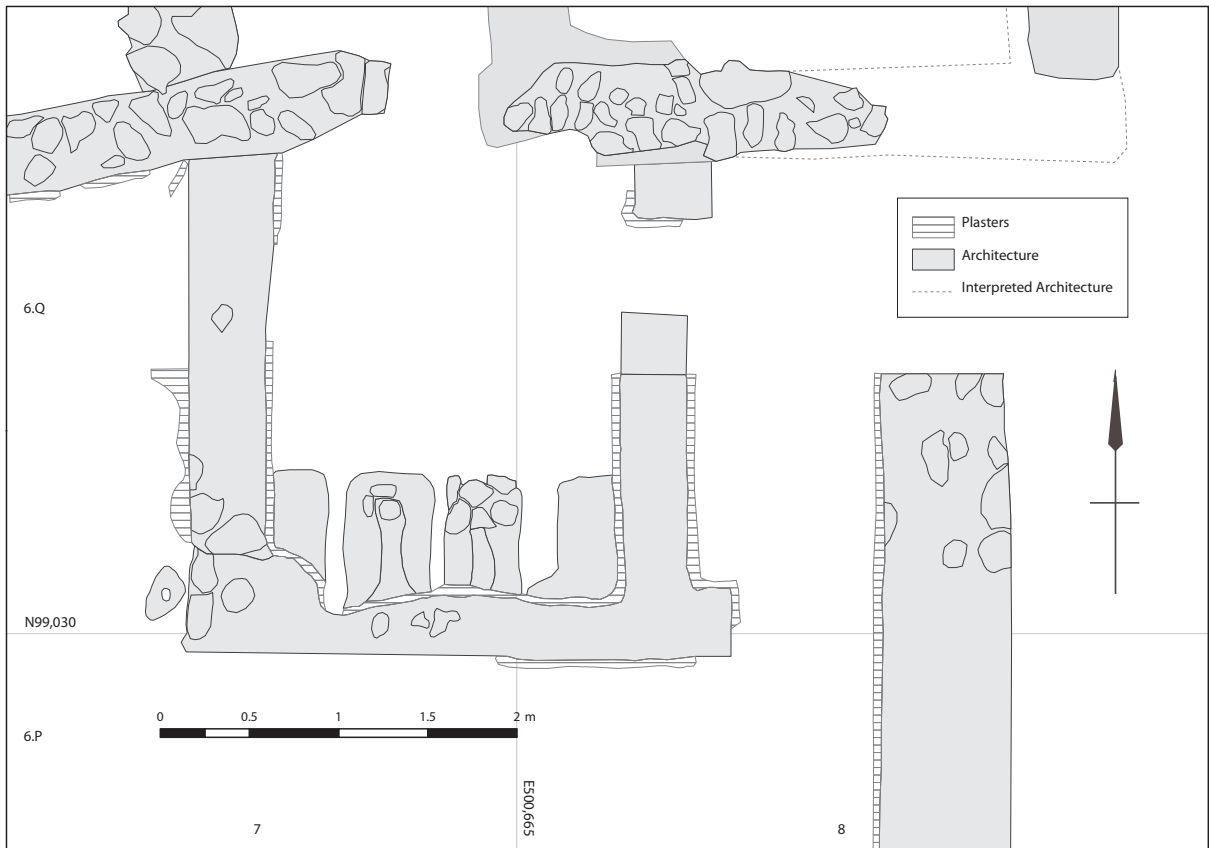


Figure 2.26. Plan showing the pedestals in the Mastaba Room of the Western Roadway. Plan by Rebekah Miracle, AERA GIS.



Figure 2.27. Facing south, the pedestals in the Mastaba Room of the Western Roadway. Photo by Petter Nyberg.

A slightly similar arrangement of pedestals was also found in the Pedestal Building, in the Western Town. The Pedestal Building may also have been a governmental type, serving the inhabitants of the Western Town. However, some of the large house units in the Western Town contained their own pedestals. A domicile type of pedestal is located in the Western Town in buildings that we refer to as house units (sFW House Unit 3) and the magazine in Area WRW (fig. 2.18). These pedestals tend to be groups of three to four pedestals (although this type of pedestal was also found in the Pedestal Building). In House Unit 3 the pedestals had been deliberately located in a private location within the building. Pedestals do not appear to have been required in all of the Western Town residences. The large house unit (sFW House Unit 1) to the west of House Unit 3, for example, did not contain pedestals (G0P5: 135–145).

Function

The pedestals are still enigmatic structures. They are mostly unknown outside of Giza, except for those mentioned above. At the HeG site, the pedestals have been found in industrial areas and inside houses. They

are usually constructed from limestone. They did not follow a specific orientation (sometimes east-west and sometimes north-south), and to our knowledge they have not been found in any settlement from the Middle or New Kingdom. They could be free-standing arranged in rows or could be attached to walls. Their original height appears to have been less than one meter. Their function is a puzzle. Perhaps they served multiple functions. Among the hypotheses about the function of the pedestals is that they were part of the production of dairy products (Lehner 2009a: 194–195); boards for baking or the fermentation of bread in the sun, or supports for boxes or wet objects soaked with water or other liquids (Saleh 1974: 146). They might have been worktables for manufacturing papyrus sheets or even tanning hides (Saleh 1974: 146). However it is unlikely that production of papyrus sheets was such an ubiquitous and integral part of everyday activities at the site, and tanning is an odorous and unclean process that requires water, drying areas, and would leave substantial residues (Driel-Murray 2000: 300–306.) Saleh considered the possibility of worktables for the production of faience but found no traces of such production associated directly with the pedestals (Saleh 1974: 147).

Lehner discusses in detail the hypotheses of “desert refrigeration,” involving evaporative cooling (Lehner 2009a: 195–198), and pedestals as part of malting and beer production (Lehner 2009a: 199–208).

Pedestals suggest storage off the ground and requiring ventilation. Similar structures at Tell Karrana (Upper Mesopotamia) have imprints of reed matting on their surface and served as grain-drying platforms (Lehner 2002a: 44–46; Zaccagnini 1993: 29–33). Another hypothesis is that the pedestals kept grain silos off the ground, away from rodents and moisture. The grain could then be extracted by pouring from an outlet at the base of the silo (Lehner 2009a: 194). A representation of a granary with small silos on individual pedestals underneath a lightweight canopy was found at late 6th Dynasty tomb of Mehi at the Pepi II complex at Saqqara (Jéquier 1929: 74, fig. 83; Lehner 1991: 24). A model of a granary with small silos on individual pedestals was found in the tomb of Ankhtify at el-Moala, from the First Intermediate period and now in the Egyptian Museum (Abd el-Aziz, personal observation).

Conclusions

Area Main Street East (MSE) is located in the northeast part of an industrial and production area (East of Galleries, or EOG) that is the interface between the Gallery Complex to the west and the Eastern Town to the east. Our excavations in MSE have provided us with a better understanding of the access routes in the eastern part of the HeG settlement. Area MSE represents the intersection of a number of key areas: the Eastern Town, Main Street, Area EOG, and a possible thoroughfare (east of the wall) connecting the southeast portion of the site to the northeast. Our excavations in the MSE area have shed light on this intersection.

The Eastern Boundary Wall divided MSE into two halves, with Area EOG to the west and the Eastern Town to the east. The western part of MSE was very busy compared to its eastern part. To the west we exposed a row of nineteen pedestals. These extended north of the Main Street’s northern wall, indicating that through time the production yard (Area EOG) had expanded north. The MSE pedestals are very similar to

the other pedestals in the HeG settlement in construction material, dimensions, and orientation. In Area MSE a north-south narrow corridor is located between the wall and the pedestals. We exposed small sockets at the bases of eight of the slots, which were constructed from mudbrick and stone fragments between the pedestals. We believe these supported jars. The function of the pedestals might have been related to other activities in the EOG area such as baking.

The eastern side of the Eastern Boundary Wall was a comparatively empty space. Here there may have been an Eastern Roadway running north-south (or inner north-south lane in the Eastern Town). There is one east-west mudbrick wall, [25,936], that abuts wall [25,945]. There may be an access through this wall in the unexcavated area to the east.

Later, when the pedestals had gone out of use the area was still industrial in character. We excavated a number of deposits that were rich with stone objects (sandstone and dolerite object fragments), including a cluster of hand hammerstones and a cluster of dolerite fragments. There was evidence of flint-knapping (evidenced by cores), large amounts of lithics, exotics, pigment samples, and mineral samples. The area to the south of Main Street East (MSE) contains evidence for more activities than the north of MSE because the southern part of MSE is closer to EOG, which expanded to the north.

Acknowledgements

We would like to thank Dr. Mark Lehner for letting our team excavate for two seasons in the MSE area. Thanks to AERA Field Directors Mohsen Kamel and Ana Tavares for their support. Thanks to Freya Sadarangani, Ali Witsell, and Wilma Wetterstrom for their help with editing this article. Many thanks to my AERA colleagues Tim Stevens, Freya Sadarangani, James Taylor, Mike House, Pieter Collet, and Yukinori Kawae for their ideas and help. We would also like to thank the workers who excavated in MSE, especially Mohammed Abd el-Aziz, Samy Khamees, Salem Mohammed, and Abd-Allah Ragab.

3. A Study on the Ceramics from the Main Street East Area

by Mahmoud el-Shafey, Mohamed Naguib, and Sherif Abd el-Monaem, with Ilham Ahmed M. el-Tawil, Mohamed Ali Abd el-Hakim, Shaima Rasheed Salem, and Nermeen Shabaan Abayazeed

The pottery presented in this chapter comes from a part of the Heit el-Ghurab site (HeG) called the Main Street East (MSE) area (frontispiece 2; fig. 1.8). The HeG site is composed of houses, galleries, bakeries, and industrial areas (Lehner 2007a: 21–47). The industrial area is located in the East of the Galleries (EOG) area and contains bakeries and a faience production area (GOP3: 44–59).

The site was reused after its main occupation in the Old Kingdom as a cemetery (Kaiser 2006b: 24–26) (fig. 4.1). The dating of the site is based on the pottery assemblage studied by Wodzińska (2007b: 283–318) and clay sealings recovered by the AERA team, dating largely to the reigns of Khafre and Menkaure (Lehner 2007a: 46–47).

MSE is, in part, probably a continuation of the northeastern part of the industrial area EOG. In MSE, AERA excavators uncovered a north-south row of 19 enigmatic limestone and mud pedestals in its western part (see fig. 2.3), perhaps related to malting or beer brewing (Lehner 2009a: 199–208). Unusually dense lithic scatters at the southern end of MSE contribute to the hypothesis that the area was an industrial area (GOP3: 35–44). For more details see Abd el-Aziz et al., Chapter 2, in this volume.

The pottery from the HeG site has been extensively studied by Anna Wodzińska (2007b; 2009a). Earlier studies on the HeG pottery were completed by University of Chicago students in a 1996 seminar led by Mark Lehner on Egyptian ceramics and by Lacovara (1997). The material from Area MSE was allocated for training MSA inspectors in the Analysis and Publication Field School (APFS). The pottery presented in this chapter is a sample of the total excavated Area MSE ceramics. We analyzed the pottery from three alternate 5 m × 5 m grid squares (4.128, 4.K28, and 4.M28) (fig. 2.1; see Abd el-Aziz et al., Chapter 2, this volume).

The pottery team consisted of teachers Dr. Teodozja Rzeuska (Polish Academy of Sciences), Dr. Janine Bourriau (McDonald Institute for Archaeological Research, Cambridge), and Dr. Sabine Laemmel (McDonald Institute for Archaeological Research, Cambridge), and supervisors Sherif Mohamed Abd el-Monaem (MSA) and Mohamed Ali Abd el-Hakim (MSA). The students were Mohamed Naguib Reda (MSA), Mahmoud el-Shafey (MSA), Nermeen Shabaan Abayazeed (MSA), Ilham Ahmed M. el-Tawil (MSA), and Shaimaa Rasheed Salem (MSA). Dr. Mary Ownby (Cambridge University) oversaw the petrography analysis of the pottery chips from MSE.

Pottery from Heit el-Ghurab (HeG)

Pottery from the HeG site is generally settlement material. Comparable Old Kingdom pottery is also known from Deir el-Bersha (Willems et al. 2009: 308–313), Kom el-Hisn (Wenke et al. 1988: 5–34), Wadi Garawi near Helwan (Dreyer 1982; Dreyer and Jaritz 1983), Elephantine (Raue 1999), and Dendera (Marchand 2004).

Wodzińska divided the assemblage from the HeG site into approximately 200 different types of pottery (2009b: 225). In addition to the typical Old Kingdom types such as bread molds, beer jars, Meidum bowls, high and low stands, etc., the HeG site is characterized by a large number of white carinated bowls (CD7 in the Wodzińska/HeG typology, 2006a: 405–429). In general the pottery from MSE does not show major differences in the types and statistical patterns that occur in the overall HeG corpus. The typical types mentioned above occur in the same relative percentages. Bread molds are still the highest percentage of the assemblage, followed by white carinated bowls, stands, and beer jars.

As stated above, the only datable textual information from the site are the clay sealings recovered by the

AERA team. These mainly date to the reigns of Khafre and Menkaure, with some ephemeral 5th Dynasty activity indicated by a handful of sealings dating to the reign of Userkaf (Nolan 2012: 3). This corresponds well with the MSE ceramic material.

The typology used for this study is different from the typology used in the publications by Wodzińska. It is standard procedure for the field school students to practice creating a new typology from scratch in order to more adequately face the challenge of starting work at a new site. In Table 3.1 we present the correlations between the MSE typology used in this publication and the HeG/Wodzińska typology (Wodzińska 2007b: 292–309).

The Pottery of the MSE Area

The ceramic material from our sample contained 5,133 diagnostic pieces. There were no complete jars preserved. We had a few complete profiles, but the majority of our pieces were sherds. The bread mold (BM) is the most common type in the MSE area, representing 32.47% of the total assemblage. The white carinated bowls (WCB) are the second most common at 12.49% of the assemblage, followed in decreasing order by stands (S, 12.41%), beer jars (BJ, 9.30%), unidentified sherds (7.50%), bowls with an internal ledge (BL, 7.13%), bread trays (BT, 5.48%), jars (J, 4.32%), bowls with simple profile (B, 3.43%), red carinated bowls (RCB, 2.27%), miniatures (M, 1.01%), coarse plates (CP, 0.84%), platters (P, 0.68%), vats (V, 0.47%), and lids (L, 0.13%) (fig. 3.1).

The clay types in the MSE area consist of three different groups: Nile clays, marl clays, and mixed clays. The most common clay is Nile clay, which represents 94.8% of the total assemblage, while the marl clay represents a small percentage, only 3.8% of the total assemblage. We have only one sherd of mixed clay. Regarding fabric, there is 1.2% from our total assemblage that we could not classify due to identification difficulties.

The bread mold fabrics (1A, 1B, and 1C) represent one-third of the total percentage of the fabric types (see discussion below). Bread mold fabric 1A is the most common fabric among the bread molds; it alone represents 30% of the total assemblage. The large percentage of this fabric type agrees with the large percentage of the bread molds among the total assemblage. Coarse Nile fabrics 2A and 2B represent 8.1% of the total assemblage, and are represented by

bread trays, some platters, plates, vats, and bowls with simple profiles. The most common fabrics are the medium fine Nile clay (3A and 3B) that represent together 43.9% of the total assemblage. The high percentage of this fabric is due to the many different types that are made with this fabric; e.g., large amounts of different kinds of bowls, some platters, plates, jars, and stands. Marl clay 5B is the most common marl fabric type; it is used in making some of the following types: jars (J1, J2, and J3); white carinated bowls (WCB5); and red carinated bowls (RCB4) (fig. 3.2).

Methodology

To begin our work we washed the pottery that could withstand water and left the sherds to dry. After this we sorted the diagnostic pottery sherds (a sherd that we could assign to a type based on some characteristic feature) from the non-diagnostic sherds. We split them into two groups: body sherds of bread molds and bread trays and another group representing all other types. We weighed these groups. In addition, we recorded any important information pertaining to the diagnostic sherds (imported fabric, important type, etc.). We weighed and discarded the non-diagnostic sherds and marked the diagnostic sherds with the appropriate feature number (the numerical identifier that the excavators assign to each excavated wall or deposit). Then we classified our diagnostic types into four categories based on the shape of the pot: open forms, closed forms, non-containers, and miniature vessels.

We used tile snips to create a fresh break in the edge of our sherds, studied the fabric using a hand lens and microscope, and then created a classification system. We drew sherds that we considered to be important, such as sherds with a complete profile, sherds bearing potmarks, pieces that were white or red slipped, and sherds that were crucial to illustrating our typology. After drawing the sherds we inked the drawings. Our next step was to fill out pottery forms for the drawn sherds. The last step was statistical analysis. We constructed a database for all the pottery we analyzed and entered the data we recorded on forms we created, which can be used later at any site. After this we counted the rim pieces and added the percentages of the state of preservation of all rims. We did this in order to know how many vessels from each type we had, as well as the relative frequency of those types.

We studied only a sample of the ceramics from Area MSE (the ceramics from Squares 4.128, 4.K28 and

Table 3.1.
Equivalencies
between the MSE
typology and the
HeG/Wodzińska
typology.

Type	MSE Typology	Heit el-Ghurab/Wodzińska Typology
Platters (PT)	PT1	CD1
	PT2	CD1
Coarse plates with flat base (CP)	CP1	CD1
	CP2	CD1, CD2
Bread trays (BT)	BT1A	F1A
	BT1B	F1B
	BT2	F1C
Bowls with simple profile (B)	B1	CD11
	B2	CD23
	B3	CD23
	B4A	CD20
	B4B	CD23
Bowls with internal ledge (BL)	BL1	CD32A
	BL2	CD32B
	BL3	CD11
White carinated bowls (CB1)	CB1A	CD7
	CB1B	CD7 II
	CB1C	CD7 IV
	CB1D	CD7
	CB1E	CD7
Red carinated bowls (CB2)	CB2A	CD6-A
	CB2B	CD6-B
	CB2C	CD6-A
	CB2D	CD6-B
Bread molds (BM)	BM1	F2C
	BM2A	F2B
	BM2B	F2B
	BM3	F2B
Vats (V)	V1	CD25
	V2	CD22
	V3	CD24
Jars (J)	J1, J2	AB7
	J3	AB3
	J4	AB35
Beer jars (BJ)	BJ1	AB4-A
	BJ2	AB4-C
Stands (S)	S1A	E2
	S1B	E2?
	S1C	E2?
	S1D	E2
	S1E	E1
	S2A	E2
	S2B	E1
	S3	E1
Lids (L)	L1, L2	G
Miniatures (M)	M1	CDM9
	M2	CDM4

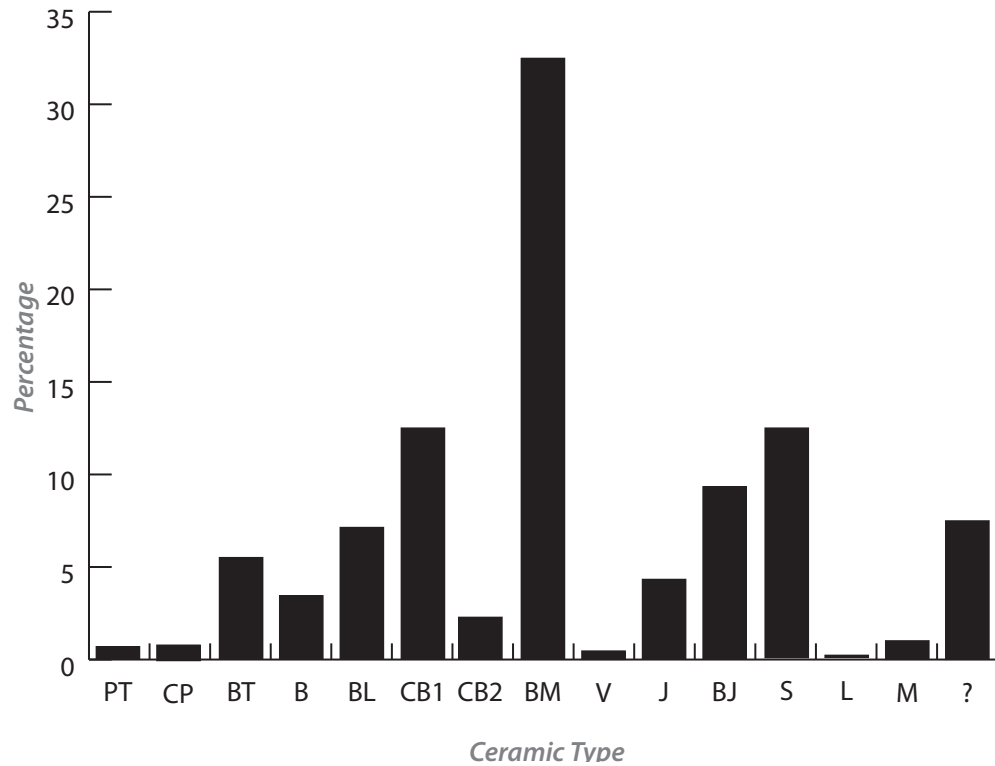


Figure 3.1. Percentage of ceramic types in the Main Street East area assemblage (for abbreviation codes, see table 3.1). The category of “?” indicates pieces that were too small to classify to a type, but were non-body sherds.

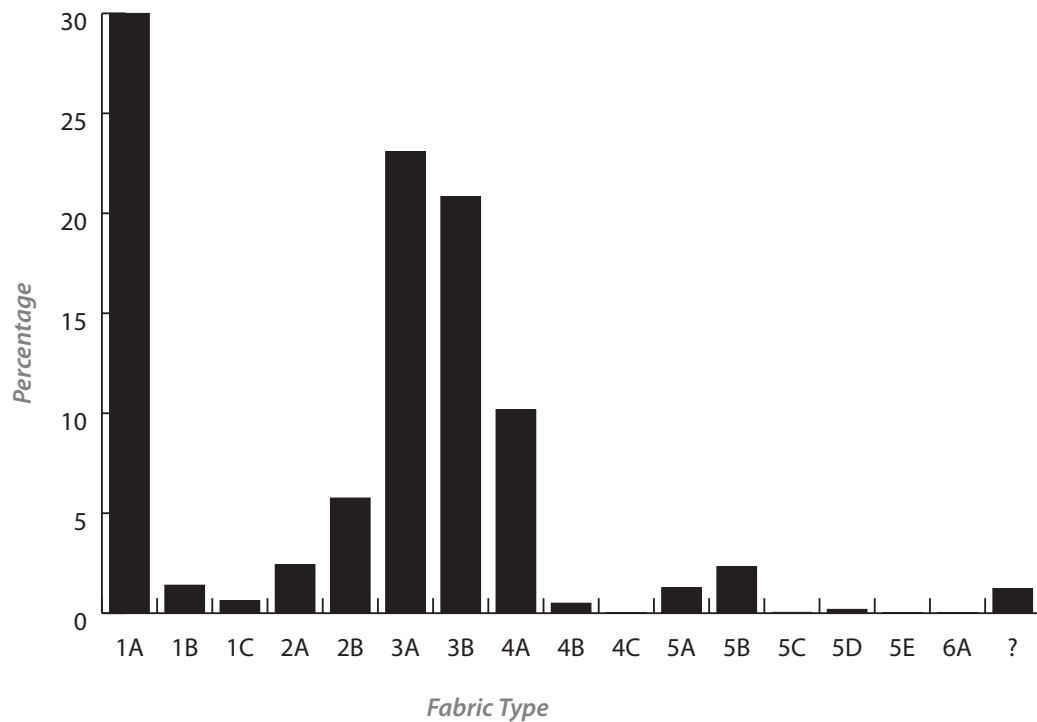


Figure 3.2. Percentage of fabric types in the Main Street East area assemblage (for abbreviation codes, see fabric section).

4.M28). This sample represents the ceramics that were recovered during the 2007 excavation season (see Abd el-Aziz et al., Chapter 2, this volume). The remainder of the MSE ceramics (recovered during the 2006 excavation season, from Squares 4.N28, 4.L28, 4.J28, and 4.H28) had previously been studied and analyzed by project ceramicist Anna Wodzińska, using her own typology (2007a) and analytical methods. Due to time constraints we were unable to integrate our data with Wodzińska's data or with the excavation data. We have therefore not been able to group and analyze the ceramic material by phase or space (see Abd el-Aziz et al., Chapter 2, this volume).

The next section describes how we created our form typology and fabric typology, with a description and analysis of the various pottery types. This is followed by a discussion on shaping methods, finishing techniques, and surface treatments used in the MSE assemblage. This is followed by our conclusion, an appendix discussing three MSE Buto-Maadi sherds, and a partial catalog.

The Typology

The main criteria we used in dividing the ceramic assemblage of the MSE area is the relationship between the rim diameter of the vessel (AP) and the maximum body diameter of the vessel (MBD). This relationship is called the aperture index (AI). Using a mathematical formula to determine the AI, we divided the ceramic assemblage into two main categories: open forms, where the rim diameter is bigger than the maximum body diameter, and closed forms, where the rim diameter is less than or equal to the maximum body diameter (Aston 1989: 424; Rzeuska 2006: 57). Besides these two categories, there are some pots that cannot be classified as containers due to their shape or construction, such as stands and lids. We classified these into a third category of non-containers. Lastly, our fourth category was for miniature vessels, which are small copies of true vessels.

Taking our four categories, the next stage was to divide each category into a specific group depending on the ratio of the vessel height (H) to its maximum diameter (MBD). This measurement is called the vessel index (VI) (Aston 1989: 425; Rzeuska 2006: 58). Using a mathematical formula to determine the VI, we divided the open form vessels into four groups: platters, plates, bowls, and beakers (bread molds and vats). The VI of plates and platters was more than

700, the VI of bowls between 500 and 150, and that of a beaker, less than 150. We grouped the closed form vessels into one overarching group of jars. The third category, non-containers, was divided into two groups: stands and lids. We only found the fourth category, the miniature vessels, in open forms of small plates and small red slip carinated bowls. The VI of the miniature vessels is as follows: for the open forms it is equal or more than 100, and for the closed forms it is less than 100. We used both primary and secondary features in subdividing the groups into sub-groups, types, and sub-types (see table 3.2).

The Fabric Groups of MSE

Just as with the form typology, we created a new system for the fabrics used in MSE ceramics, although there was already a system established for the HeG site by Wodzińska (2007b: 291–292). Again, the reason for this was to help us gain firsthand experience setting up our own typologies and classificatory systems. We provide comparative charts giving the equivalencies between the MSE fabric system and HeG fabric system (table 3.4), in addition to that of the Vienna system (table 3.5) (Bourriau and Nordström 1993: 147–190).

The term *fabric* refers to the physical composition and makeup of the clay used in the pottery. In the beginning we divided the Nile fabrics into four main groups and the marl fabrics into five groups, some of these groups with subdivisions. But during our analysis we discovered that we also had a mixed fabric that needed to be added. Because the bread molds were the most numerous type, we created a special group of fabric for their subdivisions. We also had a few ceramics dating back to the Buto-Maadi culture (three sherds, see Appendix 1 below). Because they were rare we did not give the fabrics a specific name, but describe them in the Appendix discussion.

We examined all samples on a fresh break of the sherd at 20× magnification using the Fieldlite microscope with a lens graticule.

We use the following terms when describing the composition and quantity of components within the fabric: a *little* or a *few* is estimated at less than 5 examples scattered over the break, while *plentiful*, *abundant*, *common*, or *large* means that one-third to one-half of the microscope view is covered with the inclusions. *Contiguous* means that the inclusions are so close that they touch. The dimensions of the inclusions vary from very fine, fine, and medium, to coarse (table 3.3)

Table 3.2. The MSE typology, showing reasons/factors for division.

CATEGORY	GROUP	SUB-GROUP	TYPE	SUB-TYPE
Open Forms	Platters	Platters (PT) <i>further divided by surface treatment into:</i>	PT1, PT2	
	Plates	Coarse plates with flat base (CP) <i>further divided by shape of base into:</i>	CP1, CP2	
		Bread Trays (BT) <i>further divided by height of walls into:</i>	BT1 <i>further divided by shape of rim into:</i>	BT1A, BT1B
			BT2	
	Bowls	Bowls with simple profile (B) <i>further divided by shape details into:</i>	B1, B2, B3	
			B4 <i>further divided by shape of rim into:</i>	B4A, B4B
		Bowls with internal ledge (BL) <i>further divided by shape of the rim into:</i>	BL1 <i>further divided by size of rim into:</i>	BL1A, BL1B, BL1C
			BL2, BL3	
		Carinated bowls (CB) <i>further divided by color into:</i>	CB1 White Carinated Bowls <i>further divided by fabric and rim shape into:</i>	CB1A, CB1B, CB1C CB1D, CB1E
			CB2 Red Carinated Bowls <i>further divided by fabric and shoulder shape into:</i>	CB2A, CB2B CB2C, CB2D
	Beakers	Bread Molds (BM) <i>further divided by shape into:</i>	BM1 <i>further divided by shape of rim into:</i>	BM1A, BM1B
			BM2	
			BM3	
		Vats (V) <i>further divided based on shape of the rim into:</i>	V1, V2, V3	
Closed Forms	Jars	Jars (J) <i>further divided based on shape into:</i>	J1, J2, J3, J4	
		Beer Jars (BJ) <i>further divided based on shape of the rim into:</i>	BJ1, BJ2	
Non-Containers	Stands	Stands (S) <i>further divided based on shape of the rim and surface treatment into:</i>	S1 <i>further divided by shape of rim into:</i>	S1A, S1B, S1C, S1D, S1E
			S2 <i>further divided by shape into:</i>	S2A, S2B
			S3	
	Lids	Lids (L) <i>further divided by fabric into:</i>	L1, L2	
Miniature Vessels	Miniature Vessels	Miniature Vessels (M) <i>further divided by shape into:</i>	M1, M2	

Table 3.3. The dimensions of the inclusions.

The dimensions of the minerals	The dimensions of the plants
Very fine < 4 gaps (1 gap = 0.050 mm)	Fine <2 mm = 40 gaps
Fine 4-5 gaps	Medium 2-5 mm = 40-100 gaps
Medium 5-10 gaps	Coarse >5 mm = > 100 gaps
Coarse > 10 gaps	

Table 3.4. A comparison between MSE fabrics and HeG fabrics (Wodzińska 2007b).

MSE Fabric Typology	HeG Fabric Typology	Remarks
None present	GN10	
None present	GN9	
1A	GN8	
1B	GN8	
1C	GN8	
2A	GN7	
2B	GN5	
3A	GN4	
3B	GN6	
4A	GN2	
4B	GN3	
4C	GN3	
5A	GM3	
5A (pink variant)	None present	Less fired than 5A
5B	GM2	
5C	None present	
5D	GM1	
5E	GM2	
None present	GM4	Local Giza marl
6A	None present	Mixed clay

Table 3.5. A comparison between the MSE fabrics and the Vienna system fabrics (Nordström and Bourriau 1993).

MSE Fabrics	Vienna System
1A	NC
1B	NC
1C	NC
2A	NB2
2B	NB2
3A	NB2
3B	NB2
4A	NB1
4B	NB1
4C	NB1
5A	MC
5A (pink variant)	None
5B	MA1
5C	Non
5D	MA2
5E	MA1
6A	None

(we borrowed the descriptions presented in Bourriau, Nicholson, and Rose 2000: 129). The *sorting* (well, poor, etc.) of the components or particles in the clay refers to their distribution throughout the body of the clay (even, uneven, etc.). Clays that are more thoroughly prepared and mixed will have a more even distribution of components. We refer to the *hardness* of both the clay fabric and the clay's mineral components with terms like *soft*, *medium*, *hard*, or *very hard*. Hardness is also often measured in Mohs' scale of mineral hardness, where a higher number (1–10) indicates a harder substance.

Group 1: Bread Mold Fabrics

Bread Mold Fabric 1A (Color Plate 9d)

This is the most common bread mold fabric within the assemblage. It is a Nile clay fabric, with components that are poorly or unevenly sorted throughout the clay, and it has open pores. The fabric contains large amounts of very fine, fine, and medium sand; a large amount of fine plant remains and also few medium- and coarse-sized plant remains; few limestone fragments of all sizes; a large amount of medium and few coarse-sized soft red-brown particles; very fine mica; and few medium and coarse-sized, rounded sand grains. Some of the limestone particles are decomposed.

Bread Mold Fabric 1B (Color Plate 9e)

This fabric is much less common than fabric 1A in this assemblage. It is a Nile clay fabric, much less porous and sandier than fabric 1A. The fabric contains a small amount of both very fine and fine sand; a large amount of medium and coarse sand; a few fine plant remains; a few fine, medium, and coarse-sized limestone inclusions; a little fine mica; and a few coarse, rounded sand grains.

Bread Mold Fabric 1C (Color Plate 9f)

This is the rarest of the bread mold fabrics within the assemblage. It is a Nile clay fabric; it has been well prepared by the potter so that it is dense, well or evenly sorted, and medium hard. The fabric contains abundant very fine and fine sand and fine plant remains; abundant very fine limestone particles; a few medium-sized soft red-brown particles; a large amount of very fine mica and very fine rounded sand grains; plentiful fine and a few medium black stone particles.

Group 2: Coarse Nile Fabrics

Coarse Nile Fabric 2A (Color Plate 9g)

The porosity is medium and the sorting is poor. The break is crumbly and not hard. This fabric contains: a little very fine, fine, medium, and coarse sand grains; plentiful fine and a few medium-sized plant remains; plentiful fine and medium limestone particles; a few fine soft red-brown particles; a little coarse red-brown rock particles; a few medium rounded sand grains; and a little very fine mica.

Coarse Nile Fabric 2B (Color Plate 9h)

The porosity is medium and the sorting is poor. This fabric contains: plentiful very fine sand and a little fine, medium, and coarse-sized sand grains; a few fine and medium-sized plant remains; plentiful very fine limestone and a few fine, medium, and coarse-sized limestone particles; a few medium-sized soft red-brown particles; a few medium and coarse rounded sand grains; a few fine gray-white particles; and a little very fine mica. There are a few very fine decomposed limestone particles and a few coarse elongated air-holes.

Group 3: Medium Nile Fabrics

Medium Nile Fabric 3A (Color Plate 9i)

This is medium fine Nile clay fabric with a few scattered fine plant remains and particles of sand and limestone. The fabric is used, in this case, for a bowl with a restricted shape. The fabric contains a few particles of very fine, fine, medium, and coarse-sized sand grains; a few fine plant remains; a few limestone particles of all sizes; a few fine soft red-brown particles; a few medium and coarse rounded sand grains; and very fine mica. It is of medium porosity and the sorting is fair. There are a few fine decomposed limestone particles.

Medium Nile Fabric 3B (Color Plate 9j)

This is a medium Nile clay fabric of medium porosity and fair sorting. It has more sand and plant remains than 3A. The fabric contains abundant very fine sand and a few fine particles of medium and coarse-sized sand grains; a large amount of fine plant remains and a few medium and coarse-sized plant remains; abundant very fine, fine, and medium limestone particles; a few medium rounded sand grains; a few very fine

black rock particles; and a few very fine, fine, and medium-sized particles of mica. It is crumbly, rather than hard, because of the quantity of sand.

Group 4: Fine Nile Fabrics

Fine Nile Fabric 4A (Color Plate 9k)

This is fine Nile clay fabric. It is well levigated and well prepared by the potter so that it is dense, well sorted, and medium hard. The fabric contains contiguous very fine sand and a few fine and medium particles of sand; a few fine plant remains; common very fine limestone particles and a few fine and medium limestone particles; a few fine soft red-brown particles; a few medium rounded sand grains; a few fine black rock particles; and a few very fine mica particles. It is dense with a few elongated air-holes and a few decomposed limestone particles.

Fine Nile Fabric 4B (Color Plate 9l)

This is also a well prepared fine Nile clay fabric, but is easily distinguished from fine Nile 4A because of the large particles of mica present. Mica appears in very fine particles in almost all fabrics, but the size and quantity visible to the naked eye in this case are exceptional. This example comes from a stand and a single sherd of a white carinated bowl.

The fabric contains contiguous very fine particles of sand and a few fine, medium, and coarse-sized sand grains; a few fine plant remains; a few limestone particles of all sizes; a few very fine soft red-brown particles; a few coarse rounded sand grains; a few medium black rock particles; a few very fine and fine-sized particles of mica; and abundant medium-sized particles of mica. It is dense and well sorted. There are a few coarse decomposed limestone particles.

Fine Nile Fabric 4C (Color Plate 10a)

The fabric contains plentiful very fine, fine, and a few medium and coarse-sized sand grains; a little fine and medium-sized plant remains; plentiful very fine limestone particles and a few fine, medium, and coarse-sized limestone particles; a few very fine soft red-brown particles; a few very fine red-brown rock particles; a few rounded sand grains; plentiful very fine black rock particles; plentiful very fine and a few fine mica particles. It is a dense clay, and it is well-sorted. There are a few fine and medium-sized air-holes.

Group 5: Marl Fabrics

Marl Fabric 5A (Color Plate 10b and d)

This fabric is a marl fabric with very conspicuous inclusions of fine decomposed limestone particles visible in the dark matrix. It is dense, well sorted, and medium hard. The presence of a few medium particles of unmixed clay is conspicuous and diagnostic for this fabric. It contains a little fine and medium-sized sand grains; a few fine plants remains; contiguous very fine and fine limestone particles, and a few medium-sized limestone particles; a few fine soft red-brown particles; a little fine mica; and a few medium particles of unmixed clay.

Marl Fabric 5A (pink variant; Color Plate 10c)

This is a marl fabric belonging to the 5A group but is less fired than marl fabric 5A. The fabric is dense, well sorted, and medium hard. There is much fine limestone but only some particles are decomposed. It was used for wheel made carinated bowls and jars.

The fabric contains a large amount of very fine sand particles; a large amount of very fine and a little fine limestone particles; a few fine soft red-brown particles; a few red-brown rock particles; a little very fine mica; and a little very fine black rock particles. There is a large amount of very fine and fine decomposed limestone particles, and a few fine and medium-sized air-holes.

Marl Fabric 5B (Color Plate 10e)

This is a dense and well-sorted marl clay. It is hard, thick-walled, and consistently fired. The fabric contains both common very fine and fine sand, and a few medium-sized particles of sand; common very fine and fine limestone particles and a few medium-sized limestone particles; a few medium-sized soft red-brown particles; a little fine and medium-sized red-brown rock particles; a few fine black rock particles; and fine mica. It has abundant medium-sized air-holes.

Marl Fabric 5C (Color Plate 10f)

This is the rarest of the marl fabrics present in the assemblage. It has conspicuous black inclusions which have been identified as particles of plant ash because of the tiny air-holes they contain. Otherwise the fabric is dense, reasonably well sorted, and medium hard.

The fabric contains a little very fine, fine, and medium-sized sand grains; a few fine plant remains;

abundant very fine and a few fine limestone particles; a few fine and medium-sized soft red-brown particles; a little very fine mica; and plentiful very fine, medium, and a few fine black rock particles. A few limestone particles are decomposed and there are abundant fine and a few medium-sized air-holes.

Marl Fabric 5D (Color Plate 10g)

This is a dense, well sorted marl clay, with few inclusions that measure larger than fine-sized. It was used for jars with a distinctive slip of a pink color overlaid with gray. There are very few—if any—plant remains present. The fabric contains abundant very fine and a few fine sand grains; a few fine plant remains; a few very fine, fine, and medium-sized limestone particles; a few very fine, fine, and medium-sized soft red-brown particles; abundant very fine and a few medium and coarse-sized red-brown rock particles; a little very fine mica; and a large amount of very fine, a little fine and medium-sized black rock particles. It is medium-hard. There are a few very fine decomposed limestone particles and also a few fine and medium air-holes.

Marl Fabric 5E (Color Plate 10h)

This fabric is filled with plentiful sand. The porosity is dense, and it is well sorted. The fabric contains plentiful very fine; a few fine and medium sand grains; plentiful very fine and a little fine limestone; plentiful very fine soft red-brown particles; plentiful very fine and fine black rock particles; plentiful very fine mica. The porosity is dense, it is well sorted, and medium hard. There are a few very fine and coarse-sized decomposed limestone particles and also a few fine and coarse-sized air-holes.

Group 6: Mixed Fabrics

Mixed Fabric 6A (Color Plate 10i)

This is a coarse sand fabric. The fabric contains a little very fine, fine, and plentiful medium and coarse-sized sand grains; a little fine plant remains; plentiful very fine, fine, and a few medium and coarse-sized limestone particles; a little fine, medium, and coarse-sized soft red-brown particles; a few medium rounded sand grains; little very fine and medium-sized black rock particles; and a few very fine mica particles. There are a few particles of crushed limestone. The porosity is dense and the sorting is medium hard. There are a few fine and medium-sized decomposed limestone particles.

Shaping Methods and Finishing Techniques

After examining the different shaping methods and finishing techniques used in the MSE pottery, we did further research on how these techniques are fully used by the potter. We give a brief explanation of these common techniques here for the benefit of other Egyptian colleagues who may not have direct access to the books we consulted.

Shaping Techniques

We recognized different techniques for the shaping and finishing of the vessels and their bottoms in the ceramic material of the MSE area. The shaping techniques included hand-shaping, shaping over a core, and throwing on the wheel; the finishing techniques included hand-finishing, scraping, trimming, cutting off the wheel, and pounding.

Hand-shaping

The majority of the pottery of the MSE area was handmade. Among the oldest handmade methods recognized in the MSE ceramics is the technique of pinching and hollowing. This method is a simple way for shaping vessels, especially small ones. The potter holds a rounded clay lump in the palm of one hand, and with the other hand makes a cavity in it with his thumb or fingers, and then squeezes it and makes a hollow, and continues by turning the clay lump in his left hand. He repeats this action many times to expand the cavity and to build the vessel's walls. Next he pats the bottom of the vessel to thin it out, while pinching the walls to thin them until it reaches the desired shape (Aston 1998: 28; Rice 1987: 125; Shepard 1980: 55). This technique is visible in the bases of the MSE beer jars.

The most popular method used in the MSE area pottery was the coiling technique. Here the potter rolls a piece of clay between both hands into a long, narrow cylinder. Holding these rolls from both ends, the potter builds the vessel by starting with one end between his thumb and fingers and coiling it around and around as he builds the pot walls up. After each coil the potter squeezes the joint between the new and previous coils (Shepard 1980: 58). This technique was used in building some parts of the MSE vessels, but not for the entire vessel, e.g., the walls of the beer jars, vats, and bread trays. Often we can still feel the coils in the walls of some of the MSE stands (Types s2 and s3), providing evidence that these types were at least partly coiled as well.

This technique has some general advantages. It gives the potter the ability to control the thickness of the vessel wall by controlling the length and diameter of the coils, and it is very useful in building up large pots like vats. As for disadvantages, coiling can allow for separations and cracks between the coils in the vessel walls, and it is a slower shaping method (Shepard 1980: 59).

Shaping over a Core

This idea is to take advantage of the shape of a block or core of wood (or fired clay or any other available material) in shaping a whole pot or part of it. The clay lump is put on the top of the core, then the potter presses it down with his hands to cover the core or part of it from all directions, using one or both hands to rotate the core. When finished, he cuts off the excess clay with a sharp tool. Subsequently the potter shapes the rim and then joins the two parts together with a patch of clay (Arnold and Bourriau 1993: 25, fig. 22). Conical bread molds and most likely red carinated bowls with sharp carinated shoulders are among the MSE vessels made with this technique. Pots made in this way often have thick walls and a smooth interior surface, with pressure/finger marks on the exterior (el-Sanussi 2008: 40).

Turning Device

This device could be a flat piece of wood, or an open pot (Hope 2001: 13), or any other thing larger than the diameter of the pot to be formed. It is used more as a way of pushing the clay than turning it as on a fast wheel. This technique does not produce central or parallel continuous rotation marks, but uneven and slow rotation marks (Arnold and Bourriau 1993: 36). It is used as a primary or secondary shaping process. This technique could be used to finish the rim and neck of some pots. Some rims of the MSE pottery are likely to have been made by this technique, such as the two sub-variants of red slip carinated bowls, the red slip carinated bowls with sharp shoulder made from marl clay (RCB1) and Nile clay (RCB3). Here the rim has been shaped on a turning device after the body of the bowl was shaped over a core.

Forming on the Wheel

The invention of the wheel represented a big leap in the field of pottery making. This is due to the presence of a center rotational pivot that produces a

symmetrical rotation, making the proportions of the pot more equal. Furthermore, a wheel helps in producing enough speed to make large quantities of pots in less time than was spent on the handmade methods (Hope 2001: 13).

The depiction of the potter's wheel in Ti's tomb from the 5th Dynasty shows that wheel consists of a platform and an axle, but it not obvious if that axle is fixed to the platform or not (Wodzińska 2010: 41). The potter sitting down in front of this wheel appears to be forming the pot with his left hand and turning the platform with the other hand (Holthoer 1977: 7, fig. 4). This type of wheel was used in Egypt during the 4th Dynasty (Aston 1998: 29).

Some MSE vessels have fine parallel lines on both surfaces, indicating the considerable rotational force placed while shaping them on a wheel. Among the MSE vessels using this technique are the miniature vessels, jars, some stands and some examples of the two red slip carinated bowl sub-variants—red slip carinated bowls with rounded shoulders made from marl clay (RCB2) and from Nile clay (RCB4).

Base Finishing Techniques

Due to the lack of complete pots or pots with complete profiles in the MSE corpus, we cannot go in depth into base finishing techniques. However we can make a few general comments.

Trimming

This is a method of cutting the bases of the vessels—especially those with a flat base—from the rest of the clay lump by using a knife or hard tool. The traces left by this method are indicated by straight parallel grooved lines over the entirety of the base (Wodzińska 2010: 42). This process occurs while the pot is still wet or after the leather-hard stage of drying. This method was used to trim the bases of some MSE vessels, such as the coarse plates and platters.

Scraping

Scraping is done by eliminating extra clay from the surface of the vessel in order to thin it using a hard tool while the pot is still wet or in the leather-hard stage of drying. It is always used with vessels shaped by coiling, molding, and pinching finishing techniques (Rice 1987: 137). The traces of scraping appear in a linear form. In the MSE corpus, this method is typical for the bowls with internal ledges, beer jars, and some of the

bowls with a simple profile. The difference between trimming and scraping is that trimming is a way to separate the base from the clay lump, but scraping is a way to shape the base by eliminating extra clay.

Cut from the Wheel

This method uses a thin string or another sharp tool to separate the pot from the wheel. The potter sometimes uses both of his hands to cut off the pot, and other times he uses just one hand (Holthoer 1977: 33, fig. 47). These pots are usually of medium and small size. Because the pot is cut while rotating, the resulting marks are indicated by spiral rings moving out away from the center of the base (Arnold and Bourriau 1993: 54). In the MSE corpus, we saw this method used with the miniature vessels.

Pounding

With this technique, the potter beats the clay lump either with his hand or an instrument (stone or wood) that has a slightly flat surface. He repeats that action many times to make the base flat. The traces left behind by this method on the surface of the base are traces of open palm strikes from the potter's hand, or strikes from the instrument. Also the surface will be uneven (Rzeuska 2006: 48). In MSE, this technique was used to form some of the bread trays, plates, and platters.

Surface Treatment

There are two main reasons a potter might apply a surface treatment to a pot. Firstly, to improve the function of a pot, for example, decreasing the porosity of the vessel by closing the pores of the clay via smoothing, burnishing, or polishing. A second reason is simply to decorate the surface and make a more attractive pot. Of course all of the treatments mentioned in the former instance can play a decorative purpose (Arnold and Bourriau 1993: 85).

The MSE potters used many different methods of treatment for most of the types present. But it is worth mentioning that they often left one side of some of the pots without any treatment, so that it was simply the natural surface of the clay, for the decorative effect it provided. For example, we saw this in the inner surface of the beer jars and the outer surface of some bread trays and bowls with internal ledges.

Smoothing

This is the simplest method of surface treatment for

improving the surface of the vessel. Traces of hand manufacture, such as coiling, pinching, and hollowing are very visible. However, in some cases the potter smoothed those using a wet hand or a wet piece of cloth or leather while the surface was still moist (Shepard 1980: 66). The potter sometimes smoothed the pot on both sides, as we found in some of the MSE bread trays and bowls, or on one side alone, such as with the bread molds, beer jars, and some of the jars, platters, and stands.

The Use of Slip

Slip is an extra layer of clay and water covering the surface of a vessel that can sometimes be colored by pigment. It is added before the pot is fired (Arnold and Bourriau 1993: 86). The color of the slip can vary depending on several factors, including pigment color and firing conditions. If the firing took place in an oxidizing atmosphere, the color will be similar to the original pigment color or slightly darker, but if the firing is done in a reducing firing atmosphere, the color will take on shades of gray (Rzeuska 2006: 54).

We found two colors of slip in the MSE corpus: red, made from red ochre; and white, made from calcite or gypsum. Red is the most common, and was present in plates, platters, red slip carinated bowls, bowls with simple profiles, vats, and stands. Most of these types were covered with red slip on both surfaces, but sometimes, as with some of the jars, only on one side. White slip is very rare and only represented in the white carinated bowls.

White Wash

White wash is also a thin coating layer containing pigment and water, but it is added after firing (Arnold and Bourriau 1993: 86). It was added by swabbing the surface of the vessel with a piece of cloth or by the potter's wet hand (Aston 1998: 30). It is less common than other surface treatment methods, but is typical for bowls with internal ledges in the MSE corpus.

Scum (Self Slip)

Scum, or self slip, is a phenomenon that can occur during the drying stage, when water added to the clay before the shaping process escapes to the surface of the vessel carrying soluble salts that stay on the pot's surface (Shepard 1980: 193). This is typical in the MSE corpus for some bread trays and jars.

Burnishing

Burnishing was used to improve the surface of a pot by scraping or pressing on the surface in a zigzag motion with a hard tool like a pebble or a piece of wood, in order to decrease the porosity of a vessel or for decorative purposes. Traces of burnishing are easily noticed (Hope 2001: 22). The process of burnishing is done during the leather-hard stage while the surface is still slightly soft (Arnold and Bourriau 1993: 85). For MSE, it is typical of the types that have red slip, for example, some of bowls, jars, stands, and miniatures.

Polishing

This method is similar to burnishing. It is also used to improve the surface of the vessel, but the difference between burnishing and polishing is that the latter gives the vessel surface a uniform luster by rubbing the surface with a piece of cloth or leather before firing (Shepard 1980: 66). It was also typical in the MSE corpus for red-slipped types, such as some of the red carinated bowls, stands, bowls, jars, and miniatures.

MSE Pottery Forms

Here we describe the pottery types and their various sub-groups. We discuss the frequencies of these types in the MSE assemblage and how they were made. We also look at their wider context where possible and examine how these types compare to the rest of the HeG assemblage and to other known Old Kingdom sites.

Category: Open Forms

Group: Platters

Sub-Group: Platters (PT)

Platters are open vessels with no walls and flat bases, where the rim diameter is equal to the base diameter. The MSE platters are made of coarse Nile fabric. They were pounded, and then the rim was shaped with a hard tool.

They can be subdivided into two types on the basis of the surface treatment:

1. uncoated platters (PT1; Pl. 1a)
2. red-slipped platters (PT2; Pl. 1b, Color Plate 1a, 1b)

The first type, PT1, has a rim/base diameter ranging from 32 to 36 cm. The total height of the vessel is approximately 1.8 cm. The majority of these platters are made of Coarse Nile Fabric 2B. The interior

surface was smoothed while wet (wet-smoothed) and the exterior was untreated. They are not well fired.

The second type of platter, PT2, has a rim/base diameter ranging from 33 to 36 cm. The total height is approximately 2 cm. The most characteristic fabric for this type is Coarse Nile Fabric 2A. The inside surface is covered with red slip and it has a red band around the rim on the outside. There is a groove close to the edge of the rim on the inside. Additionally, some examples are burnished inside.

Types PT1 and PT2 are the same as type CD1 in the HeG typology (Wodzińska 2009a: fig. 1). Type PT1 has a good comparative in Wodzińska 2010: 363, pl. 19.11 [1321]. There is a good parallel from Dahshur (Faltings 1989: 146, Abb. 10b, A49). For type PT2 (Wodzińska 2009a: fig. 1), MSE Number 134 (Pl. 1b) has a parallel from elsewhere in the HeG site (Wodzińska 2010: 363, pl. 19, 6 [2853]) dated to the 4th Dynasty. Another 4th Dynasty parallel is from Abu Rawash (Marchand 2009: 83, 87, class 3).

The platter could have been used for serving food (Wodzińska 2007b: 299), but the existence of two different types, one with a wet-smoothed inner surface and the other with a red slip inside, may indicate that they served different purposes. Future studies are needed to solve this issue.

Group: Plates

Sub-Group: Coarse Plates with a Flat Base (CP)

This sub-group is characterized by a simple rounded rim, flaring wall, and a flat base. Some of these plates have a groove on the inside, either close to the edge of the rim or between the wall and the base. The majority of the sherds of this sub-group were very small fragments, making it difficult to know the exact rim diameter of most of these plates. We estimate the rim diameter of this sub-group as ranging between 26 to 35 cm. The total height is 2 cm on average. This sub-group is made exclusively of Nile clay. They are made from both coarse and medium Nile clay 2A and 2B—with type 2B being more common—in addition to one example of fine Nile clay, 4A. All these fabric types were used in all examples of the coarse plates with flat base, meaning that there are no specific types of clay used for one particular sub-group. Most of these plates were hand built in two parts: the wall was coiled, and the base was pounded and later scraped on the outside with a hard tool. Some of them were finished on a simple wheel. Most of the vessels of this sub-group

were covered on one or both sides with a red slip.

Coarse plates with a flat base are divided into two types on the basis of both shape and base:

1. Plates with flaring rim and wall, and prominent base (CP1; Pl. 2a)
2. Plates with flaring rim and wall and a plain base (CP2; Pl. 2b, c, d, e)

The rim diameter of the first type, CP1, ranges from 30 to 35 cm. The vessel height is 2 cm approximately. The second type, CP2, has a rim diameter ranging from 29 to 32 cm. The height ranges from approximately 1.8 to 2.2 cm.

The surface of these plates in general was covered with red slip on both the inside and outside (CP2). Some of them were smoothed only on the inside and the outer surface left untreated (CP1). And some others were covered with red slip on the inside and the upper part of the outside, with the remainder left untreated (CP1). Most of these were fired in medium temperatures, but some are highly fired.

This sub-group corresponds with types CD1 and CD2 in the HeG's typology (Wodzińska 2007b: 298–299). The first type (CP1) has one example in the MSE corpus. MSE Number 138 (Pl. 2a) has a parallel from other parts of the HeG site (Wodzińska 2010: 365, 363, pl. 19.4 [887]) and also from Nazlet es-Samman (Hawass and Senussi 2008: 178, fig. H 15). There are four MSE examples for type CP2. The first is MSE Number 134 (pl. 2b), with parallels from the 4th Dynasty from other parts of the HeG site (Wodzińska 2007b: 301, fig. 11.15). The second is MSE Number 141 (pl. 2e). It has a good parallel from the Menkaure Valley Temple (Reisner and Smith 1955: 86, fig. 125, [14-1-25]), and another from the HeG site (Wodzińska 2010: 364, pl. 20, 6). Both date to the 4th Dynasty. Also it has parallels from Abusir (Charvát 1981: 247, pl. 28j, 166) and Abu Ghurab (Kaiser 1969: 77, LIII: 256). The third one is MSE Number 139 (pl. 2c). It has a parallel from the lower cemetery of the pyramid builders (Hawass and Senussi 2008: 73, fig. 215). The fourth example is MSE Number 140 (pl. 2d). It has a good parallel from the HeG site (Wodzińska 2010: 364, pl. 20, 5 [6016]).

The main function of the coarse plates with flat bases is for serving food. Many tomb scenes show these plates used as a tray filled with different kinds of breads and food, e.g. the scene showing Kanofer, the owner of tomb G2150, sitting in front of an offering table filled with many kinds of foods (Reisner 1942: 439, fig. 259).

Sub-Group: Bread Trays (BT)

These are open vessels with both low or high walls and flat bases. Nile clay is used exclusively for making this type. The most common fabric is coarse Nile fabric 2B. There are a few examples of coarse Nile fabric 2A used only in type BT2A. Medium fine Nile clay 3B is used exclusively in type BT1A. All the bread trays are handmade by coiling, with a base made by a pounding technique. Their surfaces are either smoothed or covered with a kind of whitish or grayish “self slip” or scum (see discussion below).

Bread trays in the MSE area are very common and have different shapes. We divided them into two main morphological types depending on the height and shape of their walls.

1. Bread trays with short walls (BT1):
 - a. Bread trays with sloping flat rims (BT1A; Pl. 3a, Color Plate 2a)
 - b. Bread trays with rims narrowing toward the top (BT1B; Pl. 3b, Color Plate 2b)
2. Bread trays with high walls (BT2; Pl. 3c)

The rim diameter of the bread trays with sloping flat rims and short walls (BT1A) varies between 30 to 36 cm; their total height is 3.6 cm on average. This type is the most common among the bread tray types. The rim diameter of the bread trays with a rim narrowing toward the top and short walls (BT1B) varies between 30 to 36 cm; the total height is approximately 4 cm. Those with high walls and flat rim (BT2) may have an oval shape. The total height is almost 6 cm, and the average thickness is about 2 cm.

The BT1A, BT1B sub-types and the BT2 type are comparable with the F1A, F1B, and F1C types, respectively, in the HeG typology (Wodzińska 2007b: 306). There are two additional bread tray types from the HeG typology that did not exist in the MSE area, F1D and F1E (Wodzińska 2010: 202). This may be due to their general rarity across the HeG site.

The three bread tray types found in the MSE area have good parallels in the pottery found at Al-Shaykh Saaid/Wadi Zabayda (Willems et al 2009: 311, figs. 11d, e, f). Sub-type BT1A has a parallel from the cemetery of the pyramid builders in Giza (Hawass and Senussi 2008: 30, 58, fig. 112). Sub-type BT1B has a parallel from Abusir (Bárta 1996b: 154, pl. I, class 6, E-LIII). Type BT2 is comparable with type xxvi from the corpus found in the Menkaure Valley Temple (Reisner 1931: 223, fig.

71), and additionally, examples from Qua (Brunton 1927: pl. XIII: 1N), Nazlet es-Samman (Hawass and Senussi 2008: 137, 156, fig. A28), and Balat (Soukiassian, Wuttman, and Pantalacci 2002: 506, fig. 346).

Bread trays (or *aprt* trays) were used mainly for bread baking, but some of these trays have burnt marks on the inside, perhaps indicating a secondary function as portable ovens for baking or warming food. There are parallels found at west Saqqara dating to the late 6th Dynasty (Rzeuska 2006: 398, forms 47, 59–64).

Group: Bowls

We divided our bowls into three sub-groups based on the shape and form of each bowl.

Sub-Group: Bowls with a Simple Profile (B)

This sub-group of bowls has a simple contour and a characteristic smooth outline. However there are some variations between these bowls, among them are the size, the profile of their walls, and shapes of their rims. Nile clay is the exclusive clay used in making these bowls. The main fabrics used in all types of these bowls are medium fine Nile clay 3A and 3B, but there are other fabrics used for special types mentioned below. Most of these bowls are thrown on a simple wheel. The surface of these bowls is commonly covered with red slip on both sides, but some exceptions will be described below.

Vessels belonging to this group have differing morphological criteria. We divided them into four types depending on the outline of the wall and the shape of the rim:

1. Bowls with edged rim (B1; Pl. 4a, b)
2. Bell-shaped bowls (B2; Pl. 4c)
3. Bowls with slightly flaring wall (B3; Pl. 4d, e, f, Color Plate 3a, b, c)
4. Bowls with inward facing walls (B4)
 - a. Bowls with simple rims and hemispherical bodies (B4A; Pl. 4g, h)
 - b. Bowls with molded rims (B4B; Pl. 4i, j)

The bowls of type B1 have a flattened rim and slightly inward curving walls; the bases were not preserved in the examples we studied. The rim diameter ranges from 26 to 31 cm, with a wall thickness of 0.8 to 1.5 cm on average. Type B2 is a bowl with a flat rim

and flaring walls. The rim diameter ranges from 18 to 25 cm. Type B3 has a rim diameter ranging from 15 to 26 cm. The last type—bowls with inward facing walls (B4)—has two different shapes that we further subdivide: bowls with simple rims and hemispherical bodies (B4A; Pl. 4g, 4h), and bowls with molded rims and inward facing walls (B4B; Pl. 4i, 4j). The rim diameter of both ranges from 18 to 25 cm.

Coarse Nile clay 2A fabric and fine Nile clay 4A fabric are rarely used in type B1. Additionally, fabric 4A is rarely used in types B4A and B4B. Type B1 is usually smoothed on both sides, except for a few examples that are coated in red slip on both sides. Moreover, types B4A and B4B also had a few sherds that were smoothed on both sides.

All of the MSE bowl types have parallels in the HeG typology. Type B1 corresponds with type CD11 in the HeG typology (Wodzińska 2010: 376, pl. 32). Type B2 is equal with type CD23; it matches Wodzińska's example 9 (2010: 385, pl. 41). Type B3 corresponds with type CD23 (Wodzińska 2010: 384, pl. 40, 1). Sub-type B4A corresponds with type CD20 (Wodzińska 2010: 378, pl. 34, 11). Sub-type B4B corresponds with type CD23 (Wodzińska 2010: 386, pl. 42, 1).

There are parallels from outside the HeG site as well. Type B2 is analogous to examples from the cemetery of the pyramid builders in Giza (Hawass and Senussi 2008: 25–26, 46, 49; figs. 26, 29, 49, 52). Sub-type B4 has a parallel in Nazlet el-Samman (Hawass and Senussi 2008: 138, 148, 158, 185, figs. A 36 and H 67). Sub-type B5 also has a parallel from Nazlet es-Samman during the same period (Hawass and Senussi 2008: 146, 180, fig. H 24).

The function of the bowls with simple profile from the MSE area is unclear. Comparison with the types from the HeG typology and other sites suggest, however, that their functions could vary, but they were most often used for serving, storage, cooking and warming food (Wodzińska 2010: 147, 154, 165).

Sub-Group: Bowls with Internal Ledge (BL)

This bowl has an internal ledged rim, flaring walls, and a flat base. Area MSE has a few sherds of this type preserved as complete profiles, but the majority of identified fragments were rim sherds. This group belongs to a type of pottery that Wodzińska believes can be found in both settlement and funerary contexts (Wodzińska 2009a: 217). The oldest examples of this type date back to the Nagada period (Köhler 1998: pl. 34).

The typical fabric for this type of vessel are the medium Nile fabrics 3A and 3B. Some are made of fine Nile fabric 4A and some of coarse Nile fabric 2A. The internal ledge bowl is wheel-turned, and the bases are always trimmed with a tool.

We divided the bowls with an internal ledge into three types:

1. Bowls with a simple rim (BL1; Pl. 5a). These are sub-divided into three sub-types according to size.
 - a. Bowls with a c. 20 cm rim diameter (BL1A, Color Plate 3e)
 - b. Bowls with a c. 26 cm rim diameter (BL1B)
 - c. Bowls with a c. 32 cm rim diameter (BL1C, Color Plate 3d)
2. Bowls with rounded rim (BL2; Pl. 5b)
3. Bowls with thick rim (BL3; Pl. 5c)

The interior and exterior surfaces of sub-type BL1A are generally smoothed. Two MSE examples of this sub-type have a white slip. The majority of our examples of sub-types BL1B and BL1C were left uncoated, but some fragments are covered with a red slip on the inside. One piece of a BL1C bowl is covered with a white slip. The rim diameter of type BL2 is 32 cm. The rim is covered with red slip inside. The rim diameter of type BL3 is 29 cm. Both surfaces are wet smoothed.

The most common type of internal ledge bowl is type BL1 (represented by approximately 20 bowls) and the least common is type BL3, represented by only one part of a bowl.

These bowls were probably used for food consumption but could also have a secondary function as lids (Baud et al. 2003: 49). Some of the internal ledge bowls have burn marks inside the rim and interior surface; this may indicate that these vessels were also sometimes used as lamps. The blackened areas correspond to the level of the flammable substance inside.

The internal ledge bowls from Area MSE have parallels from within the larger corpus of mid to late 4th Dynasty ceramic material found at the HeG site. Type BL1 is similar to HeG CD32A type, the most common subgroup type at the HeG site (Wodzińska 2007b: 304). Type BL2 is similar to HeG type CD32B (Wodzińska 2007b: 296) and type BL3's parallel from the HeG site is CD11 (Wodzińska 2007b: 292). Types BL1, BL2, and BL3 also have parallels from Abu Rawash

(Baud et al. 2003: 49; fig. 15 [28–30] and [27–29], respectively) dating back to the 4th Dynasty. By the end of the 4th Dynasty, this type of bowl had started to disappear (Raue 1999: 183; Willems et al 2010: 311).

Sub-Group: Carinated Bowls (CB)

Type: White Carinated Bowls (CB1)

White carinated bowls have a hemispherical body shape and rounded base (Wodzińska 2006a: 408). The production of about 95% of this type of bowl is in a Nile clay fabric. They are covered with a pinkish-white coat on both the inside and outside surfaces, and have a rounded bent shoulder (Wodzińska 2006a: 409–410), hence their name.

These are called CB7 bowls in the HeG typology (Wodzińska 2006a: 408). There are traces of trimming on the base of the bowls and smoothing on the inside surface. Marks between the body and the upper part of the bowl allow us to say that the body was first hand-shaped while the upper part was turned. This shaping technique reminds us of the shape of the early Meidum bowls of the 4th–5th Dynasties; the technique used a core or a hump for its main production and the bowl was then turned (Arnold and Bourriau 1993: 21–22). The rim diameter of the bowls ranges between 12 and 32 cm. The excavation of Area MSE at Giza did not produce any complete examples of white carinated bowls. Therefore the classification proposed by AERA's ceramicist for these vessels from the HeG site will be used in the present report (Wodzińska 2006a: 408, table 1). In the MSE typology white carinated bowls (CB1) are divided into five sub-types. The first three (CB1A–CB1C) consist of bowls made of Nile fabric. These three sub-types are further differentiated by the shape of the rim. Sub-types CB1D and CB1E are made up of bowls produced of marl clays. These two sub-types are further divided according to variations in the fabric.

1. White carinated bowls, Nile fabrics:
 - a. white carinated bowls with a flat rim (CB1A; Pl. 6a, Color Plate 4a, b)
 - b. white carinated bowls with a rounded rim (CB1B; Pl. 6b, Color Plate 4c)
 - c. white carinated bowls with a pointed rim (CB1C; Pl. 6c)
2. White carinated bowls, marl fabrics:
 - a. white carinated bowls made of Fabric 5A (CB1D; Pl. 6d)

- b. white carinated bowls made of Fabric 5B (CB1E; Pl. 6e)

In addition to variations in rim shape, white carinated bowls also exhibit variability in the height ratio between the rim and the shoulder, which may indicate production by different potters. The white carinated bowls made in Nile fabrics are perhaps an imitation of those made in marl clays. Three sherds of white carinated bowls have a potmark on their exterior surface (see the details in the potmark section), MSE Nos. 94, 95, and 126.

Parallels for the MSE white carinated bowls appear in the Gebel el-Qibli worker's cemetery site at Giza, also dating to the 4th–5th Dynasties (Sherif Abd el-Monaem, personal communication). Parallels outside of Giza occur at three other sites. The first is al-Shaykh Saaid in the Mynia governorate (Vereecken 2011), the second is the Wadi Garawi site in Helwan (Wodzińska 2006a: 418), and the third is the Kom el-Fakhry site at Mit Rahina (Rzeuska and Soliman 2013). The Wadi Garawi material comes from what has been interpreted as a late 3rd, or more likely early 4th Dynasty, context. On the basis of such a restricted distribution in both time and space, Wodzińska argues that the production of the white carinated bowls was confined to the time of the 4th Dynasty and to the Giza area (Wodzińska 2006a: 405). The white carinated bowls may have been used for daily food consumption, but the marl ones could be used for keeping liquids because they are less porous (Wodzińska 2006a: 415).

Type: Red Slip Carinated Bowls (CB2)

These are an open form bowl with a carinated profile or s-shape, a recurved rim, and a rounded base. The type varies by shape, but the common feature for all of these bowls is the color of the slip covering the surfaces. It ranges in color between the shades of brown-red and orange-yellow, but a red color is the most typical. Some bowls were fired in a reducing atmosphere, resulting in the red color of the slip turning dark brown or light black. Another typical feature for this type is the surface treatment, which is mostly polished or burnished, but we will discuss the surface treatment in details under each sub-type.

The red-slipped carinated bowls are typical of the Old Kingdom in both cemeteries and settlement sites (Op de Beeck 2004: 239). They are called Meidum bowls because W. M. F. Petrie found many examples of

this shape in the so-called foundation deposits of the pyramid of Sneferu at Meidum (Petrie, Mackay, and Wainwright 1910: 36).

The first appearance of this customary shape of red slip carinated bowl was in the 3rd Dynasty (Sterling 2004: 63), but Op de Beeck (2004: 242–43) and Hendrickx et al. (2002: 277) believe that the type occurred from the 1st Dynasty onward. The decline of this type paralleled the end of the Old Kingdom and the beginning of the early First Intermediate Period (Bader 2009: 30; Ballet 1987: 16).

No complete example of a red-slipped carinated bowl was recovered from Area MSE. The majority of the sherds are tiny, making examination of the material problematic. The fragments are usually too small to establish either the proportions or the exact morphology of the pots. As a result, it is impossible to classify all the sherds to certain types.

We divided the red-slipped carinated bowls into bowls made of marl clays and bowls made using Nile fabrics. We then further divided these into sub-types according to the morphology of the rim and shoulder.

1. Red slip carinated bowls, Nile fabrics:

- a. red-slipped carinated bowl with a sharp shoulder (CB2A; Pl. 7a)
- b. red-slipped carinated bowl with a round shoulder (CB2B; Pl. 7b, c, d, Color Plate 4d)

2. Red slip carinated bowls, marl fabrics:

- a. red-slipped carinated bowl with a sharp shoulder (CB2C; Pl. 7e, f, Color Plate 4e)
- b. red-slipped carinated bowl with a round shoulder (CB2D; Pl. 7g)

1. *Red Slip Carinated Bowls, Nile Fabrics*

This grouping represents the largest percentage of the type of red-slipped carinated bowl, its fabrics range between groups 3 and 4 of the Nile clay fabrics.

Most of the bowls of this grouping are thrown in one piece, but a few bowls were made in two parts. The rim shows wheel marks while the rest of the body shows no wheel marks and the outside shows traces of scraping friction. These are similar to the marl fabric bowls.

2. *Red Slip Carinated Bowls, Marl Fabrics*

We cannot say much about this type, but one point is worth mentioning. Carinated bowls with a sharp

shoulder, made of marl clay, are the most common of the marl clay RCB bowls, a point that agrees with Wodzińska's analysis of the HeG corpus (2007b: 299). The most common fabric is 5B, with fabrics 5D, 5A (pink variant), and 5E also being used. The rarest one is mixed marl fabric 6A. Regarding the HeG fabric typology, the fabrics GM1 and GM2 are used in this type (Wodzińska 2007b: 299), so our 5A pink variant and mixed clay 6A are used for the first time in HeG in the MSE area. Most of these bowls are made in two parts: the body made over a core and a rim made on a turning device added secondarily (Arnold and Bourriau 1993: 21).

The majority of the CB2C and CB2D examples have a pink or red slip, and they are burnished on both surfaces. Additionally, some bowls are polished either only on the outside surface or on both surfaces.

The most common sub-type is CB2B, the bowl with a rounded shoulder. A great number of the bowls are polished on both surfaces or on the outside only. A few examples are burnished on both surfaces.

The majority of the red-slipped carinated bowls from the MSE area have specific morphological criteria that are characteristic for the 4th Dynasty. The bowls are shallower than the previous period and the neck is higher and less developed. An angular shoulder is also characteristic of this period (Op de Beeck 2004: 270).

The form of our red slipped carinated bowls is equivalent to type CD6 in HeG's typology (Wodzińska 2007b: 299), and Reisner identified it as a type C-XXXII (Reisner and Smith 1955: 61). Other parallels related to the 4th Dynasty include: Giza (Kromer 1978: pl. 23, 4; Wodzińska 2007b, forms CD6-A, CD6-B: 299), Meidum (Petrie, Mackay, and Wainwright 1910: pl. xxv, 42T), Qau (Brunton 1927: pl. XIII, 38L2, 3264), Abu Rawash (Marchand 2009: 86), Abu Ghurab (Kaiser 1969: 79–80, Abb. 8, Abb. 9, XIV-92), Dahshur (Faltings 1989: 145, Abb. 9b), al-Shaykh Saaid (Willemms et al. 2009: 309), and Elephantine (Raue 1999: 184, 186, Abb. 39, 40). Similar shapes were also found at Nuwayrāt (De Meyer et al 2011: 688–689, fig. 3).

The high quality of the vessels implies that they were used as tableware for serving food (Balcz 1932: 80, Abb. 4, 10; Bourriau 1981: 52). Additionally, tomb scenes indicate many other functions, such as for milking, or use as a flowerpot, and large versions of this bowl have traces of soot, indicating use as a cooking pot (Hendrickx et al. 2002: 279).

Group: Beakers

This group consists of two sub-groups with totally different functions; the first sub-group is bread molds and the second is vats.

Sub-Group: Bread Molds (BM)

Bread molds are the most common among the MSE pottery types, representing about one-third (32.48%) of the total percentage of the MSE pottery assemblage. This large quantity led us to separate them from the rest of the ceramic material by creating a specific “bread mold fabric” system that only includes Nile fabric (Bread mold fabrics 1A, 1B, and 1C).

The bread mold was made by molding over a core and smoothed inside by adding very finely-levigated clay; the exterior is rough and uneven (Jacquet-Gordon 1981: 11). The MSE bread molds were divided according to fabric, but shape was also taken into consideration. They include the following:

1. Bread molds of fabric 1A (BM1)
 - a. Bread molds with a flat bottom inside and external sloping flat rim (BM1A) (BM1; Pl. 8a, b)
 - b. Bread molds with a conical bottom inside and internal sloping rim or straight flat rim (BM1B; Pl. 8c, Color Plate 5a)
2. Bread molds of fabric 1B with a conical bottom inside and rounded rim (BM2, Pl. 8d)
3. Bread molds of fabric 1C (BM3, Pl. 8e)

Sub-type BM1A is the most common among all the bread molds and is the largest one in size. It is made of a poorly levigated Nile fabric, bread mold fabric 1A. The vessel walls are very thick (more than 2 cm) and the maximum diameter of the rim is 36 cm. We do not have a complete profile of this type of vessel; however from complete vessels found in other parts of the HeG site, its rim diameter averages between 27–36 cm (Wodzińska 2009a: 211). Sub-type BM1B is less common than the sub-type BM1A. It is made of bread mold fabric 1A and has a flat rim. The diameter of the rim is c. 20 cm, with a total height of 19 cm.

The second type, BM2, is made of bread mold fabric 1B, which is sandier than bread mold fabric 1A. BM2 has a round rim with a diameter of 12 cm and a total height of c. 18 cm.

The last type of bread molds, BM3, is made of bread mold fabric 1C. It is the most well-prepared among the bread mold fabrics, but also the rarest

within the assemblage. The diameter of the rim measures 20 cm, but neither the height nor the shape of the inside of the bottom is known.

When we compare the size of our conical bread molds with the other areas within the HeG site we find that the first sub-type (BM1A) is among the larger sizes known and is similar to HeG type F2C, whose height is 27–36 cm with a rim diameter measuring between 33–36 cm (Wodzińska 2007b: 306). The very distinctive feature of these large bread molds is the flat interior bottom, which is unique and known only from two sites that date to the second half of the 4th Dynasty, Giza (Wodzińska 2009a: 211) and Deir el-Bersha (Willems et al. 2009: 313, figure 11, B).

Conical bread molds from Area MSE are also open forms. The development of vessels in this group seems to have begun in the Archaic Period (Bárta 1995a: 21). Sub-type BM1B (which is made of bread mold fabric 1A and has a flat rim) and type BM2 (made of bread mold fabric 1B and has a rounded rim) seem to be close to the HeG F2B type. F2B's rim diameter measures 18–20 cm and its height, 18–19 cm. The HeG F2A type measures 10–14 cm in rim diameter and 9–10 cm in height, respectively (Wodzińska 2007b: 306).

The small size of the BM3 sample makes it difficult to compare its fabric to those from the rest of the HeG site. Its rim diameter (20 cm) indicates that it is close to the HeG F2B type (Wodzińska 2007b: 306).

Sub-Group: Vats (V)

Vats are closed forms. They are large holemouth forms with narrowing rims in different shapes. No complete profiles of vats were preserved in Area MSE but we know from other HeG parallels that such vats had flat bases (Wodzińska 2009a: 210, fig. 1).

The vats from Area MSE are all made of Nile fabrics of varying quality. The majority of the vats with flat rims are made of the coarse Nile fabric 2A. Those with rounded and grooved rims are made of the medium Nile fabrics 3A and 3B. Large-sized pots such as the vats could not be made from a single lump of clay; they were always made by coiling. In general, rope traces can be observed on the outer surface in the middle part of the vat. The rope helps the vessel to retain its shape until completely dry (Arnold and Bourriau 1993: 91). The vats from Area MSE are usually red-slipped. In some cases, however, they are simply smoothed without any other form of surface treatment. The vats with rounded and grooved rims are

covered with a red slip on both the inside and outside, and are usually well polished on both surfaces. Usually vats were well fired, but some present a black core in the sherd break.

Additionally, Old Kingdom tomb scenes show very clearly that vats were used as dough containers in scenes of bread production and also as containers in scenes of beer and wine production (Faltings 1998: 92–111). Some vats have burnt surfaces and traces of burning on the rims. These could be related to the firing activities that happen when the vats were used for cooking (Paice 1997: 13, fig. 9).

Area MSE did not produce a complete vat or a complete profile of a vat. The shape is represented by about 40 rim sherds of different types. We divided the vats into three types according to the shape of the rim:

1. Vats with a flat rim (v1; Pl. 9a, Color Plate 5c)
2. Vats with a rounded rim (v2; Pl. 9b, Color Plate 5d)
3. Vats with a grooved rim (v3; Pl. 9c)

The rim diameter of the first type (v1) is 42 cm. The most frequent type of vats is v2, representing 74.6% of the vat assemblage; its rim diameter measures 37 cm. The rim diameter of the last type (v3) is 34 cm.

The scarcity of vats in Area MSE is striking, especially when compared to what has been observed in the adjacent area of EOG. In effect, in the latter area, vats were extremely numerous and represented by complete vessels and complete profiles (A. Wodzińska, personal communication). Parts of Area EOG have been interpreted as bakeries (GOP3: 44–58). In Area MSE, there are no bakeries (Abd el-Aziz, this volume). The striking difference in the total proportion of vats in both areas can be explained by the different function of each. Vats are numerous in Area EOG because the mixing of the dough was carried out in the bakeries. On the contrary, they are rare in Area MSE, and this may be interpreted as reflecting the absence of bread or beer production.

Vats with a flat rim (v1) are found in the 4th Dynasty from the tomb of Hetepheres (Reisner and Smith 1955: fig. 71, No. 1199/45). Vats with a rounded rim (v2) are found in Saqqara from the late Old Kingdom (Rzeuska 2006: 320) and from Abu Rawash (Marchand 2009: 90). Vats with a grooved rim (v3) are found in the cemetery of the workers in Giza (Hawass and Senussi 2008: 236, type E3) and from Nazlet el-Samman (Hawass and Senussi 2008: 235, A33).

Summarizing, vats from Area MSE represent an insignificant percentage of the whole assemblage, and the traces of burning on some rims could be an indicator for the usage of the vats in a bakery.

Category: Closed Forms

Group: Jars

Sub-Group: Jars (J)

The jars group is varied but their most common feature is that their maximum diameter is usually situated at their shoulders. Also their walls are hard and the fabrics tend to be less porous in order to keep liquids inside. All jars have necks but there can be different shapes to the rims. Their bases can be pointed, rounded, or flat. Most of them are found in both settlements and funerary/sacral contexts.

The MSE jars are made in a variety of fabrics, Medium Nile 3A and fine Nile 4A fabrics. The marl fabrics are represented by 5D fabric. Usually the outer surface is carefully finished while the inner surface is just smoothed. All the jars are wheel made, with wheel marks visible on the interiors and exteriors of the pots. The bases are both scraped and smoothed on the outside.

In terms of abundance, the sub-group of jars are in eighth place among all types in MSE. No complete jars or complete profiles were recovered, and because of this it is difficult to create any reliable typology of jars. We were able to reconstruct only one example of a J4 jar. Our jar typology is divided as follows:

1. Jars with rounded rims (J1; Pl. 10a, Color Plate 6a)
2. Jars with a triangular rim (J2; Pl. 10b)
3. Jars with a pointed rim and a collared neck (J3; Pl. 10c)
4. Jars with a spout (J4; Pl. 10d)

Type J1 is a jar with a rounded rim and short neck, the rim diameter of this sub-group ranges from 10 to 11 cm. In the MSE corpus, these were made of medium Nile clay 4A, but according to Wodzińska this type is made of both Nile silt and marl clay fabric (Wodzińska 2010: 58). All the examples of this type were red coated outside and smoothed inside. This type was also found in 4th Dynasty deposits at Dahshur (Alexanian 1999: 139, fig. 57, M70) and Giza (Kromer 1978: 71, pl. 20, 2).

Type J2 is a jar with a triangular rim with a diameter of 11 cm, made of marl fabric 5D. The examples

found in MSE show that the outer surface was smoothed both inside and outside. This type is the rarest type in the MSE jar assemblage, representing 6.7%.

Type J3 is a jar with a pointed rim and a collar on the neck. It is equal to type AB3 in the HeG typology (Wodzińska 2010: 348). This is the most common type among the jars, representing 48.7% of the total. As for the jar with a collar neck, the examples found in the MSE corpus are red coated outside and part of the inside, and are made of fine Nile clay 4A. According to Sanussi, this type appeared in the 3rd Dynasty until the mid of the 5th Dynasty (el-Sanussi 2008: 212). This type is also found at Giza by the Reisner excavations (Tomb G1201 in the Eastern Cemetery, Reisner 1942: 473, fig. 285, 13-10-27). This type also occurred in other areas of HeG site (Wodzińska 2010: Pl. 10, fig. 1) and dates to the late 4th Dynasty.

Type J4 is a jar with a broad flat base, broad body, narrow straight neck, round shoulder, and long spout on the body. This type is usually made of medium Nile 3A fabric. The outer surface is red coated and polished while the inner surface is smoothed. This type is usually found in funerary contexts, rather than domestic contexts (el-Sanussi 2008: 217). We found only one example of J4 in the MSE corpus. Sub-group J4 is also found in other parts of the HeG site (HeG type AB35) (Wodzińska 2010: 284). It is also known from Giza (Junker 1943: 160, fig. 55) and from Qau (Brunton 1928, Pl. LXXXI, 90j).

The jars from Area MSE are a very small percentage of the overall assemblage; they are statistically insignificant.

Sub-Group: Beer Jars (BJ)

Beer jars are closed vessels with ovoid bodies and simple or rounded rims, rounded shoulders, a rounded or pointed base, and a wavy surface. The rim diameter ranges from 9 to 12 cm. The height of a complete beer jar varies from 32 to 35 cm. The maximum body diameter is about 18 to 20 cm on the shoulder.

The beer jar is one of the most common vessel types at Old Kingdom sites throughout Egypt, both in necropolis sites such as Giza (Reisner and Smith 1955: 70) and Saqqara (Rzeuska 2006: 60), as well as at settlements like HeG at Giza (Wodzińska 2007b: 296–297; 2009a: 210–217) and Elephantine (Raue 1999: 180).

The term “beer jar” was first introduced by R. Holthoer (1977: 40). However, in some publications

such vessels are called “ordinary traditional offering jar” (Reisner and Smith 1955: 70).

Beer jars from Area MSE were made of poorly levigated fabric (the fabric is mixed and has abundant inclusions) that lends the pot a coarse surface. The most common fabrics used for this type of vessel in the MSE sample are coarse Nile fabrics 2A and 2B, which are rich in sand, straw, and limestone inclusions. They are characterized by a crude manufacturing technique. They were made by connecting three parts: a base made by pinching and hollowing, the body made by coiling, and the rim made by a turning device (Bárta 1996a: 127). This is suggested by the relatively regular horizontal lines on the rims. They were made without slip or wash and no potmarks were found. Usually traces of the finger impressions of the potters are still clearly visible on the outer and inner surfaces of the beer jars. The dark color of the breaks suggests that the jars were fired at low temperature with limited access to oxygen. Because of the lack of complete profiles, the beer jars from Area MSE were divided into types according to the shape of the rims only:

1. rounded rims (BJ1; Pl. 11a, b, c, Color Plates 6b, 6c)
2. simple rims (BJ2; Pl. 11d, e)

Beer jars in MSE represent the fourth largest grouping after bread molds, bread trays, and stands, and 9.3% of the whole assemblage. Compared to the whole pottery assemblage of the HeG site, there are no significant differences in the overall percentage of beer jars in Area MSE. According to Wodzińska, the beer jar represents 10.36% in the whole assemblage of the HeG site (Wodzińska 2010: 67).

What is very interesting is that in Area AA, which also contained pedestals like in MSE, the percentage of beer jars is as high as 27.04% (Wodzińska 2010: 68, table 4). For a more detailed discussion of the possible function of the pedestals and *in situ* beer jars, see Abdel-Aziz et al., Chapter 2, this volume. The difference in the percentage of beer jars in MSE and AA could be evidence for the different functions of the beer jars in both areas. But the function of the beer jars from Area MSE is more vague because of the unclear nature of this area of the site itself.

Within the larger HeG corpus, copper lumps were found in 29 partial beer jars; others had contents such as pigments (red and yellow) and gypsum (Wodzińska 2010: 65), indicating they were used for other purposes beyond storing liquids. However the

beer jars we studied from MSE were devoid of any pigments or residue found inside the pots.

The ceramic material from elsewhere in the HeG site can be securely dated to the mid- to late 4th Dynasty, and the beer jars from Area MSE are of the same date. They are standard; their shapes, fabrics, and surface treatment show little variation from the beer jars of HeG as a whole.

Category: Non-Containers

This group is reserved for stands and lids.

Group: Stands (S)

Stands are “independent pottery devices which have both the upper and lower ends open and were used as supports for vessels” (Holthoer 1977: 73). We do not have any complete stands, but we have one complete profile. The MSE area material includes both short and tall stands, but the majority of the stands were short. The fabrics used for stands were predominately the Nile fabrics, and the most common fabric for stands is fine Nile fabric 4A. We also have examples of stands made of marl fabric. We recognized different surface treatments, but the majority of stands are smoothed. We will discuss both the fabric and the surface treatment in detail below in the sub-group descriptions.

We divided them initially according to the outer surface treatment of the stands, but shape was also taken into consideration. We have three main types of stands, some of which are further subdivided into subtypes. They are:

1. Stands with smoothed surfaces (s1):
 - a. Stands with a smoothed surface outside and a large folded rim (s1A, Pl. 12a, Color Plate 7a)
 - b. Stands with a smoothed surface outside and a small folded rim (s1B, Pl. 12b)
 - c. Stands with a smoothed surface outside and a folded rim ending in a sharp groove below the rim (s1C, Pl. 12c)
 - d. Stands with smoothed surface outside, simple rims, and an internal groove (s1D, Pl. 12d)
 - e. Represented only by a central part of a stand with a smoothed surface, the shape of which cannot be ascribed with certainty to any other sub-groups (s1E, Pl. 12e)
2. Stands with a red-slipped surface on the outside (s2):

- a. Stands with red slip and folded rim (s2A, Pl. 12f, Color Plate 7b)
- b. Stands with red slip and concave walls (s2B, Pl. 12g)
3. Stands with white-slipped surface outside (s3, Pl. 12h)

All the examples of sub-types s1B and s2A are made of fine Nile fabric 4A, as well as many examples of sub-types s1D, s1E, s2B, and type s3. Fine Nile fabric 4B is attested for only one sherd, and this belongs to the undetermined sub-group s1D. Medium Nile fabrics 3A and 3B are characteristic of s1A stands and very common for s1E stands. Marl fabric 5A is evidenced by one sherd, belonging to sub-type s2B. Sub-types s1C, s1D, and s2B are smoothed. There are stands with red slip that are occasionally polished on the outside (s1E) and some that are occasionally polished in the interior rim. The s3 type is white-slipped.

We have two potmarks (plate 15e and 15f) on the external surface of two stands of sub-type s1E that were made before firing. Similar potmarks have been found before at the Workers Cemetery at Giza, on the bottom of beer jars (Hawass and Senussi 2008: 78–79).

The most common group among the stands is the s1C sub-type (23 pieces) and the least common is sub-type s1D (1 piece). The published material from the HeG site shows the same division between tall and short stands, as is partially seen in the similarity in shape between s2B (plate 12g) and the E1 type from the 4th Dynasty (Wodzińska 2007b: 308, fig. 11.40). The other shapes are difficult to find parallels for among the HeG types. The short stand s1C (plate 12c) has a 4th Dynasty parallel from the tomb of Hetepheres I (Reisner and Smith 1955: fig. 77, no. 54).

Group: Lids (L)

Lids are regarded as independent pottery objects used to cover the opening or mouth of a vessel (Holthoer 1977: 70). In general there were very few lids in the Old Kingdom and the characteristic feature for the Old Kingdom pottery is their multi-functionality, like the use of miniature dishes as lids (el-Sanussi 2008: 223). They are rare in the MSE area; we have only five sherds, including one complete profile. All the sherds were wheelmade, red-slipped, and polished.

We divided lids into two types according to the fabric:

1. Lids made of Nile fabric 4A (L1; Pl. 13a, Color Plate 8a)
2. Lids made of marl fabric 5B (L2; Pl. 13b)

The MSE lids with a flat top do not fit as lids with Reisner's type LII (Reisner and Smith 1955: 67) or with the shapes presented by Rzeuska (2006: 424), which represent a domed shape with ledge or loop handle on the top or with holes. Despite that, the shapes are similar to CDM10 from the HeG site (Wodzińska 2007b: 305).

Our shapes (plate 13a, b) are not explicitly lids, they are probably miniatures used as lids. This explains the appearance of so few fragments of this type on the site. The diameter of MSE 63 (plate 13a) is 13 cm, which is suitable to cover jars of types J1 and J2, which have a diameter of about 11 cm. MSE 62 (plate 13b) is missing its rim but has a maximum body diameter of 19 cm, indicating that it could have been used for covering one of the MSE bowls.

Category: Miniature Vessels

Group: Miniature Vessels (M)

These types of vessels are known to have different names, such as votive and symbolic (Allen 2006: 19). Bárta defines this type of pot as a "small plate or bowl made of clay reaching the width or height, respectively, of up to about 10 cm" (Bárta 1995b: 15).

The miniatures, in general, occur in specific contexts. They can be found in great quantities in temples, especially in mortuary temples, for example, 45,000 pots of this type were recovered from the mortuary temple of Rêdjedef (Marchand and Baud 1996: 275), and they also are very frequently found in cemeteries dating to the Old Kingdom (Bárta 1995b: 15). But miniatures can also be found in settlement debris. Wodzińska says that the bases of the settlement miniatures were cut with a knife while the bases of funerary miniatures were cut with a string (Wodzińska 2009a: 219). The surface treatment of the miniatures found in funerary contexts is usually different from those of domestic contexts. In the funerary context they are usually only smoothed, and not slipped, while in domestic contexts they are carefully smoothed or polished (Wodzińska 2009a: 219). One of the miniature types found at the HeG site (a CDM3 in the HeG typology) had soot on its interior surface, indicating that it may have been used for illumination (Wodzińska 2010: 194).

The occurrence of miniatures in MSE is very rare, there are only a few fragments of miniature vessels in our assemblage, representing only 1.018% of the total. The function of miniatures in Area MSE is not quite clear, but they may have been used as a part of the tableware. All the examples from MSE were red-slipped, polished, and wheel made.

Despite the small quantity of examples, we were able to identify two types of miniatures:

1. Miniature carinated bowls (M1; Pl. 14a, b)
2. Miniature plates (M2; Pl. 14c)

They belong to different types and all of them represent actual types in larger sizes, e.g., M1 is a miniature to CD6 in HeG typology, and M2 a miniature of CD2 (Wodzińska 2007b: 298–299).

The complete shape of the M1 type is a bowl with a carinated shoulder and a rounded base. Only one sherd of this type has been found in MSE, a shoulder fragment with a diameter measuring 9.5 cm. The fabric is medium fine Nile clay 3A. The surface is red-slipped inside and outside. This type is found at the HeG site (Wodzińska 2010: 194) and at Abu Rawash, both dating to the 4th Dynasty (Marchand 2009: 83–86, Class 1a).

The second type is the miniature plate group M2, which includes flat plates with a flaring rim that have a rim diameter of 12 cm. The total height of the plates is 1.2 cm. This type is found at HeG (Wodzińska 2010: 194), from Kromer's excavations over the Gebel el-Qibli west of the HeG site (Kromer 1972: pl. 19, 6) and from Nazlet es-Samman (Hawass and Senussi 2008: 146, 181, fig. H36).

Overall, the MSE miniatures represent a special type of miniature that is typical for the settlement, but still has an unclear function.

Potmarks

The MSE assemblage has six sherds with potmarks (see pl. 15). Of these, four were incised before firing and the other two after firing. All marks were executed on the exterior surface. Although the state of preservation for the sherds bearing potmarks was poor, these marks are almost all well preserved, but not complete. The white carinated bowls are the most common type to have potmarks, then stands, and jars. There are no painted potmarks.

The MSE potmark motifs are both geometrical, featuring a cross (pl. 15a), arches (pl. 15f), vertical and horizontal lines (pl. 15b, 15e, Color Plate 8b), and

hieroglyphic, such as in the two with a *nefer* sign (pl. 15c, 15d, Color Plates 8c, 8d).

The kind of potmark (made pre- or post-firing) depends on the function of the vessels. Potmarks executed pre-firing may be related to the potter, usage of the pot, their contents, the distribution of the ceramics, ownership of the pot, or the intended destination of the pot (Wodzińska 2009c: 244). These potmarks were probably made by the potter in the workshop during the manufacturing process (Wodzińska 2009c: 244).

Potmarks made after firing could have denoted a change in the intended contents or function of a vessel, or a specific sign might indicate its new possession by a different group of people than originally intended (Wodzińska 2009c: 246). Additionally, potmarks could be indicators of the place where the pots were from or where they might be moved (Wodzińska 2009c: 246).

We noticed similarities between potmarks occurring both in the MSE and general HeG corpora. Both had the *nefer* sign, the crossed line motif, and the arched line motif (Wodzińska 2009c: 253–54). It is interesting that the *nefer* sign and cross sign are identical in white carinated bowls in both the MSE corpus and the larger HeG corpus. Additionally, the arch sign (pl. 15f) is clearly represented on an MSE stand, and on bread trays in other HeG areas.

Slag

In ceramic studies, “slag” refers to pieces of waster vessels that are overfired and deformed. This deformation happens when “walls of the individual clay platelets begin to melt and fuse together” during the firing process (Nordström and Bourriau 1993: 103). This process is also described as an accident of firing, which may occur because of “flaws in the vessel or careless firing” (Shepard 1980: 91). The characteristic feature for the overfiring is the malformation of the walls of the pot by “too rapid vitrification” (Shepard 1980: 91).

Among our MSE pottery assemblage there are three fragments of slag. These include a highly fired rim of a beer jar made from coarse Nile clay, a melted sherd of a carinated bowl with unrecognizable fabric, and a completely melted sherd of unknown type.

The waster sherds in Area MSE seem to be an accidental result of firing. This event is not a common defect with open firing because the maximum temperatures reached during this kind of firing are “generally below the vitrification range” (Shepard 1980: 91). This means that the process in which the clay transforms

to slag cannot happen in open firing activities (e.g., food preparation or heating molds for baking bread). This leads us to hypothesize that there was an industry nearby that required high temperatures within a closed structure like a kiln, perhaps for firing pottery or faience in the vicinity of Area MSE.

Conclusion

The pottery presented in this report came from Area MSE, a part of the HeG site with an unclear function but an industrial feel (see Abd el-Aziz et al., Chapter 2, this volume). But overall, we want to emphasize that the ceramic corpus of the MSE area relates to a settlement context and this ceramic corpus corresponds well with the other ceramic corpora from the HeG site.

Most of the ceramic vessels from the MSE area date to the second half of the 4th Dynasty, with very few sherds that might be from the 5th Dynasty.

The existence of three sherds from the Buto-Maadi culture in the MSE area (especially from Phase 3 collapse and abandonment deposits and Phase 9 dump deposits of lithic industrial waste, see Abd el-Aziz et al., Chapter 2, this volume) may indicate a site dating to the Buto-Maadi period nearby or possibly that Buto-Maadi sherds found their way into mudbricks used at HeG.

These MSE vessels were made of three different kinds of fabrics. The most common are Nile fabrics, followed by marl fabrics. We had only one sherd of a red slip carinated bowl made from a mixed fabric. The vessels made of marl and mixed clay could be

brought to Giza from other places in Egypt, perhaps from Upper Egypt (Wodzińska 2009b: 239). Two main kinds of manufacturing were used for producing the pottery from the Area MSE. The vessels are handmade, thrown on the wheel, or a combination of the two.

The Area MSE pottery corpus is divided into four general categories: open forms, closed forms, non containers, and miniature vessels. The open forms are platters, plates, bowls, and beakers. Plates are further subdivided into coarse plates with a flat base and bread trays. The bowls are sub-grouped further into bowls with a simple profile, bowls with internal ledges, and carinated bowls (these are even further divided into white carinated bowls and red carinated bowls). Beakers are subdivided into vats and bread molds. The closed form category consists of one group, that of jars, that is further sub-divided into beer jars. The non-containers are divided into stands and lids. The last category is miniature vessels.

It seems that the majority of the ceramic vessels came from Phase 12, which represents the final ancient use of Area MSE, and from Phase 10, when much of MSE area was demolished (see Abd el-Aziz et al., Chapter 2, this volume) and had been dumped into Area MSE. These particular ceramic vessels therefore, may not necessarily help with interpreting the use or function of Area MSE. The next stage in the analysis of the MSE material is to analyze the corpus in relation to specific features, and tie them to space and phase. This will give the ceramics more meaning and will contribute to the overall understanding of Area MSE. We hope to complete this work at some point in the future.

APPENDIX

Buto-Maadi Sherds in the MSE Area

The identification of the Buto-Maadi culture—a pre-historic culture dating from 3,800 to 3,200 BC—is based on a number of sites in Lower Egypt, such as Maadi, Wadi Degla, Heliopolis (Debono and Mortenson 1988), and Buto (Way 1996). The pottery is one of the most abundant and characteristic material culture markers of that culture and therefore very important. All the pots were handmade at that time. Most Buto-Maadi vessels were globular with flared rims. The neck was more or less narrow and the base flat. Other forms of Buto-Maadi vessels include narrow goblets with a pointed base (referred to as “lemon”-shaped), and bowls and cups with flat or round bottoms (Midant-Reynes 1992: 211).

Three Buto-Maadi sherds were recovered from the MSE excavations. Our vessels represent two different types of vessels typical of the Buto-Maadi culture. Two fragments (Nos. 1 and 2) are a type of shallow bowl with a slightly rounded rim and upright or flaring walls, and the third fragment (No. 3) belongs to a holemouth jar with a slightly rounded rim and narrowing walls. All the sherds have a Nile clay fabric, see Color Plate 9a-c. All the sherds were smoothed on both the inside and outside surfaces, and there are traces of a red coating on the outer surface of sherds 2 and 3.

Our recovery of Buto-Maadi sherds was not the first instance of their appearance in the Giza region. We have evidence, mainly in the form of pottery, of the culture occurring at Giza and in the neighboring area. In 1898 during the construction of a tramway near the Giza Pyramids, possibly northeast of the Great Pyramid, two small oval jars typical of the Buto-Maadi culture were found (Midant-Reynes 1992: 219; el-Sanussi and Jones 1997: 252). Also a set of four Buto-Maadi jars was found on the Giza Plateau by Ahmed Bey Kamal in 1907 (el-Sanussi and Jones 1997: 252). Additionally, a group of nine Buto-Maadi vessels and a fragment of a basalt beaker were found during work on the Greater Cairo Waste Water Project in April 1992, beside the Mansuriyah Canal (el-Sanussi and Jones 1997: 242, 245).

At the HeG site some vessel pieces that may belong to the Buto-Maadi culture were also found in the walls of the Royal Administrative Building (Wodzińska 2005: 1), a large building complex housing silos in

the southeast corner of the site. Also two sherds from the Main Street area date to the Predynastic Period (Wodzińska 2003: 2).

Generally in Egypt the location of both settlements and necropolis sites are related to the annual inundation levels of the Nile. Buildings and tombs had to be situated above the flood level. For example late Predynastic and Early Dynastic sites are located in the Delta only on relatively high ground, mostly over six meters above the floodplain (Bietak 1979: 100).

If we consider the elevations at which these pieces of Buto-Maadi material culture were found, we see that those found in 1992 at Giza were recovered at 13.0 m above sea level (asl) (el-Sanussi and Jones 1997: 242) and those from Area MSE were found at 16.07 m asl. The suggested elevation for the floodplain at Giza in the Old Kingdom is 12–13m asl (Lehner 2009c: 142), with Old Kingdom settlement in the floodplain varying between 12.99 and 14.85 m asl (Jones 1995) and between 15–17 m asl along the desert edge (for a detailed discussion see Lehner 2009c: 97–151). The Buto-Maadi sherds from Giza were found at elevations which would be suitable for a settlement.

We offer three possible explanations for the Predynastic Buto-Maadi sherds in Area MSE. The first is that debris from the removal of an earlier site in the vicinity of the HeG site was dumped in the area of MSE and the adjacent areas. The second is that the 4th Dynasty settlement overlies earlier, prehistoric occupation, and perhaps this earlier site had been demolished to make space for the 4th Dynasty settlement. A third possible explanation is that the debris of the demolished prehistoric site was reused as building materials of the 4th Dynasty settlement. This explanation is supported by the fact that the Buto-Maadi sherds were found within mudbrick collapse deposits of Area MSE.

Summarizing, three rim sherds of Buto-Maadi culture were found in Area MSE and may indicate a Predynastic presence or occupation on the site, or elsewhere on the Giza Plateau. That Buto-Maadi site may have been removed during the construction and development of the 4th Dynasty settlement. Or, Buto-Maadi sherds were used in the building materials of the HeG site.

See plate 16 for the catalog of these three sherds.

MSE Ceramics Catalog

All field drawings were completed by the APFS Ceramics Team; all digital drawings by Hassan Ramadan.

“State of preservation” refers to the percentage of the rim or base preserved, not that of the whole vessel. “MSE Number” is the field number given to each sherd.

Number 1: Rim of platter (PT1)

Illustration: Plate 1a, **MSE Number:** 146, **Feature:** [29,079], **Phase:** 9, **Fabric:** 2B,

Shaping technique: handmade, pounded, **Surface treatment:** outside is untreated, inside is wet-smoothed,

Color: outside and inside is 5YR 7/4 pale red, **Rim diameter:** 33 cm, **State of preservation:** 6%

Number 2: Rim of platter (PT2)

Illustration: Plate 1b, **MSE Number:** 136, **Feature:** [28,775], **Phase:** 10, **Fabric:** 3B, **Shaping technique:** handmade,

Surface treatment: outside and inside are red-slipped, **Color:** outside is 10R 6/8 light red, inside is 10R 5/8 red,

Rim diameter: 33 cm, **State of preservation:** 7%, complete profile

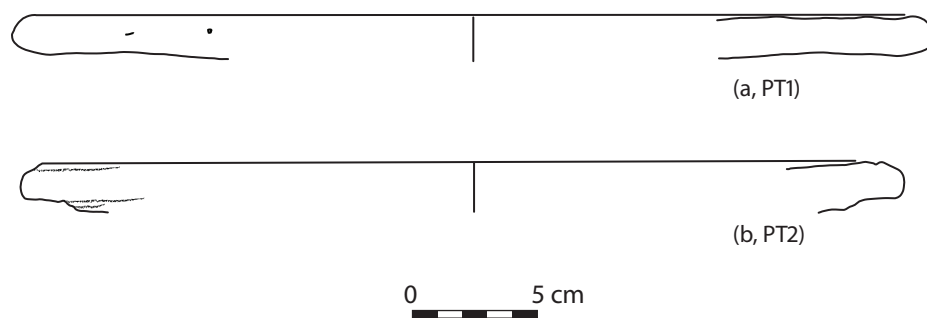


Plate 1: Platter, 1:3

Number 3: Rim of plate (CP1)

Illustration: Plate 2a, *MSE Number:* 138, *Feature:* [28,781], *Phase:* 2C, *Fabric:* 2B, *Shaping technique:* handmade
Surface treatment: outside is untreated, inside is red-slipped, *Color:* outside is 5YR 6/6 reddish-yellow, inside is 5YR 6/8 reddish-yellow, *Rim diameter:* 28 cm, *State of preservation:* 4%, complete profile

Number 4: Rim of plate (CP2)

Illustration: Plate 2b, *MSE Number:* 134, *Feature:* [27,069], *Phase:* 10, *Fabric:* 2B, *Shaping technique:* handmade,
Surface treatment: outside and inside are red-slipped, *Color:* outside is 5YR 6/4, inside is 2.5YR 7/6 light red,
Rim diameter: 28 cm, *State of preservation:* 10%, complete profile

Number 5: Rim of plate (CP2)

Illustration: Plate 2c, *MSE Number:* 139, *Feature:* [27,061], *Phase:* 12, *Fabric:* 2A, *Shaping technique:* handmade
Surface treatment: outside and inside are red-slipped, *Color:* outside is 10R 6/8 light red, inside is 10R 4/3 weak red
Rim diameter: 38 cm, *State of preservation:* 6%, complete profile

Number 6: Rim of plate (CP2)

Illustration: Plate 2d, *MSE Number:* 140, *Feature:* [29,018], *Phase:* 9, *Fabric:* 2B, *Shaping technique:* handmade
Surface treatment: outside and inside are red slipped, *Color:* outside is 10R 5/4 weak red, inside is 10R 5/4 weak red
Rim diameter: 29 cm, *State of preservation:* 5%, complete profile

Number 7: Rim of plate (CP2)

Illustration: Plate 2e, *MSE Number:* 141, *Feature:* [27,061], *Phase:* 12, *Fabric:* 2A, *Shaping technique:* handmade
Surface treatment: outside and inside are red-slipped, *Color:* outside is 10R 6/8 light red, inside is 10R 4/3 weak red
Rim diameter: 30 cm, *State of preservation:* 7%, complete profile

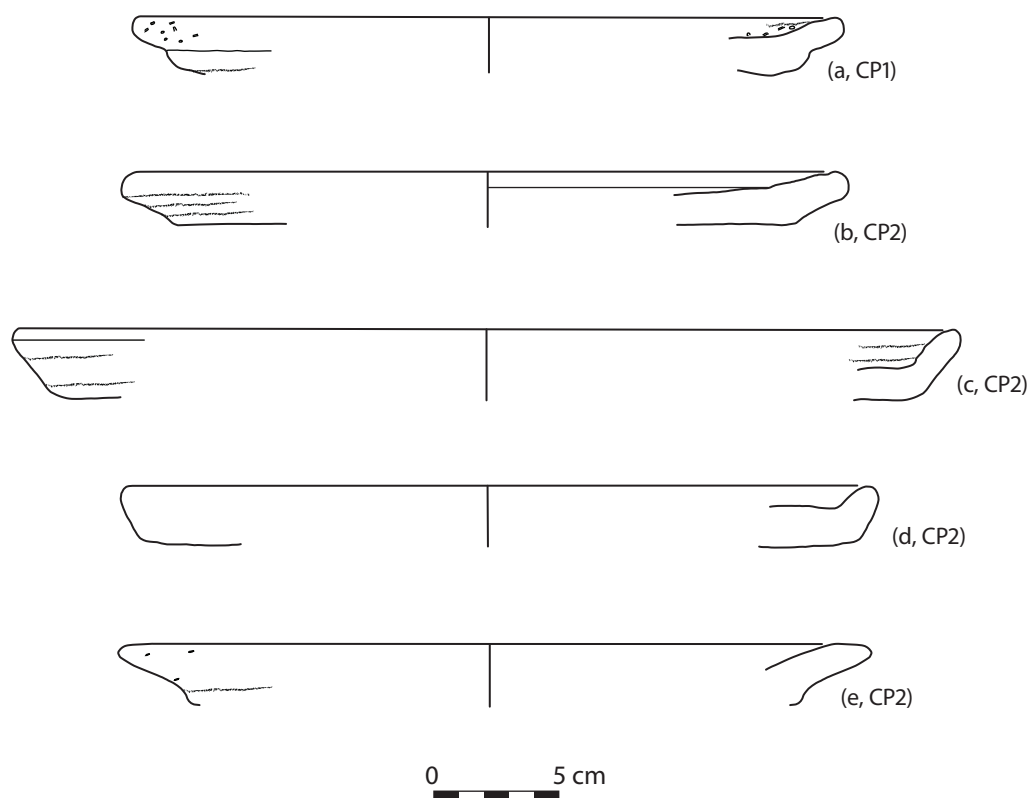


Plate 2: Coarse plates, flat bases, 1:3

Number 8: Rim of bread tray (BT1A)

Illustration: Plate 3a, *MSE Number:* 64, *Feature:* [27,057], *Phase:* 13, *Fabric:* 2B, *Shaping technique:* handmade, *Base technique:* pounded, *Surface treatment:* inside and outside are smoothed with whitish scum, *Color:* outside is 5YR 8/3 pink, inside is 5YR 6/6 reddish-yellow, *Rim diameter:* 22 cm, *State of preservation:* 9%

Number 9: Rim of bread tray (BT1B)

Illustration: Plate 3b, *MSE Number:* 66, *Feature:* [27,068], *Phase:* 12, *Fabric:* 2B, *Shaping technique:* handmade, *Base technique:* pounded, *Surface treatment:* inside and outside are smoothed, *Color:* outside is 5YR 6/4 light reddish-brown, inside is 7.5YR 7/6 reddish-yellow, *Rim diameter:* 22 cm, *State of preservation:* 11%

Number 10: Rim of oval bread tray (BT2)

Illustration: Plate 3c, *MSE Number:* 59, *Feature:* [27,069], *Phase:* 10, *Fabric:* 2B, *Shaping technique:* handmade, *Base technique:* pounded, *Surface treatment:* inside and outside are smoothed, *Color:* outside is 5YR 5/6 yellowish red, inside is 5YR 5/2 reddish yellow, *Rim diameter:* 26 cm, *State of preservation:* 12%

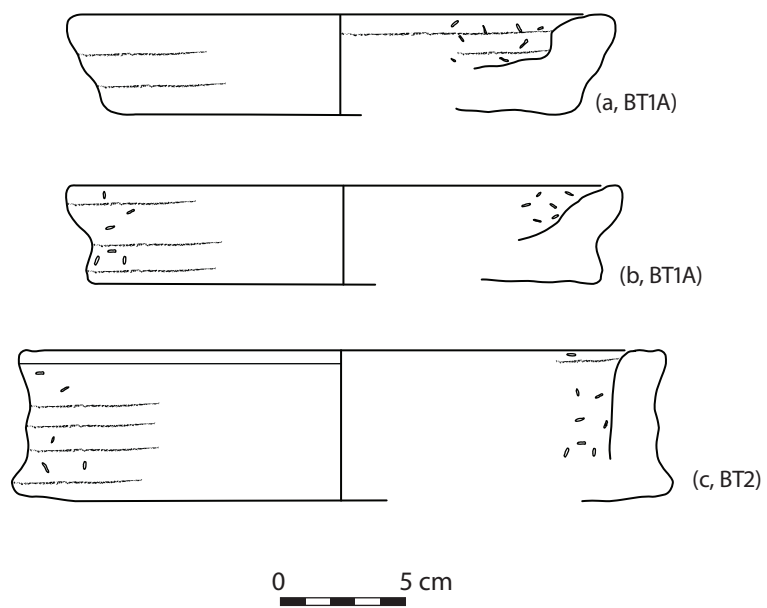


Plate 3: Bread trays, 1:3

Number 11: Rim of bowl with edged rim (B1)

Illustration: Plate 4a, *MSE Number:* 142, *Feature:* [29,097], *Phase:* 3, *Fabric:* 3A, *Shaping technique:* wheelmade, *Surface treatment:* inside and outside are smoothed, *Color:* outside is 10R 6/4 pale red, inside is 2.5YR 5/4 reddish-brown, *Rim diameter:* 31 cm, *State of preservation:* 6%

Number 12: Rim of bowl with edged rim (B1)

Illustration: Plate 4b, *MSE Number:* 143, *Feature:* [29,009], *Phase:* 8, *Fabric:* 3A, *Shaping technique:* wheelmade, *Surface treatment:* outside and inside are smoothed, *Color:* outside is 10R 6/4 pale red, inside is 2.5YR 5/4 reddish-brown, *Rim diameter:* 29 cm, *State of preservation:* 6%

Number 13: Rim of bell-shaped bowl (B2)

Illustration: Plate 4c, *MSE Number:* 157, *Feature:* [27,069], *Phase:* 10, *Fabric:* 4A, *Shaping technique:* wheelmade, *Surface treatment:* outside and inside are red-slipped, *Color:* outside is 10R 5/6 red, inside is 10R 5/8 red, *Rim diameter:* 26 cm, *State of preservation:* 4%

Number 14: Rim of bowl (B3)

Illustration: Plate 4d, *MSE Number:* 205, *Feature:* [29,092], *Phase:* 7, *Fabric:* 4A, *Shaping technique:* wheelmade, *Surface treatment:* outside and inside are red-slipped, *Color:* outside and inside are 10R 5/8 red, *Rim diameter:* 24 cm, *State of preservation:* 8%

Number 15: Rim of bowl with thickened rim and slightly flaring wall (B3)

Illustration: Plate 4e, *MSE Number:* 153, *Feature:* [27,067], *Phase:* 10, *Fabric:* 3A, *Shaping technique:* wheelmade, *Surface treatment:* outside and inside are red-slipped, *Color:* outside is 10R 4/6 red, inside is 10R 4/6 red, *Rim diameter:* 16 cm, *State of preservation:* 1%, complete profile

Number 16: Rim of bowl with thickened rim and flaring wall (B3)

Illustration: Plate 4f, *MSE Number:* 183, *Feature:* [28,767], *Phase:* 12, *Fabric:* 3A, *Shaping technique:* wheelmade, *Surface treatment:* outside and inside are red-slipped, *Color:* outside and inside is 10R 5/4 weak red, *Rim diameter:* 23 cm, *State of preservation:* 53%

Number 17: Rim of bowl with inward turning wall (B4A)

Illustration: Plate 4g, *MSE Number:* 207, *Feature:* [27,061], *Phase:* 12, *Fabric:* 3A, *Shaping technique:* wheelmade, *Surface treatment:* outside and inside are red-slipped, *Color:* outside is 5YR 6/6 reddish-yellow, inside is 5YR 5/3 reddish-brown, *Rim diameter:* 15 cm, *State of preservation:* 5%

Number 18: Rim of bowl with inward turning wall (B4A)

Illustration: Plate 4h, *MSE Number:* 206, *Feature:* [27,061], *Phase:* 12, *Fabric:* 3A, *Shaping technique:* wheelmade, *Surface treatment:* outside and inside are red-slipped, *Color:* outside is 10R 4/4 weak red, inside is 10R 4/3 red, *Rim diameter:* 16 cm, *State of preservation:* 10%

Number 19: Rim of bowl with inward turning wall (B4B)

Illustration: Plate 4i, *MSE Number:* 156, *Feature:* [28,751], *Phase:* 10, *Fabric:* 3B, *Shaping technique:* wheelmade, *Surface treatment:* outside and inside are red-slipped, *Color:* outside is 10R 5/8 red, inside is 10R 6/2 pale red, *Rim diameter:* 23 cm, *State of preservation:* 8%

Number 20: Rim of bowl (B4B)

Illustration: Plate 4j, *MSE Number:* 149, *Feature:* [28,751], *Phase:* 10, *Fabric:* 3B, *Shaping technique:* wheelmade, *Surface treatment:* outside and inside are red-slipped, *Color:* outside is 10R 5/8 red, inside is 10R 6/2 pale red, *Rim diameter:* 20 cm, *State of preservation:* 6%

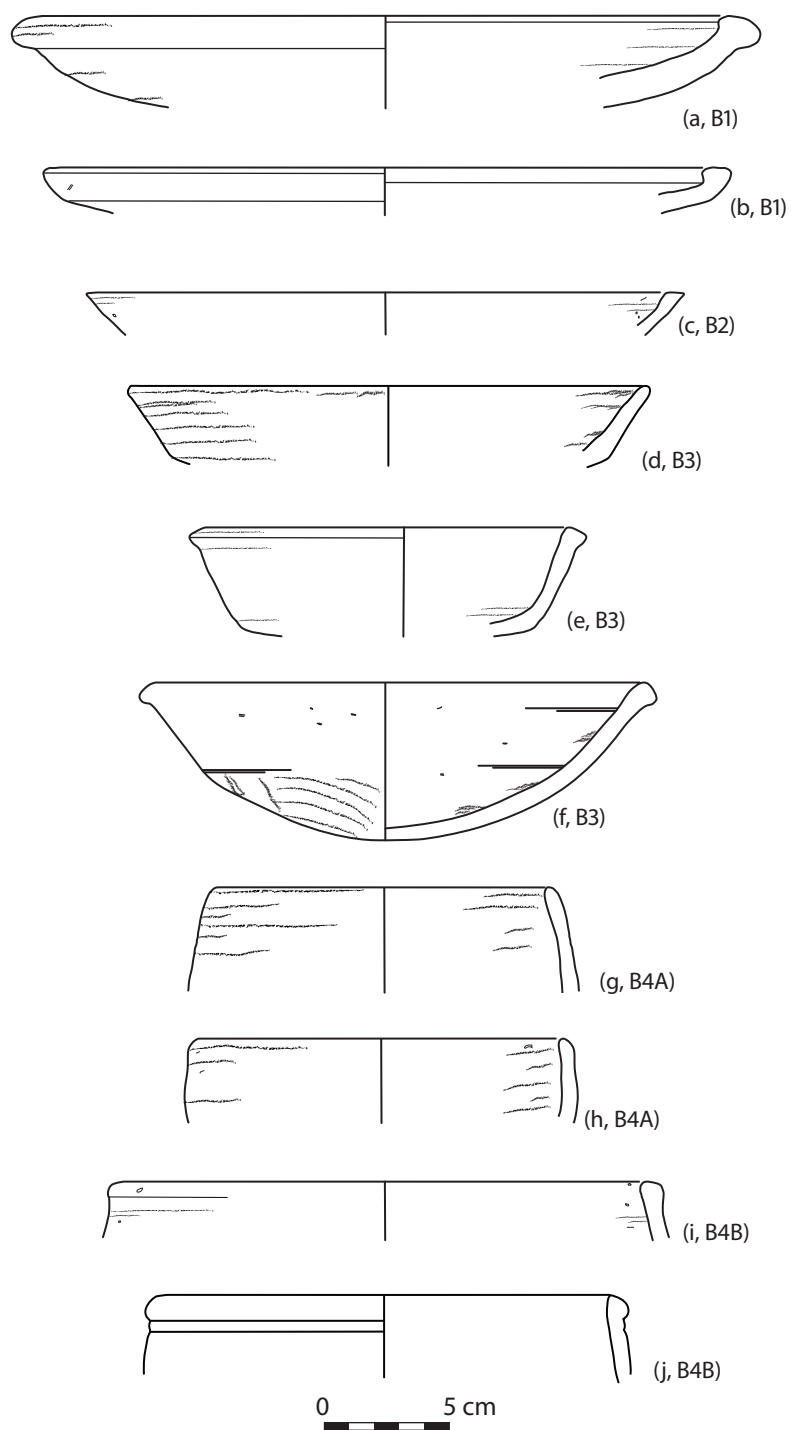


Plate 4: Bowls, 1:3

Number 21: Rim of bowl with internal ledge (BL1A)

Illustration: Plate 5a, *MSE Number:* 20, *Feature:* [29,092], *Phase:* 7, *Fabric:* 3B, *Shaping technique:* wheelmade, *Surface treatment:* outside and inside are smoothed, *Color:* outside is 10R 6/8 light red, inside is 10R 6/8 light red
Rim diameter: 21 cm, *State of preservation:* 45%, complete profile

Number 22: Rim of bowl with internal ledge (BL2)

Illustration: Plate 5b, *MSE Number:* 57, *Feature:* [29,097], *Phase:* 3, *Fabric:* 4A, *Shaping technique:* wheelmade, *Surface treatment:* outside and inside are smoothed, *Color:* outside is 5YR 6/4 light reddish-brown, inside is 5YR 6/4 light reddish-brown, *Rim diameter:* 32 cm, *State of preservation:* 12%

Number 23: Rim of bowl with internal ledge (BL3)

Illustration: Plate 5c, *MSE Number:* 16, *Feature:* [29,091], *Phase:* 9, *Fabric:* 3B, *Shaping technique:* wheelmade, *Surface treatment:* outside is untreated, inside is smoothed, *Color:* outside is 5YR 6/4 light reddish-brown, inside is 5YR 6/4 light reddish-brown, *Rim diameter:* 29 cm, from internal ledge, *State of preservation:* 3%

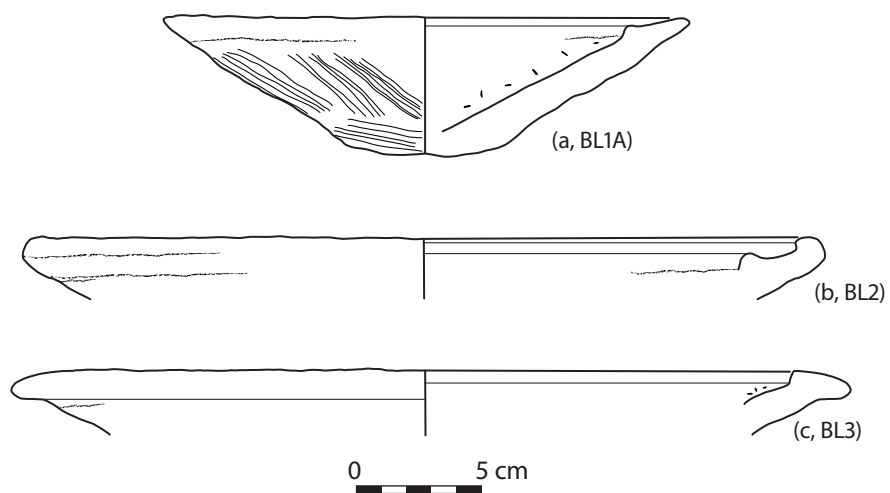


Plate 5: Bowls with internal ledge, 1:3

Number 24: Rim of white carinated bowl (CB1A)

Illustration: Plate 6a, *MSE Number:* 123, *Feature:* [27,080], *Phase:* 10, *Fabric:* 3A, *Shaping technique:* hand-shaping, upper part shaped on a turning device, *Surface treatment:* outside and inside are white slipped, *Color:* outside and inside are 5YR 6/4 light reddish-brown, *Rim diameter:* 26 cm, *State of preservation:* 13%

Number 25: Rim of white carinated bowl (CB1B)

Illustration: Plate 6b, *MSE Number:* 96, *Feature:* [28,768], *Phase:* 10, *Fabric:* 4B, *Shaping technique:* hand-shaping, upper part shaped on a turning device, *Surface treatment:* outside and inside are smoothed, *Color:* outside and inside are 5YR 8/2 pale yellow, *Rim diameter:* 22 cm, *State of preservation:* 24%

Number 26: Rim of white carinated bowl (CB1C)

Illustration: Plate 6c, *MSE Number:* 117, *Feature:* [27,068], *Phase:* 12, *Fabric:* 3B, *Shaping technique:* hand-shaping, upper part shaped on a turning device, *Surface treatment:* outside and inside are white-slipped, *Color:* outside and inside are 5YR 7/6 reddish-yellow, *Rim diameter:* 22 cm, *State of preservation:* 11%

Number 27: Rim of white carinated bowl (CB1D)

Illustration: Plate 6d, *MSE Number:* 122, *Feature:* [27,068], *Phase:* 12, *Fabric:* 4B, *Shaping technique:* hand-shaping, upper part shaped on a turning device, *Surface treatment:* outside and inside are white-slipped, *Color:* outside and inside are 2.5YR 6/6 light red, *Rim diameter:* 22 cm, *State of preservation:* 8%

Number 28: Rim of white carinated bowl (CB1E)

Illustration: Plate 6e, *MSE Number:* 70, *Feature:* [27,051], *Phase:* 12, *Fabric:* 5A, *Shaping technique:* hand-shaping, upper part shaped on a turning device, *Surface treatment:* outside and inside are smoothed, *Color:* outside and inside are 2.5YR 8/3 pale yellow, *Rim diameter:* 22 cm, *State of preservation:* 14%

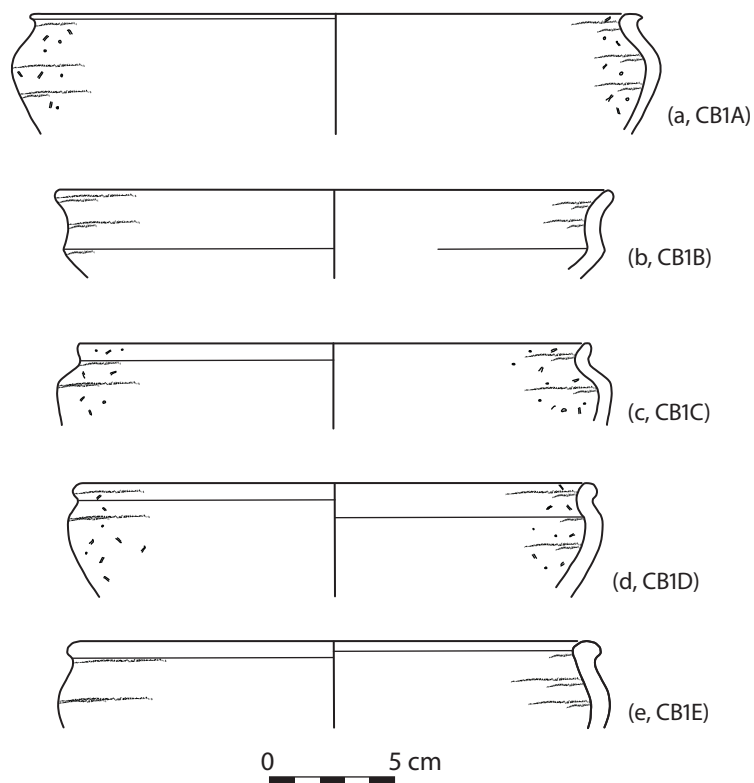


Plate 6: White Carinated Bowls, 1:3

Number 29: Rim of red slip carinated bowl (CB2A)

Illustration: Plate 7a, *MSE Number:* 273, *Feature:* [29,079], *Phase:* 9, *Fabric:* 4A, *Shaping technique:* wheelmade, *Surface treatment:* outside is red-slipped and polished, inside is red-slipped and burnished, *Color:* outside is 10R 6/8 red, inside is 10R 6/8 red, *Rim diameter:* 19 cm, *State of preservation:* 4%

Number 30: Rim of red slip carinated bowl (CB2B)

Illustration: Plate 7b, *MSE Number:* 275, *Feature:* [28,751], *Phase:* 10, *Fabric:* 4A, *Shaping technique:* handmade, rim is turned, *Surface treatment:* inside and outside are red slipped and burnished, *Color:* outside is 2.5YR 3/3 dark reddish-brown, inside is 2.5YR 4/3 reddish-brown, *Rim diameter:* 25 cm, *State of preservation:* 9%

Number 31: Rim of red slip carinated bowl (CB2B)

Illustration: Plate 7c, *MSE Number:* 264, *Feature:* [27,095], *Phase:* 10, *Fabric:* 3B, *Shaping technique:* wheelmade, *Surface treatment:* outside and inside are red-slipped and burnished, *Color:* outside is 10R 6/8 light red, inside is 10R 6/8 light red, *Rim diameter:* 25 cm, *State of preservation:* 5%

Number 32: Rim of red slip carinated bowl (CB2B)

Illustration: Plate 7d, *MSE Number:* 265, *Feature:* [27,065], *Phase:* 12, *Fabric:* 4A, *Shaping technique:* wheelmade, *Surface treatment:* outside is red-slipped and polished, inside is red-slipped and burnished, *Color:* outside is 10R 4/8 red, inside is 10R 6/8 light red, *Rim diameter:* 20 cm, *State of preservation:* 9%

Number 33: Rim of red slip carinated bowl (CB2C)

Illustration: Plate 7e, *MSE Number:* 48, *Feature:* [27,067], *Phase:* 10, *Fabric:* 5A pink variant, *Shaping technique:* handmade, rim is turned, *Surface treatment:* outside and inside are red-slipped and burnished, *Color:* outside and inside are 5YR 6/6 reddish yellow, *Rim diameter:* 16 cm, *State of preservation:* 6%

Number 34: Rim of red slip carinated bowl (CB2C)

Illustration: Plate 7f, *MSE Number:* 218, *Feature:* [27,065], *Phase:* 12, *Fabric:* 6A, *Shaping technique:* handmade, rim is turned, *Surface treatment:* outside and inside are red-slipped and burnished, *Color:* outside is 10R 6/8 red, inside is 10R 6/8 red, *Rim diameter:* 16 cm, *State of preservation:* 5%

Number 35: Rim of red slip carinated bowl (CB2D)

Illustration: Plate 7g, *MSE Number:* 284, *Feature:* [27,050], *Phase:* 13, *Fabric:* 5D, *Shaping technique:* handmade, rim is turned, *Surface treatment:* outside and inside red slipped and burnished, *Color:* outside is 10R 5/8 red, inside is 10R 5/8 red, *Rim diameter:* 16 cm, *State of preservation:* 6%

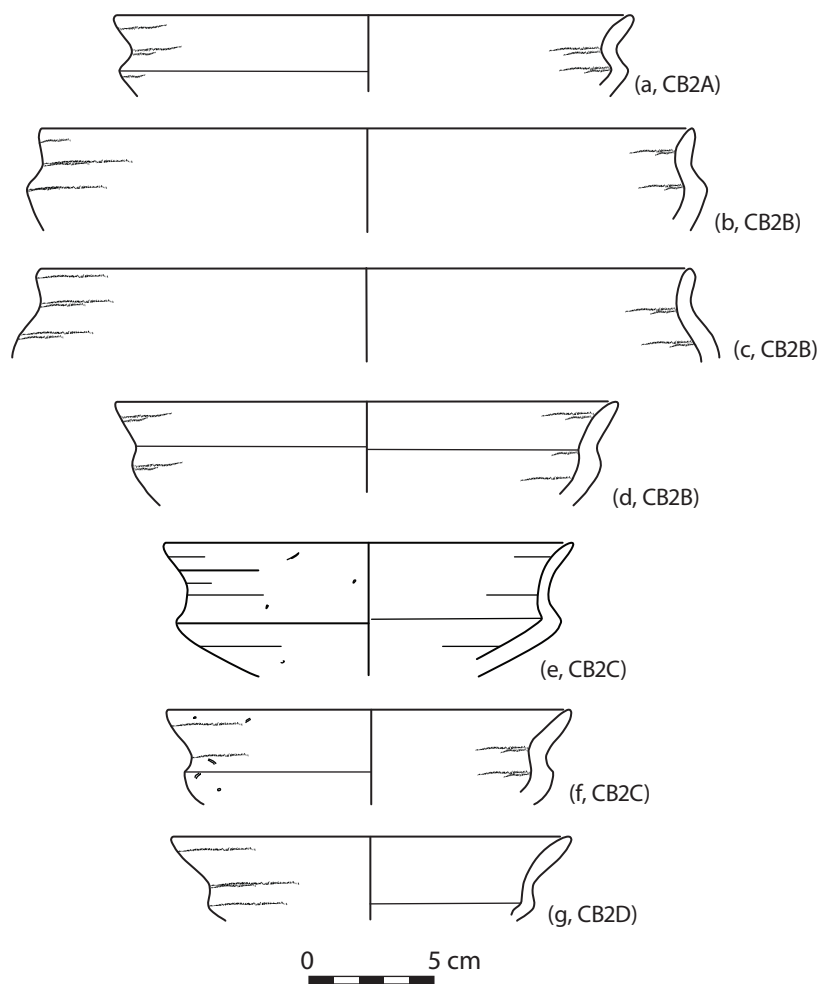


Plate 7: Red Slip Carinated Bowls, 1:3

Number 36: Base of bread mold (BM1A)

Illustration: Plate 8a, *MSE Number:* 75, *Feature:* [27,098], *Phase:* 8, *Fabric:* 1A, *Shaping technique:* molded, *Surface treatment:* outside is untreated, inside is smoothed, *Color:* outside is 5YR 6/6 reddish yellow, inside is 5YR 6/6 reddish yellow, *State of preservation:* 100%

Number 37: Rim of bread mold (BM1A)

Illustration: Plate 8b, *MSE Number:* 74, *Feature:* [27,069], *Phase:* 10, *Fabric:* 1A, *Shaping technique:* molded, *Surface treatment:* outside is untreated, inside is smoothed, *Color:* outside is 5YR 6/6 reddish yellow, inside is 5YR 6/6 reddish yellow, *Rim diameter:* 34 cm; *State of preservation:* 7%

Number 38: Rim of bread mold (BM1B)

Illustration: Plate 8c, *MSE Number:* 1, *Feature:* [29,091], *Phase:* 9, *Fabric:* 1A, *Shaping technique:* molded, *Surface treatment:* outside is untreated, inside is smoothed, *Color:* outside is 5YR 6/6 reddish yellow, inside is 5YR 6/6 reddish yellow, *Rim diameter:* 20 cm, *State of preservation:* 8%, complete profile

Number 39: Base of bread mold (BM2)

Illustration: Plate 8d, *MSE Number:* 2, *Feature:* [27,098], *Phase:* 8, *Fabric:* 1B, *Shaping technique:* molded, *Surface treatment:* outside is untreated, inside is smoothed, *Color:* outside is 5YR 6/6 reddish yellow, inside is 5YR 6/6 reddish yellow, *State of preservation:* 100%

Number 40: Rim of bread mold (BM3)

Illustration: Plate 8e, *MSE Number:* 8, *Feature:* [27,069], *Phase:* 10, *Fabric:* 1C, *Shaping technique:* molded, *Surface treatment:* inside and outside are smoothed, *Color:* outside and inside are 5YR 6/6 reddish yellow, *Rim diameter:* 20 cm, *State of preservation:* 9%

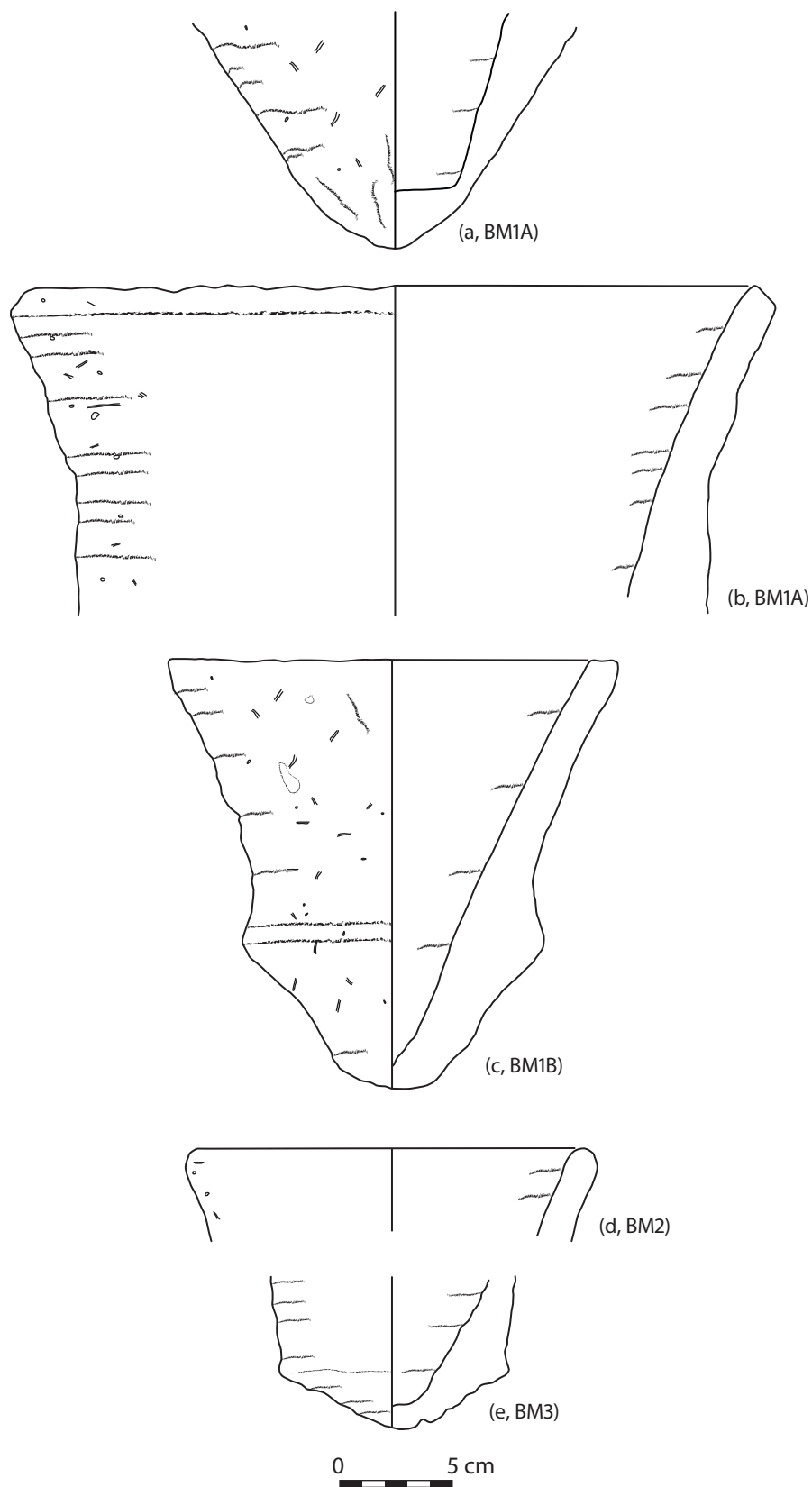


Plate 8: Bread molds, 1:3

Number 41: Rim of vat (v1)

Illustration: Plate 9a, *MSE Number:* 107, *Feature:* [27,067], *Phase:* 10, *Fabric:* 2B, *Shaping technique:* handmade, *Surface treatment:* outside and inside are red-slipped, *Color:* outside is 2.5YR 7/6 light red, inside is 2.5YR 7/6 light red, *Rim diameter:* 42 cm, *State of preservation:* 6%

Number 42: Rim of vat (v2)

Illustration: Plate 9b, *MSE Number* 212, *Feature:* [27,067], *Phase:* 10, *Fabric:* 3A, *Shaping technique:* handmade, *Surface treatment:* outside and inside are red-slipped, *Color:* outside is 2.5YR 5/8 red, inside is 2.5YR 5/8 red, *Rim diameter:* 37 cm, *State of preservation:* 6%

Number 43: Rim of vat (v3)

Illustration: Plate 9c, *MSE Number* 130, *Feature:* [28,768], *Phase:* 10, *Fabric:* 2A, *Shaping technique:* handmade, *Surface treatment:* outside and inside are smoothed, *Color:* outside is 10R 6/6 light red, inside is 10R 6/6 light red, *Rim diameter:* 34 cm, *State of preservation:* 6%

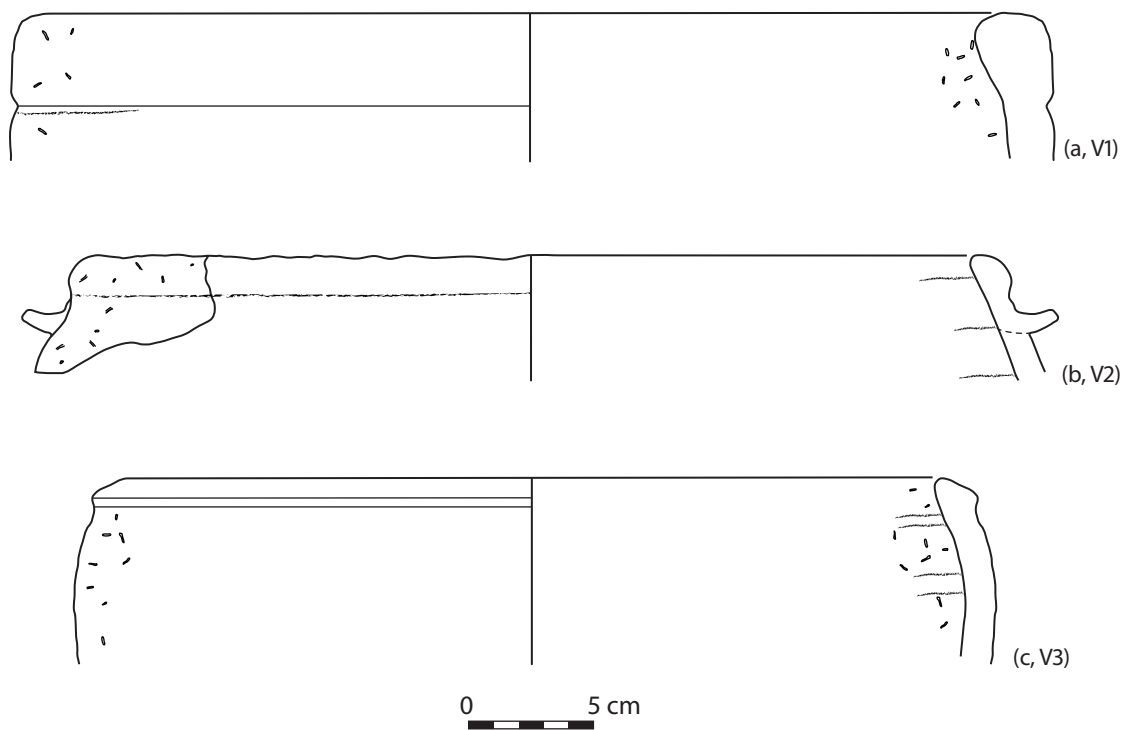


Plate 9: Vats, 1:3

Number 44: Rim of jar (J1)

Illustration: Plate 10a, *MSE Number:* 78, *Feature:* [29,096], *Phase:* 2A, *Fabric:* 4A, *Shaping technique:* wheelmade, *Surface treatment:* outside and inside are smoothed, with white slip, *Color:* outside is 2.5YR 6/8 light red, inside is 2.5YR 6/8 light red, *Rim diameter:* 10 cm, *State of preservation:* 33%

Number 45: Rim of jar (J2)

Illustration: Plate 10b, *MSE Number:* 60, *Feature:* [27,066], *Phase:* 12, *Fabric:* 3B, *Shaping technique:* wheelmade, *Surface treatment:* outside and inside are smoothed, *Color:* outside is 5YR 6/8 reddish-yellow, inside is 5YR 6/4 light reddish-brown, *Rim diameter:* 9 cm, *State of preservation:* 6%

Number 46: Rim of jar (J3)

Illustration: Plate 10c, *MSE Number:* 73, *Feature:* [27,071], *Phase:* 10, *Fabric:* 3B, *Shaping technique:* handmade, *Surface treatment:* outside and inside are smoothed, *Color:* outside is 2.5YR 5/4 reddish-yellow, inside is 2.5YR 5/4 reddish-yellow, *Rim diameter:* 10 cm, *State of preservation:* 12%

Number 47: Jar with spout (J4)

Illustration: Plate 10d, *MSE Number:* 93, *Feature:* [27,051], *Phase:* 12, *Fabric:* 3A, *Shaping technique:* handmade, *Surface treatment:* outside and inside are red-slipped, *Color:* outside is 10R 5/6 red, inside is 10R 5/6 red, *Rim diameter:* 10 cm, *State of preservation:* 14%

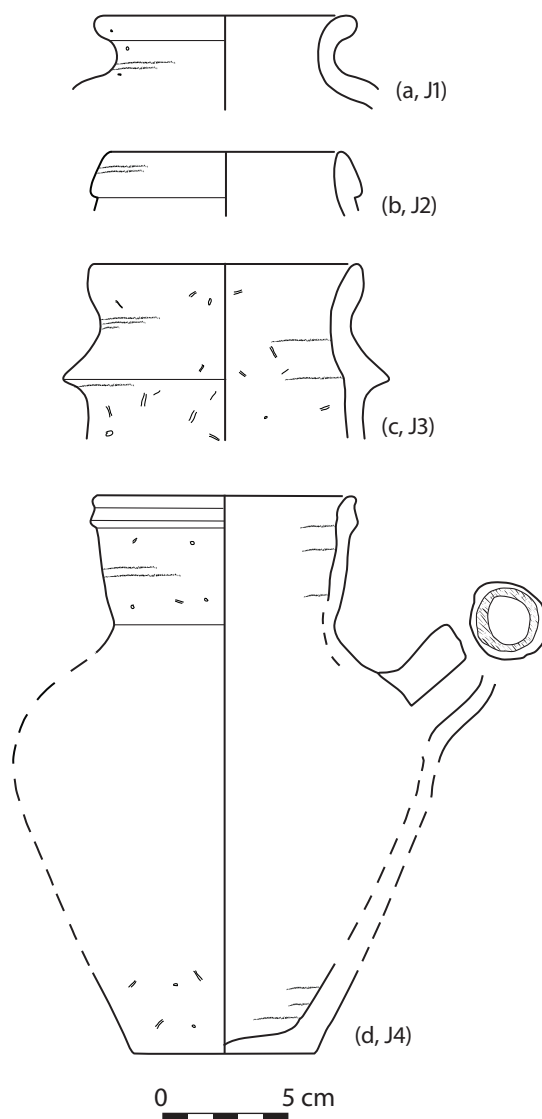


Plate 10: Jars, 1:3

Number 48: Beer jar (BJ1)

Illustration: Plate 11a, *MSE Number:* 55, *Feature:* [27,067], *Phase:* 10, *Shaping technique:* handmade,
Surface treatment: outside and inside are smoothed, *Color:* outside is 10R 6/3 pale red, inside is 10R 6/6 red,
Rim diameter: 9 cm, *State of preservation:* 25%, complete profile

Number 49: Beer jar (BJ1)

Illustration: Plate 11b, *MSE Number:* 128, *Feature:* [27,061], *Phase:* 12, *Shaping technique:* handmade,
Surface treatment: outside and inside are smoothed, *Color:* outside is 10R 6/3 pale red, inside is 10R 6/6 red,
Rim diameter: 9.5 cm, *State of preservation:* 12%, complete profile

Number 50: Rim of beer jar (BJ1)

Illustration: Plate 11c, *MSE Number:* 36, *Feature:* [28,751], *Phase:* 10, *Fabric:* 2A, *Shaping technique:* handmade,
Surface treatment: outside and inside are smoothed, *Color:* outside is 10R 6/2 pale red, inside is 10R 6/2 pale red,
Rim diameter: 10 cm, *State of preservation:* 9%

Number 51: Rim of beer jar (BJ2)

Illustration: Plate 11d, *MSE Number:* 26, *Feature:* [28,751], *Phase:* 10, *Fabric:* 2A, *Shaping technique:* handmade,
Surface treatment: outside and inside is smoothed, *Color:* outside is 10R 6/2 pale red, inside is 10R 6/2 pale red,
Rim diameter: 10 cm, *State of preservation:* 9%

Number 52: Rim of beer jar (BJ2)

Illustration: Plate 11e, *MSE Number:* 92, *Feature:* [28,751], *Phase:* 10, *Fabric:* 2A, *Shaping technique:* handmade
Surface treatment: outside and inside are smoothed, *Color:* outside is 10R 6/2 pale red, inside is 10R 6/2 pale red,
Rim diameter: 9.5 cm, *State of preservation:* 9%

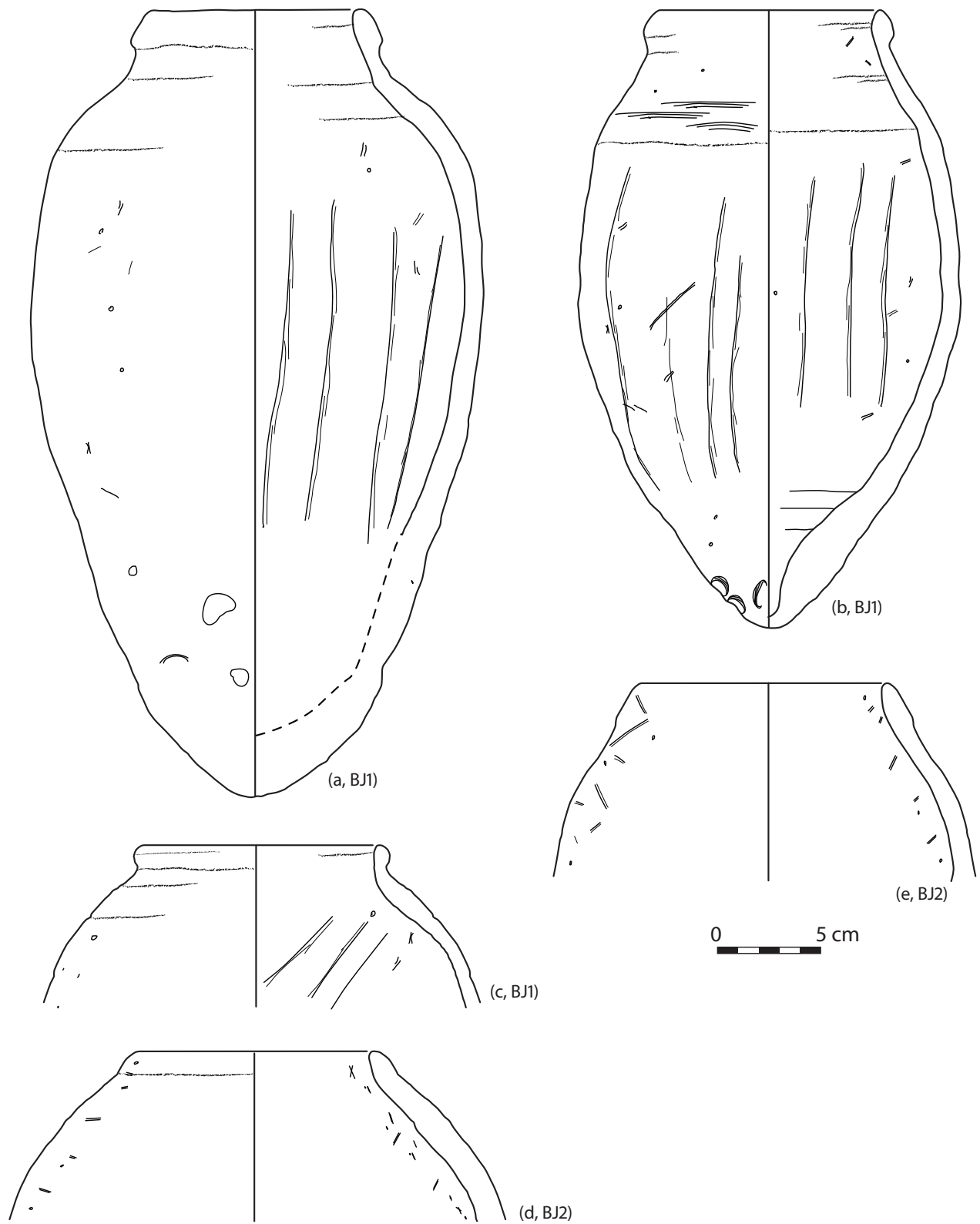


Plate 11: Beer jars, 1:3

Number 53: Stand (s1A)

Illustration: Plate 12a, **MSE Number:** 49, **Feature:** [29,097], **Phase:** 3, **Fabric:** 4A, **Shaping technique:** wheelmade, **Surface treatment:** outside and inside are smoothed, **Color:** outside is 7.5YR 6/4 light brown, inside is 7.5YR 6/4 light brown, **Rim diameter:** 12 cm, **State of preservation:** 46%, full profile

Number 54: Rim of a stand (s1B)

Illustration: Plate 12b, **MSE Number:** 36, **Feature:** [28,767], **Phase:** 12, **Fabric:** 4A, **Shaping technique:** wheelmade, **Surface treatment:** outside and inside are smoothed, **Color:** outside is 2.5YR 6/6 light red, inside is 2.5YR 6/6 light red, **Rim diameter:** 12 cm, **State of preservation:** 13%

Number 55: Base of a stand (s1C)

Illustration: Plate 12c, **MSE Number:** 46, **Feature:** [29,079], **Phase:** 9, **Fabric:** 4A, **Shaping technique:** wheelmade, **Surface treatment:** outside and inside are smoothed, **Color:** outside is 7.5YR 6/4 light brown, inside is 7.5YR 6/4 light brown, **Rim diameter:** 11 cm, **State of preservation:** 28%

Number 56: Rim of a stand (s1D)

Illustration: Plate 12d, **MSE Number:** 44, **Feature:** N/A, **Phase:** N/A, **Fabric:** 4A, **Shaping technique:** wheelmade, **Surface treatment:** outside and inside are smoothed, **Color:** outside is 5YR 6/3 light reddish-brown, inside is 5YR 6/3 light reddish-brown, **Rim diameter:** 13 cm, **State of preservation:** 11%

Number 57: Center section of a stand (s1E)

Illustration: Plate 12e, **MSE Number:** 32, **Feature:** [29,079], **Phase:** 9, **Fabric:** 4A, **Shaping technique:** wheelmade, **Surface treatment:** outside and inside are smoothed, **Color:** outside is 7.5YR 6/4 light brown, inside is 7.5YR 6/4 light brown

Number 58: Rim of a stand (s2A)

Illustration: Plate 12f, **MSE Number:** 33, **Feature:** [28,767], **Phase:** 12, **Fabric:** 3B, **Shaping technique:** handmade, **Surface treatment:** outside is red-slipped, inside is untreated, **Color:** outside is 5YR 6/6 reddish-yellow, inside is 5YR 6/6 reddish-yellow, **Rim diameter:** 13 cm, **State of preservation:** 17%

Number 59: Rim of a stand (s2B)

Illustration: Plate 12g, **MSE Number:** 38, **Feature:** [29,083], **Phase:** 7, **Fabric:** 4A, **Shaping technique:** wheelmade, **Surface treatment:** outside and inside are red-slipped and polished, **Color:** outside and inside are 10YR 6/8 red, **Rim diameter:** 15 cm, **State of preservation:** 11%

Number 60: Rim of a stand (s3)

Illustration: Plate 12h, **MSE Number:** 43, **Feature:** [28,788], **Phase:** 10, **Fabric:** 3A, **Shaping technique:** handmade, **Surface treatment:** outside and inside are white-washed, **Color:** outside is 7.5YR 6/4 light brown, inside is 7.5YR 6/4 light brown, **Rim diameter:** 17 cm, **State of preservation:** 26%

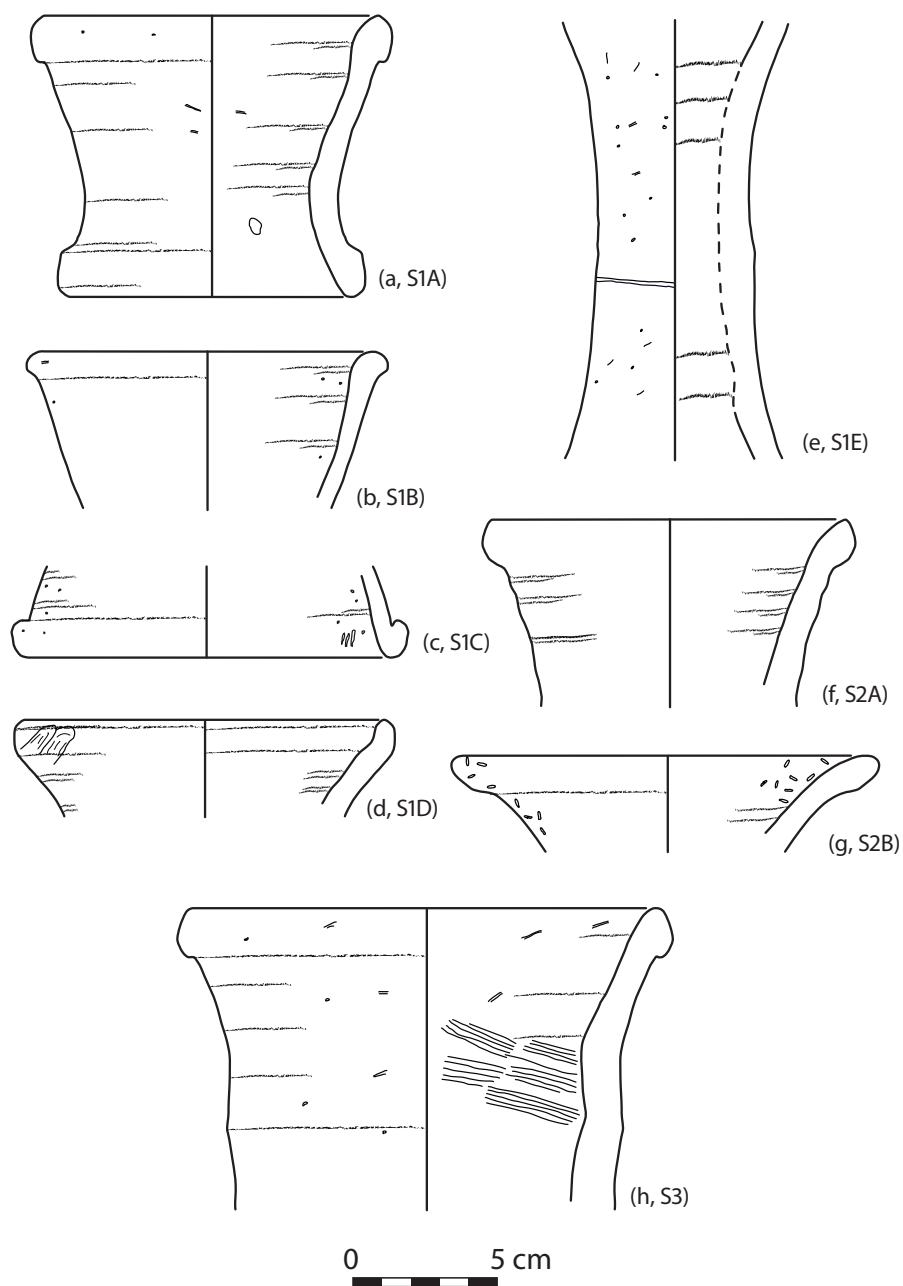


Plate 12: Stands, 1:3

Number 61: Rim of a lid (L1)

Illustration: Plate 13a, *MSE Number:* 63, *Feature:* [27,071], *Phase:* 10, *Fabric:* 4A, *Shaping technique:* wheelmade, *Surface treatment:* outside and inside are red-slipped and polished, *Color:* outside and inside are 7.5YR 6/4 light red
Rim diameter: 13 cm, *State of preservation:* 14%

Number 62: Rim of a lid (L2)

Illustration: Plate 13b, *MSE Number:* 62, *Feature:* [27,065], *Phase:* 12, *Fabric:* 5B, *Shaping technique:* wheelmade, *Surface treatment:* outside and inside are red-slipped and polished, *Color:* outside is 5YR 8/4 pink, inside is 5YR 8/4 pink, *Max body diameter:* 19 cm, *State of preservation:* 7%

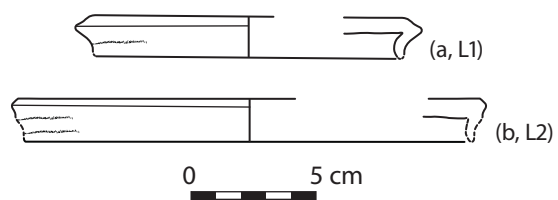


Plate 13: Lids, 1:3

Number 63: Rim of miniature dish (M1)

Illustration: Plate 14a, *MSE Number:* 195, *Feature:* [29,092], *Phase:* 7, *Fabric:* 3A, *Shaping technique:* wheelmade, *Surface treatment:* outside and inside are red-slipped, *Color:* outside is 10R 5/8 red, inside is 10R 5/8 red, *Rim diameter:* 12 cm, *State of preservation:* 12%

Number 64: Rim of miniature dish (M1)

Illustration: Plate 14b, *MSE Number:* 196, *Feature:* [29,097], *Phase:* 3, *Fabric:* 3A, *Shaping technique:* wheelmade, *Surface treatment:* outside and inside are red-slipped, *Color:* outside is 10R 7/8 light red, inside is 10R 5/8 red, *Rim diameter:* 11.6 cm, *State of preservation:* 10%

Number 65: Shoulder of miniature vessel (M2)

Illustration: Plate 14c, *MSE Number:* 197, *Feature:* [27,067], *Phase:* 10, *Fabric:* 3A, *Shaping technique:* wheelmade, *Surface treatment:* outside and inside are red-slipped, *Color:* outside is 2.5YR 5/2 weak red, inside is 2.5YR 5/2 weak red, *Body diameter (maximum):* 9.5 cm

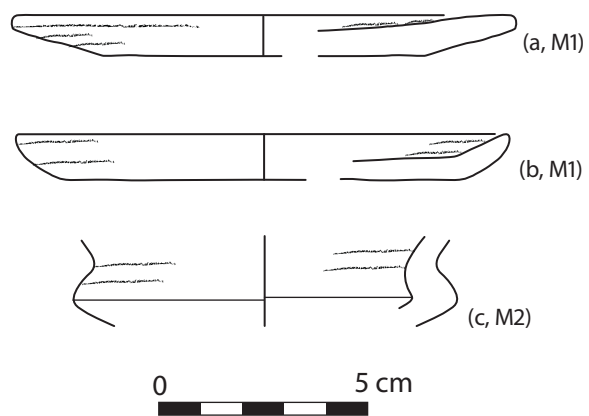


Plate 14: Miniature Vessels, 1:3

Number 66: Potmark, body sherd of white carinated bowl

Illustration: Plate 15a, *MSE Number:* 126, *Feature:* [29,092], *Phase:* 7, *Fabric:* 3A, *Shaping technique:* handmade, *Surface treatment:* outside and inside are smoothed and have white slip, *Height (of sherd):* 7.5 cm, *State of preservation:* 12%, *Type of Mark:* a cross, made before firing

Number 67: Potmark, body sherd of a jar

Illustration: Plate 15b, Color Plate 8b, *MSE Number:* 260, *Feature:* [27,061], *Phase:* 12, *Fabric:* 3B, *Shaping technique:* wheelmade, *Surface treatment:* outside and inside are smoothed, *Height (of sherd):* 8 cm, *State of preservation:* 12%, *Type of Mark:* vertical and horizontal lines, made after firing

Number 68: Potmark, body sherd of white carinated bowl

Illustration: Plate 15c, Color Plate 8d, *MSE Number:* 94, *Feature:* [27,065], *Phase:* 12, *Fabric:* 5B, *Shaping technique:* handmade, rim is turned, *Surface treatment:* outside and inside are smoothed with self-slip, *Rim diameter:* 24 cm, *Height (of sherd):* 9.5 cm, *State of preservation:* 11%, *Type of Mark:* a *nefer* sign, made after firing

Number 69: Potmark, body sherd of white carinated bowl

Illustration: Plate 15d, Color Plate 8c, *MSE Number:* 95, *Feature:* [27,065], *Phase:* 12, *Fabric:* 5B, *Shaping technique:* handmade, rim is turned, *Surface treatment:* outside and inside are smoothed with self-slip, *Rim diameter:* 24 cm, *Height (of sherd):* 8 cm, *State of preservation:* 11%, *Type of Mark:* a *nefer* sign, made before firing

Number 70: Potmark, rim of stand

Illustration: Plate 15e, *MSE Number:* 135, *Feature:* [27,061], *Phase:* 12, *Fabric:* 3A, *Shaping technique:* wheelmade, *Surface treatment:* outside and inside are red-slipped and polished, *Rim diameter:* 36 cm, *Height (of sherd):* 7 cm, *State of preservation:* 4%, *Type of Mark:* vertical and horizontal lines, made after firing

Number 71: Potmark, rim of stand

Illustration: Plate 15f, *MSE Number:* 69, *Feature:* [27,069], *Phase:* 10, *Fabric:* 3B, *Shaping technique:* wheelmade, *Surface treatment:* outside and inside are red-slipped and polished, *Rim diameter:* 13 cm, *Height (of sherd):* 6 cm, *State of preservation:* 12%, *Type of Mark:* a straight line and an arched line, made before firing

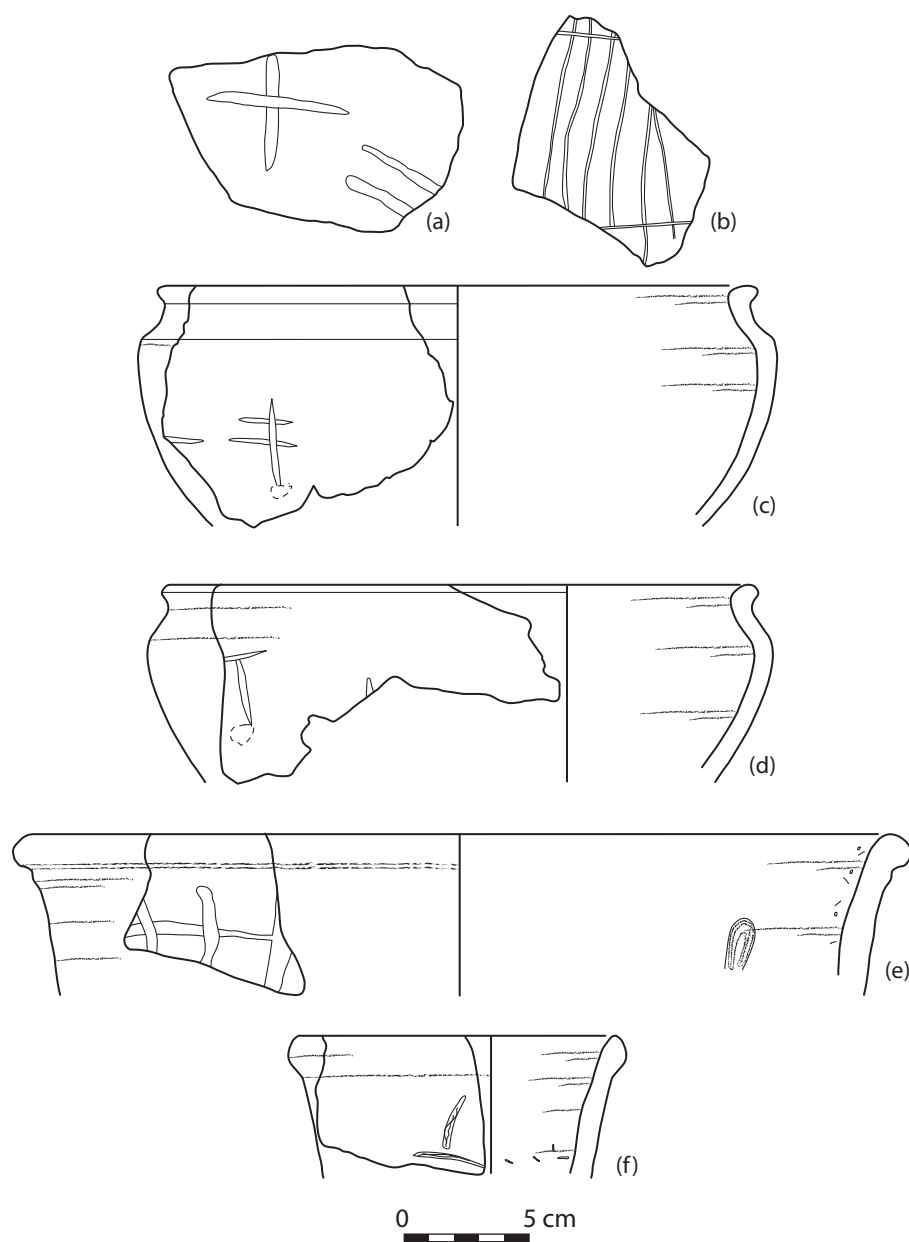


Plate 15: Potmarks, 1:3

APPENDIX 1: BUTO-MAADI SHERDS

Number BM1: Rim of a bowl

Illustration: Plate 16a, **MSE Number:** 85, **Feature:** [29,018], **Phase:** 9, **Diameter of rim:** 20 cm, **State of preservation:** 4%, **Height:** 3.8 cm, **Surface treatment:** smoothed on inside and outside surfaces

Reference: Jucha 2005: Pl. 53, Nos. 1, 2, 5

Fabric: A highly fired sandy coarse Nile clay. It contains: common very fine sand; common fine, medium, and coarse-sized plant remains; rare coarse limestone particles; common very fine mica particles. It has an open porosity, is poorly sorted, and medium hard. See Color Plate 9.

Color: fracture is 5YR 5/6 yellowish red, outside surface is 7.5YR 6/4 light brown, inside surface is 7.5YR 5/4 brown

Number BM2: Rim of a bowl

Illustration: Plate 16b, **MSE Number:** 86, **Feature:** [29,097], **Phase:** 3, **Diameter of rim:** 23 cm, **State of preservation:** 6%, **Height:** 3 cm, **Surface treatment:** smoothed outside and inside, outside has traces of reddish-brown slip

Reference: Jucha 2005: Pl. 66, No. 6

Fabric: A coarse Nile clay. It contains: a large amount of very fine sand; common fine, medium, and coarse plant remains; rare coarse particles of limestone; and common very fine mica. It has an open porosity, is poorly sorted, and medium hard. See Color Plate 9.

Color: fracture is 10YR 4/1 dark gray outside surface is 7.5YR 6/3 light brown, inside surface is 7.5YR 3/1 dark brown

Remarks: traces of soot on the rim

Number BM3: Rim of a jar

Illustration: Plate 16c, **MSE Number:** 84, **Feature:** [29,097], **Phase:** 3, **Diameter of rim:** 23 cm, **State of preservation:** 7%, **Height:** 4.8 cm, **Surface treatment:** smoothed on inside and outside surfaces, outside has traces of reddish-brown slip

Reference: Jucha 2005: Pl. 41, No. 4

Fabric: A coarse Nile clay. It contains: very common very fine sand; common fine, medium and coarse plant remains; rare, fine, and medium limestone particles; and common very fine mica. It has an open porosity, is poorly sorted, and medium hard. See Color Plate 9.

Color: fracture is dark gray 10YR 4/1, outside and inside surfaces are 10YR 7/4 very pale brown

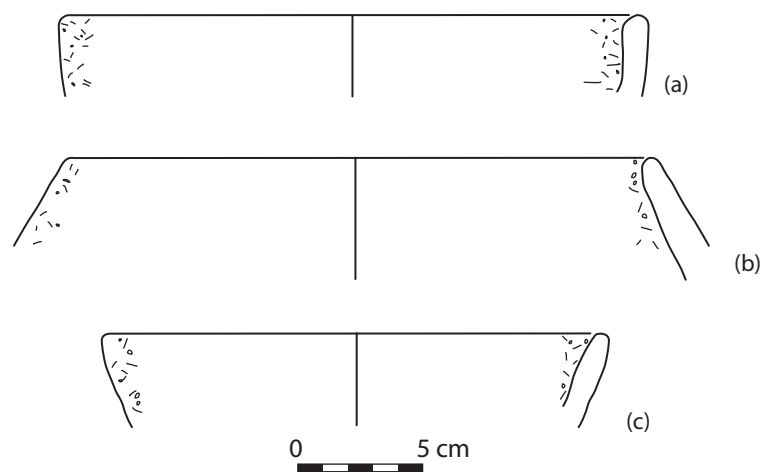


Plate 16: Buto-Maadi, 1:3



(a) Simple Platter, PT2



(b) Simple Platter, PT2

Color Plate I. Open forms: Simple platters, PT2. Photos by Jason Quinlan.



(a) Bread Tray, BT1A



(b) Bread Tray, BT1B

Color Plate 2. Open forms: Bread trays (a, b). Photos by Jason Quinlan.



(a) Bowl with slightly flaring rim, B3, interior



(b) Bowl with slightly flaring rim, B3, exterior



(c) Bowl with slightly flaring rim, B3



(d) Bowl with internal ledge, BL1C



(e) Bowl with internal ledge, BL1A

Color Plate 3. Open forms: Bowls with simple profile (a, b, c), Bowls with internal ledges (d, e). Photos by Jason Quinlan.



(a) White carinated bowl, CB1A



(b) White carinated bowl, CB1A



(c) White carinated bowl, CB1B



(d) Red slip carinated bowl, CB2B



(e) Red slip carinated bowl, CB2C

Color Plate 4. Open forms: White Carinated Bowl (a, b, c), Red slip Carinated Bowls (d, e). Photos by Jason Quinlan.



(a) Bread Mold, BM2A



(b) Bread Mold, BM3



(c) Vat, V1



(d) Vat, V2

Color Plate 5. Closed forms: bread molds (a, b), vats (c, d). Photos by Jason Quinlan.



(a) Jar, J1



(b) Beer Jar, BJ1



(c) Base of beer jar



(d) Beer Jar, BJ1

Color Plate 6. Closed forms: jar (a), beer jars (b, c, d). Photos by Jason Quinlan.



(a) Stand, S1



(b) Stand, S2

Color Plate 7. Non-Container, stands (a, b). Photos by Jason Quinlan.



(a) Lid, L1



(c) Potmark (*nfr* sign), White Carinated Bowl

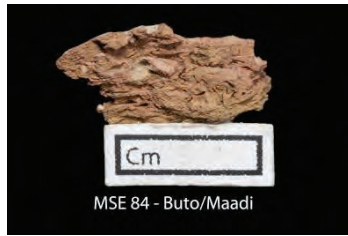


(d) Potmark (*nfr* sign), White Carinated Bowl

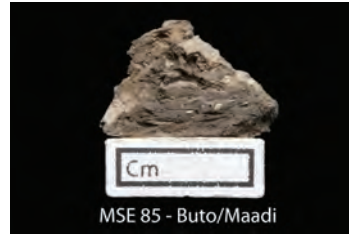


(b) Potmark (vertical and horizontal lines), Jar

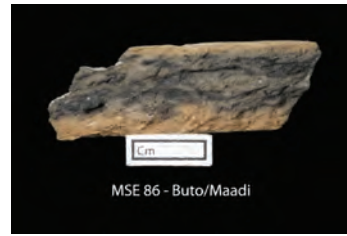
Color Plate 8. Non-container, Lid (a), potmarks (b, c, d). Photos by Jason Quinlan.



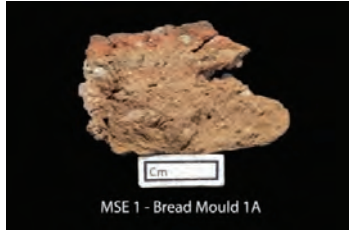
(a)



(b)



(c)



(d)



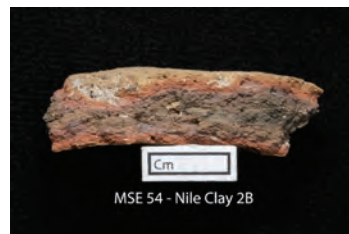
(e)



(f)



(g)



(h)



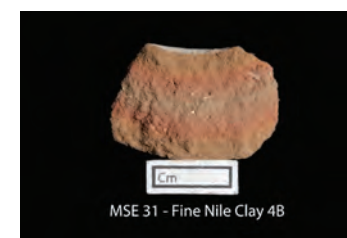
(i)



(j)

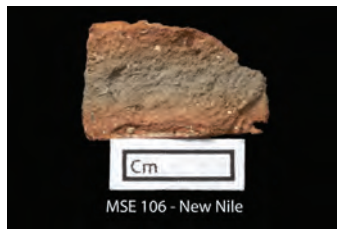


(k)



(l)

Color Plate 9. Buto-Maadi fabrics (a, b, c), Bread mold fabrics (d, e, f), Coarse Nile fabrics (g, h), Medium Nile fabrics (i, j), Fine Nile fabrics (k, l). Photos by Jason Quinlan.



(a)



(b)



(c)



(d)



(e)



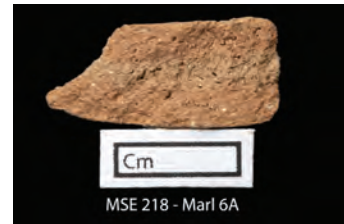
(f)



(g)



(h)



(i)

Color Plate 10. Fine Nile Clay (a), Marl Clay 5A (b, c, d), Marl Clay 5B (e), Marl Clay 5C (f), Marl Clay 5D (g), Marl Clay 5e (h), Mixed Clay (i). Photos by Jason Quinlan.

4. A Report on the 2009 Burials from the Chute Area

by Scott D. Haddow and Afaf Wahba Abd el-Salam Wahba, with Sara Sabri Abdallah, Maha Siah Abd el-Tawb, and Mahmoud Ali Abd el-Rahman

In 2009 AERA ran an Advanced Field School in the northwest corner of the Heit el-Ghurab (HeG) site. Here students in the AERA Advanced Osteology course worked alongside students from the Advanced Excavation program, excavating in areas known as the Western Compound and the Chute (frontispiece 2, fig. 4.1). The osteology teachers and students excavated 35 Late Period (25th Dynasty and onward) human burials from these two areas, including 19 from the Chute, as well as a votive deposit containing eight dog mummies (fig. 4.2). In 2010 as part of the Analysis and Publication Field School we prepared an article and burial catalog for publication that dealt

with the human skeletal remains we had excavated and analyzed from the Chute. Osteology team leader Jessica Kaiser published a summary of the osteological findings of the 2009 season in 2011 as part of AERA's *Giza Occasional Papers* 5 (Kaiser 2011a: 183–195; Kaiser 2011b: 197–199). In this piece we present the Chute burial catalog, a detailed account of our methods, and some interpretative analysis of the material. For more detailed interpretative and contextual analyses please refer to Kaiser's article in *GOP* 5 (Kaiser 2011a).

The Chute burials are Late Period inhumations, of which there are hundreds concentrated at the northern end of the HeG site, around the Wall of the

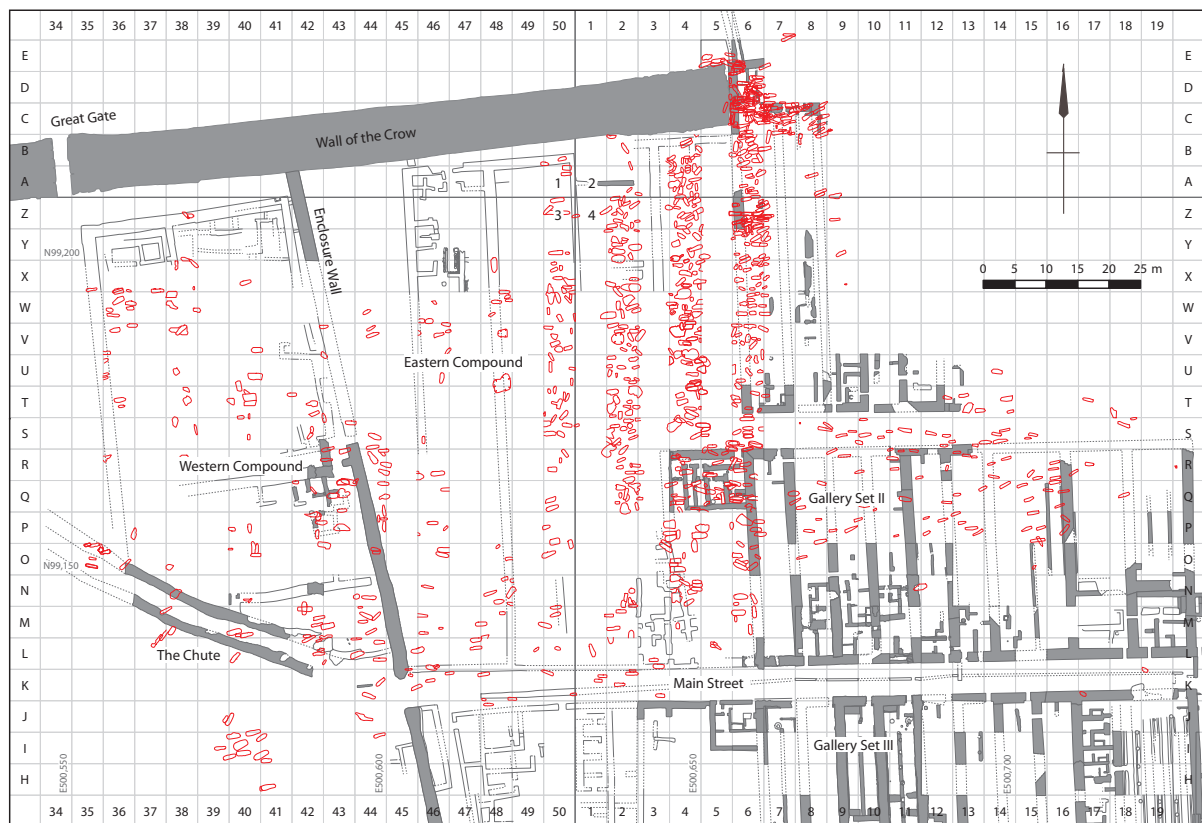


Figure 4.1. Plan showing the concentration of Late Period Burials around the Wall of the Crow and through Gallery Set I. Plan by Rebekah Miracle, AERA GIS, and Hassan Ramadan, after an original plan by Camilla Mazzucato.

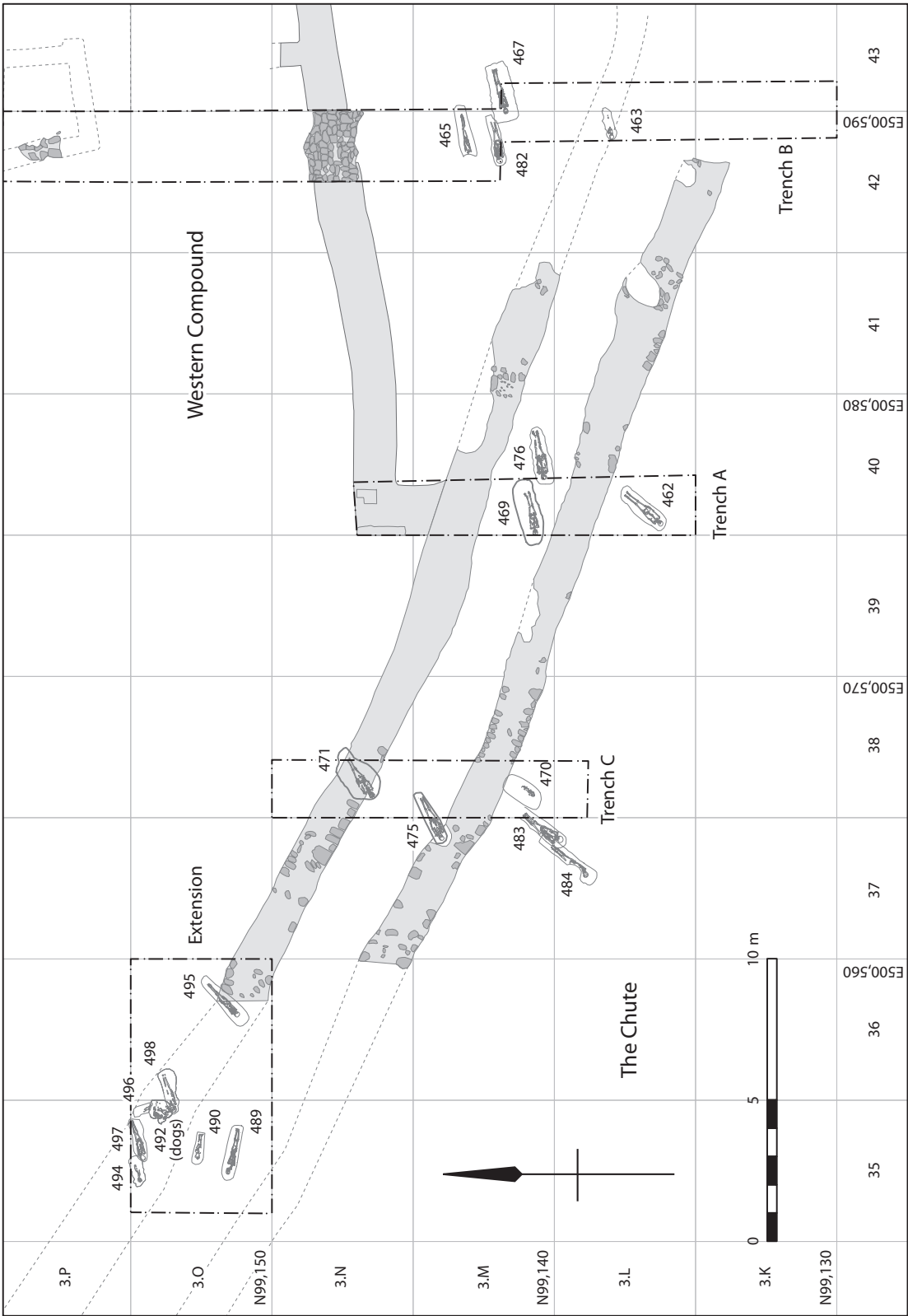


Figure 4.2. Plan showing the excavated burials (2009) in the area of the Chute. Plan prepared by Rebekah Miracle, AERA GIS, and Hassan Ramadan, after an original plan by Camilla Mazzucato.

Crow (fig. 4.1). The Late Period Cemetery had been dug through sand that covered the 4th Dynasty settlement (Kaiser 2005: 77). In 2005 the Osteology team conducted a burial survey at the northern end of the site, recording burial cuts that were visible on the surface. This survey picked up 630 burials (Kaiser 2005: 77).

The Chute area takes its name from the passage that runs northwest-southeast leading into the Main Street entry way, a street that provides access into individual gallery units within Gallery Sets II and III. Limestone walls bound the passage (Abd el-Aziz 2011: 123). All of these elements are part of the 4th Dynasty settlement at the HeG site.

The 2009 Osteology Field School Team

Jessica Kaiser (University of California, Berkeley) and Scott D. Haddow (University College London) led the 2009 osteology team. They were assisted by Ministry of State for Antiquities (MSA) supervisors Afaf Wahba, Zeinab Hashish, and Ahmed Gabr. The 2009 MSA field school students were Sarah Sabri Abdallah (Giza Inspectorate), Ayman Mohamed Damarany (Abydos Inspectorate), Mahrous Eid Mustafa el-Sanadidi (Saqqara Inspectorate), Ahmed Mohamed-Atef Kamel (Beni Suef Inspectorate), Maha Siah Abd el-Tawb (Saqqara Inspectorate), and Shereen Ahmed Shawqi (Luxor Inspectorate).

Aims and Objectives

The primary aim of AERA at the HeG site is the recording and analysis of the Old Kingdom settlement. However, because we excavate stratigraphically—exposing and removing the most recent features first

(see Chapter 7, this volume)—we must first excavate the intrusive burials that overlie or cut through the Old Kingdom settlement (Kaiser 2011a: 183). Since the beginning of the first AERA Field School in 2005, the osteology team has used these burials as an opportunity to teach the Egyptian inspectors from the Ministry of State for Antiquities (MSA) how to properly excavate and record human skeletal remains. One of the goals for the 2009 excavation of the Chute was to gain a better understanding of the relationship between the Chute, the Enclosure Wall (the large wall that partially encloses the Gallery Sets), Main Street, and the gate in the Wall of the Crow (Abd el-Aziz 2011: 12). Before the excavators could proceed, however, it was necessary to remove a large number of Late Period burials cutting through into the Old Kingdom archaeological horizons.

Dating

The 2009 burials from the Chute area are tentatively dated to the Late Period based on coffin style and burial orientation (see below). Although the AERA burials are usually referred to as “the Late Period Cemetery,” the material can actually be dated to six primary phases of use and abandonment (Kaiser 2006b: 24–26), ranging from the Old Kingdom through to the Late Roman, see table 4.1.

The Late Period coffins are similar in construction and style to some of the Late Period burials from the Anubeion at Saqqara (Giddy 1992: 35). These burials are distinct in orientation and body position from the small number of Old Kingdom burials recovered over several seasons at the site. Although three of the burials contained objects (generally beads and shells),

Table 4.1. Phasing of the Heit el-Ghurab burials. Burials are dated on the basis of pottery finds (Kaiser 2006b, Tavares and Laemmel 2011).

Phase I	Old Kingdom burials in the southwest corner of the site. The burials in this phase are in a state of poor preservation, but the heads are oriented to the north and are in a tightly flexed position.
Phase Ib	Abandonment until the 25th Dynasty
Phase II	25th Dynasty (c. 712–657 BC)
Phase III	Saite to Persian Period (6th–4th centuries BC)
Phase IIIb	Possible abandonment. No evidence of material culture has been found in any of the burials that date to the period between the Saite/Persian and Early Roman period.
Phase IV	Early to Mid-Roman period (1st–2nd century AD)
Phase V	Late Roman period (3rd–4th century AD)
Phase VI	Post-Roman period (Byzantine, Late Antique, and Coptic). The exact dating of these burials is unclear (Kaiser 2006b: 26).

dateable objects such as vessels were not found with any of the burials.

Taphonomy and Preservation

“Taphonomy” derives from the Greek *taphos* (burial) plus *nomos* (law). Within the field of bioarchaeology, taphonomy is the study of the factors—both natural and cultural—that affect the preservation of skeletal remains (reviewed in Henderson 1987). The human remains at the HeG site are typically found in poor condition; many of the bones survive only as extremely fragmented, powdery stains (Kaiser 2006b). The most important environmental factors affecting the preservation of burials at the HeG site are the high water table—especially as the site is low-lying in relation to the Giza Plateau—and the soil composition of the burial environment, specifically the density of the burial fill and high permeability of the sandy burial matrix (Kaiser 2006b: 84). Other environmental factors include animal (i.e., rodents, insects) and plant (especially root) activity, which can lead to the displacement and/or destruction of skeletal elements. Cultural processes that affect preservation include the disturbance of earlier graves by the cutting of pits for subsequent burials, robber pits, and heavy equipment. When graves have been disturbed by the cutting of new graves, disarticulated human bone from truncated burials may be found in the fill of later graves. As such disturbances are common on the site, we make a distinction between primary (i.e., intentionally deposited) and secondary (i.e., unintentionally deposited/redeposited) skeletons in our recording system.

The 2009 burials are in a marginally better state of preservation than other burials from the HeG site as a result of the higher elevation of the Chute area, although the skeletal remains are extremely friable and the coffins—where they occur—are highly degraded. For example, we have Burial 489 from the Chute area in a good state of preservation, with a top elevation of 18.48 meters above sea level (m asl) and a bottom elevation of 17.504 m asl, in comparison with Burial 464, poorly preserved, from the Western Compound with a top elevation of 18.05 m asl and a bottom elevation of 16.71 m asl. In a few cases, earlier burials are truncated by later ones, although not as frequently as in other areas of the site. One burial (484) from the Chute area also appears to have been cut by a relatively recent robber pit.

Methodology

Field Work

AERA has employed a single context recording system since 2005 (Chapter 7, this volume). This system is based on the Museum of London Archaeology (MoLA) Manual (Museum of London 1994). When a grave cut is discovered it is assigned an individual burial number. Unique feature numbers are then assigned to the grave cut, skeleton, fill, and coffin (if present). Consequently, each burial is comprised of at least three feature numbers which represent distinct temporal events; i.e., the cutting of the grave pit, the placement of the body, and the refilling of the grave. Recording forms are used to collect standardized information for each burial.

The first step is to expose and clean the burial with a variety of tools such as trowels, brushes, wooden sticks, and air bulb puffers. The orientation of the skeleton is recorded in degrees with the use of a magnetic compass. The Munsell color chart is used to record the color of the bones, grave fill, and any plaster or paint found on the coffins. Because of poor preservation, much of the analysis takes place *in situ* before the skeleton is lifted (Kaiser 2011a: 183). This analysis includes a basic skeletal inventory, preliminary age and sex assessment, and measurements of the long bones. Soil samples are taken from the abdominal cavity of the skeleton and sieved for gallstones, kidney stones, etc. In order to recover all of the finds from the burial, we dry sieve the grave fill of the burial on site (finds are handpicked, sorted, and bagged) and send the remaining soil to be wet-sieved. Once wet-sieved, any remaining finds are handpicked, sorted, and bagged.

Rather than planning each burial by hand (typically at a 1:10 scale), each burial is digitally photographed and surveyed using a Sokkia™ Total Station theodolite. The photographs, along with their survey coordinates, are subsequently plotted onto the site plan using MapInfo (a Geographic Information System software) and digitized.

In cases of extremely poor preservation, a consolidation agent (Paraloid B-72) is used to reinforce the bones before they are lifted from the soil. Each bone is lifted individually and wrapped in an aluminum foil packet by element (e.g., one each for skull, vertebrae, right and left arms, legs, hands, and feet) before being transported to the lab. Grave goods are also bagged and sent to the lab for further analysis.

Lab Work

After excavation, recording, and preliminary analysis on site, the bones are taken to the lab for cleaning and additional analysis. This includes a complete skeletal and dental inventory, final age and sex assessment, recording for pathological lesions and non-metric traits, and calculation of the minimum number of individuals (MNI) for each burial. When these analyses are complete, the bones are wrapped in acid-free tissue paper and placed in labeled plastic bags. Finally, the skeletons are archived in plastic boxes for safekeeping.

Burial Practices

Position and Orientation of the Body

While there are a small number of Old Kingdom burials that have been recovered from the HeG site, 98% of the 388 excavated burials postdate the Old Kingdom occupation levels, mainly deriving from the Late and Greco-Roman Periods. At the HeG site, Old Kingdom burials can easily be distinguished from those of later periods by the position and orientation of the skeleton. The former are typically oriented in a flexed position with the long axis of the body oriented north-south, while the latter are placed in an extended supine position (lying on the back) with the head oriented to the west (Kaiser 2006b). In the post-Old Kingdom burials, the arms are usually extended with the hands either on the upper thighs or across the pelvic region (Kaiser 2004; 2005; 2006a, b; 2011a). In this regard, the 2009 Chute burials are not dissimilar from Late Period burials recovered from other areas of the site. Deviations from the general east-west orientation of burials may be indicative of seasonal mortality patterns as it is generally assumed that the graves are oriented with respect to the position of the rising sun (Strouhal and Bareš 1993: 77; Williams 2008: 8).

Mummification

The Ancient Egyptian preoccupation with preserving the body may have been inspired by the observation of naturally desiccated bodies that had been interred directly in the sand in the Predynastic period (Ikram and Dodson 1998). During the Old and Middle Kingdoms, mummification was typically reserved for the upper and ruling classes, and the techniques for preserving the body continued to be refined. It was not until the New Kingdom, however, that the process of mummification reached its apogee (Auferderheide

2003: 212). In the Late Period, however, embalmers tended to focus more on the wrapping and packaging of the mummy rather than the preservation of the soft tissues. From this time onwards, the quality of mummification appears to have declined (Ikram and Dodson 1998: 109). Herodotus records three types of mummification ranging in quality and cost. The cheapest of these methods does not involve removal of the internal organs, but rather a quick rinse of the intestines with some type of purge and soaking the body in natron for 70 days (Herodotus, *Histories*, 2.86-88). Because of the generally poor level of preservation at the HeG site, we do not have much direct evidence for mummification (Kaiser 2006b: 7), for example, we have very few traces of textile or linen. But we sometimes find black material in the abdomen and/or throat region and sometimes mud packing (Kaiser 2006b: 7). However, from indirect evidence of mummification, such as the body position, we can conclude that for some burials the body appears to have been tightly wrapped before being put in the coffin (Kaiser 2011a: 188-189). For example, in Burial 475 (see burial catalog below) the v-shaped position of the clavicles indicates that the burial had been tightly wrapped.

For the Chute burials, we have only one individual (5%) that displays direct evidence of mummification: Burial 482, in which traces of black material were found in the throat and abdominal area. That is not to say that the others had not been mummified, however, just that the poor soil conditions at the HeG site are likely to have obliterated any traces of mummification, such as textiles. The non-elite status of the individuals buried at HeG means that higher quality materials such as resins, which might have survived the burial environment, would likely not have been used. Some burials, for example, Burial 467, appear to have been packed with mud in the abdominal area and other regions of the body, perhaps as a cheap way of providing shape to the wrapped body. One of us (Haddow) has observed this phenomenon in Late Period and Greco-Roman burials at Quesna in the Western Delta.

Coffins

As with the skeletal material, the coffins from HeG are generally found in very poor condition. Most appear to have been constructed of a rudimentary wood framework covered in a thick layer of mud (Kaiser 2006b: 33). Unfortunately, the wooden core of the

coffin is not preserved in the majority of cases and we are left only with a collapsed mud shell. On some coffin lids, mud was also used to mold face masks and wigs. The lids from the Chute area are typically decorated in geometric red, black, yellow, white, or blue color combinations, although some coffins appear to have been left unpainted. Anthropoid- and rectangular-shaped coffins are the most common types found on site (Kaiser 2006b: 30).

Thirteen of the nineteen Chute burials (68%) excavated in 2009 contained poorly preserved coffins. Of these, eight are anthropoid-shaped, three are subrectangular or rectangular in shape, and two are oval-shaped. Ten (76%) of the thirteen coffins had traces of painted decoration surviving on the outer surfaces. Five of these had masks with wigs typical of the Late Period (Giddy 1992). The three unpainted coffins belonged to juveniles (one infant and two young children). The most elaborate coffin found in 2009 is from Burial 467, which consisted of a rectangular outer coffin with side panels depicting mummiform figures and a painted anthropoid inner coffin with a mask and wig (see burial catalog below and Kaiser 2011a: 191). This coffin is similar in style to ones described by Giddy (1992: 37) from Late Period Saqqara.

Grave Goods

The majority of Late Period inhumations from HeG contain very few grave goods. However, the few we do recover are typically generic, low-quality items such as bracelets and necklaces made of cowrie shell, faience, or stone beads used for personal adornment (Kaiser and Westlin 2005). Amulets, copper alloy objects, and pottery vessels are also common. Burials of infants and children are more likely to have grave goods than those of adults (Kaiser 2006b: 34; 2011a: 189). In this regard, the 2009 Chute burials are not atypical. Only six (32%) of the nineteen Chute burials had grave goods: two infant burials (Burials 470 and 494), one child burial (Burial 490), and three adult burials (Burials 462, 495, and 497). Burial 494, belonging to an infant, contained the greatest number of items: 27 cowrie shell beads, two faience beads, and one alabaster bead (Kaiser 2011a: 190) (see burial catalog below). Burial 490, that of a young child, contained the greatest variety of items: two copper earrings, cowrie shell bracelets, beads of carnelian, red jasper, and faience, as well as a *wadjet* amulet in red jasper (Kaiser 2011a:

190) (see burial catalog below). No vessels were found with any of the Chute burials.

Osteological Analysis

In conducting bioarchaeological research at AERA, we try to gain as much information as we can from the human remains through the estimation of age, sex, and stature, as well as the identification and interpretation of pathological lesions. These analyses allow us to construct a demographic profile of the HeG skeletal assemblage, providing insights into overall health and growth patterns, as well as occupational activity and diet. Future analyses, such as stable isotope and morphometric studies, may also provide information on population structure and immigration, as well as more detailed data on dietary practices. This diverse range of information, when compared with data from other ancient Egyptian skeletal assemblages, will allow us to build a picture of the lives of the individuals buried at the HeG site.

Minimum Number of Individuals

Sometimes there are disturbances to primary burials by later burials or by other post-depositional processes that result in the introduction of loose secondary bones into primary burials. We use the Minimum Number of Individuals (MNI) as our main recording figure in order to find out how many individuals are actually represented in each burial. We examine the bone assemblage in each grave to look for duplicate skeletal elements. For example, if two mandibles are found together in a grave, we can say that there are at least two individuals represented. The MNI for the Chute area in 2009 is 24 from a total of 19 excavated burials. The occurrence of bones from an additional five individuals in these nineteen primary burials is likely a result of disturbances to earlier burials by later ones. For example, Burial 497, which contained an MNI of four individuals (including the primary skeleton), may have disturbed an earlier burial in the same location, and this might explain the presence of several extra adult long bones found in the grave fill. In the case of Burial 495, however, the presence of bones from two extra individuals in the coffin may be the result of sloppy workmanship during the mummification process (or perhaps a result of the advanced state of decomposition of the primary skeleton) which necessitated the construction of a “composite mummy” using bits and pieces of other bodies lying around the embalmer’s workshop.

Age Assessment

Methods

The first goal of our osteological analysis is the age assessment of the individual. There are several techniques used for aging human skeletal remains depending on the developmental stage of the individual. For subadults, the technique is based on the growth and developmental sequence of the dentition and bones, while for adults the techniques are based on degenerative changes in the skeleton (Buikstra and Ubelaker 1999; White and Folkens 2005).

We use dental development and eruption patterns to assess subadult age according to Ubelaker (1999). Dental development is considered one of the most reliable techniques for aging subadult remains. It is known that each tooth erupts at a regular interval, and that tooth development is more closely associated with chronological age than other indicators such as cranial suture closure (White and Folkens 2005: 361). The growth and development of bones can also be used to estimate age in subadults. At the end of the growth stage each bone, typically comprised of several elements, fuses within a relatively well-established time frame (Scheuer and Black 2000). Measurements of bones may also be used to establish an age estimate (Scheuer and Black 2000).

Once skeletal growth is completed, we assess age in adult individuals by examining degenerative changes in the skeleton that occurred during the individual's life. The most common methods are observation of changes to the symphyseal surfaces of the pubic bones (Brooks and Suchey 1990) and the auricular surface of the ilium (Lovejoy et al. 1985). Because these bones are not always well-preserved in archaeological skeletal material, however, we sometimes use dental wear patterns to provide a broad age estimate using the methods established by Brothwell (1981). We have to note, however, that using degenerative changes to age the skeleton is less precise than age estimation methods for juveniles, which provide us with a narrower age range.

Based on White and Folkens (2005: 360), we use six age categories for human osteological remains:

Infant	0–3 years
Child	3–12 years
Adolescent	12–20 years
Young Adult	20–35 years
Middle Adult	35–50 years
Old Adult	50+ years

We assigned each burial from the 2009 Chute excavations to an age category. The primary skeletal assemblage contains three infants (0–3 yrs), four

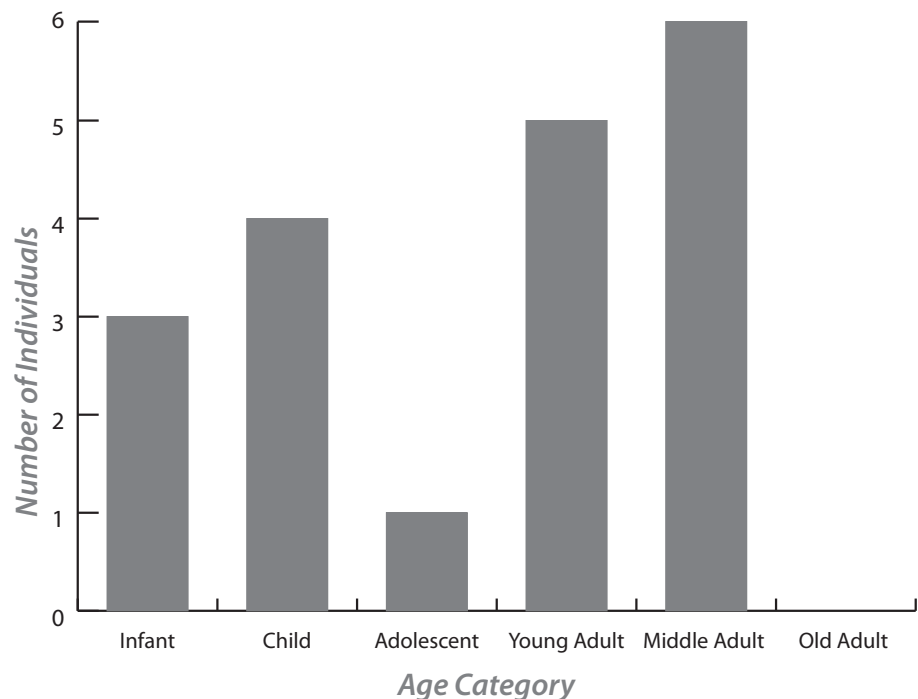


Figure 4.3. Chart Showing the Primary Skeleton Age Distribution of the 2009 Chute Burials.

children (3–12 yrs), one adolescent (12–20 yrs) five young adults (20–35 yrs), six middle adults (35–50 yrs), and no old adults (50+ yrs) (fig. 4.3). We have one burial with secondary bones for two adult individuals but they cannot be assigned to a more precise age category; as such, they are excluded from the age distribution chart. According to Kaiser, the age distribution percentages from the 2009 burials (the Chute and Western Compound burials) fit with the age distribution percentages throughout the HeG cemetery (Kaiser 2011a: 185). The exceptions are the middle and old adult groups (35–74 years old in the age categories used by Kaiser), which have a higher percentage in the 2009 sample compared to the wider HeG assemblage, and the children (under 10 years old in the age categories used by Kaiser), which have a lower percentage compared to the wider HeG assemblage (Kaiser 2011a: 185). Kaiser suggests that the higher percentage of middle and old adult groups may indicate that older individuals tended to be buried in the western end of the HeG site, but also mentions that the discrepancy may be because we excavated only a small sample in this area (Kaiser 2011a: 185). Kaiser also suggests that the lower percentage of children is unsurprising because there is such a high representation of children around the eastern end of the Wall of the Crow (Kaiser 2011a: 185–186).

Sex Assessment

Methods

Along with the estimation of age, sex assessment analyses allow us to reconstruct the demographic structure of archaeological skeletal assemblages. The main method of sex assessment in human skeletal remains is the evaluation of sexually dimorphic features of the pelvis and skull (White and Folkens 2005: 392). It is important to note, however, that these methods are only applicable once sexual maturity has been reached, as it is only then that the morphological features of the skeleton that distinguish between males and females become sufficiently pronounced (White and Folkens 2005: 385). Pelvic morphology is considered the most reliable indicator of sex for skeletal remains, and the method developed by Phenice (1969) is the most commonly used. The differences in pelvic morphology between males and females are related to child birth and locomotion. In females, the sacrum

and os coxa are typically smaller and less robust than in males, while the pelvic inlet and sciatic notch tend to be wider in order to accommodate parturition (White and Folkens 2005: 394). The main morphological criteria used are presence/absence of the ventral arc, preauricular sulcus, and subpubic concavity; relative shape of the ischiopubic ramus ridge; and relative size of the subpubic angle and greater sciatic notch. These methods are summarized in Bass (1995: 200–201), Brothwell (1981: 62), Buikstra and Ubelaker (1994: 18–19), and White and Folkens (2005: 385–398).

Sex differences in the cranium and mandible are based on relative levels of robusticity in several dimorphic indicators. In general, males tend to be more robust than females and have more pronounced areas for muscle attachments. The following indicators are used to determine sex in the cranium and mandible: the mastoid process, supraorbital ridge, supraorbital margin, nuchal crest, the mental eminence, and the mandibular angle (Brothwell 1981: 61; Buikstra and Ubelaker 1994: 19–20; White and Folkens 2005: 386–391). Each one of the dimorphic features for the pelvis and cranium is scored on a five-point scale: Female (F), Probable Female (F?), Indeterminate (?), Probable Male (M?), and Male (M). Because of the poor preservation of skeletal remains at the HeG site, especially of the pelvic bones, we cannot always determine the sex of individuals. In the absence of the pelvic and cranial bones, we can estimate sex by taking measurements of dimorphic dimensions in the long bones such as the maximum diameter of the femoral head (Bass 1995: 231).

As for the sex distribution of the primary skeletons in the 2009 Chute burials, we have seven females, two possible females, and four males, as well as six individuals who are too young to be assessed for sex (fig. 4.4). As for the secondary skeletons, the bones were so fragmented and the skeletons were so incomplete that we cannot be precise in any assessment of the sex. The combined 2009 material (burials from both the Chute and the Western Compound) showed the distribution of males and females to be relatively even when considering only the securely assessed skeletons (Kaiser 2011a: 186). However when Kaiser considers the “probables” this figure is 54% male to 46% female—which is a sex ratio (number of males per 100 females) of 117 (Kaiser 2011a: 186). The sex ratio of the HeG cemetery is 116 (Kaiser 2011a: 186).

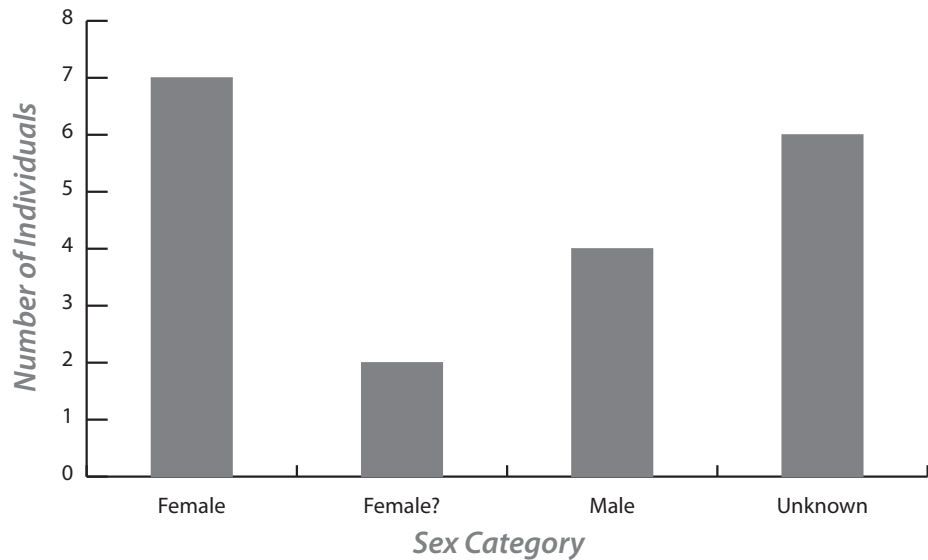


Figure 4.4. Chart showing the Primary Skeleton Sex Distribution of the 2009 Chute Burials.

Pathology

The most commonly observed pathological conditions in ancient skeletal assemblages are degenerative joint disease (DJD), trauma, and infection (periostitis) (Ortner 2003). Dental diseases, along with hematopoietic diseases (diseases of the circulatory system) that affect the cranium, such as cribra orbitalia and porotic hyperostosis, are also common among preindustrial populations (Ortner 2003). Here we provide an overview of the types of pathological lesions observed in the 2009 Chute burials. It is important to recognize, however, that many diseases are acute in nature and lead to the death of the individual before any trace is left on the skeleton. Also, the poor overall preservation of the skeletal remains at the HeG site means that we are likely to have lost a great deal of information.

Degenerative joint disease, including osteoarthritis, is typically associated with advanced age: the older the individual, the more likely he/she will be affected by wear and tear on the joints, although other factors such as sex, workload, trauma, genetic makeup, and other illnesses may also play an etiological role (Waldron 2009: 28). Seven individuals (37%) from the 2009 Chute burials had evidence of degenerative joint disease, most commonly in the spine in the form of osteophytic growths along the disk margins of the vertebral bodies, especially of the lower back (Burials 467, 469, 475, 476, 482, 483, and 497), as well as in the carpal bones of the wrist (Burial 475). Except for Burials 467 and 483 (both young adults), these individuals were middle adults. Osteophyte development is scored

according to Ubelaker's (1999: 85) five grade method, wherein 0=no lipping and 4=maximum lipping.

Trauma can be defined as an injury to the body deriving from an external source, either accidental or intentional. Fractured bones are the most common type of trauma found in archaeological skeletal remains, but surgical interventions, joint dislocation, nerve or blood supply disruption, and abnormal bone shape may also be observed (Ortner 2003: 119; Waldron 2009: 138). In the Chute burials we have four individuals (21%) with evidence of trauma including two individuals with healed fractures of the right wrist (Burials 462 and 475). This type of fracture, known as a Colles' fracture, is often the result of an attempt to break one's fall with outstretched arms. Burial 482 has a healed fracture of the left first rib, and Burial 497 has a bony callus on the midshaft of the left femur, which may have come from an injury that damaged but did not break the bone.

Periostitis is an inflammation of the periosteum, a connective tissue that lines the outer surfaces of bones (except the joint surfaces). The prevalence of periostitis in a skeletal population is often used as a non-specific indicator of stress and overall health levels, although it may also occur as a result of trauma or other disease processes (Ortner 2003). Periostitis was observed in four individuals (21%) from the Chute area: Burials 471, 484, 489, and 495.

Cribra orbitalia and porotic hyperostosis, porotic lesions that occurs on the roof of the eye sockets and cranial vault, respectively, are thought to be associated

with metabolic iron-deficiencies occurring as a result of either genetic defects (e.g., thalassemia or sickle-cell anemia) or acquired conditions, such as malnutrition or chronic illnesses (Ortner 2003: 370). Cribra orbitalia and porotic hyperostosis are among the most commonly observed lesions in the skeletons from the Chute area. Seven individuals (37%), mainly female, had either healed or active cribra orbitalia and/or porotic hyperostosis: Burials 462, 471, 476, 484, 495, 497, and 498.

The most interesting case from the 2009 Chute excavations is Burial 475: a middle adult male with a well-healed wrist fracture, multiple ossified ligaments, and several fused lumbar vertebrae. The fusion of segments of the vertebral column, combined with the profusion of ossified ligaments (many of them bilateral), may indicate a condition known as DISH (diffuse idiopathic skeletal hyperostosis). The prevalence of this condition is highly correlated with increased age and occurs more often in males than in females (Ortner 2003: 559).

Cavities, abscesses, enamel hypoplasias, periodontal disease, and calculus are the most common afflictions of the dentition in ancient populations, and can give us a lot of information about individual health, diet, and age (Hillson 1996). We have seven individuals (37%) from the Chute area with some form of dental disease.

Dental caries, or tooth decay, occur as a result of the production of acid by bacterial activity caused by the fermentation of food debris in the oral cavity, which leads to demineralization of tooth enamel. Dental caries may be found on occlusal surfaces, as we found in Burial 476, or in the interproximal Cemento Enamel Junction (CEJ), as we can see in Burial 484. We had three individuals with caries (Burials 475, 476, and 484) out of nineteen burials (16%).

An abscess occurs when the pulp chamber of a cracked or carious tooth becomes infected. A pus-forming cyst forms around the apex of the infected tooth root which may eventually perforate the bone.

This infection may lead to blood-poisoning and death if the abscess becomes deep. Burial 475 had a large abscess in the body of the left mandible.

Enamel hypoplasias occur when the enamel surface of the tooth does not form properly as a result of dietary or other environmental stresses during the development of the dentition. We can observe it as the presence of horizontal grooves on the teeth, especially on the canines and sometimes on the incisors and premolars. There are four individuals (21%) from the 2009 Chute excavations who had enamel hypoplasia: Burials 462, 467, 489, and 498.

Periodontal disease is an inflammation of the alveolar bone that supports and surrounds the teeth. This inflammation may be caused by irritation of the gums as the result of the buildup of calculus (dental plaque or tartar) on the surface of the teeth—a common occurrence among the Chute skeletons. Seven out of nineteen individuals (37%) from the Chute had calculus observable on the dentition: Burials 462, 467, 469, 476, 483, 484, and 495. Burial 462, however, is the only individual who had evidence of periodontal disease.

Summary

The nineteen burials recovered from the Chute area in 2009 constitute a small subset of the overall skeletal assemblage excavated at the HeG site since 1998. Further analysis and integration with the previously excavated skeletal material are required in order to understand how the Chute area burials relate to burials from other areas of the site. As such, this report represents only the first step in a larger, ongoing analysis of the human remains from HeG that aims to incorporate comparative skeletal data from other cemetery sites in Egypt. This will help us situate the burial assemblage within the broader context of ancient Egyptian society in terms of mortuary practices, socioeconomics, demography, population structure, health, and lifestyle.

Burial Catalog

BURIAL 462

Feature Numbers: Skeleton [31,309], Coffin [31,307], Cut [31,305], and Fill [31,306]

Square: 3.L40

Orientation of long axis: 140° west of north

Top elevation of grave cut: 18.70 m asl

Bottom elevation of grave cut: 18.29 m asl

This is an extended supine Late Period burial located south of the Chute. The burial was oriented east-west (with the head to the west) and had a yellow-painted anthropoid mud coffin (fig. 4.5). The burial had a damaged mask of which we could only see its lips and chin, and it had been put in an oval-shaped grave cut (fig. 4.6). The left and right hands of the skeleton were placed on the hips and its feet were extended (fig. 4.7). The skeleton belongs to a young adult female. Based on her dental wear, she was between 18–25 years of age. The skeleton had a lesion on her distal right radius that may be an indication of an infection and a well-healed fracture of her distal right ulna, indicated by a localized thickening of the distal right radius shaft (fig. 4.8). The inner table of her frontal bone had thickened, possibly as the result of healed porotic hyperostosis from an earlier event. The orbital vaults are missing (post-mortem) so we are unable to tell whether there are indications of cribra orbitalia. There is slight calculus on the labial surfaces of the mandibular canines and incisors, in addition to slight enamel hypoplasia on the anterior teeth. Burial 462 contained no objects.

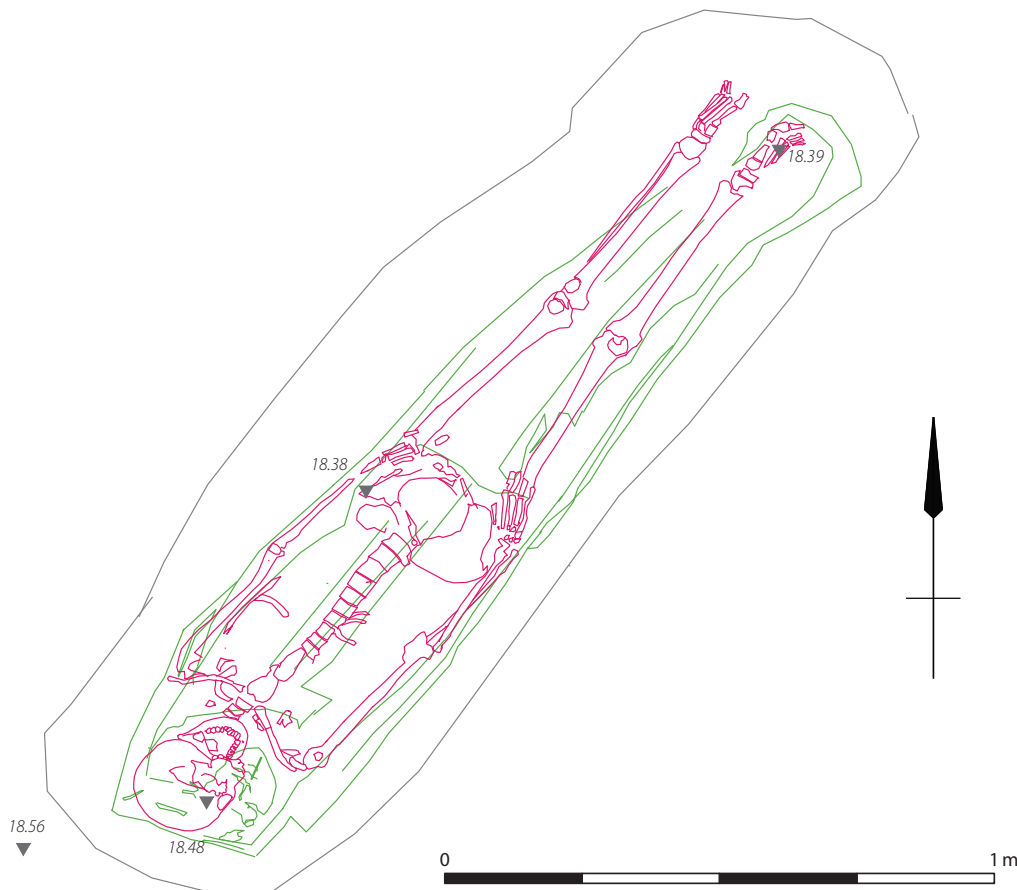


Figure 4.5. Burial 462. Cut [31,305] is shown in gray, skeleton [31,309] in pink, and coffin [31,307] in green. Elevations (in meters above sea level, marked with triangles) indicated on skeletons were measured on the bone itself, not on coffin remains.

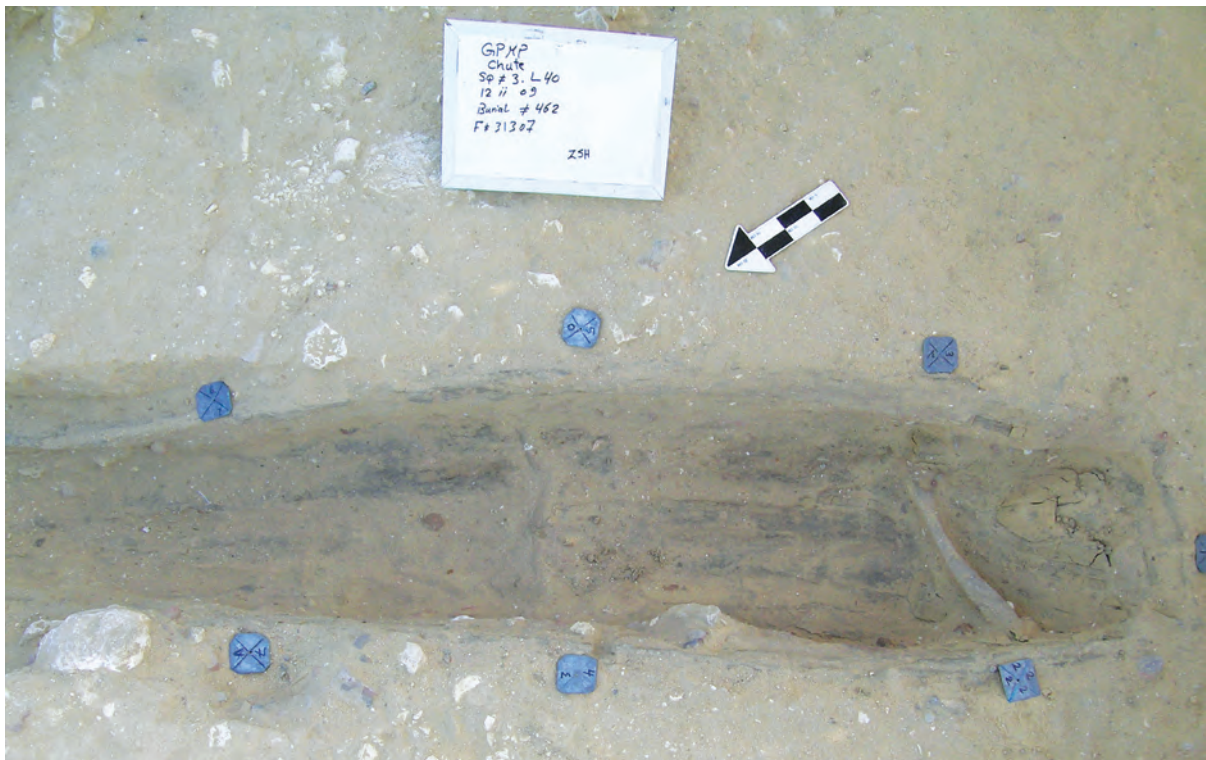


Figure 4.6. Burial 462. Damaged painted anthropoid coffin [31,307] with only the lips and chin visible. Photo by Zeinab Sayed Hashish.



Figure 4.7. Burial 462, showing skeleton [31,309]. Photo by Zeinab Sayed Hashish.



Figure 4.8. The distal ulna of skeleton [31,309] from Burial 462 showing a thickening of the shaft. Photo by Ahmed Mohamed Gabr.

BURIAL 463

Feature Numbers: Skeleton [31,314], Coffin [31,322], Cut [31,312], and Fill [31,313]

Square: 3.L42 and 3.L43

Orientation of long axis: 110° west of north

Top elevation of grave cut: 17.82 m asl

Bottom elevation of grave cut: 17.50 m asl

Burial 463 is a poorly-preserved, extended supine coffin burial in an oval grave cut located in the northern Chute wall. It dates to the Late Period. The skeleton is that of a child (figs. 4.9, 4.10). The burial is in poor condition, and the coffin is unpainted. The child's hands had been placed on the pelvis and femur. It is aged 3 years (-/+1 year) based on dental eruption. We were unable to determine its sex because the child was too young. We observed no pathological lesions. Burial 463 contained no objects.

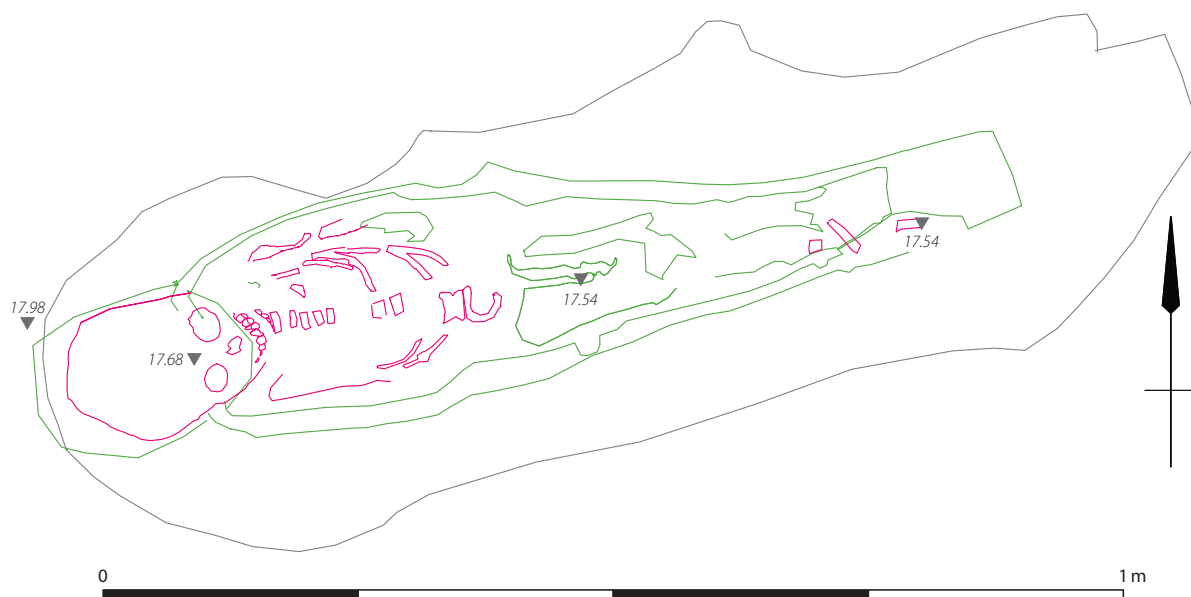


Figure 4.9. Burial 463. Cut [31,312] is shown in gray, skeleton [31,314] in pink, and coffin [31,322] in green. Elevations indicated on skeletons were measured on the bone itself, not on coffin remains.



Figure 4.10. Burial 463 showing skeleton [31,314]. Photo by Zeinab Sayed Hashish.

BURIAL 465

Feature Numbers: Skeleton [31,340], Coffin [31,319], Cut [31,317], and Fill [31,318]

Square: 3.M42 and 3.M43

Orientation of long axis: 100° west of north

Top elevation of grave cut: 17.75 m asl

Bottom elevation of grave cut: 17.51 m asl

Burial 465 was a poorly preserved, extended supine coffin burial in an oval-shaped grave cut, located just north of the Chute wall. It dates to the Late Period. The skeleton is without a skull because it was truncated by a later grave cut, [31,327] (figs. 4.11, 4.12). It had an oval-shaped coffin painted in red, yellow, and black. The coffin was in extremely poor condition. The hands were placed over the pelvic region and the left foot was placed over the right. Based on measurements of the tibiae taken in the field, this individual is a child between 10 and 11 years of age.¹ Sex cannot be determined because the individual had not reached sexual maturity. No grave goods were found with this burial, and no pathological lesions were observable due to the poor preservation of the skeleton.

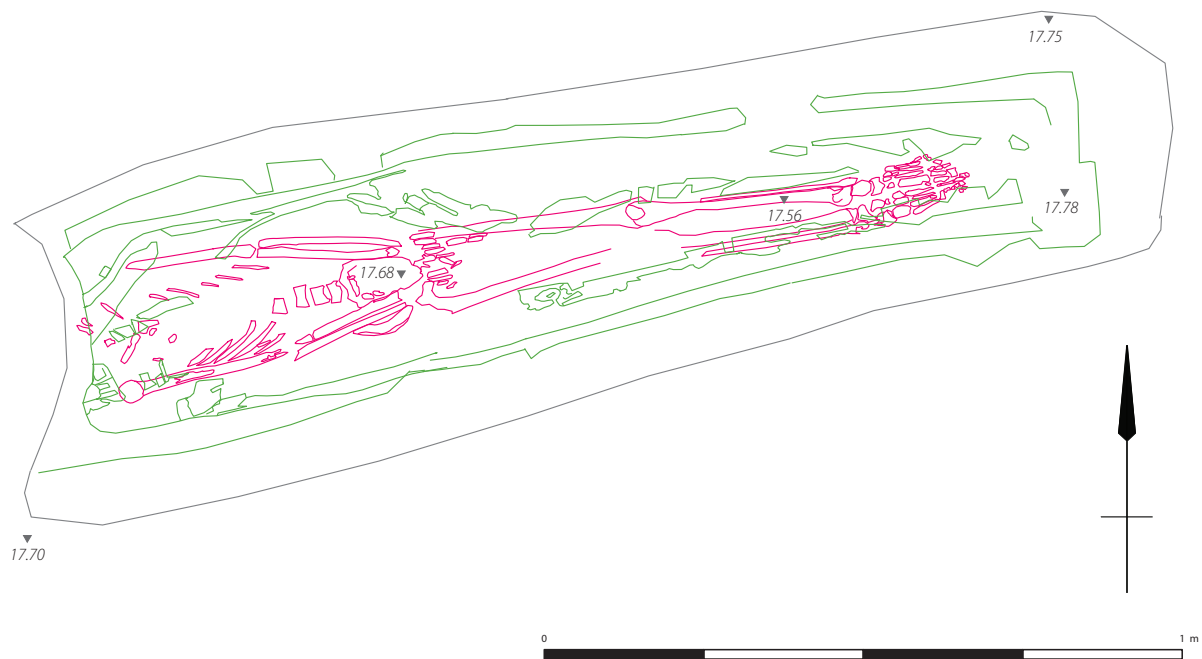


Figure 4.11. Burial 465. Cut [31,317] is shown in gray, skeleton [31,340] in pink, and coffin [31,319] in green. Elevations indicated on skeletons were measured on the bone itself, not on coffin remains.

1. This assessment supersedes the previous assessment of 12–20 years (Kaiser 2011a: 185).



Figure 4.12. Burial 465 showing skeleton [31,340]. Photo by Ahmed Mohamed Gabr.

BURIAL 467

Feature Numbers: Skeleton [31,360], Coffin [31,333], Cut [31,323], and Fill [31,324]

Squares: 3.M42–43

Orientation of long axis: 105° west of north

Top elevation of grave cut: 17.55 m asl

Bottom elevation of grave cut: 17.20 m asl

Burial 467 is an extended supine, east-west oriented double coffin burial (fig. 4.13) dating to the Late Period. It had a crushed mask, and the face of the mask had degraded considerably. The skeleton had been placed in a rectangular grave cut, located immediately north of the Chute. Some parts of the skeleton appear to be covered in mud, especially in the abdominal region, perhaps as a means of packing the body and providing shape for the outer wrappings. The skeleton is a young adult female between 25–35 years of age² based on dental wear (fig. 4.15). We determined the sex based on pelvic and cranial morphology. As for pathological lesions, she had very slight linear enamel hypoplasia in the left and right maxillary first incisors. There was a slight amount of calculus on the labial surface of the central incisors on the mandible and a slight amount of calculus on the buccal surface of the left mandibular second molar. There was also slight margin lipping and osteophytic growth in the lumbar vertebrae.

The double coffin had been elaborately decorated. It consisted of an outer, mud-plastered, rectangular wooden coffin. The inner surface had been painted yellow; the outside had been painted with panels representing the four sons of Horus, in blue, red, yellow, and black colors (figs. 4.14, 4.16). The inner, anthropoid coffin had been made of mud, painted with geometric shapes and symbols in different colors, including white, blue, yellow, and red (fig. 4.17). The mask had a striped wig that was blue, yellow, and white. The mask had been crushed and had lost most of its color. There were traces of the frame for the outer coffin preserved underneath the skeleton. Burial 467 contained no objects.

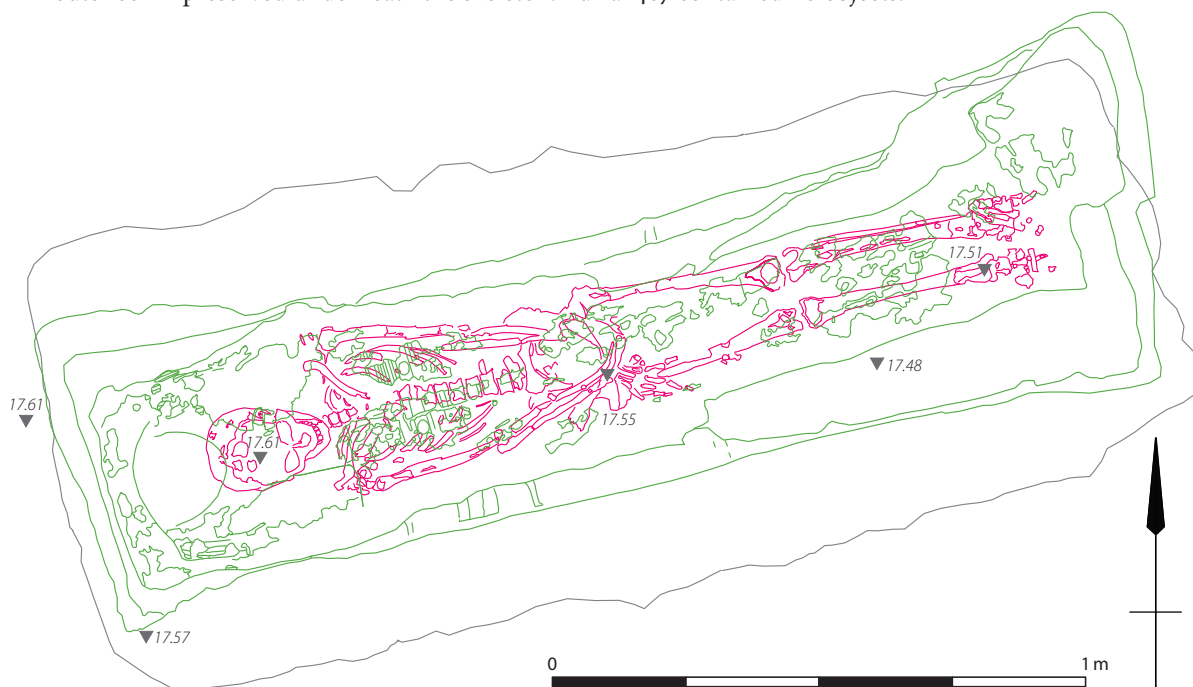


Figure 4.13. Burial 467. Cut [31,323] is shown in gray, skeleton [31,360] in pink, and coffin [31,333] in green. Elevations indicated on skeletons were measured on the bone itself, not on coffin remains.

2. This assessment supersedes the previous assessment of 18–44 years (Kaiser 2011a: 185).



Figure 4.14. The elaborately decorated double coffin [31,333] of Burial 467. Photo by Scott D. Haddow.



Figure 4.15. Burial 467, showing skeleton [31,360]. Photo by Zeinab Sayed Hashish.



Figure 4.16. Painted panels representing the four sons of Horus in blue, red, and yellow on coffin [31,333] of Burial 467. Photo by Scott D. Haddow.

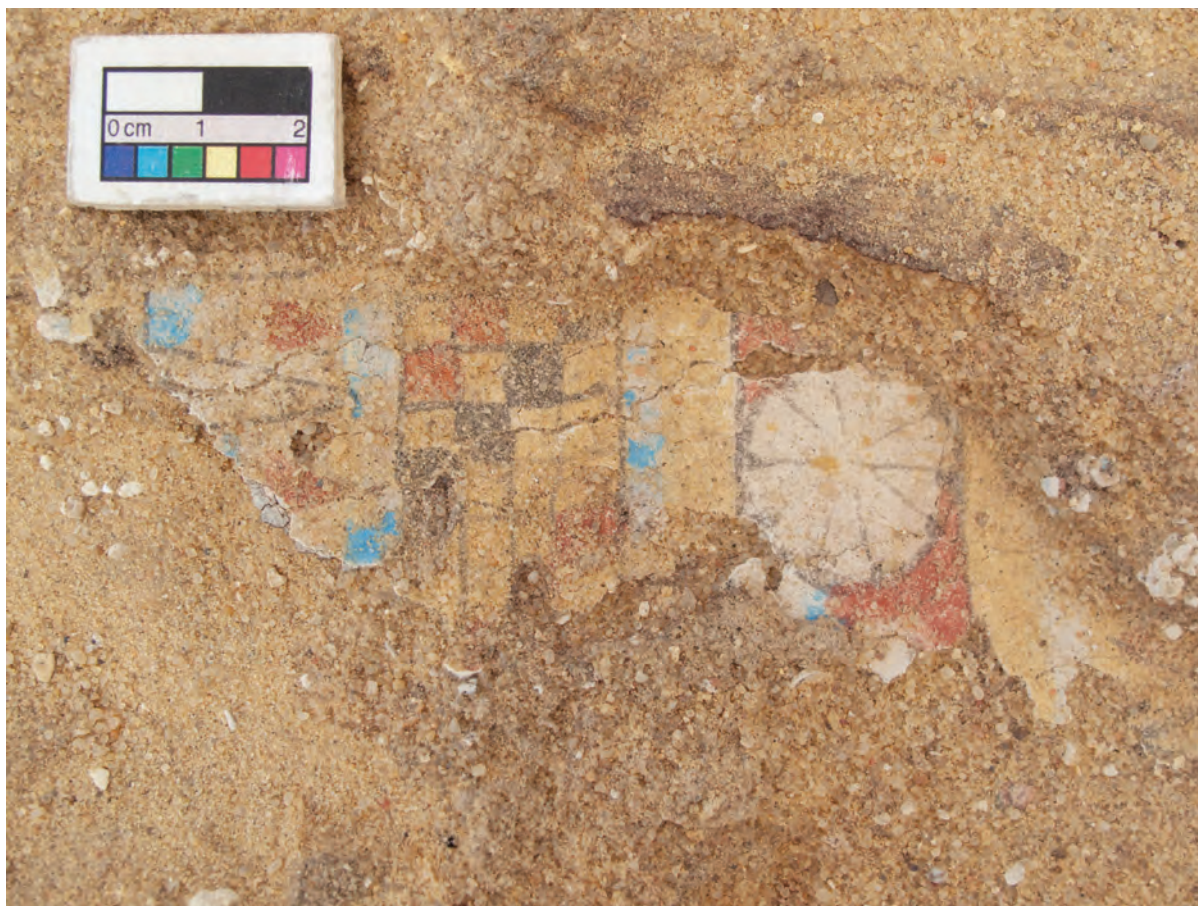


Figure 4.17. Detail showing several registers and geometric shapes of coffin [31,333], Burial 467. Photo by Scott D. Haddow.

BURIAL 469

Feature Numbers: Skeleton [31,364], Coffin [31,345], Cut [31,344], and Fill [31,337]

Square: 3.M40

Orientation of long axis: 100° west of north

Top elevation of grave cut: 18.58 m asl

Bottom elevation of grave cut: 18.07 m asl

Burial 469 is an extended supine, east-west oriented (with head to the west) coffin burial in an oval-shaped grave cut located between the two walls of the Chute (fig. 4.18). This Late Period burial contained a poorly preserved anthropoid mask coffin painted in red, black, yellow, and blue (fig. 4.19). The hands of the skeleton had been placed across the pelvic region and the feet were extended (fig. 4.20). This skeleton belongs to a middle adult female greater than 45 years of age,³ based on dental wear. As for pathology, we observed degenerative joint disease in the form of Grade 2 osteophytes (scored using the method developed by Brothwell 1981: 51) on the marginal rims of the fourth and fifth lumbar vertebrae. Her right mandibular molars had been lost antemortem. There was very slight calculus on the anterior teeth of the mandible. The right second incisor and canine of the mandible had been lost antemortem. Burial 469 contained no objects.

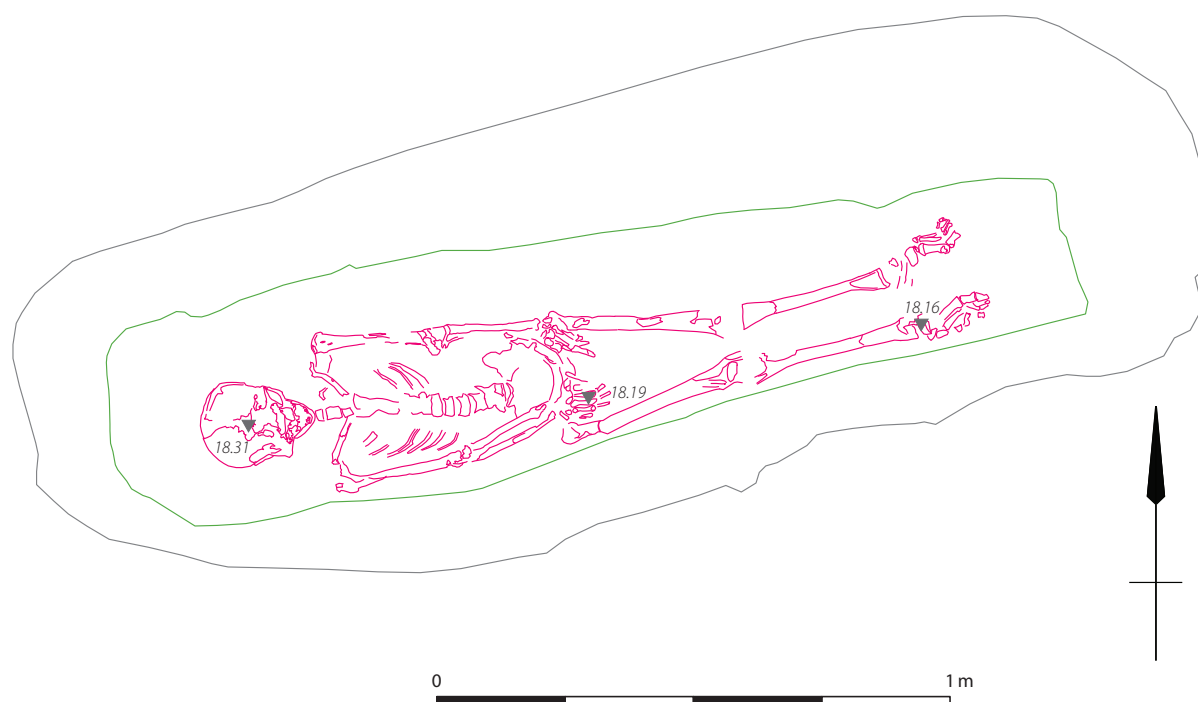


Figure 4.18. Burial 469. Cut [31,344] is shown in gray, skeleton [31,364] in pink, and coffin [31,345] in green. Elevations indicated on skeletons were measured on the bone itself, not on coffin remains.

3. This assessment supersedes the previous assessment of 60+ years (Kaiser 2011a: 185).

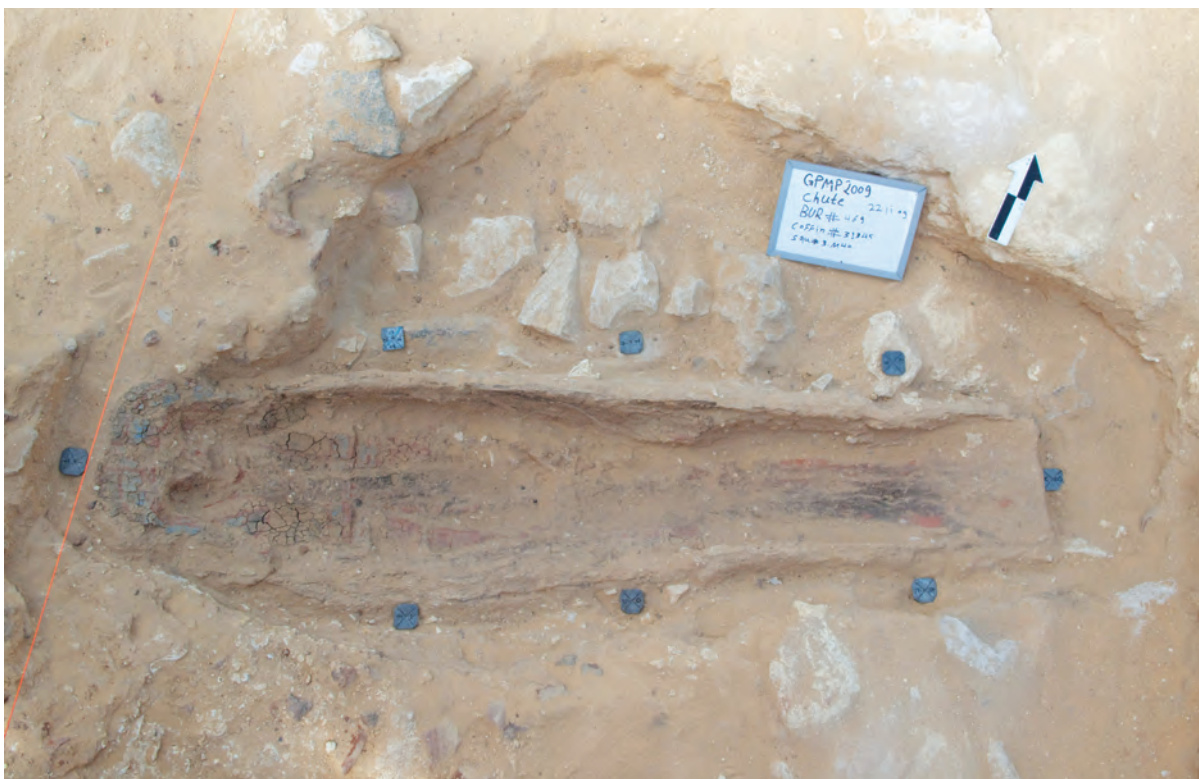


Figure 4.19. Burial 469, showing coffin [31,345]. Photo by Ayman Mohamed el-Damarany.



Figure 4.20. Burial 469, showing skeleton [31,364]. Photo by Ayman Mohamed el-Damarany.

BURIAL 470

Feature Numbers: Skeleton [31,355], Cut [31,342], and Fill [31,343]

Square: 3.M38

Orientation of long axis: 140° west of north

Top elevation of grave cut: 18.90 m asl

Bottom elevation of grave cut: 18.34 m asl

Burial 470 contained the poorly preserved skeleton of a Late Period infant extended supine burial in a large sub-rectangular grave cut, located just outside the southern wall of the Chute (figs. 4.21, 4.22). The hands were crossed on the pelvis/femur. The skeleton was an infant, 9 months old (+/- 3 months), based on dental eruption. Additionally, the length of the femur suggests an age between 6 months and one year. As this individual had not reached sexual maturity, sex could not be determined. All the bones were very thin and therefore fragile. No pathological lesions were observable. Burial 470 contains a faience disc-shaped bead (object number 3420) and a cowrie shell near the neck (object number 3425). These objects are not shown in figure 4.21.



Figure 4.21. Burial 470. Cut [31,342] is shown in gray and skeleton [31,355] in pink.



Figure 4.22. Burial 470 showing skeleton [31,355]. Photo by Ahmed Mohamed Gabr.

BURIAL 471

Feature Numbers: Skeleton [31,403], Coffin [31,402], Cut [31,348], and Fill [31,349]

Square: 3.N38

Orientation of long axis: 125° west of north

Top elevation of grave cut: 18.16 m asl

Bottom elevation of grave cut: 18.05 m asl

Burial 471 was a very poorly-preserved, extended supine coffin burial in a sub-rectangular grave cut dug into the northern wall of the Chute (fig. 4.23). This Late Period burial had a poorly-preserved, rectangular yellow-painted coffin. The remnants of a yellow-painted lid were preserved at the legs and upper chest area, but it had no apparent decorations. The right hand was placed on the pelvis and the left hand placed on the left hip with feet extended (fig. 4.24). The skeleton belongs to a young adult female aged between 25–35 years of age, based on dental wear. Some of the bones inside the inner table of the skull vault are thick and dense, which may indicate a healed case of porotic hyperostosis. She has an enlarged right mastoid process with periostitis and small lytic lesions (tiny destructive perforations) penetrating the compact bone, possibly indicative of mastoiditis—an infection which spreads from the middle ear and penetrates the air cells of the mastoid bone behind the ear. The cortical bone of the limbs (especially the lower limbs) and the pelvis is extremely thin, suggesting osteoporosis. Burial 471 contained no objects.

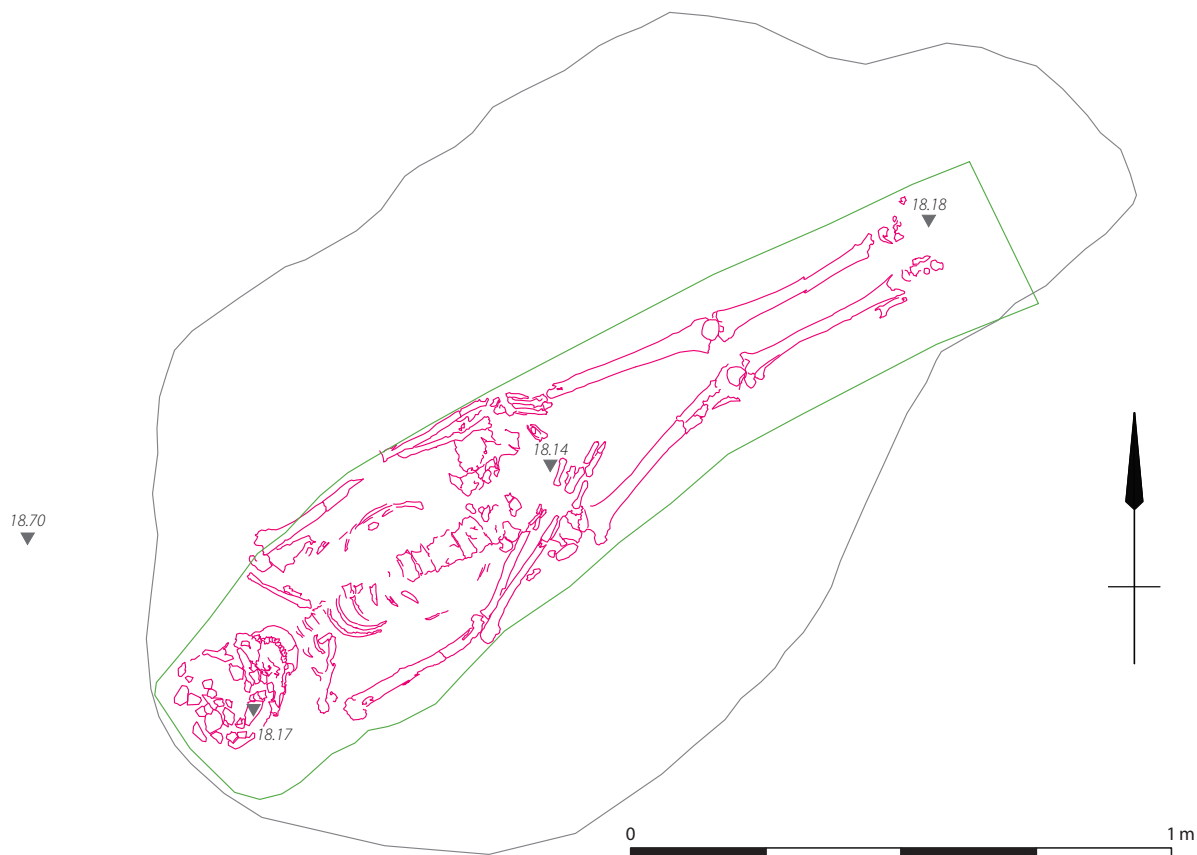


Figure 4.23. Burial 471. Cut [31,348] is shown in gray, skeleton [31,403] in pink, and coffin [31,402] in green. Elevations indicated on skeletons were measured on the bone itself, not on coffin remains.



Figure 4.24. Burial 471, showing skeleton [31,403]. Photo by Scott D. Haddow.

BURIAL 475

Feature Numbers: Skeleton [31,386], Coffin [31,374], Cut [31,373], and Fill [31,372]

Square: 3.M37–38

Orientation of long axis: 115° west of north

Top elevation of grave cut: 18.24 m asl

Bottom elevation of grave cut: 18.01 m asl

This is a unique Late Period coffin burial (fig. 4.25). It had a mud anthropoid coffin with painted lid and a yellow, blue, red, and black mask. The burial contained an extended supine skeleton, oriented east-west (with the head to the west) (fig. 4.26). The skeleton is that of a middle adult male, between the age of 35–45 years based on dental wear, and 19–34 years based on the pubic symphysis. Our sex assessment was based on pelvic and cranial morphology. Burial 475 contained no objects.

In terms of pathology, this individual had a healed fracture of the distal right ulna and radius (wrist) that resulted in a bridging fusion of the two bones, several centimeters above the distal ends (fig. 4.27). This type of trauma is known as a Colles' fracture and occurs most commonly as the result of a fall. Several bones of the right wrist (carpals) showed arthritic changes, including joint margin lipping on the lunate, hamate, and triquetral wrist bones. An unfused bony callous/ossified hematoma (an accumulation of blood within the tissue but outside the blood vessels, i.e. a bruise, which has turned to bone) was also found in the right wrist. All of these lesions are likely associated with the trauma to the wrist. There was a strange lesion, possibly an ossified ligament (known as an enthesophyte), on the mid-shaft of the left ulna and radius that may represent an injury to the ligaments which bridge the shafts of the radius and ulna known as the interosseus crest (fig. 4.28). A small piece of bone, possibly an ossified hematoma, was found at the acromioclavicular joint of the left shoulder in association with arthritic changes in the acromial facet of the left clavicle. In addition, we noted bilateral muscle insertion ossifications (enthesophytes) on the midshaft of the humerus (at the deltoid tuberosity), enthesophytes on the lateral epicondyle of the distal left humerus (fig. 4.29), and also on the anterolateral surface of the distal left femur. This lesion appears to be partially erosive with lipping around the margins, which seems to have formed a pseudoarthrosis (false joint). The margins of the cervical vertebral end plates are lipped, along with the superior and inferior articular facets. He also suffered from osteophytic lipping of the lower spine, with a large bridging osteophyte formation along the left lateral surface of the bodies of the lumbar vertebrae. The profusion of enthesophytes throughout the skeleton, combined with the state of the lumbar vertebrae, may indicate a condition known as Diffuse Idiopathic Skeletal Hyperostosis (or DISH; fig. 4.30). This condition is age-related and tends to occur more often in males than in females (Ortner 2003: 559–560). He had a large abscess in the anterior body of the left mandible, and a cavity in his upper third molar. Most of his mandibular teeth were lost during his life.

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Papers from the 2010 AERA-ARCE Analysis and Publication Field School 199



Figure 4.27. Healed fracture of the distal right ulna and radius, Burial 475. Photo by Scott D. Haddow.



Figure 4.28. Unusual lesion at the interosseous margins of the proximal third of the left ulna and radius, Burial 475. Photo by Scott D. Haddow.



Figure 4.29. Left and right humeri showing location of enthesophytes (circled in red), Burial 475. Photo by Scott D. Haddow.



Figure 4.30. Close-up of lumbar vertebrae *in situ* showing degenerative lesions possibly associated with Diffuse Idiopathic Skeletal Hyperostosis (DISH), Burial 475. Photo by Afaf Wahba Abd el-Salam Wahba.

BURIAL 476

Feature Numbers: Skeleton [31,405], Coffin [31,390], Cut [31,388], and Fill [31,389]

Square: 3.M40

Orientation of long axis: 100° west of north

Top elevation of grave cut: 18.26 m asl

Bottom elevation of grave cut: 18.01 m asl

Burial 476 was an extended supine Late Period coffin burial (fig. 4.31). The burial was a subrectangular grave cut located between the two walls of the Chute. The burial contained a poorly preserved painted plaster anthropoid mud coffin, in black, red, and yellow (figs. 4.33, 4.34). This burial contained no objects.

The skeleton belongs to a middle adult female, based on pelvic and skull morphology (fig. 4.32). We assessed the age to be 45+ years, based on dental wear and auricular surface bone in the pelvis. The left hand was placed over the pelvis and the right hand on the right hip. The feet were extended. As for pathological conditions, she had degenerative joint disease at the time of her death as indicated by a Grade 1 (slight lipping) osteophytic growth on the cervical and thoracic vertebrae. The inner table of the cranial vault is very thick with active porotic hyperostosis on the external surface, while the cortical bone is very thin. A large carious lesion (cavity) has obliterated the left maxillary second molar crown, while a second carious lesion occurs on the distal interproximal surface of the left maxillary first molar. Large calculus deposits are also present on the anterior mandibular dentition.

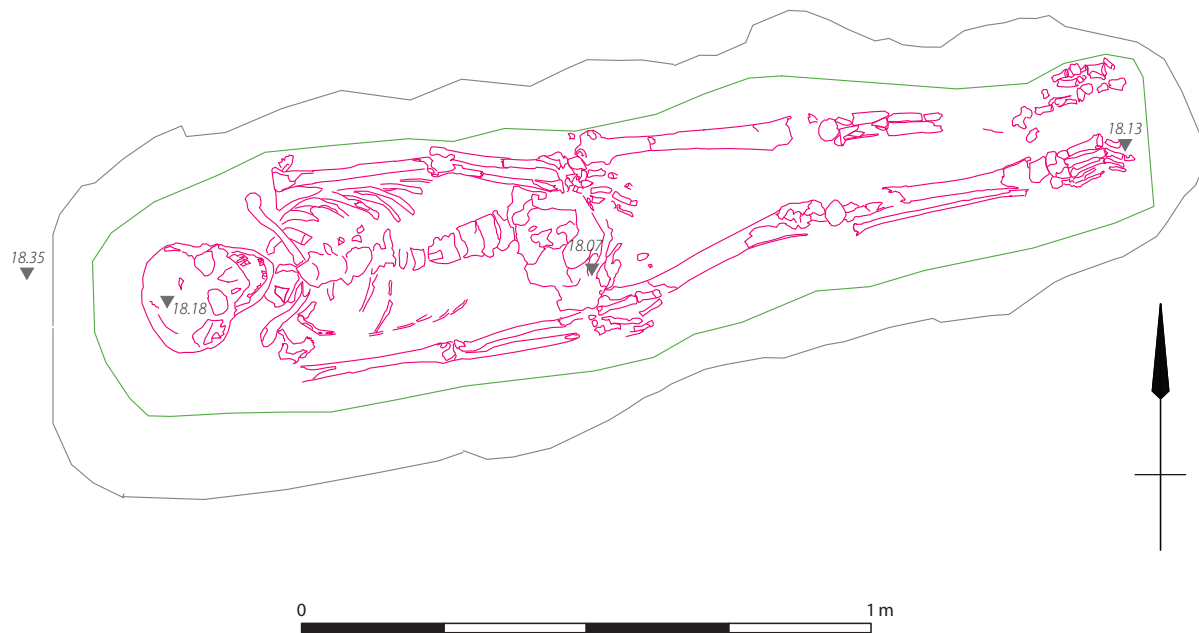


Figure 4.31. Burial 462. Cut [31,373] is shown in gray, skeleton [31,386] in pink, and coffin [31,374] in green. Elevations indicated on skeletons were measured on the bone itself, not on coffin remains.



Figure 4.32. Burial 476, showing skeleton [31,405]. Photo by Afaf Wahba Abd el-Salam Wahba.



Figure 4.33. Burial 476, showing coffin [31,390]. Photo by Ahmed Mohamed Gabr.



Figure 4.34. Burial 476, showing painted detail on face of coffin [31,390]. Photo by Ahmed Mohamed Gabr.

BURIAL 482

Feature Numbers: Skeleton [31,905], Cut [31,904], and Fill [31,903]

Square: 3.M42

Orientation of long axis: 105° west of north

Top elevation of grave cut: 17.77 m asl

Bottom elevation of grave cut: 17.52 m asl

This was an east-west (with head to the west) oriented, extended supine Late Period burial without coffin, located north of the Chute (figs. 4.35, 4.36). It is in fair condition. This burial was truncated at the feet by cut [31,323] for Burial 467. The skeleton is male based on skull and pelvic morphology. Its age is that of a middle adult over 45 years old, based on dental wear. The left hand of the skeleton had been placed over the pelvis. The right hand and legs were extended. We found black material on the throat and abdomen, which may indicate that the body had been mummified. As for pathological lesions, Grade 2 osteophytes were observed on all five lumbar vertebrae. He has a healed fracture of the left first rib. All his incisors have been worn down, perhaps indicating he was using his teeth as gripping tools. This burial contained no objects.

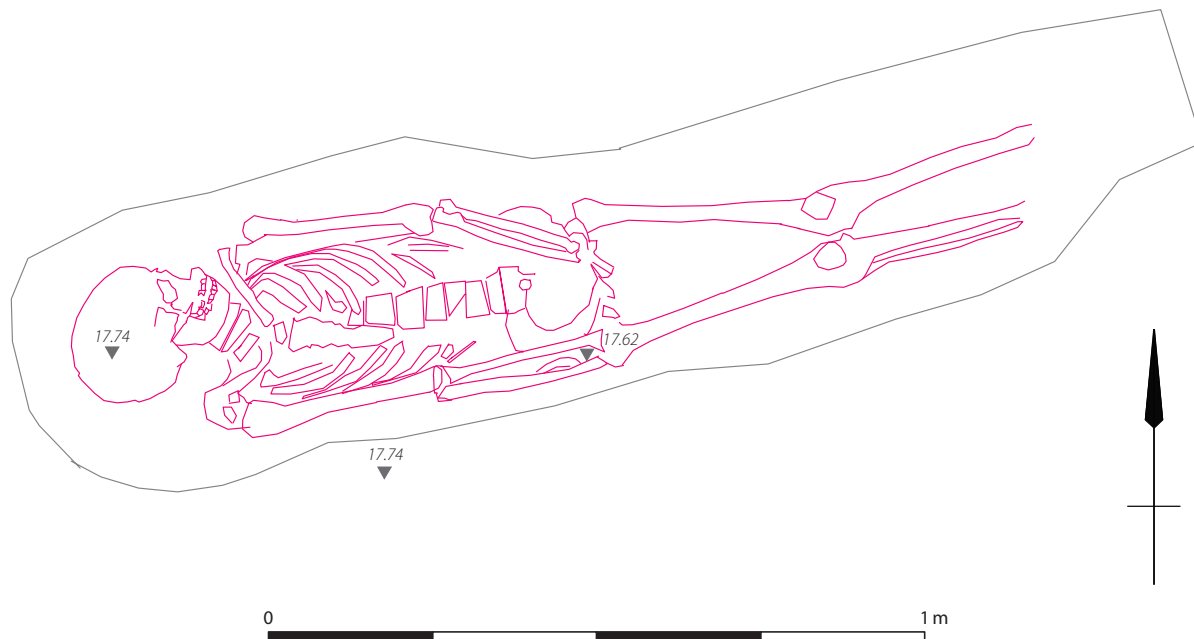


Figure 4.35. Burial 482. Cut [31,904] is shown in gray and skeleton [31,905] in pink.



Figure 4.36. Skeleton [31,905] in Burial 482. Photo by Maha Abd el-Tawab Hassan.

BURIAL 483

Feature Numbers: Skeleton [31,914], Cut [31,912], and Fill [31,913]

Square: 3.L37–38

Orientation of long axis: 140° west of north

Top elevation of grave cut: 18.90 m asl

Bottom elevation of grave cut: 18.50 m asl

Burial 483 was an extended supine Late Period burial with a sub-rectangular grave cut, located to the south of the Chute wall (figs. 4.37, 4.38). The southwest corner of this burial was slightly truncated by Burial 484. The cut for this later burial was not sufficiently deep as to damage the skull of skeleton [31,914] (Burial 483). The skeleton is a young adult between 25–35 years of age based on dental wear. The sex is male based on cranial and pelvic morphology. We recorded osteophytic growths on the thoracic vertebrae (Grade 2) and squatting facets on the distal tibiae. We also noted small enthesophytes on the joint margins of the proximal left fibula. There was calculus on the lingual surfaces of the left maxillary first and second incisors, and also on the right maxillary first incisor. This burial contained no objects.

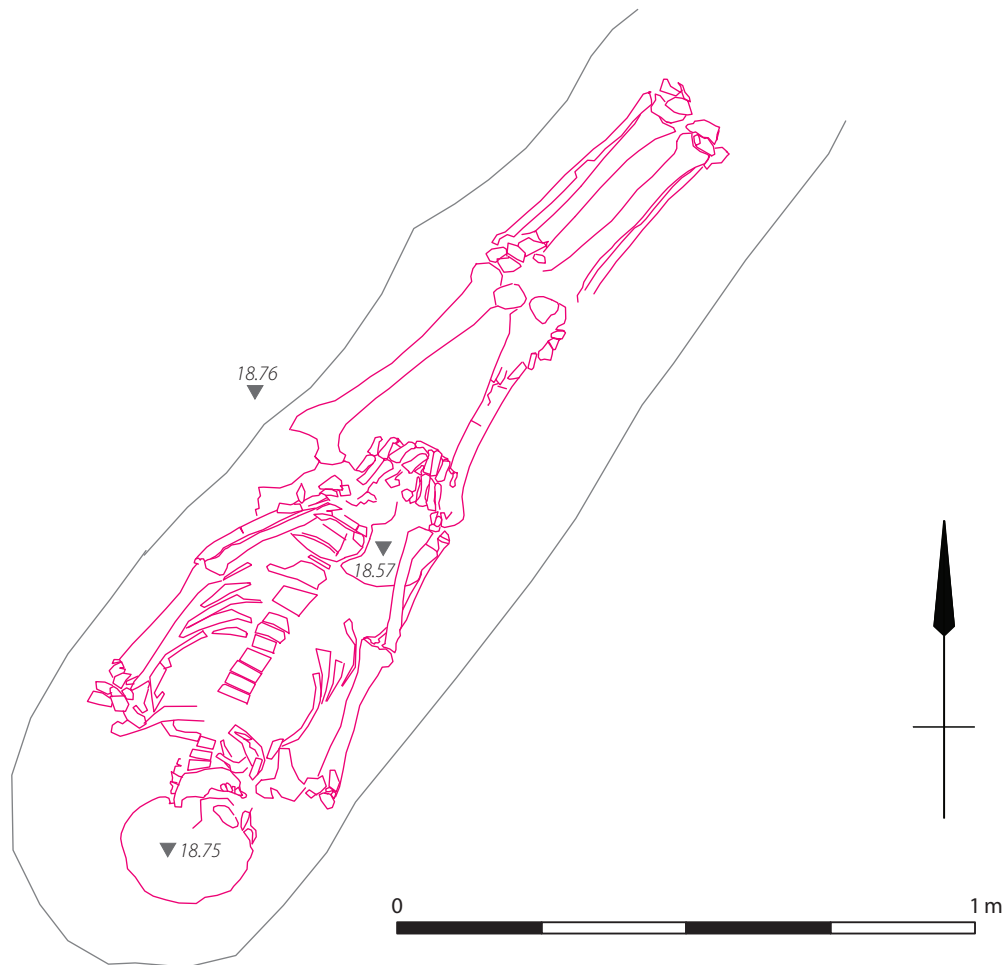


Figure 4.37. Burial 483. Cut [31,912] is shown in gray and skeleton [31,914] in pink. The feet were partially truncated during the excavation of Trench C (fig. 4.2).



Figure 4.38. Skeleton [31,914] in Burial 483. Photo by Scott D. Haddow.

BURIAL 484

Feature Numbers: Skeleton [31,938], Coffin [31,923], Cut [31,921], and Fill [31,922]

Square: 3.L37

Orientation of long axis: 140° west of north

Top elevation of grave cut: 19.10 m asl

Bottom elevation of grave cut: 18.77 m asl

This is an extended supine Late Period coffin burial with subrectangular grave cut, dug into Old Kingdom limestone tumble just south of the Chute walls (fig. 4.39). The left side of the burial had been truncated by modern robber cut [31,928]. The burial had an anthropoid painted coffin and mask/wig with geometric decorations (fig. 4.40). The face on the mask was red with white eyes, and the wig was black and white with yellow and black dots. The hands were placed over the pelvic region and the legs extended (fig. 4.41). The skeleton belongs to a middle adult female aged between 35–45 years based on dental wear. The inner table of the cranial vault appears enlarged or thickened while the outer table is thin. We recorded slight periostitis in the right mastoid and evidence of healed porotic hyperostosis. We found calculus on the maxillary left first incisor and mandibular left first and second incisors. There was also a small carious pit on the mesial interproximal surface of the right maxillary third molar at the cemento-enamel junction. This burial contained no objects.

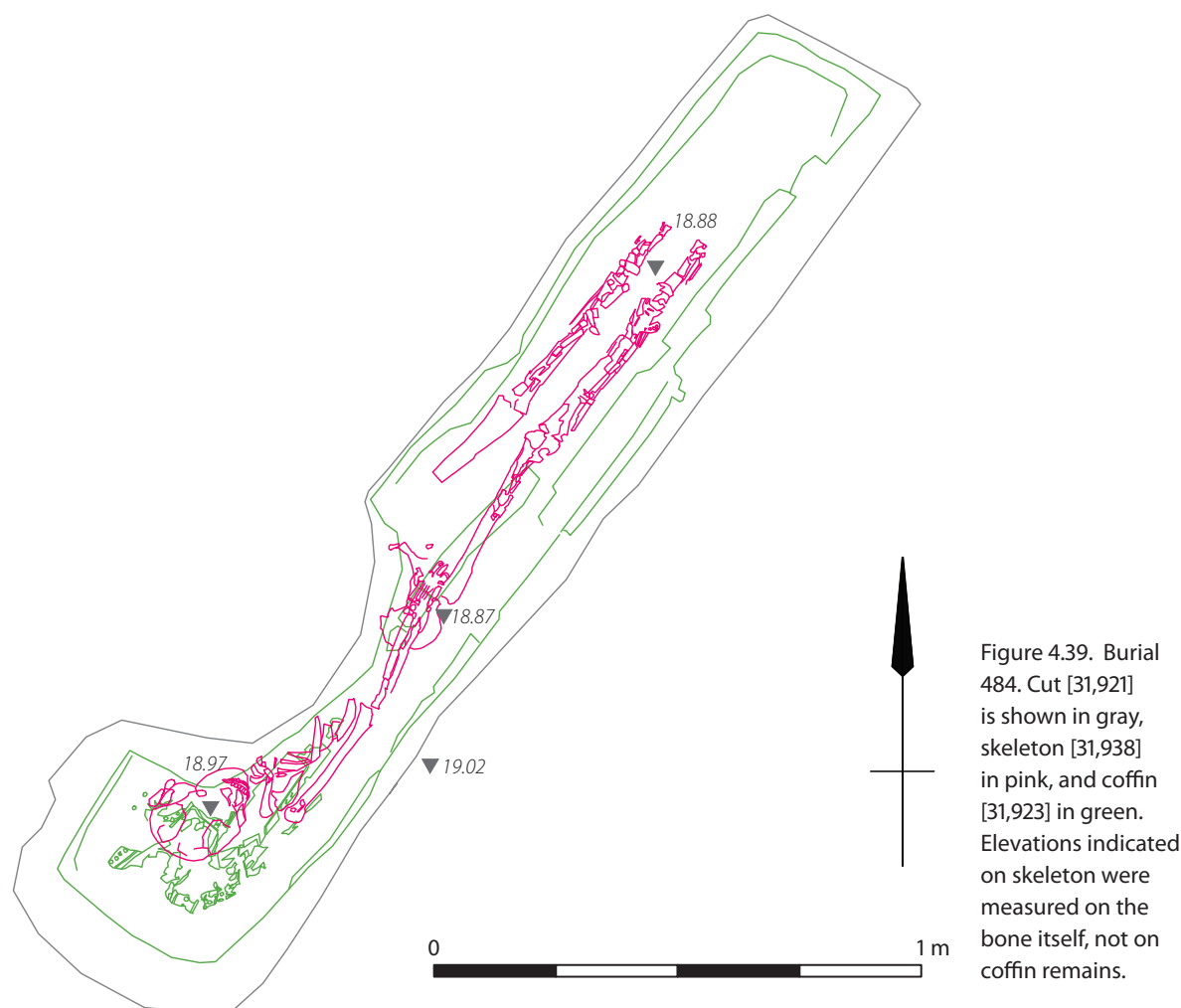




Figure 4.40. Painted coffin and mask [31,923] in Burial 484. Photo by Ahmed Mohamed Gabr.



Figure 4.41. Skeleton [31,938] in Burial 484. Photo by Scott D. Haddow.

BURIAL 489

Feature Numbers: Skeleton [31,961], Coffin [31,950], Cut [31,948], and Fill [31,949]

Square: 3.035

Orientation of long axis: 80° west of north

Top elevation of grave cut: 18.48 m asl

Bottom elevation of grave cut: 18.31 m asl

This was an extended supine Late Period coffin burial with an oval-shaped grave cut (fig. 4.42). The anthropoid coffin was painted in blue, red, white, and yellow (fig. 4.43). The coffin mask was fragmented; it had a blue and white striped wig (bands on wig) with a horizontal red stripe at the bottom and dots (fig. 4.44). Extensive root activity had shifted and partly destroyed the skull (fig. 4.45). The skeleton was on its left side with its crown to the east. The mandible was found on the chest. The right hand was disarticulated or had been placed over the pelvic region. The feet were extended.

The skeleton was found in a good state of preservation. It is an adolescent between 12–16 years of age based on tooth wear and epiphyseal closure. Based on cranial and pelvic morphology, the individual is probably female, although this individual has not reached full sexual maturity, so this sex assessment should be taken with caution. On the right humerus a perforation in the septum of the distal humerus where the ulna articulates is observable. This is recorded as a non-metric trait: an anomaly in the normal anatomy of the skeleton which is thought to have a genetic origin. There is localized periostitis on the proximal third of right fibula shaft with thickened marrow space. We found a slight porotic lesion on the occipital, but no thickening of the cranial vault. There is slight enamel hypoplasia on the left maxillary canine, right maxillary first premolar, and right maxillary incisor. This burial contains no objects.

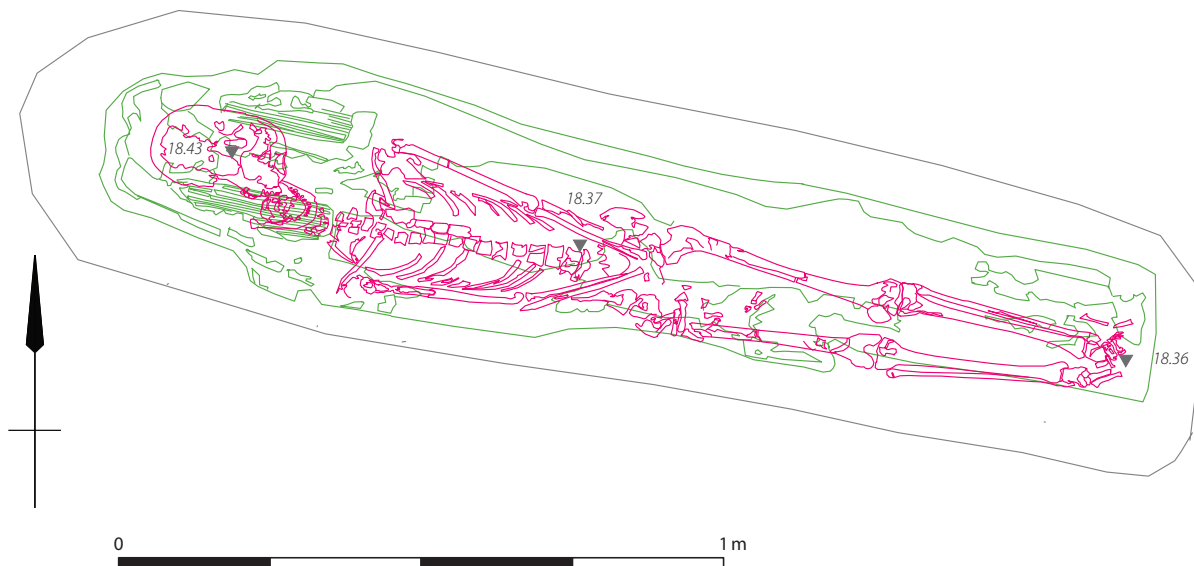


Figure 4.42. Burial 489. Cut [31,948] is shown in gray, skeleton [31,961] in pink, and coffin [31,950] in green. Elevations indicated on skeletons were measured on the bone itself, not on coffin remains.



Figure 4.43. Burial 489. Photo of coffin [31,950]. Photo by Jessica Kaiser.



Figure 4.44. Burial 489. Photo of coffin [31,950]. Photo by Jessica Kaiser.



Figure 4.45. Burial 489. Photo of skeleton [31,961]. Photo by Ayman Mohamed el-Damarany.

BURIAL 490

Feature Numbers: Skeleton [31,955], Coffin [31,969], Cut [31,953], and Fill [31,954]

Square: 3.035

Orientation of long axis: 80° west of north

Top elevation of grave cut: 18.35 m asl

Bottom elevation of grave cut: 18.22 m asl

This was an extended supine Late Period coffin burial with oval-shaped grave cut, located between the two walls of the Chute (fig. 4.46). The coffin was subrectangular shaped and unpainted. The skeleton belongs to a child, approximately 4 years of age (+/-1 year) based on dental development (figs. 4.47, 4.48). We could not assess the sex because the skeleton had not reached sexual maturity. The hands had been placed on the pelvis and the feet were extended. No pathological lesions were observable. Burial 490 contained the following objects: a copper loop earring (object 3417), a bracelet consisting of a shell bead and a spherical faience bead (objects 3431 and 3430, respectively), a bracelet of two shell beads and one spherical carnelian bead (objects 3428 and 3429, respectively), and a bracelet with one spherical bone bead and a faience *wadjet*-eye amulet (objects 3418 and 3419, respectively). Not all of these objects are not shown in figure 4.48.

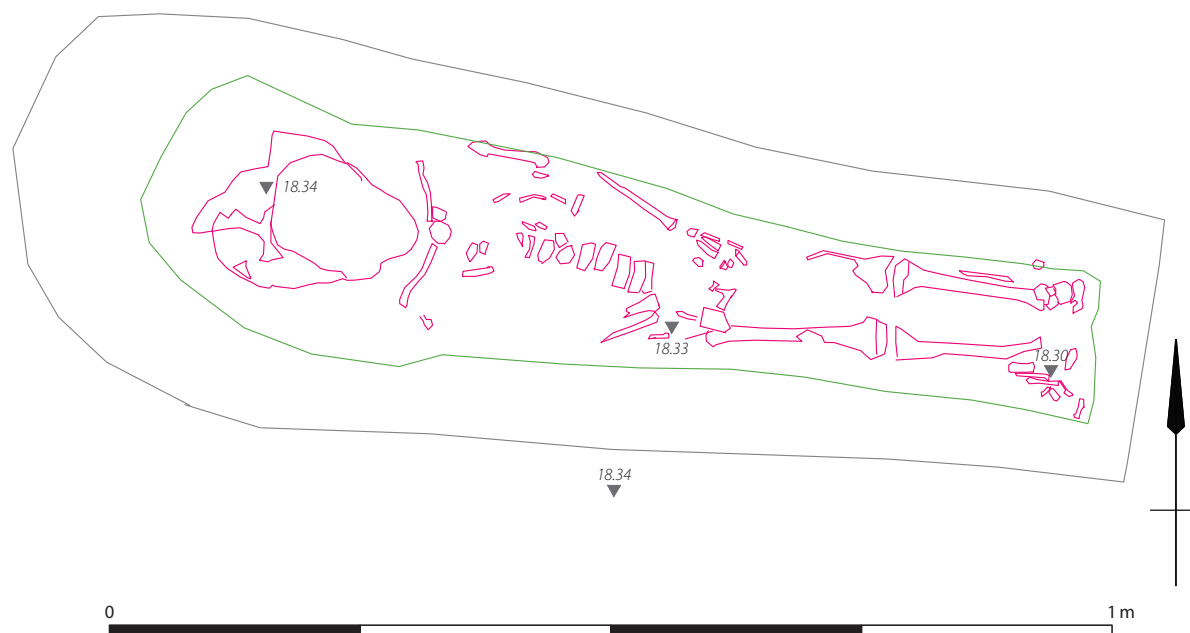


Figure 4.46. Burial 490. Cut [31,953] is shown in gray, skeleton [31,955] in pink, and coffin [31,969] in green. Elevations indicated on skeletons were measured on the bone itself, not on coffin remains.



Figure 4.47. Burial 490, showing skeleton [31,955]. Photo by Jessica Kaiser.



Figure 4.48. Burial 490, showing detail of small finds found with skeleton [31,955]. Photo by Ayman Mohamed el-Damarany.

BURIAL 494

Feature Numbers: Skeleton [31,988], Cut [31,986], Fill [31,987], and Coffin [31,993]

Square: 3.035

Orientation of long axis: 120° west of north

Top elevation of grave cut: 18.48 m asl

Bottom elevation of grave cut: 18.03 m asl

Burial 494 was an east-west oriented, extended supine coffin burial in an oval-shaped grave cut dug into the northern wall of the Chute (fig. 4.49). It dates to the Late Period. This southeast corner of the grave cut had been truncated by Burial 497. The skeleton is in fair condition. The mud coffin is subrectangular and unpainted (fig. 4.50). The skeleton belongs to an infant approximately 1 year of age (+/- 4 months)⁴ based on the pattern of dental eruption, while the measurements of the femoral, tibial, and humeral maximum length provide an age range of between 6 and 18 months (fig. 4.51). The skeleton's left hand had been placed on its pelvis; the right hand and feet were extended. We were unable to determine the sex of the skeleton because the individual had not yet reached sexual maturity. There were no pathological lesions observable. The skeleton had several large cowrie shell beads placed around the head. The burial contained the following objects: four cowrie shell beads (object numbers 3291, 3424, 3426, and 3427), one rectangular travertine bead (object number 3432) interpreted as a stylized *wadjet*-eye amulet by Kaiser (2011a: 190), one cowrie shell bead (object number 3596), one spherical Egyptian blue bead (3328a), one faience drum-shaped bead (3328b), and one faience disc-shaped bead (3328c). Not all of these objects are not shown in figure 4.51.

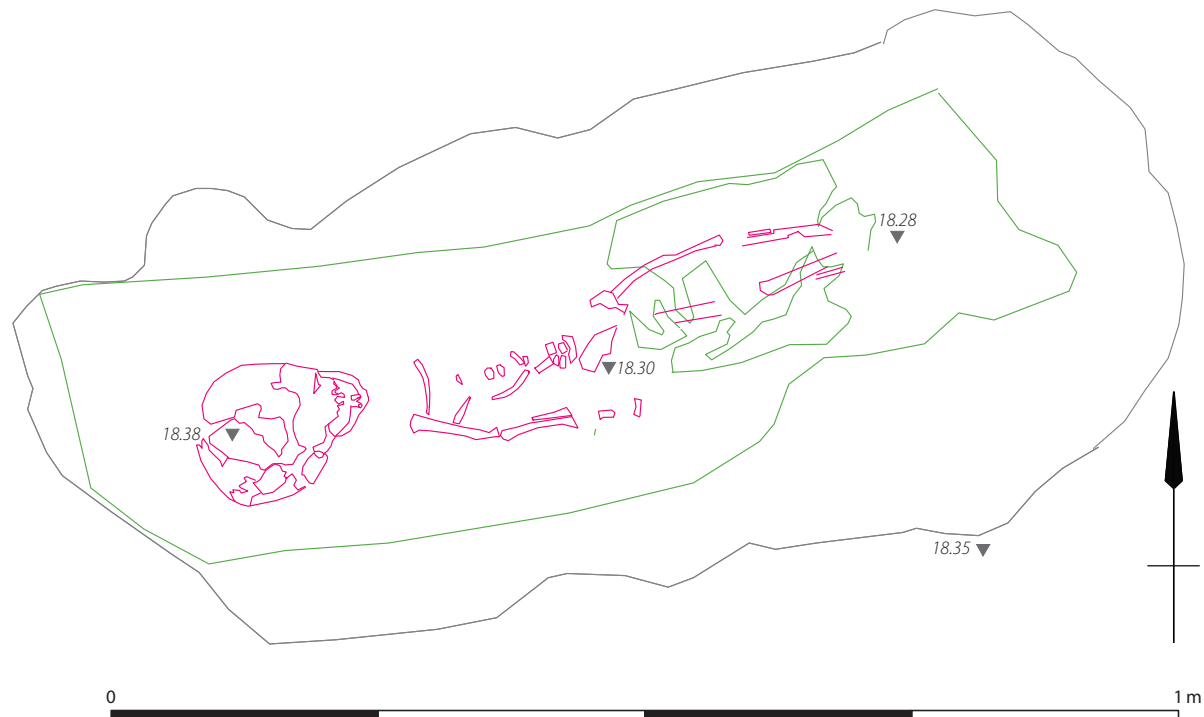


Figure 4.49. Burial 494. Cut [31,953] is shown in gray, skeleton [31,955] in pink, and coffin [31,969] in green. Elevations indicated on skeletons were measured on the bone itself, not on coffin remains.

4. This assessment supersedes the previous assessment of 9 months +/- 3 months (Kaiser 2011a: 185).



Figure 4.50. Burial 494, showing coffin [31,993]. Photo by Alex Jacobsen.



Figure 4.51. Burial 494, showing skeleton [31,988]. Photo by Alex Jacobsen.

BURIAL 495

Feature Numbers: Primary Skeleton [31,997]; Secondary Skeletons [32,001] and [31,998]; Coffin [31,991]; Cut [31,989]; and Fill [31,990]

Square: 3.036

Orientation of long axis: 140° west of north

Top elevation of grave cut: 18.56 m asl

Bottom elevation of grave cut: 18.26 m asl

Burial 495 was an extended supine Late Period coffin burial in an oval-shaped grave cut (fig. 4.52). The poorly-preserved anthropoid coffin was painted in black, yellow, red, and blue (fig. 4.53) and contained the bones of three individuals: skeleton [31,997], skeleton [32,001], and skeleton [31,998]. The main skeleton is that of a young adult male aged 25–35 years based on dental wear (fig. 4.54).

Skeleton [31,997] exhibited pathological conditions including slight periostitis on the right and left fibulae with the cross-section partly filled with solid bone, slightly healed cribra orbitalia, and a deep lytic (destructive) lesion which extends 3 cm from the distal end of the ulna up the shaft. We noted slight resorption on the proximal joint surface of the right tibia. We recorded calculus in the mandibular left second incisor and canine, and in the maxillary left canine. We recorded a retained metopic suture (the persistence of two halves of the frontal bone [i.e. forehead] into adulthood)—these two halves normally fuse in early childhood—in the frontal bone of the skull as a non-metric trait. Surprisingly, skeleton [31,997] was missing its entire spine, and in its place was an adult left tibia (belonging to skeleton [32,001]), where the cervical and thoracic vertebrae should have been.

Secondary skeleton [31,998] is represented by an articulated set of legs (left femur, left and right tibiae, left fibula) and feet placed alongside the left leg of skeleton [31,997] in the opposite direction. The most that can be said for skeleton [31,998] is that it belongs to an adult (based on epiphyseal union) of unknown sex with no pathological conditions observable. It would seem that the main skeleton [31,997] had lost its spine before being prepared for burial—perhaps due to decomposition, or a mix-up during the mummification process—which necessitated the use of a substitute (in this case a random long bone). The second set of legs may also have been added in order to provide additional stability to the mummy package. Where these additional skeletal elements came from will never be known. At any rate, it provides a fascinating insight into the process of body preparation during the Late Period—an era that is well known for its industrial-scale funerary workshops and shoddy mummification techniques (Ikram and Dodson 1998). This burial contained no objects.

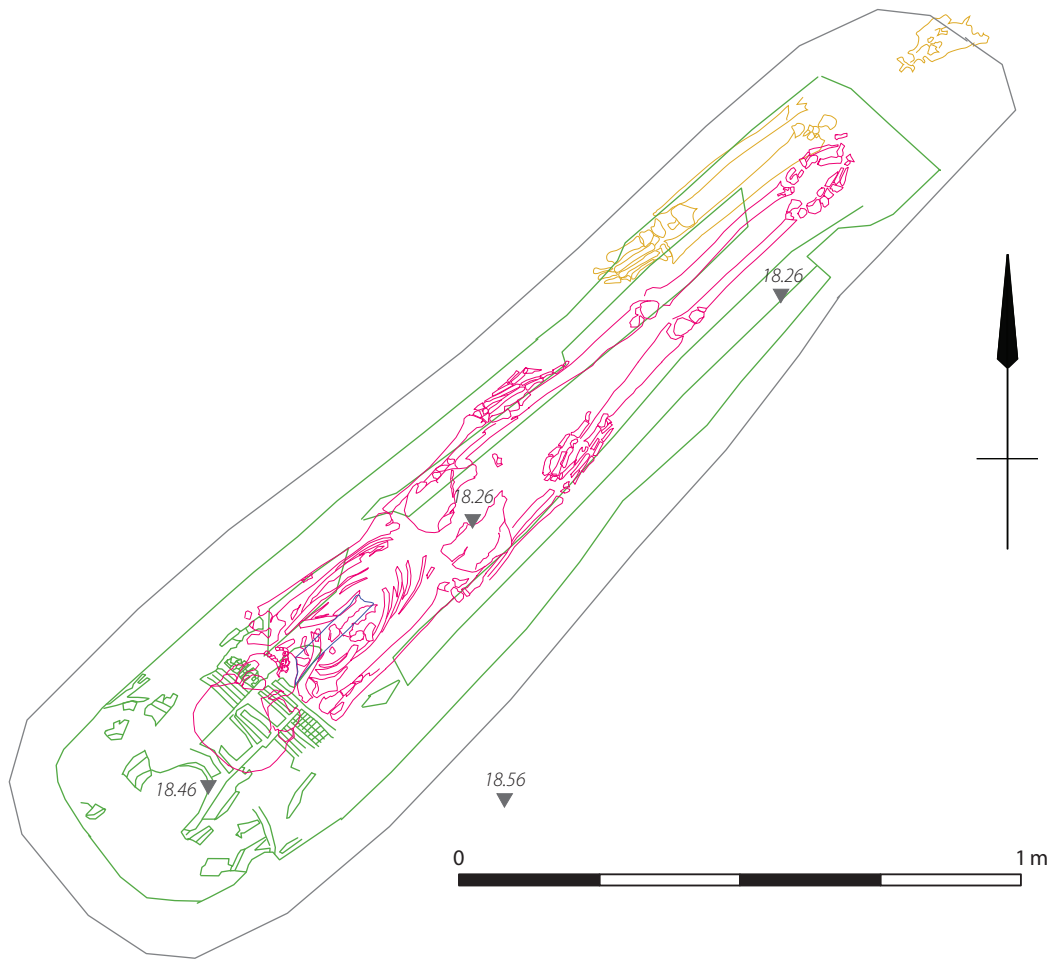


Figure 4.52. Burial 495. Cut [31,989] is shown in gray, coffin [31,991] is shown in green, skeleton [31,997] in pink, skeleton [32,001] in blue, and skeleton [31,998] in yellow. Elevations indicated on skeletons were measured on the bone itself, not on coffin remains.



Figure 4.53. Burial 495 showing coffin [31,991]. Photo by Shereen Ahmed Sawqi.



Figure 4.54. Burial 495, showing both primary skeleton [31,997] and secondary skeleton [31,998]. Photo by Zeinab Sayed Hashish.

BURIAL 496

Feature Numbers: Skeleton [32,010], Cut [32,006], and Fill [32,007]

Square: 3.035

Orientation of long axis: indeterminate

Top elevation of grave cut: 18.31 m asl

Bottom elevation of grave cut: 18.26 m asl

Burial 496 was a very poorly preserved, extended supine burial with an oval-shaped grave cut located in the northern wall of the Chute (fig. 4.55). It dates to the Late Period. The skeleton appears to have been disturbed by the subsequent interment of eight votive dog mummies (Burial 492; see Kaiser 2011b) immediately south of the burial. Based on the maximum length of the right radius (Maresh 1970), this individual is an infant between 3 months and 1 year old.⁵ We were unable to determine sex, and there were no pathological lesions observable. This burial contained no objects.

5. This assessment supersedes the previous assessment of 6–18 months (Kaiser 2011a: 185).

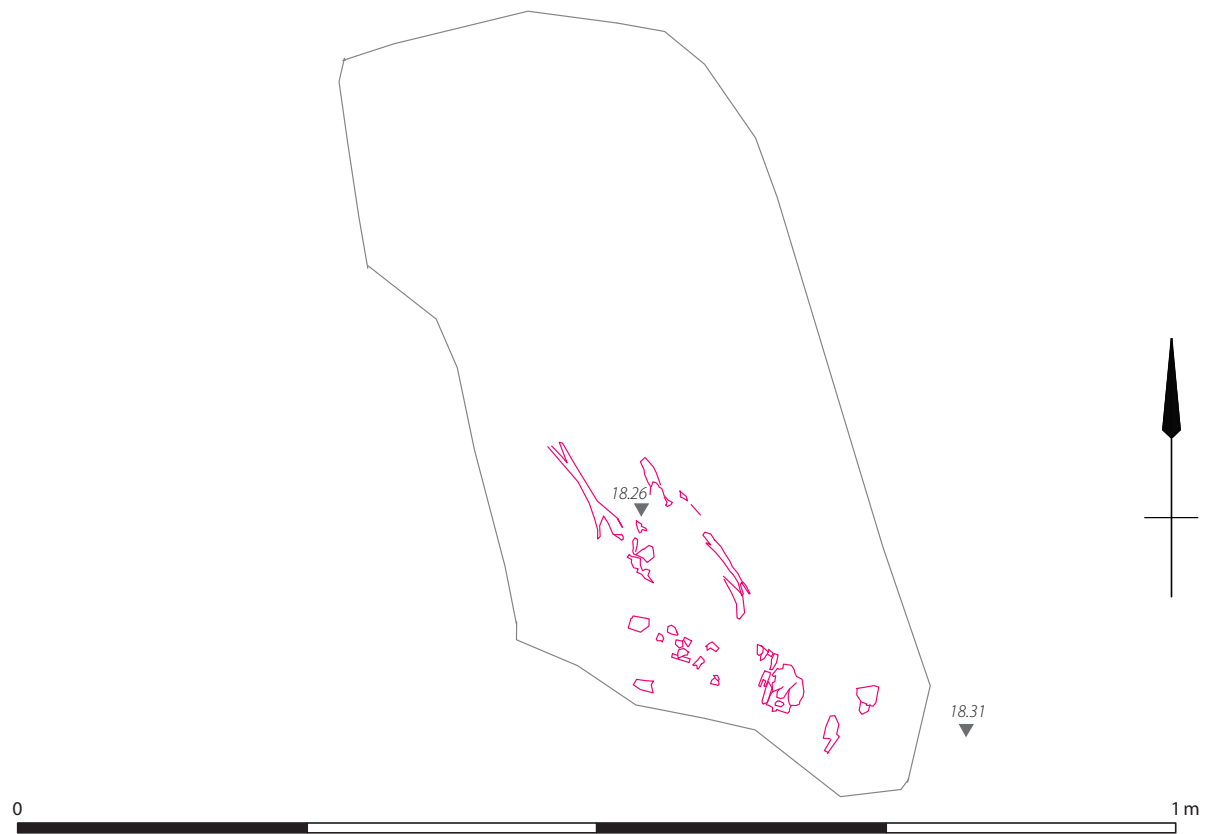


Figure 4.55. Burial 496. Cut [32,006] is shown in gray and skeleton [32,010] in pink.

BURIAL 497

Feature Numbers: Primary Skeleton [32,014]; Secondary Skeletons [32,015] and [32,016]; Cut [32,008]; and Fill [32,009]

Square: 3.035

Orientation of long axis: 105° west of north

Top elevation of grave cut: 18.52 m asl

Bottom elevation of grave cut: 18.06 m asl

Burial 497 was an extended supine Late Period burial in an oval grave cut dug into the northern Chute wall (fig. 4.56). This burial appears to have slightly truncated the southeast corner of grave cut [31,986] for Burial 494, without disturbing the skeleton. A minimum number of four individuals were recovered from this burial. These include primary skeleton [32,014], a secondary infant skull [32,016], and a secondary left humerus [32,015], which may belong to another secondary individual represented by a right femur.

As for the primary skeleton [32,014], the arms were extended with the hands placed over the pelvic region (fig. 4.57). The feet were also extended. The age is between 35–45 years based on dental wear. The pubic symphysis gives us an age range between 26–70 years.⁶ Based on pelvic and cranial morphology, the sex is female. As for pathological lesions, there is slight lipping on the thoracic and lumbar vertebra and well-healed cribra orbitalia in the orbital vaults. There is a small raised callus on the midshaft of the left femur and a large foramen (or opening) on the posterior joint surface of the proximal left clavicle. This is a very interesting burial because there was a child's skull (skeleton [32,015]) placed on the left ribs of the primary skeleton [32,014]. Perhaps skeletons [32,014] and [32,016] represent the burial of a mother and child. This burial contained no objects.

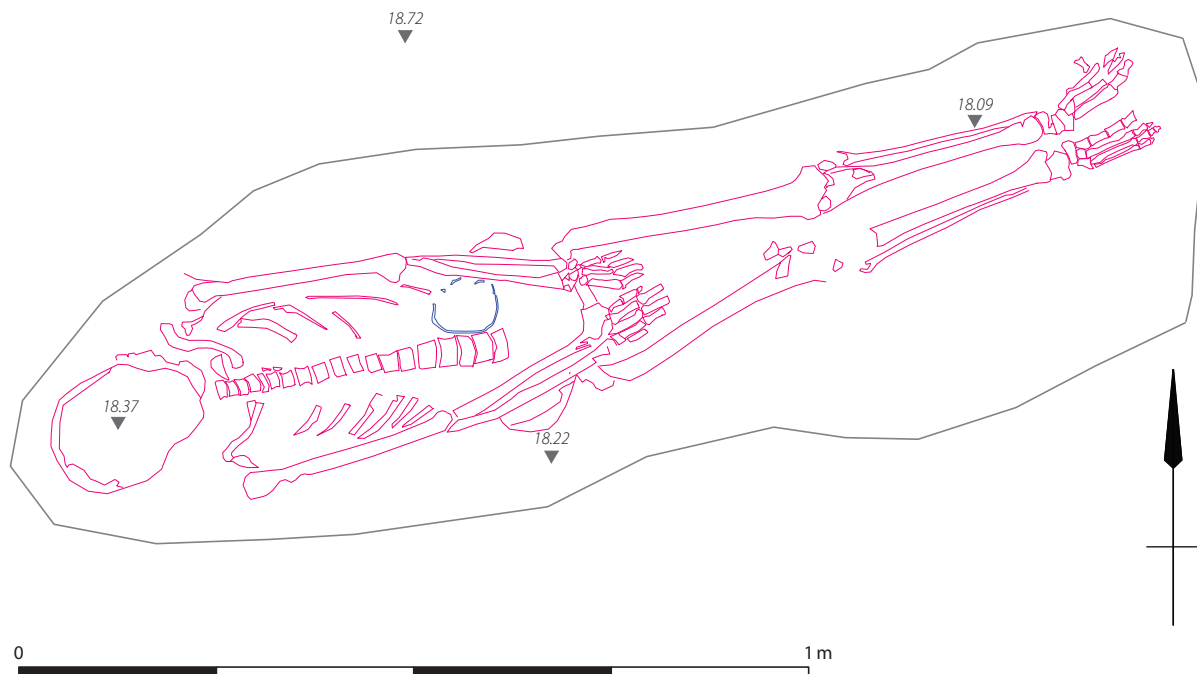


Figure 4.56. Burial 497. Cut [32,008] is shown in gray, skeleton [32,014] in pink, and skeleton [32,016] in blue.

6. This assessment supersedes the previous assessment of 44–54 years (Kaiser 2011a: 185).



Figure 4.57. Burial 497 showing skeleton [32,014] and skull [32,016]. Photo by Maha Abd el-Tawab Hassan.

BURIAL 498

Feature Numbers: Skeleton [32,011], Cut [32,012], and Fill [32,013]

Squares: 3.035–36

Orientation of long axis: 105° west of north

Top elevation of grave cut: 18.30 m asl

Bottom elevation of grave cut: 18.22 m asl

Burial 498 was an extended supine Late Period burial in a subrectangular grave cut (figs. 4.58, 4.59). This burial appears to have been disturbed by the later interment of eight dog mummies (Burial 492; see Kaiser 2011b), as the left shoulder and arm of the skeleton are missing at the intersection of the two grave cuts. This very poorly-preserved skeleton belongs to a child, 9 years of age (+/- 3 years) and of indeterminate sex. We assessed the age using long bone measurements and dental development. The left hand of the skeleton had been placed on the pelvis; the right hand and feet were extended. As for pathological lesions, this individual had very active porotic hyperostosis on the cranial vault, and small enamel hypoplasias on the permanent mandibular left canine and right premolar. This burial contained no objects.



Figure 4.58. Burial 498. Cut [32,012] is shown in gray and skeleton [32,011] in pink.



Figure 4.59. Burial 498, showing skeleton [32,011]. Photo by Ayman Mohamed el-Damarany.

5. A Report on the Faunal Remains from the AA Bakery

by Rasha Nasr Abd el-Mageed

I have completed the analysis of the faunal remains from the AA Bakery, which was excavated in 1988, 1991, 2005, and 2006–2007, and here I present the results of this analysis. The AA Bakery is one of several large bakeries known in the Heit el-Ghurab (HeG) site (fig. 1.3), but it is the only known large bakery located in the Western Town outside of a house (see Mahmoud and Taylor, this volume).

I want to compare the faunal remains from the AA Bakery to other areas of the site. There are some important questions I will attempt to answer using the data. The first question is what is the AA Bakery fauna like? What are the dominant taxa and what does this tell us about the diet of the occupants who left their garbage in and around the AA Bakery? The second question is how do the faunal remains of the AA Bakery compare to the other areas in the HeG site? In what ways are they similar and in what ways are they different? Lastly, I will try to explain any differences or similarities.

The AA Bakery

The AA Bakery is located in the Western Town (frontispiece 2). It covers an area of 7.00 m (north-south) by 8.00 m (east-west) and comprises five or seven rooms (Rooms G–J and possibly Rooms E and F) (Mahmoud and Taylor, this volume; fig. 1.18). Room G is the north-western corner of the bakery and is subdivided into north and south chambers by short jambs. The second room is designated H. This room is 2.30 m (east-west) by 2.66 m (north-south) and has doorways through the western partition wall. Concentrated ash fills the southwest portion of the room. The third room, I, was used for baking. A hearth or oven (fig. 1.21) was found in the northwest corner of this room. A thick ash layer was found and three linear cuts along four walls form shallow troughs (fig. 1.24). The fourth room is designated J and the excavators think this is a preparation

room. This room had a low curb in the northeast corner and a circular, plaster-lined pot emplacement in the center (fig. 1.26). We refer to this room as the Basin Room. The last room is Room K. Here the team found two doorways that open in the southern and northern end of the eastern wall.

Although we have excavated large bakeries in many areas of the HeG site, the AA Bakery is the only example from the Western Town. Since we believe that high status individuals occupied the Western Town (Redding 2010: 73–74), I need to compare its structure and contents to other areas of the site.

In this paper I will compare the faunal remains from the AA Bakery that were excavated in the 2006–2007 season by Susan Sobhi and James Taylor (Taylor 2009b) to faunal remains from other areas of the site. I will compare the AA Bakery sample to the samples from the Royal Administration Building (RAB), Gallery III.4, and the Pottery Mound (PM) (frontispiece 2). RAB is a large structure that we believe was a government building (Lehner 2007a: 45; GOP2: 43–60; GOP3: 59–61; Redding 2010: 66). Gallery III.4 we think functioned as a barracks (Abd el-Aziz 2007b; Lehner 2007b). The Pottery Mound is a dump in the Western Town, the contents of which we believe came from high status households (Redding 2007: 6–7; Redding 2010: 73–74).

I found that the majority of the faunal remains of the AA Bakery came from Phase 6b (table 1.2). The deposits of Phase 6b consist of ash and collapse features that include cultural material, animal bone, and charcoal. This phase is associated with the abandonment of the structure. The animal bone is probably from garbage deposited after the structure was abandoned and the roof collapsed. The sample of bone probably primarily reflects the diet of the occupants of the houses near the AA Bakery.

Methodology

The excavators recovered the bone from each feature by hand. Added to this handpicked sample were bone fragments found in a 0.2 cm screen and some found during wet sieving (see Chapter 7, this volume). Some bone was also found in the heavy fraction, but this material has not been included in this analysis. All of the bones were in storage. I removed and washed the bones, then allowed them to dry in the shade before examining them.

I identified the animal remains by bag, dumping the contents into a small screen and then sorting the bone fragments into three piles: mammal, bird, and fish. The fish were sorted into two piles, one that contained potentially identifiable fragments and another that contained unidentifiable fragments. I identified the fragments in the first pile to body part and taxon, and then weighed each identified fragment. The unidentified fish fragments were sorted into three piles: skull, vertebra, and post-cranial not vertebra (pcnv). I counted and weighed each of these unidentified quantities of bone.

Just as with the fish, I also sorted the bird fragments into two piles: identifiable and unidentifiable. The first pile contained fragments I believed would be identifiable, but I was not able to identify because a comparative collection was not available to me. So I put the identifiable bird fragments in a bag to hold for later identification. The other pile contained unidentifiable fragments and I sorted them into limb, vertebra, rib, sternum/synsacrum, and skull fragments. I counted and weighed these piles.

I also initially sorted the mammal fragments into two piles, again identifiable and unidentifiable fragments. For the identifiable fragments I recorded the taxon, body part, fusion/wear, evidence of burning,

and other information. I then weighed each of the identifiable fragments. I sorted the unidentified fragments into limb, skull, vertebra, teeth, and rib by size (large, medium, and small). Then I counted and weighed the resulting piles.

In this report I use the “number of identified specimens,” or NISP, to talk about the abundance of bones. NISP is a simple count of the number of bones in each category.

The Fauna from the AA Bakery

I examined 10,342 fragments of bone in the AA Bakery sample from Season 2006–2007. I sorted them into mammals with a count of 9,908 fragments, birds with 125 fragments, and fish with 309 fragments. These bones are in good condition and do not have animal gnawing marks. I did not find much burning in this sample. Figure 5.1 shows the relative abundance of mammals, bird, and fish. In the AA Bakery mammals dominate the fauna with 96% of the fragments. Figure 5.1 also shows a pie chart for the whole HeG site sample, where mammals also dominate the fauna, making up 93% of the sample. I did not find any significant statistical difference between the AA Bakery sample and the whole site sample, as mammals heavily dominate both.

Fish

Among the 309 fragments of the fish sample I was able to identify 109 fragments to a taxon (fig. 5.2). I could not identify 200 fragments so I sorted them into skull, vertebra, and post-cranial not vertebra (pcnv) fragments. The most common species is the Nile catfish, *Clarias gariepinus*, represented by 38 fragments. The second most common species is the Schall (*Synodontis schalli*), which is represented by 37 fragments. The Nile

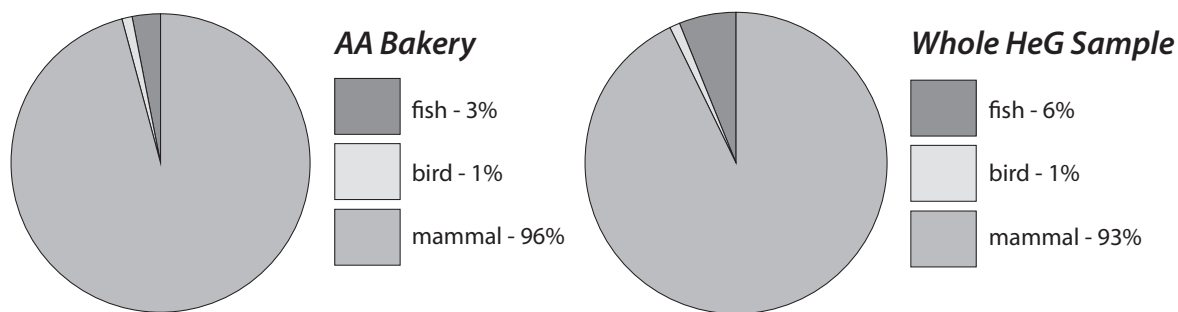


Figure 5.1. A comparison of the abundance of mammals, birds, and fish from the AA Bakery with the whole HeG site sample.

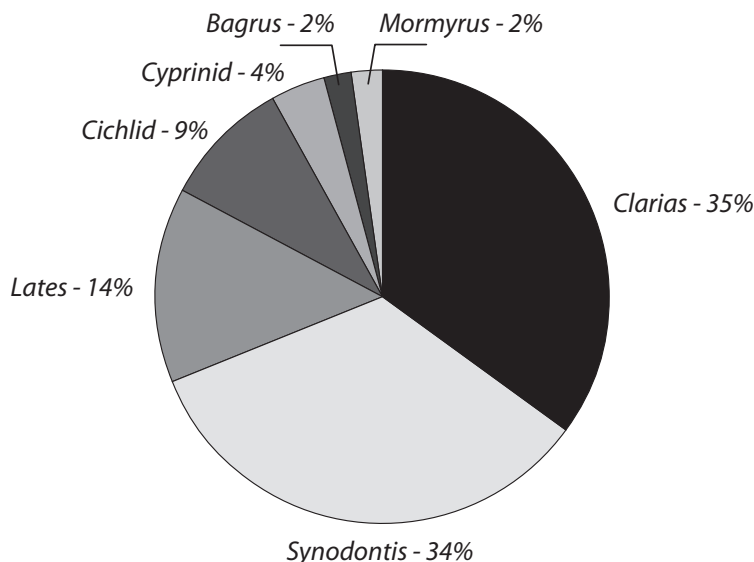


Figure 5.2. Percent representation of each of the identified fish taxon based on counts of the number of identified specimens, or NISP.

perch, *Lates niloticus*, is the third most common taxon and represented by 16 fragments. The cichlids are represented by 10 fragments. Other fish taxa I identified were a cyprinid with five fragments, the *bajad* or *docmak* (*Bagrus bayad* or *Bagrus docmak*) with two fragments, and *Mormyrus sp.* with one fragment.

In the following discussion of the fish taxa all the information on ecology is taken from Froese and Pauly (2009). The information for size, weight, and capture are taken from Brewer and Friedman (1989), Linseele (2007), and Froese and Pauly (2009).

The Taxa

Clarias Gariepinus

The Nile catfish is known in modern Egypt by the names *armoot*, *garmoot*, and *hoot*. It lives in the shallow and quiet water of lakes, pools, and canals. *Clarias gariepinus* can endure conditions that may kill other fish. It can leave the water and move over the land during the day and night. It can be caught easily by hand. It is omnivorous, feeding on insects, fish, birds, plants, plankton, and invertebrates. It is not a very desirable food fish as it is very oily, and it is inexpensive. When I visited the fish market in Cairo in 2010 with Dr. Richard Redding, we found that one kilogram of this fish cost about 12 LE. The largest *Clarias gariepinus* can weigh up to 60 kilograms with a length of about 170 cm.

Synodontis Schalli

The modern Egyptian names for this catfish are *schall* and *gargoor*. It occurs in fresh water near the surface and is caught by net. *Synodontis schalli* feeds on insects, larvae, eggs, and detritus on the surface. It has a white and soft flesh that is desirable. In the fish market in Cairo a large fish is 25 LE per kilogram. The largest *Synodontis schalli* are about 30–40 cm in length and weigh up to 500 gm.

Lates Niloticus

The modern Egyptian name of the Nile perch is *isher bayad*. It lives in fresh and deep water in rivers, lakes, and larger irrigation canals. In the winter *Lates niloticus* comes near the surface or into shallow water, but in the summer it is still in the deep water, making it more easily caught by a net during the winter. The largest example of this fish is about 2.00 m, and it weighs about 200 kilograms. It is the most excellent food fish in the Nile and an expensive fish. One kilogram of Nile perch in the Cairo fish market cost 30 LE.

Cichlid

This taxon has three genera in Egypt. The most common is *Oreochromis*, whose modern Egyptian name is *boliti*. There are eight species of this fish in Egypt and it is difficult to differentiate between them. They are found in shallow fresh water, particularly in the Delta. They are easily collected by net and are an inexpensive

Area \ Ratio	<i>Clarias: Synodontis</i>	<i>Clarias: Lates</i>	<i>Clarias: Cichlid</i>	<i>Lates: Cichlid</i>
AA Bakery	1.1:1	2.4:1	3.8:1	1.6:1
RAB	1.3:1	4.7:1	3.5:1	0.7:1
Gallery III.4	0.3:1	3.1:1	0.5:1	0.2:1
PM	1.3:1	14.0:1	3.3:1	0.2:1

Table 5.1. A comparison of the ratios for identified fish taxa from the AA Bakery with other areas of the Heit el-Ghurab site based on the number of identified specimens or NISP.

food fish. When we visited the fish market in Cairo we found them to be very common, and one kilogram cost 15 LE.

Cyprinid

This group has many species in the Nile, and we cannot differentiate between them easily. These fish are omnivorous, feeding on insects, organic debris, and crustaceans. They live in deep fresh water. The largest individuals reach about 82 cm. It is not a preferred food fish because the meat does not taste good, and it is filled with many small bones. It can be caught by net or hook.

Bagrus sp.

The modern Egyptian names are *bayad* and *docmac*. The genus *Bagrus* has two species in the Nile, *B. bayad* and *B. docmac*. These species cannot be easily differentiated in archaeological samples. The two species are found in deep fresh water. *Bagrus* hides during the day and is active at night. It is a predatory fish, feeding on insects, larvae, shrimp, and small fish. Its maximum length is about 1 m, and its weight reaches up to 25 kilograms for *B. docmac* and 12.5 kilograms for *B. bayad*. It is a good food fish, with one kilogram of this species costing about 25 LE in the Cairo fish market.

Momyrus sp.

This genus has four species in Egypt, but we cannot differentiate between them easily. These species have a snout and feed on insects, larvae, and earthworms. They live in deep fresh water, and their length may reach up to 1 m in some individuals. It is not a preferred fish in the Cairo fish market.

Discussion of Fish Remains

We found among the identified fish that *Clarias gariepinus* and *Synodontis schalli* are the most common taxa in the AA Bakery (fig. 5.2). The sample may not accurately reflect the diet. *Clarias gariepinus* and

Synodontis schalli are probably over-represented here because both species have many hard skull plates that are easily identified and likely to be preserved. This may skew their numbers and make it seem that they are more important in the diet than they actually might have been.

The abundance in the sample of fish from both deep and shallow waters suggests use of both environments for fishing activity. *Lates niloticus* and *Synodontis schalli* are both desirable fish and together make up 48% of the fish in the sample (fig. 5.2). The cichlids are an intermediate fish and comprise 9% of the sample (fig. 5.2). The low quality *Clarias gariepinus* makes up 35% of the sample (fig. 5.2).

A Comparison of the Fish from AA Bakery to Other Areas of the HeG

I compared the identified fish from the AA Bakery to other areas of the HeG site: the Royal Administrative Building (RAB), Pottery Mound (PM), and Gallery III.4 (frontispiece 2). Then I compared the abundance of each pair of taxa by dividing the number of *Clarias gariepinus* by the number of *Synodontis schalli*, the number of *Clarias gariepinus* by the number of *Lates niloticus*, the number of *Clarias gariepinus* by the number of *Cichlid*, and the number of *Lates niloticus* by the number of *Cichlid* for different areas of the site (table 5.1). I found that *Clarias gariepinus*—relative to *Synodontis schalli*, *Lates niloticus*, and *Cichlid*—is the most common taxon in the AA Bakery, RAB, and the PM. But *Clarias gariepinus* is much less abundant in Gallery III.4 relative to *Synodontis schalli* and *Cichlid*. The ratios of *Clarias gariepinus* to *Lates niloticus* and *Lates niloticus* to *Cichlid* in Table 5.1 show that *Lates niloticus* is more important in the AA Bakery than in the other areas. *Lates niloticus* is much less important relative to *Cichlid* in all other areas. *Cichlid* is the most important species relative to the other taxa in Gallery III.4. The importance of the abundance of *Lates niloticus* is that, as I discussed above, it is considered an

excellent food fish. Its relative abundance in the AA Bakery sample suggests that the people whose garbage ended up in AA Bakery were wealthier than the inhabitants of RAB, Gallery III.4, and the PM.

The Birds

In the AA Bakery sample I identified 125 fragments as bird bones, weighing a total of 25.9 grams. I classified these bones into skull, limb, rib, vertebra, and sternum-synsacrum fragments. Most of these fragments are from medium-sized birds. I could not identify these fragments to taxon because I did not have access to a comparative collection. I hope to identify these birds sometime in the future.

The Mammals

I examined 9,908 fragments that I classified as mammals. I was able to assign 397 fragments of this total to taxa. I found that cattle are the most commonly occurring taxon in the AA Bakery (fig. 5.3). Cattle are represented in the AA Bakery sample by 255 fragments, which weighed 1762.9 grams. I also identified 122 fragments as sheep-goat, which weighed 333.3 grams. In addition, I identified 19 fragments of pig, which weighed 68.0 grams. I found only a single *Gazella* bone, which weighed 1.5 grams, and one cat bone, which weighed 0.2 grams.

The Taxa

Bos Taurus

All of the 254 cattle bones appear to be from domestic animals. I classified them into skull fragments

and limb bones. I further classified the limb bones as either meat bearing or non-meat bearing. Meat bearing bones included the scapula, humerus, radius, ulna, pelvis, femur, patella, tibia, and lateral malleolus. Non-meat bearing bones included the metacarpal, metatarsal, and all carpals, tarsals, and phalanges. Among the limb bones 73% are non-meat bearing. The skull is represented by 103 fragments, which represents 40% of the total bones in the cattle assemblage. From the fusion of some elements, like the distal tibia, distal humerus, distal metapodial, and phalanges, I was able to construct the age structure for cattle. I found that most cattle were killed before 12 months, and only 25% lived after 12 months (fig. 5.4), meaning the cattle in the AA Bakery were killed when very young.

Ovis Aries/Capra Hircus

All of the sheep-goat remains must be from domestic animals because the wild ancestors of sheep and goats did not occur in Egypt (Osborn and Osbornova 1998). There are 122 fragments sheep-goat in the AA Bakery sample. I used only nine elements (the petrousal, distal humerus, proximal radius, intermediate carpal, ulnar carpal, astragalus, calcaneum, distal metapodials, and first and second phalanges) to differentiate between sheep and goats. These are the only elements that I feel can be reliably identified to species. I was able to identify 12 of the 122 sheep-goat fragments as either sheep or goat. Of the 12 bones, I identified ten fragments as sheep and two fragments as goat.

I also sorted the sheep-goat bones into skull, meat bearing limb, and non-meat bearing limb fragments. Skull fragments represented 33% of the total

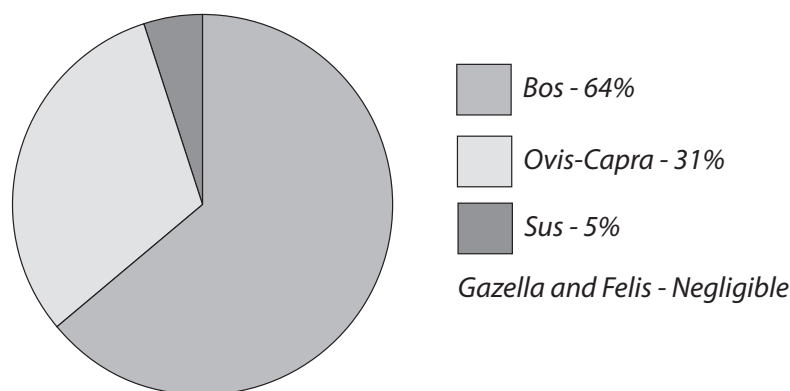


Figure 5.3. Percent representation of each of the identified mammal groups. Taxon are based on counts of the number of identified specimens, or NISP.

bones of the sheep-goat sample. Non-meat bearing fragments represented 51% of the total limb bone sample. From the fusion data I was able to construct the age structure for sheep-goat. I found that most sheep-goat were killed between 12 and 24 months; 78% lived to 12 months and only 22% lived after 24 months. As for the sex ratio for sheep-goat, using three elements (the pubis, axis, and atlas), I was able to sex five fragments. Four fragments are from males and one from a female; this is a sex ratio of 4:1.

Sus Scrofa

A small number of pig bones occur in the AA Bakery sample, only 19 fragments. I sorted these bones into skull, meat bearing limb, and non-meat bearing limb fragments. The skull is represented by 38% of the total bone. Non-meat bearing limb bone is represented by 33% of the total limb bone sample. The sample of limb bones for which I could record fusion was too small to allow me to construct the age structure for the pig.

Gazella sp.

Six species of gazelle are known from Egypt. I found only one fragment of gazelle, a distal tibia. Since the most reliable way to differentiate these species is by horn core shape, I could not identify the fragment to species.

Felis sp.

Only one fragment of cat was found in the AA Bakery sample. A small cat is represented by a fourth metatarsal. I could not tell if this bone was from a wild or domestic cat.

Discussion of the Mammals from the AA Bakery

Cattle are the dominant taxon in AA Bakery. If we look at the ratio of cattle to sheep-goat, we find that the ratio is 2.1:1. But since each young *Bos taurus* provides 7.5 times as much meat as each sheep-goat, the ratio of cattle meat to sheep-goat meat is actually 15.5:1. This meat ratio shows the importance of cattle in the diet of this area of the site, and suggests that the people in the AA Bakery were eating almost solely beef.

If we look at the body part distributions for cattle, sheep-goat, and pig, we find that the skull fragments among cattle represented 40% of all cattle bone, but in sheep-goat they represent 33% of all sheep-goat bone,

and 38% of all pig bone. There is not a big difference among the percentages of the skull fragments in all the taxa from the AA Bakery. If we look at the relative abundance of non-meat bearing and meat bearing limb fragments, we find that the largest percentage of non-meat bearing bones is in the cattle assemblage, 73%, in sheep-goat, 51%, and in pig, 33%. There is a big difference in the percentage of non-meat bearing fragments among the taxa. If whole animals were being brought to this area, then we would expect that 63% of limb fragments should be from non-meat bearing bones. The percentage of the non-meat bearing bones in the cattle and sheep-goat AA Bakery sample is close to what we expected. In pigs the percentage of non-meat bearing bones is much less than expected, only 33%. This under-representation of non-meat bearing bones in the pig sample has two possible explanations: the first could be a sample size; the second may be that pigs were killed and cuts were brought from another place.

When I compared the age structure for cattle to sheep-goat, I found that the ancient Egyptians killed the cattle at a very young age, before 12 months, but sheep-goat were killed slightly later, between 12 and 24 months. This is an interesting difference because the sheep-goats seem to be killed at the most desirable age, around 16–24 months (Redding 1981: 300). But they killed the cattle very young. One explanation for the cattle being killed at this age is that this is the most desirable and expensive meat. As for sex, the sheep-goats were mostly male, and the sample for cattle was not large enough to get a reliable sex ratio.

The predominance of the more expensive and desirable young cattle reflects the high status of the individuals whose garbage was dumped in and around the AA Bakery. The age and sex structure of the sheep-goat sample suggests that the people who discarded the garbage were provisioned, which means that the sheep-goat and cattle were provided by a central authority (Redding 2010: 72).

A Comparison of the AA Bakery Mammals to Other Areas

When I compared the mammal sample from the AA Bakery to other areas of HeG site, the PM, RAB, and Gallery III.4 (table 5.2), I found that the AA Bakery sample looks most like the PM sample. Redding provided data on the age structure of the cattle and sheep-goat from the other areas (2010: 68–69). Cattle

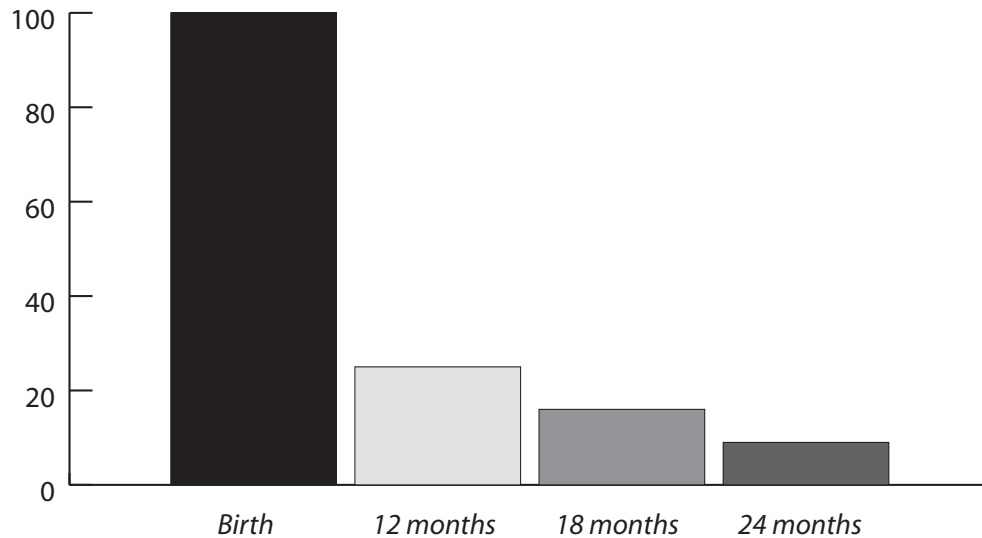


Figure 5.4. Percent of cattle that survived in each age class based on the number of identified specimens, NISP, of fused and unfused elements.

Table 5.2. A comparison of the ratios for identified mammal taxa from AA Bakery to other areas of the Heit el-Ghurab site based on the number of identified specimens, or NISP.

Area \ Ratio	<i>Bos: Ovis-Capra</i>	<i>Bos: Sus</i>	<i>Ovis-Capra: Sus</i>	<i>Ovis: Capra</i>
AA Bakery	2.1:1	13.4:1	6.4:1	5.0:1
RAB	0.4:1	0.9:1	1.9:1	4.2:1
Gallery III.4	0.1:1	4.0:1	14.7:1	1.3:1
PM	13.6:1	156.0:1	11.5:1	2.0:1

is the most common taxon in both the AA Bakery and the PM sample. But based on the ratios in RAB and Gallery III.4, sheep-goats are more important in both areas than the cattle. Sheep are more abundant than goats in all areas of HeG. In the RAB sample, pigs are more abundant than in all other areas. The ratio of sheep-goat to pigs in Gallery III.4 is similar to PM (table 5.2).

I also compared the age structure of cattle in the AA Bakery to the other HeG areas. I found that the AA Bakery sample looks most like the PM and Gallery III.4 samples. In the AA Bakery, PM, and Gallery III.4 the cattle were eaten very young; in the AA Bakery only 25% survived to 12 months; in PM 100% were killed before 12 months; only 23% lived beyond 12 months in Gallery III.4; and in RAB 55% of the cattle lived beyond 12 months.

Comparing the age structure of sheep-goat for the AA Bakery to the other areas of HeG, I found that

the AA Bakery looks similar to Gallery III.4, but that older animals form a larger percent of the sample in the RAB. In the AA Bakery sample only 22% lived after 24 months, in RAB 42% lived after 24 months, and 19% lived after 24 months in Gallery III.4. While the sheep-goats in the AA Bakery and Gallery III.4 were provisioned, the RAB sample was most likely not. Perhaps the individuals whose garbage was found in the RAB area were obtaining their sheep-goat from their own flocks or through exchange.

Conclusion

In the AA Bakery sample, mammals are the dominant source of meat. The mammals are dominated by young cattle. Only 25% of the cattle lived to 24 months. These suggest that the people in AA Bakery were eating almost solely beef, actually veal. There were more sheep than goat, at a ratio of 5:1. The above data suggest that the houses near the AA Bakery was occupied

by high-status individuals. The AA Bakery is most like PM, which was deposited by high status consumers, perhaps because the AA Bakery is near the PM area, and we believe that the same people were dumping their trash in both places.

In the AA Bakery, *Clarias gariepinus* and *Synodontis schalli* are the most common fish taxa in the sample, but, because the bones of these two taxa are over-represented in the sample (as they have more bones that preserve well), they may not provide as much meat to the diet as other taxa. A large number of *Lates niloticus* occurs in the AA Bakery sample, more than the other areas relative to other taxa. *Lates niloticus* is considered the best food fish. This may also reflect the wealth and status of people in this area.

The people whose garbage was deposited in the AA Bakery were receiving only young male cattle and sheep-goats. The absence of older animals, more than 2 years of age, and females suggest offtake from herds that were maintained by other individuals. The residents were being provisioned and, given the high number of cattle of less than 1 year of age, were receiving a very high status diet.

I think that this study shows the importance of the study of faunal remains. From the animal bone we can not only reconstruct the diet of the people, but the fauna can also tell us about the economy and the social status of the occupants.

Acknowledgements

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6. A Report on the Khentkawes Town-House E Archaeobotanical Remains

by Mary Anne Murray and Rebab el-Gendy¹

We present here the results from the analysis of the Old Kingdom plant samples from five rooms within House E of Khentkawes Town North (KKT-N) at Giza. Khentkawes Town North is located east of the tomb of Khentkawes, due north of the Menkaure Valley Temple, and northeast of AERA's main excavation site of Heit el-Ghurab (HeG) (frontispiece 2; fig. 6.1). The preservation of the ancient plants in House E is very good, and they show some interesting differences between rooms. Due to the diversity and density of species present in the chosen samples, they were ideal for teaching the fundamentals of archaeobotanical analysis in the AERA-ARCE Field School. In all, we identified 14,101 plant items from House E, including 43 different plant types.

House E is one of six large modular houses built along the Khentkawes causeway (Tavares and Yeomans 2009; fig. 6.1). Selim Hassan initially excavated the Khentkawes Town in 1932. His publication map shows a single phase settlement, and he describes a generic house based on information conflated from the excavation of Houses A to H (S. Hassan 1943: 38). Although Hassan removed occupation deposits, and the site has been badly eroded since it was exposed, AERA's recording work has produced a new understanding of this settlement (Lehner 2011b). Hassan excavated House E to the lowest floor levels, removing most of the occupation deposits, and leaving walls, floors, and some features (such as hearths and silos) of different phases. In 2009 Lisa Yeomans and Hanan Mahmoud excavated House E and identified six broad phases, including construction and occupation (Phases 5a), remodeling (Phases 5b and 5c), possible abandonment (Phase 6), and final rebuilding and reoccupation (Phase 6) (Yeomans 2009, Yeomans and Mahmoud 2011). The excavators think that House

E was not occupied for a long period (Yeomans 2009). Preliminary discussions of the different house plans and function of rooms, as well as the implication of the phasing of House E for our understanding of the Khentkawes and MVT settlements have been published elsewhere (Lehner 2011b; Yeomans and Mahmoud 2011).

The original function of the rooms in House E was inferred from the architectural layout (Arnold 1998; S. Hassan 1943) since there was little information left from occupation deposits. The house was modified quite radically over time, and the function of rooms was also likely to have been altered. House E covers approximately 189 m² and was entered at the southeast from the causeway (fig. 6.2). A zigzag passage provided privacy and led to a transversal, east-west vestibule (74), possibly left unroofed. This vestibule led to an open courtyard (79)—which was later modified with the construction of both walls [31,092] and [31,089=31,090] and the silos—at the back of the house and to the inner rooms of the house: an L-shaped room (73), probably a kitchen; and an audience hall (71) with a low bench in a niche and a hearth in the southeast corner, [31,723], (probably to provide heat). From Room 71 there was access to two private rooms (68, 69) possibly bedrooms. Room 69 had several hearths along the eastern wall, also probably for heating. The open courtyard (79) was accessible from a street running between the houses and the town's enclosure wall. The original flow in House E was substantially altered in Phase 5b (Yeomans 2009). The two northern accesses (from Northern Street to Room 70 and 79) were blocked, Room 70 became a more private space (with the construction of wall [31,097]), and one of the accesses from Room 69 to Building D were blocked (Yeomans 2009). In Phase 5c the

1. The authors would like to thank Dr. Claire Malleson for helpful comments and editorial work on this piece.

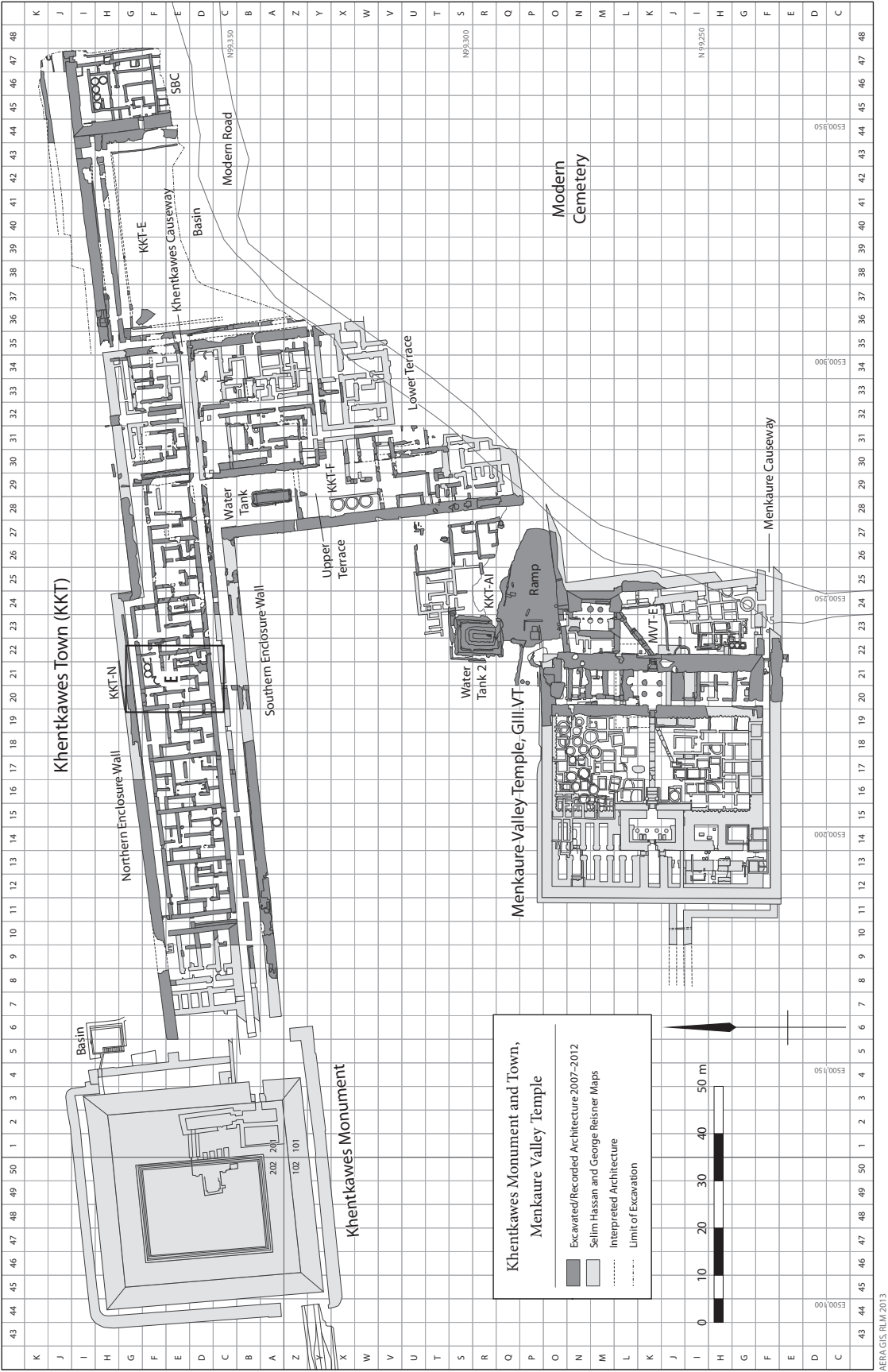


Figure 6.1. Plan showing the Khentkawes Monument and Town, as well as the Menkaure Valley Temple. House E (KKT-N) is highlighted in the Khentkawes Town. Plan by Rebekah Miracle, AERA GIS, and Hassan Ramadan.

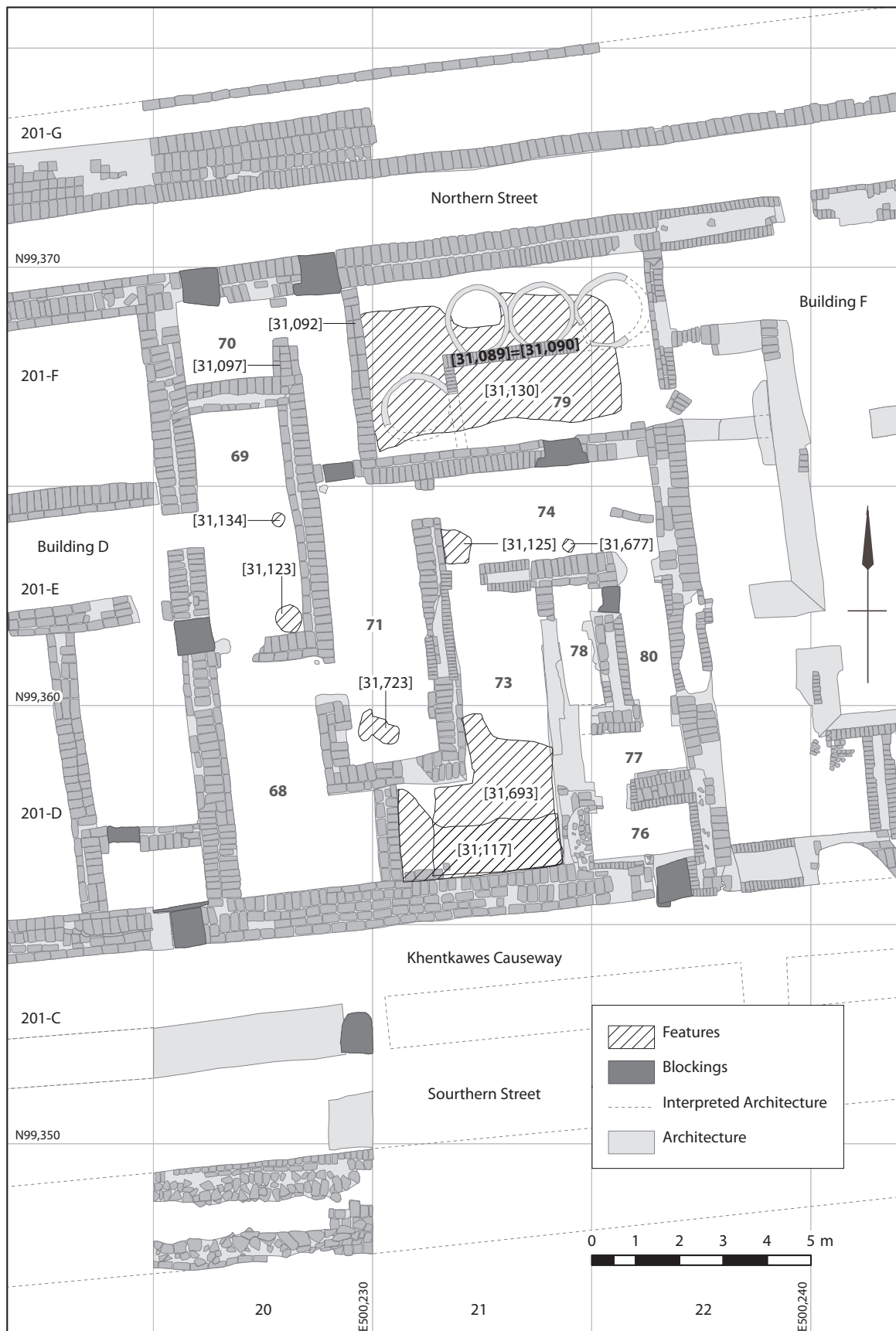


Figure 6.2. Multi-phase plan (Phases 5 and 6) of House E indicating features that produced botanical samples considered in this report. Plan by Rebekah Miracle, AERA GIS.

doorways from Rooms 71 and 74 into the courtyard 79 were blocked so that the courtyard was only accessible from House F, the adjacent house to the east (fig. 6.2). In this phase, walls [31,092] and [31,089=31,090] were also constructed and four silos (probably for the storage of emmer and/or barley grain) were built in the courtyard, which is effectively part of House F. The eight botanical samples discussed in the article come from Rooms 69, 71, 73, 74, and 79, and from Phases 5b, 5c, 5b/c, and 6 (see table 6.2).

Objectives

The aim of the botanical analysis of the House E samples is to answer certain questions about the agricultural economy during the Old Kingdom and the daily food and fuel use in the building. Many questions will be addressed using the archaeobotanical record of this area, for example:

- Which field, orchard, garden, and wild plants were used as cereals, legumes, fruits, and oil/fiber plants?
- Do the plant remains show us the function of any rooms, such as cooking, crop processing, or storage?
- What types of fuel were used for cooking and heating?
- What do the wild/weed plants from the samples tell us? Do the wild plants offer clues to harvesting techniques or field conditions?

The richness and diversity of the House E plants will help us answer these questions.

Methodology

All of the ancient plants from House E at KKT-N have been preserved by charring, i.e., they were exposed to high temperatures with little or no oxygen. In all, we analyzed 14,101 plant items from House E and recovered 312 ml of wood charcoal from the samples. This is quite a contrast to the plant assemblage from HeG (frontispieces 1, 2), which overall has a low density and diversity of plants. A total of 32 liters of soil were floated from the House E samples, which ranged in size from 2 to 9 liters.

Sampling

The eight archaeobotanical samples were taken from throughout House E and include several different types of features (fig. 6.2). We sampled two hearths in Room 69, [31,123] and [31,134], an area of *in situ* burning, [31,723], in Room 71, “ash from under the granary,” [31,130], in Room 79, “ash from leveling/occupation layer” [31,693] and a “build up of ash” in a kitchen area, [31,117], in Room 73, and in Room 74, a hearth, [31,677], and a floor, [31,125] (see table 6.2).

Recovery

Charred plant remains float when put in water, and all of the plant samples were recovered using a flotation machine that easily separates organic material from deposits sampled during excavation. We used sieves with 1 mm and 250 micron (µm) mesh to collect the plants. The part of the sample that does not float (called the heavy fraction) is caught within a 1 mm mesh inside the flotation tank. All of the heavy fraction from each sample was sorted for pottery, bone, and other small objects.

Sorting Samples

Before sorting the plant samples, one of us (R. el-Gendy) put each one through a nest of sieves to help make sorting easier (i.e., 1 mm and 250 micron [µm] size mesh) and then sorted them under the microscope to find the whole and fragmented plants. We analyzed all the samples using a 10× to 65× binocular Nikon SMZ800 microscope. We removed all items, including the seeds and chaff of cereals, legumes, fruits, nuts, wild/weed plants, root/tuber tissue, wood charcoal, other plant parts, and animal dung, and classed them by family, genus, species, or item type, such as nut or fruit fragments, etc. We also removed all wood charcoal and measured the volumes in a milliliter beaker.

Identification of Taxa

Identifications of plant taxa were made on the basis of the unique shape and character of each item and the comparison of the ancient specimens with modern reference material, as well as using the criteria and illustrations available from other Egyptian archaeobotanical reports and seed atlases (e.g., van Zeist and de Roller 1993; Fahmy 1997; Smith 2003; Cappers 2006). Each identifiable plant type was recorded. All items of these types were counted for each sample, and a final taxa list was then completed.

The Presentation of Data

The archaeobotanical results from House E are shown in table 6.2 following this report. This table includes the counts for each plant type by sample. The list of plants in the table refers to the seeds of the plant unless otherwise stated.

In table 6.3 the plant types are presented as plant groups, which include emmer and barley grain and chaff, large and small legumes, fruit, nuts, oil/fiber plants, wet-loving taxa, wild grasses, all wild/weed taxa, root/tuber remains, as well as animal dung and certain indeterminate items. The plant counts are presented as the relative density of plant items per liter.

Quantification of the Plants

We use several methods for counting the plants to assess the presence, relative density of items, abundance, diversity, and preservation of the House E plant assemblage. These indices are:

- Presence percentages
- Density of items per liter
- Number of plant types
- Fragmentation index
- Density of wood charcoal

These methods, especially when used as a group, help to take into account the influence of the many factors affecting charred plant assemblages, such as sample size and history of deposition. These are briefly described below.

Presence Percentages

Presence analysis was used to determine the relative quantities of plants within all the samples, rather than within any particular sample, by counting the number of samples in which it occurred. For example, if barley grain was found in 8 out of 10 samples, then it had a presence of 80% within that sample group.

Density of Items per Liter (IPL)

The relative density of plant items in each sample was measured as the average number of items per liter of deposit. This is a useful tool to measure the relative “richness” of plants when comparing areas, feature types, etc. (fig. 6.3).

Number of Plant Types (Taxa)

The numbers of different plant types in each sample

were counted to show the variety of plants present (fig. 6.4).

Fragmentation Index

Used with other methods of measurement, the amount of fragmentation in a sample can be an important indicator of plant use and deposition. A single common plant has been chosen to measure this, *Lolium* sp., a wild grass, as well as Graminae indet. (indeterminate), which is likely to be badly preserved or fragmented *Lolium* sp. The whole seeds, fragments, and totals of these were counted for each sample. Fragmentation is calculated as the number of fragments to the total number of seeds and fragments expressed as a percentage, i.e. a sample with 5 whole *Lolium* grains and 10 fragments (totaling 15 items) will have a percentage of 67%, which is a “medium high” degree of fragmentation (see table 6.1 below) (also fig. 6.5).

Table 6.1. Fragmentation Index

Percentage	Degree of Fragmentation
0%	None
1–10%	Very low
10–20%	Low
20–30%	Medium low
30–40%	High low
40–50%	Medium
50–60%	Low high
60–70%	Medium high
70–80%	High
80–90%	Very high
90–100%	Total fragmentation

Density of Wood Charcoal

The volume of wood charcoal from the samples was measured in milliliters (ml), and the index of wood charcoal density was milliliters per liter (ml/L). A comparison of wood charcoal densities can tell us about the relative use of fire and the use of wood as fuel (fig. 6.6).

Results by Taxa Group

The House E samples are composed of a rich mixture of charred cereal grain and chaff, legumes, fruit and nut remains, wild/weed seeds, roots/tubers, wood charcoal, and animal dung. The variety of plants present includes the two staple cereals of ancient Egypt:

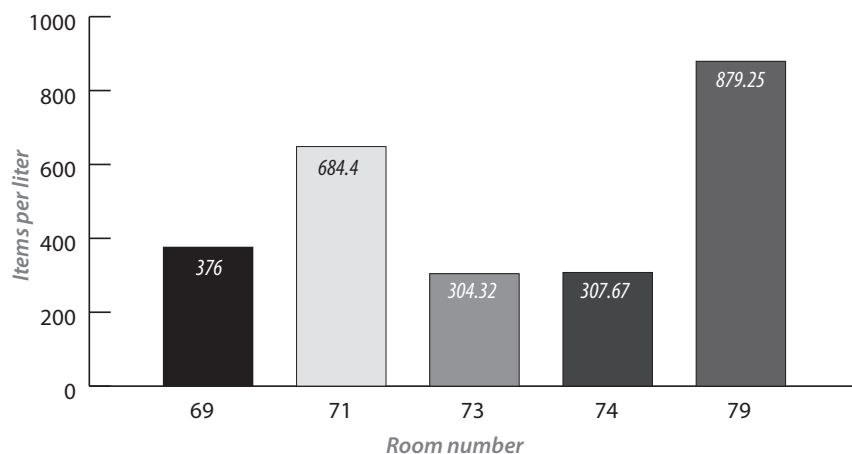


Figure 6.3. Density of items per liter by room.

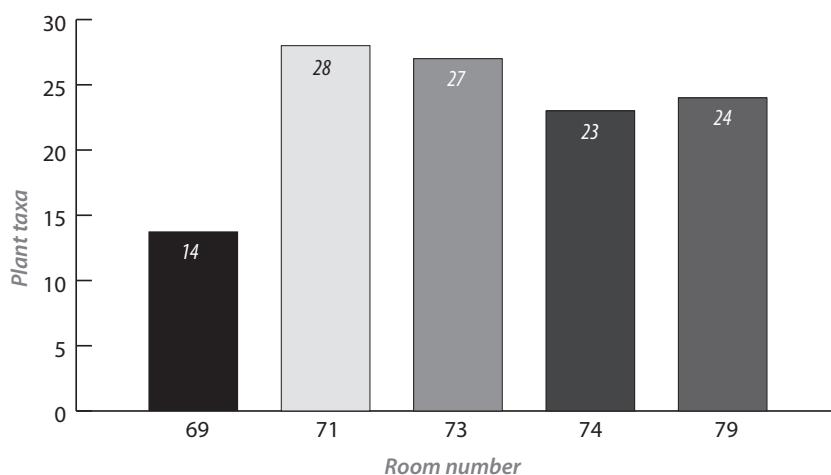


Figure 6.4. Number of plant taxa by room.

emmer wheat (*Triticum dicoccum*) and hulled barley (*Hordeum vulgare*). As for legumes, lentil (*Lens culinaris*), faba bean (*Vicia cf. faba*), and other edible legumes of the *Viciae* tribe, such as bitter vetch (*Vicia ervilia*) and grass pea (*Lathyrus sativus*), are present. Fruit remains include grape (*Vitis vinifera*) and fig (*Ficus sycomorus* and *Ficus carica*). The roots and tubers present include the edible tuber chufa (*Cyperus esculentus*). Flax, used for the oil from its seed (linseed) and to make cloth from its stem (flax), is present. Wild/weed species are the largest plant group in the samples; they are mostly wild grasses and large and small legumes (table 6.3).

House E plant remains are denser and display more variety than the plant assemblage of Heit el-Ghurab (HeG) as a whole, as well as the various areas of that settlement. The site of HeG itself has a density of 8 items per liter (IPL), while House E has 441 IPL (fig. 6.7).

The plant types in the House E samples suggest that much of the assemblage was probably from cereal processing residues. For example, the weeds from the cereal fields were often harvested with the cereals. The

weeds and cereal chaff were then gradually removed by several processing methods. These residues, the weeds and chaff, were then often used as fuel in cooking and heating fires, thus becoming charred and therefore preserved. Exceptions to this might be the fruit and nut remains, which were probably swept or thrown onto a fire, and possibly the edible tubers which, if not harvested along with the cereal crops, may have been collected separately for food. In all, only 6% of the entire plant assemblage is comprised of food items, while the remaining 94% is largely cereal chaff and wild/weed taxa.

The following are the descriptions of the plant types and the results of the quantitative analyses of the plant types found in the House E samples. This discussion will focus on the cereal grains and chaff, legumes, and the wild/weed items found in the samples.

Cereals

Cereal grain and chaff were present in all eight samples, making up 32% of the House E plant assemblage

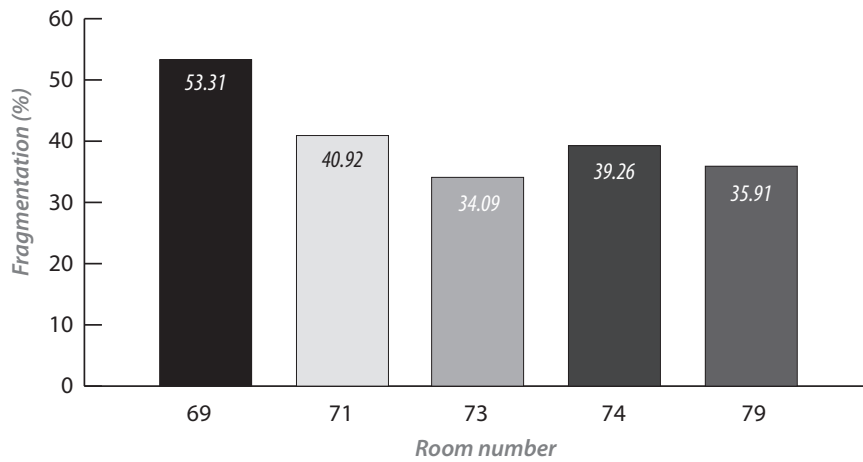


Figure 6.5. Fragmentation of plants by room.

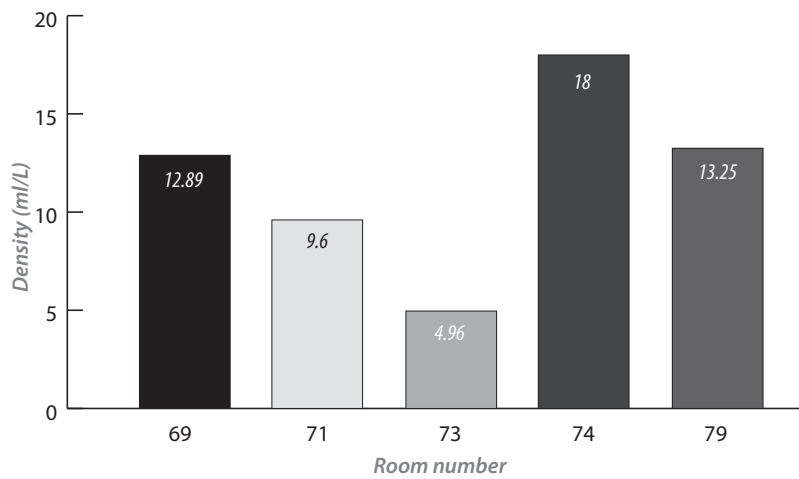


Figure 6.6. Wood charcoal densities by room.

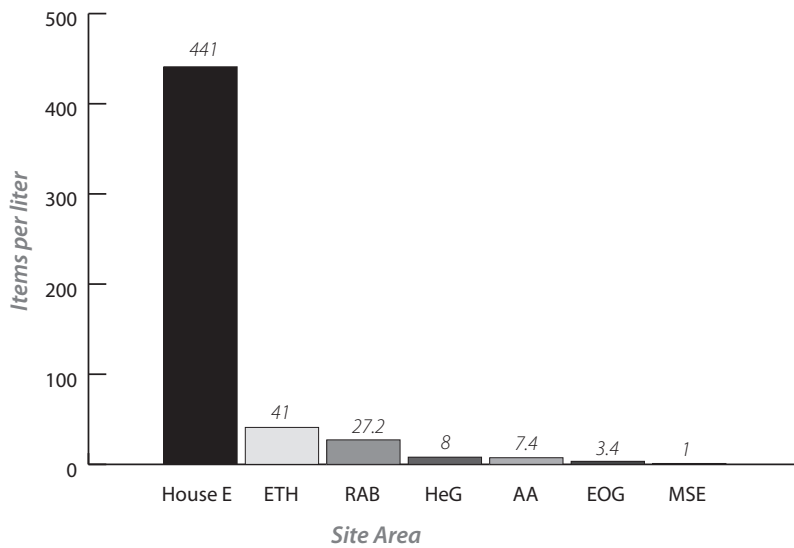


Figure 6.7. Number of plant items per liter by area, including House E and the settlement of Heit el-Ghurab (HeG).

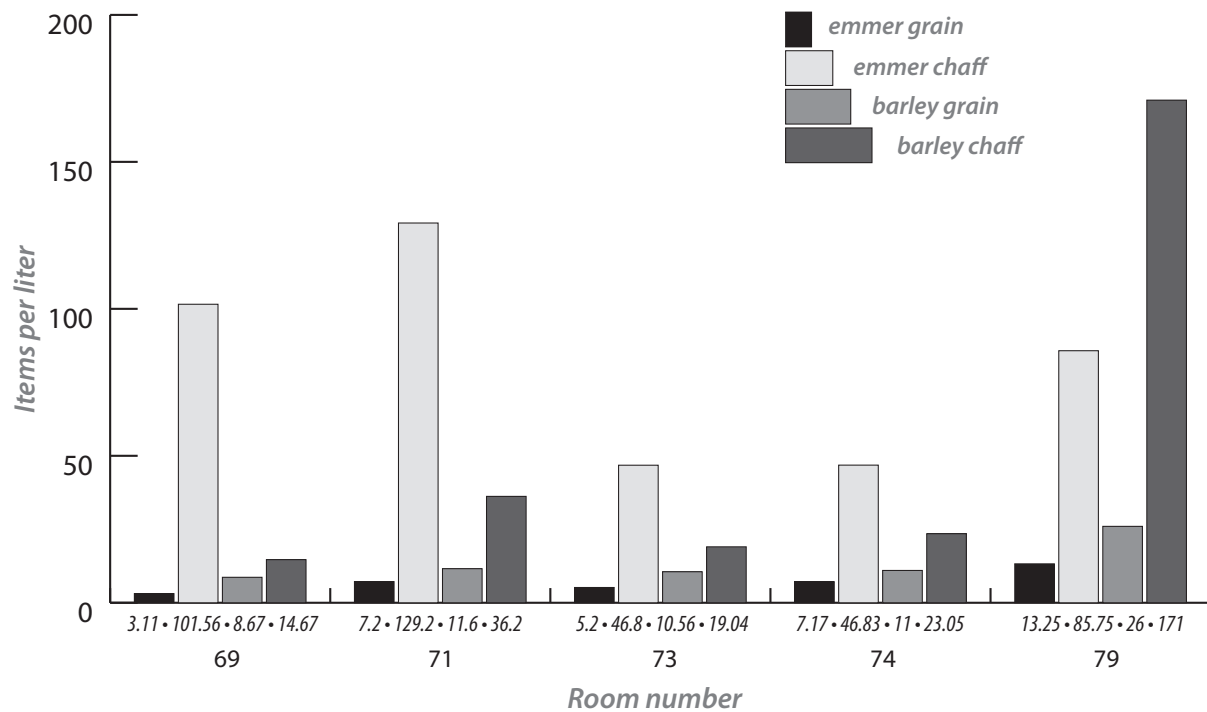


Figure 6.8. Items per liter of emmer, barley grain, and chaff by room.

that we studied (cereal grain at 6% and cereal chaff at 26%). Cereal grains were found in densities of 23.5 per liter, while cereal chaff was 118 items per liter (IPL) (table 6.3). Cereal grains found in the samples may be present for several reasons. They may be cooking spills, the accidental mixing of grain and processing wastes stored in close proximity, part of the residue from processing the cereal crops to obtain a cleaned grain product, and so on. Upon analysis, we concluded the cereal grains in these samples are most likely to be the residue from the sieving stage of crop cleaning, a common component of archaeobotanical samples.

By room, a higher density of both cereal grain (269.5 IPL) and chaff (47.75 IPL) was found in Room 79. Room 73 had the lowest density of cereal chaff (66.24 IPL), and Room 69 had the lowest density of cereal grain (13.78 IPL; see fig. 6.9).

The two primary cereals from House E and, indeed, Pharaonic Egypt are emmer wheat (*Triticum dicoccum*) and hulled barley (*Hordeum vulgare*). The two products of emmer and barley, bread and beer, were likely to have been the main staples in the diet of the Khentkawes residents. Emmer was primarily used to make bread, but also used in beer brewing, while barley was most suitable for the latter. Emmer and barley grain were always found mixed with the

discarded weeds and chaff from crop processing and other debris, and never as pure grain in any features.

Emmer and barley grain and chaff were present in 100% of the samples. The density of barley grain (13 IPL) is greater than that of emmer grain (7 IPL), while barley chaff (41 IPL) density, on the other hand, is less than that of emmer chaff (72.3 IPL). For the nearby HeG settlement as a whole, emmer and barley grain are both found in about 30–40% of the samples and both in densities of about 0.2 items per liter. Figure 6.8 shows the relative densities of emmer and barley grain and chaff in each of the five rooms of House E.

By room, there is a higher density of barley grain than emmer grain in every room and there is a higher density of emmer chaff than barley chaff in every room apart from Room 79 where there is a far higher density of barley chaff (171 IPL) than emmer chaff (86 IPL). Room 79 later contained the granary, and the samples are from a thick layer of cereal processing waste and household debris under the granaries, which was burnt elsewhere and may have been deliberately placed there to protect the cereal grain from insects (Yeomans and Mahmoud 2011: 49) (fig. 6.8).

Legumes

Legumes, such as lentil (*Lens culinaris*) and faba bean

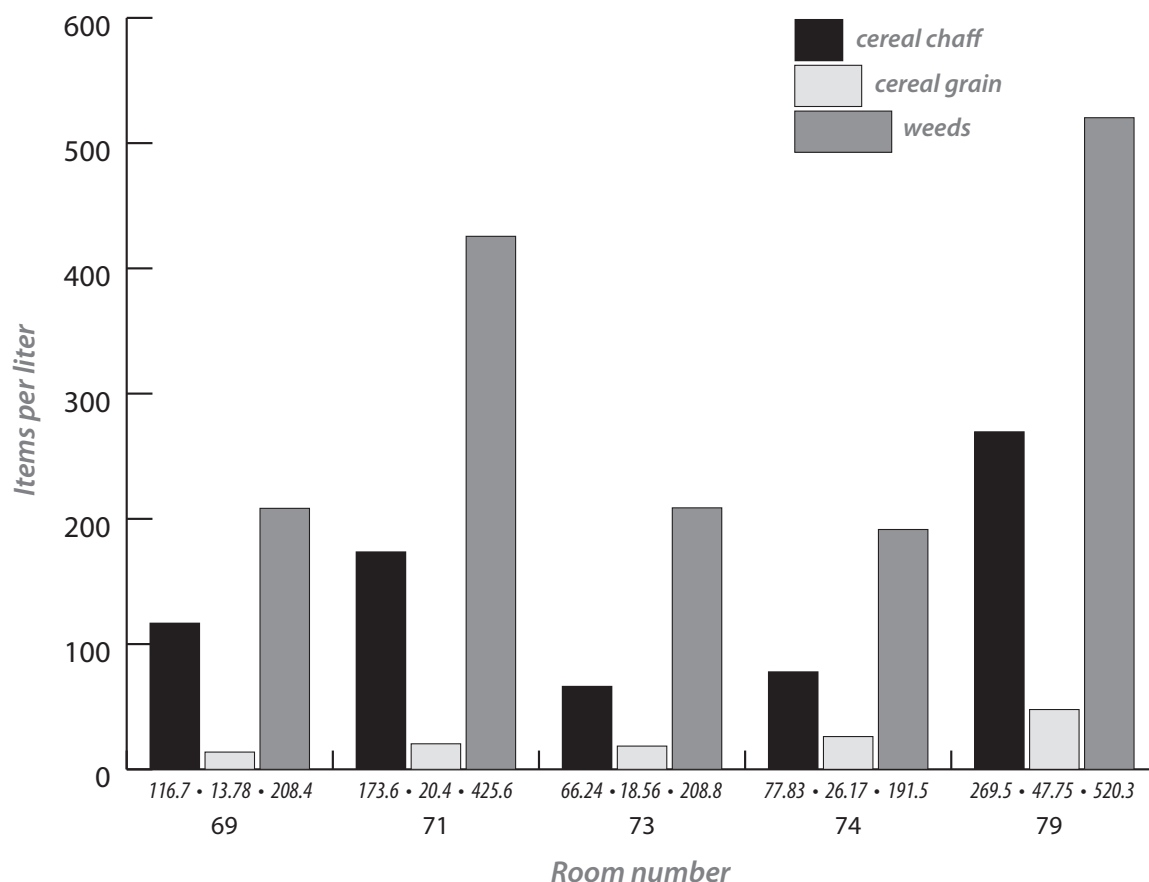


Figure 6.9. Items per liter of cereal grain, chaff, and weeds by room.

(*Vicia faba*), are winter crops, sown at the same time as emmer and barley. Ancient legumes can be problematic since important features used for determining species often can be unclear or missing and, without them, telling the difference between similar genera and species and between the wild and domesticated forms can be difficult (e.g., Butler 1991, 1996). For example, the separation of certain legumes, such as members of the Viciae tribe (i.e. *Vicia* and *Lathyrus*) and the Trifolieae tribe (i.e. *Trifolium*, *Trigonella*, *Medicago*, and *Astragalus*) can be difficult due to the overlap of size, shape, and other characteristics (e.g., Butler 1991, 1996). Certain plants among both the large-seeded legumes (e.g. Viciae tribe) and the small-seeded legumes (e.g. Trifolieae tribe) may have been weeds, used as human food, or animal fodder (see Murray 2008).

Both large legumes and small legumes were found in 100% of the samples. Large-seeded legumes, including lentils, comprise 2.1% of total assemblage (9.2 IPL), while small-seeded legumes comprise 22% (97.2 IPL).

Room 71 had the highest number of small legumes (148.6 IPL); Room 79 had the lowest (63.25 IPL). Room 79 had the highest number of large legumes (17.5 IPL), Room 74 had the lowest (5 IPL).

Lentils were found in 100% of the samples and occur at a rate of 3.1 IPL. Room 79 had the highest number of lentils (9.5 IPL) and Rooms 71 and 73 had the lowest (1.5 IPL). Faba beans were found in 25% of the samples and occur at a rate of 0.2 IPL. Faba beans were only found in two rooms, Room 71 (0.4 IPL) and Room 74 (0.5 IPL) (table 6.3).

Wild/Weed Taxa

Wild/weed plants are the largest plant group from House E. They are found in 100% of samples (278.4 IPL) and make up 62.3% of the assemblage. Wild grasses, especially *Lolium*, make up 47% of the wild taxa with 131 items per liter (table 6.3).

It is likely that the grasses and most of the other wild taxa arrived on site as weedy contaminants of the harvested emmer and barley crops. The annual weeds

of cereal crops usually produce large number of seeds that often ripen at the same time or just prior to the harvest (Muenscher 1980: 4, 43). Through various operations, such as winnowing, sieving, and hand sorting, the field weeds and chaff were gradually filtered out to obtain a clean grain product prior to milling, baking, or brewing. These residues were an important fuel in Old Kingdom Egypt, thus becoming charred and preserved (Hillman 1981, 1984a, 1984b; G. Jones 1987, 1991).

The Room 79 sample, from the ash layer under the granaries, had the highest numbers of weeds (520.3 IPL). Room 74 had the lowest (191.5 IPL).

Discussion of Results

Which field, orchard, garden, and wild plants were used as cereals, legumes, fruits, and oil/fiber crops?

The field plants in the samples include emmer wheat, hulled barley, lentils, and faba beans, as well as bitter vetch and grass pea, which may have been used as food. Tree fruits include grape and two species of fig. *Linum* raised for linseed and/or flax is a useful field crop. The edible wild tuber chufa may have been cultivated in ancient Egypt as it was an important food source. Some of the wild plants in the samples may also have been used as food, medicines, dyes, building materials, textiles, bedding, tools, basketry, and so on.

Do the plant remains show us the function of any rooms, such as cooking, crop processing, or storage?

A study of the rooms shows differences between them. Two hearths from Room 69 were analyzed, and yielded a medium density of plants per liter (376 IPL). The plants present were mostly cereal chaff and weeds. The number of plant types was fairly low for these samples (16). The wood charcoal density was 13 ml/L, which is medium high for these samples. The fragmentation rate was 53.3%. This suggests that cereal processing waste and wood charcoal was being burned in these hearths for cooking or heating. The higher fragmentation here than in Room 71 may indicate the repeated use of these hearths.

The sample from Room 71, a possible “living room,” was from *in situ* burning and may have been for cooking or heating the room. There were 648.4 plant items per liter, a relatively high figure for these samples, and this room had the highest number of plant types (30). The sample was made up primarily of cereal chaff and weeds. The wood charcoal density was

the second lowest for these rooms (10 ml/L) and the degree of fragmentation was 41%. In Room 71, the high number of plants and plant types and the low wood charcoal density suggests that cereal processing waste may have been more commonly used here than wood for fuel.

The ash under the granary in Room 79 had the second highest items per liter figure (879.3 IPL) and a relatively high number of plant types. The wood charcoal density within the sample was 13.3 ml/L. The fragmentation rate was the second lowest (36 IPL). The plants here were also primarily cereal chaff and weeds. The ash was burnt elsewhere and was deliberately placed under the granary silos, possibly to deter insects. No evidence of stored products was found in this or any of the archaeobotanical samples analyzed so far.

Room 73 was thought to be a kitchen area by the excavators. Feature [31,693] from this room had the lowest number of plant types (12), the lowest wood charcoal density (1.3 IPL), and the highest fragmentation of 55.3%. The plants were mostly cereal chaff and weeds, but in low densities. However, the dense ash layer in this room, [31,117], had the highest density of plants per liter of all the features sampled (925.4 IPL). The plants were mainly cereal chaff and weeds. The ash also had the second highest number of plant taxa (26) and the second highest density of wood charcoal (14.3 ml/L), as well as the lowest fragmentation rate (30%) of any of the samples. This suggests that this ash was possibly not burned repeatedly, which resulted in lower fragmentation of the plants and wood fuel. The material from this sample does indicate that this space may have been a kitchen area, containing a build-up of cooking ashes. The material from [31,693] may represent the last few remains of an earlier build-up which had been mainly cleared out.

The two samples from Room 74 were from a floor and a hearth. The density of items per liter is 308, the number of plants types is 21. As in the other rooms, the plants were mostly made up of weeds and chaff. This room had the highest wood charcoal densities (18 ml/L): the floor had 20 ml/L of charcoal and the hearth had 15 ml/L. The fragmentation rate was 39.3%. The hearth was burning wood charcoal and cereal processing waste as fuel for cooking or heating. The sample from the floor appears to be dumped ash of a similar nature, possibly from the hearth nearby.

What types of fuel were used for cooking and heating?

In every room the botanical evidence shows that wood charcoal and cereal processing waste were the two main fuels used. In Rooms 73 and 79, animal dung was also present in the burnt remains, suggesting that this was also used as a fuel, although it is not common in the samples.

What can the wild/weed plants from the samples tell us?

Emmer, barley, lentils, other legumes, and linseed/flax would have been sown in the autumn, after the annual flood waters receded. They were harvested in the spring. The weed taxa from House E show this pattern since many of the weeds are those that seed in the spring and were most likely to have been harvested with the winter sown crops. Among the most common spring-seeding weeds found here are ryegrass (*Lolium*) and canary grass (*Phalaris*) (Fahmy 1997). In House E, there were 83 IPL of *Lolium* and 32 IPL of *Phalaris*. Both grasses were found in 100% of the samples. The presence of plants that tolerate moist soils or grow in moist habitats in the assemblage (14.1 IPL) may indicate such conditions in the cereal fields or the harvesting of these plants from the canals or the Nile banks.

The role of wild taxa as building materials, textiles, bedding, tools, basketry, medicines, and dyes is difficult to determine from the archaeobotanical record, since these items are less likely to become charred and preserved because plants used in this way were not likely to be exposed to fire (Hillman 1981: 155). The reeds and fibers of the Cyperaceae genera *Scirpus* and *Cyperus*, for example, might have been used as materials for building, furnishings, matting, or basketry. At present, however, we can only speculate as to the full range of wild species utilized by the House E residents or, indeed, the site as a whole. It is most likely that the majority of wild taxa from House E arrived on site as weeds of the cereal crops.

The wild plants in the samples primarily tell us about agriculture and cereal processing. We see that the cereals were probably harvested low enough on the straw to have also included these weeds. We have evidence from the stage of processing during which the cereals are pounded to remove their chaff; we see

this in the high density of chaff in the samples. The cereals would then need to be sieved to clean them further and we have evidence of this stage and perhaps also the final stage of hand sorting the cereals for large items that cannot be sieved out (e.g., Hillman 1981; Murray 2000 for Egypt).

Conclusions

The results from House E show that most of the plant material comes from cereal processing waste which had been used as fuel, charred, and therefore preserved. This processing waste and wood (or wood charcoal) appear to have been the most important fuels.

Among the important differences between KKT-N and the nearby settlement of Heit el-Ghurab is the excellent preservation of the KKT plants, which has helped us to identify certain plants to species level. For example, the *Rumex* species from Heit el-Ghurab is now known to be *Rumex dentatus*. We also have clearer examples of *Eleocharis*, *Crypsis*, and *Trigonella astroides*.

The plant results from House E add an important contribution to the archaeobotanical record of the Giza Plateau and to our understanding of individual houses from Old Kingdom settlements. Future work on the plants will include studying what other food plants might have been used and what the weeds in the samples can more specifically tell us about cereal agriculture. The results here provide a good baseline for the ongoing analysis of this corpus currently being completed by Dr. Claire Malleson at the time of writing.

Acknowledgements from Rebab el-Gendy

I want to thank everyone in the 2010 AERA-ARCE Analysis and Publication Field School. I want to thank Dr. Mark Lehner, Ana Tavares, and Mohsen Kamel for selecting me to be the first student in archaeobotany. I also want to thank my great teacher, Dr. Mary Anne Murray, who has guided me in my studies. I want to thank the Supreme Council of Antiquities for giving me this opportunity. Thank you to my husband and my parents who encouraged me to join the field school. I also want to thank Dr. Mohammed Abd el-Rafe and all my friends who helped me, especially Zeinab Hashash, a previous Field School graduate.

Table 6.2. House E Species List by Sample.

Khentkawes Town North-House E	[31,117]	[31,123]	[31,125]	[31,130]	[31,134]	[31,677]	[31,693]	[31,723]
Bag Number	1520	1546	1534	1582	1603	1733	1773+1774	3030
Square Number	201-D21	201-E20	201-E21	201-F20-2	201-E20	201-E21	201-D21	201-D22
Phase	6	5b/5c	5b/5c	5c	5b/5c	5b/5c	5b/5c	5c
Room	73	69	74	79	69	74	73	71
Feature type	ash layer	hearth	floor (silty)	ash under silo	hearth	hearth	kitchen area	<i>in situ</i> burning
Volume of deposit (L)	3.5	2.5	4	4	2	2	9	5
Charcoal volume (ml)	50	23	78	53	18	30	12	48
Charcoal density (ml/L)	14.29	16	20	13.3	9	15	1.3	10
Number of taxa	26	16	23	25	13	15	12	30
Number of items	3239	1012	1536	3517	680	310	565	3242
Number of items per liter	925.4	405	384	879.3	340	155	63	648.4
Fragmentation index (%)	30%	54%	35.40%	36%	53%	67.30%	55.30%	41%
Cereals								
<i>Hordeum sativum</i> grain	112	26	47	104	13	19	20	58
<i>Hordeum sativum</i> rachis internode	221	27	129	684	39	12	17	181
<i>Triticum dicoccum</i> grain	63	9	41	53	5	2	2	36
<i>Triticum dicoccum</i> spikelet forks	162	65	126	200	133	10	67	479
<i>Triticum dicoccum</i> glume bases	280	155	139	143	104	6	76	167
Cereal Indeterminate grain	25	4	44	34	5	4	10	8
Cereal Indetermi- nate - culm nodes	1		6	43	2	36		39
Cereal Indetermi- nate - culm bases	3		1	8		2	1	2
Legumes								
<i>Lens culinaris</i>	12	10	7	38	1	2	7	21
<i>Vicia cf. faba</i>			3					2
<i>Vicia ervilia</i>	1			2				
<i>Lathyrus sativus</i>	4							2
Viciae tribe	69	21	12	30	8	6	4	26
LEGUMINOSAE - small-seeded			5	19			6	6
Fruits								
<i>Ficus carica</i>	1		1					3
cf. <i>Ficus sycomorus</i>								1
cf. <i>Ficus</i> fruit fragments				1				
<i>Vitis vinifera</i>								1

Table 6.2. cont.

Khentkawes Town North-House E	[31,117]	[31,123]	[31,125]	[31,130]	[31,134]	[31,677]	[31,693]	[31,723]
<i>Oil/Fiber Plants</i>								
cf. <i>Linum</i> sp.	1		5					7
<i>Wild/Weed Taxa</i>								
Trifoliae tribe A	880	332	423	217	184	82	139	703
Trigonella type	1	1		1				
Medicago type pod	7	1		3				
<i>Scorpiurus</i> sp.	33	12	10	34	1	1		46
cf. <i>Acacia</i> sp. seed				1				
cf. <i>Acacia</i> sp. pod				1				2
cf. <i>Acacia</i> sp. stem				3				
<i>Polygonum</i> sp.	1							
<i>Rumex dentatus</i> seed	57	15	11	228	8	1	13	29
<i>Rumex dentatus</i> tubercle	15	1	1	55				9
UMBELLIFERAE A								1
UMBELLIFERAE B								1
PRIMULACAE	1		1					
<i>Malva</i> sp.		1				1		
cf. Anthemidae flower head	1			7		2		6
<i>Beta vulgaris</i>			1	1				
<i>Chenopodium</i> cf. <i>murale</i>				2	1			1
<i>Portulaca</i> cf. <i>oleracea</i>	2			2				1
<i>Silene</i> sp.								1
BORAGINACAE		1		1				
<i>Lolium</i> sp.	683	120	316	535	83	32	129	746
<i>Phalaris</i> sp.	188	68	64	447	29	18	7	195
<i>Bromus</i> sp.		2	8	145	8	6		50
<i>Crypsis</i> sp.	4			1				
GRAMINAE – wild	44	2	65	72	12	20	21	9
GRAMINAE – embryos		2				2		
<i>Eleocharis</i> sp.	71	11	11	204	18	12	8	20
<i>Eleocharis</i> sp. kernels	24					1		14
<i>Scirpus</i> sp. – A	1			1				
<i>Cyperus</i> cf. <i>esculentus</i> tuber			2				3	1
CYPERACAE	55							

Table 6.2. cont.

Khentkawes Town North-House E	[31,117]	[31,123]	[31,125]	[31,130]	[31,134]	[31,677]	[31,693]	[31,723]
<i>Other</i>								
Seed indeterminate	140	24	42	107	9	2	12	257
Seed indeterminate A	3	1	3	1		2	1	12
Seed indeterminate B			1					9
Seed indeterminate C	2				1			6
Seed indeterminate D		1						
Seed indeterminate E			2					1
Seed head indeterminate								5
Seed pod indeterminate	2			1		2		
Fruit fragments						1		
cf. Nut shell fragments			1	1				3
Fruit/nut indeterminate	1							
Root/tuber fragments				1		1		
Vesicular indeterminate			3	35	2	15	16	15
Textured fragments	4		5	13	14	9		24
cf. Dung fragments				4			1	
cf. Rodent dung	2	1		1				
Indeterminate fragments	3			28				25

Table 6.3. Taxa Group Table by Presence and Items per Liter.

Khentkawes Town North-House E	[31,117]	[31,123]	[31,125]	[31,130]	[31,134]	[31,677]	[31,693]	[31,723]
Bag number	1520	1546	1534	1582	1603	1733	1773+1774	3030
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Phase	6	5b/5c	5b/5c	5c	5b/5c	5b/5c	5b/5c	5c
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Number of taxa	26	16	23	25	13	15	12	30
Number of items	3239	1012	1536	3517	680	310	565	3242
Number of items per liter	925.4	405	384	879.3	340	155	63	648.4
Fragmentation index (%)	30%	54%	35.40%	36%	53%	67.30%	55.30%	41%
<i>Items per liter of plant groups (relative density)</i>								
All cereal grain	57.1	16	33	48	11.5	12.5	4	20.4
All cereal chaff	191	99	100.25	270	139	33	18	174
All weeds	648.3	238	964	520.3	172	92.5	38	426
Emmer wheat grain	18	4	10.3	13.3	3	1	0.2	7.2
Barley grain	32	10.1	12	26	7	10	2.2	12
Emmer wheat chaff	126.3	88	66.3	86	119	8	16	129.2
Barley chaff	63.1	11	32.3	171	20	6	2	36.2
Culm nodes & bases (straw)	1.1		2	13	1	19	0.1	8.2
Lentils	3.4	4	2	0.3	0.5	1	1	4.2
<i>Vicia faba</i>			1					0.4
Large legumes	25	12.4	5.5	17.5	4.5	4	1.2	10.2
Small legumes	261	138.4	109.3	63.3	93	41.5	17	149
Fruit seeds/ fragments	1		0.3	0.3		0.5		1
Oil/fiber plants	0.3		1.3					1.4
Nuts fragments			0.3	0.3				1
Wild grass	278.3	78	113.3	300	66	39	17.4	200
Wet loving taxa	43.1	4.4	3	51.3	9	6.5	1	7
Root/tuber fragments			0.5	0.3		0.5	0.3	0.2
Textured fragments	1.1		1.3	3.3	7	4.5		5
Dung fragments	0.3			1			0.1	



Figure 7.1. The 2010 AERA team, including the 2010 Analysis and Publication Field School team. Photo by Jason Quinlan.

7. The AERA-ARCE Field School in Context

by Ana Tavares

“... an unpublished excavated site has been destroyed or mutilated as surely as if it had been bulldozed” (Barker 1977: 222).

Although we might not take such an extreme view—as excavation records can be archived, curated, and eventually published—we would undoubtedly consider publication a primary archaeological obligation. However, bringing archaeological results to publication is not a straight-forward task, even in well-established and long-running projects.

In this article I chart the process of bringing to publication the work of the joint Ancient Egypt Research Associates-American Research Center in Egypt (AERA-ARCE) Field School. First, the field school is placed in the context of archaeological training in Egypt. This is followed by an account of the comprehensive AERA-ARCE training program, which encompasses Beginners, Advanced, Salvage, and the Analysis and Publication Field Schools. The articles in this volume were initially prepared during the 2010 Analysis and Publication Field School (fig. 7.1). The goals and approach of this field school session are discussed, followed by a detailed presentation of its structure, schedule, and course content. The work of the individual APFS groups is summarized; namely the excavation, graphics, ceramics, and osteology groups, followed by the archaeozoology and archaeobotany training. The issues encountered during the APFS are discussed openly, as these qualify the depth and breadth of the articles in this volume, and may be useful to others involved in this type of training. We publish this detailed account of the APFS, given the renewed interest in archaeological training and its relationship with the formation of knowledge, community archaeology, and heritage (Mytum 2012). We feel these are crucial issues in the current context of Egyptian archaeology.

Why Publish and Teach?

As archaeologists, we destroy; once ancient deposits

are removed they cannot be put back. However careful the initial archaeological recording, until the data is brought to publication it remains inaccessible and unusable. Sites and archives are at risk if the data remains unpublished and unknown.

As archaeologists working in ancient Egyptian settlements—as opposed to the excavation of tombs and temples—we are privileged to glimpse ancient lives while we piece together the past from clues inadvertently left behind. Settlement archaeology is “difficult” archaeology, often involving the excavation of mudbrick structures in deeply stratified sites. Settlements have been neglected as they require considerable time and technical know-how. Thus settlement archaeology seemed an ideal, if challenging, context for archaeological field training. Excavation and recording are the first steps in such an elaborate and time-consuming process, which involves analysis, research, interpretation, publication, and other forms of dissemination (Connah 2010, Harding 2007, Renfrew and Bahn 2007). As part of the excavation process we meticulously record, archive, and write up the data in a descriptive, preliminary way.

From 2005 to the present, AERA held nine AERA-ARCE Field Schools, and two AERA-only Field Schools (table 7.1). The AERA-ARCE field training developed into a program consisting of Beginners, Advanced, Salvage, and Analysis and Publication Field Schools (AERAGRAM 2011b). The program is described below. The structure and syllabus of the AERA-ARCE Field Schools were developed using Mohsen Kamel’s and my experience of teaching archaeological field skills in Europe and the Middle East and our knowledge of Egyptian sites and working conditions. AERA’s team of professional archaeologists, in particular Freya Sadarangani and James Taylor, were fundamental to AERA’s systematic adoption of Single Context

Table 7.1. Chart with sequence of AERA-ARCE Field Schools in the overall training cycle.

<i>AERA-ARCE Archaeological Field Schools</i>	
Beginners	Giza 2005, Giza 2007, Mit Rahina 2011 (in collaboration with the Egypt Exploration Society), Giza 2012
Advanced	Giza 2006, Giza 2009
Salvage Archaeology	Luxor 2008, Luxor 2010
Analysis and Publication	Giza 2010, Luxor 2011
<i>AERA-only Field Schools</i>	
Field Training	Giza 2012
Analysis and Publication	Giza 2013

Recording (SCR). The AERA-ARCE Field Schools built extensively upon their knowledge, skills, and dedication. We also benefitted greatly from the experience of the Fayum ARCE Field School (Wendrich 2005 and 2010b) with whom we share staff and teaching materials (AERAGRAM 2006). Additionally, the field school would not have been possible without Mark Lehner's unceasing support, encouragement, and input.

ARCE archaeological field schools in Egypt have exclusively trained personnel from the Egyptian antiquities' service (currently the Ministry of State for Antiquities, MSA, formerly the Supreme Council of Antiquities, SCA). This was in response to an urgent need. Although Antiquities Inspectors are university graduates, their coursework does not include archaeological field skills. Until recently such field training was only available through the ARCE program or other field schools run by foreign missions.

In previous decades, the training of foreign archaeologists in Egypt has been severely restricted. Most foreign students were required to learn excavation skills outside Egypt before being allowed to join an archaeological team working in Egypt. Many did not acquire the necessary excavation experience required on archaeological sites in Egypt, especially the skills necessary to excavate the delicate and intricate stratigraphy of adobe settlement sites (for an example of complex settlement stratigraphy see Jeffreys 2006). As a result, training has become an important component of many foreign archaeological missions in Egypt. Egyptian inspectors are often trained side-by-side with foreign students on sites ranging from the Delta (Rowland 2012) to Middle Egypt (Horizon 2012: 12) and Upper Egypt. Combined training is beneficial to both Egyptian and foreign trainees. AERA also intends to expand its archaeological field training to

foreign students, hopefully beginning with an upcoming 2015 season.

Current field schools in Egypt cover a wide range of archaeological skills including: survey, augering, and remote sensing (Anonymous 2012: 10); bioarchaeology (Anonymous 2012b: 12); architectural recording (Hampikian and al-Ibrashy 2006); numismatics (Scott 2010: 4–5); conservation, archives, and museum management (Anonymous 2010: 14); and heritage and site management (arce.org/conservation/currentconservation/u14).

The AERA-ARCE Field School Program

A Tradition of Field Schools

The first joint AERA-ARCE Field School—held in 2005 at the Heit el-Ghurab (HeG) workers' settlement at Giza (frontispiece 2, this volume; AERAGRAM 2006; Lehner 2005)—followed a long-standing tradition of ARCE field training for inspectors of the MSA. The training, inaugurated when ARCE director Mark Easton secured USAID funding for the program, began with archaeological field schools held at Mit Rahina (Memphis) in 1995, 1996, and 1997 under the direction of Diana Craig-Patch (Saunders 2005). This program continued with sessions held in Napta Playa in 2000 and 2001, directed by Fred Wendorf; the Fayum in 2002, directed by Willeke Wendrich (Wendrich 2005, 2010a); and Mit Rahina in 2003, co-directed by Craig-Patch and Anthony Cagle (Saunders 2005).

Beginners Field Schools

(Giza 2005, Giza 2007, Mit Rahina 2011, Giza 2012)

AERA held Beginners Field Schools at Giza in 2005 (AERAGRAM 2006), 2007, and 2012 (AERA 2012: 19), as well as at Mit Rahina in 2011 (AERAGRAM 2011c,

Tavares and Kamel 2012). The AERA-ARCE Field School fulfilled the requirements set out in the original ARCE Memphis 1995 Field School, namely to teach archaeological methodology in a settlement with mudbrick structures and complex stratigraphy (Craig-Patch 2010: 268). The philosophy and structure of AERA's Beginners Field School is based on archaeological standard practice, within a multi-disciplinary setting, and with a low-tech approach (Lehner 2005).

We teach standard practice archaeological excavation and recording methodology—known as single context recording (SCR)—as developed by the Department of Urban Archaeology in London and the Museum of London (1994). This methodology was developed in the early 1970s to deal with the pressures of contract excavation in deeply stratified urban sites (for an overview, see Clark and Hutcheson 1993). The method has been partially used at the HeG site since 1989, and systematically since 2004 (GOP5: 9–12). This methodology is used elsewhere in Europe, for instance in France by the *Institute nationale de recherches archéologiques préventives* (INRAP) in preventive and salvage excavations (Py 1991, SYSLAT) and in Iceland (Lucas 2003). In the Near and Middle East SCR is also used in sites such as Çatalhöyük in Turkey (Farid 2000, Tringham and Stevanovic 2000, 2012); Wadi Faynan 16 (Finlayson et al. 2011) and Shubayqa (Richter, Bode, House et al. 2012) in Jordan; and al-Zubārah in Qatar (Richter, al-Naimi, Yeomans et al. 2012) among others. In the field school we discuss other recording systems and the danger that standard practice becomes the only acceptable practice (Wendrich 2010b: 273). We also propose modifications to the SCR method (without compromising stratigraphic excavation), so that it can be applied in projects with a limited budget, a lack of equipment, inexperienced staff, and tight time constraints.

Over a period of eight to ten weeks we cover basic excavation techniques, written and graphic site recording, basic survey and photographic skills, material culture sampling, and report writing. We also teach and practice excavation and recording of human burials. Each field school group spends one week in the laboratory being introduced to ceramics, archaeozoology, archaeobotany, lithics (chipped stone), archaeological drawing, and first-aid conservation. The students take exams, give presentations, and write reports weekly. They give biweekly site tours to their colleagues and the AERA team. At the end of

every session each group submits a complete, detailed account of the excavation called a Data Structure Report (DSR), which includes a detailed stratigraphic narrative, stratigraphic matrices, drawings, and appendices (Sadarangani and Taylor, forthcoming). The data generated by the field school—the description of features, drawings, and photos—is integrated into the AERA archive and database. It must meet the rigorous recording standards used within the project.

Advanced Field Schools (Giza 2006 and 2009)

AERA held Advanced Field Schools at Giza in 2006 (AERAGRAM 2007) and 2009 (Kamel 2009). These were the natural sequel to the Beginners Field School, as archaeological teams need specialists to analyze ceramics, draw finds, and survey the site. Trainees themselves recognized the need for specialist training (Wendrich 2005). Constant practice is also needed to become proficient in archaeological techniques. In the Advanced Field School, students specialized in one of the following: advanced excavation techniques, human osteology, survey, ceramics (Bourriau and Nordström 2009), or archaeological illustration. We also provided specialist training in archaeobotany and archaeozoology (Murray 2011; Redding 2011), although this training was held during our first Analysis and Publication Field School in 2010. Advanced Field School students acquired a variety of specialized skills beyond their own specializations, such as photography, analytical database construction, and presentation skills. They have continued to work as professionals in other Egyptian sites and are able to form teams capable of handling the diversity of tasks needed in archaeological excavations. They have also become teachers in AERA-ARCE Field Schools (Mahmoud and Mahmoud 2012) and other field schools, such as those at North Minia, Tel Basta, Matarya, Saqqara, South Saqqara, Giza, Fayum, Amarna, Sohag, Luxor, and Karnak, as well as teaching archaeological skills to university groups.

Salvage Field Schools (Luxor 2008 and 2010)

AERA held a Salvage Archaeology Field School (SAFS) in the Garden Khaled Ibn el-Waleed (KIW) in Luxor during 2008 and a second Salvage Field School on the Luxor Town Mound in 2010. The salvage field schools were a response to a direct appeal by the MSA

for emergency work in Luxor. For these sessions we re-structured the team and field school to be able to teach and implement salvage techniques, including appropriate archaeological site assessment, sampling and recording strategies, archival work, and report writing.

In the 2008 KIW work, we recorded a large, pylon-like brick structure pre-dating the Nectanebo I Sphinx Avenue; we excavated cross-sections of the avenue, later burials, and industrial and domestic structures dating from Nectanebo I to the 14th century AD (Lehner 2008). We confirmed that the avenue became a Nile canal, with pottery- and wine-processing structures on its banks (Boraik et al., forthcoming). The SAFS was structured to include first-time students embedded within teams of experienced MSA archaeologists (Kamel and Tavares 2008). This school ran for twelve weeks, longer than other AERA-ARCE field schools (AERAGRAM 2008).

We held a second Salvage Archaeology Field school (SAFS2) in early 2010 on the Luxor Town Mound (AERAGRAM 2010a). Here we excavated and recorded the deeply stratified settlement mound from the Late Roman Period to modern times (AERAGRAM 2010b). The 2010 Salvage Archaeology Field School (SAFS2) again combined beginners' training with teaching two advanced groups, one in ceramics and another in archaeological illustration (AERAGRAM 2010a). The large amount of archaeological material generated by the excavators was processed by mixed teams of foreign and MSA archaeologists (AERAGRAM 2010b).

Both salvage projects provided an excellent testing ground for the effectiveness of the excavation and recording techniques taught in the Beginners and Advanced Field Schools.

The Analysis and Publication Field Schools (Giza 2010, 2013, Luxor 2011)

AERA held an Analysis and Publication Field School at Giza in 2010 (AERAGRAM 2010c) and in Luxor in 2011 (AERAGRAM 2011a). The APFS is the final step in the comprehensive AERA-ARCE Field School program, teaching the skills necessary to prepare reports for publication. Preparing data for publication is a time-consuming but essential step of the archaeological process. Although report writing, data management, analysis, and archiving are essential components of the Beginners, Advanced, and Salvage Field Schools,

the preparation of a publication requires a further set of skills and a concerted effort between the authors, illustrators, and editors.

The APFS is based on several years of informal experience of AERA team members working with MSA colleagues on archaeological articles for publication. In particular, we built upon the experience of preparing a preliminary article on the KIW excavations in Luxor (SAFS). This archaeological report will be published in *ASAE* 86 (Boraik et al., forthcoming).

We carried out two sessions of the Analysis and Publication Field School: an intensive eight-week field school in Giza in 2010, working on material from the HeG settlement and Khentkawes Town (AERAGRAM 2010c), and a supplementary four-week session in Giza in 2013, with the principal authors (without students) to produce a final manuscript for publication.

The Giza 2010 APFS took place from the 20th of March to the 13th of May, 2010. The team from the MSA included 28 students and 8 supervisors. Our aims were to prepare for publication archaeological reports on four excavation areas from the HeG site at Giza (including a group of burials), to prepare the graphics to accompany the articles, and to analyze and write a report on a ceramic corpus. For the first time we trained an archaeozoologist and an archaeobotanist, who each learned the basic skills of the discipline and wrote a report on a small, discrete set of data. The structure of the Giza 2010 APFS is discussed further below.

Following the close of the 2010 APFS season, we realized just how ambitious our goals had been. The team produced a 300-page manuscript at the end of the eight week session. However, there was still much editing, re-writing, and re-structuring to be done. Between 2010 and 2013 the AERA team was busy with a series of field projects, field schools, and publications, which postponed further work on this publication. In 2012, Mark Lehner, Richard Redding, and Wilma Wetterstrom (AERA's Art and Science Editor) reviewed the APFS manuscript and deemed it suitable for an in-house AERA publication. Their general comments were followed by a detailed review of the structure and content of the articles by Freya Sadarangani (AERA Post-Excavation Manager, Field School teacher, and Senior Archaeologist) and Alexandra Witsell (AERA Managing Editor). Ceramics team supervisor Teodozja Rzeuska updated her thorough review of the ceramics article prepared at the end of the 2010

APFS. It became clear that the excavation, ceramics, and osteology articles required restructuring, further research on comparative material, and re-writing of several sections. Most articles needed careful editing, referencing, and an updated bibliography. These time-consuming tasks needed close collaboration between authors and editors, in cycles of editing and re-writing, followed by feedback, further edits, and more re-writing. In early 2013 Sadarangani and Witsell held an APFS session at Giza with the main excavation authors (Mahmoud, Abd el-Aziz, and Eissa) and ceramicists (el-Shafey, Naguib, and Abd el-Monaem). Rzeuska worked remotely with the ceramics team, while Hassan Ramadan, worked closely with Witsell and Rebekah Miracle (AERA GIS Manager), redrafting many of the illustrations for the current publication using AERA's graphic conventions.

Following the Luxor Town Mound excavation (SAFS2, see above), we held the 2011 Luxor Field School in order to train students in recording and analysis prior to publication. The work consisted of the recording, drawing, photographing, and conserving of ceramics, decorated blocks, and a wide range of objects. The season was intended to process much of the material—too abundant to analyze during the excavations itself—as a preliminary step to further work leading to publication.

APFS 2010 Structure and Aims

Preliminary Reports versus Complete Volume

Although graduates from the AERA-ARCE Field Schools excavate and record sites and material culture according to the standard practice taught in the Beginners, Advanced, and Salvage Field Schools, it is to no avail to the wider scientific community if their work remains unpublished. Archaeologists may prefer to publish sites fully referenced, integrated with material culture analysis, and placed within a wide research context. However, many sites have been saved from oblivion (or at least from languishing as unknown and inaccessible archives) by being published as preliminary reports.

The publication of annual preliminary reports is a tradition for many archaeological missions working on major sites in Egypt. The long standing German mission on the island of Elephantine has also reported regularly (in *MDAIK*) prior to the publication of the fuller, integrated archaeological volumes (Dreyer 1986, Jaritz

1980, Ziermann 1993, and von Pilgrim 1996), as have the British missions working in Amarna. (Compare preliminary reports in *JEA* [Kemp 1978, 1979, 1980, 1981 and 1983] with Amarna Reports—a site-specific series [Kemp ed. 1984, 1985, 1986, 1987, 1989, and 1995], and volumes such as Kemp and Stevens 2010, and Stevens 2012a and 2012b).

At the beginning of the last century the journal *Annales du Service des Antiquités de l'Égypte* (ASAE) was founded in order to publish preliminary reports on the archaeological work of the Egyptian antiquities authority. The ASAE was originally published by the Institut français d'archéologie orientale (IFAO 1900–1993) and since 1998 (vol. 73) it has been published by the MSA. With the APFS we aimed to teach inspectors to produce written reports of such content, length, and format as would be suitable for publication in such a journal. As mentioned above, the field school team will publish the preliminary results of the Luxor KTW excavations in ASAE volume 86 (Boraik et al., forthcoming).

Teaching versus Publication:

Criteria for Selecting Publication Material

This volume consists of three excavation reports and four specialist reports. The excavation areas chosen for publication had to meet the following criteria: be excavated by the Advanced Field School, be small enough to be written up in eight weeks, be suitable for teaching research and publication skills, provide comparative material already available within the HeG excavations, and fall within the overall publication objectives of AERA. The AA Bakery, EOG Bakery-D, and Area MSE fulfilled these criteria. The choice of material culture for the APFS was also determined by didactic objectives. A discrete body of data was necessary so it could be analyzed and prepared for publication during the APFS. The dataset had to provide enough scope for teaching and practicing data-gathering and post-excavation skills, analysis and synthesis, as well as background research on comparative material. Although the articles have been edited together as a single volume, sharing figures and bibliography, they were originally intended to stand alone. These are preliminary reports. That is, the excavation articles are not fully integrated with material culture analysis, and specialist articles are not fully integrated in a broader area, phase, or spatial analysis. They remain descriptive and are a first step in disseminating the data to the archaeological community.

WEEK

DATE

GROUP

WEEK	DATE	DATE	DATE	DATE	DATE	DATE
1	Saturday 20 march	Sunday 21	Monday 22	Tuesday 23	Wed 24	Thurs. 25
7-10am Graphics	Revise basics	SITE Photo revise site basics A	Osteo DSR/1 Villa	Osteo DSR/2 Villa	Osteo DSR/3 Villa	GIS Site plans Camilla M
Exc	Review data and status forms MARI					
Osteo	Introduction to APFS 2010 (themes/goals)	Review basics (osteology: excavation/forms)	Osteo DSR/1 Villa	Osteo DSR/2 Villa	Osteo DSR/3 Villa	LAB (osteos only) Analysis of 2007 burials
Ceramics	LAB	LAB	LAB	LAB	LAB	
	Break	Break	Break	Break	Break	Break
10.30-1pm Graphics	Revise basics SAFS2 plans James	Photo revise basics Overall plans A-C	Osteo DSR/1 Villa	Osteo DSR/2 Villa	Osteo DSR/3 Villa	GIS Site plans Camilla M
Exc	Review data					
Osteo	Organizing & structure of burial report (outline)	Review basics (osteology: age & sex/forms)	Osteo DSR Villa	Osteo DSR Villa	Osteo DSR Villa	LAB (osteos only) Analysis of 2007 burials
Ceramics	LAB	LAB	LAB	LAB	LAB	LAB
1-2.30pm	Lunch	Lunch	Lunch	Lunch	Lunch	Lunch
2.30-4.15pm Graphics	IT rules ALL ½ h Compile list of figs.	House style	Collect drawings FS1-2-3	ALL English basics	Photo archive Download basics	
Exc	IT rules ALL			ALL English basics		
Osteo	Organizing & structure of burial report (outline)	Review basics (osteology: paleopathology/forms)	Building the burial catalogue from the forms	ALL English basics	Building the burial catalogue	
Ceramics	IT rules ALL	LAB	LAB	ALL English Basics	LAB	
	Break	Break	Break	Break	Break	Break
4.30-5.30pm Lecture ALL	Why publish? Mark L	Different types of Publications Scott H	C-14 project Mark L	Ceramics group ONLY Mary Ownby	Why excavate cemeteries? Scott.H	

Figure 7.2. Schedule for week 1.

Schedule

The daily schedule (Saturday to Thursday) was intense, with a team meeting at 6:45 am, followed by site, lab, or office work until 1 pm. The afternoon work sessions ran from 2:30 to 4:30 pm and were followed by a core, one-hour lecture or workshop (fig. 7.2). Teams often continued to work until dinner at 7 pm, with some groups holding informal work sessions after dinner. In the Beginners, Advanced, and Salvage Field Schools there were weekly Saturday tests and quizzes, student presentations on Wednesday afternoon, and weekly reports submitted on Thursday morning. The APFS was somewhat different. Although weekly reports were still submitted, Thursday afternoons and Fridays were free days.

Student Groups and Staff

Field school students are first selected on the basis of a Curriculum Vita, followed by interviews held at the Zamalek offices of the Ministry of State for Antiquities. The AERA-ARCE Field Schools are advertised directly by the MSA to local Inspectorates throughout Egypt and on the MSA website. AERA-ARCE Field Schools aim at a gender balance and a wide geographic distribution of Egyptian students and staff. Students come from both the Pharaonic and Islamic departments. Given the task at hand, most students selected for the APFS were graduates of either the Advanced or Salvage Field Schools. As mentioned above, two candidates in 2010 showed an aptitude for fauna and botany and, although not graduates from an AERA-ARCE Field School, were chosen for training in archaeobotany and archaeozoology.

2010 TEAM

Project Director: Mark Lehner

Field School Directors: Mohsen Kamel and Ana Tavares

EXCAVATION TEAM

Name	Inspectorate
Mohamed Abd el-Aziz Gabr	Mansoura
Mohamed Ahmed Abd el-Rahman	Sohag
Aiman Ashmawy Ali	Excavation Dept.
Mansour el-Badry Mustafa Ali	Esna
Mohamed Hatem Ali	Luxor
Shaima Montaser Abu el-Hagag	Luxor
Osama Mostafa Mohamed el-Nahas	Alexandria, Underwater Dept.
Hussein Rekaby Hamid	Aswan

Moamen Saad Mohamed	Luxor
Ahmed Omar Shoukri Mohamed	Alexandria, Underwater Dept.
Amr Zakaria Mohammed	Sohag

Supervisors: Amelia Fairman, James Taylor, Ashraf Abd el-Aziz (MSA), Hanan Mahmoud (MSA), and Rabee Eissa Mohamed Hassan (MSA)

OSTEOLOGY TEAM

Mahmoud Ali Abd el-Rahman	Garbiya
Sarah Sabri Abdallah	Giza
Maha Siah Abd el-Tawab	Saqqara

Supervisors: Scott D. Haddow and Afaf Wahba (MSA)

GRAPHICS TEAM

Ibrahim Ahmed Mohamed Mitwali	Alexandria, Underwater Dept.
Saad Bakhit Abd el-Hafez	Luxor
Mohamed el-Sayd Osman	Egyptian Museum
Wael Fathi Mursi	Saqqara
Essam Nagy Mostafa Ali	Karnak
Hassan Ramadan Mahmoud	Luxor
Hazem Salah Abd Allah	Abydos

Supervisors: William Schenck, Ana Tavares, Mohamed Abd el-Basset (MSA), and Yaser Mahmoud Hussein (MSA)

CERAMICS TEAM

Ilham Ahmed M. el-Taweil	Qalubia
Mahmoud Mohamed el-Shafey	Saqqara
Mohamed Naguib Reda	Abydos
Shaimaa Rasheed Salem	Alexandria
Nermeen Shaban Abayazeed	Saqqara

Supervisors: Janine Bourriau, Teodozja Rzeuska, Sabine Laemmel, Sherif Mohamed Abd el-Monaem (MSA) and Mohamed Aly Abd el-Hakiem Ismail (MSA)

ARCHAEOZOOLOGY TEAM

Rasha Nasr Abd el-Mageed	Saqqara
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Supervisor: Richard Redding

ARCHAEOBOTANY TEAM

Rebab Sayed el-Gendy	Kafr es-Sheik
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Supervisor: Mary Anne Murray

Jason Quinlan taught archaeological photography and Christine Clifton-Thornton was the editor and writing coach during the first APFS. The following AERA team members lectured or held seminars and workshops at the field school: Peter French (ceramics), Camilla Mazzucato (GIS), Mari Rygh (archives), Emmy Malak (databases), Pieter Collet (graphics), and Mohamed Said (IT).

2013 TEAM

Project Director: Mark Lehner

Field School Directors: Mohsen Kamel and Ana Tavares

EXCAVATION TEAM

Hanan Mahmoud (MSA)

Ashraf Abd el-Aziz (MSA)

Rabee Eissa Mohamed Hassan (MSA)

Freya Sadarangani

James Taylor

CERAMICS TEAM

Mahmoud Mohamed el-Shafey (MSA)

Mohamed Naguib Reda (MSA)

Sherif Mohamed Abd el-Monaem (MSA)

Teodozja Rzeuska

GRAPHICS TEAM

Hassan Ramadan Mahmoud (MSA)

Rebekah Miracle

Alexandra Witsell

EDITORS

Freya Sadarangani

Alexandra Witsell

Afaf Wahba, Scott D. Haddow, Mary Anne Murray, Rasha Nasr Abd el-Mageed, and Richard Redding also worked with Sadarangani and Witsell in revisions of the text and graphics in 2013.

Libraries, Archives, and Research Tools

The team acquired a good understanding of the structure of the AERA archive and online database, enabling them to use both fully to retrieve data (reports, photos, and drawings) and write their reports. They created their own databases for ceramics, osteological material, and photographs of their respective areas. They used the AERA hard copy library and digital e-library, learning to check references and log-out books and

publications. They were responsible for the archival material they checked out during the field school and for returning it complete and in good condition at the end of the session.

Twenty-five MSA students and supervisors were welcomed at the library of the German Archaeological Institute in Cairo (DAIK). They were issued library cards and shown how to use the library and catalog. They worked there in small groups lead by Sabine Laemmel. To prepare for the library visit they searched relevant bibliographic references for their topic (Online Egyptological bibliography [oeb], JSTOR, the Deir el-Medinah database hosted by Leiden University, Electronic Tools and Ancient Near East Archives [ETANA/ABZU]) using a table of archaeological web resources that they compiled themselves (fig. 73). Finally the students prioritized the references and assembled a list of available items by consulting the DAIK library online catalog. For many students, this was the first opportunity to use a research library.

Delegating Tasks, Cascading Information

We encouraged all teams to be autonomous and reduced to a minimum an approach to teaching that puts students in a passive position. Further, the teams prepared and implemented their own work plans. We also implemented a system of “cascading” information during the APFS. Students, or occasionally supervisors, became familiar with specific tasks, and subsequently guided the team through these processes, which ranged from retrieving data from AERA’s archives to the effective and appropriate use of IT resources. The MSA team was involved in as many aspects of the running of the field school as possible through a system of point people. This system is in place, to varying degrees, in all AERA-ARCE Field Schools. In 2010 the students effectively ran the APFS at many levels.

Lectures and Seminars on Research Procedures

Basic research procedures were covered in a series of lectures and seminars. We discussed research tools relevant to Egyptology; referencing systems and bibliographic requirements for some principal Egyptological journals and publications (namely *JEA*, *JARCE*, *MDAIK*, and *BIFAO*); critical thinking and constructing an argument from data; differences between primary and secondary sources and when to use them; how to make summaries of articles and

Archaeological web resources

Notes: These links are the direct links to resources and libraries, so you may try to look around in it and try to explore the entire site looking for more resources or links.

Main Websites:

Egyptology Resources	http://www.fitzmuseum.cam.ac.uk/er
ABZU	http://www.etana.org/abzu/
WÖRTERBUCH DER AEGYPTISCHEN SPRACHE	http://www.egyptology.ru/lang.htm#Woerterbuch
Altägyptisches Wörterbuch	http://aaew.bbaw.de/
Oriental Institute if Chicago	http://oi.uchicago.edu/research/pubs/catalog/
Porter and Moss	http://www.griffith.ox.ac.uk/gri/3.html
THE EGYPTOLOGISTS' ELECTRONIC FORUM (EEF)	http://www.egyptologyforum.org/

Web Databases and resources:

TRISMEGISTOS: papyrological and epigraphical resources	http://www.trismegistos.org/
Sisyphos: a collection of online archaeological and Egyptological resources	http://vifa.ub.uni-heidelberg.de/sisyphos/servlet/de.izsoz.dbclear.query.browse.Query/domain=allg/lang=de/?querydef=query-simple
Online Egyptological Bibliography (OEB)	http://oeb.griffith.ox.ac.uk/
Wilbour Library of Egyptology	http://arcade.nyarc.org/search%7eS3
AIGYPTOS	http://www.aigyptos.uni-muenchen.de/
(ADS) Archaeology Data Service	http://ads.ahds.ac.uk/catalogue/archive/oe_ahrc_2006/
Ägyptologischen Forschungsstätte für Kulturwissenschaft (ÄFKW)	http://www.aefkw.uni-hd.de/
The Giza Archives	http://www.gizapyramids.org/code/emuseum.asp
Tutankhamun Griffith Database	http://www.griffith.ox.ac.uk/gri/4tut.html
Cachette de Karnak	http://www.ifao.egnet.net/bases/cachette/
Deir el-Medina Database	http://www.leidenuniv.nl/nino/dmd/dmd.html
Ägyptologischen Datenbank AHA, Berlin	http://www.sesch-projekt.de/webseite/
Leuven Online Index of Ptolemaic and Roman Hieroglyphic Texts	http://www.arts.kuleuven.be/ptt/intro.htm
Theban Mapping Project	http://www.thebanmappingproject.com/
Digital Egypt for Universities	http://www.digitalegypt.ucl.ac.uk//Welcome.html
Petrie Museum Database	http://www.petrie.ucl.ac.uk/index2.html
Perseus Digital Library	http://www.perseus.tufts.edu/hopper/

Library Catalogues:

The University of Chicago Library	http://www.lib.uchicago.edu/eos/html/page.form.html
Online-Katalog des DAI Kairo	http://opac.kairo.dainst.org/
Catalogue for Libraries of Heidelberg University	http://katalog.ub.uni-heidelberg.de/cgi-bin/search.cgi?zweig=0&teil=sgay&sess=992885fd2b4694d45c7a6cf2fd7aa924&sprache=ENG
Heidelberg University	http://www.ub.uni-heidelberg.de/Englisch/Welcome.html
Institut Français d'Archéologie Orientale (IFAO) library	http://www.ifao.egnet.net/recherche/

Institutes:

Deutsche Archäologische Institut	http://www.dainst.org/abteilung.php?id=265
The Griffith Institute	http://www.griffith.ox.ac.uk/
Nederlands-Vlaams Instituut in Cairo	http://www.instituten.leidenuniv.nl/nvic/
Tell El Dabaa	http://www.auaris.at/

Please if you have other useful links, contact Mohamed Osman, so it will be added in this list. A copy of this list is on the server under "archeological web resources" in: \\Aera001\\Field School\\

Figure 7.3. Handout of web resources prepared by the students and shared with the field school team.

Table 7.2. Core lectures and seminars indicating the variety of topics covered during the APFS.

<i>Date</i>	<i>Title</i>	<i>By</i>	<i>Details</i>
Week 1 March			
Sat 20	Why Publish?	Mark Lehner	Why publishing is an obligation.
Sun 21	Different Types of Archaeological Publications	Scott Haddow/ Ana Tavares	Different types of publications: academic articles, notices, monographs, popular articles.
M 22	C-14 Dating Project	Mark Lehner	Example of a project without final publication
T 23	English Basics	James Taylor	Simple rules for written English
T 23	Ceramics Analysis	Mary Ownby	Ceramics thin sections and chemical analysis (ceramics group only)
W 22	Why Excavate Cemeteries?	Scott Haddow	What kind of information can be obtained from excavating burials
Week 2 March			
Sat 27	Introducing Databases	James Taylor	Basics in Access (Lisa Yeomans' lecture) Queries (Emmy Malak)
M 29	Sampling 1	Richard Redding	Big-N and small-n
T 30	Ceramics Sampling at Kom Rabia Memphis	Janine Bourriau	Different sampling strategies used to analyze the enormous amount of ceramic material from the settlement at Memphis.
T 30	Representativeness and Bias in Skeletal Material	Scott Haddow	When is material considered representative? What is bias?
Sat/ Sun / M/ T	GPMPDB	Mari Rygh/ supervisors	Basic gpmpdb/queries/find info. Archive outline - why is set up as it is? Area folders - why? Archiving tips
W 30	Powerpoint Basics	Ana Tavares and team discussion	Timing, style, spelling, transitions. Team discussion, very different approaches and styles presented.
W 31	Ceramics from Surface Survey	Virpi Perunka and Claire Malleson	Workshop with the Gurob team on the importance and methodology for ceramics surface surveys. (ceramics group only)
Week 3 April			
Sat 3	AA Bakery (extended lecture)	Mark Lehner	AA Bakery and other bakeries on HeG site
Sun 4	Computer Assisted Graphics	Pieter Collet	Epigraphy and ceramics drawings on computer (seminar graphics group only).
Mon 5	Bibliography, References and Plagiarism	Amelia Fairman	How to search for bibliographies. Using PM, Orientalia, oeb, ABZU, JSTOR, Sisyphous. Notes to contributors for MDAIK, JEA, JARCE, etc.
T 6	Statistics 2	Richard Redding	Big-N and small-n
T 6	Basic e-library	Mari Rygh	How to search/download/enter data
W 7	EoG Bakery	Mark Lehner	The elongated bakery in the EoG area
W 7	Ceramics Surface Survey Fayum	Team from Liverpool University	Methodology for ceramics surface survey at Fayum - Liverpool University (ceramics group only)
W7	Data Integration Between Site and Material Culture.	Amelia Fairman / Mary Anne Murray	Data integration from UK examples / MAM data integration other sites

Table 7.2. (cont.) Core lectures and seminars indicating the variety of topics covered during the APFS.

<i>Week 4 April</i>			
Sat 10	Western Delta Survey	Joanne Rowland	Site survey strategies, remote sensing techniques.
Sun 11	Pedestal Enigma 1	Mark Lehner	The ubiquitous "pedestal" structures at the HeG site.
M 12	Pedestal Enigma 2	Mark Lehner	Possible function and parallels for the pedestal structures.
W 14	Osteological Research in Egypt	Scott Haddow	Interpretative publications, other sites - details of Amarna material
W 14	Baking in Ancient Egypt Seminar	Mark Lehner, Mary Anne Murray, Anna Wodzinska	Archaeological, botanical and ceramic evidence
<i>Week 5 April</i>			
Sat 17	Baking and Brewing Seminar	Mark Lehner	Answer questions on baking, pedestals, etc.
Sun 18	Brewing in Ancient Egypt	Mark Lehner, Mary Anne Murray, Anna Wodzinska	Site, botanical and ceramics evidence.
Sun 18	Writing a Preliminary Report	Mark Lehner	Seminar with excavation groups on basic points to cover in a preliminary report.
Sun 18	Setting up a Database 1	Ibrahim Metwalli	Workshop on setting up a basic archaeological database with Access - in Arabic with English templates.
M 19	Data Interpretation	Richard Redding	Kom el-Hisn excavations at an Old Kingdom site, 1984, 1986, 1988
T 20	Data Interpretation	Mary Anne Murray	In complex agricultural societies
T 20	Data Interpretation	Richard Redding	Using archaeological data to reconstruct economy and social structure
W 21	Setting up a Database 2	Ibrahim Metwalli	linked tables and queries
W 21	Excavations at Deir el Bersha/ Sheikh Sayid	Veerle Linseele	Old Kingdom quarry site with workmen's huts, similar material culture to HeG (Leuven University)
<i>Week 6 April</i>			
T 27	APFS mini-conference	All SCA students and supervisors	see program and abstracts enclosed
W 28	APFS mini-conference	All SCA students and supervisors	see program and abstracts enclosed
<i>Week 7 May</i>			
Sat 1	Hands-on! The ARCE/AERA Field Schools.	Ana Tavares	At the Egypt Exploration Society, British Council Agouza. The structure and philosophy of the field schools: Beginners, Advanced, Salvage and Publication
<i>Week 8 May</i>			
Sat 8	Excavating a Lower Status Cemetery at Amarna	Anna Stevens	Results and methodology of the Amarna cemetery excavations (Amarna Project)

books; referencing, quoting, and plagiarism; and passive and active voice in academic writing.

Lecture Schedule

The program for each group is explained below. The core lecture schedule (table 7.2) shows the range of lecture and workshop topics covered during the field school.

Tutorials in Written English

One of the main challenges of the APFS was the difficulty with written academic English. This applied even to those experienced with DSR and weekly report writing. We held a series of seminars on English grammar and writing. These seminars and the regular feedback and edits on the texts submitted by the groups were essential. To keep the “voice” of the authors we tried not to over-edit the text.

In 2010, APFS directors, teachers, and supervisors shared research and writing techniques with the students. James Taylor, Amelia Fairman, and Christine Clifton-Thornton held workshops on basic writing and research skills. Fairman and Clifton-Thornton provided students with elementary English grammar rules. Clifton-Thornton held both individual and group writing sessions, working on the students’ written material. She also prepared quick reference cards on grammar, writing rules, and formatting for the students. This aspect of the field school was extremely useful for all the participants, who requested it to be an integral part of future field schools (see below).

We originally suggested that the texts could be written in Arabic and later translated into English. However, the Egyptian team decided to write from the start in English, as the original records, site reports, and most of the comparative research datasets were written in English and as English remains a main publication language within the subject of Egyptology. The ability to publish in English will ensure a wider audience for the students’ publications. Arabic abstracts are included at the end of this volume.

The Mini-Conference

According to the Egyptian students and staff, some of the most useful and motivating skills were acquired in the preparation and implementation of the Mini-Conference. During Week 7 of the APFS, each MSA student and supervisor gave a 15-minute PowerPoint presentation on a topic of their choice. In holding

this mini-conference we intended the field school participants to gain experience in presenting a short, concise, and well thought-out lecture to their peers, as they might at an academic conference or colloquium.

The participants had to choose a suitable title, prepare a short abstract, assemble, and deliver their presentation. We deliberately encouraged the presenters to use their own research interests rather than safely present a field school-related topic. This allowed them to assess their peers’ interest in their research and to obtain the necessary permissions when speaking about work under the auspices of the MSA or other missions. Thirty-six presentations were given over two intensive days. A small committee of APFS students organized the entire event. This involved assessing if the titles proposed were suitable, correcting the abstracts, and grouping topics into a presentation schedule (fig. 7.4).

For most, this was the first experience of preparing and delivering a PowerPoint presentation. Many needed individual help. The committee designated experienced APFS team members to “mentor” their colleagues, helping to assemble suitable images in the correct format, timing and rehearsing the talks, correcting spelling, and questioning the structure and ideas presented. A graphics student took the initiative of designing a poster for the event. The committee printed an abstracts’ booklet which was handed out, with a conference package, at the event.

The APFS mini-conference inaugurated the lecture room of the AERA-Egypt Center at Giza. Each session had a chairman who introduced the speaker, kept the talks on time, and directed questions. Following the conference we held two sessions in which the participants gave a short assessment of their performance, and the overall team offered suggestions to improve both presentation content and delivery. Both the students and the teaching staff treated it with great solemnity and felt that it was a most valuable experience.

Group Work

Additional Courses

In addition to the core lectures listed above (table 7.2), students had supplementary courses on DSR writing, osteology, and photography. Jason Quinlan covered the principles of archaeological photography in a series of lectures and practical sessions both on site and in

First Day: Tuesday 27th April, 2010**Ana Tavares: Opening****First session — Giza Chairman: Rabee Eissa Mohamed**

- Ashraf Abd el-Aziz: *The Chute: the Western Access to Madinet Heit el-Ghurab at Giza*
 Mahmoud Ali Abd el-Rahman: *A Study of the Dental Pathology in the Late Period of the Giza Plateau "Chute area"*
 Shima Montaser Abu el-Hagag: *The Western Compound Excavation at Giza*
 Maha Siah Abd el-Tawb: *Mummification Practices in the Late Period at Giza*
 Sara Sabri Abdallah: *Analysis of Late Period Mud Coffin Construction at Giza and Saqqara*

Second session — Delta Chairman: Hanan Mahmoud

- Afaf Wahba: *The Position of the Body as a Main Source for Understanding the Mortuary Behaviour: Two Dramatic Study Cases*
 Mohamed Abd el-Aziz: *Cultural and Social Development in the Delta in the Late Predynastic Period: An Analytical Study*
 Ayman Ashmawy Ali: *Second Intermediate Period sites in the Delta: A Review*
 Mohamed Hatem Ali: *Graeco-Roman Baths in the Eastern Delta*

Third session — General 1 Chairman: Afaf Wahba

- Rabee Eissa Mohamed: *The Duality of Ancient Egyptian Art*
 Moamen Saad: *Red Sea Sites from the Prehistory to the 19th century A.D.*
 Osama Mostafa el-Nahas: *Towards an Information System for Ancient Egyptian Harbours: Case Study, Lake Mareotis Harbours*
 Ibrahim Ahmed Metwalli: *An Archaeological Study of the Historic Shipwreck "Le Coureur" (1818): An Illegal Slave Trader in Mauritius*

Fourth session — General 2 Chairman: Osama el-Nahas

- Yasser Mahmoud Hussein: *New Early Dynastic Cemetery at Abydos*
 Hazem Salah Abdallah: *Pilgrimage to Abydos in Ancient Egypt (Pharaonic Times)*
 Mohamed Naguib Reda: *Introduction to Shisha Clay Bowls in Modern Egypt*
 Mohamed Sayd Osman: *The Rise of the City in Ancient Egypt: a General Discussion*
 Wael Fathi Morsi: *Houses in Ancient South Arabia from the Second Millennium B.C. to the 5th Century A.D.*

Second Day: Wednesday 28th April, 2010**Fifth session — Giza Chairman: Ashraf Abd el-Aziz**

- Ahmed Omar Shoukri: *AA Area at Giza FS 2007 Excavation*
 Rasha Nasr Abd el-Mageed: *The Faunal Remains from the AA Bakery with a Comparison to Other Areas of the Heit el-Ghurab Site at Giza*
 Hanan Mahmoud Mohamed: *Building E at Khentkawes (KKT-N) Excavation, Giza 2009*
 Rebab Sayed: *The Plants from the Rooms Within House E at Khentkawes*
 Mansour El Badri Mustafa Ali: *The EOG Bakery at the Heit el-Ghurab Excavation, Giza FS 2006*

Sixth session — Technique Chairman: Yaser Mahmoud

- Hassan Ramadan Mahmoud: *Techniques of Drawing Difficult Objects*
 Essam Nagy Mostafa: *House Style in Publication*
 Amr Zakaria Mohammed: *Survey Challenges in Archaeology: Low Tech Solutions*
 Mohamed Abd el-Basset: *Survey Achievements at Luxor Town Mound 2010*

Seventh session — Luxor Chairman: Moamen Saad

- Mohamed Ali Abdel-Hakim: *Roman and Late Roman Ceramic from Luxor KIW SAFS 2008 Excavation*
 Mohamed Abd el-Rahman: *Structure 6 at Luxor Town Mound Excavation. SAFS 2010*
 Hussein Rikaby Hamed: *Structure 3 at Luxor Town Mound Excavation. SAFS 2010*
 Saad Bakhit Abdel-Hafez: *Archaeological Primary Study of Structure 12 at Luxor Town Mound*

Eighth session — Pottery Chairman: Mohamed Ali

- Sherif Abd el-Monaem: *Amphorae in the New Kingdom: Definition, Function and Importance*
 Elham Ahmed M. el-Tawil: *Late Roman Amphora 1*
 Mahmoud M. el-Shafey: *The most Distinctive Pottery of the New Kingdom*
 Nermeen Shabaan Abayazeed: *Bes Jars: the Development of their Shape from the New Kingdom to Ptolemaic Period*
 Shaima Rasheed Salem: *Islamic Ceramics from the Fatimide and Mamluke Periods*

Richard Redding: *Conference closing*

Figure 7.4. AERA APFS 2010 Mini-Conference list of speakers and titles.

the Giza laboratory. Quinlan worked intensively with the graphics group members, showing them how to prepare photographs for publication with Photoshop and Aperture. He covered core information on light, shutter speed, aperture, metering, etc. He also taught the photographing of special items such as objects, ceramics, and human bone.

Excavation Group

The excavation group was divided into three teams. Each prepared an area for publication, namely, the AA Bakery, the EOG-D Bakery, and Area MSE, all from the HeG site (frontispiece 2). The APFS excavation groups assembled data from the archives, then read and summarized the preliminary reports for their area. They retrieved reports and primary data from the AERA online database and collected drawings and photographs. They prepared a work plan (updated weekly), an outline of the article, and a final phased matrix for publication.

It was important for the students to understand that the designations used for recording on site and in AERA's in-house, gray literature may need to be redefined when preparing a document for publication; this applies to phasing, room designations, as well as graphic conventions. The aim was to be as informative and explicit as possible, while using a consistent but not overly rigid system.

In preparing the material from these areas for publication, the field school students wrote sections on excavation methodology, goals, and aims of the excavation. They wrote a phased narrative of the archaeological deposits and structures and a short discussion of comparative material from within the site and from other Egyptian sites, where possible.

Hanan Mahmoud worked with Mohamed Abd el-Aziz Gabr, Mohamed Ahmed Abd el-Rahman, and Momeen Saad on the AA Bakery report. Rabee Eissa, with Mansour el-Badri Mustafa Ali, Shaima Montasser Abu el-Hagag, Ahmed Omar Shoukri, and Hussein Rikaby Hamed, wrote the EOG-D Bakery report. Ashraf Abd el-Aziz wrote the article on Main Street East with the help of Ayman Ashmawy Ali, Mohamed Hatem Ali, and Osama Mostafa Mohamed.

The AA and EOG-D groups prepared a chart to compare information on the different components of bakeries. They collected information on various bakeries recorded at HeG and selected the following elements for comparison:

- Type and size of bread molds
- Entrance
- Location of the hearth
- Thickness of ash deposits
- Number of rooms
- Size of vats

Towards the end of the APFS, the bakery groups used this information to help form their interpretations of bread and bakeries. They combined information from the archaeobotanical and ceramics analyses with their interpretations of both the architecture and archaeological deposits from the bakeries. They also did background reading on bread-making in ancient Egypt. To avoid duplication, they made a joint summary on bread-making for their articles, which is published here as the Chapter 1 Introduction. With the MSE group they prepared a joint bibliography. The final preparation of the publication was carried out in 2013 (details above). The teams writing on bakeries focused on one of the main topics developed by Mark Lehner within the AERA research program: the study of elementary structures of everyday life in the infrastructure of pyramid building, in this case bread and its intensified production. The reports on the bakeries contribute to this question, as they discuss a household mode of production replicated in order to achieve an economy of scale (AERAGRAM 2001: 2).

Graphics Group

The graphics group included both surveyors and illustrators. William Schenck, Ana Tavares, Mohamed Abd el-Basset, and Yaser Mahmoud Hussein supervised Ibrahim Ahmed Mohamed Mitwali, Saad Bakhit Abd el-Hafez, Mohamed el-Sayd Osman, Wael Fathi Mursi, Essam Nagy Mostafa Ali, Hassan Ramadan, and Hazem Salah Abd Allah. The group's task was to prepare maps, plans, line drawings, and photographs to illustrate the different articles, including overall site and area maps, sections, elevations, and object and ceramic drawings. The graphics group analyzed the graphics "house style" used by AERA, as well as those of standard archaeological publications. They prepared a set of graphic conventions (fig. 7.5) and wrote a step-by-step methodology for the preparation of archaeological illustrations.

Differing Demands and Methods

The conflicting demands of teaching and publication

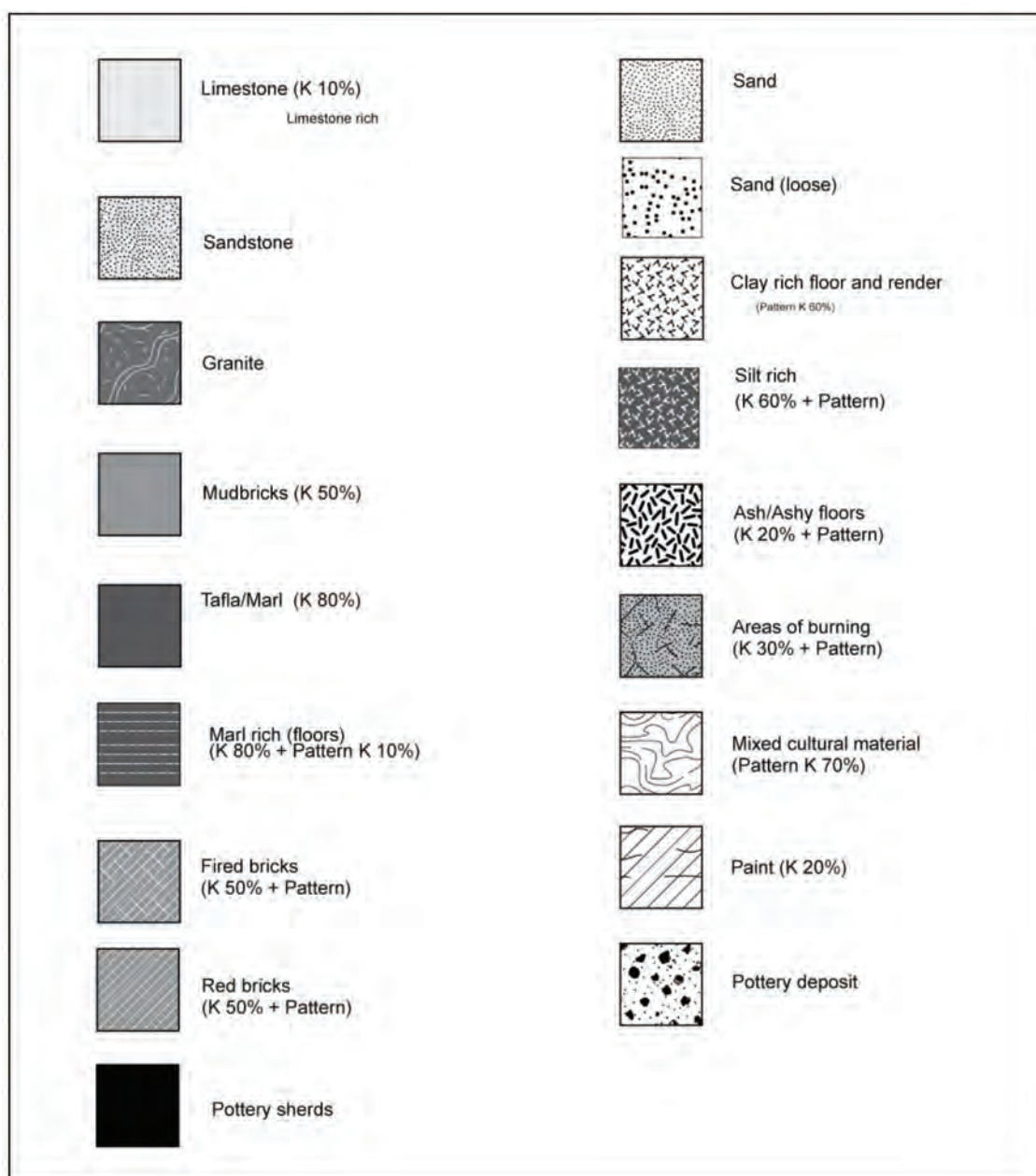


Figure 7.5. Part of a set of graphic conventions developed by the graphics group during the APFS. The group reviewed different schools or traditions of graphic labels currently used in archaeological publications before developing their own set.

were highlighted in the work of the graphics group. The group practiced preparing illustrations manually from site plans of the Luxor Town Mound, not related to the APFS publication but essential to the teaching. The group reviewed different traditions of graphic legends currently used in archaeological publications, before developing their own set (fig. 7.5). In 2013 when AERA decided to publish the APFS

volume in-house the illustrations were redrafted to conform to AERA's graphic conventions.

The graphics group practiced different methods of preparing illustrations for publication: traditional manual drafting and partial or full digital methods. They used traditional drafting to prepare a complete set of phase plans illustrating the results of the excavations of the Luxor Town Mound. Traditional drafting

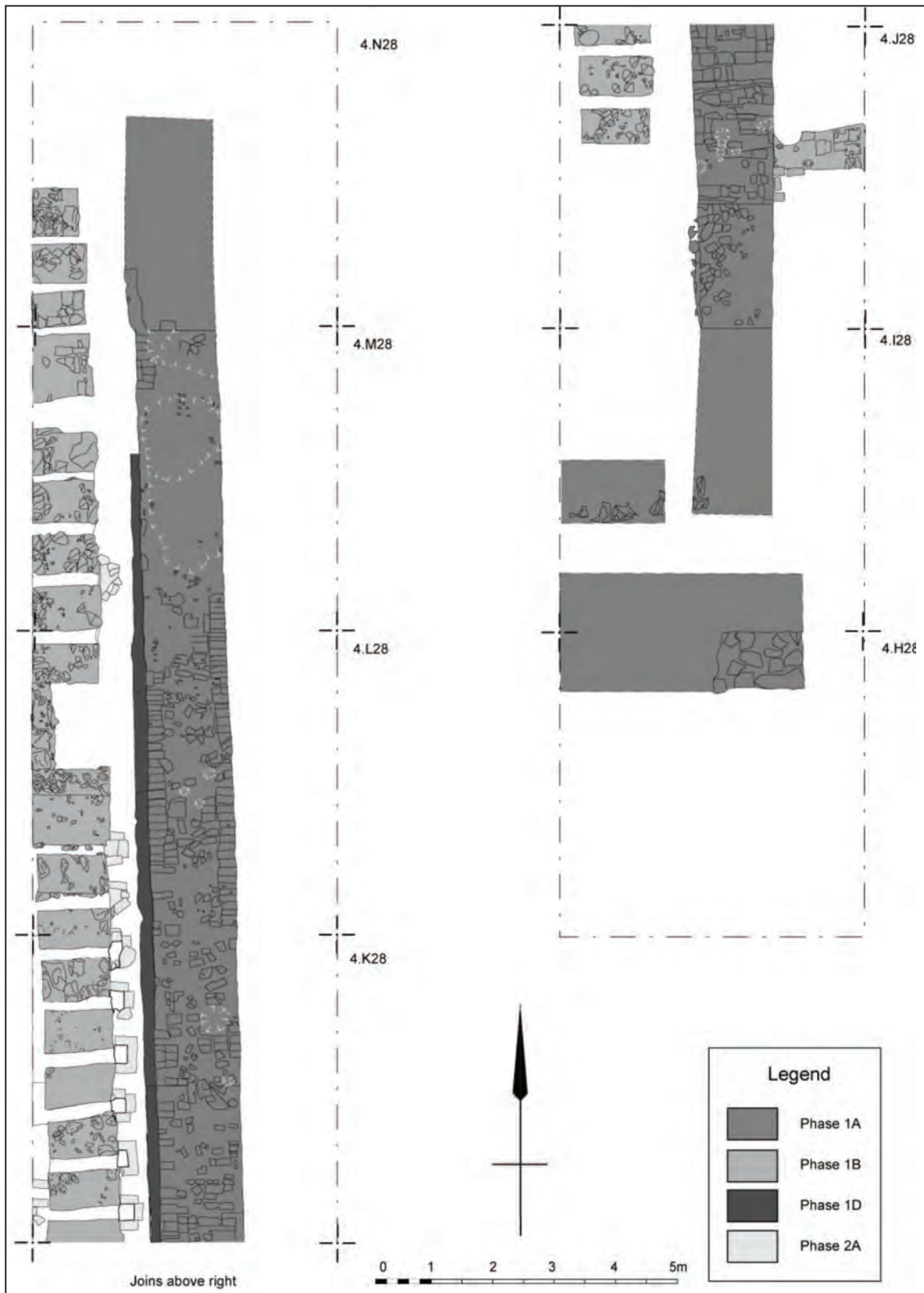


Figure 7.6. Overall plan of MSE area, prepared by the graphics group. This figure illustrates the use of graphic conventions developed by the group during the APFS. It also shows their graphic solution to presenting a narrow but very long (35m) excavation area on a single page.

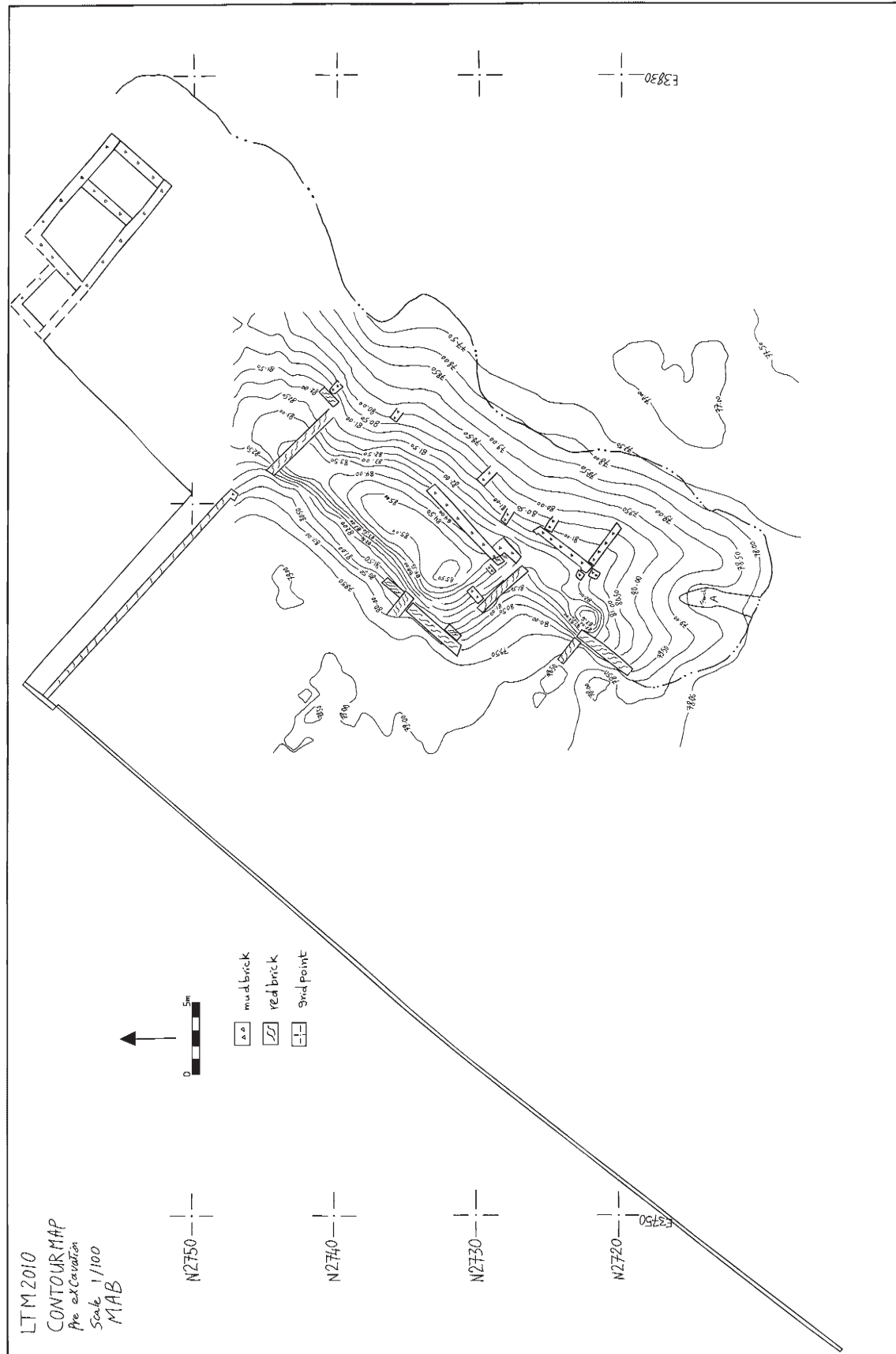


Figure 7.7. Luxor Town Mound contour map assembled at scale 1:100, showing the topography of the site prior to excavation. This illustration was prepared using a manual method (including hand-drawn legend and labels) suitable when no IT equipment is available. Field drawing by Mohamed Abd el-Baset.

Graphics Group House Style

North Arrow: Preferred: Black Arrow, Alternative: White Arrow, to be used occasionally when useful.



Scale: Preferred: Black/White Visual Scale, when necessary include subdivisions.



- Location:** Preferred: Lower Left, Alternatives: Upper Left, then Lower Right, and Upper Right. Both North Arrow and Scale should be kept together.
- Legend:** Preferred: Kept together with North Arrow and Scale, and arranged vertically.
- Conventions:** Preferred: Grey tones for structures, Patterns for deposits. To be decided upon submission of article plans. (greyscale) 50% if we have one phase
- Survey Points:** Grid and Coordinate references on large area plans. 2 sides of the plan. Small area plans, only grid references.
- Sections:** Vertical and horizontal scales should frame the section. Feature numbers should be included within the section. Directional arrows included. A visual scale added to clarify scale of section

Fonts

Font name: Arial - regular

Font size: 8pt

Line Thickness: For outlines 0.75pt, and for details 0.50pt

Dashed line:

- Dash line (Dash=0.5 cm, Gab= 0.3 cm)
- Dash, dot line (Dash = 0.5 cm, Gab= 0.3 cm, Dash= 0.05, Gab = 0.3)
- Dash, two dots line (dash =0.4 cm, gab = 0.03 cm, gab = 0.1cm, dash = 0.03 cm)
- Space between the grid reference and the coordinates values = 0.15 cm
-

Note:-

Those values are settable for A4 size, when you are going to print in different size you have to adjust this value

Figure 7.8. A page from the Guidelines handout prepared by the graphics group during the APFS. These standardize graphic elements needed in archaeological illustrations and provide guidance for future work.

techniques are applicable in the all-too-frequent situations where there is no access to photocopiers or scanners, and archaeologists have to prepare reductions in scale and final figures manually (see fig. 7.7, showing the contour plan of the Luxor Town Mound prior to excavation).

The APFS graphics students preferred digital methods, with which they were already familiar, to hand-drawing for publication. We used a variety of programs and graphic solutions including: extracting overall site maps from GIS, then labeling, adding or adjusting graphic elements as required; using base maps prepared with Adobe Illustrator, then modifying as needed; and preparing illustrations from site records, which involves making high resolution scans, stitching together the images, redrawing digitally, then finishing with the appropriate graphic conventions.

Guidelines for Archaeological Illustration

The graphics group prepared instructions for the methods they used, including short-cuts and hints for easier and speedier work, technical difficulties encountered, and solutions (a sample page of this manual is reproduced in fig. 7.8). The students wrote a final report defining when specific methods should be used for particular tasks (including advantages and disadvantages), what equipment to use and when, a list of suppliers and costs, and time estimates for each type of method/project. Although further experience is essential, this type of approach will enable graduates to work autonomously and make relatively accurate assessments of what is required to complete a task. In effect, the graphics group wrote their own manual of archaeological illustration, which they and their MSA colleagues can use in the future.

Teaching—including sessions led by the students—involved sharing techniques, tips, and experiences. Practice brought to light a myriad of questions for which the solution (or alternative solutions) was decided by the entire group. Initially the graphics group supervisors set out the aims of the field school and defined the type and number of figures needed with the excavation groups. The students then organized their tasks autonomously. This included researching and assembling sources, defining suitable drafting techniques for the job, defining graphic conventions, dealing with technical problems, and reviewing schedules.

Graphics group members met regularly with the excavation groups and often took the initiative in proposing content and format of illustrations for the text. It became obvious to both writers and illustrators that detailed and close liaison between groups is essential in obtaining professional and timely results. The graphics students also drew objects and ceramics in the Giza laboratory. They inked these drawings both manually and digitally for publication.

Specialist Training

The 2010 APFS produced four specialist reports: ceramics, osteology, botany, and faunal reports. As with the excavation group, both the ceramics and the osteology groups consisted of graduates from previous AERA-ARCE Advanced Field Schools (Anonymous 2007; Kamel 2009), while two new students, one for each discipline, were trained in archaeobotany and archaeozoology (see above for selection process). As the main purpose of the APFS was to train students in the process of preparing preliminary reports in different specializations, the resulting articles are not homogenous. Data analysis in each discipline required the acquisition of fairly diverse skills.

Ceramics Group

Teodozja Rzeuska, Sabine Laemmel, Janine Bourriau, Sherif Abd el-Monaem, and Mohamed Ali Abd el-Hakim Ismail supervised the ceramics group (see Students Groups and Staff above). The group analyzed a large corpus of ceramics from the MSE area, working in close collaboration with the MSE excavation team. They applied to this corpus (over 30 large sandbags of ceramic sherds) the full methodology learned in the Advanced Field School; they washed and marked all the sherds, sorted the material by fabric, identified types, and described surface treatment and ware. The ceramics group prepared a catalog (including drawings) and wrote a description of the material.

The ceramics group faced similar issues encountered by the excavation and osteology groups, such as the conflicting demands of teaching and completing a publication, under-developed research and language skills, and a lack of background knowledge of the subject. This group had the most demanding and ambitious program of the APFS, as they undertook to record and analyze a large amount of unprocessed material.

Working from Scratch/Structure of the Course

The aim of the APFS ceramics group was to analyze the material “from scratch,” without relying on the existing shape typology and fabric classification of the Old Kingdom Giza material (Wodzińska 2007a, b). The rationale of this approach was to train competent and autonomous ceramicists and teach students to deal with ceramic material as if they were facing a new site. They will need this know-how when processing pottery retrieved from excavations in their inspectorates.

All diagnostic sherds were washed and marked with feature numbers. This was time-consuming but an essential step for the material to be manipulated and classified without losing track of the original archaeological context.

The group reviewed the principles of analyzing shapes, wares, and formal ceramic typologies. Practice consisted of processing, recording, researching, and writing up the entire MSE ceramics corpus. The students sorted the sherds into broad types, then sub-divided them into specific categories. They prepared a fabric classification by describing the matrix and inclusions in ceramic chips viewed under the microscope.

As a substantial amount of recording and background research had to be undertaken for the report, each student chose a specific category of pottery to work on. Nermeen Shabaan Abayazeed and Mohamed Naguib classified the bread molds according to the internal base shape (conical or flat); Ilham Ahmed M. el-Taweil worked with stands and white carinated bowls (assisted by Mohamed Naguib); Sherif Abd el-Monaem and Shaimaa Rasheed Salem were responsible for the beer jars and open forms; and Mohamed Ali was responsible for the bread trays.

Seminars and Workshops

The ceramic team was required to do a large amount of reading and background research. They used the AERA library and e-library extensively, which is well provided with ceramic publications and reports.

As in a university setting, the students researched a topic which they then presented to their peers in a seminar. The entire group was expected to contribute to the seminar discussion, and the students were given guidance for further research. The ceramics group also designed a database to process the information gathered in the ceramics recording form. This was then used for a preliminary statistical analysis of the material.

Specialist workshops enhanced the ceramics course. Mary Ownby showed the group how to use the petrographic microscope to observe and describe sherd fabrics and how to take photos, to illustrate fabrics, via the microscope. Virpi Perunka and Claire Malleson discussed the methodology used at Gurob for the collection of surface ceramics. Cornelia Romer, working in the Fayum, discussed ceramic surface collection. William Schenck and Yaser Mahmoud held practical workshops on inking ceramic drawings for publication (see Seminar and Workshop list, above).

The Ceramics Study Collection

The teaching of ceramics at Giza has been greatly improved by the use of a comparative collection. The Giza material, covering a range of periods, was enlarged in 2009/2010 with material from Saqqara (from the EES excavations at the Anubieion and Sacred Animal Necropolis) and from the KTW excavations in Luxor. The teaching collection now includes material up to the Islamic period. We are very grateful to the MSA officials who have facilitated the creation of the Field School ceramics comparative collection. Sabine Laemmel and Peter French used the comparative collection to give students an overview of Late Dynastic ceramics.

Ceramics Report

The report prepared during the APFS included a section on methodology; a detailed discussion of the overall MSE ceramics corpus, including shaping methods, surface treatment, fabrics, and decoration; and a catalog. The depth and scope of background knowledge needed for the written discussion of the material required reading and research beyond the already intense field school schedule. Given the ambitious program of the ceramics group, the preparation of a draft report by the end of the field school was an arduous task.

A further APFS follow-up session was held in 2013 to prepare the present publication. Teodozja Rzeuska oversaw the work of Mahmoud el-Shafey, Mohamed Naguib, and Sherif Abd el-Monaem. Freya Sadarangani coordinated this study season and edited the report. The report needed restructuring and rewriting, particularly the introduction, typology, and appendices. Rzeuska guided the team through substantial reading and research on comparative material. Approximately three-quarters of the original text was

rewritten, and most of the illustrations re-drafted by Hassan Ramadan.

The final report includes methodology, a shape typology and discussion (sub-divided into open forms, closed forms, non-containers, and miniature vessels), a fabric typology, and a discussion of shaping methods, finishing techniques, and surface treatment. The report concludes with a catalog, plates, and color photos of the MSE material.

The work of the ceramics group highlighted the fundamental issues faced by the Analysis and Publication Field School (discussed below); hence, the ceramics report constitutes its most substantial achievement. We are grateful to the team for persevering with this work.

Osteology Training

Human osteology has been a component of the AERA-ARCE Field Schools since their inception in 2005. Excavation, recording, and analysis of burials are essential skills in Egyptian archaeology, particularly for Antiquities Inspectors who have to deal with frequent—and extensive—cemetery excavations. Jessica Kaiser developed the human osteology course and teaching materials for the 2006 Advanced Field School. Graduates Afaf Wahba, Zeinab Hashish, and Ahmed Gabr reached a high professional standard and became teachers at subsequent AERA-ARCE Field Schools. Human osteology is one of the most successful components of the AERA-ARCE Field School specializations.

The osteology group prepared for publication nineteen human burials excavated from the Chute area of the HeG site (see preface and frontispiece 2; Abd el-Aziz 2011). Scott D. Haddow and Afaf Wahba worked with Sara Sabri Abdallah, Maha Siah Abd el-Tawb, and Mahmoud Ali Abd el-Rahman on this report.

As with other APFS groups, the field school training required the osteology group to work with material that had been partly analyzed and published (in this case, by Kaiser in *GP5* [Kaiser 2011a]). Although partly duplicating work, the analysis of this dataset served the APFS didactic aims. Each student took responsibility for writing up and analyzing six to seven burials. The work included analysis in the lab to determine sex and age and to record measurements and pathologies; setting up a database in Microsoft Excel to enter the data; reading and summarizing comparative

material from the HeG site as well as comparative material from other Egyptian and non-Egyptian sites.

Some burials had fragile mud coffins with painted decoration. These required delicate excavation and meticulous field recording, as most do not survive once exposed. With the APFS the students gained experience with the full gamut of skills needed to bring excavated material to publication.

Although there is an overlap with archive reports (Kaiser 2004, 2005, 2006b; Kaiser and Westlin 2005) and partly with published preliminary reports (Kaiser 2006a, 2011a), the article in this volume explains in a more didactic way the methodology and osteological analysis and provides a full burial catalog. The report comprises field and laboratory methodology and discussions on minimum number of individuals (MNI), age and sex assessment, stature, and pathologies. It briefly covers burial practices including discussions on burial orientation, coffins, grave goods, and mummification.

Archaeozoology Training

Richard Redding taught Rasha Nasr Abd el-Mageed the basics of archaeozoology, including the identification of animal bone fragments to taxon, quantification of bone samples, estimation of age structure by species, determination of sex ratios by species, and recording of fragmentation. By the end of the APFS Rasha differentiated fish, bird, and mammal bone, and sorted, identified, and recorded samples of bone fragments. She dealt with five important variables: taxa ratios, sex ratios, survivorship, body part distributions, and metrics.

As part of the course, the team went to the fish market in el-Moneeb to acquire specimens for the comparative collection and to carry out ethnographic work. With the archaeobotany team, they also visited the Agricultural Museum in Dokki where they looked at articulated skeletons and mummified remains. A further field visit to an ongoing MSA excavation on the Bakenrefef escarpment at Saqqara allowed the team to discuss recording methodology for mummified dog remains, interred there in New Kingdom and Late Period tombs.

Course assignments included the written descriptions of the ecology and behavior of four fish taxa; observation of cattle, sheep, goats, donkeys, and horses; and background reading. The report was the result of Rasha's analysis of the AA Bakery samples and hence she retains sole authorship.

Archaeobotany Training

Mary Anne Murray trained Rebab el-Gendy in the principles and practice of archaeobotany. This included using the “flotation” processes to recover ancient charred plant remains and long hours sorting and identifying samples under the microscope. Rebab drew and made descriptive notes of different specimens. She also learned the family, genus, and species names of plants, how to recognize and write Latin names, and the Latin binomial names of the most common species found in Pharaonic sites in Egypt. She prepared an ongoing species list and a glossary of terms (in English, Arabic, and Latin). She submitted weekly written reports and as the analysis progressed she made presentations of the results to her colleagues. She practiced sampling strategies and prepared the results of archaeobotanical data in species tables and different types of charts.

Her training included a visit to the Agricultural Museum in Dokki and an ethnoarchaeology assignment collecting wheat just before harvest time from a local village. This sample was then analyzed and discussed in the Giza laboratory. There were opportunities for discussions in the Giza laboratory with the late Ahmed Fahmy, archaeobotanist and professor of biology at Helwan University, and Elena Marinova, archaeobotanist of the Leuven mission working at the Old Kingdom site of Al-Shaykh Sa'īd, Bersha.

In the Giza laboratory Rebab made a presentation to Adéla Pokorná, an experienced botanist relatively new to archaeobotany working with the Czech Republic mission at Abusir. Their discussions were mutually beneficial. Rebab used the extensive species list from the material she sorted and identified from House E in the Khentkawes Town for this presentation. This material is presented in Chapter 6 of this volume.

Issues Faced and the Way Forward

Written English and Research Skills

Throughout the APFS, research skills and written English presented the greatest challenges. The students practiced—many for the first time—summarizing academic articles; assessing the value of sources and distinguishing between primary, secondary, and tertiary sources; critical thinking skills; and writing beyond basic descriptive reports. They also practiced researching comparative material, preparing a fully

referenced text and bibliography, and constructing a long academic report in English. These tasks seemed quite daunting at the beginning of the APFS. It is a credit to the entire APFS team that they worked relentlessly to produce the articles published in this volume.

Since the 2005 Beginners Field School we have been aware of the need for English language training. Although this has been outside the remit of the AERA-ARCE Field School, in every field school many hours are devoted to report writing. A future collaboration between AERA and the American University in Cairo (AUC) might enable field school students to take courses in academic written English and research skills.

Critical Thinking and Deductive Reasoning

Over the years, students have pointed out their lack of opportunity to develop critical thinking and deductive reasoning (Loveluck 2012: 8; MENA 2012: 2). In response we encourage them to practice these skills in all the field schools.

In the Salvage and Advanced Field Schools, students became familiar with the role of inductive reasoning in early archaeology (Kelly and Thomas 2010: 21–48; Salmon 1976), and enjoyed working through the popular book *Motel of the Mysteries* (Macaulay 1979), which highlights its shortcomings.

Current archaeological publications emphasize explicit research models and theoretical frameworks. In the APFS we promoted a first stage of data preparation for preliminary publication, prior to a more sophisticated level of analysis. We do, however, encourage a critical and analytical approach to data and reading material, as well as the application of deductive reasoning (see lecture list). This is a long-term process.

Authorship and “Voice”

The defining characteristic of the articles in this volume is that the data had to serve the APFS's core purpose—to teach publication skills. This may have resulted in a disparate set of articles, with uneven levels of discussion and research. As discussed above, the three excavation datasets—the AA Bakery, the EOG-D Bakery, and Area MSE—were chosen because these areas had been excavated by a field school, and the data seemed sufficiently contained to be assembled, analyzed, and written up in the course of the APFS.

Inevitably there was an overlap with previously

written reports, given that at the end of every field season each excavation team (including the field school teams) writes a complete Data Structure Report (DSR). Further, many excavation areas have been published in preliminary form since 2004 in AERA's *Giza Occasional Papers* series (GOP1–5). The AA Bakery article has drawn considerably from the DSR written by James Taylor (Taylor 2009b). We have tried to minimize repetition without removing essential information. The articles in this volume were deliberately not over-edited; hence the AA Bakery article has two quite distinct “voices” indicative of the co-authors. There is also an overlap between the human osteology APFS report and Jessica Kaiser's report in GOP5 (2011a). However, asking the APFS teams to prepare these articles was not a pointless exercise, as the data served the didactic purpose of the APFS. We have not brought to publication the complete articles produced during the APFS. These were cut and edited to avoid re-publishing the same data.

Ambitious Aims

To write and illustrate a preliminary report in eight weeks was an ambitious task, made harder by the basic data analysis and other coursework that the groups had to complete. The estimated ratio of fieldwork to publication time is 1:3. That is, most archaeologists require three months of analysis and post-excavation work for each month spent in the field. The areas published in the APFS were excavated over a period of six to twelve weeks. For a fully integrated publication we would have needed 18 to 36 weeks. The APFS team found the process of research, editing, and dealing with feedback challenging. We often had to slow down progress to make sure all students were involved at all stages of the publication process. The guiding principle of the APFS publication was to avoid false bylines and ghost-writing. This is the first volume written, almost entirely, by an Egyptian field school team. Field school graduates have prepared technical reports, such as DSRs and end of season Specialist Summary Reports. However, it required close collaboration with specialists in their field and an editor to enable them to prepare a fully professional, publishable text. The preparation of this volume highlights this as a tripartite process, which requires a final editorial field-school session, with individual authors, subsequent to an Analysis and Publication Field School.

Modifications to Future Publication Field Schools

The APFS was characterized by a strong collegial spirit. For example, students familiar with French and German translated articles for their colleagues, while those competent in Excel, Access, and Photoshop held workshops. We would like to build on this positive experience in future field schools.

However it is clear that more time is required to prepare a future AERA Field School publication. Material culture analysis should be partly completed prior to the writing field school, and English language and research skills training are essential. The team must include a post-excavation manager and a full-time editor to work from the start with the field school. Advanced Field School students must be encouraged to use libraries regularly, prepare book and article summaries, and write referenced reports. Finally, editing, peer review, and re-writing must be part of the field school report-writing process.

The three AERA-ARCE Field Schools held outside Giza, namely in Luxor and Memphis, would be eminently suitable for an Analysis and Publication Field School as their results remain mostly unpublished (except for Boraik et al., forthcoming). In the coming years we have three ambitious aims for the AERA-ARCE Field Schools: to run the field schools predominantly with Egyptian staff trained through the full cycle of AERA-ARCE Field Schools; to publish the results of the Luxor Town Mound and Mit Rahina Field Schools; and to expand our training to foreign students, who will excavate side by side with Egyptian Inspectors for a fully inclusive and collegiate experience.

Conclusion

Archaeology is an all-inclusive profession that requires an unusually wide-ranging set of skills: the physical excavation of the site, meticulous recording skills (drawing, photography, and database work), abstract analytical thinking, and the research skills needed to bring the material to publication. Few professions allow for such a full experience—from laborer to thinker, and back again. The AERA-ARCE Field School program encompasses the full range of archaeological skills from the trowel edge to the printed page. The APFS is our initial step to help bridge the gap between field and academic training.

The reports assembled in this volume, and particularly those of the specialists, clearly demonstrate the successful training of Egyptian Antiquities Inspectors

in the analysis of archaeological material in the field with moderate access to research facilities. There is an urgent need for Egyptian specialists to work within MSA teams. In the last few years AERA-ARCE Field School graduates have worked in MSA projects as surveyors, illustrators, epigraphers, human osteologists, ceramicists, and archaeozoologists. Ceramicists are in great demand in Egyptian excavations, given the importance of pottery in dating settlement sites. Their training is long and requires specialization by region and time period. We are encouraged that AERA-ARCE specialist graduates are now teaching at MSA sites and at Egyptian universities. They have also started to present their work at specialist conferences, such

as the bio-archaeology conference held in Cairo in January 2013 by the MSA and the American University in Cairo (MSA-AUC Bio-conference 2013) and at ARCE's Annual Conferences 2012 and 2013 (ARCE 2012, ARCE 2013).

Training a new generation of Egyptian archaeologists requires the concerted efforts of numerous missions. This volume is the culmination of various sessions of such training. Although the process of bringing the field school work to publication has been slow, expensive, and demanding, it is clearly empowering in the long run. We are proud of this, our first field school volume.

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Arabic Abstracts, Excavation Chapters

Bread and Bakeries in Ancient Egypt: An Introduction

Hanan Mahmoud and Rabee Eissa

مقدمة عن الخبز والمخابز في مصر القديمة

لعب الخبز دوراً هاماً في حياة المصريين القدماء الاقتصادية والدينية، بجانب كونه أحد أهم الأطعمة التي حرصوا على وجودها على موائد أطعمتهم. ولقد شرحت لنا مناظر مقابر الدولة القديمة مراحل إنتاج الخبز في مصر القديمة بدءاً بعملية تثبيت قوالب الخبز وتسخينها قبل أن يُصب فيها العجين.

جدير بالذكر أن كسرات وبقايا قوالب الخبز شكّلت النسبة الأكبر من نسبة الفخار الأثري المكتشف في مدينة "حيط الغراب"، حيث وُجِدَت هذه القوالب في شكلين مختلفين عن بعضهما الآخر، كان النوع الأول ذو فوهة وقاعدة مفتوحة عريضة، بينما كان النوع الثاني مخروطي الشكل. وقسّم متخصصي الفخار في بعثة AERA هذين النوعين الرئيسيين إلى ثمانية أنواع أخرى، مقترحين في دراستهم أن كل صنف منهم كان مُخصص لإنتاج نوع معين من الخبز، أي أنه كان يتم إنتاج ثمانية أصناف مختلفة من الخبز.

أسفرت أعمال الحفائر في مدينة "حيط الغراب" منذ بداية عملها في أوائل تسعينات القرن الماضي حتى يومنا هذا عن اكتشاف ما يقرب من عشرة مخابز. تشابهت هذه البنايات العشر في بعض العناصر المعمارية واختلفت في البعض الآخر، كما كان يملئها رديم أثري ناتج لعملية الخبز والذي تمثل في كميات الرماد الكبيرة التي ملئت معظم المخابز، إلا أنه بصفة عامة تضمن كل مخبز منهم عناصر ثابتة كموقد النار المعروف بالكانون، حيثما كان يتم تسخين قوالب الخبز قبل ملئها بالعجين، كذلك مساحة ذات سطح منخفض عن باقي أرضية المخبز، ملئت هذه الأرضية بحفر دائرية الشكل، صغيرة المقاس، ضحلة العمق، كانت تستقر فيها قوالب الخبز الفخارية وهي تشبه "كرتونة البيض في عصرنا الحديث".

وجدير بالذكر أن هذا الجزء المنخفض كان مكان تسوية الخبز عن طريق وضع قوالب الخبز بعد ملئها بالعجين ثم إحاطتها بالفحم الساخن "الجمر" من كل مكان، لإتمام عملية التسوية. واتضح قصة إنتاج الخبز في مخابز مدينة "حيط الغراب" بما حوته أطلالها بعدد من الأواني الفخارية كبيرة الحجم والمعروفة حالياً في سكان الريف المصري بالـ "مواجير". فقد اكتشفت البعثة هذه الأواني الكبيرة ثابتة في أماكنها الأصلية داخل المخابز، حيث استخدمت لخلط الماء بالدقيق وتجهيز العجين لسكبه في قوالب الخبز.

وفي تصور مبدئي وصلت إليه أعمال الدراسة والمقارنة لإعداد هذا النشر العلمي، يمكن القول أن مخابز مدينة "حيط الغراب" العشرة، اندرجت تحت ثلاثة أنواع رئيسية. أُعتبر النوع الأول مخابز حكومية مرتبطة بمشاريع حكومية كتلك المعروفة في مصر الحديثة

بالـ"طابونة" وهو حال مخبز EOG-D, في حين ظهر النوع الثاني داخل المنازل كبيرة المساحة, أي منازل عليّة القوم, أما النوع الثالث فلم يستقر حتى الآن على تحديد هوية المكان الذي كان يشغله أو معرفة وظيفته المعمارية, ومنها مخبز AA.

A Preliminary Report on the AA Bakery

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تقرير مبدئي عن أعمال الحفائر في مخبز AA

تتعرض هذه المقالة لإبراز ما وصلت إليه أعمال الدراسة والتحليل لنتائج الحفائر والتنقيب التي تمت في مخبز AA بصفة عامة خلال أعوام 1998, 1999, 2005 وبصفة خاصة تلك التي قام بها أحد طلبة مدرسة الحفائر من مفتشي وزارة الدولة لشئون الآثار موسم 2006, 2007. ولقد هدفت أعمال الحفائر في مخبز AA للربط بينه وبين سلسلة القواعد المبنية من الطوب اللبن والمعروفة اصطلاحاً لدى البعثة باسم Pedestal Building, كذلك محاولة الوصول إلى ماهية من كان يُنتج الخبز داخل هذا المخبز, كما هدفت أعمال الحفائر والدراسة لمعرفة ما إذا كان هذا المبنى ينتج أي من أنواع الغذاء غير الخبز كالبيرة على سبيل المثال أم تقتصر دوره على إنتاج الخبز فقط.

بلغت مساحة مخبز AA نحو 8 أمتار طولاً و7 أمتار عرضاً, متضمناً خمسة حجرات, فمنها ما كان مكاناً لتجهيز العجين وإعداده بينما كانت عملية التسوية تتم في غرفة أخرى. وكانت أرضية غرفة تسوية الخبز مغطاة بطبقة سميكة من الرماد الناتج عن عملية الإنتاج, كما كان يغطي الرماد نفسه فرن من الطوب اللبن محتوياً على بقايا من أطباق الفخار, وتميزت أرضية غرفة الفرن بوجود حفر دائرية الشكل, صغيرة المقاس, ضحلة العمق, حيث كانت تستقر فيها قوالب الخبز الفخارية.

عثر الحفارين داخل غرفة التجهيز على جزء منخفض عن مستوى أرضية الغرفة به بقايا طبقة من الملاط, يبدو أنه كان يُستخدم كحوض, وتتميز أرضية هذا الحوض بشكل دائري يُرجح أنه نتيجة لقاعدة أحد أواني العجن الفخارية الكبيرة المعروفة بالـ"مواجير", كما عثر داخل حجرة التجهيز هذه على بقايا موقد نار "كانون" يبدو أنه استخدم لتسخين قوالب الخبز قبل ملئها بالعجين.

أسفرت عملية تحديد المراحل الزمنية التي مر بها هذا المخبز بعد دراسة الطبقات الأثرية الخاصة به إلى خمسة مراحل هي: الأرض الطبيعية, مرحلة استخدام مبكرة في المكان ذاته, مرحلة تحديد وتخطيط لمباني AA, مرحلة بناء مخبز AA ومرحلة استخدام مخبز AA وهجره. كما أسفرت عملية الدراسة والتحليل إلى أنه كانت هناك ثمة علاقة بين

مخبز AA ومبنى Pedestal Building . كما أرخت نقوش بعض الأختام الطينية التي عثرت عليها البعثة داخل رديم هذا المخبز بعصر الملك "منكاورع" وأوضحت أن سكان منطقة AA كانوا من القائمين على أعمال المجموعة الجنائزية للملك المذكور. وذهبت نتائج تحليل بقايا العظام الحيوانية المكتشفة داخل هذا المخبز إلى رفاهية هؤلاء السكان وأكلهم لأجود أنواع اللحوم.

وفي النهاية يمكن القول أن الصورة النهائية في تخيل المنظومة الكبيرة لمباني منطقة AA, بنيت على أنه في الوقت الذي كان يُنتج فيه الخبز داخل مخبز AA, كان يتم إنتاج البيرة داخل مبنى Pedestal Building, فالخبز والبيرة مثلاً عنصري الغذاء الرئيسي لقداماء المصريين. ويقترح البعض أن فرن AA, لم يكن لإنتاج الخبز وإنما كان وحده مساعده لإنتاج البيرة داخل Pedestal Building, وأن دوره كان مكاناً لعملية التخمير. وأخيراً يرى فريق ثالث أن مخبز AA اندرج تحت الأفران المنزلية, وذلك لتشابهه الكبير مع الأفران المكتشفة في House Unit 1 كذلك الأفران المكتشفة في منازل المدينة الغربية.

A Preliminary Report on the EOG-D Bakery

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تقرير مبدئي عن أعمال الحفائر في مخبز EOG-D

تتناول هذه المقالة عرضاً لنتائج أعمال الحفائر التي قام بها اثنين من أثريي وزارة الدولة لشئون الآثار المتحقيين كطلبة في مدرسة الحفائر التخصصية عام 2006. تمت أعمال الحفائر في هذا المكان في مساحة مستطيلة الشكل بلغ طولها 11.50 متر تقريباً و 1.80 متر عرضاً.

هدفت أعمال الحفائر هنا إلى أمرين اثنين, كان الهدف الأول هو التأكد من وظيفة وطبيعة المبنى مستطيل الشكل المشيد من الحجر الجيري, ومن ثم ربطه بمنظومة الإنتاج والصناعة الكبيرة في منطقة EOG الرئيسية, وتُمثل الهدف الثاني في الربط بين الطبقات الأثرية في منطقة EOG وتلك الموجودة في جوانب حفرتين الكبيرتين اللتين تم حفرهما بالمعدات الثقيلة عن طريق الخطأ BHT و BBHT-2 ومن ثم فهم الصورة الكبيرة التي كانت عليها كل المباني والمنشآت الواقعة في منطقة EOG

وقد أسفرت أعمال الحفائر والدراسة عن أن مخبز EOG تضمن في مراحل استخدامه النهائية حجرتين. شغلت الحجرة الأولى الجزء الشمالي بنسبة تصل إلى نحو ثلثي المساحة الكلية للمخبز, وكانت هذه الحجرة مكان تسوية الخبز, حيث احتوت على بقايا فرن أو موقد النار "الكانون", بجانب تلك المساحة ذات الأرضية المنخفضة عن باقي أرضية

المخبز، والتي ميزت أرضيتها أماكن قواعد قوالب الخبز، مستديرة الشكل التي تشبه "كرتونة البيض في العصر الحالي"، هذا بجانب كميات امتلاء هذه الحجرة بكميات كبيرة من الرماد الناتج عن عملية التسوية. أما الحجرة الثانية وهي الأصغر فكانت على ما يبدو مكان تجهيز وإعداد العجين، وهو ما دُلل عليه ما وجد بداخلها من بقايا صومعتين مربعتين الشكل، بجانب إناء العجن الكبير المعروف بالـ "ماجور".

هذا وقد أسفرت عملية تحديد المراحل الزمنية التي مر بها مخبز D-EOG بعد دراسة الطبقات الأثرية الخاصة به إلى ستة مراحل هي، مرحلة الإنشاء الأولى للمخبز، مرحلة الاستخدام الأول للمخبز، مرحلة إعادة تخطيط وتوسعة المخبز، مرحلة الاستخدام الثاني للمخبز ومرحلة هجر المخبز وتركه. وأخيراً فإنه من المقترح أن مخبز D-EOG كان أحد المخابز الحكومية التي شُيّدت من أجل إطعام العمال المقيمين في عنابر مدينة "حيط الغراب"، شأنه في ذلك شأن عدد من لمخابز التي تطابقت معه في التصميم المعماري والمعروفة لدى البعثة بـ A8 و A7D و A7E

(A Preliminary Report on Area Main Street East (MSE

Ashraf Abd el-Aziz, with Ayman Ashmawy Ali, Mohamed Hatem Ali, and Osama Mostafa Mohamed

تقرير مبدئي عن أعمال الحفائر في منطقة شرق الشارع الرئيسي MSE

تضع هذه المقالة بين يدي القارئ عرضاً مفصلاً لنتائج أعمال الحفائر التي تمت في منطقة شرق الشارع الرئيسي والمعروفة في سجلات البعثة تحت اسم MSE. وقد تمت أعمال هذه الحفائر بأيدي المتدربين من مفتشي وزارة الدولة لشئون الآثار ضمن برنامج مدرستي الحفائر عامي 2006، 2007.

تمت أعمال الحفائر في هذا المكان في مساحة مستطيلة الشكل تمتد من الشمال للجنوب بطول 35 متر تقريباً، بهدف أن يمر مكان التنقيب عبر ثلاثة تقسيمات فرعية داخل مدينة "حيط الغراب"، وهي منطقة الصناعات المعروفة بـ EOG، الشارع الرئيسي والمدينة السكنية الشرقية، في محاولة لربط كل من النهاية الشمالية الشرقية بالنهاية الجنوبية الشرقية لمدينة "حيط الغراب". وأسفرت أعمال الحفائر في شرق الشارع الرئيسي عن اكتشاف حائط الحد الشرقي، كذلك اكتشاف الحائط الفاصل بين منطقة الصناعات EOG وبين المدينة السكنية الشرقية. وإلى الغرب من هذا تم الكشف عن الامتداد الشرقي من الحائط الشمالي للشارع الجنوبي، والذي يُعتقد أنه قد مثّل في الوقت ذاته الحد الشمالي لمنطقة الصناعات EOG.

وتشير الدلائل الأثرية أنه تم إزالة أجزاء من الحائط الشمالي وتم بناء نحو تسعة
مقاعد من الحجر الجيري في صف واحد، ويوجد أسفل كل قاعدة حفرة دائرية
كل صغيرة المقاس وضحلة العمق، يعتقد أنها كانت أواني فخارية. ويُعد هذا
ببر دليلاً على عملية توسعة حدثت لمنطقة الصناعات EOG ناحية الشمال. كما أسفرت
الحفائر موسمي 2006، 2007 في منطقة MSE عن وجود شارع فرعي يمتد من
شمال إلى الجنوب ليربط المبنى الإداري الملكي المعروف اصطلاحاً بـ RAB بالناحية
جنوبية. هذا وتم تحديد المراحل الزمنية التي مر بها مخبز D-EOG بعد دراسة
بقات الأثرية الخاصة به إلى أربعة عشر مرحلة مختلفة.

وجدير بالذكر أن فريق العمل قام بدراسة ومقارنة هذه القواعد التسعة عشر المعروفة
Pedestal عند الإعداد لكتابة هذا المقال وقد أفرزت أعمال الدراسة والمقارنة عن التشابه
ير الذي وصل إلى حد التطابق لكل أنواع القواعد التي تم اكتشافها داخل مدينة "حيط
اب" والتي كان أكبرها المجموعة الموجودة فيما يعرف Pedestal Building بمنطقة AA.
قام فريق العمل بمقارنة هذه القواعد بمثيلاتها خارج محيط مدينة "حيط الغراب".
ييراً فإن التصور الأولي يُصنف هذه القواعد إلى نوعين، ارتبط النوع الأول بالمشاريع
باني الحكومية، بينما وجد النوع الثاني داخل المنازل، ولكن كلا النوعين اشتركا في
فة واحدة، ألا وهي حمل أواني التخزين الكبيرة.

Arabic Abstracts, Specialist Chapters

A Report on the 2009 Burials from the Chute Area

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تقرير عن الدفنات المكتشفة في منطقة الـ Chute موسم 2009

تتناول هذه المقالة دراسة لمجموعة من الدفنات السطحية التي تم اكتشافها في منطقة chute موسم 2009. وقد تم الكشف عنها وتسجيلها بواسطة أثيريو وزارة الدولة لشئون الآثار المتحقيقين كطلبة للتدريب بمدرسة الحفائر. بلغ عدد الدفنات المكتشفة في منطقة الـ chute هذا العام نحو تسعة عشر دفنة آدمية. وجدير بالذكر أن هذه الدفنات تمثل جزء من جبانة كبيرة أقيمت على أنقاض مدينة "حيط الغراب" المؤرخة بعصر الدولة القديمة.

هذا وقد تم تأريخ هذه الدفنات بالعصر المتأخر، وذلك طبقاً لاتجاهاتها، كذلك هياكل وأشكال التوابيت التي تضمنتها. ويمكن القول أن دفنات منطقة الـ chute أحسن حالاً من ناحية درجة الحفظ وذلك بالمقارنة مع باقي الدفنات المكتشفة في أجزاء أخرى من نفس الجبانة. وعلى الرغم من ذلك فإن بقايا عظام الهياكل إلى جانب اللقائف الكتانية التي حُفظت بداخلها وجدت في حالة تحلل وتآكل كبير.

أما عن اتجاهات الدفنات محل البحث، فإنه قد عُثر عليها ممتدة من الشرق إلى الغرب في وضع الانبطاح، كما كانت رأس كل دفنه تميل ناحية الغرب، في حين كان كل ذراع مُمتد بجانب النصف العلوي للمومياء وينتهي بوضع اليدين أعلى منطقة الحوض. ويجب الإشارة إلى أنه على الرغم من وجود بعض الأدلة الواضحة على تحنيط هذه المومياوات، إلا أنه الوضع الذي وجد عليه بعض مومياوات هذه الدفنات يؤكد على أنه قد تم لفة بإحكام قبل وضعه في التابوت.

هذا وقد اكتشفت البعثة أن التوابيت التي احتوت نحو 68% دفنات منطقة الـ chute "ما يقرب من الثلثين" كانت في حالة سيئة جداً. وبدراسة هذه التوابيت تبين أنه قد جاءت ثمانية منها على الهيئة الأدمية، كما تبين أنه قد احتفظت توابيت 76% من هذه الدفنات "عشرة دفنات" ببقايا بعض الزخارف المرسومة على أسطحها الخارجية. هذه وتضمنت زخارف خمسة من هذه التوابيت العشرة رسومات لأقنعة آدمية وشعر مستعار مطابقة تماماً لزخارف العصر المتأخر، أما عن الثلاثة توابيت الأخرى والتي لا تحتوي على أية زخارف فإنه يُرجح السبب في ذلك إلى عوامل الزمن.

وتكونت التوابيت الأكثر اتقاناً في صناعتها من تابوت خارجي مستطيل الشكل في هيئة آدمية لها قناع وشعر مستعار، كما يُزين جانبيه رسومات لعملية التحنيط. وتجدر الإشارة إلى أن هناك ستة دفنات احتوت على مقتنيات أثرية خاصة بالمتوفى. فعلى سبيل المثال عُثر مع دفنة لطفل صغير على عدد كبير من اللقى الأثرية التي تضمنت أقراط من

نحاس, أساور من صدف, عقيق أحمر, خرز من الفيانس, كذلك تميمة من العقيق على شكل المعبودة "واجيت".

عشرين دفنة, اكتشف فريق العمل أن واحدة فقط من هذه الدفنات كان لها تابوتين خارجيين, ويبدو أن السبب في ذلك يرجع إلى عدم الدقة في عملية التحنيط ورداءتها. جاءت النتيجة المبدئية لدراسة هذه الدفنات أنها تكونت من دفنتين لطفلين رضع, ثلاثة دفنات لأطفال, ثلاثة دفنات لمراهقين, خمسة دفنات لأناس في مرحلة الشباب, خمسة دفنات أخرى لبالغين ودفنة واحدة لرجل كبير السن. كما أظهرت الدراسة أن دفنات هذه المجموعة تضمنت سبعة هياكل نسائية وأربعة فقط لرجال, كما أنه صعب على فريق العمل تحديد جنس عدد ستة من دفنات هذه المجموعة نظراً لصغر السن. وأكدت نتائج التحليل والدراسة لهياكل هذه المجموعة أن هناك أدلة توضح أن عدد سبعة منهم (بنسبة 37%) كانوا قد حملوا نفس الأمراض. فعلى سبيل المثال اتضح أن هناك أربعة هياكل (نحو 21%) كانوا أصحابها من مرضى الـ trauma, كما حملت أربعة هياكل أخرى مرض الـ Periostitis. وأوضحت نفس الدراسة أن نحو سبعة هياكل (أي ما يمثل 37% من دفنات هذه المجموعة) يبدو أن أصحابها كانوا من مرضى healed or active cribia orbitalia and/or porotic hyperostosis, وأخيراً فإنه طبقاً لنفس الدراسة فإن نحو سبعة هياكل أخرى كان قد انتاب أصحابها بعض المشاكل الصحية في الأسنان.

A Report on the Faunal Remains from the AA Bakery

Rasha Nasr Abd el-Mageed

تقرير عن بقايا العظام الحيوانية المكتشفة خلال أعمال الحفائر بمخبز AA.

تختص هذه المقالة بعرض نتائج الدراسة لما عُثر عليه من بقايا عظام حيوانية في منطقة مخبز الـ AA, والذي تم حفره موسم 2006-2007 كجزء من أعمال مدرسة الحفائر التي قام بها مفتشي الآثار العاملين بوزارة الدولة لشئون الآثار. وهدفت هذه الدراسة إلى مقارنة بقايا العظام الحيوانية المكتشفة في منطقة المخبز سابق الذكر بما عُثر عليه من عظام حيوانية أخرى في مدينة "حيط الغراب" لمعرفة الغذاء الرئيسي وما كان يأكله ساكني هذه المنطقة, وذلك بدراسة مخلفاتهم التي تركوها داخل وبجوار المخبز.

قام فريق العمل بدراسة نحو 10342 عظمة من العظام المكتشفة, تضمنت هذه المجموعة نحو 9908 من عظام الثدييات, 125 من بقايا عظام الطيور ونحو 309 من كسرات عظام الأسماك, وكانت جميعها في حالة حفظ جيدة. ويلاحظ القارئ من عرض نسبة العظام المكتشفة هنا أن عظام الثدييات قد مثلت نحو 96% من مجموع العظام محل الدراسة وهو

أمر مطابق تماماً لما تم دراسته من عظام حيوانية في معظم أجزاء مدينة "حيط الغراب".

أوضحت دراسة بقايا عظام الأسماك أنه قد حلّ في المرتبة الأولى من حيث الانتشار سمك الـ Nile catfish تلاه سمك Schall ثم سمك Nile Perch. ويبدو أن كل من سمك الـ Nile catfish و Schall كانا السمك المفضل في غذاء السكان، حيث مثّلت عظامهما معاً نسبة 48% من مجموع عظام السمك المكتشف، في حين مثّلت بقايا عظام سمك Nile catfish وهو معروف بقلّة جودته الغذائية نسبة 34%.

وجديرٌ بالذكر، أنه بمقارنة بقايا العظام الحيوانية المكتشفة في مخبز AA، بثلاثة مناطق فرعية داخل مدينة "حيط الغراب" وهي (المبنى الإداري الملكي، عنبر 4/3 وتل الفخار)، تبين أن السكان الذين كانوا يلقون مخلفاتهم بجانب مخبز AA- أي سكان المنطقة، كانوا أغنى وأحسن حالاً من قاطني المناطق الثلاثة محل المقارنة. وبدراسة عظام الثدييات تبين أنه مثّلت عظام الماشية النسبة الأكبر، تلاها عظام الأغنام والماعز ثم عظام الخنازير وجاءت نسبة عظام الغزال في المرتبة الأخيرة من خلال تمثيلها بعظمة واحدة. كما أوضحت الدراسة ذاتها أن الماشية المدروس عظامها في هذه المقالة تنتمي إلى سلالة الحيوانات المستأنسة، وأنه قد تم ذبحها للأكل في سن صغير جداً، قبل أن تستكمل عامها الأول، أي قبل اثنتي عشر شهراً. وتشير الدلائل أن أعمار ما تم ذبحه من أغنام وماعز تراوح بين السنة والسنتين. وقد اعتبر أن كل من الماشية بجانب الأغنام والماعز هما المصدر الرئيسي لوجبة اللحوم لسكان هذه المنطقة. وكانت النسبة بين لحوم الماشية على لحوم الأغنام والماعز 15.5:1 وهو ما يوضح أن سكان منطقة AA كانوا غالباً ما يأكلون اللحوم الحمراء عن غيرها.

وأوضحت الدراسة أيضاً أن هناك اختلاف كبير في بين الأجزاء الأقل كثافة في كمية اللحوم في عظام الثدييات محل الدراسة، حيث أنها جاءت على نحو 73% في عظام الماشية، 51% في عظام الأغنام والماعز و 33% في عظام الخنازير. هذا وقد وصل المتخصصين إلى أنه هناك ما يُرجح أن لحوم الخنازير كانت يتم جلبها من خارج المنطقة، أي أن عملية الذبح كانت تتم بعيداً عن منطقة AA. كما تشير المعلومات إلى أن الأهالي الذين كانوا يلقون مخلفاتهم من الأطعمة كانوا من عليّة القوم قاطني مدينة "حيط الغراب". وفي النهاية فإن النتيجة النهائية تشبه إلى حد كبير نتيجة دراسة بقايا العظام الحيوانية التي تم استخراجها من "تل الفخار".

A Report on the Khentkawes Town-House E Archaeobotanical Remains

Mary Anne Murray and Rebab el-Gendy

تقرير عن بقايا النباتات الأثرية المكتشفة خلال أعمال الحفائر بالمنزل رقم E بمدينة الملكة "خنتكاوس".

تعرض هذه المقالة نتائج الدراسة والتحليل لعينات من بقايا النباتات الأثرية التي تم استخراجها خلال أعمال الحفائر التي تمت في "منزل رقم E" في مدينة الملكة "خنتكاوس". قام فريق العمل بتحليل نحو ثمانية عينات من بقايا النباتات الأثرية تم استخراجها من خمس حجرات داخلية من المنزل سابق الذكر، وقد تضمنت هذه الحجرات كل من المطبخ وغرفة الصوامع "التخزين". وهدفت هذه الدراسة الوصول إلى حقائق مؤكدة عن طبيعة الاقتصاد والبيئة الزراعية خلال الدولة القديمة، كذلك معرفة أنواع الغذاء والوقود الذي استخدمه سكان هذا المنزل خلال حياتهم.

وقامت الدراسة على تحليل نحو 14,101 عنصر من بقايا هذه النباتات، وأسفرت النتائج عن اكتشاف كميات من الحبوب المتفحمة، والتي تضمنت "قمح وشعير"، كذلك اكتشاف كميات من البقوليات والتي تضمنت "عدس، فاصوليا وأنواع أخرى"، كما تضمنت هذه العينات بذور لبعض الفاكهة كالـ "عنب وتين"، وأسفرت النتائج أيضا عن اكتشاف بقايا لعدد من النباتات والأعشاب البرية والفحم وبعض بقايا روث حيوانات.

وبمقارنة بقايا النباتات الأثرية المكتشفة في منزل E، بمناطق أخرى داخل كل مدينة الملكة "خنتكاوس" ومدينة "حيط الغراب"، تبين لفريق العمل أن العينات المستخرجة من منزل E كانت أعلى كثافة في نسبة النباتات، كذلك في تعدد أنواعها. هذا وقد وصل المتخصصين بعد فحص وتحليل هذه العينات إلى ما يشير أن هذه البقايا هي نتاج لمخلفات النباتات في حالتها الكاملة أي أنها من الفضلات والبقايا الناتجة عن استخدام ثمار وبذور النبات، حيث مثلت العناصر الغذائية نحو 6% فقط من النسبة الكلية لهذه العينات في حين مثل القشر والحبوب البرية نحو 96% منها.

كما أظهرت نتائج الدراسة أن الفحم والبوص كانا الوقود الرئيسي لسكان هذه المنزل، هذا بجانب استخدام روث الحيوانات كوقود في بعض الأحيان. وتشير بعض الدلائل من خلال التحليل والدراسة أن كان يتم حصاد نسبة كبيرة من هذه النباتات في فصل الربيع، كما أن نوعية هذه النباتات كانت تنمو في بيئة رطبة، وهو ما يذهب إلى القول بأنه كان يتم حصادها من ضفاف الترغ والقنوات.

A Study on the Ceramics from the Main Street East Area

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دراسة للفخار المكتشف ضمن أعمال الحفائر بمنطقة الشارع الرئيسي MSE.

تتناول هذه المقالة دراسة للفخار المكتشف من منطقة "شرق الشارع الرئيسي" (MSE) وذلك خلال أعمال الحفائر التي تمت موسم 2007. وقد أوضحت هذه الدراسة أن السواد الأعظم من الفخار محل الدراسة يؤرخ بالنصف الثاني من عصر الأسرة الرابعة، في حين يوجد عدد قليل جداً لبعض كسرات الفخار التي تعود إلى عصر الأسرة الخامسة. وجدير بالذكر، أن هذه النتيجة تتطابق مع تأريخ معظم ما تم دراسته من الفخار في جميع أجزاء مدينة "حيط الغراب"، كما أنه تم العثور على ثلاثة كسرات فخار من عصر حضارة بوتو-المعادي.

قامت الدراسة المذكورة هنا بفحص وتحليل نحو 5,133 قطعة فخار. وقد قام فريق العمل باستحداث طريقة جديدة لعرض نتائج الفرز والتصنيف، حيث تم تقسيم المجموعة محل الدراسة كلها إلى أربعة أصناف عامة هي: أواني مفتوحة، أواني مغلقة، non containers و أواني طقسية صغيرة الحجم. وخرجت نتائج الدراسة بأن كسرات قوالب الخبز كانت الأكثر شيوعاً حيث مثّلت نحو 32.47% من إجمالي العدد محل الدراسة، ومثّلت السلطانيات ذات الحافة البيضاء نسبة 12.49%، ومثّلت حوامل الأواني 12.41%، في حين بلغت نسبة أواني البيرة نسبة 9.30% وشكلت السلطانيات ذات الحافة الداخلية 7.13%، وأطباق الخبز 4.49%، وأواني التخزين نحو 4.32%، السلطانيات ذات الجوانب البسيطة نحو 3.43%، السلطانيات ذات الحافة الحمراء نحو 2.27%، ومثّلت الأواني الطقسية الصغيرة نسبة 1.01%، في حين شكلت الأطباق ذات الملمس الخشن نحو 0.84%، ومثّلت الأطباق الكبيرة نسبة 0.68% وأخيراً فقد شكّلت المواجير نحو 0.47% والأغطية نسبة 0.13%.

كما اتضح للقائمين بعملية الدراسة والتحليل أن طمي النيل كان المادة الأكثر استخداماً في صناعة الفخار محل الدراسة، تلاه في ذلك الطفلة، كما عُثر على إناء واحد فقط مصنوع من خليط المادتين معاً. ويُعتقد أن الأواني المصنوعة من الطفلة أو من خليط الطفلة مع طمي النيل قد استوردت من خارج مدينة "حيط الغراب". وأخيراً فقد أفرزت نتائج البحث والدراسة لفريق العمل أن صانع الفخار في هذه المنطقة استخدم في صناعته طريقتين رئيسيتين هما الطريقة اليدوية أو باستخدام عجلة الفخاراني، وفي بعض الأحيان استخدم الطريقتين معاً في صناعة إناء واحد.

The AERA-ARCE Field School in Context

Ana Tavares

منظومة مدرسة الحفائر التابعة لـ AERA-ARCE (عرض لبرامج التدريب والتعلم)

يُقدم هذا الفصل لعملية نشر نتائج مدارس الحفائر المشتركة بين AERA-ARCE. فقد نظمت AERA مع ARCE عدد تسعة مدارس حفائر، في حين نظمت AERA وحدها مدرستين وذلك منذ عام 2005. هذا وقد خُصصت هذه المدارس لتدريب مفتشي الآثار العاملين بوزارة الدولة لشئون الآثار، الذين حضروا التدريب كطلبة تحت إشراف مدرسين.

وتضمن برنامج AERA إقامة سلسلة متدرجة من مدارس الحفائر بدأت بمدارس للمبتدئين، ثم مدارس تخصصية، فمدارس للتدريب على حفائر الإنقاذ وأخيراً مدارس للتدريب على النشر العلمي. أشتمل برنامج مدارس المبتدئين على تدريب طلبة مدارس الحفائر طرق الحفائر العلمية من خلال التدريب على مهارات الحفر، وطرق التسجيل المختلفة بالكتابة والرسم، وكذا أعمال المسح الأثري، ومهارات التصوير، بجانب كيفية جمع اللقى الأثرية وأخذ العينات الأثرية، وأخيراً التدريب على كيفية كتابة التقارير المبدئية. وجدير بالذكر، أنه قد تضمن برامج مدارس المبتدئين أيضاً على إعطاء مقدمات ومعلومات أولية للآثرين الطلبة عن كيفية حفر وتسجيل الدفنات، الفخار الأثري، بقايا العظام الحيوانية، بقايا النباتات الأثرية، الطران، الرسم الأثري، الإسعافات الأولية و الترميم.

أما في المدارس التخصصية فقد أصبح لكل متدرب من مفتشي وزارة الدولة لشئون الآثار مجال واحد للتخصص وهي، الحفائر، العظام البشرية، المسح الأثري، الفخار أو الرسم الأثري.

هذا وقد أقيمت مدرستي الإنقاذ في منطقة الأقصر بناءً على طلب من وزارة الآثار للمساعدة على وجه السرعة، حيث تم خلالهما تدريب الطلبة الملتحقين على أعمال الحفائر والتسجيل. وفي النهاية جاءت مدرسة النشر العلمي لتنتهي وتكتمل بها سلسلة مدارسنا بالتدريب على أساليب الكتابة العلمية ونشر أعمال الحفائر. وجدير بالذكر، أن هذا الكتاب يتضمن نشر علمي لعدد من مقالات مدرسة النشر العلمي في 2010، حيث أنه يحتوي على ثلاثة مقالات عن أعمال حفائر، وأربعة مقالات تخصصية.

بدأت مجموعة الحفائر كتابة تقاريرها بجمع المعلومات الأولية والتقارير المبدئية والصور الفوتوغرافية لمواقع الحفائر المراد نشرها وذلك من سجلات البعثة. وجاءت الخطوة الثانية في عمل تصور وهيكل عام للمقالة، وبدأت عملية الكتابة الفعلية بعناصر تضمنت نبذة

عن طريقة الحفائر، الهدف والغرض من حفر كل الموقع المذكور بالمقالة، ثم الحديث عن أثرية الموقع نفسه، تأريخه، وظيفته، مع مقارنته مع أماكن أخرى مشابهة له في خصائصه الأثرية من داخل مدينة "حيط الغراب"، ومقارنته ببعض المواقع الأثرية المشابهة له أيضاً من خارج مدينة "حيط الغراب" إن أمكن ذلك.

تمثلت وظيفة فريق الرسم الأثري في إعداد الخرائط، الرسوم الأثرية، الصور الفوتوغرافية المستخدمة في المقالات المختلفة. أما دور متخصصي الفخار فقد كان القيام بدراسة كمية كبيرة من الفخار المستخرج من منطقة "شرق الشارع الرئيسي" (MSE)، حيث بدعوا عملهم بغسل الفخار محل الدراسة، ثم تجميعه طبقاً لمادة الصناعة، لتبدأ عملية التصنيف فوصف وتحديد طريقة معالجة السطح. وأنهى فريق عمل الفخار دراسته بعمل كتالوج وكتابة تقرير مفصل عن الفخار. قام المجموعة المتخصصة بدراسة بقايا العظام البشرية بدراسة وتحليل نحو تسعة عشر دفنة، حيث كانت عملية التحليل والدراسة داخل معمل خاص، وذلك لتحديد جنس وعمر صاحب كل هيكل، كذا تسجيل المقاسات.

وخلال مدرسة النشر العلمي في 2010 تم تدريب مفتشة الآثار رشا نصر عبد المجيد على أساسيات علم بقايا العظام الحيوانية، وتضمنت برنامج التدريب على معرفة بقايا العظام الحيوانية، قياس وتحديد كميات عينات العظام محل الدراسة، تقدير أعمار وتحديد جنس بقايا هذه العظام، بالإضافة إلى تسجيلها. وجدير بالذكر أن المقالة الخاصة بعظام الحيوانات في مخبز AA هي نتاج خالص لدراساتها وتحليلها أثناء فترة التدريب بالمدرسة.

وكما تم تدريب مفتشة الآثار رشا نصر لتصبح متخصصة في مجال دراسة بقايا العظام الحيوانية، تم تدريب مفتشة أخرى على دراسة بقايا النباتات الأثرية وهي رحاب الجندي، حيث تضمنت فترة تدريبها على كيفية استخدام جهاز التعويم بالماء لتنقية العينات محل الدراسة من الشوائب، ثم استخدام الميكروسكوب لتحديد نوع النبات وعائلته واسمه.